

NO. 3 ESS  
 TRUNK AND LINE TEST PANEL (TLTP) TESTS

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1. GENERAL INFORMATION

1.1 Description

1.11 This section provides a manual method for verifying the various functions of the Trunk and Line Test Panel (TLTP) and the Voltmeter and 23CR Transmission Measuring Set (optional) circuits.

1.2 Sequence

1.21 These tests must not be performed concurrently with Network Fabric System Verification Tests (HB 269, Section 521).

1.22 The tests described in this section should be performed following MW Distribution Circuit Tests (HB 50, Section 7.1).

1.3 References

1.31 The following documents may be useful as references during the performance of these tests:

<u>Document</u>	<u>Title</u>
SD-3H520-01	Peripheral Test Unit Circuit
SD-3H904-01	Test Frame Circuit

1.4 Records

1.41 The results of these tests should be recorded on Forms SD-97-1313 and SD-97-1315. Information regarding the completion of these forms appears in Handbook 3, Section 6B.

2. TEST EQUIPMENT

2.1 Test Sets

2.11 The following test sets will be required for the performance of these tests:

<u>Amt.</u>	<u>Code</u>	<u>Description</u>
1	ITE-5632	Digital Multimeter
1	ITE-5237B	Tektronix 465 Oscilloscope

<u>Amt. (Cont.)</u>	<u>Code</u>	<u>Description</u>
1	23D	Transmission Measuring Set (T)
1	52N	Head Telephone Set (T)

(T) - Telephone Company Maintenance Equipment.

2.2 Accessories

2.21 The following accessories are required for the performance of these tests:

<u>Amt.</u>	<u>ITE</u>	<u>Description</u>	<u>With ITE</u>
5	9169D	6 in. Test Cord with E-Z Mini-Hook on each end	**5543
1	5191,D5	Plug, Terminating, 1000 Ohm	*5653
1	9600	6 ft. cord equipped with 310 plug on each end	*5653
1	4631	Test Receiver Set	*5653
1	5477B	Extender Board	**5543
1	-	258C Dummy Plug	*5653

\* No. 3 ESS Test Accessory Set.  
 \*\* 3ACC/Auxiliary Processor Test Accessory Set.

3. TEST PREPARATION

3.1 Unseat the FC181 circuit packs in locations 56-24, 56-25, 56-27 and 56-29 on the Peripheral Test Unit (PTU) and remove FB505 (52-03) and FB516 (52-40) circuit packs from the PTU.

3.2 Position TLTP and Voltmeter keys such that NO lamps are lit.

3.3 Using an ITE-9169D Test Cord, activate the TLTP by grounding 056-29-218. Verify the ON lamp is lit.

4. TEST PROCEDURE

4.1 Transmission Measuring Tests

4.11 Locate the 23D Transmission Measuring Set (TMS) in front of the Test Frame and set the DIAL-MEAS-EXT switch to MEAS and INPUT switch to 900.

4.12 Using ITE-9600 Test Cord, connect the MEAS 310 jack of the 23D TMS to the 0 DBM jack on the front of the writing shelf and verify a reading of 0 DBM.

4.13 Operate the CAL key and verify the pointer drops off scale.

**NOTE:** If the TEST Frame is equipped with the 23CR Transmission Measuring Set, verify a reading of 0 DBM on this frame mounted set.

4.14 Move the 23D TMS connection from the 0 DBM jack to the TM 2 jack on the writing shelf and verify a reading of 0 DBM. →

4.15 Operate (to release) the CAL key and verify the pointer drops off scale. →

4.16 Move the 23D TMS connection to the -10 DBM jack and verify a reading of -10 DBM.

4.17 Operate the 0 DBM key and verify the pointer drops off scale. Operate (to release) 0 DBM key and verify pointer returns to -10 DBM reading.

4.18 Move 23D TMS connection to the TM 1 jack and insert ITE-5477B Extender Board in equipment location 052-39 of the Peripheral Test Unit (PTU). Clipcord Extender Board terminals 306 to 307 and 207 to 208. Operate the -10 DBM key and verify a -10 DBM reading on the 23D TMS.

4.19 Plug a 258C Dummy Plug into -10 DBM jack. With the -10 DBM key operated, operate the 0 DBM key and verify the 23D TMS reading is 0 DBM. Operate (to release) 0 DBM and -10 DBM keys, remove clipcords and Extender Board from the PTU, remove 258C Plug and disconnect the 23D TMS from frame.

