Installation Engineering Handbook 62
Western Electric Company, Incorporated
Columbus Works

TERMINATING MARKER AND TERMINATING MARKER APPLIQUE

Replaces: Section 225
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CONTENTS

1. GENERAL INFORMATION

1.1 Description of Test

1.11 Sections 225 to 225.8 describe a method of testing:

(1) SD-25283-01, Terminating Marker Circuit
(2) SD-27765-01, Terminating Marker Applique Circuit
(3) SD-25055-01, Miscellaneous Circuit for Terminating Marker Circuit
(4) SD-27819-01, Miscellaneous Circuit for Terminating Marker Applique Circuit
(5) SD-27960-01, Terminating Marker Auxiliary Digit Registration and Translation Circuit

NOTE: When DID-LLP and/or DADID to No. 101 ESS is equipped, the Terminating Marker Circuit, SD-25283-01, is modified to be associated with the Terminating Marker Applique Circuit, SD-27765-01. When the office under test is so arranged, it is to be understood that where any Section 225 refers to the marker, the marker and marker applique is intended.

The terminating trouble indicator frame is used for testing all features and wiring of the terminating markers that are accessible to the trouble indicator. The Terminating Equipment Test Set, ITE-4010, or OGT Test Frame SD-25177-01, is used on the following tests: "Crossed Hundred Block" leads in Section 225.3, "Intercepting Trunks" in Section 225.7 and "Subscribers Line Overflow Register by Number Groups Cross Connections" in Section 225.8.

The marker under test may be made busy to all other equipment except the trouble indicator by inserting a 322A make busy plug in its DB jack.

1.12 Lamps on the trouble indicator are used to check the operation of the markers. When testing a particular feature of a marker it is necessary to observe only those lamps associated with the feature under test and the lamps that indicate whether or not the call is completed successfully. Other lighted lamps which appear to be erroneously lighted should be investigated.

1.13 The wiring and functions of the Terminating Marker Circuits associated with the Terminating Sender Test, the Marker Connector, the Incoming Link and Number Checking Trunk Circuits, which are not covered by this method are tested in connection with associated circuits.

1.2 Test Procedure

1.21 Some tests, such as the check of fuses, contact protection installed on the job, channel selection test, time measure, etc., can be made early in the test period. The markers then should be conditioned to handle test calls before the remaining tests are performed.

1.22 When the markers are available for handling test calls from the incoming trunks and terminating senders, busy at regular intervals, the first choice markers to connector circuits; first and second choice markers; first, second and third choice markers, etc., as a means of exercising the connector circuits. Insert a 322A make busy plug into the proper CB jack to busy a particular marker to a particular connector without busying the marker to other connectors.

1.23 During the test of the markers the regular lockout circuit (MP relays) and the emergency lockout circuit (E relays) on the incoming link frames,

line choice connector frames and number group connector frames should be used alternately at regular intervals as a means of exercising these circuits.

1.24 During the test of the markers, using 349A make busy plugs, busy channels so as to use channels 0 to 9 in the order they are selected by the marker, at different intervals. The channels should be busied at the following points at different intervals.

(1) Incoming Link Frames - MB jacks

(2) Line Link Frames - SS jacks

2. RECORDS AND REQUIREMENTS

2.1 Records: Forms SD-4-1313, SD-4-1315 and SD-4-1334 are required for recording the results of these tests.

2.2 Requirements: The tests of Sections 225 to 225.8 must be applied to meet the equipment performance requirements per BSP 816-007-181.

3. TEST EQUIPMENT

3.1 Test Sets Required

Amt	ITE	Description
1	4010	Terminating Equipment Test Set
1	4033B	Link Frame Test Set

3.2 Cords Required

Amt	ITE	Lgth	Cdrs	One End	Other End	With ITE
1	9598	12'	2	310 Plug	310 Plug	4033B
4	9984	12'	10	Jones Plug 312 CCT	10 ITE-2461	4033B
1	9627	12'	3	508A Key	310 Plug	4023

3.3 Accessories Required

Amt	Code or ITE	Description	With ITE
As Req.	ITE-4069	Blocking Tool, Multi-Contact Relay	4023 4023
As Req.	322A,349A 329A & 351C	Make Busy Plug	4023
1	ITE-4042	Hand Tel. Set	4023
1	ITE-8253	Contact Protection Test Set	4023
1	R-3314	Stop Watch	4023
1	ITE-4442	Volt-Ohmmeter	4023
1	R-9572	Test Receiver	4023
1	R-1824	Pencil Lamp	4023

