

**NO. 4A TRAFFIC USAGE RECORDER (TUR) SD-95738-01 AND  
AUXILIARY SCANNER UNIT (FAST SCAN UNIT)**

**CONTINUITY CHECKS, VERIFICATION OF ASSIGNMENTS, AND CHECKS OF CROSS-CONNECTIONS**

**1. GENERAL**

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**1.01** This section describes the method of performing continuity checks, verification of assignments, and checks of cross-connections of the traffic usage recorder (TUR) SD-95738-01 and the optional auxiliary scanner unit (fast scan unit). Tests of this section are performed with the aid of the TUR connection verifier test set H-400-430. Optional manual testing methods have been provided for checks of the 4A TUR when the H-400-430 test set is not available.

**B. Terminal Finder:** This test is designed to locate missing scan switch leads. . . . . 12

**C. Traffic Register Verification:** This test checks the register lead between the TUR detector output and the traffic register for crosses and proper assignment. It also checks the ability of the register to follow a 20 PPS rate. . . . . 15

**1.02** This section is reissued for the following reasons:

**D. Verification of Traffic Data Converter Input Assignment:** This test checks that the proper switch cross-point is connected to the proper traffic data converter (TDC) input and that the TDC generates the correct word. . . . . 17

- (a) To add Tests J through Q which were transferred from Section 252-122-501
- (b) To revise Tests F and I and Fig. 8 and 11 to provide a more adequate means of testing the auxiliary scanner unit
- (c) To revise apparatus Table A
- (d) To make minor changes as required.

**E. Crossed Contact Test:** This test checks whether contacts on scan and register switches are crossed. . . . . 20

This reissue affects the Equipment Test List.

**FOR AUXILIARY SCANNER UNIT (H-400-430 TEST SET AVAILABLE)**

**1.03** The following tests are covered.

**F. Scan Lead Verification (Auxiliary Scanner Unit):** This test checks the scan leads between the source circuits and the detector inputs. . . . . 25

**FOR 4A TUR (H-400-430 TEST SET AVAILABLE)**

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**A. Scan Lead Verification:** This test checks the scan leads between the central office equipment (COE) and the TUR detector inputs for opens, crosses, and proper assignment. . . . . 7

**G. Terminal Finder (Auxiliary Scanner Unit):** This test is designed to assist in locating trouble involving input leads. . . . . 29

**H. Auxiliary Scanner Verification of Encoder Input Leads When Associated With Peg Count Converter**

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**(SD-95968-01):** This test provides verification of encoder input leads and provides a check of the peg count leads associated with detector FD8. . . . . 32

**I. Traffic Register Verification (Auxiliary Scanner Unit):** This test checks the register leads between assigned traffic register and its associated detector for continuity, crosses, and proper assignment. It also checks the ability of the register to follow a 20 PPS rate. . . . . 36

▶FOR 4A TUR (H-400-430 TEST SET NOT AVAILABLE)

**J. Continuity Test of Circuits Connected to Scan Crossbar Switches:** This test checks:

- (1) Assignment of circuits to crosspoints on scan crossbar switches
- (2) Assignment of register punchings to circuits
- (3) Register groupings
- (4) Busy detection
- (5) False grounds and crosses on register and scan switch crosspoints
- (6) Operation of the TUR from the point at which the busy indication originates in the assignment circuit through the TUR. . . . . 39

**Note:** This assignment through test is necessary only when verification of cabling, wiring, and assignments is required.

**K. Continuity Test From Register Switch to Usage Registers:** This test checks:

- (1) Correct number of register operations
- (2) Crosses on register leads . . . . . 42

**L. Verification of Register Assignment:** This test checks

that the proper usage register operates from each assigned REG punching. . . . . 43

**M. Cross Detection Between Stationary Springs of Scan Switches:** This test provides a manual check for crosses between stationary springs of scan switches. . . . . 43

**N. Cross Detection Between Stationary Springs of Register Switches:** This test provides a manual check for crosses between stationary springs of register switches. . . . . 44

**O. Verification of Cross-Connections:** This test provides a rapid check of cross-connections following rearrangement of trunks, links, junctors, etc, or traffic registers associated with the TUR. . . . . 45

**P. Verification of Traffic Data Recording System (TDRS) Traffic Data Converter Input Assignment:** This test checks that the proper TUR converter input is connected to the proper switch crosspoint. . . . . 46

**Q. Verification of EADAS Traffic Data Converter Input Assignment Leads:** This test verifies that the leads connected between the 4A TUR and the EADAS traffic data converter are free from crosses and are connected as assigned. . . . . 48

H-400-430 TEST SET AVAILABLE▶

**1.04** The TUR connection verifier test set consists of three portable units, the TUR UNIT, the REMOTE UNIT, and the CONTROL UNIT, which are so designated on the equipment and in the tests.

**1.05** The cords and connections required for the three units of the TUR connection verifier test set is shown in Fig. 1.

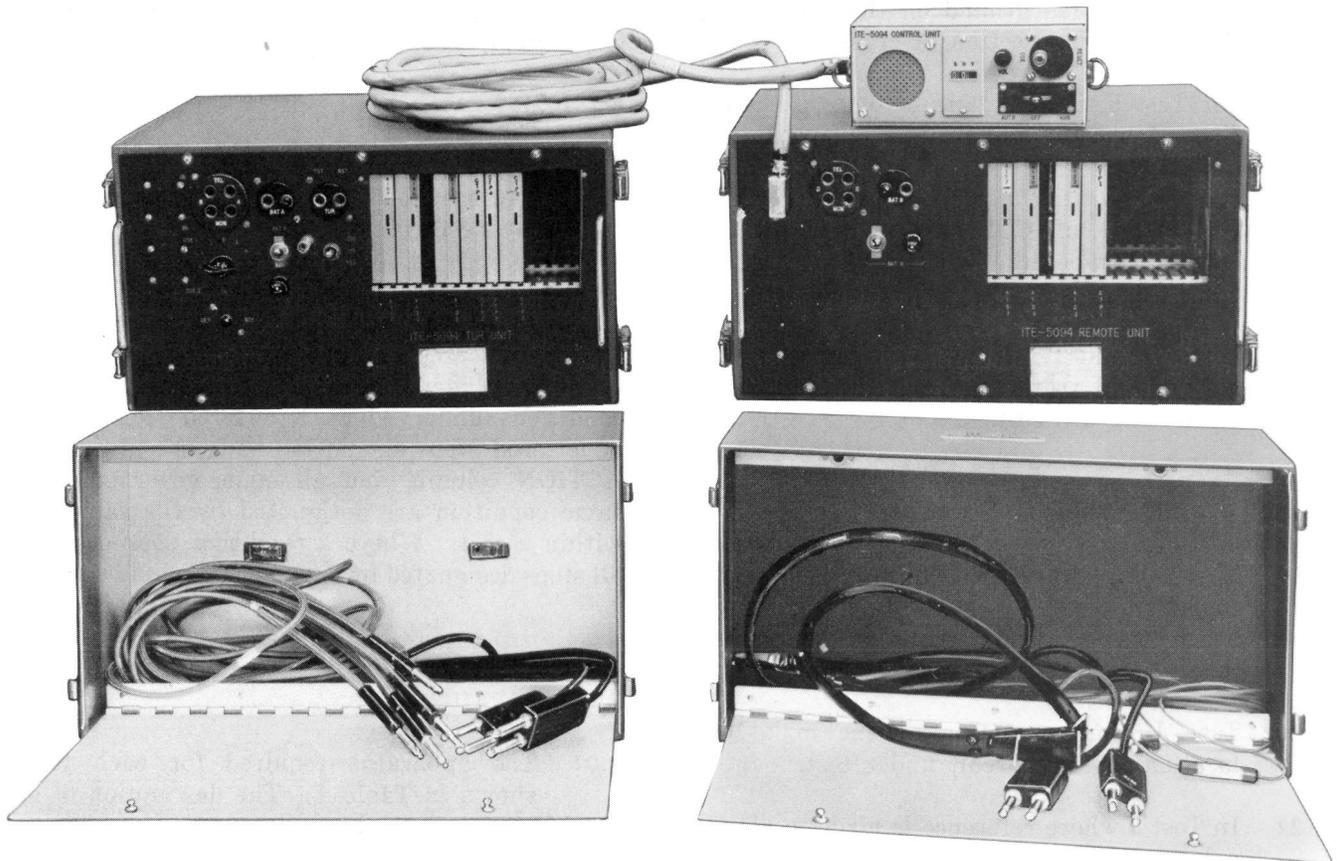


Fig. 1—TUR Connection Verifier Test Set

- 1.06** Test A requires that each circuit connected to the scan switches be in the idle condition when seized for test. Busy circuits must be passed by to be retested when they become idle.
- 1.07** Test A requires action at the make-busy location for the circuit under test.
- 1.08** In Test A where reference is made to placing a busy condition on a circuit under test, it is assumed that this action will be carried out in the approved manner. Depending upon the nature of the circuit involved, this may mean using a make-busy plug, opening a contact to remove the idle condition, etc.
- 1.09** For Test B, the equipment associated with tested usage leads must be made idle when performing this test.
- 1.10** Test C requires verification at the traffic register bay.
- 1.11** In Tests C and D, the traffic register cameras, where provided, must be removed from the traffic register bays to facilitate observation of register scoring. At completion of testing, the cameras should be placed back into position. The camera clock settings must be corrected if the ac power was interrupted.
- 1.12** For Test C, determine from locally prepared worksheets the quantity of circuits associated with each usage register.
- 1.13** For Test D, the summarizer should not seize control of the TUR.
- 1.14** For Test D, refer to office records for TUR crosspoint to converter input (P-lead or G-terminal assignment).

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- 1.15 Test E should be performed at minimum traffic hours as ground on the leads (busy trunks) will prevent detection of crosses.
- 1.16 For Test F, if dual tone becomes excessive, discontinue test and resume during a light load period.
- 1.17 For Test G, all COE connected to the GP\_ leads must be idle while performing this test.
- 1.18 Tests G and H should be performed only during light traffic periods since busy COE can make testing difficult.

### ◆H-400-430 TEST SET NOT AVAILABLE

- 1.19 Test J requires that each circuit connected to the scan switches be in the idle condition when seized for test. Busy circuits must be passed by to be retested when they become idle.
- 1.20 Test J requires action at the make-busy location for the circuit under test.
- 1.21 In Test J where reference is made to placing a busy condition on a circuit under test, it is assumed that this action will be carried out in the approved manner. Depending upon the nature of the circuit involved, this may mean using a make-busy plug, opening a contact to remove the idle condition, etc.
- 1.22 Tests J, K, L, and O require verification at the traffic register bay.
- 1.23 In Test J when an assignment through test is made, the traffic register cameras, where provided, must be removed from the traffic register bays to facilitate observation of register scoring. At completion of testing, the cameras should be placed back into position. The camera clock settings must be corrected if the ac power was interrupted.
- 1.24 In Tests M and N, the figure numbers referred to are figures in the circuit drawing for the TUR, SD-95738-01.
- 1.25 For Test P, the summarizer should not seize control of the TUR.

- 1.26 For Test P, refer to office records for TUR crosspoint to converter input (P-lead or G-terminal) assignment.

### ALL TESTS◆

- 1.27 Local instructions should be followed with reference to recording any register operations caused by performing these tests.
- 1.28 **Lettered Steps:** A letter a, b, c, etc, added to a step number in Part 4 of this section indicates an action which may or may not be required depending on local conditions. The conditions under which a lettered step or series of lettered steps should be made are given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

## 2. APPARATUS

- 2.01 The apparatus required for each test is shown in Table A. The description of each item is covered in the indicated paragraphs.
- 2.02 TUR connection verifier test set H-400-430.
- 2.03 67C test set.
- 2.04 TDC test set SD-99313-01 (J94734).
- 2.05 ◆EADAS test set SD-3B220-01 equipped with testing cords.
- 2.06 KS-14510 portable volt-ohm-milliammeter (or equivalent)◆
- 2.07 Test set cord, 12 feet long, 3-conductor, equipped with two 310 plugs (H-400-430 DET. 32 cord).
- 2.08 Test cord, 25 feet long, 14-conductor, equipped with one Amphenol 67-06P18-64 plug and one Amphenol 67-01P18-64 plug (H-400-430 DET. 33 cord).
- 2.09 Test set cord, 12 feet long, 6-conductor, equipped with one Jones 306-CCT plug at one end and six ITE-2461 sockets at the other end (H-400-430 DET. 35 cord).

→ TABLE A ←

APPARATUS	A P P P P	TESTS																				
		A	B	C	D	E			F	G	H	I	J	K	L	M	N	O	P	Q		
		OPTION 30G	OPTION 30H				GROUND BUSY	OPEN BUSY OR BATTERY BUSY	RESISTER SWITCHES													
TEST SET H 400-430 (2.02)		1	1	1	1	1	1	1	1	1	1	1										
TEST SET 67C (2.03)				1																		
TEST SET TDC (2.04)					1						1								1			
TEST SET (2.05)																				1		
VOM (2.06)																1	1					
32A (REMOTE CONTROL) TEST SET													1					1	1	1		
CORD (2.07)		4	4	4	4	4	4	4	4	2	2	2	2									
CORD (NOTE 1) (2.08)		1	1	1	1	1	1	1	1	1	1	1	1									
CORD (NOTE 2) (2.09)		1	1	1			1	1	1	1	1		1									
CORD (2.10)		2	2	2	2	1	1	1	1	2	2	2	2									
CORD (2.11)				1	1	1	1	1	1		1	1	1									
CORD (2.12)																1			1	1		
CORD (2.13)										2	1	1	2									
CORD (2.14)										1	1											
419A TOOL (2.15)							5	5	5							1			1	1		
365 TOOL (2.16)										2	2											
624B TOOL (2.17)		6	6	6	6					4	4		4									
138 TOOL (2.18)						1																
258-PLUG (2.19)										1	1		1									
322 (MAKE-BUSY) PLUG														1								
KS-6278 CONNECTING CLIP (2.20)																1			1	1		
TEST LAMP (2.21)														1								
14E OR 15A REGISTER																			1			
BLOCKING AND INSULATING TOOLS (2.22)		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓

NOTE 1: A SECOND DET. 33 CORD CAN BE USED WHEN ADDITIONAL LENGTH WILL FACILITATE TESTING.  
NOTE 2: EQUIP ITE-2461 SOCKETS ON DET. 35 CORD WITH SIX 624B TOOLS (PUSH-ON CLIPS).

