

D4 CHANNEL BANK OR SLC[®] 96 CARRIER SYSTEM TERMINAL AHG18 AND AHG28 BRITE II CHANNEL UNITS FOR ISDN APPLICATIONS INSTALLATION AND TESTING

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1. OVERVIEW

1.01 This practice contains installation and testing procedures for the AHG18 and AHG28 basic rate interface transmission extension second generation (BRITE II) channel units for D4 channel bank and SLC 96 carrier system terminal. It is intended for the technician as an aid to properly set the options in the BRITE II channel unit(s), to install the unit(s), to perform acceptance tests or verify certain requirements of the Integrated Services Digital Network (ISDN) circuit, and to locate and clear trouble at the BRITE II channel unit level. Although the BRITE II channel units are compatible with any digital switch that complies with T1.601-1988 American National Standard Institute (ANSI) U-interface, this practice considers the 5ESS switch as the serving switch. Therefore, some procedures in this practice may not be applicable to other types of serving switches. This practice also describes some of the BRITE II channel unit applications and general prerequisites for ISDN applications.

1.02 When this practice is reissued, the reason for reissue will be listed in this paragraph.

1.03 This practice contains admonishments in the form of **DANGERS, WARNINGS, and CAUTIONS.**

1.04 Technical assistance can be obtained by calling the Regional Technical Assistance Center (RTAC) at 1-800-225-RTAC. This telephone number is staffed 24 hours per day.

2. BRITE II CHANNEL UNITS APPLICATIONS

2.01 The BRITE II channel units (AHG18 and AHG28) are used to transport ISDN services to remote customers of a digital switch. The AHG18 interfaces between the serving switch and the DS1 line facility and functions as a network termination unit. The AHG28 interfaces between the customer premises equipment and the DS1 facility and functions as a line termination unit. The serving switch can be a 5ESS switch using Generic 5E6 or later software or another digital switch compatible with T1.601-1988 ANSI U-interface. The interface equipment used at the customer location is a network termination 1 (NT1U-200). Figure 1 shows typical ISDN applications using BRITE II channel units including SLC series 5 AUA93 BRITE II units. The BRITE II channel units can also be used in tandem as shown in Figure 1.

3. ISDN SERVICE PREREQUISITES

A. OVERVIEW

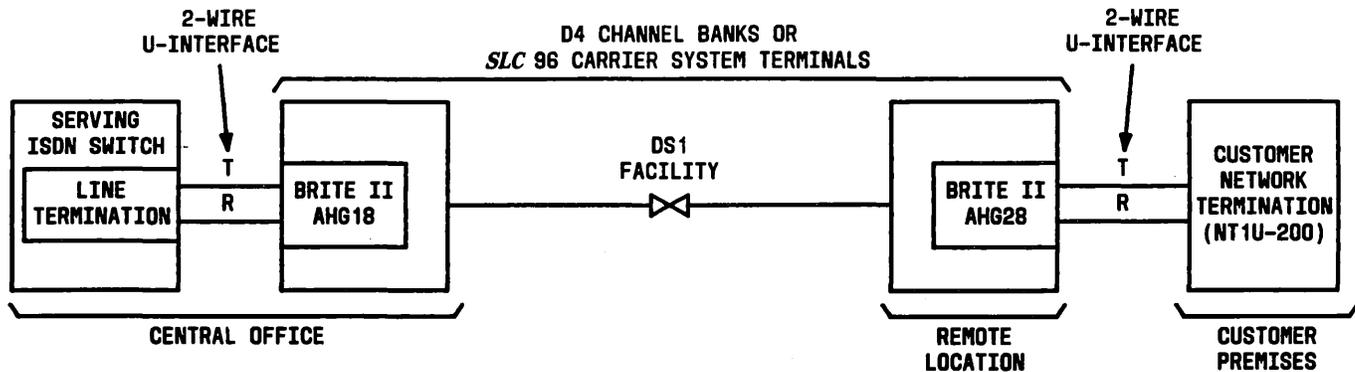
3.01 Before a BRITE II channel unit can be used to transport ISDN service to remote locations from the serving switch, several prerequisites must be met. The prerequisites are divided into three areas as follows:

- Serving switch
- Transmission equipment
- Customer-premises equipment.

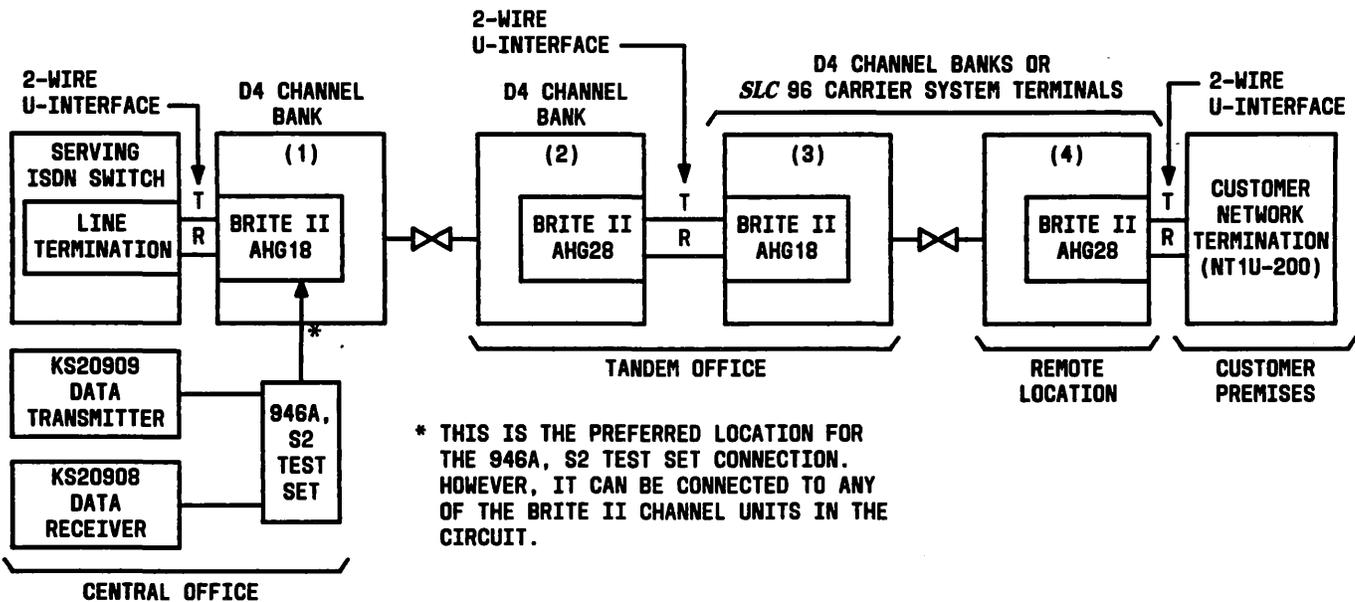
B. AT THE SERVING SWITCH

3.02 ISDN service prerequisites at the serving switch are as follows:

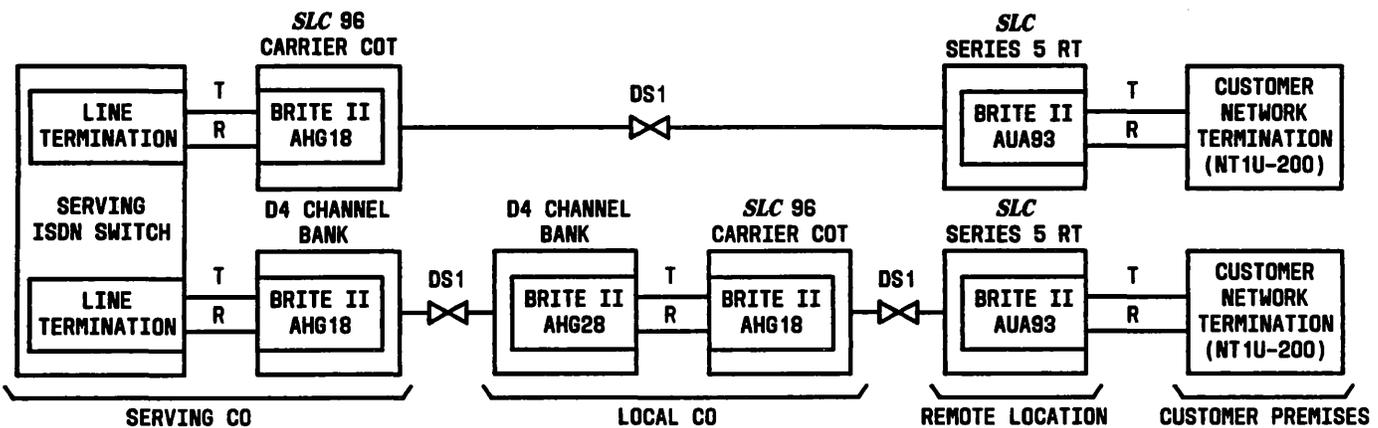
- A line termination unit (**not an AHG28 channel unit**) must be installed in the serving switch and made available for service. For example, an integrated services line unit (ISLU) card or remote integrated services line unit (RISLU) card must be installed in the 5ESS switch and made available for service.



A. TYPICAL ISDN APPLICATION USING BRITE II CHANNEL UNITS



B. TYPICAL ISDN APPLICATION USING BRITE II CHANNEL UNITS WITH TANDEM UNITS



C. TYPICAL ISDN APPLICATIONS USING SLC SERIES 5

Figure 1 — ISDN Applications Using the BRITE II Channel Unit

- Tip and ring cable from the switch must be connected at the distribution frame where the D4 channel bank or *SLC 96* carrier terminal tip and ring cable terminates. (The polarity of tip and ring is not an issue with BRITE II channel units.)
- The proper switch translations for the line must be administered. For the *5ESS* switch, translations are made using the proper switch generic software release (5E6 or later) translations data and the *5ESS* Switch Translations Guide (TG-5).
- The B-channel assignments (voice or data) must be made according to the engineering work order, facilities work order, circuit/service order, Work Order Record and Details (WORD) document, or other type of document that specifies the service.
- **A common timing source must be used by the switch and transmission equipment so that synchronization will exist throughout the ISDN circuit.** Composite clock (64 kHz) must be used to time the transmission equipment. A suggested timing and synchronization method used in a typical application is shown in Figure 2. Other methods may be used to obtain a common timing source to synchronize the ISDN circuit(s).

3.03 As shown in Figure 2, the *5ESS* switch receives the clock source from the DS1 facility. The DS1 output is taken to the DSX terminating field where the synchronization distribution expanders (SDEs) in Office A and Office B extract timing from the DS1 facility and then generate the composite clock. The SDEs distribute the 64-kHz composite clock to the D4 channel banks or *SLC 96* carrier central office terminals in both offices. The remote channel bank is usually loop timed but it can be externally timed to the same composite clock if it is available at the remote location. A *SLC 96* carrier remote terminal is always loop timed.

