Installation Engineering Handbook 59
Western Electric Company, Incorporated
Columbus Works

Section 108
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ANI LEADS TESTS - PART 1

CONTENTS

1. GENERAL INFORMATION

1.1 This section and Section 109 of this handbook describe the leads tests to be performed on ANI circuits.

1.2 Fusing tests per Section 107 of this handbook should be performed prior to tests of this section.

1.3 These leads tests are arranged so that, if desired, two groups of testers may perform leads tests at the same time, one group using this section and the other group using Section 109 of this handbook. Tests per Paragraph 4 of this section may be performed at the same time as Paragraph 4 of Section 109, etc.

1.4 Sleeve leads tests per Section 117 Paragraph 7 may be performed at any time after these leads are connected at the Number Network Frames.

2. RECORDS AND REQUIREMENTS

2.1 The results of tests per this section shall be recorded on forms ID-1313 and ID-1315 as described in Handbook 50, Section 3.

3. TEST EQUIPMENT

Amt	Code	Description
1	R-9572	Test Receiver
10	329A	Make-Busy Plugs (Furnished with Misc. Ckt for Trouble Ticketer)

4. IDENTIFIER TO OUTPULSER

4.1 Perform the test operations described in Table A between Identifier 0 and each Outpulser Circuit.

4.2 Repeat the tests of Table A (SD-95810-01) and Table B (SD-1C593-01) between Identifier 1 and each Outpulser.

TABLE A

(SD-95810-01)

Test No.	Leads Under Test	Test Operations		Observe Results	
		At Identifier	At Outpulser	At Identifier	At Outpulser
1	TH-	Using Test Receiver Connected to Ground, Touch Test Probe to Relay TH1 Stationary Contact 1	Block Operated OCA, ICA-		TH4, TH7, THK Operate
		Contact 3			TH0, TH2, THK Operate
		6			TH1, TH4, THK Operate
2	H-	Relay H1 Made Contact 1			H4, H7, HK Operate

TABLE A (Cont'd.)

Test No.	Leads Under Test	Test Operations		Observe Results	
		At Identifier	At Outpulser	At Identifier	At Outpulser
2 (Cont.d.)		Contact 3 6			HO, H2, HK Operate H1, H4, HK Operate
3	T-	Relay T1 Make Contact 1 3 6	Release OCA, ICA- Block Operated 1CB-, OCB		 T4, T7, TK Operate TO, T2, TK Operate T1, T4, TK Operate
4	U-	Relay U1 Make Contact 1 3 6			U4, U7, UK Operate UO, U2, UK Operate U1, U4, UK Operate
5	SO	Block Nonoperated ON, ON2 Operate SO (Grd Terminal 25)	Release ICB-OCB Block Operated ICC, OCC		SO Operates
6	RP		Operate and Release RP	RP Operates and Releases	
7	TP		Operate and Release TP	TPA, TPB, TPC Operate and Release	
8	TST		Block Operated TST	TST Operates	
9	LT		Block Operated PS	TST Releases and LT Operates	
10	WC	Operate and Release EP	Release TST and PS		1TR Operates and Releases
11	TBL		Operate and Release TTCO	TBL, TBLA Operate and Release	
12	OIT		Operate and Release Relay OT1	OIT Operates and Releases	
13		Release ON, ON2	Release OCC, ICC-		

TABLE A (Cont'd.)

Test No.	Leads Under Test	Test Operations		Observe Results	
		At Identifier	At Outpulser	At Identifier	At Outpulser
14	OF0 to OF5	Block Operated Relay OFKA Operate and Release One at a Time Relays OFOA to OF5A	Block Operated ICD-, OCD		Relays OF0 to OF5 Operate in Succession.
15		Release OFKA. Block Nonoperated. Relay ON1. Block Operated Relays OFKD, ON. Insulate 6M OFKD.	Release ICD-, OCD. Block Operated RElays ICE-, OCE, OFK		
16	OFG, OFK0 to OFK5	Connect Ground thrEst Receiver to Contact 9 of Relay OFK	Operate and Release, One at a Time, Relays OF0 to OF5	Relays OF0, OFOA to OF5. OF5A Operate and Release in Pairs.	
17	THK, HK, TK, UK	Remove Ground from Contact 9 of Relay OFK	Release OFK Manually Operate, One at a Time THK HK TK UK	Relays THKm HK, TK and UK Operate and Release, One at a Time.	
18	PTY	Operate and Release PTY (Grd Terminal 35)			PTY Operates and Releases.
19			Release IC-, OCE		

TABLE B

(SD-1C593-01)

Test No.	Leads Under Test	Test Operations		Observe Results	
		At Identifier	At Outpulser	At Identifier	At Outpulser
1	TH-	Using Test Receiver Connected to Ground, Touch Test Probe to T.S.C 00, 16, 20, 30, 40	Block Operated OCA, ICA-		TH0, TH1, TH2, TH4, TH7 Operate
2	H-	T.S. C, 01, 11, 21, 31, 41			H7 Operate H2 Operate H0, H1, H2, H4, H7 Operate H4 Operate

TABLE B (Cont'd.)