✓ AS REQUIRED.

- 2.10 Test set cord, 6 feet long, 4-conductor, equipped with two 327A plugs (H-400-430 DET. 31 cord).
- 2.11 Test set cord, 12 feet long, one-conductor, equipped with one Mini-Gator clip at one end and ITE-2455 G-1 plug at the other end (H-400-430 DET. 34 cord).
- 2.12 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord).
- 2.13 Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord).
- 2.14 Patching cord, 1 foot long, equipped with two 360A tools (P1Y cord).
- 2.15 419A tool to be used in conjunction with 360 tools of 1W13B cord.
- 2.16 365 tool to be used in conjunction with 360 tools of P1Y cord for connection to relay terminals.
- 2.17 624B tool to be used in conjunction with 360 tools of 3W4B cord for connection to terminal strips and for use with DET. 35 cord.
- 2.18 138 tool for use in Test D for adjusting traffic registers, as required.
- 2.19 258-type (dummy) plug.
- 2.20 ♦KS-6278 connecting clip used with 1W13B cord.

2.21 Insert a 2Y lamp into a 1Z lamp socket (or equivalent). Connect one terminal of socket to 48-volt test battery. The other terminal of socket is to be connected to punchings, as required.♦

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

**3. PREPARATION**

3.01 From the office records, obtain a list of the circuit or circuits associated with each usage register or converter input. This list should contain crosspoint contact number and crosspoint number assigned to each circuit, register grouping (RG\_) number for each circuit, and the location where each circuit may be made busy. The type of detector used for the circuit group under test should also be determined.

3.02 Where traffic registers not associated with the TUR are included in the same camera group with registers that are associated with the TUR, the PC key shall be operated to supply battery to the registers not associated with the TUR. Also, where a camera group consists only of registers not associated with the TUR, the PC key for these registers shall be operated.

3.03 ♦When making use of the TUR connection verifier test set, a preliminary operational check♦ should be made to provide assurance that the units are functioning properly before they are used over the central office "talk" circuit. The procedures for this check are covered in Section 252-124-301.

**4. METHOD**

STEP	ACTION	VERIFICATION
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**A. Scan Lead Verification**

*Note:* Reference should be made to Fig. 2 throughout this test for verification of test set connections when ground-busy or battery-busy detectors (option 30G) are provided or to Fig. 3 throughout this test for verification of test set connections when ground idle—open-busy detectors (option 30H) are provided.

- |   |                                 |
|---|---------------------------------|
| 1 | Locate TUR UNIT near TUR frame. |
|---|---------------------------------|

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STEP	ACTION	VERIFICATION
2	<p>At TUR UNIT— Using H-400-430 DET. 32 cord, connect RST jack on TUR UNIT to RST jack on TUR frame.</p> <p><b>Caution:</b> In Step 3, connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.</p>	
3	Using H-400-430 DET. 32 cord, connect BAT A jack on TUR UNIT to BAT A jack on TUR frame.	
4	Using H-400-430 DET. 32 cord, connect TST jack on TUR UNIT to TST jack on TUR frame.	
5	Using H-400-430 DET. 31 cord, connect TEL jack on TUR UNIT to TEL jack on TUR frame.	

**Ground-Busy or Battery-Busy Detectors (Option 30G)**

- 6 At TUR frame—  
Using H-400-430 DET. 35 cord, connect Jones plug to GB socket (when observing ground-busy detectors) or to BB socket (when observing battery-busy detectors) of TUR UNIT and connect cord tips equipped with 624B tools to the DA0-5 and DA6-11 punchings corresponding to the detector contact numbers of the TUR scan switch. See note.
- Note:** When connecting the H-400-430 DET. 35 cord to the TUR frame, the 624B tools are connected to the DA0-5 and DA6-11 punchings corresponding to the contact numbers of the TUR scan switch.
- Example:** If DA0 terminal is assigned to contact 0 of any scan switch, then the H-400-430 DET. 35 cord end stamped 0 would be connected to terminal DA0. A typical arrangement is shown in Table B. Refer to office records for DA0-11 assignments.
- 7 At TUR UNIT—  
Set DET switch to desired detector contact number.
- 8 Operate TDC-OFF-REG key to OFF.

STEP	ACTION	VERIFICATION
9	Operate BAT A key to ON.	BAT A lamp lighted.
10	At TUR frame— Block EC relay nonoperated.	
11	Block H0 and H1 relays (options ZO, ZN) nonoperated or remove GA relay (option ZW).	
12	Locate REMOTE UNIT and CONTROL UNIT near circuit to be tested.	
13	At REMOTE UNIT— Using H-400-430 DET. 33 cord, connect CU connector on REMOTE UNIT to RU connector on CONTROL UNIT.  <i>Note:</i> A second DET. 33 cord can be used when additional length will facilitate testing.	
14	Using H-400-430 DET. 31 cord, connect TEL jack on REMOTE UNIT to TEL jack on nearby frame.  <i>Caution: In Step 15, connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.</i>	
15	Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
16	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
17	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO or MAN to advance TUR to desired scan switch crosspoint.	
18	At circuit corresponding to TUR scan switch crosspoint— Make circuit busy per Busy Test Tables H through M.  <i>Note 1:</i> If another detector becomes busy during test, a dual tone of 697 Hz and 1447 Hz will be heard as long as the tested detector is busy. Release and rebusy circuit several times to determine if the dual tone is a false cross indication.	On CONTROL UNIT— If crosspoint properly wired— 697-Hz tone heard. (Adjust volume control to desired level). If cross exists— Dual tone of 697-Hz and 1447-Hz heard. If open exists— No tone heard.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
	<i>Note 2:</i> If busy tone not heard, record the trouble on a trouble record (crosspoint and contact number and "no response"). This lead can be located with Terminal Finder Test B.	
19	Record test indication.	
20	Remove busy condition.	697-Hz tone silenced.
21a	If other scan switch crosspoints assigned to detector contact under test are to be tested— Repeat Steps 17 through 20.	
22b	If other detector contacts are to be tested— At TUR UNIT— Set DET switch to detector contact to be tested and the corresponding H-400-430 DET. 35 cord end connected to the DA terminal at the TUR frame.	
23b	Repeat Steps 17 through 22b.	
24	At TUR UNIT and REMOTE UNIT— Operate BAT switch to OFF.	
25	Remove all cords and blocking tools and restore all keys to normal.	

**Ground Idle—Open-Busy Detectors (Option 30H)**

26 At TUR frame—  
Using H-400-430 DET. 35 cord, connect Jones plug to GB socket and connect one cord tip at a time equipped with a 624B tool to the DA-punching corresponding to the detector contact numbers of the TUR scan switch under test. See note.

*Note:* Only one DA\_ terminal may be connected to the H-400-430 DET. 35 cord at any one time. One end is connected to the GB socket of the TUR UNIT and the other end of the cord is placed on one of the open busy DA\_ terminals of the TUR frame.

*Example:* If terminal DA6 is associated with an open-busy detector and is assigned to contact 5 of a TUR scan switch, then the DET switch on the TUR UNIT is placed in the 5 position and the H-400-430 DET. 35 cord end stamped 5 is placed on the DA6

STEP	ACTION	VERIFICATION
	terminal at the TUR frame. Refer to office records for DA0-11 assignments.	
27	At TUR UNIT— Set DET switch to desired detector contact number.	
28	Operate TDC-OFF-REG key to OFF.	BAT A lamp lighted.
29	At TUR frame— Block EC relay nonoperated.	
30	Block H0 and H1 relays (options ZO, ZN) nonoperated or remove GA relay (option ZW).	
31	Locate REMOTE UNIT and CONTROL UNIT near circuit to be tested.	
32	At REMOTE UNIT— Using H-400-430 DET. 33 cord, connect CU connector on REMOTE UNIT to RU connector on CONTROL UNIT.	
	<i>Note:</i> A second DET. 33 cord can be used when additional length will facilitate testing.	
33	Using H-400-430 DET. 31 cord, connect TEL jack on REMOTE UNIT to TEL jack on nearby frame.	
	<i>Caution: In Step 34, connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.</i>	
34	Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
35	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
36	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO or MAN to advance TUR to desired scan switch crosspoint.	If crosspoint properly wired— 697-Hz tone heard. If open exists— No tone heard.
	<i>Note:</i> This is the opposite of what occurs when testing other kinds of detectors.	
37	At circuit corresponding to TUR scan switch crosspoint—	697-Hz tone silenced.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
	Make circuit busy per Busy Test Tables H through M.	
38	Remove busy condition.	697-Hz tone heard.
39a	If other scan switch crosspoint assigned to detector contact under test are to be tested— Repeat Steps 36 through 38.	
40b	If other detector contacts are to be tested— At TUR UNIT— Set DET switch to detector contact to be tested and the corresponding H-400-430 DET. 35 cord end connected to the DA_ terminal at the TUR frame.  <i>Note:</i> A cross cannot be detected on inputs associated with open-busy detectors since only one detector at a time can be tested.	
41b	Repeat Steps 36 through 40b.	
42	At TUR UNIT and REMOTE UNIT— Operate BAT switch to OFF.	
43	Remove all cords and blocking tools and restore all keys to normal.	

**B. Terminal Finder**

*Note:* Reference should be made to Fig. 4 throughout this test for verification of test set connections.

- 1 The equipment associated with usage lead to be tested must be made idle when performing this test. See Busy Test Tables H through N for make-busy methods and locations.
- 2 Locate TUR UNIT near TUR frame.
- 3 At TUR UNIT—  
Using H-400-430 DET. 32 cord, connect RST jack on TUR UNIT to RST jack on TUR frame.

*Caution: In Step 4, connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.*

STEP	ACTION	VERIFICATION
4	Using H-400-430 DET. 32 cord, connect BAT A jack on TUR UNIT to BAT A jack on TUR frame.	
5	Using H-400-430 DET. 32 cord, connect TST jack on TUR UNIT to TST jack on TUR frame.	
6	Using H-400-430 DET. 31 cord, connect TEL jack on TUR UNIT to TEL jack on TUR frame.	
7	Using H-400-430 DET. 35 cords, connect Jones plugs to COE-1 and COE-2 jacks on TUR unit and connect cord tips equipped with 624B tools to all assigned DA_ terminals.	
	<b>Note 1:</b> All detectors are connected to the COE-1 and COE-2 sockets at the same time and in any order.	
	<b>Note 2:</b> Use COE-1 and COE-2 connectors with additional H-400-430 DET. 35 cord required for more than six detectors.	
8	At TUR UNIT— Operate TDC-OFF-REG key to OFF.	
9	Operate BAT A key to ON.	BAT A lamp lighted.
10	At TUR frame— Block EC relay nonoperated.	
11	Block H0 and H1 relays (options ZO, ZN) nonoperated or remove GA relay (option ZW).	
12	Locate REMOTE UNIT and CONTROL UNIT near circuit to be tested.	
13	At REMOTE UNIT— Using H-400-430 DET. 33 cord, connect CU connector on REMOTE UNIT to RU connector on CONTROL UNIT.	
14	Using H-400-430 DET. 31 cord, connect TEL jack on REMOTE UNIT to TEL jack of nearby frame.	

**Caution:** In Step 15, connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.

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STEP	ACTION	VERIFICATION
15	Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
16	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
17	At CONTROL UNIT— Depress RESET key to reset TUR frame.	CONTROL UNIT register indicates 00.
18	Using H-400-430 DET. 34 cord, connect COE jack on CONTROL UNIT to usage lead of idle equipment under test. (See Busy Test Tables H through N for terminal strip and punching number of usage lead.)  <i>Note:</i> If the usage lead is associated with an open-busy detector, the usage lead must be temporarily removed from the terminal strip at the equipment end. The removed end is then connected to the H-400-430 DET. 34 cord.	
19	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO.  <i>Note 1:</i> If no 852-Hz tone is received for a full cycle of the TUR frame, the usage lead is open and should be replaced.  <i>Note 2:</i> If a TURDF is provided, check to see if there is a cross-connect missing. Leave tone on usage lead and check for tone at TURDF where lead should appear.	After TUR frame stops scanning (when missing lead located)— 852-Hz tone heard. CONTROL UNIT register indicates the crosspoint at which the TUR stopped scanning.
20	When TUR frame stops scanning— Operate AUTO-OFF-MAN key to OFF.	
21	At wiring side of TUR frame— Using 67C test set, test detector contacts of the operated crosspoint in turn.  <i>Note:</i> When scan lead is associated with a TURDF, the wiring error may be in the cross-connections on the DF. To check for this, use a 67C test set to locate the tone on the TURDF and with the office records determine where the wiring error exists.	852-Hz tone heard when contact associated with missing lead is found.
22	Reconnect usage lead if disconnected for test and restore circuit to normal.	