C. AT THE TRANSMISSION EQUIPMENT

3.04 The transmission equipment provides connectivity between the serving switch and the NT1U-200 equipment and transports the ISDN service to remote customers of the switch.

3.05 The requirements for the transmission equipment to transport the services are as follows:

- The tip and ring cable from the transmission equipment must be connected to the appropriate distribution frame or cross-connect blocks. (Connection to the serving switch must exist but tip and ring polarity is not important.)
- Transmission path continuity must exist from the switch to the NT1U-200 equipment. —
- D4 channel bank(s) and/or *SLC 96* carrier terminal(s) must be properly timed and synchronized using the same clock source that provides timing to the serving switch.
- The appropriate BRITE II channel units must be properly optioned and installed into the D4 channel bank or *SLC 96* carrier terminal for each ISDN circuit.
- The B and D channels must be properly optioned according to the engineering work order, facilities work order, circuit/service order, WORD document, or other type of document that specifies the service.
- Proper counting sequence and time-slot alignment for the channel assignment must exist. The 2B+D channel services uses a 3-slot format on the DS1 facility. The first time slot carries the B1 channel, the second time slot (D+) carries the D channel and other channels (used for maintenance purposes, path performance monitoring, etc.), and the third time slot carries the B2 channel. In B1+D or B2+D channel services, the first time slot carries the B1 or B2 channel and the second time slot (D+) carries the D channel. With D-only channel services, the first time slot (D+) carries the D channel.

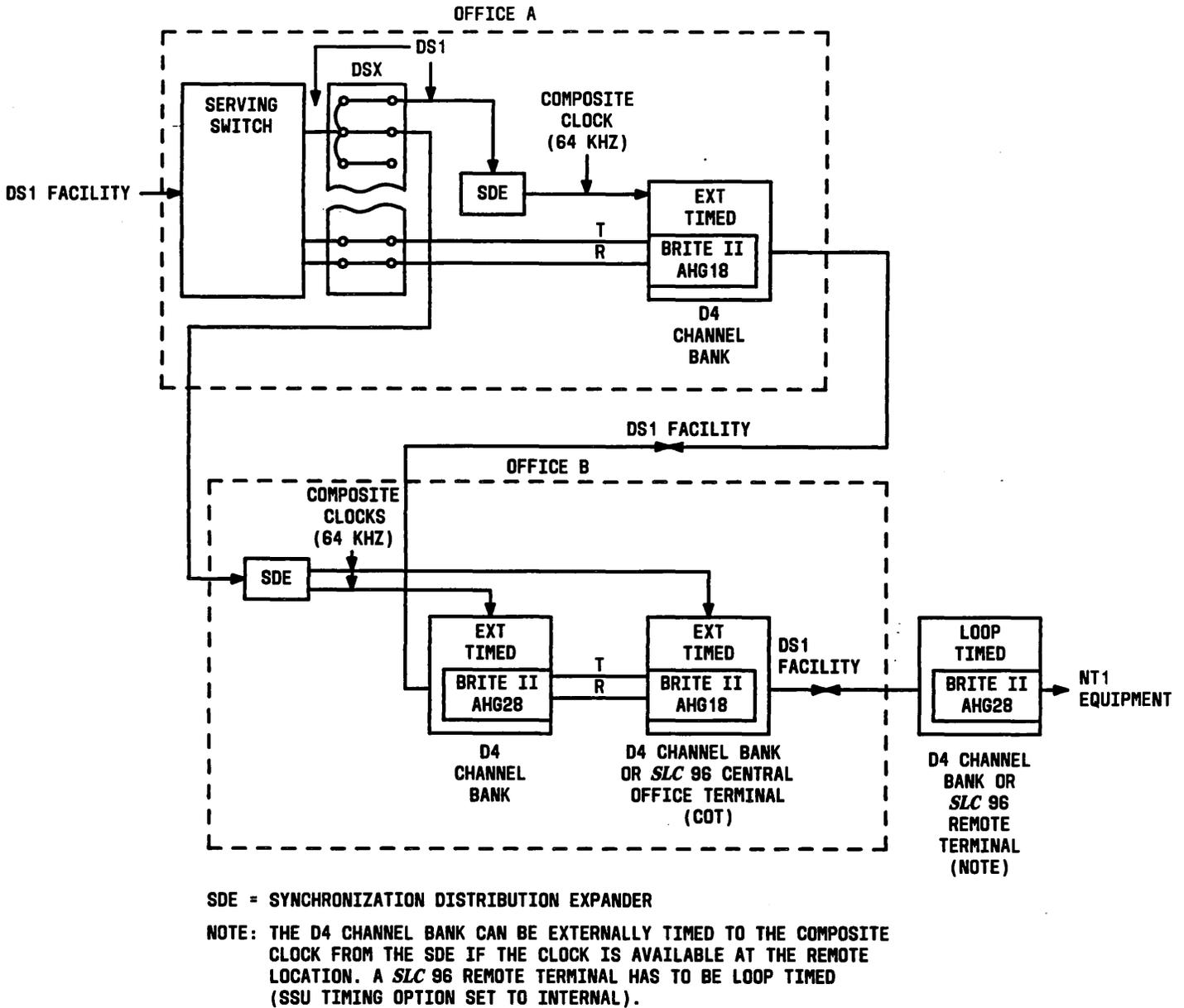


Figure 2—Suggested Methods of Timing and Synchronization for ISDN Circuits

3.06 If a Digital Access Cross-Connect System (DACS) is in the ISDN circuit, time slot placement is very important for the B and D channels. The order in which the time slots enter the DACS must be the same when leaving the DACS. DACS must also be configured for clear channel operation.

Service and Power Consumption Restrictions and Limitations

3.07 There are restrictions and limitations to consider when equipping a D4 channel bank or SLC 96 carrier terminal with BRITE II channel units and/or when mixing BRITE II and other types of channel units in the same D4 channel bank or SLC 96 carrier terminal. These restrictions and limitations are based on the type of service used and other considerations. The following guidelines may be used to determine channel unit placement using BRITE II channel units with or without other types of channel units.

3.08 *Service restrictions and limitations* are as follows:

- A BRITE II channel unit occupies one physical channel slot, but up to three slots may be required depending on type of service. 2B+D channel service requires three time slots and B1+D or B2+D channel service requires two time slots. D-only channel service requires one time slot.
- BRITE II channel units should not be mixed with program channel units in the same D4 channel bank or SLC 96 carrier terminal.
- The type of mode and counting sequence should be considered for SLC 96 carrier system terminals. Mode 1 D1D channel counting assigns two time slots to the same physical channel slot and with 2B+D channel service, either one time slot or two time slots from the adjacent physical channel slot are required.

3.09 See Figure 3 for physical channel and time slot deployment restrictions in a D4 channel bank or a SLC 96 carrier terminal using BRITE II channel units. Table A lists physical channel slots that cannot contain BRITE II channel units for each type of channel service provided.

3.10 In an ISDN circuit that includes a subscriber loop interface module (SLIM) before the SLC 96 carrier system remote terminal, the physical channel slot designation strips on the remote terminal requires restenciling. The order of the channel slot numbers depends upon the type of channel counting used. Refer to AT&T 363-203-100 to properly restencil the physical channel slots.

3.11 In some applications a SLC 96 carrier system terminal may emulate a D4 channel bank by using an F-62115 data link unit (DLU). This allows a SLC 96 carrier system terminal configured for Mode 3 to directly interface to a D4 channel bank without requiring a SLIM. In this configuration, certain common units must be optioned appropriately. Refer to AT&T 363-005-047 for proper optioning information.

3.12 *Power consumption restrictions and limitations* are as follows:

- BRITE II channel units do not have power consumption restrictions. However, they should not be mixed with J98726DB-1 L1, L2, or L3 dataport OCUs (office channel units) in the same D4 channel bank or SLC 96 carrier terminal.
- Each BRITE II channel unit requires 0.3 watts of power from the power unit (PU) and 1.8 watts from the -48 volt source.
- All the message, special service, and later vintage dataport channel units require from 0.5 to 1.5 watts of power each. One exception is the J98726DP-1, L1 DSU II V.35 dataport which requires 2.4 watts of power. Therefore, when equipping either the D4 channel bank or SLC 96 carrier terminal with a mixture of BRITE II channel units and other types of channel units, the total power drain should not exceed the power capacity of 44 watts for each 325A PU or WP74 PU.
- Schematic diagram (SD-3C304-02) lists the current drain by voltage for each channel unit for the D4 channel bank and most of the channel units used in the SLC 96 carrier terminal. SD-97770-01/02 lists current drains of other channel units used in the SLC 96 carrier terminal. These schematic diagrams can be used to calculate power consumption for most of the channel units and thus determine the maximum wattage required for a given mixture of BRITE II channel units and other type channel units.

PHYSICAL AND TIME SLOTS →	1	2	3	4	5	6	7	8	9	10	11	12
	13	14	15	16	17	18	19	20	21	22	*	*
												†

D4 BANK - D4 CHANNEL COUNTING
(SEE NOTE 1)

PHYSICAL SLOTS →	1	2	3	4	5	6	7	8	9	10	11	12
TIME SLOTS →	1	5	9	13	17	21	2	6	10	14	18	22
	3	7	11	15	19	*	4	8	12	16	20	*
						23						24

SLC 96 CARRIER MODE I TERMINAL - D1D CHANNEL COUNTING
(SEE NOTE 2)

PHYSICAL SLOTS →	1	2	3	4	5	6	7	8	9	10	11	12
TIME SLOTS →	1	3	5	7	9	11	13	15	17	19	*	*
												†
TIME SLOTS →	2	4	6	8	10	12	14	16	18	20	*	*
												†
PHYSICAL SLOTS →	13	14	15	16	17	18	19	20	21	22	23	24

D4 BANK - D1D CHANNEL COUNTING
AND
SLC 96 CARRIER MODE III TERMINAL - D4 CHANNEL COUNTING
(SEE NOTE 1)

PHYSICAL SLOTS →	1	2	3	4	5	6	7	8	9	10	11	12
TIME SLOTS →	3	7	11	15	*	*	4	8	12	16	*	*
					19	23						†
					†							
TIME SLOTS →	1	5	9	13	*	*	2	6	10	14	*	*
					17	21						†
					†							
PHYSICAL SLOTS →	13	14	15	16	17	18	19	20	21	22	23	24

SLC 96 CARRIER MODE III TERMINAL - D1D CHANNEL COUNTING
(SEE NOTE 1)

NOTES:

1. IF 2B+D CHANNEL SERVICE IS USED, THE TWO ADJACENT PHYSICAL SLOTS (NOT TIME SLOTS) TO THE RIGHT OF THE SLOT OCCUPIED BY THE BRITE CHANNEL UNIT MUST BE VACANT. IF B1+D OR B2+D CHANNEL SERVICE IS USED, THE NEXT ADJACENT PHYSICAL SLOT TO THE RIGHT OF THE SLOT OCCUPIED BY THE BRITE CHANNEL UNIT MUST BE VACANT.
2. IF 2B+D CHANNEL SERVICE IS USED, THREE TIME SLOTS ARE REQUIRED AND IF THE D1D COUNTING STARTS WITH THE SECOND TIME SLOT IN THE PHYSICAL SLOT OCCUPIED BY THE BRITE CHANNEL UNIT, THE NEXT ADJACENT PHYSICAL SLOT TO THE RIGHT MUST BE VACANT. B1+D OR B2+D CHANNEL SERVICE REQUIRES TWO TIME SLOTS.