4. SETTING UP TEST CALLS

NOTE: The Laboratories, in the process of modifying the Terminating Trouble indicator (TTI), has replaces many jacks and/or keys with correspondingly designated keys and/or switches respectively. Therefore, the office under test may be so arranged that many of the jacks and/or keys, mentioned in this section, may actually be keys and/or switches respectively. If a key or switch is equipped instead of a jack or key, setting the key or switch to the position corresponding to the jack or key designation will satisfy the requirements of this test section.

4.01 At the terminating trouble indicator, key the number of the terminal to be called by operating a thousands key (TH) 0-9, a hundreds key (H) 0-9, a tens key (T) 0-9, and a units key (U) 0-9.

4.02 Operate an incoming frame numerical key to transmit the number of the incoming frame to the marker. Incoming frame keys (F) 0-9 correspond to incoming frames 0-9 respectively. With key F10 operated, keys (F) 0-9 correspond to incoming frames 10-19 respectively. Key NCF should be operated when a test call is made to simulate an A switchboard number check call (NCL class of call key operated). In this case the marker is directed to select a number checking trunk instead of an incoming link frame and, therefore, no F key should be operated when the NCF key is operated.

4.03 Operate a class of call key to simulate in the marker the class of call desired.

Key FS for full selector call
Key MAN for manual call
Key TOL for toll call
Key NH for no hunt call
Key NHX - no hunt extra numbers
Key NCT for toll number check call
Key NCL for local number check call
Key NT for no test call
Key NTX - no test extra numbers
Key NN for neither no test nor no hunt call
Key NNX - NN extra numbers

4.04 If an office indication is required, where more than one central office is served by the same group of terminating markers, key OAB is operated to provide office B translation. Key OAB normal provides office A translation.

4.05 Operate key IP for tests of line numbers associated with the physical office (PN) of 10,000 number series A or B. Operate key IT for tests of line numbers associated with the theoretical office (TN) of 10,000 number series A or B. Test calls may be directed to PTN line numbers by the use of: Incoming physical (IP) incoming theoretical (IT) or incoming physical-theoretical (IPT) office selection signal keys.

4.051 IPT office selection key may be used to complete test calls to hundred block relays at the block relay frame which returns a: physical (PN), theoretical (TN) or a common, physical-theoretical (PTN) signal to the marker.

4.052 Where the marker is arranged to distinguish between physical and theoretical by means of the "OAB" lead, key OAB normal provides physical translation and key OAB operated provides theoretical translation.

4.06 Operate key RV when a call is made to a tip party line. Otherwise key RV should be normal.

4.07 Operate key MT associated with the marker to be tested and after operating the keys described in the preceding paragraphs, momentarily operate the ST key to start the test.

4.071 When the marker is seized, the associated lamp MB-, the proper lamps NGC-, LLG-, and LCF, any lamp CH-, and lamp RL should be lighted.

4.08 Lamps, RL followed by TRL, light as a signal that the test is completed. Operate key LP to light the indicator lamps displaying a record of the information taken from the marker. The LP key may be operated in advance to light the indicator lamps while the record is being taken.

4.09 Momentarily operate the RL key to restore the trouble indicator circuit to normal.

4.10 Other keys such as TR2, RO, PU, GT, etc. are operated to test certain functions of the marker. The operation of these keys is covered in the detailed tests of these methods.

4.11 Where conditions permit, all or any number of markers may be checked for the same feature by operating their associated MT keys in turn and then originating calls, leaving other keys as they are.

4.12 F jacks are provided at marker, incoming link, line choice connector, number group connector, automatic intercept, block relay and line link frames for use with an ITE-9627 cord to originate and release calls as set up at the trouble indicator. This feature may be used to observe the operation of the circuits at these frames or for the purpose of verifying certain features, as for example, the twenty block (TB) cross connections by observing the operations the operation of the HP relays of the marker. In case cross connections or other features are verified in this manner instead of observing lamps as specified in this method, it will be found that starting and releasing a call several times will facilitate checking the relays that operate.

