

NO. 3 ESS
TWO-WAY TRUNK CIRCUIT
E&M LEAD SUPERVISION
SD-3H220, CPS FB391

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<u>1. GENERAL INFORMATION</u>	<u>Document</u>	<u>Title</u>
1.1 <u>Description</u>	SC,CD-3H220	Universal Trunk Circuit
1.11 This section provides an operational test of CPS-FB391, Two-Way E&M Trunk Circuit. The method of testing each trunk group depends on whether the outgoing or incoming capabilities of the group are being tested.	SD-3H901	Network Frame Circuit
1.12 Outgoing capabilities will be tested by using a test telephone to originate a call to a directory number which is routed to seize the trunk under test. The call will then be terminated at a Miscellaneous Trunk Test Set, ITE-5267.	CPS-FB391	Two-Way E&M Lead Trunk Circuit
1.13 Incoming capabilities will be tested by using an Incoming Trunk Test Set, ITE-5158, to originate a call through the trunk under test to a test telephone.	TMO-5158	Test Method of Operation, Incoming Trunk Test Set
1.2 <u>Cross-Connections</u>	TMO-5267	Test Method of Operation, Miscellaneous Trunk Test Set
1.21 Cross-connections from the trunk being tested to circuits outside the No. 3 ESS should be removed prior to these tests and then reconnected following the tests.		
1.3 <u>References</u>		
1.31 The following documents will be useful as references during the execution of these tests:		
	<u>2. RECORDS AND REQUIREMENTS</u>	
	2.1 <u>Records</u>	
	2.11 The results of this section shall be recorded on forms SD-97-1313 and SD-97-1315. For information on test records refer to Section 6B of Handbook 3.	
	2.2 <u>Requirements</u>	
	2.21 The tests in this section are based on the No. 3 ESS Performance Requirements, BSP 820-650-180.	
	<u>3. TEST EQUIPMENT</u>	
	3.1 <u>Test Sets</u>	
	3.11 The following test sets are required for these tests:	

<u>Document Code</u>	<u>Description</u>
ITE-5158	Incoming Trunk Test Set
ITE-5267	Miscellaneous Trunk Test Set
(2) 1500D*	TT Telephones
ITE-4631**	Test Receiver Set
1C2*	Coin Telephone
(6) ITE-9172**	Test Cord

* Provided by Telephone Company.
 ** Part of Test Accessory Set ITE-5653.

3.2 Cords

3.21 The power cord (ITE-9265) is furnished with test sets ITE-5158 and ITE-5267. The cords required for making test connections (ITE-9172) are furnished in the Test Accessory Set, ITE-5653.

4. SETUP INFORMATION

4.1 Worksheet Information

4.11 Information about the trunk to be tested is needed. The equipment location of the trunk is found on Input Form ESS 3201. The circuit code for CPS-FB391 is "01".

4.12 The trunk group's direction, trunk type, type of pulsing, and start dial signal are found on Input Form ESS 3204-1.

4.13 The number of members in each group to test as well as the number of digits expected for incoming groups are found on Input Form ESS 3202-3.

4.14 Determine an outgoing trunk group's access number as follows:

- A. Using the trunk group number, determine the Route Index (RI) from Input Form ESS 3303.

- B. Using the RI, determine the Code Index (CI) from Input Form ESS 3304.
- C. Using the CI, determine the 3-digit NPA and/or office code to access the trunk group (may need 1 or 0 prefix).

4.15 Select two test lines with major originating and terminating classes of 8 (usually Line Class Code 1FR or 1MR qualifies) from ESS Form 3100. (If the group has coin control features, select one of these lines to have a major originating and terminating class of 24 or 25. Line Class Code 1PC or DTF usually qualifies.)

4.16 This information can be conveniently organized on a worksheet similar to Figure 1.

4.2 Test Connections

4.21 Locate either the ITE-5158 (when testing incoming capabilities) or the ITE-5267 (when testing outgoing capabilities) at the rear of the network frame containing the trunk to be tested.

