Installation Engineering Handbook 59
Western Electric
Hawthorne Works

Section 275B
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PBX AIOD - A1
TEST OPERATIONS

CONTENTS

1. GENERAL INFORMATION

1.1 Description

1.11 This sub-section provides the tests to be applied to the PBX Automatic Identified Outward Dialing Type A1 (PBX AIOD - A1) frame utilizing the built-in Test Circuit.

1.12 Refer to Section 275 for coordinating information, e.g., subsections containing preliminary information and trouble shooting information.

1.2 Cross-Connections

All cross-connections must be made prior to power turn-on. Table 1 is a check list of these cross-connections. For an explanation of these cross-connections refer to Paragraph 3.23, Section 275A or to the indicated SD.

Table 1

Cross-Connection For	Terminal Strip Location	Refer to
Digit Register thousands digit	AB-A (DRA field) and AB-B (DRB field)	SD-1C001-01, FS 2, Note 401
Store Control thousands digit	AB-C (TK-TH field)	SD-1C002-01, FS 10, Note 401
Office Index Translator	AB-D (DT and OI fields)	SD-1C002-01, FS 20, Note 401
Data Trunk Strapping (as required)*	AB-A,B,C, D	SD-1C005 FS 7 Notes 1 and 2

* REMARKS: Assigned Data Trunks must be temporarily strapped as unassigned until the PBX is connected for normal operation.

1.3 General Precautions

PRECAUTION 1: TO PREVENT DAMAGE TO THE CIRCUIT PACKS IT IS EXTREMELY INPORTANT THAT THE CP NUMBER AGREE WITH THE CP NUMBEP OF THE TRAY LOCATION USED. ANY MISMATCH OF CARD AND CONNECTOR CAN CAUSE SERIOUS DAMAGE.

PRECAUTION 2: WHEN CARDS ARE REMOVED FOR ANY REASON, OR WHEN CARD EXTENDERS ARE USED, EXTREME CARE MUST BE USED IN REPLACING THE CARD TO ASSURE THAT THE CARD IS PROPERLY ALIGNED AND IS NOT ANGLED TOWARD AN ADJACENT CONNECTOR. THE PROCEDURES OF REMOVING AND REPLACING CARDS SHOULD BE PRACTICED A FEW TIMES UNDER SUPERVISION WHILE THE SYSTEM IS WITHOUT POWER TO OBTAIN SOME PROFICIENCY IN THIS TECHNIQUE, THE CONNECTING TERMINALS AT THE REAR OF EACH CARD ARE SOMEWHAT FRAGILE AND SHOULD NEVER BE FORCED INTO POSITION IF THE CARD IS PROPERLY ALIGNED IT WILL SLIDE SMOOTHLY INTO THE CONNECTOR WITH A PERCEPTIBLE TENSION AS THE CONNECTOR SPRINGS ARE ENGAGED. THE FACE OF THE CARD SHOULD REST SNUGLY AGAINST THE FRONT OF THE TRAY.

2. FUSING

2.1 Verify that all fuses have been removed from the AIOD Fuse Panels.

2.2 Operate the INPUT switch of the DC Converters to the "ON" position, +6V Converters first. +12V Converters second, and +24V Converters third.

2.3 Using the ITE-4442 Volt-Ohmmeter check each fuse post for the absence of battery and ground. Using fuses of the correct type as specified by the schematic drawings and panel designations, insert the fuses one at a time. After each fuse is inserted verify (1) that all unfused posts are free of battery and (2) that the correct potential is present at the designated Test Point per the Fuse Table.

FUSE TABLE

FUSE	UNIT	TEST POINT		POTENTIAL
		CIRCUIT PACK	TERM	
TEST A	J-1C000H-1	17A10	13	+6
TEST B	"	13D07	17	+6
TEST C	"	13D16	13	+6
TEST D	"	13D10	17	+6
TEST E	"	21A04	13	+6
TEST F	"	21B10	13	+6
TEST G	"	21B16	13	+6
TEST H	"	21D13	17	+6
TEST J	"	21B22	13	+6
TEST K	J-1C000L-1	05D01	22	+6
TEST L	"	05A22	13	+6
TEST M	"	05B10	13	+6
TEST N	"	05B22	13	+6
TEST P	"	05C10	13	+6
TEST R	"	05C22	12	+6
TEST S	J-1C000H-1	17D07	17	+6
TEST T	J-1C000L-1	09D13	13	+6
TEST U	"	09D22	13	+6
TEST V	J-1C000H-1	17B22	17	+6
TEST W	"	17B04	13	+6
TEST X	"	17B10	13	+6
TEST Y	CONTROL PANEL	LAMP SOCKET 20	B	+6
TEST Z	J-1C000L-1	01B16	13	+6
TEST AA	"	01B13	13	+6
TEST AB	"	01C19	17	+6
TEST AC	CONTROL PANEL	(B) LAMP SOCKET	B	+6
TEST AD	CONTROL PANEL	(TSB) LAMP SOCKET	B	+6
TEST AE	J-1C000K-1	(RC) RELAY	CF	+6
REG CONN S	J-1C000F-1	09D04	17	+6
REG CONN Z	"	13D22	13	+6
# MISC H	CONVERTER	TERMINAL STRIP	3B	+6
STORE CONT A	J-1C000C-1	09A01	13	+6
STORE CONT B	"	09C16	13	+6
STORE CONT C	"	01A01	24	+6
STORE CONT D	J-1C00D-1	25A16	17	+6
STORE CONT E	"	21B07	13	+6
STORE CONT F	"	17A01	13	+6
STORE CONT G	"	13C07	13	+6
STORE CONT H	"	21C07	17	+6
STORE CONT J	"	13A04	13	+6
REG A	J-1C000L-1	01A13	13	+6
REG B	"	01B04	13	+6
TEST A	J-1C000L-1	09C10	3	+12
TEST B	J-1C000H-1	17A10	3	+12
TEST C	"	13C22	3	+12
TEST D	"	13C01	27	+12
TEST E	"	21A01	27	+12
TEST F	J-1C000L-1	05A10	27	+12
TEST G	"	05A22	27	+12
TEST H	"	05B10	27	+12
TEST J	"	05B22	27	+12
TEST K	"	05C10	27	+12
TEST L	"	05D01	27	+12