STEP	ACTION	VERIFICATION
23a	If other missing scan leads are to be tested— Repeat Steps 7 and 17 through 23a.	
24	Remove all cords and blocking tools and restore all keys to normal.	

### C. Traffic Register Verification

**Note:** Reference should be made to Fig. 5 throughout this test for verification of test set connections.

- 1 Locate TUR UNIT near TUR frame.
- 2 At TUR UNIT—  
Using H-400-430 DET. 32 cord, connect RST jack on TUR UNIT to RST jack on TUR frame.

**Caution:** In Step 3, connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.

- 3 Using H-400-430 DET. 32 cord, connect BAT A jack on TUR UNIT to BAT A jack on TUR frame.
- 4 Using H-400-430 DET. 32 cord, connect TST jack on TUR UNIT to TST jack on TUR frame.
- 5 Using H-400-430 DET. 31 cord, connect TEL jack on TUR UNIT to TEL jack on TUR frame.
- 6 Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to desired detector output terminal (D0-11 or DR0-11) on TUR frame.

**Note:** Use DR0-11—terminal to check DGU (detector group usage) and individual usage registers. (Use D0-11—terminal to check the individual usage register only.)

- 7 At TUR UNIT—  
Operate TDC-OFF-REG key to REG.
- 8 Operate BAT A key on ON. BAT A lamp lighted.

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STEP	ACTION	VERIFICATION
9	At TUR frame— Operate RG_ key associated with registers under test.	
10	Block EC relay nonoperated.	
11a	◆If provided with limited scanning feature— Block LSC or LS relay operated.◆	
12	Block H0 and H1 relays (options ZO, ZN) nonoperated or remove GA relay (option ZW).	
13	Locate REMOTE UNIT and CONTROL UNIT near traffic register bay.	
14	Using H-400-430 DET. 33 cord, connect CU connector on REMOTE UNIT to RU connector on CONTROL UNIT.	
	<b>Caution: In Step 15 connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.</b>	
15	At REMOTE UNIT— Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
16	Using H-400-430 DET. 31 cord, connect TEL jack on REMOTE UNIT to TEL jack on nearby frame.	
17	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
18	At CONTROL UNIT— Depress RESET button to reset TUR.	CONTROL UNIT register indicates 00_.
19	Operate AUTO-OFF-MAN key to AUTO or MAN to advance TUR to desired register switch crosspoint.	At traffic register bay— Traffic register associated with crosspoint and D_ or DR_ terminal operates at 20 PPS.
		<b>Note 1:</b> Each register should be pulsed until the hundreds wheel advances at least one digit.
		<b>Note 2:</b> A DGU register may be wired in parallel to the traffic register under test and should also operate at 20 PPS. If a register other than a DGU register is operating at 20 PPS, a cross may be indicated.

STEP	ACTION	VERIFICATION
20b	If traffic register does not operate at 20 PPS— Attempt to adjust register using 138A tool and if adjustment is not possible, replace register.	
21c	If other register switch crosspoints assigned to detector contact under test are to be tested— Repeat Steps 19 and 20b.	
22d	If any other detector contacts are to be tested— Repeat Steps 6, 9, 19, 20b, and 21c connecting REG-TDC jack on TUR UNIT to desired detector output terminal on TUR frame.	
23e	If register grouping is provided— At TUR frame— Operate register group key.	
24e	Repeat Steps 6, 9, 19 through 22d connecting REG-TDC jack on TUR UNIT to desired detector output terminal on TUR frame.	
25	At TUR UNIT and REMOTE UNIT— Operate BAT keys to OFF.	
26	Remove all cords and blocking tools and restore all keys to normal.	

#### D. Verification on Traffic Data Converter Input Assignment

**Note:** Reference should be made to Fig. 6 throughout this test for verification of test set connections.

- 1 Locate the TUR UNIT, REMOTE UNIT, and CONTROL UNIT near the TUR frame.
- 2 At TUR UNIT—  
Using H-400-430 DET. 32 cord, connect TST jack on TUR UNIT to TST jack on TUR frame.
- 3 Using H-400-430 DET. 32 cord, connect RST jack on TUR UNIT to RST jack on TUR frame.

**Caution:** In Step 4 connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.

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STEP	ACTION	VERIFICATION
4	At TUR UNIT— Using H-400-430 DET. 32 cord, connect BAT A jack on TUR UNIT to BAT A jack on TUR frame.	
5	Using H-400-430 DET. 31 cord, connect TEL jack on TUR UNIT to TEL jack on REMOTE UNIT.	
6	At TUR UNIT— Operate TDC-OFF-REG key to OFF.	
7	At TUR UNIT— Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to pin 6 of the first detector (D0) tube.	
	<b>Caution: In Step 8 connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.</b>	
8	At REMOTE UNIT— Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
9	Using H-400-430 DET. 33 cord, connect CU connector on REMOTE UNIT to RU connector on CONTROL UNIT.	
10	At TUR frame— Remove GA relay.	
11	Block EC relay nonoperated.	
12	Locate the traffic data converter test set near the TDC.	
13	Connect TDC test set gray TST cable to TST jack on TUR converter.	
14	Connect TDC test set black lead to converter frame ground.	
15	Connect TDC test set red (-48 volt) lead to test battery.	
16	Release CO key of TDC test set.	
17	At TUR UNIT— Operate BAT A key to ON.	BAT A lamp lighted.

STEP	ACTION	VERIFICATION
18	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
19	At CONTROL UNIT— Depress RESET key to reset TUR.	CONTROL UNIT register indicates 00_.
20	Operate AUTO-OFF-MAN key to AUTO or MAN to advance TUR to desired register switch crosspoint associated with P lead and G terminal under test.	
21	At TDC test set— Operate BS 0 through 10 keys according to P lead and G terminal under test as given in Tables C and D.	
	<b>Note 1:</b> Refer to office records for TUR crosspoint to converter input (P lead or G terminal assignment).	
	<b>Note 2:</b> For peg count converters, the P lead and the G terminal are the same. Therefore Table C is not applicable for peg count converters, and Table D is applicable.	
22	At TUR UNIT— Operate TDC-OFF-REG key to TDC.	At TDC test set— Register operates at 7 PPS. At converter— AN lamp flickers. When usage registers provided— At traffic register bay— Usage register associated with converter input will operate at 7 PPS.
23a	If TDC test set register fails to score a 7 PPS and the AN lamp flickers, perform Steps 24a through 29a to determine the identity of the unknown word.	
24a	At TDC test set— Operate CO key.	
	<b>Note 1:</b> Operation of the CO key causes the test set to ignore any "1" bits it receives in slots that should be "0".	
	<b>Note 2:</b> When performing Steps 25a through 27a if there is a "1" bit in the "0" slot, the TDC test set register will score. Make a record of all the BS_ keys for which the test set register scored.	

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
25a	Operate test set BS0 key and release all other BS_ keys.	
26a	Operate test set BS1 key and release BS0 key.	
27a	Repeat Steps 25a and 26a until all test set BS_ keys have been tested.	
28a	Release CO key.	
29a	Operate all BS_ keys in which test set register scored.	TDC test set register operates at 7 PPS. At converter— AN lamp flickers.
30a	Check GP_ lead of detector under test for any troubles that may exist.	
31b	If other crosspoints are to be tested— Repeat Steps 20 through 22 or 30a for each crosspoint to be tested.	
32c	If other detectors are to be tested— Repeat Steps 7, 20 through 22, or 30a connecting REG-TDC jack on TUR UNIT to pin 6 of next detector tube to be used in test.	
33	Remove all cords and blocking tools, replace GA relay, and restore all keys to normal.	

**Note:** A detector test must be made after all leads and registers are verified and after all relays are normal. (A procedure for detector testing is given in Section 252-122-501, Test B.)

**E. Crossed Contact Test**

**Note 1:** This test per ground-busy detection on strapped scan leads assumes all like-numbered contacts on all scan switches are strapped together. If optional detection [open-busy (option H) and/or battery-busy (option G) detection] is also present, perform test per ground-busy detection on strapped scan leads only on those scan switches with like-numbered contacts strapped together for ground-busy detection. The remaining switches and contacts will be tested per open-busy (option H) or battery-busy (option G) detection. This test per register switches is to be performed only on register switches not connected to TDC.

STEP	ACTION	VERIFICATION
	<i>Note 2:</i> Reference should be made to Fig. 7 throughout this test for verification of test set connections.	
1	Locate TUR UNIT, REMOTE UNIT, and CONTROL UNIT near TUR frame.	
	<i>Caution: In Step 2 connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.</i>	
2	At TUR UNIT— Using H-400-430 DET. 32 cord, connect BAT A jack on TUR UNIT to BAT A jack on TUR frame.	
3	Using H-400-430 DET. 32 cord, connect RST jack on TUR UNIT to RST jack on TUR frame.	
4	Using H-400-430 DET. 32 cord, connect TST jack on TUR UNIT to TST jack on TUR frame.	
5	Using H-400-430 DET. 31 cord, connect TEL jack on TUR UNIT to TEL jack on REMOTE UNIT.	
	<i>Caution: In Step 6, connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.</i>	
6	At REMOTE UNIT— Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
7	Using H-400-430 DET. 33 cord, connect CU connector on REMOTE UNIT to RU connector on CONTROL UNIT.	
	<i>Note:</i> A second DET. 33 cord is provided and can be used when additional length will facilitate testing.	
8	At TUR UNIT— Operate TDC-OFF-REG key to OFF.	
9	Operate BAT A key to ON.	BAT A lamp lighted.
10	At TUR frame— Block EC relay nonoperated.	

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STEP	ACTION	VERIFICATION
11	Block H0 and H1 relays (options ZO, ZN) nonoperated or remove GA relay (option ZW).	
12	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
<b>Ground Busy Detection on Strapped Scan Leads</b>		
13	At TUR UNIT— Using H-400-430 DET. 35 cord, connect Jones plug to COE-1 socket of TUR UNIT and connect five (any five) cord tips equipped with 419A tools to contact punchings 1, 2, 3, 4, and 5 (S_ punchings) on any scan switch.	
14	At CONTROL UNIT— Using H-400-430 DET. 34 cord, connect COE jack on CONTROL UNIT to contact punching 0 of same switch of Step 13.	
15	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO.  <i>Note:</i> If no COE tone is received for a full cycle of the TUR frame, these contacts are not crossed with the contact to which the clip lead is connected. Proceed with test.	After TUR frame stops scanning (at crosspoint where contacts are crossed)— COE tone heard. CONTROL UNIT register indicates the crosspoint at which the TUR stopped scanning.
16	When TUR frame stops scanning— Operate MAN-OFF-AUTO key to OFF.	
17	Momentarily disconnect all five leads of the H-400-430 DET. 35 cord, one at a time, from their corresponding contact punchings.	Termination of COE tone when a lead is disconnected indicates that this contact is crossed with the contact to which the clip lead is connected. Clear the cross.  <i>Note:</i> When testing scan switches having "short holding time current" strapping, a cross may also appear at the ten multiplied crosspoint locations.
18	At CONTROL UNIT— Operate MAN-OFF-AUTO key to AUTO (to continue test).	
19	At the end of the scanning cycle— Remove lead of H-400-430 DET. 35 cord connected to contact punching 1.	
20	Using H-400-430 DET. 34 cord, connect COE jack on CONTROL UNIT to contact punching 1 of Step 19.	

STEP	ACTION	VERIFICATION
21	Repeat Steps 15 through 18.*	
22	Repeat Steps 19 and 20 for contacts punchings 2, 3, and 4.	
23	Remove all cords and restore all keys to normal.	
<b>Open-Busy (Option H) or Battery-Busy (Option G) Detection</b>		
24	At TUR UNIT— Using H-400-430 DET. 35 cord, connect Jones plug to COE-1 socket of TUR UNIT and connect five (any five) cord tips equipped with 419A tools to contact punchings 1, 2, 3, 4, and 5 (S_ punchings) on switch being tested.	
25	At CONTROL UNIT— Using H-400-430 DET. 34 cord, connect COE jack on CONTROL UNIT to contact punching 0 of same switch of Step 24.	
26	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO.  <i>Note:</i> If no COE tone is received for a full cycle of the TUR frame, these contacts are not crossed with the contact to which the clip lead is connected. Proceed with test.	After TUR frame stops scanning (at crosspoint where contacts are crossed)— COE tone heard. CONTROL UNIT register indicates the crosspoint at which the TUR stopped scanning.
27	When TUR frame stops scanning— Operate MAN-OFF-AUTO key to OFF.	
28	Momentarily disconnect all five leads of the H-400-430 DET. 35 cord, one at a time, from their corresponding contact punchings.	Termination of COE tone when a lead is disconnected indicates that this contact is crossed with the contact to which the clip lead is connected. Clear the cross.  <i>Note:</i> When testing scan switches having "short holding time current" strapping, a cross may also appear at the ten multiplied crosspoint locations.
29	At CONTROL UNIT— Operate MAN-OFF-AUTO key to AUTO (to continue test).	
30	At the end of the scanning cycle— Remove lead of H-400-430 DET. 35 cord connected to contact punching 1.	

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STEP	ACTION	VERIFICATION
31	Using H-400-430 DET. 34 cord, connect COE jack on CONTROL UNIT to contact punching 1 of Step 30.	
32	Repeat Steps 26 through 29.	
33	Repeat Steps 30 and 31 for contact punchings 2, 3, and 4.	
34	Remove all cords and restore all keys to normal.	