5. LAMP INDICATIONS

5.1 Terminating Marker, SD-25283-01

NOTE: The following lamps are listed in the general order they appear on the trouble indicator lamp panel reading from top to bottom. Refer to specific tests in other 225 Sections for lamps which are not listed.

LAMP DESIGNATION	LAMP INDICATION
DR 0-9	Indicates the marker from which the record was taken.
DL 0-9	Indicates the markers that failed and were released without a trouble record being taken because the trouble indicator was busy.
CF 0-4	Indicates the marker connector frame on which the marker connector circuit is located.
CN 0-3	Indicates the particular marker connector on the connector frame.
SN 0-4	Indicates the sender in a marker connector group.

LAMP DESIGNATION	LAMP INDICATION
TH 0, 1, 2, 4, & 8 - H 0, 1, 2, 4, & 5 - T 0, 1, 2, 4, & 5 - U 0, 1, 2, 4, & 5 -	These lamps indicate digits of the called number received by the marker from the sender. Where there are more than one of these lamps lighted, the numbers are added to determine the digit number.
F 0, 1, 2, 4, 5, & 10	Indicates the incoming link and connector frame number received by the marker from the sender. Where there are more than one of these lamps lighted, the numbers are added to determine the incoming link and connector frame number. If lamps F1 and F4 are both lighted, this indicates connection with a local number checking trunk.
TR 2	Failure occurred when the marker was making second trial.
RO	Reorder call was requested by the sender.
OAB	The marker has been set to terminate a call to Office B. Office A is indicated by the absence of this lamp.
NGC 0-24	Indicates the number group connector in which the called line is located.
HB 0-24	Indicates the hundreds block lead grounded by the marker. Refer to the marker cross-connections to determine which lamp HB- should light.
HP 0-8	Indicates the hunt-progress relays operated in the marker. From this indication the twenty block relay lead that was grounded by the marker can be obtained. The HP 0, 2, 4, 6, & 8 lamps indicate the 0, 1, 2, 3, & 4 twenty block leads, respectively.
L 0-19	Indicates the individual line relay that was operated in the marker.
JF 0-4 JC 0-18 (EVEN)	Indicates that the call was not completed in the first twenty block seized but that the marker functioned to "jump hunt" to a twenty block and a line terminal as recorded by the JF- and JC- lamps respectively.
AL 1 & 2	Indicates the position of the allotter relays in the marker.
ALG	Indicates that the call used the allotter group requiring the PBX Auxiliary Line Circuit, PBX Block Allotter Circuit and PBX Block Register Circuit.
LCF 0-19	Indicates the line choice connector frame number.
LLG A-D	Indicates the line link group in the line choice.
LOG	Indicates that originating traffic was locked out of the line link group in which the called line is located.
HF RF TF	Indicates whether the line is PBX, ring party or tip party. NOTE: When 4 party ringing is provided for any or all of the offices (AP, AT, BP and BT) served by the marker, the party line ringing set by the marker as indicated by the following lighted lamps: Party Line / Lighted Lamps / Ringing Code 1 / RF, RC / Ring on Ring 2 / TF, RC, RV / Ring on Tip 3 / RF, RC, H5, RP / Ring on Ring, Reverse Polarity 4 / TF, RC, RV, H5 RP / Ring on Tip, Reverse Polarity

LAMP DESIGNATION	LAMP INDICATION
	When 4 party ringing is not provided, lamp RP is not lighted and lamp H5 does not effect the ringing signal indication.
CA 0-9 CB 0-9	Indicates the line link subgroup relay operated in the marker. The half choice and line link horizontal group is obtained from this indication.
IF 0-19	Indicates the incoming link and connector frame to which the marker is connected. There is no IF- lamp indication when connection is made to the local number checking trunk.
LC 0-9 M 0-9	The LC lamp that is lighted indicates the LC relay operated in the incoming link and connector circuit and, therefore, the incoming primary switch. The M lamp that is lighted indicates the select magnet operated on the incoming link primary switch and, therefore, the primary switch level. Together these lamps indicate the number of the incoming trunk circuit. The M lamp indicates the units digit of the incoming trunk circuit number and the LC lamp indicates the tens digit. For example, if the M5 and LC8 lamps are lighted it would indicate: Incoming primary switch level - 5. Incoming primary switch - 8. Incoming trunk circuit - 85. These indications are taken directly from the incoming link and connector circuit that was connected to the marker at the time the record was taken.
CH 0-9	Indicates the channel selection relay operated in the marker, and from this indication the incoming secondary switch, or the line link secondary switch can be obtained.
LJ 0-9	Indicates the line junctor relay operated in the connector circuit. The vertical on the line link secondary switch is also indicated by these lamps.
JPN JP 0-8	Indicates the junctor pattern relays operated in the marker circuit.
JG A-E	Indicates the line junctor group relay operated in the marker circuit.
FS MAN TOL	Full Selector) Manual) Toll) Class lamps indicating information given to marker by the incoming trunks.
CN	Class lamp indicating that a call is being set up to a coin line.
RC RV RP TC	Ringing control) Ringing reverse) Ringing polarity) Tone control) Indicates the ringing combination set up in the incoming trunks.
LIN LTI TIN TTI	Local intercept) Local trouble intercept) Toll intercept) Toll trouble intercept) Indicates that the call was rerouted to intercept.
OF BB	Overflow - All channels busy. Busy back - Subscribers line busy.