Test No.	Leads Under Test	Test Operations		Observe Results	
		At Identifier	At Outpulser	At Identifier	At Outpulser
3	T-	T.S. C, 02, 12, 22, 32, 42	Release OCA, ICA- Block Operated ICB-, OCB		TK Operate TK, TO, T1, T2, T4, T7 Operate TK Operates
4	U-	T.S. C, 03, 13, 23 33, 43			UK Operates UK, UO, U1, U2, U4, U7 Operate UK Operates
5	SO	GND. T.C. C - 14	Release ICB- OCB Block Operated ICC-, OCC		SO Operates
6	RP		Operate and Release RP	GND on T.S. C-37	
7	TP		Operate and Release TP	TPC and GND on T.S. C - 27	
8	TST		Block Operated TST	GND on T.S. C - 36	
9	LT		Block Operated PS		
10	WC	GND T.S. C - 48	Release TST and PS		1TR Operates and Releases
11	TBL		Operate and Release TTCO	TBL Operate and Release	
12	OIT		Operate and Release Relay OT1	GND on T.S. C - 07	
13		Release ON, ON2 Remove GND T.S. C - 14	Release OCC, ICC-		
14	OFO to OF5	GN T.S. C - 09, 19,29, 39, 49, 59	Block Operated ICD-, OCD		Relays OFO to OF5 Operate in Succession. Relay OFK Operates with OF- Relay.
15		Release OFKA. Block Nonoperated. Relay ON1. Block Operated Relays OFKD, ON. Insulate 6M OFKD.	Release ICD-, OCD. Block Operated Relays ICE-, OCE, OFK		

TABLE B (Cont'd.)

Test No.	Leads Under Test	Test Operations		Observe Results	
		At Identifier	At Outpulser	At Identifier	At Outpulser
16	OFG, OFK0 to OFK5	Connect Ground through a Test Receiver to Contact 9 of Relay OFK	Operate and Release, One at a Time, Relays OF0 to OF5	Relays OF0, OF0A to OF5. OF5A Operate and Release in Pairs.	
17	THK, HK TK, UK	Remove Ground from Contact 9 of Relay OFK	Release OFK Manually Operate, One at a Time THK HK TK UK	Relays THK, HK, TK and UK Operate and Release, One at a Time.	
18	PTY	GND on T.S. C - 04			PTY Operates and Releases
19			Release ICE-, OCE		

5. OUTPULSER TO TROUBLE TICKETER

5.1 Perform the following operations at the Outpulser, and observe the indicated results at the Trouble Ticketer frame. Block relay TTST normal at Outpulser.

AT OUTPULSER		AT TROUBLE TICKETER	
LEAD	OPERATE	OBSERVE RESULT	
NI	TTCO	NI	Operates
SER	"	SER	"
ECTM	" ETMA	CTM	"
ETM1	" ST, ETMA	TM1	"
ETM2	" ETM2	TM2	"
TAL	" TAL1	TA	"
TT	" TST	TT	"
PS	" IRLA, PA	PSR	"
PST	" PS	PST	"
LV	TTCO, TST, PS	LV	"
RO	TTCO RO	RO	"
1TR	TCT1, 1TR	1TR	"
2TR	" 2TR	2TR	"
IDG2	" ID2	IDG2	"
IDG1	" ID1	IDG1	"
IDGO	" IDO	IDGO	"
PIK	" PIK	PIK	"
PT1	" PT1	PT1	"
IYK	" IYK	IYK	"
SP	" SP	SP	"
GRF	" GRF	GRF	"
OIT	" OT1	OIT	"
KP	TTC2, KP	KP	"
IDS	" IDS	IDS	"
AS	" AS	AS	"
CS	" CS	CS	"

5.1 (Cont'd.)

AT OUTPULSER		AT TROUBLE TICKETER
LEAD	OPERATE	OBSERVE RESULT
BS	TTC2, BS	BS Operates
THS	" THS	THS "
HS	" HS	HS "
US	" US	US "
TS	" TS	TS "
EP	" EP	EP "
STS	" STS	STS "
RL	" RL	RL "