4.22 Using the ITE-9172 cords supplied in the test accessory set (ITE-5653) connect the trunk to be tested to the test set as follows:

CPS-FB391 LEAD	FROM TRK CP CONN	TO ITE-5158	TO ITE-5267
T1	005	T	T
R1	205	R	R
EA	209	E	E
SG	201	G	GRD
MA	008	M	M
SB	208	N	S

TRUNK GROUP NUMBER	TRUNK MEMBER NUMBER	LOCATION			TRK DIREC.		OUTGOING TRUNK						INCOMING TRUNK								
		NW FR.	FR LVL.	PACK	IN	OUT	ACCESS CODE NO.	OUTPULSE		START DIAL				COIN?	INPULSE		START DIAL			DIGITS EXP.	
								MF	DP	WK	ST	NO	ST		MF	DP	WK	ST	NO		ST
TEST PHONES																					
LINE CLASS CODE		TEN			CDF																

FIGURE 1

4.23 Using the ITE-9265 power cord supplied with the test sets, connect the test set to ground, -48 volt and +24 volt jacks located at the network frame control panel.

4.24 Connect the ITE-4631 headset to the TEL jack on the test set.

4.25 Connect the test phones as applicable, to their correct TENS as selected in paragraph 4.15.

5. TEST OPERATION

5.1 General

5.11 All trunks in an outgoing trunk group must be removed from service except the particular trunk to be tested in order to insure that this trunk is selected. This is accomplished with the following TTY input message (see IM/OM for description):

RMV:TRK (a,b),DSA;UCL!

This message must be repeated for each outgoing trunk circuit to be removed.

5.12 A trunk which has been removed from service must be restored to service before it may be tested. This is accomplished with the following TTY input message (see IM/OM for description):

RST:TRK (a,b);UCL!

5.2 Test Procedures

5.21 Select Table A, B, C, D, E, F or G and test all incoming, outgoing, and two-way CPS-FB391 trunk groups as specified.

NOTE: IF E&M APPLIQUES OR F-SIGNALING UNITS ARE WIRED TO THE TRUNKS, TEST SET LAMP INDICATIONS MAY BE DIFFERENT BUT TEST CALLS SHOULD STILL COMPLETE!

TABLE A

TEST PROCEDURES

CPS-FB391, USED AS OGT, NO START (NON-OPERATOR)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
1	Busy all the FB391s in the group to be tested except the trunk to be tested.	RMV:TRK (a,b),DSA;UCL!	M tt RMV TRK a b c d
2	Make the connection from the trunk under test to the ITE-5267.		Refer to paragraph 4.22.
3	Set up the ITE-5267 for the test.	At the ITE-5267: a. Operate "SL" switch. b. Operate "TALKO". c. Depress and lock the "ST" key.	
4	Place the test call to seize the trunk.	Using the test phone, dial the trunk group's 3-or 6-digit access code + any four digits.	At the end of dialing, the "S" lamp will light to indicate seizure, then, if the trunk is dial pulse, will pulse digits.

TABLE A (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
5	Verify a talking path between the test phone and the headset at the ITE-5267.		
6	Disconnect the call.	Hang up the test phone and release the "ST" key at the ITE-5267.	
7	Remove the tested trunk from service.	RMV:TRK (a,b),DSA;UCL!	M tt RMV TRK a b c d
8	Restore an untested member of the group being tested.	RST:TRK (a,b);UCL!	M tt RST TRK a b c
9	Repeat Steps 2-8 for all members of the group being tested.		
10	Repeat Steps 1-9 for all FB361 trunk groups used as outgoing, no start.		

TABLE B
TEST PROCEDURES
CPS-FB391, USED AS OGT, WINK START (NON-OPERATOR)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
1	Busy all the FB391s in the group to be tested except the trunk to be tested.	RMV:TRK (a,b),DSA;UCL!	M t t RMV TRK a b c d
2	Make the connection from the trunk under test to the ITE-5267.		See paragraph 4.22.
3	Set up the ITE-5267 for the test.	At the ITE-5267: a. Operate "SL" switch. b. Operate "TALKO" switch. c. Depress and lock the "ST" key.	
4	Place the test call to seize the trunk.	Using the test phone, dial the trunk group's 3- or 6-digit access code + any four digits.	The "S" lamp will light and if the trunk is MF, the "M" lamp will flash to indicate seizure. Then, if the trunk is DP "S" will flash during outpulsing. If the trunk is set up for overlap, seizure will occur after the 3- or 6-digit access is dialed while in the nonoverlap case, after all digits are dialed. In any case the wink must be provided immediately after seizure (see Step 5).
5	Provide a wink signal at the ITE-5267 to allow outpulsing.	At the ITE-5267: a. Quickly toggle the "E" switch first on (up), then off (down).	<u>NOTE</u> : If the trunk has timed out or the wink was too long, you must hang up the test phone and redial the call.
6	Verify a talking path between the test phone and the headset at the ITE-5267.		