FUSE TABLE (Cont)

FUSE	UNIT	TEST POINT		POTENTIAL
		CIRCUIT PACK	TERM	
TEST M	J-1C000M-1	17D13	27	+12
TEST N	J-1C000L-1	09D22	27	+12
TEST P	"	09A04	27	+12
TEST R	J-1C000M-1	17C01	27	+12
TEST S	J-1C000L-1	01A04	27	+12
TEST T	"	01A10	27	+12
TEST U	"	01A16	27	+12
TEST V	"	01A22	27	+12
TEST W	"	01B04	27	+12
TEST X	"	01B13	27	+12
TEST Z	J-1C000M-1	17D19	3	+12
TEST AA	J-1C000L-1	01B10	27	+12
REG A	J-1C000E-1	01A07	27	+12
REG B	"	01B01	27	+12
STORE CONT A	J-1C000C-1	09A01	3	+12
STORE CONT B	"	05A01	3	+12
STORE CONT C	"	01A01	3	+12
STORE CONT D	J-1C000D-1	25A04	3	+12
STORE CONT E	"	21A10	3	+12
STORE CONT F	"	17A01	3	+12
STORE CONT G	"	13A01	3	+12
STORE CONT H	"	21B04	3	+12
REG CONN M	J-1C000F-1	13B07	27	+12
REG CONN N	"	09B19	27	+12
REG CONN Q	"	09C19	27	+12
REG CONN R	"	13B10	3	+12
REG CONN AA	"	01B01	27	+12
STORE A	J-1C000B-1	05C01	3	+12
STORE B	"	C1L01	27	+12
(LIST 5) MISC J	FIG K	CONN C	6	+12
(LIST 6) MISC J	FIG K	CONN B	6	+12
REG A	J-1C000E-1	01C07	27	+24
REG B	"	01D10	27	+24
STORE CONT E	J-1C000D-1	21C10	13	+24
STORE CONT G	"	13C07	17	+24
STORE CONT H	"	21C07	13	+24
STORE A	J-1C000B-1	01D16	3	+24
STORE B	"	13D05	17	+24
STORE C	"	09C13	17	+24
STORE D	"	09D05	17	+24
STORE E	"	09D22	17	+24
STORE F	"	13C22	27	+24
REG CONN H	J-1C000F-1	05B07	13	+24
REG CONN T	J-1C000G-1	(SD1) RES	B	+24
REG CONN X	J-1C000F-1	13B04	13	+24
REG CONN U	"	09B16	27	+24
REG CONN V	"	05B16	27	+24
REG CONN Y	"	05C01	27	+24
* MISC D	FIG L	(R1) RES	RIGHT	+24
REG CONN J	J-1C000G-1	(RCO) RELAY	2L	+24
REG CONN K	"	(RSC1) RELAY	2U	+24
REG CONN L	"	(EMD) RELAY	24F	+24
TEST TALK A	J-1C000K-1	(CA2) CONNECTOR	1	+24
TEST TALK B	J-1C000L-1	01B19	17	+24
TEST TALK C	"	(PS) RELAY	L	+24
TEST SIG A	"	17B01	13	+24
(LIST 5) MISC AF	FIG K	CONN C	12	-48
(LIST 6) MISC AF	FIG K	CONN B	12	-48
* MISC A	FIG E	L1 INDUCTOR	1	-48
STORE CONT A	J-1C000C-1	13D19	17	-48
TEST A	FIG I or G	HIGHEST EQPT. (SL-) LAMP TOP		-48
TEST B	J-1C000P-1	UNIT TERM. STRIP	1	-48
TEST C	J-1C000K-1	(TSD) RES	B	-48
REG CONN A	J-1C000J-1	(CRAA0) CONN	3	-48
(LIST 2) REG CONN B	"	(CRAA2) CONN	3	-48
(LIST 3) REG CONN C	"	(CRAA4) CONN	3	-48
(LIST 4) REG CONN D	"	(CRAA6) CONN	3	-48

FUSE TABLE (Cont)

FUSE	UNIT	TEST POINT		POTENTIAL
		CIRCUIT PACK	TERM	
REG CONN W	J-1C000G-1	(FP) CONN	12	-48
REG CONN E	J-1C000F-1	13D22	16	-48
TEST DO	J-1C000K-1	(JR0) RES	b	-48
(LIST 2) TEST D1	"	(JR2) RES	b	-48
(LIST 3) TEST D2	"	(JR4) RES	b	-48
(LIST 4) TEST D3	"	(JR6) RES	b	-48
TEST E	"	(RLS) RES LP	1	-48
+VOLT - FA E	FUSE PANEL	(R2) RES	1	-48
+VOLT - FA F	FUSE PANEL	(R3) RES	1	-48
+VOLT - FA G	FUSE PANEL	(R4) RES	1	-48
REG A	J-1C000E-1	01C07	17	-48
REG B	"	01D10	17	-48
REG CONN F	J-1C000J-1	(T0) RES	b	-48
REG CONN G	"	(T1) RES	b	-48

#. Also, temporarily remove ED-1C008 -G1 or G2 amplas circuit packs from Fig. K.