LAMP DESIGNATION	LAMP INDICATION
SPL NC NT NTX NH NHX NN NNX NTT	Special Number Check No Test No Test on Extra Numbers No Hunt No Hunt on Extra Numbers Neither No Test Nor No Hunt NN on Extra Numbers No Test Train) Class lamps indicating information given to marker by the incoming trunks.
GS	Ground sleeve test used on a number check test call.
IP	Physical Incoming Trunk
IT	Theoretical Incoming Trunk
IPT	Nondiscriminating Incoming Trunk
PN	Physical Called Number
TN	Theoretical Called Number
PTN	Nondiscriminating Called Number
MKO & MK1	Indicates the operation of similarly designated relays in the marker circuit. These relays in the marker circuit are controlled by the incoming secondary switch select magnet lock-out and throw-over circuit when mate frames are used.
CKG - K 1-3 -	Indicates numerical registration check leads are satisfactory.
TBK	Indicates that the path to relay TB in the number group connector is closed.
LIL, RIL	Correspondingly designated relays in the marker have operated.
BC	Channel linkages have been tested and are available.
GJ	Attempt was made to operate secondary line link and secondary incoming link hold magnets.
GC	Secondary line link hold magnet has operated.
GLH	Attempt was made to operate primary line link hold magnet.
CON	Primary line link hold magnet has operated.
GT2	No false ground on tip or ring and ringing control relays operated satisfactorily.
RL	Release signal given to sender.
PG	Attempt to advance from one junctor retest group to another.
LE	Relay L 0-19 in marker has not yet operated.
FC	Indicates closure of path to operate relay F in the incoming trunk.
AK	Relay LC in incoming link and connector has operated.
TK	Indicates closure of check lead through relays TB, LJ, and HG of connector frames.

LAMP DESIGNATION	LAMP INDICATION
TE	Relay CH 0-9 in marker has not yet operated.
SL	Primary and secondary incoming hold magnets are operated.
FCG	Indicates a grounded tip, battery on the ring or a cross between tip and ring.
FL	Free line.
NFL	No free line.
AL	Allotter.
NAL	No allotter.
	NOTE 1: Lamps FL and AL light when the call is to a twenty block containing the directory number of the allotted PBX. The cross-connection to relay SH is AL to AF. NOTE 2: Lamps NFL and AL light when the call is to a twenty block containing no free lines and containing the directory number of the allotted PBX. The cross-connection to relay SH is AL to AL. NOTE 3: Lamps FL and NAL light when the call is to a twenty block containing free lines and not containing the directory number of the allotted PBX. The cross-connection to relay SH is AL to NAF. NOTE 4: Lamps NFL and NAL light when the call is to a twenty block containing no free lines and not containing the directory number of the allotted PBX. The cross-connection to relay SH is AL to NAL.
LTR HTR	Indicates that the corresponding relays in the terminating marker circuit are operated. LTR for light traffic and HTR for heavy traffic.
EX	Indicates a battery or ground condition on the maintenance test punchings in the terminating marker. These punchings are designated EXB and EXG and may be temporarily connected one at a time to any point in the marker. The EXB punching is used to detect battery and the EXG punching is used to detect ground.
XOS	Indicates that a call has encountered a line having an open sleeve which allows the marker (HG) relay to release.
XALG	Indicates trouble in the PBX block allotter circuit, which might be due to failure of the block allotter relays to operate, more than one block register relay operated, or failure to match a marker busy test against the allotter.
SDT	Indicates that the sender test class relay was operated in the marker circuit.
TCT	Indicates that the current flow test of the CON relay is not yet completed.
TRL	Indicates that the "TRL" lead is grounded.
XIK	Indicates the IK relay is falsely operated.
X	Indicates operation of marker X relay usually in combination with other cross detecting relays.
XFC	Indicates a false ground on "FC" lead.