* A CHANNEL UNIT WITH 2B+D SERVICE CANNOT OCCUPY THIS SLOT.
† A CHANNEL UNIT WITH B+D SERVICE CANNOT OCCUPY THIS SLOT.

Figure 3— Channel Slot Deployment Restrictions for BRITE II Channel Units

TABLE A CHANNEL SLOT RESTRICTIONS				
TYPE OF CHANNEL SERVICE BEING PROVIDED	CHANNEL UNIT SLOTS THAT CANNOT CONTAIN BRITE II UNITS			
	D4 BANK WITH D4 COUNTING	D4 BANK WITH D1D COUNTING OR SLC 96 BANK-MODE 3 WITH D4 COUNTING	SLC 96 BANK-MODE 3 WITH D1D COUNTING	SLC 96 BANK-MODE 1 WITH D1D COUNTING
D	-	-	-	-
B1+D or B2+D *	24	12, 24	6, 12, 18, 24	†
2B+D‡	23, 24	11, 12, 23, 24	5, 6, 11, 12, 17, 18, 23, 24	6, 12 **

* For B+D service, the next adjacent physical channel slot to the right of the BRITE II channel unit must be vacant except in the case of a SLC 96 terminal operating in Mode 1 with D1D counting.

† A BRITE II channel unit cannot occupy physical channel slots 6 and 12 if time slot counting starts with the second time slot in these channel slots.

‡ For 2B+D service, the next two adjacent physical channel slots to the right of the BRITE II channel unit must remain vacant except in the case of a SLC 96 carrier terminal operating in Mode 1 with D1D counting.

** A BRITE II channel unit cannot occupy a physical channel slot if another BRITE II channel unit to the left of the physical channel slot uses both time slots assigned to it (for example, physical channel slot 4 can not be used if a BRITE II channel unit installed in physical channel slot 3 uses time slots 11, 13, and 15 for 2B+D channel service).

D. CUSTOMER-PREMISES EQUIPMENT

3.13 At the customer premises, NT1 equipment, such as the NT1U-200, must connect to the tip and ring cable from the transmission equipment to complete the subscriber loop for ISDN services. The NT1U-200 provides the 2-wire to 4-wire interface for the ISDN terminals.

3.14 For the majority of ANSI standard ISDN circuits, **loop qualification** is not necessary since, statistically, about 98 per cent of all nonloaded subscriber loops can operate satisfactorily, with margin. For those circuits that fall outside the maximum cable length (18 kft of 26 gauge), the maximum total bridge tap length (6 kft), and/or the maximum DC resistance (1300 ohms), detailed loop qualification information is available in the ISDN Customer Premises Planning Guide -- AT&T 533-700-100.

4. TRANSMISSION EQUIPMENT PREPARATION

A. OVERVIEW

4.01 This part contains general information for preparing the D4 channel bank or SLC 96 carrier system terminal for ISDN service.

B. D4 CHANNEL BANK PREPARATION

4.02 Before ISDN service is provided, a service work order (circuit, service, or engineering work order), WORD document, or a similar document is prepared by the appropriate organization. One of the items that the order document will specify is the proper timing source to be used and which digroup will be used as the timing reference. An office interface unit-2 (OIU-2), OIU-4, or OIU-4A must be installed in the D4 channel bank.

Caution: *Digital service will be interrupted in a D4 channel bank if the OIU plug-in has to be removed for replacement or to change the timing option.*

4.03 The D4 channel bank must be externally timed or loop timed to a common timing source. Figure 2 shows a suggested method for timing the D4 channel bank to provide synchronization.

4.04 For loop timing, the LT option is selected on the OIU-2 or OIU-4 plug-in by positioning the white plugs in the front window on the faceplate. One plug must be installed in the LT position and another plug installed for the applicable referenced digroup (A DGP or B DGP position). With the OIU-4A, loop timing and the digroup reference are selected by turning the faceplate rotary switch to the LT A/LT B position.

4.05 External timing of the D4 channel bank requires the timing leads to be connected to the terminal strip TS8 at the top right rear of the D4 channel bank. The timing leads must connect to terminal pins 9 and 10 and the shield to terminal pin 14 per CAD 27, SD-3C304-02. After the timing leads have been connected, the OIU-2, OIU-4, or OIU-4A must be optioned for EXT timing.

C. SLC 96 CARRIER SYSTEM TERMINAL PREPARATION

4.06 An engineering work order or other similar document must be initiated to establish proper timing for the ISDN circuit. For SLC 96 carrier terminals, a special service unit (SSU), a transmission receive unit (TRU), and other common plug-in units must be installed. The SSU should be a WP2C, Series 5 or later vintage and must be optioned for external timing in a central office terminal (COT) and optioned for looped (INTERNAL) timing in a remote terminal (RT). The TRU must be a WM1D, Series 2 or later vintage.

Caution: *Digital service will be interrupted in a SLC 96 carrier terminal if the SSU plug-in has to be removed for replacement or to change the timing option.*

4.07 Procedures to select the SLC 96 carrier terminal for internal/external timing options are contained in the Detailed Level Procedures (DLPs) of AT&T 363-202-400 for central office terminals and 363-202-401 for remote terminals.

5. BRITE II CHANNEL UNIT INSTALLATION AND VERIFICATION TESTS

A. OVERVIEW

5.01 This part contains the procedures to verify continuity of connections between the 5ESS switch and transmission equipment, to install the appropriate BRITE II channel units, and to verify that the circuit is properly synchronized. Procedure 1 is a suggested method to verify that the 5ESS switch translations have been accomplished and that metallic continuity exists between the switch and the D4 channel bank or SLC 96 carrier central office terminal. Procedure 2 contains BRITE II channel unit option setting information and installation procedures. Procedure 3 contains steps to verify proper synchronization between the first D4 channel bank or SLC 96 carrier central office terminal and the 5ESS switch. Procedure 4 is a suggested method to verify the continuity of the ISDN circuit from the final (far end) D4 channel bank or SLC 96 carrier remote terminal to the 5ESS switch. Procedure 5 contains steps to test the complete ISDN circuit to insure proper operation.

B. PROCEDURE 1 -- VERIFY CONTINUITY BETWEEN FIRST D4 CHANNEL BANK OR SLC 96 CARRIER TERMINAL AND 5ESS[®] SWITCH AND VERIFY THAT SWITCH TRANSLATIONS HAVE BEEN PERFORMED

5.02 Application: This procedure contains a suggested method to verify continuity of the connections between the first D4 channel bank or SLC 96 carrier terminal and the 5ESS switch. It also contains the steps to verify that the line and ISDN terminal translations have been performed at the switch.

Apparatus Required:

- ITE 6674 test set (COMCODE 106192081) or the following apparatus:
 - 1 -- 353A power unit
 - 1 -- NT1U-200 unit
 - 1 -- ISDN terminal
 - 1 -- Modified telephone cord approximately 12 feet long or long enough to reach the top shelf of a bay. The tip and ring leads must be terminated at one end to tip and ring on a 310 plug and terminated at the other end to tip (pin 5) and ring (pin 4) on an 8-pin modular plug. See Figure 4.
 - 2 -- D8W-87 cords.
- 1 -- Channel unit extender - J98726MF (for D4 channel bank only), J1C141MF (for SLC 96 carrier terminal only), or J98726MP (for either one). The J98726MP is recommended.

STEP

PROCEDURE

1. At the D4 channel bank or SLC 96 carrier terminal, remove the BRITE II channel unit (if present) and install the channel unit extender into the channel slot. (On the J98726MP channel unit extender, set the **D4/SLC 96** carrier switch to the appropriate position). See Figure 4.
2. Are you using the ITE 6674 test set?
 - No -- Continue with Step 3.
 - Yes -- Go to Step 6.
3. Connect apparatus as shown in Figure 4.
4. Insert the 310 plug on the modified telephone cord into the **DROP T/R** jack on the channel unit extender.
5. Insert the 8-pin modular plug on the modified telephone cord into the **line** jack on the NT1U-200 unit (see Figure 4). Go to Step 7.
6. Connect the ITE 6674 test set tip and ring to the **DROP T/R** jack on the channel unit extender and connect the power unit to 115V AC outlet.

STEP	PROCEDURE
-------------	------------------

7. Go off-hook at the ISDN terminal (telephone). Do you hear dial tone?

Yes -- Continue with Step 8.

No -- Stop. The circuit is not working. The problem can be due to a lack of continuity between the 5ESS switch and the D4 channel bank or SLC 96 carrier terminal or due to no line translations at the 5ESS switch.

8. Dial the 5ESS switch BRI test line (BRITL) number. Do you hear a special tone (one burst of high tone)?

No -- Stop. The 5ESS switch translations have not been performed.

Yes -- Disconnect apparatus or ITE 6674 test set and remove the channel unit extender. Reinstall the BRITE II channel unit, if applicable.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

C. PROCEDURE 2 -- SET AHG18 OR AHG28 BRITE II CHANNEL UNIT OPTIONS AND INSTALL THE CHANNEL UNIT

5.03 Application: This procedure is used to set the options and install the AHG18 (network termination) or AHG28 (line termination) BRITE II channel unit. These steps are to be performed at either the D4 channel bank or SLC 96 carrier terminal.

STEP	PROCEDURE
-------------	------------------

1. Obtain an AHG18 or AHG28 BRITE II channel unit as specified in the circuit/service order, WORD document, or similar document.

2. Locate the option switch **S1** on the component side of the main circuit board (one of two) attached to the faceplate. Refer to Figure 5 for the AHG18 BRITE II channel unit or Figure 6 for the AHG28 BRITE II channel unit.

3. Set **S1** to match the D4 channel bank counting option or the SLC 96 carrier mode of operation by setting rocker sections **1** and **2** using Figure 5 or 6 and Table B.