* Capacitor discharges through 1000 ohm resistor.

3. DIGIT REGISTER CONNECTOR INITIALIZATION

3.1 To insure that no false connections are established in the Digit Register Connector, which would cause errors to be generated, all magnetic switches must be forced into an idle state. This is accomplished in the following steps by stimulating a receiver disconnect.

3.11 Block relays RR0, RR1, RC0 and RC1 non-operated.

3.12 Remove the CP R5 from location 05D22 in the SD-1C004 circuit.

NOTE: Disregard the tape printouts and do not reset the Printer until instructed to do so.

3.13 Block relay DIS0 operated.

3.14 Block relay HG0 operated and then operate and release, one at a time, relays LV0 through LV7. Release relay HG0.

3.15 Repeat step 3.14 for each HG-relay as required. (See Table 2).

TABLE 2

60 DATA CHANNELS DETERMINED BY LV AND HG RELAY OPERATION IN DRC

LV RELAYS	HG RELAYS 0	1	2	3	4	5	6	7 (DATA CHANNELS NOT USED)
7	70	71	72	73	74	75	76	
6	60	61	62	63	64	65	66	
5	50	51	52	53	54	55	56	
4	40	41	42	43	44	45	46	
3	30	31	32	33	34	35	36	37
2	20	21	22	23	24	25	26	27
1	10	11	12	13	14	15	16	17
0	00	01	02	03	04	05	06	07
	0		1		2		3	

DR JACKS

SWITCH UNITS (J1C000J)

3.16 Remove the block from relay DIS0 and block relay DIS1 operated.

3.17 Repeat steps 3.14 and 3.15.

3.18 Remove the block from relay DIS1 and replace CP R5 at location 05D22.

3.2 Verify that all data trunks are in an idle state by checking for approximately -15V on terminals 00 through 70 and 01 through 71 of COTA- switches (rear) of the switch unit(s), J1C000J. Use the ITE-4442, 30V DC scale.

4. NORMAL STATUS

Momentarily operate switch CLR and then verify that the switches, lamps and relays are in their normal position as indicated per the following table.

NORMAL STATUS TABLE

Desig.	App.	Position
NT	Switch	Normal
TRACK	Switch	Normal
TRAC	Switch	OFF
TDR	Switch	OFF
SWO	Switch	0
SW1-SW44	Switches	0
START	Lamp	OFF
PH A or B	Lamp	ON
TSD	Lamp	OFF
TRAP	Lamp	OFF
LTA	Lamp	OFF
PSD	Lamp	OFF or ON
MAFF	Lamp	OFF
MODE A,A1,B, B1	Lamps	OFF
44 C.R.	Lamps	OFF
RMB0	Lamp	OFF
RMB1	Lamp	OFF
MJCA	Lamp	OFF
RR0	Relay	Non-operated
RR1	Relay	Non-operated
EMD	Relay	Non-operated
RC0	Relay	Non-operated
RC1	Relay	Non-operated
RSC0	Relay	Non-operated
RSC1	Relay	Non-operated
DIS0	Relay	Non-operated
DIS1	Relay	Non-operated
HG0-7	Relays	Non-operated
LV0-7	Relays	Non-operated
FA	Relay	Non-operated
FFSA	Relay	Operated
MJCA	Relay	Non-operated
OI	Relay	Non-operated
OI1A	Relay	Non-operated
OI1B	Relay	Non-operated
OI1C	Relay	Non-operated
OI2	Relay	Non-operated
OI3	Relay	Non-operated
OI4	Relay	Non-operated
OI5	Relay	Non-operated
OI6	Relay	Non-operated
TSTR	Relay	Non-operated

5. CENTRAL REGISTER CONTROL

This test verifies that information can be entered in the Central Register using the switches of the Control Panel.

STEP	OPERATION	OBSERVATION
1	Operate the NT switch to the Test position.	Both Mode B lamps light.
2	Operate switch SWO to the 1 position.	Both Mode B lamps are extinguished. Both Mode A lamps light.
3	Momentarily operate switch LD.	The START lamp lights.

5. (Cont)

STEP	OPERATION	OBSERVATION
4	Momentarily operate switch CLR.	The START lamp is extinguished.
5	Restore switch SW0 to the "0" position.	
6	Operate switch SW1 to the "1" position. Momentarily operate switch LD.	Lamp associated with switch SW1 lights.
7	Momentarily operate switch CLR. Restore switch SW1 to the "0" position.	Lamp associated with switch SW1 is extinguished.
8	Repeat steps 6 and 7 using switches SW1 thru SW44.	The lamp associated with the operated switch will light and then will be extinguished.

