TRANSVERTER CONNECTORS SD-25804-01

MISCELLANEOUS TESTS

NO. 1 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes a method of making tests of the transverter connector circuits in No. 1 crossbar offices.

1.02 This section is reissued for the following reasons:

(a) To revise Test I description to include transverter connectors which may select two, three, or four special transverters.

(b) To include in Test I a check of the guard relay functions.

(c) To revise Test G to include test of separate first choice preference for special transverters.

This reissue does not affect the Equipment Test List.

1.03 The tests covered are:

1.04 Actions and verifications are required at locations other than at the transverter connector for tests as listed.

(a) Tests A through F, H, and I—at transverter trouble indicator.

(b) Test G—at transverter trouble indicator and at other transverter connectors.

(c) Test I—at subscriber senders.

1.05 When performing Test A, a transverter connector with associated senders and a transverter will be out of service.

1.06 When performing Tests B, C, and E through I a transverter connector with associated senders will be out of service.

1.07 When performing Test D, two transverter connectors with associated senders and a transverter will be out of service.

1.08 In this section, "stationary spring" and "operating spring" refer to springs of nonwire-spring type multicontact relays; "fixed contact" and "movable contact" refer to contacts of wire-spring type multicontact relays.

1.09 During Tests C, D, and G the TTR (transverter trouble release) register may be scored.

1.10 Local instructions should be followed with reference to recording any register operations caused by performing these tests.

2. APPARATUS

2.01 The apparatus required for each test is shown in Table A. The details of each item are covered in the paragraph indicated by the number in parentheses.

2.02 1A fault locator test set, J94730A (for use in checking for false continuity and crosses). Section 100-150-301 covers the method for using this test set.

2.03 716C receiver attached to a W2AB cord equipped with two 360A tools (2W21A cord) and one KS-6278 connecting clip and one 411A (test pick) tool (used for testing for presence of battery or ground).

2.04 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), a KS-6278 connecting clip and a 607A (winding connector) tool (used for connecting battery or ground to relay windings).

2.05 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), a KS-6278 connecting clip, and a 624B (terminal connector)

TABLE A

APPARATUS	A	B	C	D	E	F	G	H	I
Test Set (2.02)								1	
Headset (2.03)	1	1		1	1	1			
Cord (2.04)		2		2	1				
Cord (2.05)			1	1	1	1	2		1
Cord (2.06)			1			1	1		
Stopwatch (2.07)					1		1		
Tool (2.08)	√	√	√	√	√	√	√	√	√
322A make-busy plug	2	√	1	2	√	1	1	1	1

√ As required.

tool or another KS-6278 connecting clip with a 108 cord tip (insulating tubing), as required (used for connecting battery or ground to terminal strip punchings).

2.06 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), a KS-6278 connecting clip and a 419A (test connector) tool (used for connecting battery or ground to relay contacts).

2.07 KS-3008 stopwatch or equivalent.

2.08 Blocking or insulating tools, as required. Use tools and apply, as covered in Section 069-020-801.

3. METHOD

STEP	ACTION	VERIFICATION
A. Transverter Busy to Transverter Connector		
1	Test for presence of battery on even-numbered springs of SMB relay.	Battery present (if senders associated with springs are equipped).
2	At TVTI— Insert 322A plug into C-GB jack of connector under test.	SMB relay operated.
3	At TVC— Test for presence of ground on even-numbered springs of SMB relay.	Ground present.
4	At TVTI— Insert 322A plug into CB_ jack associated with a selected transverter on connector under test.	Associated CB_ relay operated.
5	Remove plug from CB_ jack.	Associated CB_ relay releases.
6	Repeat Steps 4 and 5 for all other transverters on this connector.	