4. Select the appropriate channel service by setting rocker sections **3** and **4** using Figure 5 or 6 and Table C.

5. Install the BRITE II channel unit into the channel slot as specified on the circuit/service order, WORD document, or similar document.

6. If blank cards are available, install the blank card(s) into any vacant slots that carry (2B+D) or (B+D) service. This is a safety precaution to prevent inadvertent installation of channel units into these particular channel slots. As an example, if channel slot 1 has a BRITE II channel unit installed with 2B+D service, place blank cards into channel slots 2 and 3.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

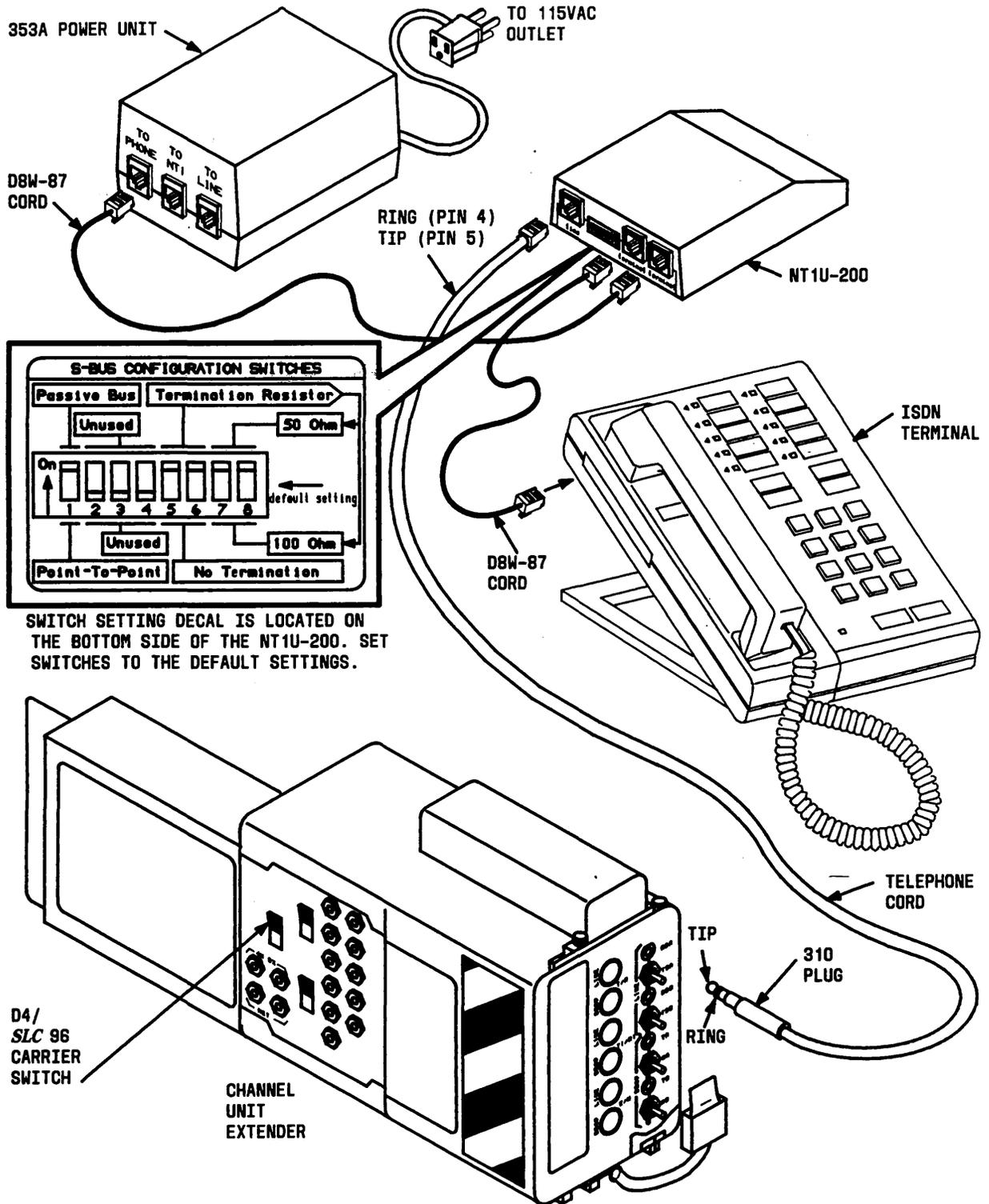


Figure 4— Apparatus Connections to Verify Continuity Between 5ESS Switch and D4 Channel Bank or SLC 96 Carrier Terminal