6. PARITY CHECK WORDS

Word 1 and Word 2 are used to check the integrity of the Parity Check Circuit. If these Words are not stored correctly an 83 error code will be printed when subsequent simulated PBX requests are performed

6.1 Word 2 NOTE: Disregard "68" error code printouts when performing tests per 6.1 & 6.2.

STEP	OPERATION	OBSERVATION
1	Perform a RO cycle on the Word 2 Address listed in Table 3.	Verify that no data, all lamps extinguished, appears in the Data Register.
1a	To perform the RO cycle: Operate switch NT to the TEST position and verify that switch SW0 is in the "0" position.	Mode B lamp lights.
1b	Operate the Address Register switches as indicated in Table 3 for Word 2.	
1c	Momentarily operate switch CLR and then switch LD.	Verify that Word 2 is displayed on the Address Register lamps.
1d	Momentarily operate switch RO.	Word 2 is displayed on the Address Register lamps. No lamps should be lit in the Data Register. If lamps are lit in the Data Register, momentarily operate switches CLR, LD and RO sequentially to obtain this observation.
2	Verify that all Data Register switches are in the "0" position.	
3	Perform a WO cycle on the Word 2 Address.	Address Register lamps remain lit. A 68 error code will be printed if lamp PSD is extinguished.
3a	To perform the WO cycle: Verify that switch NT is in the TEST position and that switch SW0 is in the "0" position.	Verify that both Mode B lamps are lit.
3b	Verify that the Address Register switches are operated as indicated in Table 3 for Word 2.	
3c	Momentarily operate switch CLR and then switch LD.	Word 2 is displayed in the Address Register lamps.
3d	Momentarily operate switch WO.	The Address Register lamps remain lit.

6.1 (Cont)

STEP	OPERATION	OBSERVATION
4	Perform a RW cycle on the Word 2 Address.	Verify all "0"s in the Data Register (all lamps extinguished).
4a	To perform the RW cycle: Verify that switch NT is in the TEST position and that switch SW0 is in the "0" position.	Verify that both Mode B lamps are lit.
4b	Verify that the Address Register switches are operated as indicated in Table 3 for Word 2.	
4c	Momentarily operate switch CLR and then switch LD.	Word 2 is displayed on the Address Register lamps.
4d	Momentarily operate switch RW.	Word 2 is displayed on the Address Register lamps. No lamps are lit in the Data Register.
5	Momentarily operate switch CLR.	The Address Register lamps are extinguished.

6.2 Word 1

STEP	OPERATION	OBSERVATION
1	Perform a RO cycle on the Word 1 Address listed in Table 3.	Verify that no data, all lamps extinguished, appears in the Data Register. It may be necessary to perform a second RO cycle.
2	With the exception of P2 enter all "1"s, switches operated to the "1" position, in the Data Register.	
3	Momentarily operate switch CLR and then switch LD.	Verify that Word 1 is displayed on the Address Register lamps. Verify that all lamps, except the P2 lamp, are lit in the Data Register.
4	Perform a WO cycle on the Word 1 Address.	Data Register and Address Register lamps remain lit.
5	Restore all Data Register switches to the "0" position.	
6	Perform a RW cycle on the Word 1 Address.	Verify that all "1"s except P2 appear in the Data Register.
7	Momentarily operate switch CLR.	All Data Register and Address Register lamps are extinguished.

NOTE: It is assumed throughout the tests of this section that one is familiar with the steps necessary to perform a RO cycle, a RW cycle and a WO cycle. If necessary, review the steps to perform these operations. Refer to Section 275A, Paragraph 5.

Table 3
Address Register

	TH	H				T				U			
	1	1	2	4	7	1	2	4	7	1	2	4	7
Word 2 Address	1	1	1	0	1	1	0	0	0	1	0	0	0
Word 1 Address	1	1	1	0	1	1	0	0	0	0	1	0	0

7. TEST CIRCUIT SELF TEST

This test checks the error monitoring features of the Test Circuit.

STEP	OPERATION	OBSERVATION
1	Momentarily operate switch RESET.	Lamp PSD is extinguished, the printer will now operate when an error is detected.
2	Restore the NT switch to the NORMAL position.	The Mode lamps are extinguished.
3	Starting at the left on the top row of Central Register switches and continuing through to the right end of the bottom row, enter alternate groups of four "1"s and four "0"s. First and last groups are "1"s.	
4	Momentarily operate switch CLR and then switch LD.	The Central Register lamps light corresponding to the switch settings.
5	Momentarily operate switch STST.	The Central Register lamps are extinguished. Verify a Sequence 1 printout consisting of error code 69 followed by alternate groups of four "1"s and four "0"s separated by dashes, beginning and ending with "1"s.
6	Restore all Central Register switches to the "0" position.	

8. INPUT/OUTPUT VERIFICATION

Peform the following steps for each Trunk Number listed in Table 4 using the data corresponding to each Trunk Number.

STEP	OPERATION	OBSERVATION
1	Perform a WO cycle: set the Address Register and Data Register switches as indicated, then momentarily operate switches CLR, LD and WO.	
2	Restore the Data Register switches to the "0" position.	
3	Perform a RO cycle: Address Register switches are as in step 1 and switches CLR, LD and RO are momentarily operated.	Verify that the contents of the Data Register is the data written into Memory in step 1.
4	Perform a second RO cycle; momentarily operate switches CLR, LD and RO.	Verify no data was in Memory, all lamps in the Data Register are extinguished.
5	Momentarily operate switch CLR.	All lamps of the Central Register are extinguished.

TABLE 4

ADDRESS REGISTER	DATA REGISTER				
TH1 H T U	TH H T U	Level	Switch	P1	P2
0 1 2 4	1 2 4 7	0	0	1	0
0 1 2 4	1 2 4 7	1	7	0	1
1 2 4 7	2 4 7 1	2	6	1	0NOTE 1
1 2 4 7	4 7 1 2	3	5	1	0
0 4 7 1	4 7 1 2	4	4	0	1
0 4 7 1	7 1 2 4	5	3	1	0
1 7 1 2	7 1 2 4	6	2	0	1NOTE 1
1 7 1 2	1 0 0 0	7	1	0	1 "
1 0 0 0	1 0 0 0	7	1	0	1 "
1 9 0 0	1 0 0 0	7	1	0	1 "
0 7 3 3	1 0 0 0	7	1	0	1 "
1 4 5 5	1 0 0 0	7	1	0	1 "
1 3 6 6	1 0 0 0	7	1	0	1 "
1 5 8 8	1 0 0 0	7	1	0	1 "
1 8 9 9	1 0 0 0	7	1	0	1 "

NOTE 1: A 68 error code will be generated when these tests are performed.