LAMP DESIGNATION	LAMP INDICATION
XC	Indicates a false ground or cross to ground on "HGA-D" or "NC" leads.
XHG	Indicates that more than one HG relay in the line link was operated.
XIN	Indicates false ground on winding of LIN, TIN, LTI, or TTI relays in marker.
XOB	Indicates false ground on winding of BB or OF relays.
XR	Indicates a false ground on "TC" or "RC" ringing control leads.
XRL	Indicates a crossed or grounded release or trouble release lead.
XS	Indicates a crossed or grounded subscribers line sleeve lead.
XSM	Indicates crossed or grounded primary line link select magnet lead.
XTI	Indicates false ground on leads tested by manual test feature.
XTB	Indicates that more than one TB relay was operated.
XTL	Indicates a false ground or cross on a "TB" lead.
XL	Indicates a false ground on a winding of a marker L relay.
XP	Indicates that more than one JP relay was operated.
XF	Indicates more than one marker LC relay winding is energized.
XHB	Indicates crosses on "HB" leads.
XPS	Indicates a circuit is closed through more than one select magnet.
XTMB	Indicates false operation of relays TMBL or TMBN.
AIS	Indicates AIS relay in marker operated.
IK	Intercept check.
A 0, 1, 3	Class of intercept 0, 1, or 3 for a call to office A with AIS without LLP.
B 0, 1, 3	Class of intercept 0, 1, or 3 for a call to office B with AIS without LLP.
CLI	Indicates that the calling line identification information has been displayed at the TTI or recorded at the ANI Trouble Ticketer.
TTB 0, 1, 2	Indicates that the trouble ticketer is plugged busy to marker groups 0, 100, and/or 200.

5.2 Terminating Marker Applique, SD-27765-01

NOTE: The following lamps are provided when DID is furnished. They are listed in the general order they appear on the trouble indicator lamp panel reading from top to bottom. Refer to the specific DID test in other 225 Sections for lamps which are not listed.

LAMP DESIGNATION	LAMP INDICATION
THC 0, 1, 2, 4, & 8 - HC 0, 1, 2, 4, & 8 - TC 0, 1, 2, 4, & 8 - UC 0, 1, 2, 4, & 8 -	These lamps indicate the registration auxiliary relays operated. On DID calls these relays contain the number group address of the PBX. The station number called is registered on the relays in FIG. 7 in this case.
TRK	Indicates a satisfactory check of DID translator and/or pretranslator output.
TLK	Indicates information to DID translator and/or pretranslator checked.
TLKA	Indicates all registration relays normal.
BLK, CHG	Indicates a blank number intercept call or changed number intercept call. Used with DID and AIS.
A 0, 1, 2, 4, & 7 - B 0, 1, 2, 4, & 7 - C 0, 1, 2, 4, & 7 - D 0, 1, 2, 4, & 7 -	Indicates lead grounded to outsender and translator and/or pretranslator by Terminating Marker Applique Circuit for DID. The A, B, C, & D digits correspond to the TH, H, T, & U digits.
A' 0, 1, 2, 4, & 7 - B' 0, 1, 2, 4, & 7 - C' 0, 1, 2, 4, & 7 - D' 0, 1, 2, 4, & 7 -	Indicates the relay operated in the outsender. Also may indicate a falsely grounded lead since A-A', B-B', C-C', and D-D' lights should agree.
A, B	Indicates the office information from the DID translator and/or pretranslator.
TRU 0 & 1	Indicates translator and/or pretranslator used.
CR 0, 1, 2, 4, & 7	Indicates "C" arbitrary digit lead grounded to the outsender by the Terminating Marker Applique Circuit for DID-LLP.
CR' 0, 1, 2, 4, & 7	Indicates relay operated in the outsender. Also may indicate a falsely grounded lead since CR-CR' lights should agree.
OS 0-4	Indicates outsender selected.
SIA, SIB	Indicates idle outsender subgroup.
SSA, SSB	Indicates selected outsender subgroup.
OSK	Indicates OSE and OSE1 relay operated. Relays SLK and SLK1 were normal.
LFK	Indicates LLP line circuit F operated.
OSE, OSE1	Indicates an OS- relay operated.
SLK1, SLK2	SLK1 indicates presence of OSL hold magnet battery. SLK2 indicates ON relay locked in the OS.
AVK	Indicates relay AVK operated in OS.
RSC	Release sender connector.
KI	Cut-in relay is operated.
TN 0, 1	Line circuit seized is connected to TN 0, 1.
OST	Outsender Timing is complete.
ORK	All OS transmitting relays checked ok in the TMA.