STEP	ACTION	VERIFICATION
7	Insert 322A plug into TV-MB jack of a selected transverter.	Associated CB_ relay operated.
8	Remove plug from TV-MB jack.	Associated CB_ relay releases.
9	Repeat Steps 7 and 8 for all other transverters on this connector.	
10	At TVC— Block operated lower half of an SA_ relay.	
11	Momentarily operate a CB_ relay.	CB_ relay locks operated.
12	Remove blocking tool from SA_ relay.	CB_ relay releases.
13	Repeat Steps 10 through 12 for each other SA_ relay except last one.	
14	Repeat Steps 10 and 11 for last SA_ relay.	
15	Momentarily operate all but one CB_ relay.	CB_ relays lock operated.
16	Momentarily operate last CB_ relay.	Last CB_ relay locks operated. All other CB_ relays release. ***Note:*** A CB_ relay may be held operated by a call in another connector or by a transverter made busy.
17	Remove blocking tool from SA_ relay.	Last CB_ relay releases.
18	At TVTI— Remove plug from C-GB jack.	

B. Sender Preference and Lockout Features

1	At TVTI— Insert 322A plug into C-GB jack of connector under test.	
2	Insert 322A plugs into CB_ jacks of all transverters on selected connector.	
3	Operate TLO key.	
4	At TVC— Test that ground is not present on 1B spring of CA5 relay.	Ground not present.
5	Block CA1 and CA2 relays nonoperated.	

STEP	ACTION	VERIFICATION
6	Connect battery to B winding terminal of lowest numbered SS_ relay.	SS_ relay operated. Associated SA_ and SB_ relays operated.
7	Connect battery to B winding terminal of next higher numbered SS_ relay.	SS_ relay not operated.
8	Remove battery from B winding terminal of lower numbered SS_ relay.	Lower numbered SS_, SA_ and SB_ relays release. Next higher numbered SS_, SA_ and SB_ relays operated.
9	Reconnect battery to B winding terminal of lower numbered SS_ relay.	Lower numbered SS_ relay reoperated. Lower numbered SA_ and SB_ relays not operated.
10	Remove battery from B winding terminal of lower numbered SS_ relay.	
11	Repeat Steps 7 through 10 for remaining SS_ relays in connector.	
12	Remove battery from B winding terminal of last SS_ relay.	Last SS_, SA_, and SB relays release.
13	Remove blocking tools from CA1 and CA2 relays.	
14	At TVTI— Restore TLO key.	
15	Remove plugs from CB_ and C-GB jacks.	

C. Transverter Preference and Lockout Features—Access to All Transverters from One Transverter Connector, CB_ Relay Chain

Note: While making this test, the operation of a TS_ relay causes the TV to time out, seize the TVTI and sound the minor alarm. If the TS_ relay is held operated for approximately 5 seconds, the major alarm sounds and the TA lamp at the TV lights. This alarm is locked in, holding the TV busy until the alarm is manually retired. After the TS_ relay is released, momentarily operate the AR key at the TV to silence the major alarm, extinguish the TA lamp and remove the TV busy condition. Momentarily operate the RL key at the TVTI to release the TVTI and silence the minor alarm.

STEP	ACTION	VERIFICATION
1	At TVTI— Insert 322A plug into C-GB jack of connector to be tested.	
2	At TVC— Block nonoperated all TA_ relays.	
3	Block nonoperated CB_ relay associated with lowest numbered TA_ relay.	
4	Connect ground to 08 terminal of SA terminal strip.	
5	Connect battery to 1T spring of highest numbered CB_ relay.	Lowest numbered TS_ relay operated. Associated TA_ relay energized.
6	Remove ground from 08 terminal of SA terminal strip.	TA_ relay deenergized.
7	Reconnect ground to 08 terminal of SA terminal strip.	
8	Block nonoperated CB_ relay associated with next higher numbered TS_ relay.	
9	Block operated CB_ relay associated with lower numbered TS_ relay.	Lower numbered TS_ relay releases. Higher numbered TS_ relay operated. Higher numbered TA_ relay energized.
10	Remove ground from 08 terminal of SA terminal strip.	TA_ relay deenergized.
11	Reconnect ground to 08 terminal of SA terminal strip.	
12	Repeat Steps 8 through 11 for all other TS_ and CB_ relays in connector.	
13	Remove battery from 1T spring of highest numbered CB_ relay.	Highest numbered TS_ relay releases. Highest numbered TA_ relay deenergized.
14	Block operated highest numbered CB_ relay.	
15	Block nonoperated lowest numbered CB_ relay.	
16	Connect battery to 2T spring of highest numbered CB_ relay.	Lowest numbered TS_ relay operated.
17	Remove battery from 2T spring of highest numbered CB_ relay.	Lower numbered TS_ relay releases.