TABLE B (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
7	Disconnect the call.	Hang up the test phone and release the "ST" key at the ITE-5267.	
8	Remove the tested trunk from service.	RMV:TRK (a,b),DSA;UCL!	M tt RMV TRK a b c d
9	Restore an untested member of the group being tested.	RST:TRK (a,b);UCL!	M tt RST TRK a b c
10	Repeat Steps 2-9 for all members in the group being tested.		
11	Repeat Steps 1-10 for all FB391 trunk groups used as outgoing wink start.		

TABLE C
TEST PROCEDURES
CPS-FB391, USED AS DP ICT (NON-OPERATOR)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
1	At the ITE-5158, verify that all keys are released and switches in the "OFF" or down position.		
2	Make the connection from the trunk under test to the ITE-5158.		Refer to paragraph 4.22
3	Set up the ITE-5158 for the test.	At the ITE-5158: a. Place large black toggle switch in "REPLY" position. b. Operate the "TALK" switch. c. Depress and lock "PWR" key.	At the conclusion of this step, the lamp should be lit in the "PWR" key.
4	Seize the trunk.	At the ITE-5158: a. Operate the "EM" switch.	The "E" lamp should light steady. <u>NOTE:</u> If the trunk group is a wink start group the "W" lamp should also light steady.
5	Pulse digits to the trunk.	Using the rotary dial on the ITE-5158, dial the number of the test phone, using only the number of digits the ICT expects.	<u>EXAMPLE:</u> If the test phone number is 123-4567 and the ICT expects 5 digits, dial 3-4567. During dialing the "E" lamp will pulse the digits.
6	Verify that audible is heard in the headset and that ringing is heard at the test phone.		

TABLE C (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
7	Answer test phone and verify a talking path to the headset.		<p>The "E" lamp should remain lit.</p> <p><u>NOTE:</u> If 1) the group is wink start, 2) the group is a charged group (CHG bit set in GRPTBL), and 3) the test phone is not free terminating, then the "MB" lamp should flash upon answer.</p>
8	Disconnect the call.	<p>Hang up the test phone and at the ITE-5158:</p> <p>a. Return the "EM" switch to "OFF" position.</p> <p>b. Release the "PWR" key.</p>	
9	Repeat Steps 1-8 for all FB391 trunks used as incoming dial pulse.		

TABLE D
TEST PROCEDURES
CPS-FB391, USED AS MF ICT (NON-OPERATOR)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
1	At the ITE-5158, verify that all the keys are released and switches are in the "OFF" or down position.		
2	Make the connection from the trunk under test to the ITE-5158.		Refer to paragraph 4.22
3	Set up the ITE-5158 the test.	At the ITE-5158: a. Place large black toggle switch in "OFF" position. b. Operate the "TALK" switch. c. Depress and lock "PWR" key.	At the conclusion of this step, the lamp should be lit in the "PWR" key.
4	Seize the trunk.	At the ITE-5158: a. Operate the "EM" switch.	The "E", "W", and "RB" lamps should light steady.
5	Pulse digits to the trunk.	Using the MF pad on the ITE-5158, punch in KP + the number of the test phone, using only the number of digits the ICT expects + ST.	<u>EXAMPLE:</u> If the test phone number is 123-4567 and the ICT expects 5 digits, punch in KP + 3-4567 + ST. At the conclusion of this step, the "RB" lamp should extinguish while the "W" and "E" lamps remain steady.
6	Verify that audible is heard in the headset and that ringing is heard at the test phone.		

TABLE C (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
7	Answer test phone and verify a talking path to the headset.		<p>The "E" lamp should remain lit.</p> <p><u>NOTE:</u> If 1) the group is wink start, 2) the group is a charged group (CHG bit set in GRPTBL), and 3) the test phone is not free terminating, then the "MB" lamp should flash upon answer.</p>
8	Disconnect the call.	<p>Hang up the test phone and at the ITE-5158:</p> <p>a. Return the "EM" switch to "OFF" position.</p> <p>b. Release the "PWR" key.</p>	
9	Repeat Steps 1-8 for all FB391 trunks used as incoming dial pulse.		