AT OUTPULSER		AT TROUBLE TICKETER	AT OUTPULSER		AT TROUBLE TICKETER
LEAD	OPERATE	OBSERVE RESULT	LEAD	OPERATE	OBSERVE RESULT
TNK	TTC3, TNK	TNK Operated	TH1	TTC5, TH1	TH1 Operates
TNC	" TNC	TNC "	TH2	" TH2	TH2 "
TKC1	" TKCI	TKCI "	TH4	" TH4	TH4 "
IK	" IK	IK "	TH7	" TH7	TH7 "
TRS	" TRS	TRS "	HO	" HO	HO "
L1	" L1	L1 "	L1	" H1	H1 "
PK	" PK	PK "	H2	" H2	H2 "
IRL	" IRL	IRL "	H4	" H4	H4 "
TP	" TP	TP "	H7	" H7	H7 "
GRT	" GRT	GRT* "	HK	" HK	HK "
PT	" PT	PT* "	THK	" THK	THK "
RP	" RP	RP "	TO	TTC6, TO	TO "
NOB	TTC4	NOB "	T1	" T1	T1 "
CCKF	" CCKF	CCKF "	T2	" T2	T2 "
SO	" SO	SO "	T4	" T4	T4 "
AB	" AB	AB "	T7	" T7	T7 "
PTY	" PTY	PTY "	U0	" U0	U0 "
OF0	" OF0	OF0 "	U1	" U1	U1 "
OF1	" OF1	OF1 "	U2	" U2	U2 "
OF2	" OF2	OF2 "	U4	" U4	U4 "
OF3	" OF3	OF3 "	U7	" U7	U7 "
OF4	" OF4	OF4 "	UK	" UK	UK "
OF5	" OF5	OF5 "	TK	" TK	TK "
THO	TTC5 THO	THO "		OBSERVE RESULT	OPERATE
			TCK	TCK Operates	OP- Relay

* Optional

5.2 Outpulser to Miscellaneous Circuit Trouble Ticketer (SD-95823-01)

5.21 Perform the following tests between the Outpulser and the Miscellaneous circuit for the Trouble Ticketer and observe the proper results.

OUTPULSER			MISC. CKT. TBL. TKTR.	
LEAD	OPERATE	RESULT	OPERATE	RESULT
1TF0	ICC0,1TR			1TF0 Register Scores
1TF1	ICC1,1TR			1TF1 " "
2TF	OCC,2TR			2TF " "
OPF	TTST			OPF " "
TC	RC,ON			TC " "

5.21 (Cont'd.)

	OUTPULSER		MISC. CKT. TBL. TKTR.	
LEAD	OPERATE	RESULT	OPERATE	RESULT
AOPB			Insert MB Plugs in All OP MB-Jacks	Relay B1 Operates
			Operate BAT Key	Lamp AOB Lights
CITN	OTM			CITN Operates
CFTF		CFTF Operates	Insert MB Plug in CFTF Jack	
DL	DL	DL Locks	Operate BAT Key	DL Lamp Lights
DLL		DL Releases	Operate AR Key	
LUG	TKL			LU0, LU1, LU2 Operate
MBI-		MBI0 Operates	Insert MB Plug IOBOP- Jack	
MBI-		MBI1 Operates	Insert MB Plug I1BOP- Jack	
MJ-	TTST,2TR			MJ Operates
			Operate AR Key	MJ Releases
MN-	IRL,TTST			MN Operates
			Operate AR Key	MN Releases
OP-	ON1		Operate BAT Key	OP Lamp Lights
TKL	2TR	TKL Operates	TKL	

6. IDENTIFIER TO TROUBLE TICKETER AND S.O. NETWORK

6.1 Identifier (SD-95810-01 Only) to Trouble Ticketer

6.11 At the Identifier, block operated relays TBL, TBLA and ON.

6.12 Observe that relays ID and NPK operate at the trouble ticketer frame.

6.13 Operate and release the following relays at the Identifier, and observe that the proper relays operate and release at the Trouble Ticketer as shown in the following chart:

IDENTIFIER OPERATE AND RELEASE	TROUBLE TICKETER RELAYS OPERATE AND RELEASE
THS	TH
HS	H
TS	T
US	U
ES	ES
ES1 (insulate 4B ESA)	ES1
ES2 (insulate 4B ESA)	ES2
OFX5 (GRD. Terminal 55)	OFX
OFO	OFOS
OF1	OF1S
OF2	OF2S
OF4	OF4S
OF5	OF5S
OFE	OFES

6.14 Upon completion of test, release relays TBL, TBLA and ON. Remove insulation from relay ESA.

6.15 Identifier (SD-1C593-01 Only) to TBL Ticketer

6.151 At Iidentifier T.S. G - 31 apply GND NPK REL. at TBL TKT operate.

6.152 Remove GND T.S. G - 31 NPK releases apply GND to T.S. G - 15 OFX at TBL TKT operates.

6.153 Remove GND T.S. G - 15 OFX releases.

6.2 Identifier to Misc. Ckt. Trouble Ticketer

6.21 Insert a make busy plug into the MBI jack associated with Identifier 0.

6.22 Observe that relay MB operates at Identifier.

6.23 Remove make busy plug. Relay MB releases.

6.24 Repeat test for Identifier 1.

6.25 Operate BAT Key on Trouble Ticketer.

6.26 Operate and release relay ON1 (SD-95810-01) Mom. apply GND. T.S. G - 15 (SD-1C593-01) at the Identifier. Observe that lamp ID associated with Identifier 0 operates at the Misc. Ckt. for the Trouble Ticketer.