**Register Switches**

35	Strap all register group punchings of like-numbered contacts together.	
36	At TUR UNIT— Using H-400-430 DET. 35 cord, connect Jones plug to COE-1 socket of TUR UNIT and connect five (any five) cord tips equipped with 419A tools to contact punchings 1, 2, 3, 4, and 5 (R_ punchings) on any register switch.	
37	At CONTROL UNIT— Using H-400-430 DET. 34 cord, connect COE jack on CONTROL UNIT to contact punching 0 of the same switch of Step 36.	
38	At CONTROL UNIT— Operate MAN-OFF-AUTO key to AUTO.  <i>Note:</i> If no COE tone is received for a full cycle of the TUR frame, these contacts are not crossed with the contact to which the clip lead is connected. Proceed with test.	After TUR frame stops scanning (at crosspoint where contacts are crossed)— COE tone heard.  <i>Note:</i> When testing register switches, the cross may not be where the TUR stops because of the register grouping field. Check the grouping field to determine possible positions when TUR stops.
39	When TUR frame stops scanning— Operate MAN-OFF-AUTO key to OFF.	
40	Momentarily disconnect all five leads of the H-400-430 DET. 35 cord, one at a time, from their corresponding contact punching.	Termination of COE tone when a lead is disconnected indicates that this contact is crossed with the contact to which the clip lead is connected. Clear the cross.
41	At CONTROL UNIT— Operate MAN-OFF-AUTO key to AUTO (to continue test).	

STEP	ACTION	VERIFICATION
42	At the end of the scanning cycle— Remove lead of H-400-430 DET. 35 cord connected to contact punching 1.	
43	Using H-400-430 DET. 34 cord, connect COE jack on CONTROL UNIT to contact punching 1 of Step 41.	
44	Repeat Steps 38 through 41.	
45	Repeat Steps 42 and 43 for contacts 2, 3, and 4.	
46	Remove all cords and restore all keys to normal.	

#### F. Scan Lead Verification (Auxiliary Scanner Unit)

**Note:** Reference should be made to Fig. 8 throughout this test for verification of test set connections.

- 1 Locate TUR UNIT of H-400-430 test set near auxiliary scanner unit.

**Caution:** In Step 2 connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.

- 2 At TUR UNIT—  
Using H-400-430 DET. 32 cord, connect BAT A jack on TUR UNIT to BAT jack on nearby frame.
- 3 Using H-400-430 DET. 31 cord, connect TEL jack on the TUR UNIT to TEL jack on nearby frame.
- 4 On TUR UNIT—  
Operate TDC-OFF-REG switch to OFF position.
- 5 Using 3P7A cord, connect TST jack of TUR UNIT, to TSTA jack of auxiliary scanner unit.
- 6 Using 3P7A cord, connect RST jack of TUR UNIT to RSTA jack of auxiliary scanner unit.
- 7 Using H-400-430 DET. 35 cord, connect Jones plug to GB socket of TUR UNIT and connect cord tips equipped with 624B tools to terminal 10 of relays SQ0, SQ1, SQ2, and SQ3 as indicated in Table E.4

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STEP	ACTION	VERIFICATION
	<b>Note:</b> The 624B tools must be inserted into the 360 tools of the DET. 35 cord.	
8	At TUR UNIT— Operate BAT A switch to ON.	BAT A lamp lighted.
9	Locate REMOTE UNIT of H-400-430 test set near auxiliary scanner unit.	
	<b>Caution:</b> In Step 10 connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.	
10	At REMOTE UNIT— Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
11	Using H-400-430 DET. 31 cord, connect TEL jack on the REMOTE UNIT to TEL jack on nearby frame.	
12	Using H-400-430 DET. 33 cord, connect CU connector on the REMOTE UNIT to the RU connector on the CONTROL UNIT.	
	<b>Note:</b> A second DET. 33 cord should be used when additional length will facilitate testing.	
13	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
14	At CONTROL UNIT— Operate RESET button.	CONTROL UNIT register indicates 00_.
15	At TUR UNIT— Set DET switch on TUR unit to verify inputs connected to a chosen detector. (See Table F.)	
16	◆Remove 48V battery fuse associated with the auxiliary scanner.	
17	Remove TMFS timer from its connector. Replace fuse.	
18	At TUR frame—◆ Insert 258-type dummy plug into TST jack.	
19	Operate FSA locking key.	

STEP	ACTION	VERIFICATION
20	Using P1Y cord, equipped with two 365 tools, connect terminal 8 of DSQA relay to terminal 9 of DSQA relay.	
21	Block EC relay nonoperated.	
	<b>Note:</b> Perform Steps 22 and 23 in the same time interval.	
22	At CONTROL UNIT— Operate AUTO-OFF-MAN key to AUTO to Step 4A TUR and auxiliary scanner unit.	SQ_ lamps on auxiliary scanner unit flash while TUR is stepping.
23	When CONTROL UNIT register indicates 099— Release AUTO-OFF-MAN key.	At 4A TUR— Crosspoint 099 is operated. (See office assignment worksheets.)
24	At CONTROL UNIT— Momentarily operate AUTO-OFF-MAN key to MAN position.	CONTROL UNIT register indicates 10_.
25	Depress RESET key.	CONTROL UNIT register indicates 00_.
26	Momentarily operate AUTO-OFF-MAN key to MAN position.	CONTROL UNIT register indicates 000. At 4A TUR frame— Crosspoint 000 operated.
	<b>Note:</b> The auxiliary scanner unit may only be reset when the control unit register indicates 10_ and crosspoint 099 is released on the 4A TUR.	
27	Disconnect the REMOTE UNIT and CONTROL UNIT.	
28	Locate REMOTE UNIT and CONTROL UNIT near the COE to be tested.	
	<b>Caution:</b> In Step 29 connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.	
29	Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
30	Using H-400-430 DET. 31 cord, connect TEL jack on REMOTE unit to TEL jack of nearby frame.	
31	Using H-400-430 DET. 33 cord, connect CU connector on the REMOTE UNIT to the RU connector on the CONTROL UNIT.	

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STEP	ACTION	VERIFICATION
	<p><b>Note:</b> A second DET. 33 cord should be used when additional length will facilitate testing.</p>	
32	<p>At REMOTE UNIT— Operate BAT B switch to ON.</p>	BAT B lamp lighted.
33	<p>At CONTROL UNIT— Operate RESET button.</p> <p><b>Note:</b> Before stepping the auxiliary scanner unit, the DET switch on the TUR UNIT must be set to the appropriate position for the association of the GP_ input leads associated with a DET switch position on the TUR UNIT. (See Tables F and G for correspondence between a detector and DET switch position.)</p>	<p>CONTROL UNIT register indicates 000. AT 4A TUR frame— Crosspoint 000 operated.</p>
34	<p>At CONTROL UNIT— Step auxiliary scanner unit to the GP_ lead to be tested by repeated operations of MAN-OFF-AUTO key to MAN position.</p>	
35	<p>At circuit being tested— Make circuit busy per Tables H through N.</p> <p><b>Note 1:</b> If another detector becomes busy during test, a dual tone will be heard as long as the tested detector is busy. Release and rebusy circuit several times to determine if the dual tone is a false cross indication.</p> <p><b>Note 2:</b> If a busy tone is not heard, do not try to locate the trouble. Record the trouble on a trouble record (unit, FS_ relay, GP_ input lead number, and "no response"). This trouble can be located later with Test G Terminal Finder Test.</p>	<p>On CONTROL UNIT— If GP_ lead properly wired— 697-Hz tone heard. If GP_ lead is crossed with another GP_ lead— Dual tone of 697-Hz and 1447-Hz heard. If open exists— No tone heard.</p>
36	Record test indication.	
37	Remove busy condition.	697-Hz tone silenced.
38	<p>To test other GP_ leads assigned to the same detector on the auxiliary scan unit— Repeat Steps 34 through 37.</p>	
39	<p>At TUR UNIT— Set DET switch to next position to check input assigned to next detector and repeat Steps 34 through 38.</p>	

STEP	ACTION	VERIFICATION
	(Repeat above test for all inputs on detectors to be tested.)	
40	At TUR UNIT and REMOTE UNIT— Operate BAT switches to OFF.	
41	Remove all cords and blocking tools and restore all keys to normal.	
<b>G. Terminal Finder (Auxiliary Scanner Unit)</b>		
	<b>Note:</b> Reference should be made to Fig. 9 throughout this test for verification of test set connections.	
1	Locate TUR UNIT of H-400-430 test set near auxiliary scanner unit.	
	<b>Caution:</b> <i>In Step 2 connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.</i>	
2	At TUR UNIT— Using H-400-430 DET. 32 cord, connect BAT A jack on TUR UNIT to BAT jack on nearby frame.	
3	Using H-400-430 DET. 31 cord, connect TEL jack on the TUR UNIT to TEL jack on nearby frame.	
4	On TUR UNIT— Operate TDC-OFF-REG switch to OFF position.	
5	Using a 3P7A cord, connect TST jack of TUR UNIT, to TSTA jack of auxiliary scanner unit.	
6	At TUR UNIT— Using H-400-430 DET. 35 cord, connect Jones plug COE-1 socket of TUR UNIT and connect cord tips equipped with 624B tools to terminal 10 of relays SQ0, SQ1, SQ2, and SQ3 as indicated in Table E.	
	<b>Note:</b> The 624B tools must be inserted into the 360 tools of the DET. 35 cord.	
7	At TUR UNIT— Operate BAT A key to ON.	BAT A lamp lighted.
8	Locate REMOTE UNIT of H-400-430 test set near equipment under test.	

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
	<b>Caution: In Step 9 connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.</b>	
9	At REMOTE UNIT— Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
10	Using H-400-430 DET. 31 cord, connect TEL jack on the REMOTE UNIT to TEL jack on nearby frame.	
11	Using H-400-430 DET. 33 cord, connect CU connector on the REMOTE UNIT to the RU connector on the CONTROL UNIT.	
	<b>Note:</b> A second DET. 33 cord should be used when additional length will facilitate testing.	
12	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
13	At CONTROL UNIT— Operate RESET button.	CONTROL UNIT register indicates 00_.
14	At TUR UNIT— Set DET switch on TUR unit to verify inputs connected to a chosen detector. (See Table F.)	
15	At auxiliary scanner unit— Insert 258-type dummy plug into TSTA jack.	
16	Operate FSA locking key.	
17	Using a P1Y cord, equipped with two 365 tools, connect one end to FD3 relay terminal 3.	
18	Connect other end of P1Y cord to FD3 relay terminal 6.	
19	At 4A TUR— Block IS relay operated.	
20	Block ASA relay nonoperated.	
21	Block SWS0 relay operated.	
22	Block SWS1 relay nonoperated.	

STEP	ACTION	VERIFICATION
23	<p>At CONTROL UNIT— Using H-400-430 DET. 34 cord, connect COE jack to usage lead of COE, to be tested.</p> <p><b>Note:</b> See Tables H through N for terminal strip and punching number. The equipment associated with the tested usage lead must be made idle when performing this test. Disconnect usage lead if necessary.</p>	
24	<p>At CONTROL UNIT— Operate RESET button.</p> <p><b>Note:</b> Before stepping the auxiliary scanner unit, the DET switch must be set to the appropriate position for the association of the GP_ input leads associated with a DET switch position on the TUR UNIT. (See Tables F and G for the correspondence between a detector and DET switch position.)</p>	CONTROL UNIT register indicates 00_.
25	<p>At CONTROL UNIT— Step auxiliary scanner unit to the GP_ lead to be tested by repeated operations of MAN-OFF-AUTO key to MAN until a steady low tone is heard at CONTROL UNIT.</p>	Low tone heard from CONTROL UNIT speaker.
26a	<p>If a steady low tone is not heard by the time CONTROL UNIT register indicates 099— Lead is opened. (Repair or replace.)</p> <p><b>Note:</b> If tone is located at auxiliary scanner unit, determine on which detector the tone appears. This may be done by connecting the ground clip of a high impedance headset to a capacitor (any nonelectrolytic capacitor with a capacitance value of .1uf or greater and dc working voltage of 60 dev or greater). Connect the other end of the capacitor to ground. This tone can then be traced to the FS_ relay terminal and DET_ TS punching on which it appears. Relocate the missing lead.</p>	
27	<p>Reconnect usage lead if disconnected for test and restore circuit to normal.</p>	
28b	<p>If other auxiliary scanner inputs are to be tested— Set DET switch to the next position to check the inputs assigned to the next detector. (See Tables F and G for the correspondence between a detector and DET switch position.)</p>	

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
29b	Repeat Steps 23 through 29b for other inputs to be tested.	
30	Remove all cords and blocking tools and restore all keys.	

**H. Auxiliary Scanner Verification of Encoder Input Leads When Associated With Peg Count Converter (SD-95968-01)**

**Note 2:** In testing TDRS TDC, if output of auxiliary scanner unit under test is decade scaled, the TDRS test set will pulse once every 10 seconds, and if the output under test is non-decade scaled, the test set will pulse every second.

**Note 3:** Reference should be made to Fig. 10 throughout this test for verification of test set connections.

- 1 At 4A TUR—  
Block IS relay operated.
- 2 Block ASA relay nonoperated.
- 3 Block SWS0 relay operated.
- 4 Block SWS1 relay nonoperated.
- 5 Locate TUR UNIT of H-400-430 test set near auxiliary scanner unit.