TABLE D
TEST PROCEDURES
CPS-FB391, USED AS MF ICT (NON-OPERATOR)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
1	At the ITE-5158, verify that all the keys are released and switches are in the "OFF" or down position.		
2	Make the connection from the trunk under test to the ITE-5158.		Refer to paragraph 4.22
3	Set up the ITE-5158 the test.	At the ITE-5158: a. Place large black toggle switch in "OFF" position. b. Operate the "TALK" switch. c. Depress and lock "PWR" key.	At the conclusion of this step, the lamp should be lit in the "PWR" key.
4	Seize the trunk.	At the ITE-5158: a. Operate the "EM" switch.	The "E", "W", and "RB" lamps should light steady.
5	Pulse digits to the trunk.	Using the MF pad on the ITE-5158, punch in KP + the number of the test phone, using only the number of digits the ICT expects + ST.	<u>EXAMPLE:</u> If the test phone number is 123-4567 and the ICT expects 5 digits, punch in KP + 3-4567 + ST. At the conclusion of this step, the "RB" lamp should extinguish while the "W" and "E" lamps remain steady.
6	Verify that audible is heard in the headset and that ringing is heard at the test phone.		

TABLE D (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
7	Answer the test phone.		<p>The "E" and "W" lamps remain steady.</p> <p><u>NOTE:</u> If 1) the group is a charged group (CHG bit set in GRPTBL) and 2) the test phone is not free terminating then the "MB" lamp should flash upon answer.</p>
8	Set up talking path through test set.	<p>At the ITE-5158:</p> <p>a. Place the large black toggle switch in the "REPLY" position.</p>	
9	Verify a talking path from the test phone to the headset.		
10	Disconnect the call.	<p>Hang up the test phone and at the ITE-5158:</p> <p>a. Return the "EM" switch to the "OFF" position.</p> <p>b. Release the "PWR" key.</p>	
11	Repeat Steps 1-10 for all FB391 trunks used as incoming MF.		

TABLE E
TEST PROCEDURES
CPS-FB391, USED AS OGT (OPERATOR)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
1	Busy all the FB391s in the group to be tested except the trunk to be tested.	RMV:TRK (a,b),DSA;UCL!	M tt RMV TRK a b c d
2	Make the connection from the trunk under test to the ITE-5267.		Refer to paragraph 4.22
3	Set up the ITE-5267 for the test.	At the ITE-5267: a. Operate "SL" switch. b. Operate "TALKO" switch. c. Depress and lock "ST" key.	
4	Using the appropriate test phone (use coin if coin features are provided for this trunk group) refer to the worksheet as prepared in 4.16 and dial the access number to seize the trunk under test.		At the end of dialing, the "S" lamp should light to indicate seizure.
5	Answer the call	At the ITE-5267: a. Operate "E" switch.	The "E" lamp should light.
6	Verify a talking path between the test phone and the headset at the ITE-5267.		
7	If the trunk group has coin control features continue with Step 8; if not, skip to Step 12.		

TABLE E (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
8	Deposit coin in test phone B.		<u>NOTE:</u> Stable call should still be up between test phone B and the headset at the ITE-5267.
9	Return the coin	At the ITE-5267: a. Operate "COIN" switch to "CIB" position. b. Operate "TIMER" switch to "150" position. c. Depress the "CR" key momentarily (1-2 seconds).	After Step c, the "E" lamp should extinguish momentarily.
10	Verify that the coin was returned at test phone B.		
11	Disconnect the call.	Hang up the test phone and return the "E" switch to the "OFF" or down position.	
12	Remove the tested	RMV:TRK (a,b),DSA;UCL!	M tt RMV TRK a b c d
13	Restore an untested member of the group being tested.	RST:TRK (a,b);UCL!	M tt RST TRK a b c
14	Repeat Steps 1-13 for all members in the group being tested.		
15	Repeat Steps 1-14 for all FB391 trunk groups used as outgoing operator trunks.		

TABLE F
 TEST PROCEDURES
 CPS-FB391, USED AS ICT (OPERATOR)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
1	At the ITE-5158, verify that all keys are released and all switches are in the "OFF" or down position.		
2	Make the connection from the trunk under test to the ITE-5158.		Refer to paragraph 4.22.
3	Set up the ITE-5158 for the test.	At the ITE-5158: a. Place large black toggle switch in "OFF" position. b. Operate "TALK" switch. c. Depress and lock "PWR" key.	At the conclusion of this step, the lamp should light in the "PWR" key.
4	Seize the trunk.	At the ITE-5158: a. Operate "EM" switch.	The "E", "W", and "RB" lamps should light steady.
5	Pulse digits to the trunk.	Using the MF pad on the ITE-5158, punch in KP + the number of the test phone using only the number of digits the ICT expects + ST.	<u>EXAMPLE:</u> If the test number is 123-4567 and the ICT expects 5 digits, punch in KP + 3-4567 + ST. At the conclusion of this step, the "RB" lamp should extinguish while the "W" and "E" lamps remain steady.
6	Set up talking path through test set.	At the ITE-5158: a. Place large black toggle switch to "REPLY" position.	At the start of ringing, the "RB" lamp extinguishes while the "E" and "W" lamps remain steady.