STEP	ACTION	VERIFICATION
18	Remove ground from 08 terminal of SA terminal strip.	
19	Remove blocking tools from CB_ relays.	
20	Remove blocking tools from TA_ relays.	
21	At TVTI— Remove plug from C-GB jack.	

D. Transverter Connector Preference and Lockout Features—Access to One Transverter from All Transverter Connectors, TS_ Relay Chain

Note 1: While making this test, the operation of a TS_ relay causes the TV to time out, seize the TVTI and sound the minor alarm. If the TS_ relay is held operated for approximately 5 seconds, the major alarm sounds and the TA lamp at the TV lights. This alarm is locked in, holding the TV busy until the alarm is manually retired. The operation of a TA_ relay will cause the connector to time out within 5 to 12 seconds and sound the major alarm. After the TS_ relay is released, momentarily operate the AR key at the TV to silence the major alarm, extinguish the TA lamp and remove the TV busy condition. Momentarily operate the RL key at the TVTI to release the TVTI and silence the minor alarm.

Note 2: From the office records, determine the TVC having the first TS_ relay in the chain for the TV to be tested. For the purpose of this test, the first TS_ relay in the chain is the relay whose winding is connected directly to ground (associated D punching connected to GA punching on the chain terminal strip).

1	At TVTI— Insert 322A plug into TV-TIB jack of lowest numbered transverter.	
2	Insert 322A plug into TV-MB jack associated with lowest numbered transverter.	At TVC having first TS_ relay in chain— CB_ relay, associated with transverter made busy, operated.
3	At TVC having first TS_ relay in chain— Block operated SMB relay.	

STEP	ACTION	VERIFICATION
4	Connect battery to B winding terminal of TS_ relay associated with lowest numbered transverter.	TS_ relay operated.
5	Connect ground to 08 terminal of SA terminal strip.	TA_ and TB_ relays, associated with lowest numbered transverter, operated. CB_ relay releases. GT, GT1, and GRA relays operated.
6	Test for presence of ground on operating spring or fixed contact 28 of SA_ and TA_ relays, and 3 of TA_ relays.	
7	Test for presence of ground on 05 and 08 terminals of TVA terminal strip.	Ground present.
8	At TVC having second TS_ relay in chain— Block operated SMB relay.	
9	Connect battery to B winding terminal of TS_ relay associated with lowest numbered transverter.	At TVC having second TS_ relay in chain— Associated TS_ relay not operated.
	Caution: Perform the operation in Step 10 as rapidly as possible in order to prevent interference with service.	
10	At TVC having first TS_ relay in chain— Remove test connection from TS_ relay, then remove test connection from SA terminal strip, and remove blocking tool from SMB relay.	At TVC having first TS_ relay in chain— Associated TS_, TA_, and TB_ relays release. At TVC having second TS_ relay in chain— Associated TS_ relay operated.
11	At TVC having second TS_ relay in chain— Connect ground to 08 terminal of SA terminal strip.	TA_ and TB_ relays, associated with transverter made busy, operated. CB_ relay releases. GT, GT1 and GRA relays operated.
12	Test for presence of ground on operating spring or fixed contact 28 of SA_ and TA_ relays, and 3 of TA_ relays.	Ground present.
13	Test for presence of ground on 05 and 08 terminals of TVA terminal strip.	Ground present.
14	At TVC having first TS_ relay in chain— Connect battery to B winding terminal of TS_ relay.	At TVC having first TS_ relay in chain— TS_ relay operated. Associated TA_ relay not operated. At TVC having second TS_ relay in chain— TS_ relay holds.
15	Remove battery from B winding terminal of TS_ relay.	At TVC having first TS_ relay in chain— TS_ relay releases.