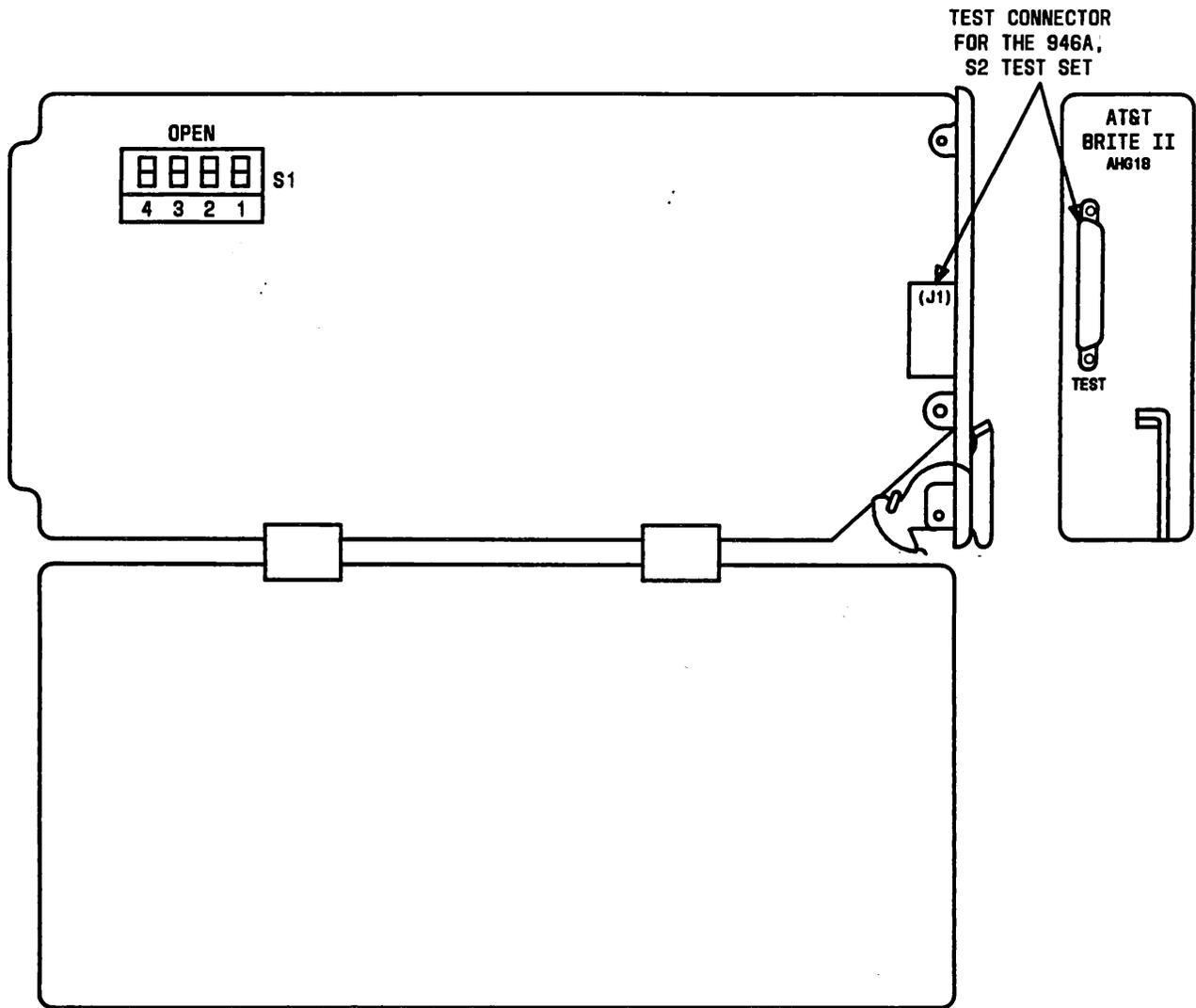


Figure 5—AHG18 BRITE II Channel Unit Option Switch Location

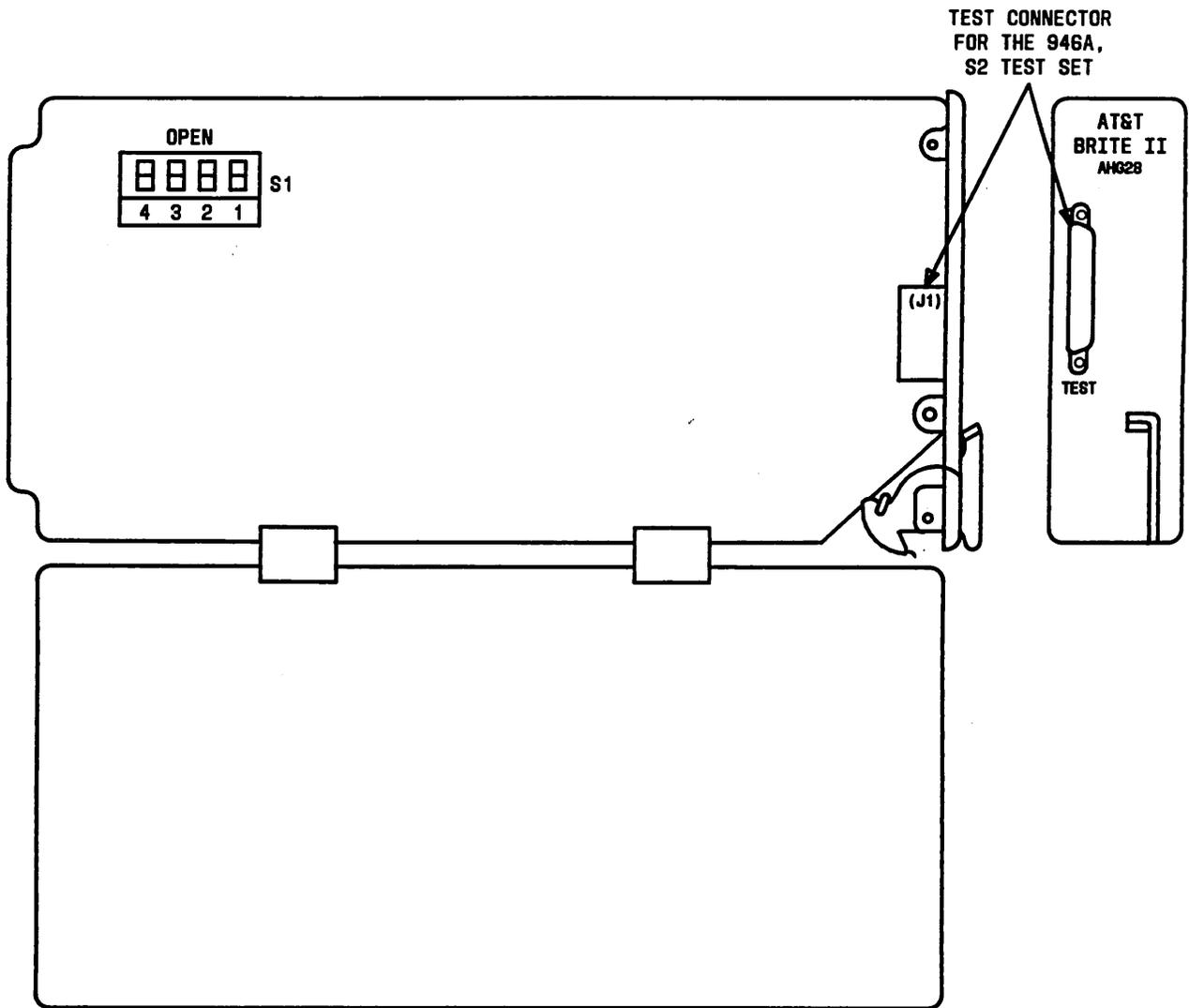


Figure 6 — AHG28 BRITE II Channel Unit Option Switch Location

TABLE B D4 COUNTING AND SLC 96 CARRIER MODE OF OPERATION OPTIONS			
BANK OR TERMINAL	COUNTING AND MODE	S1 SWITCH (NOTE)	
		1	2
D4	D4 Counting	C	C
D4	D1D Counting	O	C
SLC 96 Carrier	D1D Mode 1	O *	C *
SLC 96 Carrier	D1D Mode 1	O †	O †
SLC 96 Carrier	D4 Mode 3	O	C
SLC 96 Carrier	D1D Mode 3	C	O

Note: C = Closed; O = Open.

* These switch settings are for a channel unit that requires time slot counting to begin with the first of the two time slots assigned to a physical slot.

† These switch settings are for a channel unit that requires time slot counting to begin with the second of the two time slots assigned to a physical slot such as in the case when the first time slot is already taken by another channel unit to the left.

TABLE C CHANNEL SERVICE OPTIONS			
CHANNEL SERVICE	RATE	SWITCH (NOTE)	
		3	4
2B+D	64 kb/s and 16 kb/s	O	O
B1+D	64 kb/s and 16 kb/s	C	O
B2+D	64 kb/s and 16 kb/s	O	C
D	16 kb/s	C	C

Note: C = Closed; O = Open.

D. PROCEDURE 3 -- VERIFY PROPER SYNCHRONIZATION BETWEEN FIRST D4 CHANNEL BANK OR SLC 96 CARRIER TERMINAL AND 5ESS SWITCH

5.04 Application: This procedure is used to verify proper synchronization between the first D4 channel bank or SLC 96 carrier central office terminal in the circuit and the 5ESS switch. It should be performed after Procedures 1 and 2 have been performed at the first D4 channel bank or SLC 96 carrier terminal.

Apparatus Required:

946A, S2 test set (COMCODE 105571442)

STEP

PROCEDURE

1. Insert the 946A, S2 test set into an available channel slot.
2. Connect the ribbon cable connector to the BRITE II channel unit faceplate test connector.
3. At the 946A, S2 test set (see Figure 7), perform the following steps:
 - a. Set the **2B+D** switch to the **BRI** position.
 - b. Set the **ADDR** switch to the **1** position.
 - c. Set the **T/R** switch to the **R** position (receive only).
 - d. Set the **B1/B2** switch to either position (does not matter).
 - e. Set the **LP/CR** switch to the **CR** position (carrier).
 - f. Press the **ACT** button.
4. After about 15 minutes observe the **COS** lamp.
5. Is the **COS** lamp lighted?

Yes -- At the **D4 channel bank**, verify that the OIU plug-in is properly optioned for external timing and that the external clock leads are connected to terminal strip **TS8** located at the right top on the rear side of the channel bank. The leads should be connected to **terminal pins 9 and 10** per CAD 27 in SD-3C304-02. Replace the OIU plug-in if it is suspected of causing trouble. Press the **ACT** button on then off to reset the 946A, S2 test set.

At a **SLC 96 carrier terminal**, verify that the SSU plug-in is properly optioned for external timing (for a central office terminal) or internal (for a remote terminal) and that the backplane is properly wired per AT&T 363-202-400. Replace the SSU plug-in if it is suspected of causing trouble.

Verify that the **5ESS** switch has the same source of timing as that of the transmission equipment.

No -- **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

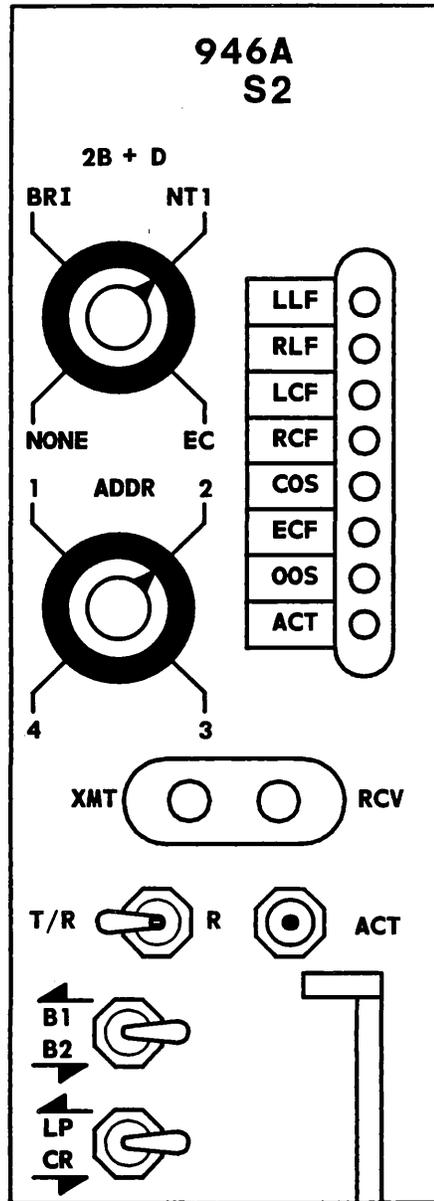


Figure 7 — 946A, S2 Test Set Faceplate

E. PROCEDURE 4 -- VERIFY ISDN CIRCUIT CONTINUITY FROM FAR END D4 CHANNEL BANK OR SLC 96 CARRIER REMOTE TERMINAL TO 5ESS SWITCH

5.05 Application: This procedure contains a suggested method of verifying continuity of connections between the final (far end) D4 channel bank or SLC 96 carrier terminal and the 5ESS switch. Before this procedure is performed, Procedure 1 should be performed to verify that the 5ESS switch translations have been administered. Procedure 2 should be performed at all D4 channel banks or SLC 96 carrier terminals in the ISDN circuit. Synchronization should be verified (Procedure 3) at the first D4 channel bank or SLC 96 carrier terminal.

Apparatus:

- ITE 6674 test set (COMCODE 106192081) or the following apparatus:
 - 1 -- 353A power unit
 - 1 -- NT1U-200 unit
 - 1 -- ISDN terminal
 - 1 -- Modified telephone cord approximately 12 feet long or long enough to reach the top shelf of a bay. The tip and ring leads must be terminated at one end to tip and ring of a 310 plug and terminated at the other end to tip (pin 5) and ring (pin 4) of an 8-pin modular plug. See Figure 4.
 - 2 -- D8W-87 cords.
- 1 -- Channel unit extender - J98726MF (for D4 channel bank only), J1C141MF (for SLC 96 carrier terminal only), or J98726MP (for either one). The J98726MP is recommended.

STEP**PROCEDURE**

1. At the D4 channel bank or SLC 96 carrier terminal, remove the AHG28 BRITE II channel unit and install the channel unit extender into the channel slot. (On the J98726MP channel unit extender (preferred), set the **D4/SLC 96** carrier switch to the appropriate position.) See Figure 4.
2. Install the AHG28 BRITE II channel unit into the channel unit extender.
3. Are you using the ITE 6674 test set?
 - No -- Continue with Step 4.
 - Yes -- Go to Step 7.
4. Connect apparatus as shown in Figure 4.
5. Insert the 310 plug on the modified telephone cord into the **LINE T/R** jack on the channel unit extender.
6. Insert the 8-pin modular plug on the modified telephone cord into the **line** jack on the NT1U-200 unit (see Figure 4). Go to Step 8.
7. Connect the ITE 6674 test set tip and ring to the **LINE T/R** jack on the channel unit extender and connect the power unit to 115V ac outlet.
8. Go off-hook at the ISDN terminal (telephone). Do you hear dial tone?
 - Yes -- Continue with Step 9.
 - No -- Stop. The circuit is not working. All appropriate connections must be made.

STEP

PROCEDURE

9. Dial the 5ESS switch BRI test line (BRITL) number. Do you hear a special tone (one burst of high tone)?

No -- Stop. The 5ESS switch translations are not correct.

Yes -- Disconnect apparatus or test set and remove the channel unit extender.

10. Install the AHG28 BRITE II channel unit into the channel slot.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

F. PROCEDURE 5 -- TEST ISDN CIRCUIT FOR OPERATION

5.06 Application: This procedure contains a suggested method of testing the ISDN circuit in both directions to verify that the circuit is operational and error-free. An average error rate of 10^{-6} or better indicates a good circuit. This procedure should be performed after Procedures 1, 2, 3, and 4 have been performed and NT1 equipment has been installed and connected at the customer-premises. If NT1 equipment is not available at the customer-premises, connect an NT1 or an ITE 6674 test set to the tip and ring cables at the cross-connect field. If the circuit does not perform properly, further testing is required. Procedures 6 and 7 can be used to test the BRITE II channel unit(s) in the circuit.

STEP

PROCEDURE

1. At the 5ESS switch, have a technician perform NT1 loopback tests toward the far end on the B1 channel and B2 (if used). Each loopback test should last for at least 15 minutes to obtain an average error rate.

2. Make an outgoing ISDN call through the 5ESS switch to an ISDN terminal located on the customer-premises.

3. Did the call complete?

Yes -- Continue with Step 4.

No -- Repeat Step 2 several times. If the call does not complete every time, further tests must be performed to isolate trouble. See Trouble Clearing in this manual.