TABLE F (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
7	Initiate and/or verify ringing at the test phone and audible at the headset.	No action required unless trunk has controlled ring. If so: a. Operate "RING" switch to "RIB" position. b. Depress "R" key on the MF pad from 1-2 seconds.	
8	Answer the test phone.		The "E" and "W" lamps remain steady.
9	Verify a talking path between the test phone and the headset.		
10	Disconnect the call.	Hand up the test phone and at the ITE-5158: a. Return the "EM" switch to the "OFF" position b. Release "PWR" key.	
11	If trunk group is a NO TEST, continue with Step 12. If not, skip to Step 16.		<u>NOTE:</u> NO TEST steps (12-15) need only be performed on one member per group.
12	Using test phone A, call test phone B, verify a talking path and leave both phones off-hook.		
13	Repeat Steps 3, 4, 5 & 6.		

TABLE F (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
14	Verify a 3-way talking path between the 2 test phones and the headset at the ITE-5158:		
15	Disconnect the calls.	Hang up the test phones and at the ITE-5158: a. Return the "EM" switch to the "OFF" position. b. Release the "PWR" key.	
16	Repeat Steps 1-15 for all FB391 trunks used as incoming operator trunks.		

TABLE G
 TEST PROCEDURES
 CPS-FB391, USED AS OGT TO CAMA OR TSP(S)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
1	Busy all the FB391s in the group to be tested except the trunk to be tested.	RMV:TRK(a,b),DSA;UCL!	M tt RMV TRK a b c d
2	Make the connection from the trunk under test to the ITE-5267.		See paragraph 4.22.
3	Set up the ITE-5267 for the test.	At the ITE-5267: a. Operate "SL" switch. b. Operate "TALK0" switch. c. Depress and lock the "ST" key.	All other switches in the "OFF" or down position.
4	Place the test call to seize the trunk.	Using the test phone (use a coin phone if coin features are provided for this group), dial the trunk group's 3- or 6-digit access code + any four digits.	The "S" lamp will light and the "M" lamp will flash to indicate seizure. The wink provided in step 5 must be provided immediately after seizure.
5	Provide a wink signal at the ITE-5267 to allow outpulsing the called number.	At the ITE-5267: a. Quickly toggle the "E" switch first on (up), then off (down).	<u>NOTE:</u> If the trunk has timed out or the wink was too long, you must hang up the test phone and redial the call.
6	Provide a steady off-hook to allow outpulsing the calling number.	At the ITE-5267: a. Operate the "E" switch on (up).	MF outpulsing should be heard at the ITE-5267. This signal should be provided immediately after the called number is outpulsed.
7	Verify a talking path between the test phone and the headset at the ITE-5267.		

TABLE G (CONT'D)

STEP	PROCEDURE	ACTION OR INPUT MESSAGE	COMMENT OR RESULT
8	If the trunk group has coin control features, continue with step 9; if not, skip to step 12.		
9	Deposit a coin in the test phone.		<u>NOTE:</u> A stable call still be up between the test coin phone and the headset at the ITE-5267.
10	Return the coin.	At the ITE-5267: a. Operate "COIN" switch to "CIB" position. b. Operate "TIMER" switch to "150" position. c. Depress the "CR" key momentarily (1-2 seconds).	After step c, the "E" lamp should extinguish momentarily.
11	Verify that the coin was returned at the test phone.		
12	Disconnect the call.	Hang up the test phone and, at the ITE-5267, return the "E" switch to the "OFF" (down) position.	
13	Remove the tested trunk from service.	RMV:TRK(a,b),DSA;UCL!	M tt RMV TRK a b c d
14	Restore an untested member of the group being tested.	RST:TRK(a,b);UCL!	M tt RST TRK a b c
15	Repeat steps 1-14 for all members in the group being tested.		
16	Repeat steps 1-15 for all FB391 trunk groups used as OGT to CAMA or TSP(S).		