4.2 Interlock Tests of Access Trunk Control Keys

4.21 Perform these tests according to the instructions in Table A.

TABLE A

STEP	MOMENTARILY OPERATE KEY*	LAMP WITHIN KEY	OTHER OBSERVATIONS
1	ACCESS TRUNK 1	Is lit	
2	ACCESS TRUNK 2	Is not lit	
3	COMM LINE	Is not lit	
4	HOLD	Is lit	ACCESS TRUNK 1 lamp remains lit <u>OR</u> flashes at 30 IPM.
5	RELEASE 1	(No lamp)	ACCESS TRUNK 1 and HOLD lamps are extinguished.
6	ACCESS TRUNK 2	Is lit	
7	COMM LINE	Is not lit	
8	ACCESS TRUNK 1	Is not lit	
9	HOLD	Is lit	ACCESS TRUNK 2 lamp remains lit <u>OR</u> flashes at 30 IPM.
10	RELEASE 2	(No lamp)	ACCESS TRUNK 2 and HOLD lamps are extinguished.
11	COMM LINE	Is lit	
12	ACCESS TRUNK 1	Is not lit	
13	ACCESS TRUNK 2	Is not lit	
14	HOLD	Is lit	COMM LINE lamp remains lit <u>OR</u> flashes at 30 IPM.
15	RELEASE COMM LINE	(No lamp)	COMM LINE and HOLD lamps are extinguished.
16	Unseat the FB514 circuit pack (EQL 048-37) and verify ON lamp is extinguished.		
17	ACCESS TRUNK 1	Is not lit	
18	ACCESS TRUNK 2	Is not lit	
19	COMM LINE	Is lit	
20	RELEASE COMM LINE	(No lamp)	COMM LINE lamp is extinguished.
21	Replace FB514 circuit pack and verify ON lamp is lit.		

\* All keys are nonlocking type.

4.3 Interlock Tests of Test Select and Access Trunk Control Keys

4.31 Perform these tests according to the instructions in Table B.

TABLE B

STEP	MOMENTARILY OPERATE KEY	LAMP WITHIN KEY	OTHER OBSERVATIONS
1	*VM 1	Is lit	100K lamp on Voltmeter is lit.
2	*VM 2	Is extinguished	VM 1 and 100K lamps remain lit.
3	*VM 1 (To release)	Is extinguished	VM 2 lamp is lit. 100K lamp remains lit.
4	*VM 1	Is extinguished	
5	*VM 1 (To release)	Is extinguished	
6	*VM 2 (To release)	Is extinguished	100K lamp is extinguished.
7	*MONITOR 1	Is lit	
8	*MONITOR 2	Is extinguished	MONITOR 1 lamp remains lit.
9	*MONITOR 1 (To release)	Is extinguished	MONITOR 2 lamp is lit.
10	*MONITOR 1	Is extinguished	MONITOR 2 lamp remains lit.
11	*MONITOR 1 (To release)	Is extinguished	
12	ACCESS TRUNK 1	Is lit	MONITOR 2 lamp is extinguished.
13	*MONITOR 2 (To release)	Is extinguished	
14	RELEASE 1	(No lamp)	ACCESS TRUNK 1 lamp is extinguished.
15	ACCESS TRUNK 2	Is lit	
16	*MONITOR 1	Is extinguished	
17	RELEASE 2	(No lamp)	ACCESS TRUNK 2 lamp is extinguished. MONITOR 1 lamp is lit.
18	*MONITOR 1 (To release)	Is extinguished	

\* Locking type key.