4. Make an incoming ISDN call through the 5ESS switch from an ISDN terminal at the customer premises.

5. Did the call complete?

No -- Repeat Step 4 several times. If the call does not complete every time, further tests must be performed to isolate trouble. See Trouble Clearing in this manual.

Yes -- **STOP. YOU HAVE COMPLETED THIS PROCEDURE.**

6. TROUBLE CLEARING

A. OVERVIEW

6.01 This part contains maintenance information for the BRITE II channel units in ISDN circuits. It also contains Procedures 6 and 7 for performing loopback tests in an ISDN circuit. The loopback tests can be used as installation aids or for trouble isolation.

B. MAINTENANCE -- GENERAL INFORMATION

6.02 In most cases, maintenance on BRITE II channel units is performed as a reaction to a customer trouble report. When a customer reports trouble, the proper organization will perform maintenance tests and/or will dispatch a technician to resolve the trouble. Maintenance capabilities are provided by the 5ESS switch and by Loop Management Operations System (LMOS) allowing an ISDN customer to dial 611 to report trouble. Maintenance can then be performed from an Automated Repair Service Bureau (ARSB).

6.03 Refer to AT&T 5D5-105-220 for procedural information about 5ESS switch corrective maintenance.

6.04 The first step in the maintenance of an ISDN circuit is to determine the area of the trouble. There are four areas in which the trouble can occur: (a) switch equipment, (b) transmission equipment, (c) customer-premises equipment, or (d) synchronization equipment.

6.05 If a problem is diagnosed to be in either the switch or customer-premises equipment, a regular course of action is taken, that is, the SCC (Switching Control Center) will make arrangements to fix problems in the serving switch. For customer premises-equipment troubles, the customer will be informed about the problem so that corrective action can be taken.

6.06 If the trouble is diagnosed to be in the transmission or synchronization equipment, then further tests must be run to isolate the trouble.

6.07 The BRITE II channel units contain counters for recording cyclic-redundancy check (CRC) block errors, errored seconds, and severely errored seconds in the receive and transmit paths. These types of errors are recorded during certain time periods under control of the serving switch. The serving switch can also control the time interval for reading and resetting the counters.

6.08 For testing and trouble isolation, the BRITE II channel units provide six types of loopbacks (Figure 8) as follows:

- 2B+D, B1, and B2 loopbacks toward the loop side (customer or drop side interface)
- 2B+D, B1, and B2 loopbacks toward the line side (facility or carrier interface).

6.09 Any of the six loopbacks can be activated by codes sent from the serving switch over the embedded operations channel. In addition to responding to loopback codes from the serving switch, the BRITE II channel units also respond to 2B+D loopback requests generated by the 946A, S2 test set. Individual B1 or B2 loopback requests cannot be generated by the test set. The test set can also activate 2B+D loopbacks in an AUA93 BRITE II channel unit (Figure 1) located in a SLC series 5 remote terminal in the circuit.

946A, S2 Test Set

6.10 The 946A, S2 test set (Figure 7) tests BRITE II channel unit(s) at the D4 channel bank or SLC 96 carrier terminal. When the test set is connected to the channel unit, the test set enables maintenance personnel to do the following:

- Check the condition of the 2B+D loops
- Activate 2B+D loopback tests
- Insert pseudorandom data patterns into the customers data channels
- Monitor slips per channel.

6.11 The test set can be installed into a vacant channel slot without interfering with service. The test set should make contact with the backplane so that it will have the same ground potential as the D4 channel bank or SLC 96 carrier terminal. One end of a cable plugs into a jack on the test set and the other end plugs into a jack on the channel unit faceplate.

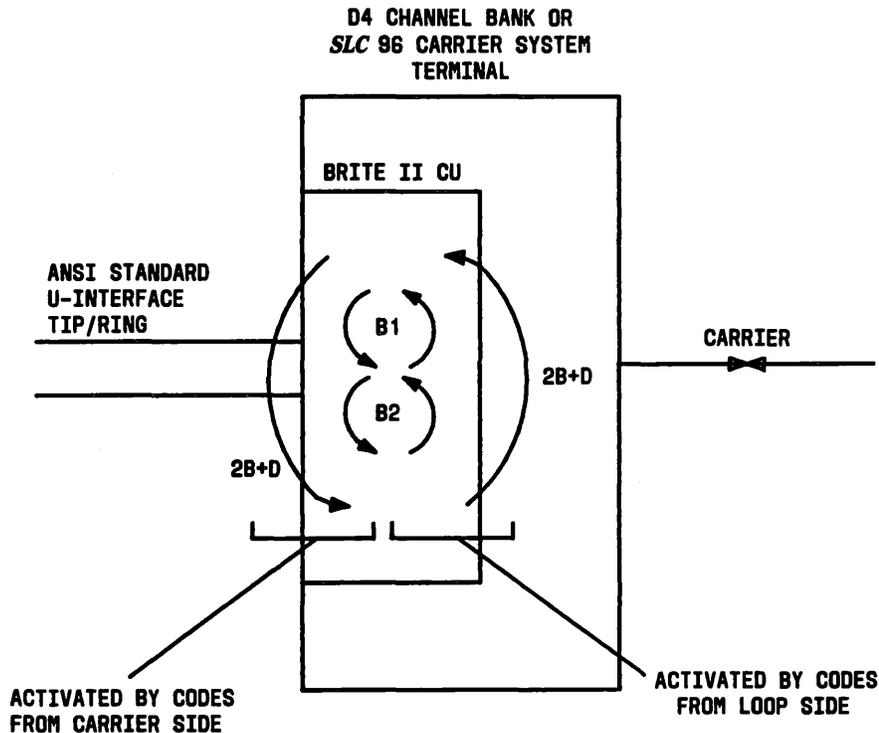


Figure 8 — BRITE II Channel Unit 2B+D and B Channels Loopback

The main function of the 946A, S2 test set is to establish a loopback connection in the immediate channel unit or in another channel unit in the circuit. Up to four channel units can be tested using the test set. The test set contains test and status lamps and provides jack access for connecting the existing KS-20908 and KS-20909 receiver and transmitter data test sets.

6.12 The 946A, S2 test set can monitor slips because the BRITE II channel units have the ability to determine if the data received in either direction is synchronized with the data transmitted in either direction. If a slip has occurred, the event is recorded by the channel unit, and when a 946A, S2 test set is connected to the channel unit test access connector, the circuit-out-of-sync (COS) lamp lights. If the circuit is still slipping after the test set is reset (by pressing the ACT button on and then off), the COS lamp will light again.

The switches and lamps on the 946A, S2 test set (Figure 7) are described in the following paragraphs.

6.13 2B+D Switch: The four positions on this switch are as follows:

- **NONE** - In this position the test set performs circuit monitoring but no test loops are established.
- **BRI** - In this position a loopback is initiated in an addressable BRITE II channel unit. The specific channel unit is determined by the setting of the **LP - CR** switch and **ADDR** switch.
- **EC** - This position is not applicable in BRITE II channel units.
- **NT1** - In this position the test set initiates a code to activate a loopback at the NT1 on the customer premises.

6.14 ADDR Switch: This switch selects the address of the applicable BRITE II channel unit in the circuit for test. Position **1** selects the channel unit that is connected to the 946A, S2 test set. Positions **2, 3, and 4** select the next channel unit (respectively) in the circuit in the direction specified by the **LP - CR** switch.

6.15 XMT - RCV Jack: The **XMT** jack provides access for the KS-20909 transmitter data test set. The **RCV** jack provides access for the KS-20908 receiver data test set.

6.16 T/R - R Switch: The **T/R** position allows transmit and/or receive testing on the B channel(s). The **R** position allows receive testing only. The B channel being tested (B1 or B2) depends on the position of the **B1 - B2** switch.

6.17 ACT Switch: After the test set is connected to the channel unit, this momentary pushbutton-type switch activates the test set and lights the **ACT** lamp. Service is interrupted when the test set is activated if the **2B+D** switch is not in the **NONE** position.

6.18 B1 - B2 Switch: This switch allows transmission testing on the selected channel (B1 or B2).

6.19 LP - CR Switch: This 2-position switch either sends the loopback code toward the loop side designated by **LP** and an arrow or sends loopback code toward the carrier side designated by **CR** and an arrow.

6.20 Table D lists and describes the lamps of the 946A, S2 test set.

Using the 946A, S2 Test Set

6.21 The 946A, S2 test set is used to help isolate trouble in an ISDN circuit. To use the test set proficiently, one must analyze the circuit from one end to the other and know the meaning of the lamp indications.

6.22 An example of an ISDN circuit with tandem offices between the 5ESS and the network termination 1 (NT1) is shown in Figure 9. In Figure 9, a 946A, S2 test set is connected to the BRITE II channel unit in the D4 channel bank at the serving office. The serving office provides the most efficient location to test the circuit. Also, a KS-20908 receiver data test set and a KS-20909 transmitter data test set are connected to the 946A, S2 test set. Each D4 channel bank in the remote access line is equipped with a BRITE II channel unit and is numbered to correspond to the **ADDR** switch numbers on the 946A, S2 test set.

6.23 Once a customer reports trouble in the circuit, a technician determines what equipment is in the access line. The technician checks for failure lamp indication(s) on the 946A, S2 test set and determines if there is loop, carrier, or possibly intermittent trouble (such as, slips). Intermittent trouble will require further testing.

TABLE D		
946A, S2 TEST SET LAMPS FOR BRITE II TESTING		
LAMPS	LIGHTED ?	REASON
All Lamps	No	BRITE II channel unit and circuit are working properly.
LLF (Local Loop Failure)	Yes	Indicates that the BRITE II channel unit connected to the 946A, S2 test set has lost framing on the customer side.
RLF (Remote Loop Failure)	Yes	Indicates that the far end BRITE II channel unit has lost framing on the customer side.
LCF (Local Channel Failure)	Yes	Indicates that N-channel framing is lost on the carrier which could be caused by a channel unit or carrier failure.
RCF (Remote Channel Failure)	Yes	Indicates that N-channel framing is lost on the tandem carrier which could be caused by a BRITE II channel unit or carrier failure.
COS (Circuit Out of Sync)	Yes	Indicates that loss of synchronization has occurred. This lamp remains lighted until the 946A, S2 test set is reset. (Press the ACT button on then off.)
ECF (Echo Canceler Failure)	-	This lamp is not applicable to BRITE II channel units.
OOS (Out of Service)	Yes	Indicates that the serving switch has placed the circuit out-of-service or there is down-stream testing of an upstream failure.
ACT (Active)	Yes	Indicates that the 946A, S2 test set is activated by the ACT switch. The lamp is extinguished upon the next activation of the ACT switch.