9. ASSEMBLY CHECK

This test verifies that the Assembly process is performed by the frame.

STEP	OPERATION	OBSERVATION
1	Connect the PC cord (3P7B) from jack DRT to jack RMBO.	Lamp RMBO lights and relay RSCO operates.
2	Operate switch NT to the TEST position and operate switch SWO to the 1 position.	Mode A lamps light.
3	Enter the Trunk Number 1111 and the Station Number 1111 in 2/5 code on the Central Register switches (switches SW1 thru SW40).	
4	Momentarily operate switch CLR and then switch LD.	The START lamp lights. The Central Register lamps light in a 2/5 code corresponding to the switch settings.
5	Operate switch TDR to the ON position.	Lamps of the Central Register may appear dimly lit. Allow the test to run for 1/2 min. and verify that no errors are printed.
6	Restore switch TDR to the OFF position.	A single error code may be printed if a transmission was interrupted. Disregard the lighting of the Central Register lamps.
7	Perform a RO cycle using Trunk Number *111.	Verify that the Station Number is 1111. Lamps L4, L2, L1, P1, S4, S2 and S1 light.
8	Remove the PC cord from RMBO. Path from jack RMB1 to jack DRT.	Lamp RMBO is extinguished and relay RSCO releases. Lamp RMB1 lights and relay RSC1 operates.
9	Repeat steps 2,3,4,5,6 and 7.	

* The setting of switch TH1 depends on cross-connections, Refer to Section 275A paragraph 3.23 for an explanation.

9. (Cont)

STEP	OPERATION	OBSERVATION
10	Remove PC cord from DRT and RMB1. Momentarily operate switch CLR.	Lamp RMB1 is extinguished and relay RSC1 releases. Central Register lamps are extinguished.

10. DIGIT REGISTER CONNECTOR

The following tests verify that a path can be extablished from the PBX Data Trunks to Digit Receiver via the Digit Register Connector.

STEP	OPERATION	OBSERVATION
1	Insert a 258 dummy plug in jack RMB1.	Lamp RMB1 lights and relay RSC1 operates.
2	Using a PC cord patch from jack J1 to jack DR00.	
3 *	Enter the Trunk Number B900 and the Station Number 5347 on the Central Register switches using the 2/5 code. Operate switch SW0 to the "1" position.	
4	Momentarily operate switch CLR and then switch LD.	The start lamp lights and Trunk Number B900 and Station Number 5347 are displayed in 2/5 code on the Central Register lamps.
5	Operate switch TRAC to the ON position.	The Central Register lamps will light (blink) once for each PBX Request. Verify that relays RR0, RC0, RSC0, DIS0, LV0 and HG0 pulse.
6	Restore switch TRAC to the OFF position. Restore switch SW0 to the "0" position.	An error code will be printed if TRAC is turned off during a message transmission, disregard the single error code. The relays of step 5 stop pulsing. Some Central Register lamps light, disregard these lamps.
7	Perform a R0 cycle using Address 1900.	The Data Register contains Station Number 5347, Level 0, Switch 0, and a P1 bit.
8	Remove the PC cord from DR00 and, one at a time, patch from jack J1 to each DR-- jack listed in Table 5 and repeat steps 3, 4, 5, 6 and 7.	When performing step 5, verify that the relays, listed in TaBle 5 associated with the DR-- jack patched to jack J1, pulse. When performing step 7, the Data Register contains Station Number 5347, the Level and the Switch indicating the DR-- jack patched to jack J1 and the appropriate P1 and P2 bits.
9	Remove the dummy plug from jack RMB1 and insert it in jack RMB0.	Lamp RMB1 is extinguished and relay RSC1 releases. Lamp RMB0 lights and relay RSC0 operates.

* Insert the Trunk Number thousands digit used to address field B of Memory, refer to Section 275A, paragraph 3.23 for an explanation.

10. (Cont)

STEP	OPERATION	OBSERVATION
10	One at a time patch from jack J1 to each DR-- jack listed in Table 6 and repeat steps 3, 4, 5 6 and 7.	When performing step 5, verify that the relays listed in Table 6 associated with the DR-- jack patched to jack J1, pulse. When performing step 7, the Data Register contains Station Number 5347, the Level and Switch indicating the DR-- jack patched to jack J1 and the appropriate P1 and P2 bits.
11	When additional Switch Units, (J1C000J) are provided, one at a time patch from jack J1 to each DR-- jack and repeat steps 3, 4, 5, 6 and 7.	When performing step 5, relays RR1, RC1, RSC1 and DISI pulse. Relays LV- and HG-, associated with the DR-- jack patched to jack J1, pulse. When performing step 7, the Data Register contains Station Number 5347, the Level and Switch indicating the DR-- jack patched to jack J1, and the appropriate P1 and P2 bits.
12	Remove PC cord from jacks J1 and DR--. Momentarily operate switch CLR.	All Central Register lamps are extinguished.