**Caution:** In Step 6 connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.

- 6 At TUR UNIT—  
Using H-400-430 DET. 32 cord, connect BAT A jack on TUR UNIT to BAT jack on nearby frame.
- 7 Using H-400-430 DET. 31 cord, connect TEL jack on the TUR UNIT to TEL jack on nearby frame.
- 8 On TUR UNIT—  
Operate TDC-OFF-REG switch to REG position.
- 9 Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to SQ0 relay terminal 3.

STEP	ACTION	VERIFICATION
10	At TUR UNIT— Operate BAT A key to ON.	BAT A lamp lighted.
11	Using a 3P7A cord, connect TST jack of TUR unit, to TSTA jack of auxiliary scanner unit.	
12	Operate TDC-OFF-REG switch to TDC position.	
13	Locate REMOTE UNIT of H-400-430 test set near peg count converter frame.	
14	Using H-400-430 DET. 31 cord, connect TEL jack on REMOTE UNIT to TEL jack on nearby frame.	
	<b>Caution:</b> In Step 15 connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.	
15	At REMOTE UNIT— Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
16	Using H-400-430 DET. 33 cord, connect CU connector on the REMOTE UNIT to the RU connector on the CONTROL UNIT.	
	<b>Note:</b> A second DET. 33 cord should be used when additional length will facilitate testing.	
17	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
18	Locate TDC test set near peg count converter frame.	
19	Connect TDC test set red (-48 volt) lead to test battery.	
20	Connect TDC test set black lead to converter frame ground.	
21	Connect TDC test set gray TST cable to TST jack on TUR converter.	
22	At converter— Operate BAT key.	
	<b>Note:</b> The TSD and CO keys at converter should be nonoperated.	

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STEP	ACTION	VERIFICATION
23	At TDC test set— Operate BAT key to ON.	
<b>Test of Peg Count Leads Associated With FDO, FD1, and FD2 Detectors</b>		
24	At CONTROL UNIT— Operate AUTO-OFF-MAN key to MAN to step auxiliary scanner to first GP_ lead to be tested.	
25	At TDC test set— Operate BS 0 through 10 keys according to GP_ lead and detector under test as given in Tables D and G.  <i>Note 1:</i> For peg count converters, the GP_ lead and the P lead are the same. Therefore, Table G is not applicable to peg count converters, and Table D is applicable.  <i>Note 2:</i> Other COE connected to P_ lead under test can be busy preventing the register operating at 1 PPS.	At CONTROL UNIT— Interrupted tone heard.  <i>Note:</i> If a steady tone is heard, the detector is busy because of normal office traffic and the GP_ lead cannot be tested until associated usage lead becomes idle.  When matching data word is received— TDC test set register operates at 1 PPS. At converter— AN lamp flickers.
26a	If the TDC test set register fails to score at 1 PPS and AN lamp flickers— Perform Steps 27a through 32a to find the identity of the unknown word.	
27a	At TDC test set— Operate CO key.  <i>Note 1:</i> Operation of the CO key causes the test set to ignore any "1" bits it receives in slots that should be "0".  <i>Note 2:</i> When performing Steps 28a through 30a if there is a "1" bit in the "0" slot, the TDC test set register will score. Make a record of all the BS_ keys for which the test set register scored.	
28a	Operate test set BS0 key and release all other BS_ keys.	
29a	Operate test set BS1 key and release BS0 key.	
30a	Repeat Steps 28a and 29a until all test set BS_ keys have been tested.	
31a	Release CO key.	

STEP	ACTION	VERIFICATION
32a	Operate all BS_ keys in which test set register scored.	TDC test set register operates at 1 PPS. At converter— AN lamp flickers.
33a	Check GP_ lead of detector under test.	
34	Repeat Steps 24 through 25 or 33a for all GP_ leads associated with detector FD0.	
35	Remove H-400-430 DET. 34 cord from terminal of relay SQ0.	
36	Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to SQ1 relay terminal 3.	
37	Repeat Steps 24 through 25 or 33a for all GP_ leads associated with detector FD1.	
38	Remove H-400-430 DET. 34 cord from terminal 3 of relay SQ1.	
39	Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to SQ2 relay terminal 3.	
40	Repeat Steps 24 through 25 or 33a for all GP_ leads associated with detector FD2.	
41	Remove H-400-430 DET. 34 cord from terminal 3 of relay SQ2.	

**Caution:** *Peg count converter inputs associated with detector FD3 may not be tested in the same manner as leads associated with detectors FD0, FD1, or FD2. To test detector FD3 leads in the same manner as FD0, 1, and 2 may cause some dry reed relays to switch current and become defective.*

#### Test of Peg Count Leads Associated With FD3 Detector

42	At CONTROL UNIT— Operate AUTO-OFF-MAN key to MAN (repeatedly) to step auxiliary scanner to first GP_ lead to be tested.	
43	Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to FD3 relay terminal 9.	

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STEP	ACTION	VERIFICATION
44	Repeat Steps 24 through 25 or 33a for all GP_ leads associated with detector FD3.  <i>Note:</i> Before stepping the auxiliary scanner unit (by repeated operations of the AUTO-OFF-MAN key to MAN) to the next GP_ lead to be tested, remove H-400-430 DET. 34 cord for each step from REG-TDC jack on TUR UNIT.	
45	Remove all cords and restore all keys to normal.	
<b>I. Traffic Register Verification (Auxiliary Scanner Unit)</b>		
<i>Note:</i> Reference should be made to Fig. 11 throughout this test for verification of test set connections.		
1	Locate the REMOTE UNIT and CONTROL UNIT, near traffic register bay.	
2	Using H-400-430 DET. 31 cord, connect TEL jack on REMOTE UNIT to TEL jack on nearby frame.	
<i>Caution: In Step 3 connect the H-400-430 DET. 32 cord into the REMOTE UNIT BAT B jack first.</i>		
3	At REMOTE UNIT— Using H-400-430 DET. 32 cord, connect BAT B jack on REMOTE UNIT to BAT jack on nearby frame.	
4	Using H-400-430 DET. 33 cord, connect CU connector on the REMOTE UNIT to the RU connector on the CONTROL UNIT.	
5	At REMOTE UNIT— Operate BAT B key to ON.	BAT B lamp lighted.
6	Locate TUR UNIT of H-400-430 test set near auxiliary scanner unit.	
<i>Caution: In Step 7 connect the H-400-430 DET. 32 cord into the TUR UNIT BAT A jack first.</i>		
7	At TUR UNIT— Using H-400-430 DET. 32 cord, connect BAT	

STEP	ACTION	VERIFICATION
	A jack on TUR UNIT to BAT jack near TUR frame.	
8	Using H-400-430 DET. 31 cord, connect TEL jack on the TUR UNIT to TEL jack on nearby frame.	
9	Using a 3P7A cord, connect TST jack of TUR UNIT, to TSTA jack of auxiliary scanner unit.	
10	◆Using a 3P7A cord, connect RST jack of TUR UNIT to RSTA jack of auxiliary scanner unit.◆	
11	At TUR UNIT— Using H-400-430 DET. 35 cord, connect Jones plug to GB socket of TUR UNIT and connect cord tips equipped wth 624B tools to terminal 10 of relays SQ0, SQ1, SQ2, and SQ3 as indicated in Table E.  <i>Note:</i> The 624B tools must be inserted into the 360 tools of the DET. 35 cord.	
12	◆Operate FSA locking key.◆	
13	Operate TDC-OFF-REG switch to REG.	
14	Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to SQ0 relay terminal 3.	
15	At TUR UNIT— Operate BAT A key to ON.	BAT A lamp lighted.
16	At CONTROL UNIT— Operate RESET button.	CONTROL UNIT register indicates 00_.
17	◆At TUR frame— Block ASA relay nonoperated.	
18	Block EC relay nonoperated.	
19	Insert 258-type dummy plug into TST jack.	
20	At auxiliary scanner unit— Using P1Y cord, connect terminal 8 of DSQA relay to terminal 9 of DSQA relay.	
21	Remove 48V battery fuse associated with auxiliary scanner unit.	

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STEP	ACTION	VERIFICATION
22	Remove TMFS timer from its connector.	
23	Replace fuse.⚡	
<b>Registers Associated With Detectors FD0, FD1, and FD2</b>		
<p><i>Note:</i> Before stepping the auxiliary scanner unit, the DET switch on the TUR UNIT must be set to the appropriate position for the association of the GP_ input leads associated with a DET switch position on the TUR UNIT. (See Tables F and G for the correspondence between a detector and DET switch position.) Test detectors in order FD0, FD1, and FD2.</p>		
24	<p>At CONTROL UNIT— Step auxiliary scanner unit to the GP_ lead and register to be tested by repeated operations of MAN-OFF-AUTO key to MAN position. (See Table G.)</p>	<p>At traffic register bay— Traffic register associated with GP_ lead being tested operates at 20 PPS.</p> <p><i>Note:</i> If a register other than register associated with GP_ lead being tested operates at 20 PPS, a cross may exist.</p>
25	Pulse each register until the hundred wheel advances at least one digit.	
26a	<p>If associated traffic register does not operate at 20 PPS— Attempt to adjust register using 138A tool.</p>	Traffic register okay after adjustment.
27b	<p>If verification of Step 26a is not obtained— Replace register.</p>	
28	Repeat Steps 24 through 27b for all GP_ leads and registers associated with FD0 detector.	
29	Remove H-400-430 DET. 34 cord from terminal 3 of relay SQ0.	
30	Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to SQ1 relay terminal 3.	
31	Repeat Steps 24 through 27b for all GP_ leads and registers associated with FD1 detector.	
32	Remove H-400-430 DET. 34 cord from terminal 3 of relay SQ1.	

STEP	ACTION	VERIFICATION
33	Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to SQ2 relay terminal 3.	
34	Repeat Steps 24 through 27b for all GP_ leads and registers associated with FD2 detector.	
35	Remove H-400-430 DET. 34 cord from terminal 3 of relay SQ2.	

**Caution:** *Registers associated with detector FD3 may not be tested in the same manner as registers associated with detectors FD0, FD1, or FD2. To test registers associated with FD3 in the same manner as FD0 1 and 2 may cause some dry reed relays to switch current and become defective.*

#### Registers Associated With Detector FD3

36	Using H-400-430 DET. 34 cord, connect REG-TDC jack on TUR UNIT to SQ3 relay terminal 3.	
37	Repeat Steps 24 through 27b of all GP_ leads and registers associated with detector FD3 to be tested.	
	<b>Note:</b> Before stepping the auxiliary scanner unit (by repeated operations of the AUTO-OFF-MAN key to MAN) to the next GP_ lead and register to be tested, remove H-400-430 DET. 34 cord for each step from TDC-REG jack on TUR UNIT.	
38	Remove all cords and restore all keys to normal.	

#### J. Continuity Test of Circuits Connected to Scan Crossbar Switches

1	At control panel— Note position of all keys and switches.	
2	Restore all keys and switches to normal.	
3	Select a group of circuits that are associated with one particular usage register or converter input and determine type of detector used with circuit group to be tested.	

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STEP	ACTION	VERIFICATION
4	At control panel— Operate RG_ key or set RG switch for circuit group to be tested.	
5	At TUR frame— Connect test lamp to REG_ punching associated with circuit group being tested.	
6	Operate and lock white button on 32A test set.	
7	Insert plug of 32A test set into TST jack.	At control panel— TBL lamp lighted.
	<b>Note 1:</b> The TUR can be advanced automatically by releasing white button on 32A test set. Locking white button will stop automatic advance. Red button will advance TUR step by step.	
	<b>Note 2:</b> Allow 30 seconds for electron tubes to become stabilized.	
8	Step TUR by means of 32A test set to crosspoint containing circuit in group being tested.	At TUR frame— D_ or DA_ lamp will light if associated circuit is busy. No lamp will be lighted if associated circuit is idle.
	<b>Note:</b> To facilitate testing, it is desirable to select circuit appearing on lowest numbered crosspoint.	
9a	If D_ lamp is lighted and circuit being tested is associated with a relay-type detector— Wait 1 minute for lamp to be extinguished.	
10b	If D_ or DA_ lamp is lighted and circuit being tested is associated with an electron tube detector— Wait 1 minute. Momentarily operate RR key.	
11c	If lamp was not extinguished in Step 9a or 10b— Repeat Steps 8 and 9a or 10b until idle circuit is found.	
	<b>Note:</b> Keep record of busy circuits passed by for retest.	
12	On idle circuit thus selected— Simulate <b>service busy</b> condition according to applicable Tests H through N.	

STEP	ACTION	VERIFICATION
13d	If relays are used as detectors— Observe lamp indications.	Test lamp lighted. D_ lamp lighted for detector number of selected circuit.  <b>Note:</b> If two D_ lamps lighted in synchronism, there may be a trouble cross.
14d	Remove busy condition.	Test lamp extinguished. D_ lamp for detector number of selected circuit extinguished.
15e	If electron tube detectors are used— Momentarily operate RR key and observe lamp indications.	Test lamp lighted. D_ or DA_ lamp for detector number of selected circuit lighted.  <b>Note:</b> If two D_ or DA_ lamps lighted in synchronism, there may be a trouble cross.
16e	Remove busy condition. Momentarily operate RR key.	Test lamp extinguished. D_ or DA_ lamp for detector number of selected circuit extinguished.
17	Repeat Steps 12 through 16e.  <b>Note:</b> The purpose of this action is to determine whether a D_ or DA_ lamp, which may be operated in addition to the one associated with the circuit being tested, represents a trouble cross or a legitimate busy.	
18f	If the circuit group under test includes intertoll trunks arranged to differentiate between a service-busy condition and a plugged-busy or patched-busy condition— Operate PBR key.	
19f	At circuit under test— Simulate plugged-busy or patched-busy condition.	
20f	At TUR frame— Momentarily operate RR key.	D_ or DA_ lamp for detector number of selected circuit lighted. Test lamp lighted.
21f	At circuit under test— Remove simulated plugged-busy or patched-busy condition.	
22f	At TUR frame— Momentarily operate RR key.	D_ or DA_ lamp for detector number of selected circuit extinguished. Test lamp extinguished.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
23	At traffic register frame— Observe that only the assigned traffic register scores.	
24	Repeat Steps 8 through 23 until all required traffic register tests have been made.	
25	Repeat Steps 8 through 24 until all circuits in group have been tested.	
26	Disconnect test lamp from REG_ punching.	
27	Remove plug of 32A test set from TST jack.	At control panel— TBL lamp extinguished.
28	Repeat Steps 3 through 27 until all groups of circuits assigned to the TUR have been tested.	
29	Restore all keys and switches to position noted in Step 1.	At TUR frame— All crossbar switches restored to normal.