LAMP DESIGNATION	LAMP INDICATION
SON	Outsender off-normal.
LLP	Line Link Pulsing call.
TST	Test call.
TKN	Trunk Number Check.
XT1	Crossed transmit lead to the OS.
XLF	Crossed line circuit LF relay.
XSS	Crossed select magnet lead to the OSL.
XSC	Crossed S relay in OS connector.
ARO, 1, 2, 4, 7 BRO, 1, 2, 4, 7	A and B arbitrary digits. Used with CR for office code for AIS.
AR'O, 1, 2, 4, 7 BR'O, 1, 2, 4, 7	Indicates the relay operated in the OS. AR and AR' and BR and BR' should agree.
CLCO, 1, 3	Class of intercept call indication to AIS.
ART	Indicates OS should await ringing trip before outpulsing to AIS. Used on plug-up calls.
RVK	Indicates PU call is to a tip party so line circuit will trip ringing on the tip side of the line.
TRSL	Translator usage.
SAT	Second attempt to translator.
DLT 0-4	Indicates delete lead grounded to OS.
CL 0, 1, 2, 3, 4, 5, 9, & 35	Class relay operated.
NSS 0, 1, 2, & 4	Number series relays operated.
ESS	Call is to a 101 ESS PBX.
PTM	Time out by the 101 DAP.
PMO	All 101 ESS line circuits are busy.
TLT	Trouble in the 101 ESS System.
DA 0-2	Direct Access Pretranslator involved in the call.
DAP 0-2	Direct Access Pretranslator Connector involved in the call. These lamps are lighted from the DAPC.

6. LAMP VERIFICATION

6.1 Terminating Marker, SD-25283-01

NOTE: The following lamps are verified in the general order they appear on the trouble indicator lamp panel reading from top to bottom. Refer to specific tests in other 225 Sections for lamps which are not listed.

6.11 At the TTI, operate Key LP.

6.12 Refer to TABLE A. Perform the operations and verify the results indicated.

NOTE 1: Tests involving optional apparatus should be omitted when the apparatus in question has not been furnished.

NOTE 2: A Test Instruction and its Test Location should be applied to the test for which it is given and to all succeeding tests until it is superceded by a subsequent Test Instruction and/or Test Location.

6.13 Restore Key LP to normal and release all electrically operated relays. Verify all relays are normal and all TTI lamps are extinguished.

TABLE A

TEST INSTRUCTION		TEST LOCATION	TTI LAMP(S) LIGHTED
	T.S.	PCHG.	
1. At each Terminating Marker momentarily ground one at a time.	MISC.	195	DR 0-9 Corresponding to the marker under test.
		265	DL 0-9 Corresponding to the marker under test.
2. At each Terminating Marker Connector Frame, momentarily ground one at a time.	MISC.	21	CF 0-4 Corresponding to the connector frame under test.
3. At the highest numbered Marker Connector Frame equipped, momentarily ground one at a time.	MISC.	35-38	CN 0-3 Corresponding to PCHG. 's 35-38 respectively.
		25-29	SN 0-4 Corresponding to PCHG. 's 25-29 respectively.
4. At the highest numbered Terminating Marker equipped, momentarily ground one at a time.	TIE	50	K1, U-0
		51	K2, TH-0, T-0
		52	K3, F-0, H-0
		00-03	U(1,2,4,5)
		10-13	T(1,2,4,5)
		20-23	H(1,2,4,5)
		30-33	TH(1,2,4,8)
		40-44	F(1,2,4,5,10)
		24	TR2
		34	RO
		14	OAB
5. At each Number Group Connector Frame, momentarily ground one at a time.	MISC.	70-73	NGC 0-24 Corresponding to the connector under test.