TABLE 5

Test No.	DR-- Jack	Relays Pulse						Parity Bits	
		RR-	RC-	RSC-	DIS-	LV-	HG-	P1	P2
1	00	0	0	0	0	0	0	1	0
2	10	0	0	0	0	1	0	1	1
3	20	0	0	0	0	2	0	1	1
4	30	0	0	0	0	3	0	1	0
5	40	0	0	0	0	4	0	1	1
6	50	0	0	0	0	5	0	1	0
7	60	0	0	0	0	6	0	1	0
8	70	0	0	0	0	7	0	1	1

TABLE 6

Test No.	DR-- Jack	Relays Pulse						Parity Bits	
		RR-	RC-	RSC-	DIS-	LV-	HG-	P1-	P2-
1	01	1	1	1	1	0	1	0	0
2	11	1	1	1	1	1	1	0	1
3	21	1	1	1	1	2	1	0	1
4	31	1	1	1	1	3	1	0	0
5	41	1	1	1	1	4	1	0	1
6	51	1	1	1	1	5	1	0	0
7	61	1	1	1	1	6	1	0	0
8	71	1	1	1	1	7	1	0	1

11. MEMORY CORE CHECK

The SI Memory has 1840 word slots which are accessible by 2/5 coded Trunk Numbers. Each Trunk Number location will be addressed and filled with "1"s. In this manner the ability of each bit to change states is checked. DO NOT reset the printer.

STEP	OPERATION	OBSERVATION
1	Using a PC cord patch from jack J1 to jack DR00.	
2***	Operate switch SW0 to the "1" position. Enter the Trunk Number A000 in 2/5 code and verify that all Station Number switches are in the "0" position.	
3	Momentarily operate switch CLR and then switch LD.	The START lamp lights, Trunk Number A000 is displayed in 2/5 code on the Central Register lamps and no Station Number lamps light.

*** Insert the Trunk Number Thousands Digit used to address field A of Memory, refer to Section 275A, paragraph 3.23 for an explanation.

11. (Cont)

STEP	OPERATION	OBSERVATION
4	Momentarily operate switch TRAS.	Central Register Lamps are extinguished.
5	Restore switch SW0 to the "0" position. Restore Trunk Number Switches to the "0" position. Remove the PC cord.	Mode .. lamps are extinguished and Mode 6 lamps light.
6	Enter the Trunk Number 0000 in the Address Register in abbreviation 2/5 code. Perform a RO cycle by momentarily operating switches CLR, LD and then RO.	Verify that the Data Register contains all "1"s.
7	Perform a second RO cycle by momentarily operating switches CLR, LD and then RO.	Verify that the Data Register contains all "0"s.
8	Enter the Trunk Number 0001 in the Address Register in abbreviation 2/5 code. Operate all (24) Data Register switches to the "1" position.	
9	Perform a WO cycle by momentarily operating switches CLR,LD and WO.	Central Register lamps light corresponding to the switch settings. A 68 error code may be printed.
10	Perform a RO cycle by momentarily operating switch RO.	Verify that the Data Register contains all "1"s. A 68 error code may be printed.
11	Perform a second RO cycle by momentarily operating switch RO.	Verify that the Data Register contains all "0"s. A 68 error code may be printed.
12	Repeat steps 8, 9, 10 and 11 using Trunk Numbers 0002 thru 0099 and 1000 thru 1939.	

12. PRINTER AND TIMED SHUTDOWN

STEP	OPERATION	OBSERVATION
1	Verify that switch NT is in the TEST position. Patch from jack J1 to jack DR00. Perform a TRAC Request with an error in the Trunk Number.	Verify seven error printouts (error codes most likely to be printed are 24, 25, 63 or 65). Lamps PSD and TRAP light. With Q option lamps PSD and TRAP light at the maintenance center. Verify that the PBX service request register and the PBX failure register do not score.
2	While lamp TRAP is lit, insert a dummy plug in jack DR10.	Lamp TSD lights, Translator relays TMBC and TMB1 operate, and with Q option lamp TSD at the maintenance center lights.
3	Remove the dummy plugs and patch cord, and then operate switch RESET.	Lamp PSD is extinguished. Lamps TSD and TRAP remain lit for 25-60 seconds.
4	Restore switch NT to the NORM position. With Q option insert a dummy plug into jack DR00.	Verify that the PBX service request register and the PBX failure register count each request. Note: The number of counts depends on how long the dummy plug remains in the DR00 jack.
5	Remove the Dummy plug.	

13. ERROR CODE CHECKS

NOTE: The following tests are designed to generate errors in the system for the purpose of verifying encoding by the SIT circuits and subsequent printouts. Seven printouts may be generated for some tests. However, it is essential that the error code printed is correct. Also check, if appropriate, for audible C.O. alarms. Refer to Table A, Section 275C for category of alarms.

13.01 Setup

13.011 At the rear of the SI frame connect a temporary jumper from pin 22 to pin 13 at location 21B16 of 1C005.

13.012*** Patch from jack J1 to jack DR00. When performing TRAS Requests in the following tests, use Trunk Number A000 and Station Number 5347, unless otherwise specified.

13.02 Initial Error Checks

Perform the following tests operation in sequence.