STEP	ACTION	VERIFICATION
16	Repeat Steps 8 through 15 for remaining TS_ relays in chain of lowest numbered transverter. Consider reference to first and second TS_ relays as two consecutive TS_ relays (second and third, third and fourth, etc.) in preference chain.	
17	At TVC having last TS_ relay in chain— Remove test connections from TS_ relay.	
18	Remove test connection from SA terminal strip.	
19	Remove blocking tool from SMB relay.	
20	At TVTI— Remove plugs from TV-MB and TV-TIB jacks.	
21	Repeat Steps 1 through 20 to check TS_ relays of remaining transverters. In these steps reference to lowest numbered transverter applies to transverter associated with TS_ relay chain under test.	
E. Time-Out Features		
1	At TVTI— Insert 322A plug into C-GB jack of connector under test.	
2	Operate BAT key.	
3	Insert 322A plugs into CB_ jacks of all transverters on connector under test.	
4	At TVC— Block nonoperated lowest numbered SS_ relay.	
5	Connect battery to B winding terminal of lowest numbered SS_ relay.	At TVTI— After 5 to 12 seconds— CT, TFA and proper C_ lamps lighted. Major alarm sounds. S_ lamp, associated with lowest numbered SS_ relay, not lighted.
6	Insulate 1B contact of CA1 relay.	CT lamp extinguished. Major alarm silenced. Minor alarm sounds.
7	At TVTI— Momentarily operate LORL key.	C_ and TFA lamps extinguished. Minor alarm silenced.

STEP	ACTION	VERIFICATION
8	At TVC— Insulate 1T contact of TVT relay.	
9	Remove blocking tool from SS_ relay.	S_ lamp associated with SS_ relay lighted. After 5 to 12 seconds— CT, TFA, and C_ lamps lighted. Major alarm sounds.
10	At TVC— Insulate 3T contact of GT relay.	
11	Test for presence of ground on 3T spring of GT relay.	At TVC— Ground present.
12	Remove test connection from SS_ relay.	At TVTI— CT and S_ lamps extinguished. Major alarm silenced. Minor alarm sounds.
13	At TVTI— Momentarily operate LORL key.	C_ and TFA lamps extinguished. Minor alarm silenced.
14	At TVC— Block nonoperated CA4 relay.	
15	Connect battery to next higher numbered SS_ relay.	Associated S_ lamp lighted.
16	Test presence of ground on 3T spring of GT relay and 2T spring of CA2 relay.	At TVC— Ground present.
17	Remove test connection from SS_ relay.	
18	Repeat Steps 15 through 17 for remaining SS_ relays.	
19	Remove insulators from CA1, TVT and GT relays.	
20	Remove blocking tool from CA4 relay.	
21	Test for presence of ground on stationary spring or movable contact 3 of each TA_ relay of connector under test.	Ground present.
22	Connect ground to 03 terminal of TA terminal strip.	At TVTI— C_ lamp associated with connector under test lighted. After 5 to 12 seconds— CT lamp lighted. Major alarm sounds.

STEP	ACTION	VERIFICATION
23	Remove test connection from TA terminal strip.	C_ and CT lamps extinguished. Major alarm silenced.
24	Block nonoperated CA5 relay.	
25	Connect ground to 03 terminal of TA terminal strip.	At TVTI— After 5 to 12 seconds— C_ and CT lamps lighted. Major alarm sounds.
26	Test for presence of ground on operating spring or fixed contact 3 of each TA_ relay in connector under test.	At TVC— Ground present.
27	Remove test connection from TA terminal strip.	At TVTI— C_ and CT lamps extinguished. Major alarm silenced.
28	Remove blocking tool from CA5 relay.	
29	At TVTI— Remove plugs from CB_ and C-GB jacks.	
30	Restore BAT key.	

F. False Ground and Second Trial Features

1	At TVTI— Insert 322A plug into C-GB jack of connector under test.	
2	Operate BAT key.	
3	At TVC— Connect ground to 06 terminal of TB terminal strip.	At TVTI— GR, CT, and C_ lamps lighted. Major alarm sounds.
4	Block operated GRA relay.	
5	At TVTI— Momentarily operate RLA key.	GR, CT, and C_ lamps extinguished. Major alarm silenced.
6	At TVC— Test for presence of ground on operating spring or fixed contact 6 of each SB_ and TB_ relay.	At TVC— Ground present.
7	Remove test connection from TB terminal strip.	
8	Remove blocking tool from GRA relay.	