**K. Continuity Test From Register Switch to Usage Registers**

1	At control panel— Note position of all keys and switches.	
2	Restore all keys and switches to normal.	
3	At traffic register bay— Record readings of all usage registers.	
4a	At control panel— If cameras are provided, photograph of usage registers may be taken by momentarily operating MCC key.	
5	Operate RG1 key or set RG switch to RG1 position for frame 0.	
6	Operate TST key.	At control panel— TST lamp lighted.
7	Operate MAN key.	ON lamp lighted.
8	When CYC register operates— Operate STOP key.	READ lamp lighted. When scanning stops— READ lamp extinguished.
9	When READ lamp is extinguished— Restore MAN key.	ON lamp extinguished.

STEP	ACTION	VERIFICATION
10	Restore STOP key.	
11	Repeat Steps 7 through 10.	
12	At traffic register bay— Record readings of all usage registers.	At traffic register bay— Each usage register operates twice for each circuit in register group 1 associated with a register.
13a	At control panel— If cameras are provided, photograph of usage registers may be taken by momentarily operating MCC key.	Each usage register operates twice for each circuit in register group 1 associated with a register.
		<b>Note:</b> When short-holding time circuits are multiplied via the SHT terminal strip, each usage register associated with short-holding time circuits will score 20 times (10 for each cycle).
14b	If in register group being tested there are trunks arranged to differentiate between a service-busy condition and a plugged-busy or patched-busy condition— Operate PBR key and repeat Step 3 or 4a and Steps 7 through 13a. Photograph of usage registers may be taken by momentarily operating MCC key.	
15	Restore RG1 key or RG switch to normal.	
16c	If register grouping is provided— Repeat Steps 7 through 14b for each register group provided.	
17	Restore all keys and switches to position noted in Step 1.	
<b>L. Verification of Register Assignment</b>		
1	At TUR frame— Momentarily connect ground to REG_punching associated with a register.	At traffic register frame— Proper usage register operates.
2	Repeat Step 1 for all assigned REG_punchings.	
<b>M. Cross Detection Between Stationary Springs of Scan Switches</b>		
1	At control panel— Note position of all keys and switches.	
2	Restore all keys and switches to normal.	

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
3a	If any S0 through S5 punchings are associated with relay-type, ground-busy detectors (Fig. 12)— At TUR frame— Connect ohmmeter to 48-volt test battery and S_ punchings so equipped.	Meter reads 30,000 ohms $\pm 10$ percent.
4b	If any S0 through S5 punchings are associated with tube-type, ground-busy detectors arranged without detectors to indicate a patched- or plugged-busy intertoll trunk (Fig. 29 without Fig. 36)— Connect ohmmeter to 48-volt test battery and S_ punchings so equipped.	Meter reads 0.25 megohm $\pm 1$ percent.
5c	If any S0 through S5 punchings are associated with tube-type, ground-busy detectors arranged with detectors to indicate a patched- or plugged-busy intertoll trunk (Fig. 29 with Fig. 36)— Connect ohmmeter to 48-volt test battery and S_ punchings so equipped.	Meter reads 0.275 megohm $\pm 1$ percent.
6d	If any S0 through S5 punchings are associated with tube-type detectors which recognize 20 or more volts negative for busy, and open or resistance ground for idle (Fig. 30 and G option)— Connect ohmmeter to ground and S_ punchings so equipped.	Meter reads 24,900 ohms $\pm 1$ percent.
7e	If any S0 through S5 punchings are associated with tube-type detectors which recognize open or -4 or more volts negative for busy, and direct or resistance ground for idle, respectively (Fig. 30 and H option)— Connect ohmmeter to 48-volt test battery and S_ punchings so equipped.	Meter reads 0.2 megohm $\pm 1$ percent.
8	Disconnect ohmmeter and restore all keys and switches to position noted in Step 1.	

**N. Cross Detection Between Stationary Springs of Register Switches**

- 1 At control panel—  
Note position of all keys and switches.
- 2 Restore all keys and switches to normal.
- 3 At TUR frame—  
Block operated RG\_ relays as provided.

STEP	ACTION	VERIFICATION
4a	If any R0 through R5 punchings are associated with relay-type, ground-busy detectors (Fig. 12)— Connect ohmmeter to 48-volt test battery and any R_ punchings so equipped.	Meter reads 33,000 ohms $\pm 5$ percent.
5b	If any R0 through R5 punchings are associated with tube-type detectors which recognize ground-busy, battery-busy, or a patched- or plugged-busy intertoll trunk (Fig. 29, 30, or 36)— Insulate all back contacts of DGU_ relay, if provided.	
6b	Connect ohmmeter to punching R0 and test in turn punchings R1 through R5.	Meter reads not less than 0.25 megohm.
7b	Connect ohmmeter to punching R1 and test in turn punchings R2 through R5.	Meter reads not less than 0.25 megohm.
8b	Connect ohmmeter to punching R2 and test in turn punchings R3 through R5.	Meter reads not less than 0.25 megohm.
9b	Connect ohmmeter to punching R3 and test in turn punchings R4 and R5.	Meter reads not less than 0.25 megohm.
10b	Connect ohmmeter to punching R4 and test punching R5.	Meter reads not less than 0.25 megohm.
11	Disconnect ohmmeter.	
12	Remove block from RG_ relays as provided.	
13b	Remove insulators from DGU_ relay.	
14	Restore all keys and switches to position noted in Step 1.	

#### O. Verification of Cross-Connections

- 1 At control panel—  
Note position of all keys and switches.
- 2 Restore all keys and switches to normal.
- 3 At TUR—  
Connect test register (14E or 15A) to 48-volt test battery and REG\_ punching for circuit group being tested.

**Note:** When a traffic data converter is associated with the TUR, only those encoder



STEP	ACTION	VERIFICATION
3	At TDC test set— Connect test set red (-48 volt) lead to test battery.	
4	Connect test set black (GRD) lead to frame ground.	
5	At TUR frame— Connect test set gray TST cable to TST jack on converter.	
6	Operate and lock white button on 32A test set.	
7	Insert plug of 32A test set into TST jack of TUR.	
8	Remove GA relay.	
9	Block EC relay nonoperated.	
10	Using 1W13B cord, connect 419A tool to pin 6 of D_ and DA_ detector tubes associated with contact under test.	
11a	If register grouping is provided for input under test— Block operated appropriate RG_ relay.	
12	Block nonoperated any other RG_ relay that may be operated.	
13	At TDC test set— Operate BS 0 through 10 keys according to P_ lead and G_ terminal under test as given in Tables C and D.	
	<b>Note:</b> The peg count converter P_ leads and G_ term are the same. Table C is not applicable to peg count converter, and Table D is applicable.	
14	At TUR frame— Using 1W13B cord, momentarily connect clip to frame ground (may be repeated as required).	At TDC test set— Register should score with each connection of clip to frame ground. If usage registers provided— At traffic register bay— Usage register associated with converter input will operate with each connection to ground.

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
15	For each crosspoint to be tested— Operate red button on 32A test set and repeat Steps 9 through 11a.	
16	Remove all patching cords, replace GA relay, and restore all keys and switches on control panel to position noted in Step 1.	

**Q. Verification of EADAS Traffic Data Converter  
Input Assignment Leads**

- 1 At TUR control panel—  
Note position of all keys and switches.
- 2 Restore all keys and switches to normal.
- 3 At EADAS TDC—  
Verify that EADAS TDC is in normal mode (NOR and PWR ON switches operated).
- 4 Consult office records to obtain input card assignments of EADAS TDC.
- 5 Verify that EADAS TDC is properly equipped with input cards.
- 6 Consult office records to obtain assignments of leads between 4A TUR and EADAS TDC.
- 7 Operate and lock white button on 32A test set.
- 8 Insert plug of 32A test set into TST jack of TUR.
- 9 At TUR frame—  
Remove GA relay.
- 10 Block EC relay nonoperated.
- 11 Using 1W13B cord, connect 419A tool to pin 6 of D\_ and DA\_ detector tubes associated with contact under test.
- 12a If register grouping is provided for input under test—  
Block operated the appropriate RG\_ relay.
- 13 Block nonoperated any other RG\_ relay that may be operated.

STEP	ACTION	VERIFICATION
14	At TUR frame— Using 1W13B cord, connect clip to frame ground (may be repeated as required).	
15	For each crosspoint to be tested— Operate red button on 32A test set and follow EADAS TDC verification procedures outlined in Section 252-115-514 or Section 252-115-515.	
16	Remove all patching cords, replace GA relay, and restore all keys and switches on control panel to position noted in Step 1.	

## 5. TABLES

### Explanation of Tables H Through N

5.01 Tables H through N provide means of making busy most circuits that may be connected to the TUR. Since most trunk circuits are similar in the method by which they can be made busy, only examples of the different types are given. The various test frames should be used to test the scan switch leads wherever possible. This will help to eliminate the need to go into such circuits as markers, decoders, etc. This procedure will also save a great deal of time. Trunks such as type A should also be seized at the test frame. A table is assigned for each switching system.

- Table H—No. 1 Crossbar
- Table I—No. 4 Crossbar
- Table J—No. 5 Crossbar
- Table K—Crossbar Tandem
- Table L—Panel
- Table N—Step-by-Step Common Control

5.02 For each circuit listed, the following information is given:

- (1) Circuit (marker, sender, trunk, etc) and SD number
- (2) Terminal strip and punching of usage lead
- (3) Usage lead identification

- (a) SB—service busy
- (b) SBM—service busy maintenance
- (c) MB—maintenance busy, etc
- (4) Usage type
  - (a) Service
  - (b) Maintenance
  - (c) Total (service and maintenance)
- (5) Make-busy method
  - (a) Plug—use make-busy plug
  - (b) Call—make test call or wait for service call
  - (c) OP ON1 RLY—operate ON1 relay
  - (d) RLS OS RLY—release OS relay
  - (e) GD SL LEAD—ground SL lead
  - (f) Two-step method
    - (1) Insert make-busy plugs in 0, 2, 5, and 7 primary switch MB jacks.
    - (2) Ground SL lead.
- (6) Make-busy location
  - (a) Test frame—ie, sender test frame

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- (b) Sender
- (c) OFF LK FR—office link frame
- (d) IDF—intermediate distributing frame
- (e) MTF—master test frame
- (f) TBL TKR—trouble ticketer.

**TABLE B**  
**TYPICAL ARRANGEMENT OF DETECTOR ASSIGNMENTS**

GROUND BUSY DETECTORS	DET. 35 CORD END	BATTERY BUSY DETECTORS	DET. 35 CORD END
DA0 assigned to contact 0	connect 0 to DA0	DA6 assigned to contact 1	connect 1 to DA6
DA1 assigned to contact 1	connect 1 to DA1	DA7 assigned to contact 4	connect 4 to DA7
DA2 assigned to contact 2	connect 2 to DA2	DA8 unassigned (or Open Busy)*	no connection
DA3 assigned to contact 3	connect 3 to DA3	DA9 unassigned (or Open Busy)*	no connection
DA4 unassigned (or Open Busy)*	no connection	DA10 unassigned (or Open Busy)*	no connection
DA5 assigned to contact 5	connect 5 to DA5	DA11 unassigned (or Open Busy)*	no connection

\* Inputs connected to DA0-11 terminals that are assigned to Open Busy detectors (Option 30H) are tested per Test A — Ground Idle — Open-Busy Detectors (Option 30H)

TABLE C

TUR CONVERTER ENCODER CONVERSION TABLE					
ENCODER P LEAD NUMBERS	ENCODER G TERMINAL NUMBERS	ENCODER P LEAD NUMBERS	ENCODER G TERMINAL NUMBERS	ENCODER P LEAD NUMBERS	ENCODER G TERMINAL NUMBERS
2 THRU 768 769 770 771	2 THRU 768 770 772 774	810 811 812 813 814	852 854 856 858 860	853 854 855 856 857	938 940 942 944 946
772 773 774 775 776	776 778 780 782 784	815 816 817 818 819	862 864 866 868 870	858 859 860 861 862	948 950 952 954 956
777 778 779 780 781	786 788 790 792 794	820 821 822 823 824	872 874 876 878 880	863 864 865 866 867	958 960 962 964 966
782 783 784 785 786	796 798 800 802 804	825 826 827 828 829	882 884 886 888 890	868 869 870 871 872	968 970 972 974 976
787 788 789 790 791	806 808 810 812 814	830 831 832 833 834	892 894 896 898 900	873 874 875 876 877	978 980 982 984 986
792 793 794 795 796	816 818 820 822 824	835 836 837 838 839	902 904 906 908 910	878 879 880 881 882	988 990 992 994 996
797 798 799 800 801	826 828 830 832 834	840 841 842 843 844	912 914 916 918 920	883 884 885 886 887	998 1000 1002 1004 1006
802 803 804 805 806	836 838 840 842 844	845 846 847 848 849	922 924 926 928 930		
807 808 809	846 848 850	850 851 852	932 934 936		