TABLE A (Cont'd.)

TEST INSTRUCTION		TEST LOCATION	TTI LAMP(S) LIGHTED
	T.S.	PCHG.	
6. At the highest numbered Terminating Marker equipped, momentarily ground one at a time.	TID	00-23	HB 0-23
	TIE	19	HB 24
		45-49	HP 0-4
		55-58	HP 5-8
	TIC	00-19	L 0-19
	TID	35-39	JF 0-4
		50-59	JC 0-18 (EVEN)
	TIC	35,36	AL 1,2
	TIB	13	ALG
	TIA	00-19	LCF 0-19
		40-43	LLG A-D
	TIB	01	LOG
	TIA	44	RF
		45	TF
		46	HF
	TIA	20-29	CA 0-9
		30-39	CB 0-9
7. At each Incoming Link and Connector Frame, momentarily ground one at a time.	MISC.	181	IF 0-19 Corresponding to the frame under test.
8. At the highest numbered Incoming Link and Connector Frame equipped, momentarily ground one at a time.		50-59	M 0-9
	6	60-69	LC 0-9
9. At the highest numbered Terminating Marker equipped, momentarily ground one at a time.	TIC	20-29	CH 0-9
	TID	40-49	LF 0-9
		25-33	JP 0-8
		34	JPN
	TIC	30-34	JGA-E
	TIE	0-9	FS

TABLE A (Cont'd.)

TEST INSTRUCTION		TEST LOCATION	TTI LAMP(S) LIGHTED
	T.S.	PCHG.	
		15	MAN
		16	TOL
		18	CN
	TIB	36	TC
		37	RP
		38	RV
		39	RC
		35	LIN
		34	LTI
		33	TIN
		32	TTI
		31	OF
		30	BB
	TIE	08	SPL
		05	NC
		06	NT
		38	NTX
	TIE	07	NH
		37	NHX
		35	NN
		36	NNX
	TIB	00	NTT
	TIE	04	GS
		26	IP
		28	IT
		25	IPT
	TIC	37	PN
		40	TN
		41	PTN

TABLE A (Cont'd.)

TEST INSTRUCTION		TEST LOCATION	TTI LAMP(S) LIGHTED
	T.S.	PCHG.	
	TIE	38,39	MK 0,1
		53	CKG
		39	TBK
	TIB	02	RIL
		03	LIL
	TIB	15	GJ
	TIE	16	BC
		17	GC
		29	GLH
	TIB	27	CON
		11	GT2
		05	RL
	TIA	08	PG
		47	LE
	TIB	06	FC
		04	AK
		10	TK
		18	TE
		14	SL
		17	FCG
		21	FL
		22	NFL
		26	AL
	TIB	27	NAL
		24	LTR
		25	HTR
	TIC	49	EX
	TIB	20	XOS
		19	XALG

TABLE A (Cont'd.)

TEST INSTRUCTION		TEST LOCATION	TTI LAMP(S) LIGHTED
	T.S.	PCHG.	
		07	SDT
	TIF	34	TRL
	MISC.	207	XIK
	TIB	58	X
		56	XFC
		44	XC
		51	XHG
		49	XIN
		57	XOB
		55	XR
		42	XRL
		47	XS
		53	XSM
		52	XTI
	TIB	46	XTB
		45	XTL
		48	XL
		50	XP
		43	XF
	TIE	59	XHB
	TIB	09	XPS
		54	XTMB
NOTE: These lamps are verified only when DID is furnished. They are listed in the general order they appear on the TTI lamp panel reading from top to bottom.	TIF	50-53	NSS 0,1,2,4
	TIB	23	ESS
	TIC	54	PTM
		55	TLT
		56	PMO
		57-59	DA 0-2

TABLE A (Cont'd.)

TEST INSTRUCTION		TEST LOCATION	TTI LAMP(S) LIGHTED
	T.S.	PCHG.	
10. At the Automatic Intercept Service Control and Connector Circuit, momentarily ground one at a time.	CC	177	AIS
		176	IK
		175	B3
		174	B1
		173	B0
		172	A3
		171	A1
		170	A0
11. At the TTI, manually operate relays CLD and TTB 0-2 one at a time. Verify that lamps CLI and TTB 0-2 are lighted while their associated relays are operated.			