STEP	ACTION	VERIFICATION
9	Connect ground to 05 terminal of TB terminal strip.	TR relay operated. At TVTI— Proper C_ lamp lighted. GR and CT lamps lighted. Major alarm sounds.
10	Block operated GRA relay.	
11	At TVTI— Momentarily operate RLA key.	C_, GR, and CT lamps extinguished. Major alarm silenced.
12	At TVC— Test for presence of ground on operating spring or fixed contact 5 of each TB_ relay.	At TVC— Ground present.
13	Connect ground to 4T spring of TR relay.	
14	Test for presence of ground on stationary spring or movable contact 6 of each SA_ relay.	Ground present.
15	Test for presence of ground on operating spring or fixed contact 3 of each SB_ relay.	Ground present.
16	Remove test connection from TB terminal strip.	TR1 relay operated. TR relay holds.
17	Connect ground to 05 terminal of TB terminal strip.	
18	Test for presence of ground on operating spring or fixed contact 5 of each SB_ relay.	Ground present.
19	Test for presence of ground on operating spring or fixed contact 2 of a TA_ relay and 1 of a TB_ relay.	Ground present.
20	Remove test connection from TR relay spring.	TR and TR1 relays release.
21	Remove test connection from TB terminal strip.	
22	Remove blocking tool from GRA relay.	
23	At TVTI— Remove plug from C-GB jack.	
24	Restore BAT key.	

G. Transverter Sequence Feature

Note: While making this test, the operation of a TS_ relay causes the TV to time out,

STEP	ACTION	VERIFICATION
	seize the TVTI and sound the minor alarm. If the TS_ relay is held operated for approximately 5 seconds, the major alarm sounds and the TA lamp at the TV is lighted. This alarm is locked in, holding the TV busy until the alarm is manually retired. After the TS_ relay is released, momentarily operate the AR key at the TV frame to silence the major alarm, extinguish the TA lamp and remove the TV busy condition. Momentarily operate the RL key at the TVTI to release the TVTI and silence the minor alarm.	
1	At TVTI— Restore TLO key, if operated.	
2	Insert 322A plug into C-GB jack of connector under test.	
3	At TVC— Block operated CA5, GT and GT1 relays.	
4	Connect battery to 07 terminal of SA terminal strip. ***Note:*** From the office records, determine the order of TV preference in the TVC under test. The first choice TV in the TVC may be identified by the TS_ and CB_ relays whose B punching is connected directly to the A punching on the chain and choice terminal strip of the connector frame on which the connector under test is located. The second, third and succeeding choices are the next higher numbered TVs in numerical order except that the choice of the highest numbered TV will be succeeded by the lowest numbered TV. ▶When a connector serves special transverters and GD relay is provided, a separate first choice for special transverters is provided in each block of connectors.◀	No TS_ relays operated.
5	Remove blocking tool from GT relay.	First choice TS_ relay operated.
6a	▶If GD relay is furnished— Block operated SPL relay.	First choice TS_ relay released. Special transverter first choice TS_ relay operated. ***Note:*** In each connector, the cross-connection between SPL and B punchings determine the special transverter first choice.

STEP	ACTION	VERIFICATION
7a	Release SPL relay.	Special transverter first choice TS_ relay released. First choice TS_ relay operated.
8	Block operated GT relay.	TS_ relay releases.
9	Insulate 4T contact of GT relay.	
10	Remove blocking tool from GT1 relay.	First choice TS_ relay operated.
11	Remove blocking tool and insulator from GT relay.	
12	Block nonoperated CA4 relay.	
13	Connect ground to 08 terminal of SA terminal strip.	TA_ and TB_ relays, associated with first choice TS_ relay, operated. GT relay operated. First choice TS_ relay holds.
14	Block operated CB_ relay associated with first choice TS_ relay.	First choice TS_, TA_, and TB_ relays release. GT relay releases. Second choice TS_, TA_, and TB_ relays operated. GT relay operated. Second choice TS_ relay holds.
15	Repeat Step 14 until all TS_ relays have been tested in their order of preference. In this case, consider reference to first and second choice TS_ relays as the second and third choice, the third and fourth choice, etc.	
16	Remove test connections from SA terminal strip.	
17	Remove blocking tools from CA4 relay and all CB_ relays.	
18	Connect ground to 04 terminal of TA terminal strip.	GT and GT1 relays operated. After 5 seconds— Minor alarm not sounded.
19	Remove blocking tool from CA5 relay.	At TVTI— After 2 to 5 seconds— TFA lamp lighted. Minor alarm sounds.
20	Block operated CA5 relay.	
21	At TVTI— Momentarily operate TLO key.	TFA lamp extinguished. Minor alarm silenced.