4.4 Coin Collect and Coin Return Functional Test

4.41 Insert ITE-5477B Extender Board at equipment location 052-02 and ground pins 213 and 214.

4.42 Momentarily operate ACCESS TRUNK 1 key.

4.43 Depress and hold the COIN COLLECT key on the TLTP and verify the COIN lamp is lit.

4.44 Release the COIN COLLECT key and verify the COIN lamp is extinguished.

4.45 Repeat 4.43 and 4.44 for the COIN RETURN key.

4.46 Momentarily operate RELEASE 1 key.

4.47 Momentarily operate ACCESS TRUNK 2 key.

4.48 Repeat 4.43 through 4.45.

4.49 Momentarily operate RELEASE 2 key remove clipcords from ITE-5477B and remove Extender Board from frame.

4.5 Functional Tests of Access Trunk Control Circuit

4.51 The MW Distribution Circuit will be used as a signal source for these tests.

4.52 Insert ITE-5477B Extender Board in equipment location 052-39 of the PTU.

4.53 Using ITE-9169D Test Cords, connect the MW signal to Access Trunk 1 by clipcording the following terminals on the Extender Board:

CLIPCORD	TO
114	117
014	017

4.54 Connect the monitoring equipment (ITE-4631 Test Receiver or ITE-5237B Oscilloscope) to terminals 118 and 217 on the Extender Board.

4.55 With no ACCESS TRUNK CONTROL or TEST SELECT keys operated the signal should not be present at the monitoring equipment.

4.56 Perform these tests according to the instructions in Table C.

TABLE C

STEP	MOMENTARILY OPERATE KEY	SIGNAL IS	
		PRESENT	NOT PRESENT
1	ACCESS TRUNK 1	X	
2	BALANCE 1		X
3	BALANCE 1 (To RLS)	X	
4	CDF IN		X
5	CDF IN (To RLS)	X	
6	CDF OUT		X
7	CDF OUT (To RLS)	X	
8	MONITOR 1	X	
9	RELEASE 1	X	
10	MONITOR 1 (To RLS)		X
11	ACCESS TRUNK 1	X	
12	TRMT 1		X
13	TRMT 1 (To RLS)	X	
14	VM 1		X
15	VM 1 (To RLS)	X	
16	RELEASE 1		X
17	Disconnect Clipcord connection on 117 and reconnect to terminal 210, disconnect clipcord connection on 017 and reconnect to terminal 119		
18	(NONE)		X
19	MONITOR 2	X	
20	COMM LINE		X
21	RELEASE COMM LINE	X	
22	MONITOR 2 (To RLS)		X
23	ACCESS TRUNK 2	X	
24	BALANCE 2		X

TABLE C (Cont.)

STEP	MOMENTARILY OPERATE KEY	SIGNAL IS	
		PRESENT	NOT PRESENT
25	BALANCE 2 (To RLS)	X	
26	TRMT 2		X
27	TRMT 2 (To RLS)	X	
28	VM 2		X
29	VM 2 (To RLS)	X	
30	RELEASE 2		X
31	Disconnect monitoring equipment and reconnect to terminals 307 and 208		
32	TRMT 2		X
33	REVERSE ACCESS TRUNKS	X	
34	TRMT OPEN		X
35	TRMT OPEN (To RLS)	X	
36	TRMT SHORT		X
37	TRMT SHORT (To RLS)	X	
38	Disconnect monitoring equipment and reconnect to terminals 015 and 115		
39	(NONE)		X
40	REVERSE ACCESS TRUNKS (To RLS)	X	
41	TRMT 2 (To RLS)		X
42	Disconnect clipcord connection on 210 and reconnect to terminal 117, disconnect clipcord connection on 119 and reconnect to terminal 017		
43	ACCESS TRUNK 1		X
44	TRMT 1		X
45	REVERSE ACCESS TRUNKS	X	
46	REVERSE ACCESS TRUNKS (To RLS)		X
47	RELEASE 1		X
48	TRMT 1 (To RLS)		X
49	Disconnect the monitoring equipment and all clipcords from the Extender Board		

4.6 Line Test Circuits Test

4.61 These tests consist of verifying proper voltage, current and resistance readings.

4.62 Perform these tests according to the instructions in Table D. ITE-5477B Extender Board should be in equipment location 052-39 of the PTU.

4.63 Remove and insulate the lead on terminal T of the guard assembly on the rear of the Tel Set. Refer to Fig. 1 for the location of the guard assembly and terminal T.