6.24 Lighted lamps on the 946A, S2 test set which indicate trouble depend upon the BRITE II channel unit position to which the test set is connected. As an example, a BRITE II channel unit that detects trouble (bad framing) at the loop interface sends an LLF (local loop failure) message to the test interface and an RLF (remote loop failure) message to the carrier interface. The LLF message causes the LLF lamp to light on the connected 946A, S2 test set. If there are other test sets connected to other BRITE II channel units on the carrier side, the RLF message causes the RLF lamp(s) to light on these test set(s). Similarly, a BRITE II channel unit that detects bad framing at the carrier interface sends an LCF (local channel failure) message to the test interface and an RCF (remote channel failure) message toward the loop interface. These failure messages cause the LCF lamp on a test set connected to the failed BRITE II channel unit to light and cause the RCF lamp on a test set connected to a BRITE II channel unit on the loop side of the failed unit to light.

6.25 Further loopback tests can be performed with the 946A, S2 test set to verify lamp indications.

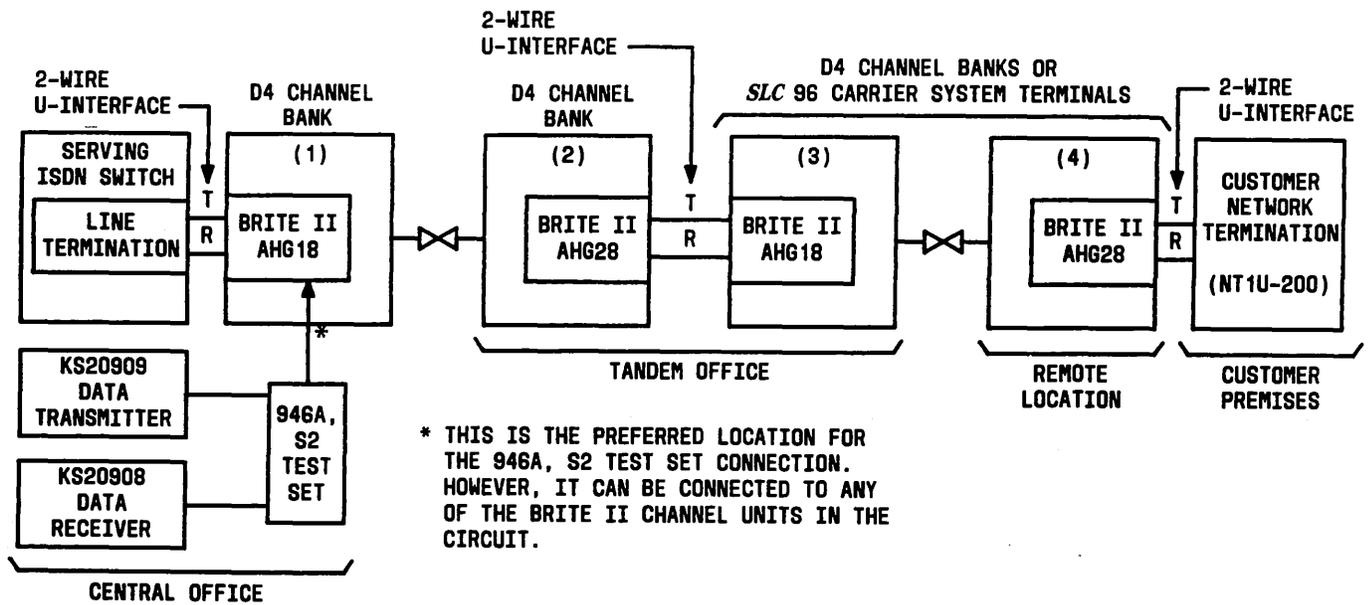


Figure 9 — Example of an ISDN Circuit With Tandem D4 Channel Banks

C. PROCEDURE 6 -- NETWORK TERMINATING 1 (NT1) LOOPBACK TEST

6.26 Application: This procedure is used to perform a loopback at the NT1 equipment and test the circuit from the BRITE II channel unit out to the NT1 equipment and back to the channel unit.

Apparatus Required:

- 946A, S2 test set (COMCODE 105571442)
- KS-20908 receiver data test set and cords
- KS-20909 transmitter data test set and cords
- ED-3C792 -- D3/D4-to-DDS interface test unit with cable assembly (COMCODE 842725111) for connecting to the clock source in the OIU or SSU. (The "clock box" and cable assembly are not required for D4 channel banks equipped with an OIU-4A.)

STEP	PROCEDURE
1.	Install the 946A, S2 test set into a vacant slot close to the channel unit to which it is to be connected. Verify that it makes connection to the backplane.
2.	Connect the ribbon cable connector on the 946A, S2 test set to the connector on the faceplate of the channel unit.
3.	Is the D4 channel bank or SLC 96 carrier terminal equipped with an OIU-2, OIU-4, OIU-4A, or SSU? OIU-4A -- Continue with Step 4. OIU-2, OIU-4, or SSU -- Go to Step 5.

STEP**PROCEDURE**

4. Using the appropriate clock cords located under the top cover of each KS-20908 and KS-20909 data test set, connect the cords to the OIU-4A faceplate as follows:
 - a. Connect the transmitter test set clock cord to the **TRMTR** connector.
 - b. Connect the receiver test set clock to the **REC** connector. Go to Step 7.
5. Connect the ED-3C792 (D3/D4-to-DDS interface test unit) to the OIU or SSU, using cable assembly (COMCODE 842725111). One end of the cable connects to the 9-pin connector on the faceplate of the OIU or SSU and the other end connects to the **TO CH BK** connector on the ED-3C792 unit.
6. Using the appropriate clock cords located under the top cover of each KS-20908 and KS-20909 data test set, connect the cords to the D3/D4 to DDS interface test set as follows:
 - a. Connect the transmitter test set clock cord to the **TRMTR** connector.
 - b. Connect the receiver test set clock cord to the **REC** connector.
7. Using the signal cords (terminated with miniature phone jacks) located under the top cover of each KS-20908 and KS-20909 data test set, connect the cords to the 946A, S2 test set as follows:
 - a. Connect the **X** cord to the **XMT** faceplate connector.
 - b. Connect the **REC** cord to the **RCV** faceplate connector.
8. Connect the power cord located under the top cover of each KS-20908 and KS-209909 data test set to a 115V AC outlet.
9. At the KS-20908 data test set (see Figure 10), perform the following:
 - a. Set the **INPUT** switch to **LOGIC - NEAR** position.
 - b. Set the **DATA RATE** switch to **56** position.
 - c. Set the **COUNTER MODE** switch to **COUNT** position.
 - d. Set the **SUBRATE CHANNEL** or **CHANNEL** switch to any position.
 - e. Set the **TEST WORD** switch to **2047** position.
 - f. Set the **COUNTER** switch to **ERRORS - BIT** position.
 - g. Press the **POWER** or **POWER ON** switch.
 - h. Verify that the **CLOCK** lamp lights.
10. At the KS-20909 data test set (see Figure 11), perform the following:
 - a. Set the **MODE** switch to **REPEAT** position.
 - b. Set the **FUNCTION** switch to **2047** position.

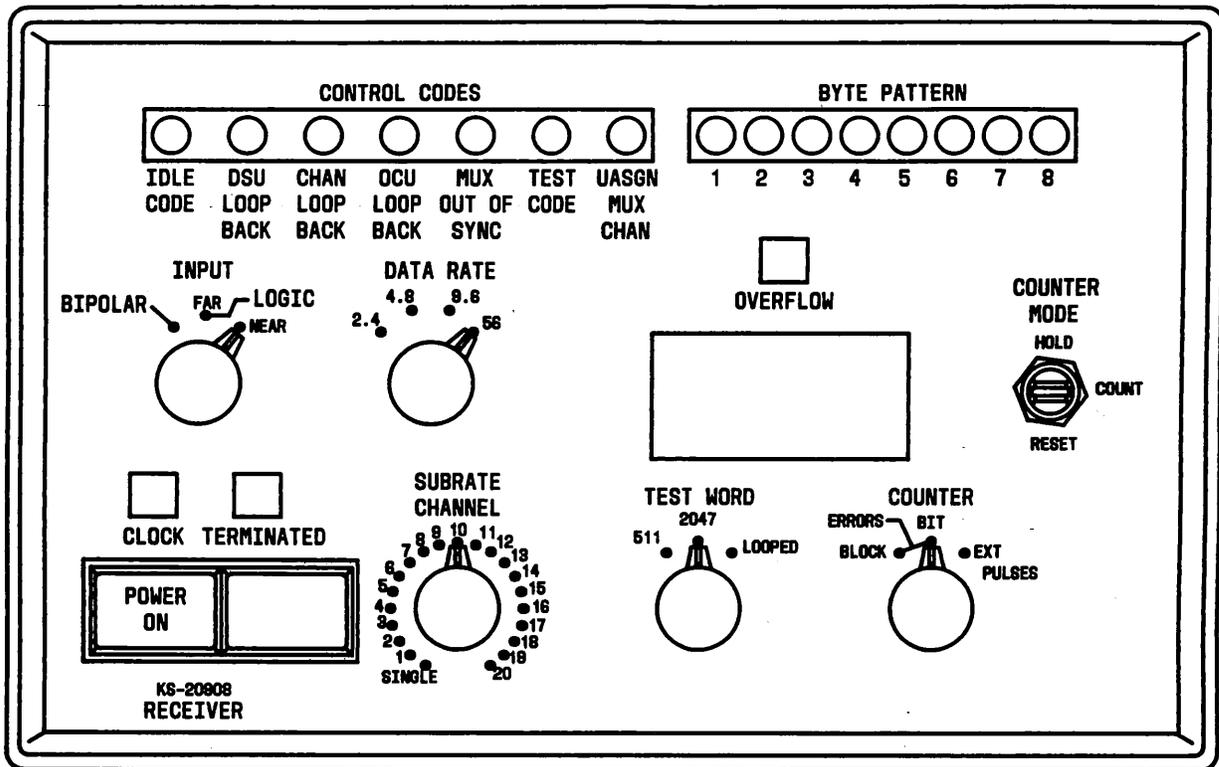


Figure 10—KS-20908 Receiver Data Test Set

STEP

PROCEDURE

- c. Set the **DATA RATE** switch to **56** position.
 - d. Set the **OUTPUT** switch to **LOGIC - NEAR** position.
 - e. Press the **POWER** or **POWER ON** switch.
 - f. Verify that the **CLOCK** lamp lights.
11. At the 946A, S2 test set (see Figure 7), perform the following:
- a. Set the **2B+D** switch to the **NT1** position.
 - b. Set the **ADDR** switch to any position (does not matter for this test).
 - c. Set the **T/R - R** switch to the **T/R** position.
 - d. Set the **LP - CR** switch to the **CR** position.
 - e. Set the **B1 - B2** switch to the **B1** position.
 - f. Press the **ACT** button.