TEST NO.	RESET PRINTER	DUMMY PLUG IN JACK	BLOCK RELAY 1) OPERATED 2) NONOPERATED	PULL CIRCUIT PACK FROM CONNECTOR	PERFORM PBX SIMULATION	VERIFY RELAY OPERATION	VERIFY ERROR CODE PRINTOUT	RESTORE CIRCUIT PACK	REMOVE RELAY BLOCK	REMOVE DUMMY PLUG
1	X	RMB1	LV1 OP		TRAS		24		X	
2	X	RMB1	HG1 OP		TRAS		24		X	
3	X	RMB1	LV0 NON		TRAS		26		X	
4	X	RMB1	HG0 NON		TRAS		26		X	
5	X	RMB1	DIS0 NON		TRAS	*EMB	32		X	X
6	X	RMB0	LV1 OP		TRAS		25		X	
7	X	RMB0	HG1 OP		TRAS		25		X	
8	X	RMB0	LV0 NON		TRAS		27		X	
9	X	RMB0	HG0 NON		TRAS		27		X	
10	X	RMB0	DIS1 NON		TRAS	*EMB	35		X	X
11	X			1C004 09B01			28	X		
12	X			1C004 09B10			29	X		
13	X			1C004 13B01			33	X		
14	X			1C002 17C01			77	X		
15	X			1C002 13A13	TRAS		62	X		
16	X			1C002 21D13			72	X		
17	X			1C002 21D07			73	X		
18	X			1C002 21C19			74	X		
19	X			1C002 21D01			75	X		
20	X			1C002 09D04			76	X		
21	X			1C002 17B22			82	X		
22	X	RMB1		1C001 01A07	TRAS		86	X		X
23	X	RMB0		1C001 01A07	TRAS		88	X		X
24	X			1C002 05D01			89	X		

*EMB relay may only wink.

*** Insert the trunk number thousands digit used to address field A of Memory, refer to section 275A paragraph 3.23 for an explanation.

13.03 Path Selection Failure

STEP	OPERATION	OBSERVATION
1.	Insert a dummy plug into jack RMB1.	Lamp RMB1 lights.
2.	Perform a TRAC Request.	Refer to paragraph 4.2, Section 275A.
3.	Connect 2 186A contact protection networks in parallel. Momentarily place the 2 186A networks across the LVO relay coil.	Verify error code 22 printout.
4.	If the frame has not released, momentarily operate the RC relay.	The relays, which were locked operated will release.
5.	Remove the dummy plug from RMB1 and insert it into RMBO.	Lamp RMB1 is extinguished and Lamp RMBO lights.
6.	If lamp PSD is lit, momentarily operate switch RESET.	Lamp PSD is extinguished.
7.	If the TRAC Request has stopped, restart the TRAC Request by: 1) Restore switch TRAC to the OFF position, 2) momentarily operate switches CLR and then LD, 3) operate switch TRAC to the ON position.	
8.	Momentarily place the 2 186A networks across LVO relay coil.	Verify error code 23 printout.
9.	If the frame has not released, momentarily operate the RC relay.	The relays, which were locked operated, release.
10.	Remove the dummy plug and operate the switch RESET.	Lamp PSD is extinguished.

13.04 Station Gating Failure

STEP	OPERATION	OBSERVATION
1	Insert a dummy plug into jack RMB1 and insert an ITE-5182 extender Board into location 05D07-1C002.	Lamp RMB1 lights.
2	Open terminal 2 of CP 204 and place CP 204 into the extender board.	
3.	Perform 7 TRAS Requests.	Refer to paragraph 4.1, Section 275A. Also verify 7 error code 85 printouts and lamp PSD lights.
4.	Momentarily operate switch RESET.	Lamp PSD is extinguished.
5.	Remove the dummy plug from jack RMB1 and insert the dummy plug into jack RMBO. Close terminal 2 and open terminal 5 of the ITE-5182 extender board.	Lamp RMB1 is extinguished and lamp RMBO lights.
6.	Perform 7 TRAS Requests.	Verify 7 error code 87 printouts and lamp PSD lights.

13.04 (Cont)

STEP	OPERATION	OBSERVATION
7.	Remove the dummy plug from jack RMBO. Remove the ITE-5182 extender board and replace CP204 in the SI frame.	Lamp RMBO is extinguished.
8.	Momentarily operate switch RESET.	Lamp PSD is extinguished.

13.05 Trunk Number Error and Station Number Error Check

Note: The 7 TRAS Requests in the following steps must be performed within 60 seconds.

STEP	OPERATION	OBSERVATION
1	Insert a dummy plug into jack RMB1.	Lamp RMB1 lights.
2.	If lamp PSD is lit, operate switch RESET.	Lamp PSD is extinguished.
3.	Insert a 1/5 error in the Trunk Number Thousands Digit, restore one switch to the "0" position.	
4	Perform 7 TRAS Requests	Verify 7 error code 63 printouts and lamps PSD and TRAP light.
5.	Momentarily operate switch RESET.	Lamp PSD is extinguished.
6.	Insert a 3/5 error in the Trunk Number Thousands Digit, 3 out of the 5 Trunk Number Thousands Digit are in the "1" position.	
7.	Perform 7 TRAS Requests.	Verify 7 error code 63 printouts and lamps PSD and TRAP light.
8.	Momentarily operate switch RESET. Restore Trunk Number Thousands Digit to a valid 2/5 code.	Lamp PSD is extinguished.
9.	Insert a 1/5 error in the Station Number Thousands Digit.	
10.	Perform 7 TRAS Requests.	Verify 7 error code 64 printouts and lamp PSD lights.
11.	Momentarily operate switch RESET.	Lamp PSD is extinguished.
12.	Insert a 3/5 error in the Station Number Thousands Digit.	
13	Perform 7 TRAS Requests.	Verify 7 error code 64 printouts and lamp PSD lights.
14.	Momentarily operate switch RESET. Restore Station Number Thousands Digit to a valid 2/5 code.	Lamp PSD is extinguished.
15.	Remove the dummy plug from jack RMB1 and insert it in jack RMBO.	Lamp RMB1 is extinguished and lamp RMBO lights.