6.2 Terminating Marker Applique, SD-27765-01

NOTE: The following lamps are verified when DID is furnished. They are listed in the general order they appear on the trouble indicator lamp panel reading from top to bottom. Refer to the specific DID test in other 225 Sections for lamps which are not listed.

6.21 At the Miscellaneous Relay Rack, block operated relays TI (G, H, L, J, and K).

6.22 At the TTI, set switches TH-, H-, T-, and U- to the OFF position. Set up a test call in accordance with Section 225, Paragraph 4. Operate key ST to seize the marker used for test.

6.23 At the Terminating Marker Applique, block operated relays DID and TTI.

NOTE: If marker seizure is lost, release all operated relays. Reseize the marker as described in Paragraphs 6.22 and 6.23.

6.24 At the TTI, operate Key LP.

6.25 Refer to TABLE B. Perform the operations and verify the results indicated.

NOTE 1: Tests involving optional apparatus should be omitted when the apparatus in question has not been furnished.

NOTE 2: A Test Instruction and its Test Location should be applied to the test for which it is given and to all succeeding tests until it is superceded by a subsequent Test Instruction and/or Test Location.

6.26 Restore Keys LP and BAT to normal. Release all electrically operated relays and remove all blocking tools. Verify all relays are normal and all TTI lamps are extinguished.

TABLE B

TEST INSTRUCTION	TMA RELAY(S) OPERATED	TTI LAMP(S) LIGHTED
1. Manually operate, one at a time.	THA(0,1,2,4,8)	THC(0,1,2,4,8)
	HA,TA,UA(0,1,2,4,5)	HC,TC,UC(0,1,2,4,5)
	TRK	TRK
	TLKB	TLK
	CK	TLKA
	BLK	BLK
	CHG	CHG
	OSC,CK	(A,B,C,D)(4,7)
	OSC,CK(TH,H,T,U)(1,2)	(A,B,C,D)(0,1,2)
	OSC,CK,KI	(A',B',C',D')(4,7)
	OSC,CK,KI(TH,H,T,U)(1,2)	(A',B',C',D')(0,1,2)
	A	A
	B	B
	TRU 0,1	TRU 0,1
	SKA	SSA
	SKB	SSB
	LFK	LFK
	OSE	OSE
	OSE1	OSE1
	OSE,OSE1	OSK
	SON,SLK1	SLK1
	SON,SLK2	SLK2
	AVK	AVK
	SON,OST2	OST
	SON,OST2,RSC	RSC
	KI	KI
	TN 0,1	TN 0,1
	ORK2	ORK
	CK,NGK	LLP
	NGK,LFK	SON

TABLE B (Cont'd.)

TEST INSTRUCTION	TMA RELAY(S) OPERATED	TTI LAMP(S) LIGHTED
2. At the highest numbered Terminating Marker Connector Frame equipped, momentarily ground Punching 53, Terminal Strip C on (TMA-) Relay Unit.		TST
3. Manually operate, one at a time.	TKN XTI XLF	TKN XTI XLF
	XSS XSC TRSL	XSS XSC TRSL
	TR 0/1 DLO CL 0,1,9	SAT DLTO CL 0,1,9
4. At the TTI, operate Key BAT.		
5. At each Direct Access Pretranslator Connector Frame, manually operate relay MCC-A/B.		DAP 0-2 Corresponding to the connector under test.
6. Apply ground to cross-connection terminals (AR, BR,CR)(0,1,2,4,7) one at a time. 6.1	 KIA	(AR,BR,CR)(0,1,2,4,7) (AR',BR',CR')(0,1,2,4,7)
7. Apply ground to contact 7B, relay DL1.		DLT 1-4 CL 2-5,35 CL 0,1,3
		ART RVK
8. Apply ground to winding U, relays SIA and SIB, one at a time.		SIA SIB
9. Apply ground to contact 6M, relays OS(0-4), one at a time.		OS 0-4

No Changes Indicated Due
To Extensive Revision

Manager, Crossbar Product Engineering
Control Center

Reason for Reissue:
1. To make a general revision.
2. To update to current Engineering Standards.