◆Note: This table provides a list of TUR Converter P lead numbers 2 through 887 with their corresponding G terminal numbers.◆



TABLE E

DET. 35 CORD CORD TIPS	ATTACH TO RELAY	TERMINAL
0	SQ0	10
1	SQ1	10
2	SQ2	10
3	SQ3	10

TABLE F

DET SWITCH POSITION	CHOSEN DETECTOR
0	FDO
1	FD1
2	FD2
3	FD3

TABLE G

CONTROL UNIT REGISTER	OPERATED SCAN RELAYS		DETECTOR SWITCH SETTINGS GP - INPUTS*				DETECTORS GP - OUTPUTS**				OPERATED REGISTER RELAYS	
			0	1	2	3	FD0	FD1	FD2	FD3		
000 to 009	FS0A0 to FS0A9	FS0B0 to FS0B9	00 to 09	10 to 19	20 to 29	30 to 39	0	1	2	3	FR0A0	FR0B0
010 to 019	FS1A0 to FS1A9	FS1B0 to FS1B9	40 to 49	50 to 59	60 to 69	70 to 79	4	5	6	7	FR1A0	FR1B0
020 to 029	FS2A0 to FS2A9	FS2B0 to FS2B9	80 to 89	90 to 99	100 to 109	110 to 119	8	9	10	11	FR2A0	FR2B0
030 to 039	FS3A0 to FS3A9	FS2B0 to FS3B9	120 to 129	130 to 139	140 to 149	150 to 159	12	13	14	15	FR3A0	FR3B0
040 to 049	FS4A0 to FS4A9	FS4B0 to FS4B9	160 to 169	170 to 179	180 to 189	190 to 199	16	17	18	19	FR4A0	FR4B0
050 to 059	FS5A0 to FS5A9	FS5B9 to FS5B9	200 to 209	210 to 219	220 to 229	230 to 239	20	21	22	23	FR5A0	FR5B0
060 to 069	FS6A0 to FS6A9	FS6B0 to FS6B9	240 to 249	250 to 259	260 to 269	270 to 279	24	25	26	27	FR6A0	FR6B0
070 to 079	FS7A0 to FS7A9	FS7B0 to FS7B9	280 to 289	290 to 299	300 to 309	310 to 319	28	29	30	31	FR7A0	FR7B0
080	FS8A0	FS8B0	32	33	34	35	32	33	34	35	FR8A0	FR8B0
081	FS8A1	FS8B1	36	37	38	39	36	37	38	39	FR8A1	FR8B1
082	FS8A2	FS8B2	40	41	42	43	40	41	42	43	FR8A2	FR8B2
083	FS8A3	FS8B3	44	45	46	47	44	45	46	47	FR8A3	FR8B3
084	FS8A4	FS8B4	48	49	50	51	48	49	50	51	FR8A4	FR8B4
085	FS8A5	FS8B5	52	53	54	55	52	53	54	55	FR8A5	FR8B5
086	FS8A6	FS8B6	56	57	58	59	56	57	58	59	FR8A6	FR8B6
087	FS8A7	FS8B7	60	61	62	63	60	61	62	63	FR8A7	FR8B7
088	FS8A8	FS8B8	64	65	66	67	64	65	66	67	FR8A8	FR8B8
089	FS8A9	FS8B9	68	69	70	71	68	69	70	71	FR8A9	FR8B9

*Notes:*

\* GP - inputs are associated with T.S. DET 0 to 3. There is duplication in the GP- inputs No. 32 through 90, therefore, to avoid confusion, make certain that the tested GP- lead connects to the proper FS - - - relay.

\*\* GP - outputs are associated with T.S. AR, BR and CR.

TABLE G (Contd)

CONTROL UNIT REGISTER	OPERATED SCAN RELAYS		DETECTOR SWITCH SETTINGS GP - INPUTS*				DETECTORS GP - OUTPUTS**				OPERATED REGISTER RELAYS	
			0	1	2	3	FD0	FD1	FD2	FD3		
090	FS9A0	—	72	—	—	—	72	73	—	—	FR9A0	—
091	FS9A1	—	74	—	—	—	74	75	—	—	FR9A1	—
092	FS9A2	—	76	—	—	—	76	77	—	—	FR9A2	—
093	FS9A3	—	78	—	—	—	78	79	—	—	FR9A3	—
094	FS9A4	—	80	—	—	—	80	81	—	—	FR9A4	—
095	FS9A5	—	82	—	—	—	82	83	—	—	FR9A5	—
096	FS9A6	—	84	—	—	—	84	85	—	—	FR9A6	—
097	FS9A7	—	86	—	—	—	86	87	—	—	FR9A7	—
098	FS9A8	—	88	—	—	—	88	89	—	—	FR9A8	—
099	FS9A9	—	90	—	—	—	90	91	—	—	FR9A9	—

*Notes:*

\* GP- inputs are associated with T.S. DET 0 to 3. There is duplication in the GP- inputs No. 32 through 90, therefore, to avoid confusion, make certain that the tested GP- lead connects to the proper FS --- relay.

\*\* GP- outputs are associated with T.S. AR, BR and CR.

TABLE H

NO. 1 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Terminating Sender SD-25013	Unit Unit Unit	38 39 39	SBM SB SB	Maint Total Service	Plug Plug/Call Opr. RL Rel	Test Fr Test Fr Sender
SD-25455	SDR Unit SDR Unit SDR Unit	38 39 39	SBM SB SB	Maint Total Service	Plug Plug/Call Opr RL Rel	Test Fr Test Fr Sender
SD-25434	Unit Unit Unit	38 39 39	SBM SB SB	Maint Total Service	Plug Plug/Call Opr RL Rel	Test Fr Test Fr Sender
Dist. Junctor (Noncoin) SD-26201	MISC VERT Unit	2	DJ	Total	Plug/Call	Test Fr
Zone Registration Control SD-25320	Unit	35	ZR	Total	Plug/Call	Test Fr
Subscriber Sender SD-25012	Unit Unit Unit	01 02 02	SBM SB SB	Maint Total Service	Plug Plug/Call Opr. ON1 Rel	Test Fr Test Fr Sender
Originating Marker SD-25016	(MA) On Fr (MA) On Fr	4 5	MBM MB	Maint Service	Plug Call	Test Fr Test Fr
Terminating Marker SD-25283	(NC) MISC MISC	177 410 411	MBM MB MB	Maint Total Service	Plug Plug/Call Opr CK10 Rel	Test Fr Test Fr Marker
Auxiliary Sender SD-96479	(A) (A) (A)	19 19 10	SBM SB SB	Maint Total Service	Plug Plug/Call Opr. ON Rel	Test Fr Test Fr Sender
Office Links SD-25033	VERT NO. 2 PRI SW	RESP HALVES	0L0-9 2R0-9 5L0-9 7R0-9	Total	1. Insert MB plug in 0, 2, 5, & 7 pri sw MB jk 2. Grd SL lead	Office Link Fr

TABLE H (Cont)

NO. 1 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Incoming Links SD-25457	—	—	LL0 LL5 LR0 LR5	Total	1. Insert MB plug in 0 & 5 sec sw MB jk 2. Grd SL lead	Incoming Link Fr
Line Junctors SD-25553	—	—	LJ0,LJ5	Total	1. Insert MB plug in 0 & 5 sec sw SS jk 2. Grd SL lead	Line Link Fr
Line Links SD-25553	—	—	L0,L5	Total	1. Insert MB plug in 0 & 5 sec sw jk 2. Grd SL lead	Line Link Fr
Subscriber Line SD-25553	—	—	SL	Total	Grd SLU jk	LDF
Identifier SD-95810	(G) (G) (G)	36 46 46	IBM IB IB	Maint Service Service	Plug Call Opr ON2 Rel	Tbl Tkr Tbl Tkr Identifier
Outpulser SD-95811	(W) (B) (B)	9 7 7	OPBM- OPB- OPB-	Maint Service Service	Plug Call Opr. ON Rel	Tbl Tkr Tbl Tkr Outpulser
3-Digit Translator Connector SD-96529	(HC) (HC) (HC)	22 12 12	DTBM DTB DTB	Maint Total Service	Plug Plug/Call Opr. BY Rel	3 Dig Trnsl 3 Dig Trnsl 3 Dig Trnsl
Code Compressor SD-96527	(C) (B) (C)	44 37 44	CBM CB CBM	Total Service Maint	Opr CCB2 Rel Opr TM Rel Opr CCB2 Rel	Cd Compr Cd Compr Cd Compr
Transverter SD-25802	(MB) ON FR (MB) ON FR (MB) ON FR	45 44 44	TBM TB TB	Maint Total Service	Opr RB Rel Opr CBT Rel Opr CBT Rel	Test Fr Test Fr Transverter

TABLE H (Cont)

NO. 1 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Coin Supervisory SD-25061	(A)	14	CS	Total Service	Plug/Call Opr RL Rel	CS
	(A)	14	CS			CS
AMA Recorder SD-25873	UPPER (TRF)	1	TU	Service	Opr ON3 Rel	Recorder
Trunks	—	—	Typ:** PB,* S1, TU	Total	Typ** opr : CO, CT, D, D2, SL, SL1, TL1	Trunk

\* Normally at ground potential

\*\* Typically

TABLE I

NO. 4 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Marker SD-68388	(MCA) (MCA) (MCA) (MCA)	91 101 91 91	MB MBM MB MB	Total Maint Service Service	Plug/Call Plug Call Opr CKG Rel	Test Fr Test Fr Test Fr Marker
Decoder SD-68340	(D) (D) (D) (D)	176 166 176 176	DB DBM DB DB	Total Maint Service Service	Plug/Call Plug Call Opr CAK Rel	Test Fr Test Fr Test Fr Decoder
Sender SD-68018	FR FR FR	SB 9 SB	SB SBM SB	Total Maint Service	Plug/Call Plug Opr S Rel	Test Fr Test Fr Total
SD-68423	FR FR FR	SB SBM SB	SB SBM SB	Total Maint Service	Plug/Call Plug Opr S Rel	Test Fr Test Fr Test Fr
SD-68221	MISC MISC MISC	SB0 129 SB0	SB SBM SB	Total Maint Service	Plug/Call Plug Opr S Rel	Test Fr Test Fr Total
SD-68222	MISC MISC MISC	SB0 129 SB0	SB SBM SB	Total Maint Service	Plug/Call Plug Opr S Rel	Test Fr Test Fr Total
SD-68424	(A) (A) (A)	25 32 25	SB SBM SB	Total Maint Service	Plug/Call Plug Opr S Rel	Test Fr Test Fr Total
SD-68489	MISC MISC MISC	204 205 204	SB SBM SB	Total Maint Service	Plug/Call Plug Opr S Rel	Test Fr Test Fr Total
Controller SD-68028	CONT & CONN CONT & CONN CONT & CONN CONT & CONN	128,135 87,134 128,135 128,135	CB CBM CB CB	Total Maint Service Service	Plug/Call Plug Opr MB Rel Call	Test Fr Test Fr Controller Test Fr
Foreign Area Translator SD-68342	MISC MISC MISC	138 148 138	FTB FTBM FTB	Total Maint Service	Plug/Call Plug 1. Insulate contacts 6-7T Rel TOS 2. Opr TOS Rel	Test Fr Test Fr Translator

TABLE I (Cont)

NO. 4 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Inc Lk Fr SD-68020	—	—	L0, R2, L5, R7	Total	1. Insert MB Plug in 0, 2, 5, & 7 pri sw MB jk 2. Grd SL Lead	Link Fr
SD-68393	—	—	L0, R2, L5, R7	Total	1. Insert MB Plug in 0, 2, 5, & 7 pri sw MB jk 2. Grd SL Lead	Link Fr
Out Lk Fr SD-68022	—	—	L0, R2, L5, R7	Total	1. Insert MB plug in 0, 2, 5, & 7 sec sw MB jk 2. Grd SL Lead	Link Fr
SD-68394	—	—	L0, R2, L5, R7	Total	1. Insert MB plug in 0, 2, 5, & 7 sec sw MB jk 2. Grd SL Lead	Link Fr
Transverter SD-68496	MISC MISC MISC MISC	5 15 5 5	TB TBM TB TB	Total Maint Service Service	Plug/Call Plug Call R1s TA1 Rel	Test Fr Test Fr Test Fr Transverter
CAMA Positions SD-25695			S	Total	Opr S Rel	Position
SD-27002 w/o ANI	(A)	27	S	Total	Opr S Rel Grd S Lead ON Pchg. 3 T.S. (B)	Position
With ANI	(A)	27	S	Total	Opr S Rel	Position
SD-95853	(B)	15	S	Total	Opr S Rel	Position
CAMA DP Registers SD-68487	(REG-) (REG-) (REG-) On Inc Reg & Lk Fr	15 16 15	RB RBM RM	Total Maint Service	Plug/Call Plug Opr RB Rel	Test Fr Test Fr Register

TABLE I (Cont)