13.05 (Cont)

STEP	OPERATION	OBSERVATION
16.	Repeat steps 2 through 8.	Verify 7 error code 65 printouts in steps 4 and 7.
17.	Repeat steps 9 through 14.	Verify 7 error code 66 printouts in steps 10 and 13.
18.	Remove the dummy plug from jack RMBO.	Lamp RMLO is extinguished.
19.	If lamp PSD is lit momentarily operate switch RESET.	Lamp PSD is extinguished.

13.06 Ferrod Detector Alarm

STEP	OPERATION	OBSERVATION
1	Using a 738A tool, connect pin 1 (grd) to pin 26 of CP R5 at location 05D22 in 1C004.	
2	Perform 7 TRAS Requests	Verify 7 error code 34 printouts and lamp PSD lights.
3	Remove the 738A tool. Momentarily operate switch RESET.	Lamp PSL is extinguished.

13.07 Power Failure

STEP	OPERATION	OBSERVATION
1	Operate the ON-OFF switch of the 6 Volt A Converter to the OFF position.	Verify 7 error code 39 printouts and lamp PSD lights.
2	Operate the ON-OFF switch of the 6 Volt A Converter to the ON position.	
3	Momentarily operate switch RESET.	Lamp PSD is extinguished.
4	Repeat steps 1, 2 and 3 for each of the six power converters.	Verify 7 error code 39 printouts when each of the Converters is shut down.

13.08 Test Circuit Parity

STEP	OPERATION	OBSERVATION
1	Perform a RW cycle on the Word 2 Address, Refer to Table 3.	Verify error code 68 printout.
2	If lamp PSD lights, momentarily operate switch RESET.	

13.09 Check Parity, Self-Check

STEP	OPERATION	OBSERVATION
1	Remove the temporary jumper from pin 22 to pin 13 at location 21B16 of 1C005, applied in step 13.011.	
2	Perform a WO cycle on the Word 1 Address with all (24) "1"s in the Data Register, including the P2 bit.	Verify error code 68 printout.

13.09 (Cont)

STEP	OPERATION	OBSERVATION
3	Set Control Panel as in Step 13.012 and perform 7 TRAS requests.	Verify 7 error code 83 printouts.
4	Restore validity to Word 1 by performing steps of paragraph 6.2.	
5	If lamp PSD is lit, momentarily operate switch RESET.	Lamp PSD is extinguished.
6	Perform a WO cycle on the Word 2 Address with a bit in the P2 position.	
7	Set Control Panel as in step 13.012 and perform 2 TRAS Requests.	Verify error code 83 printout.
8	Restore validity to Word 2 by performing the steps of Paragraph 6.1.	
9	If lamp PSD is lit, momentarily operate switch RESET.	Lamp PSD is extinguished.
10.	Set Control Panel as in step 13.012 and perform 2 TRAS Requests.	Verify no error code 83 printouts. If error code 83 printouts occur recheck the validity of Word 1 and Word 2.

13.10 Data Trunk Recording for SEQ1 Status Information

Note: When certain errors occur with the NT switch in the NORM position the tape printout will include the Data Trunk Number in use when the error occurred. The Data Trunk Number will be printed in a 1/8 code for its level and a 1/8 code for its switch and is indicated in the first 16 bits of the printout as illustrated below:

TU - XXXX XXXX XXXX XXXX
0123 4567 0123 4567
LEVEL SWITCH

STEP	OPERATION	OBSERVATION
1	Restore switch NT to the NORM position. Insert a dummy plug into jack RMB1.	Lamp RMB1 lights.
2	If lamp PSD is lit, momentarily operate switch RESET.	Lamp PSD is extinguished.
3	Momentarily insert a dummy plug into jack DR00.	Verify error code 24 or 63 sequence 1 printout with a "1" only in bit position 1 and 9 of the first 16 positions.
4	Repeat steps 2 and 3 for all equipped data channels.	Verify correct level and switch identification for each data channel.
5	Remove dummy plug from jack RMB1 and insert it into jack RMB0.	Lamp RMB1 extinguishes and lamp RMB0 lights.
6	Repeat steps 2, 3 and 4.	Verify error code 25 or 65 sequence 1 printout. Verify correct level and switch identification.
7	Remove dummy plug from jack RMB0.	Lamp RMB0 is extinguished.

14. ALTERNATE TREATMENT FOR CHANGED PBX TRUNK NUMBER

NOTE: This test is to be performed after Long Loop Tests are made. Refer to Section 275A for a description of this test.

14.1 At the AIOD Control Panel, perform a WO cycle using the New Trunk Number, 0789, in the Address Register, the Old Trunk Number, *0456, in the Data Register, the tag "67" and the proper P2 bit.

14.2 Perform a RW cycle, verify that the contents of the Data Register is the information stored in Step 14.1.

*Refer to Section 275A, paragraph 8 for the number to be used as the Trunk Number Thousands Digit and for an explanation of the '67' tag.

14.3 Perform a TPAS Request use the Old Trunk Number, 0456, Station Number 3333, and patch to any DR- jack.

14.4 At the CO test frame perform a Long Loop Test using the New Trunk Number, 0789. Verify that Station Number 3333, is retrieved.

14.5 Repeat step 14.2 and verify that the New Trunk Number, the Old Trunk Number, and the "67" tag are still in Memory.

14.6 Repeat steps 14.3 and 14.4, verify that Station Number. 3333, is retrieved.

14.7 Repeat steps 14.1 thru 14.6 inter-changing the Old Trunk Number with the New Trunk Number in every instruction.

14.8 Restore the frame to Normal Status per paragraph 4. Remove all test equipment and test tools, if applicable.

Reason for Reissue:
To make minor corrections and to change format to allow easier trouble shooting.

→ Due to change of format arrowed lines normally used, are omitted.

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