STEP	ACTION	VERIFICATION
22	At next higher numbered TVC (or lowest numbered TVC when testing highest numbered TVC)— Verify GT relay is normal. ***Note:*** In performing the following steps, do not ground the CP lead any longer than necessary since, if each of the nonbusy TVCs in the group serve a call during the time the lead is grounded, their GT and GT1 relays will be unable to release; thereby causing a traffic delay.	
23	Connect ground to 3T spring of GT1 relay (CP lead).	
24	At TVC— Remove test connection from TA terminal strip.	At TVC— GT and GT1 relays remain operated.
25	At next higher numbered TVC (or lowest numbered TVC when testing highest numbered TVC)— Remove test connection from GT1 relay.	GT and GT1 relays release. ***Note:*** If relays do not release, it may be due to some other TVC handling a call. The relays should release when this call is completed.
26	At TVC— Remove blocking tool from CA5 relay.	
27	At TVTI— Remove plug from C-GB jack.	

H. Test for False Continuity and Crosses on SA_, SB_, TA_, and TB_ Relay Contacts

1	At TVTI— Insert 322A plug into C-GB jack.	
2	At TVC— Using a 1A fault locator test set, test terminals for crosses and falsely made contacts as shown in Table B.	

TABLE B

TERMINAL STRIP TA	TERMINAL STRIP TB
01 and 09 to 59	02, 04, 07, 08 and 10 to 59

3	Insulate 2T contact of TR relay.	

STEP	ACTION	VERIFICATION
4	Using a 1A fault locator test set, test springs or contacts of all SA relays in connector, as shown in Table C. *Note:* Springs or contacts normally grounded are shown in the table. The remainder should test open.	Tone heard on open springs or contacts. Tone not heard on grounded springs or contacts.

TABLE C

SA RELAY

NUMBERS	OPERATING SPRING OR FIXED CONTACT	STATIONARY SPRING OR MOVABLE CONTACT
2		Grd
3		Grd
5	Grd	
6	Grd	

5	Remove insulator from TR relay.	
6	At TVTI— Remove plug from C-GB jack.	

I. Test for Continuity and False Ground on SPL Lead and Selection of Special Transverter for ODN Feature.

1	At TVTI— Insert 322A plug into C-GB jack.	
2	At TVC— Operate in turn each SS_ relay in the sender preference chain.	SPL relay not operated.
3	At subscriber senders SB terminal strip for senders associated with the transverter connector being tested— Ground punching 05.	ODN relay operated in subscriber sender.
4	At TVC— Operate the first SS_ relay in sender preference chain.	SPL relay operated. CB_ relays for nonspecial transverters operated.
5	Release SS_ relay.	SPL relay released. CB_ relays released.
6	Repeat Steps 4 and 5 for intermediate and last SS_ relay.	Same as Steps 4 and 5.

STEP	ACTION	VERIFICATION
7a	If GD relay is provided— Operate first SA_ relay in sender preference chain.	GD relay operated.
8a	Operate first SS_ relay in sender preference chain.	SPL relay not operated.
9a	Release SA_ and SS_ relays.	GD relay released.
10a	Block operated SPL relay.	All CB_ relays for nonspecial transverters operated.
11a	Momentarily operate any SA_ relay.	GD relay not operated.
12a	Release SPL relay.	CB_ relays released.
13	At subscriber senders— Remove grounding strap from punching 05 of SB terminal strip that was placed in Step 3.	ODN relay in sender released.
14	At TVTI— Remove plug from C-GB jack.	