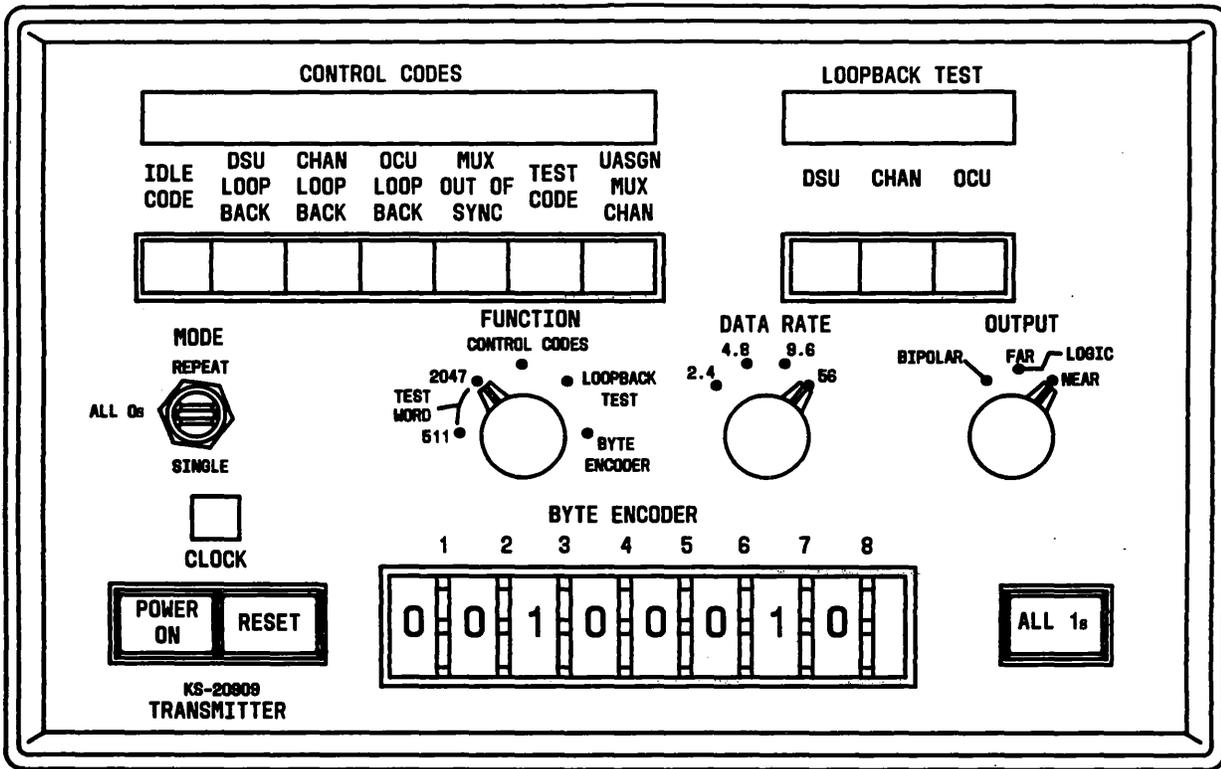


Figure 11 — KS-20909 Transmitter Data Test Set

STEP	PROCEDURE
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- | | |
|-----|--|
| 12. | Reset the KS-20908 receiver and KS-20909 transmitter data test sets as follows: <ol style="list-style-type: none"> Set the COUNTER MODE switch on the receiver data test set to the RESET position. Press the RESET button on the transmitter data test set. |
| 13. | Observe the display on the KS-20908 receiver data test set. Zero readings indicate no errors. Zero readings for 5 minutes result in an error rate better than 10^{-6} . An error rate of this quality is sufficient for data transmission. Also observe that the COS lamp does not light during this time. If it lights, timing or synchronization problems possibly exist. |
| 14. | If a BRITE II channel unit with B+D service was tested, go to Step 15. If one with 2B+D service was tested, set the B1 - B2 switch to the B2 position and repeat Steps 11f, 12, and 13. When the test is completed, continue with Step 15. |
| 15. | Press the ACT button on the 946A, S2 test set to terminate the loopback test. |
| 16. | Remove all test connections. |

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

D. PROCEDURE 7 -- BRITE (BRI) LOOPBACK TEST

6.27 Application: This procedure is used to perform the BRITE II loopback test for each BRITE II channel unit in the circuit.

Apparatus required:

- 946A, S2 test set (COMCODE 105571442)
- KS-20908 receiver data test set and cords
- KS-20909 transmitter data test set and cords
- ED-3C792 - D3/D4-to-DDS interface test unit ("clock box") with cable assembly (COMCODE 842725111) for connecting to the clock source in the OIU or SSU. (The "clock box" and cable assembly are not required for D4 channel banks equipped with an OIU-4A.)

STEP**PROCEDURE**

1. Install the 946A, S2 test set into a vacant slot close to the channel unit to which it is to be connected. Verify that it makes connection to the backplane.
2. Connect the ribbon cable connector on the 946A, S2 test set to the connector on the faceplate of the channel unit.
3. Is the D4 channel bank or SLC 96 carrier terminal equipped with an OIU-2, OIU-4, OIU-4A, or SSU?
 OIU-4A -- Continue with Step 4.
 OIU-2, OIU-4, or SSU -- Go to Step 5.
4. Using the appropriate clock cords located under the top cover of each KS-20908 and KS-20909 data test set, connect the cords to the OIU-4A faceplate as follows:
 - a. Connect the transmitter test set clock cord to the **TRMTR** connector.
 - b. Connect the receiver test set clock to the **REC** connector. Go to Step 7.
5. Connect the ED-3C792 (D3/D4-to-DDS interface test unit) to the OIU or SSU, using cable assembly (COMCODE 842725111). One end of the cable connects to the 9-pin connector on the faceplate of the OIU or SSU and the other end connects to the **TO CH BK** connector on the ED-3C792 unit.
6. Using the appropriate clock cords located under the top cover of each KS-20908 and KS-20909 data test set, connect the cords to the D3/D4 to DDS interface test set as follows:
 - a. Connect the transmitter test set clock cord to the **TRMTR** connector.
 - b. Connect the receiver test set clock cord to the **REC** connector.

STEP**PROCEDURE**

7. Using the signal cords (terminated with miniature phone jacks) located under the top cover of each KS-20908 and KS-20909 data test set, connect the cords to the 946A, S2 test set as follows:
 - a. Connect the **X** cord to the **XMT** faceplate connector.
 - b. Connect the **REC** cord to the **RCV** faceplate connector.
8. Connect the power cord located under the top cover of each KS-20908 and KS-209909 data test set to a 115V AC outlet.
9. At the KS-20908 data test set (see Figure 10), perform the following:
 - a. Set the **INPUT** switch to **LOGIC - NEAR** position.
 - b. Set the **DATA RATE** switch to **56** position.
 - c. Set the **COUNTER MODE** switch to **COUNT** position.
 - d. Set the **SUBRATE CHANNEL** or **CHANNEL** switch to any position.
 - e. Set the **TEST WORD** switch to **2047** position.
 - f. Set the **COUNTER** switch to **ERROR - BIT** position.
 - g. Press the **POWER** or **POWER ON** switch.
 - h. Verify that the **CLOCK** lamp lights.
10. At the KS-20909 data test set (see Figure 11), perform the following:
 - a. Set the **MODE** switch to **REPEAT** position.
 - b. Set the **FUNCTION** switch to **2047** position.
 - c. Set the **DATA RATE** switch to **56** position.
 - d. Set the **OUTPUT** switch to **LOGIC - NEAR** position.
 - e. Press the **POWER** or **POWER ON** switch.
 - f. Verify that the **CLOCK** lamp lights.
11. At the 946A, S2 test set (see Figure 7), perform the following:
 - a. Set the **2B+D** switch to the **BRI** position.
 - b. Set the **ADDR** switch to the number representing the position of the BRITE II channel unit in the circuit.
 - c. Set the **LP - CR** switch to either **LP** or **CR** position for BRITE II channel unit number 1 or to **CR** position for other channel units in the circuit.
 - d. Press the **ACT** button.

STEP**PROCEDURE**

12. Reset the KS-20908 receiver and KS-20909 transmitter data test sets as follows:
 - a. Set the **COUNTER MODE** switch on the receiver data test set to the **RESET** position.
 - b. Press the **RESET** button on the transmitter data test set.
13. Observe the displays on the data test sets. Zero readings indicate no errors. Zero reading for 5 minutes result in an error rate better than 10^{-6} . An error rate of this quality is sufficient for data transmission. Go to Step 15 if all channel units have been tested.
14. If the BRITE II channel unit being tested is in the number 1 position, set the **LP - CR** switch on the 946A, S2 test set to the opposite direction and repeat Steps 12 and 13. If BRITE II tandem channel units are to be tested, repeat Steps 11b, 11c, 11d, 12, and 13.
15. Press the **ACT** button on the 946A, S2 test set to terminate the test.
16. Remove all test connections.

STOP. YOU HAVE COMPLETED THIS PROCEDURE.

7. REFERENCES

A. OVERVIEW

7.01 The following publications contain description and maintenance information on the D4 channel bank and the SLC 96 carrier system terminals.

PRACTICE	TITLE
363-005-047	SLC 96 Carrier System - F62115 CP DLU Common Unit Data Sheet
363-202-100	SLC 96 Carrier System - General Description
363-202-400	SLC 96 Central Office Terminal - Pair Gain System
363-202-401	SLC 96 Subscriber Loop Carrier System - Remote Terminal
363-202-500	SLC 96 Carrier System Maintenance Loop Terminal System
363-203-100	SLIM (Subscriber Loop Interface Module) - General Description
365-170-000	D4 Channel Bank - (TOP)
365-170-100	D4 Channel Bank - Description
365-005-103	AHG28 BRITE II Channel Unit Data Sheet
365-005-104	AHG18 BRITE II Channel Unit Data Sheet
TG5	5ESS Switch Translations Guide
5D5-105-220	5ESS Switch Hardware - Maintenance Procedures
5D5-900-301	ISDN Basic Rate Interface Specifications
533-700-100	5ESS Switch ISDN Customer Premises Planning Guide

DRAWING	TITLE
SD-3C304-02	D4 Channel Bank - Application Schematic
SD-97770-01/02	SLC 96 Carrier System Terminal - Schematic Diagram

B. DOCUMENT ORDERING INFORMATION

7.02 Copies of the documents listed above can be ordered from AT&T Customer Information Center by dialing 1-800-432-6600 in the U.S.A. or 1-800-255-1242 in Canada or by writing:

AT&T Customer Information Center
 2855 North Franklin Road
 P.O. Box 19901
 Indianapolis, IN. 46219

8. ISSUING ORGANIZATION

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