6.27 Repeat test for Identifier 1.

6.28 Operate and release relay ES2 (SD-95810-01) Mom. apply GND. T.S. G - 20 (SD-1C593-01). Observe that message register IAF scores once at the trouble ticketer.

6.29 Repeat test for Identifier 1.

6.3 Identifier to S.O. Network Ckt.

6.31 At the Identifier operate relays TPA, TPB and TPC. Observe that relays TP0 to TP19 for each office operate at the Secondary Network Circuit. Also TPS relay on SD-1C593-01 only.

NOTE:Paragraphs 6.32 thru 6.37 SD-95810-01 only.

6.32 Operate relay ON2 at the Identifier. Observe relay PTK is operated at the Identifier.

6.33 Observe that relay TPS is operated at the S.O. Network Ckt.

6.34 Manually release relay TPS at the S.O. Network Ckt. Observe that relay PTK releases at the Identifier.

6.35 Release relays TPS, TPB and TPC at the Identifier and oeprate relay RP.

6.36 Manually operate relay TPS at the S.O. Network Ckt. Observe that relay PTK releases at the Identifier.

6.37 Release relays RP and ON2 at the Identifier.

6.38 SD-1C593-01 only. Apply check for GND on T.S. D - 58 and no GND on D - 48. Operate TPS Rel. check for GND on D - 48 and no GND on D - 58.

7. OUTPULSER TO LINE VERIFICATION CIRCUITS

7.1 Outpulser to Line Verification Cannector and Display Ckt. (No. 1, Pan.) (SD-95828-01)

7.11 Perform the following tests between the Outpulser and the L.V. Ckt. and observe the proper results.

OUTPULSER			L.V. CONN. & DISP. CKT.	
LEAD	OPERATE	RESULT	OPERATE	RESULT
H0	LV2,H0			H0 Operates
H1	" H1			H1 "
H2	" H2			H2 "
H4	" H4			H4 "
H7	" H7			H7 "
MP	LV1,PTY			MP "
OF0	LV1,OF0			OF0 "
OF1	" OF1			OF1 "
OF2	" OF2*			OF2 "
OF3	" OF3*			OF3 "
OF4	" OF4*			OF4 "
OF5	" OF5*			OF5 "
RLS	"	RL Operates	LO,RS	
RS	"		VC-2	RS "
TO	LV3,TO			TO "
T1	" T1			T1 "
T2	" T2			T2 "
T4	" T4			T4 "
T7	" T7			T7 "
TBL	TTB,TST,PS			TBL "
TH0	LV2,TH0			TH0 "
TH1	LV2,TH1			TH1 "
TH2	" TH2			TH2 "
TH4	" TH4			TH4 "
TH7	" TH7			TH7 "
U0	LV3,U0			U0 "
U1	" U1			U1 "
U2	" U2			U2 "
U4	" U4			U4 "
U7	" U7			U7 "

* Optional

7.2 Outpulser to Line Verification Circuit (SxS) (SD-32246-01)

7.21 Perform the following test between the Outpulser and the Line Verification circuit, and observe the proper results.

OUTPULSER			L.V. CKT.	
LEAD	OPERATE	RESULT	OPERATE	RESULT
OF0	LV1,OF0			OF0 Operates
OF1	" OF1			OF1 "
OF2	" OF2*			OF2 "
OF3	" OF3*			OF3 "
OF4	" OF4*			OF4 "
OF5	" OF5*			OF5 "
TH0	LV2,TH0			TH0 "
TH1	" TH1			TH1 "
TH2	" TH2			TH2 "
TH4	LV2,TH4			TH4 "
TH7	" TH7			TH7 "
H0	" H0			H0 "
H1	" H1			H1 "
H2	" H2			H2 "
H4	" H4			H4 "
H7	" H7			H7 "
T0	LV3,T0			T0 "
T1	" T1			T1 "
T2	" T2			T2 "
T4	" T4			T4 "
T7	" T7			T7 "
U0	" U0			U0 "
U1	" U1			U1 "
U2	" U2			U2 "
U4	" U4			U4 "
U7	" U7			U7 "
MP	LV1,PTY			MP "
RS	LV1		ST	RS "
RLS	LV1	RL Operates	ORL,RS	
TBL	TTB,TST,PA			TBL "

* Optional

No changes are indicated due
to extensive revision.

Manager, Product Engineering
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