4.64 At rear of PTU, remove connectors at 48-39-310 and 52-02-310.



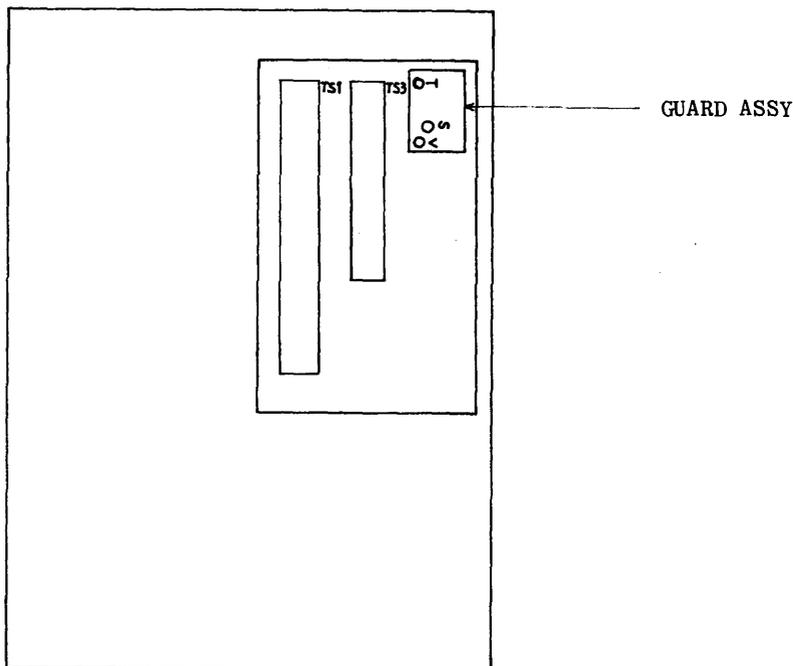


FIG. 1 - REAR VIEW OF TEL SET

TABLE D

STEP	ACTION	ITE-5632 DIGITAL MULTIMETER			
		SET TO READ	CONNECT METER LEADS TO EXTENDER BOARD TERMINALS		READING
			RED (+)	BLACK (-)	
1		DCV	118	GRD	0V
2	Operate ACCESS TRUNK 1 key				-46 to -50V
3	Operate RELEASE 1 key				0V
4	Operate ACCESS TRUNK 2 key				-46 to -50V
5	Operate RELEASE 2 key				0V
6	Operate TALK LINE key				0V
7		K ohm	217		Infinite ohms
8	Operate TALK LINE key (to RLS)				Infinite ohms
9	Operate ACCESS TRUNK 1 key	DCmA	118	Thru ITE-5191,D5 to 217	-32 to -38 mA
10	Operate RELEASE 1 key				0 mA
11	Operate ACCESS TRUNK 2 key				-32 to -38 mA
12	Operate RELEASE 2 key				0 mA
13	Operate TRMT 1 and LINE TRMSN TEST keys	DCV	017	GRD	-46 to -50V
14	Operate TRMT 1 key (to RLS)				307
15	Operate REVERSE ACCESS TRUNKS key				015

TABLE D (Cont.)

STEP	ACTION	ITE-5632 DIGITAL MULTIMETER			
		SET TO READ	CONNECT METER LEADS TO EXTENDER BOARD TERMINALS		READING
			RED (+)	BLACK (-)	
16		K ohm	115	GRD	Infinite ohms
17	Operate REVERSE ACCESS TRUNKS key (to RLS)		208		Infinite ohms
18	Operate LINE TRMSN TEST key (to RLS)				
19	Operate COMM LINE key		217	103	0 ohms
20			118	004	0 ohms
21	Operate HOLD key		103	004	855 to 945 ohms
22	Operate RELEASE COMM LINE key				Infinite ohms
23	Disconnect meter and relocate Extender Board to equipment location 052-02				
24	Operate ACCESS TRUNK 1 and TALK LINE keys	DCmA	313	Thru ITE-5191, D5 to 213	-28.4 to -34.8 mA
25	Operate RELEASE 1 key				0 mA
26	Operate ACCESS TRUNK 2 key		314	Thru ITE-5191, D5 to 214	-28.4 to -34.8 mA
27	Operate TALK LINE key (to RLS)				0 mA
28		K ohm	314	214	Infinite ohms
29	Plug a 52N Head TEL Set into TEL A & B Jacks	K ohm	314	214	535 - 625 ohms
30	Remove 52N Head TEL Set				Infinite ohms
31	Remove Telephone Handset from Switch Hook				535 - 625 ohms
32	Replace Handset				Infinite ohms
33	Disconnect Meter and connect ITE-4631 Test Receiver to Terminals 314 and 214				
34	Operate and hold ROH key and verify Receiver-Off-Hook tone is present as long as ROH key is operated				
35	Operate RELEASE 2 key				
36	Disconnect ITE-4631, remove FB513 circuit pack (EQL 048-40) and relocate Extender Board to equipment location 048-39				

TABLE D (Cont.)

STEP	ACTION	ITE-5632 DIGITAL MULTIMETER			
		SET TO READ	CONNECT METER LEADS TO EXTENDER BOARD TERMINALS		READING
			RED (+)	BLACK (-)	
37	Operate TRMT 1 and LINE TRMSN TEST keys	DCmA	316	Thru ITE-5191, D5 to 216	0mA
38	Operate CDF OUT key				-30.9 to -37.7 mA
39			318	Thru ITE-5191, D5 to 218	0 mA
40	Operate CDF OUT key (to RLS)				0 mA
41	Operate CDF IN key				-30.9 to -37.7 mA
42	Operate CDF IN, TRMT 1 & LINE TRMSN TEST keys (to RLS)				0 mA
43		K ohm	318	316	0 ohms
			218	216	0 ohms
44	Disconnect meter, remove Extender Board from PTU & replace lead on terminal T at rear of Tel Set. Also replace connector at location 48-39-310.				

4.7 Voltmeter Control Tests

4.71 These tests consist of verifying proper voltage potentials are present upon operation of various voltmeter keys.

4.72 Replace the FB513 circuit pack (EQL 048-40) and verify the operation of the frame mounted voltmeter by operating the VMR key. The meter should read approximately 100 volts on the 120V scale.

4.73 Operate the 1K key and verify a reading of approximately 20 volts on the 24V scale.

4.74 Depress (to release) the 1K key and operate the 20K key. Verify a reading of 20 volts on the 24V scale.

4.75 Depress (to release) the 20K key. The voltmeter should read 100 volts on the 120V scale.

4.76 Operate MVM key and verify voltmeter reads 0 volts. Operate (to release) MVM key and verify voltmeter reading returns to 100 volts.

4.77 Repeat 4.76 for FEMF and BT keys.

4.78 Operate (to release) VMR key.

4.79 Insert ITE-5477B Extender Board at equipment location 052-02 and perform the remainder of these tests according to the instructions in Table E.

NOTE: Verify connector at Location 52-02-310 on rear of PTU is removed.

TABLE E

STEP	OPERATE KEY(S)	LOCATION	ITE-5632 DIGITAL MULTIMETER			
			SET TO READ	CONNECT METER LEADS TO EXTENDER BOARD TERMINALS		READING
				RED (+)	BLACK (-)	
1	VM 1	TLTP	DCV	313	213	0V
2	GRD	VOLTMETER				Approx. +100V
3	TRR	VOLTMETER				Approx. -100V
4	GRD (to release)	VOLTMETER				0V
5	BT	VOLTMETER				Approx. -200V
6	TRR & BT (to release)	VOLTMETER				0V
7	+STA & GRD	VOLTMETER				Approx. +116V
8	+STA (to release)	VOLTMETER				Approx. +100V
9	-STA	VOLTMETER				Approx. -116V
10	-STA & GRD (to release)	VOLTMETER				0V
11	VM 1 (to release)	TLTP				
12	Disconnect meter from Extender Board and remove Extender Board from the PTU. Replace the FC181, FB516, and FB505 circuit packs in the PTU and replace connector at Location 52-02-310 at rear of PTU.					

#### 4.8 Frame Telephone (TEL) Jack Test

4.81 Plug a 52N Head Telephone Set into the TEL A & B jacks on the TEST Frame writing shelf, and momentarily operate ACCESS TRUNK 1 key. Plug a second 52N Head Telephone Set into any other frame equipped with TEL jacks and verify voice transmission and reception.

With one TEL Set remaining at the TEST Frame TEL jacks, proceed to move the other TEL Set to test the TEL Jacks on all remaining frames equipped with TEL Jacks.

4.82 Remove all the TEL Jack test equipment from frames. Momentarily operate RELEASE 1 key and remove clipcord from rear of PTU.

→ Arrows indicate new or changed information.

Manager, ESS Installation & Field Engineering

7-1-1

Reason for Reissue:  
To incorporate changes per  
feedback from field.