NO. 4 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
OGT To CAMA Position SD-96481	(B)	15	S	Total	Opr S Rel	Trunk
INC Trk To CAMA Pos SD-96482	(B)	23	S	Total	Opr PB Rel	Trunk
Sender Lk SD-68023	—	—	SA00-19 SB00-19	Total	1. Insert MB Plug in A & B jk of sw 2. Grd SL Lead	Link Fr
SD-68118	—	—	SA00-19 SB00-19	Total	1. Insert MB plug in A & B jk of sw 2. Grd SL lead	Link Fr
SD-68334				Total	1. Insert MB plug in A & B jk of sw 2. Grd SL lead	Link Fr
	SC0	9	SA00			
	SC0	8	SA01			
	SC1	9	SA02			
	SC1	8	SA03			
	SC2	9	SA04			
	SC2	8	SA05			
	SC3	9	SA06			
	SC3	8	SA07			
	SC4	9	SA08			
	SC4	8	SA09			
	SC5	9	SA10			
	SC5	8	SA11			
	SC6	9	SA12			
	SC6	8	SA13			
	SC7	9	SA14			
	SC7	8	SA15			
	SC8	9	SA16			
	SC8	8	SA17			
	SC9	9	SA18			
	SC9	8	SA19			
	SC0	6	SB00			
	SC0	5	SB01			
	SC1	6	SB02			
	SC1	5	SB03			
	SC2	6	SB04			
	SC2	5	SB05			
	SC3	6	SB06			
	SC3	5	SB07			

TABLE I (Cont)

NO. 4 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
	SC4	6	SB08			
	SC4	5	SB09			
	SC5	6	SB10			
	SC5	5	SB11			
	SC6	6	SB12			
	SC6	5	SB13			
	SC7	6	SB14			
	SC7	5	SB15			
	SC8	6	SB16			
	SC8	5	SB17			
	SC9	6	SB18			
	SC9	5	SB19			
SD-68486	TUR	11	SA00	Total	1. Insert MB plug in A & B jk of sw 2. Grd SL lead	Link Fr
	TUR	12	SA01			
	TUR	13	SA02			
	TUR	14	SA03			
	TUR	15	SA04			
	TUR	16	SA05			
	TUR	17	SA06			
	TUR	18	SA07			
	TUR	21	SA08			
	TUR	22	SA09			
	TUR	23	SA10			
	TUR	24	SA11			
	TUR	25	SA12			
	TUR	26	SA13			
	TUR	27	SA14			
	TUR	28	SA15			
	TUR	31	SA16			
	TUR	32	SA17			
	TUR	33	SA18			
	TUR	34	SA19			
SD-68486	TUR	35	SB00			
	TUR	36	SB01			
	TUR	37	SB02			
	TUR	38	SB03			
	TUR	41	SB04			
	TUR	42	SB05			
	TUR	43	SB06			
	TUR	44	SB07			
	TUR	45	SB08			
	TUR	46	SB09			
	TUR	47	SB10			
	TUR	48	SB11			
	TUR	51	SB12			

TABLE I (Cont)

NO. 4 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
	TUR	52	SB13			
	TUR	53	SB14			
	TUR	54	SB15			
	TUR	55	SB16			
	TUR	56	SB17			
	TUR	57	SB18			
	TUR	58	SB19			
Trunks	—	—	Typ:** GB*, MS, S	Total	Typ:** Opr CO, IN, LO, PB, S, SL	Trunk
AMA Recorder SD-25872	TRF	1	TU	Service	Opr ON3 Rel	Recorder

\* Normally at ground potential

\*\* Typically

TABLE J

NO. 5 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Dial Tone Markers SD-26001	(B)	20	MB	Total	Plug/Call	MTF
	(B)	10	MBM	Maint	Plug	MTF
	(B)	20	MB	Service	Opr MCB1 Rel	Mkr
SD-25550	CB1	242	MB	Total	Plug/Call	MTF
	CB1	243	MBM	Maint	Plug	MTF
	CB1	242	MB	Service	Rls TUR Sel	Mkr
Completing Markers SD-26002	CA	20	MB	Total	Plug/Call	MTF
	CA	10	MBM	Maint	Plug	MTF
	CA	20	MB	Service	Opr MCB1 Rel	Mkr
SD-25550	CB1	242	MB	Total	Plug/Call	MTF
	CB1	243	MBM	Maint	Plug	MTF
	CB1	242	MB	Service	Rls TUR Rel	Mkr
Transverters SD-25591	TVC	137	TB	Total	Plug/Call	MTF
	TVC	138	TBM	Maint	Plug	MTF
	TVC	137	TB	Service	Test Call	MTF
	TVC	137	TB	Service	Rls CH1 Rel	TV
SD-26010	B*	13	TB	Total	Plug/Call	MTF
	B*	14	TBM	Maint	Plug	MTF
	B*	13	TB	Service	Test Call	MTF
	B*	13	TB	Service	Rls CH1 Rel	TV
	*Top of CTV					
SD-26161	D	9	TB	Total	Plug/Call	MTF
	D	10	TBM	Maint	Plug	MTF
	D	9	TB	Service	Opr CBR Rel	TV
Originating Registers SD-26040	C	45	RBM	Maint	Plug	MTF
	B	28	RB	Service	Test Call	MTF
	B	14	PBC	TT*	Test Call	MTF
	B	28	RB	Service	Opr. ON Rel	OR
	B	14	PBC	TT*	Opr. MF Rel	OR
SD-25551	(E)	18	RBM	Maint	Plug	MTF
	(E)	12	RB	Service	Test Call	MTF
	(C)	22	PBC	TT*	Test Call	MTF
	(E)	12	RB	Service	Opr ON 1 Rel	OR
	(C)	22	PBC	TT*	Opr. MF Rel	OR

TABLE J. (Cont)

NO. 5 CROSSBAR TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Outgoing Sdr MF SD-25580	(D) (D) (D)	28 5 28	SB SBM SB	Total Maint Service	Plug/Call MB Plug Opr SB Rel	MTF MTF Sender
SD-26051	(B) (B) (B)	14 15 14	SB SBM SB	Total Maint Service	Plug/Call MB Plug Opr SB Rel	MTF MTF Sender
RP SD-25732	(D) (D) (D)	28 5 28	SB SBM SB	Total Maint Service	Plug/Call MB Plug Opr SB Rel	MTF MTF Sender
SD-26052	(B) (B) (B)	14 15 14	SB SBM SB	Total Maint Service	Plug/Call MB Plug Opr SB Rel	MTF MTF Sender
DP SD-25779			SB SBM SB	Total Maint Service	Plug/Call MB Plug Opr SB Rel	MTF MTF Sender
IMG SD-25826	(K) (K) (K)	17 7 17	SB SBM SB	Total Maint Service	Plug/Call MB Plug Opr SB Rel	MTF MTF Sender
Incoming Registers DP SD-25729	(D) (C) (D)	22 5 22	RB RBM RB	Total Maint Service	Plug/Call Plug Opr MB Rel	MTF MTF IR
SD-26041	(B) (B) (B)	54 44 54	RB RBM RB	Total Maint Service	Plug/Call Plug Opr MB Rel	MTF MTF IR
MF SD-25730	(D) (C) (D)	22 5 22	RB RBM RB	Total Maint Service	Plug/Call Plug Opr MB Rel	MTF MTF IR
SD-26042	(D) (D) (D)	15 44 15	RB RBM RB	Total Maint Service	Plug/Call Plug Opr MB Rel	MTF MTF IR
RP SD-25731	(D) (C) (D)	22/26 5/12 22/26	RB RBM RB	Total Maint Service	Plug/Call Plug Opr MB Rel	MTF MTF IR

TABLE J (Cont)

NO. 5 CROSSBAR TUR BUSY TEST TABLE

CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
SD-26043	(B) (B) (B)	45 35 45	RB RBM RB	Total Maint Service	Plug/Call Plug Opr MB Rel	MTF MTF IR
SD-27667-01 Transfer Register	(D) (D) (D)	48 46 48	RB RBM RB	Total Maint Service	Plug/Call Plug Opr MB REL	MTF MTF TRF REG
SD-26056-01 CAMA Sender	(A) (A) (A)	36 12 36	SB SBM SB	Total Maint Service	Plug/Call Plug Opr SB REL	MTF  Sender
Subscriber Line Usage SD-25546	—	—	SL0-9	Total	Grd Corres SLU jk on last line Fr in SLU Multiple	SLU Fr
SD-26030	—	—	SL0-9	Total	Grd Corres SLU jk on last line Fr in SLU Multiple	SLU Fr
Coin Supervisory SD-25736	(D) (D)	5/26 5/26	CS CS	Total Service	MB Key/Call Opr RL1 Rel	CS CS
Line Links SD-25548	HG0 Rel HG0 Rel HG1 Rel HG1 Rel	LB0 LB5 LB0 LB5	L0, L5	Horiz Grp	1. Insert 349A Plug in 0 & 5 Junctor sw MB jk on Ln Lk Fr 2. Grd SL Lead at Ln Lk Fr	Ln Lk Fr

TABLE J (Cont)

NO. 5 CROSSBAR TUR BUSY TEST TABLE

CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
SD-26030	—	—	L0, L5	Horiz Grp	1. Insert 349A Plug in 0 & 5 Junctor sw MB jk on Ln Lk Fr 2. Grd SL Lead at Ln Lk Fr	Ln Lk Fr
Trunk Links SD-25549	TUR TUR TUR TUR	00-09 10-19 20-29 30-39	LL0 LL5 LL0 LR5	Horiz Grp	1. Insert 349A Plug in 0 & 5 Junctor sw MB jk on Tk Lk Fr 2. Grd SL Lead at Trk Lk Fr	Trk Lk Fr
SD-26032	(C) or (A) (C) or (A) (C) or (A) (C) or (A)	00-09 10-19 20-29 30-39	LL0 LL5 LR0 LR5	Horiz Grp	1. Insert 349A Plug in 0 & 5 Junctor sw MB jk on Tk Lk Fr 2. Grd SL Lead on Tk Lk Fr	Trk Lk Fr
Touch-Tone To Dial Pulse Conv ES 26505	(C) (C) (C)	56 46 56	CB CBM CBM	Total Maint Service	Plug/Call Plug Opr ON1 Rel	MTF MTF Converter
Trunks	—	—	TYP:** C, CC, CO, G, S, TV, B1*	Total	TYP** OPR: B, D, SN, ON, S1 or S2 Rel	Trunk
AMA Recorder SD-25872	UPPER (TRF)	1	TU	Service	Opr ON3 Rel	Recorder

\* Normally at ground potential

\*\* Typically

TT\* TOUCH-TONE

TABLE K

CROSSBAR TANDEM TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Marker SD-25361	(MISC)	74	MB	Total	Plug/Call Plug Opr SPT Rel Call	Test Fr Test Fr Marker Test Fr
	(MISC)	75	MBM	Maint		
	(MISC)	74	MB	Service		
	(MISC)	74	MB	Service		
SD-27069	MISC(A)	73	MB	Total	Plug/Call Plug Opr SPT Rel Call	Test Fr Test Fr Marker Test Fr
	MISC(A)	74	MBM	Maint		
	MISC(A)	73	MB	Service		
	MISC(A)	73	MB	Service		
Transverter SD-25968	(MISC)	57	SB	Total	Plug/Call Plug Rls TA1 Rel Call	Test Fr Test Fr TV Test Fr
	(MISC)	67	MB	Maint		
	(MISC)	57	SB	Service		
	(MISC)	57	SB	Service		
Office Links SD-25033	VERT NO. 2 PRI SW	RESP HALVES	0L0-9 2R0-9 5L0-9 7R0-9	Total	1. Insert MB Plug in 0, 2, 5, & 7 pri sw MB jk 2. Grd SL Lead	Off Ln Fr
Trunk Links SD-25362	—	—	0L0-9 2R0-9 5L0-9 7R0-9	Total	1. Insert MB Plug in 0, 2, 5, & 7 pri sw MB jk 2. Grd SL lead	Trk Lk Fr
Senders MF SD-27024	(G)	17	SB	Total	Plug/Call Plug Opr ON1 Rel	Test Fr Test Fr Sender
	(G)	27	SBM	Maint		
	(G)	17	SB	Service		
SD-25769	(A)	73	SB	Total	Plug/Call Plug Opr ON1 Rel	Test Fr Test Fr Sender
	(B)	56	SBM	Maint		
	(A)	73	SB	Service		
DP SD-25999	(G)	17	SB	Total	Plug/Call Plug Opr ON1 Rel	Test Fr Test Fr Sender
	(G)	27	SBM	Maint		
	(G)	17	SB	Service		
SD-25478	(A)	36	SB	Total	Plug/Call Plug Opr ON1 Rel	Test Fr Test Fr Sender
	(B)	26	SBM	Maint		
	(A)	36	SB	Service		

TABLE K (Cont)

CROSSBAR TANDEM TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
PCI SD-25961	(AA) (AA) (AA)	18 17 18	SB SBM SB	Total Maint Service	Plug/Call Plug Opr ON1 Rel	Test Fr Test Fr Sender
RP SD-25359	(MISC) (MISC) (MISC)	95-99 50-54 95-99	SB SBM SB	Total Maint Service	Plug/Call Plug Opr ON1 Rel	Test Fr Test Fr Sender
MF SD-25978	(A) (B) (A)	73 56 73	SB SBM SB	Total Maint Service	Plug/Call Plug Opr ON1 Rel	Test Fr Test Fr Sender
3D Register SD-25534	(MISC) (MISC) (MISC)	180-189 190-199 180-189	RB RBM RB	Total Maint Service	Plug/Call Plug Opr H2 Rel	Test Fr Test Fr Register
2 Way Interoffice Trk SD-27000	(A)	32	S2	Service	Opr A Rel	Trunk
Sender Link & Controller SD-25358	—	—	S	Total	Plug	Controller
OGT to CAMA Position SD-96481	(B)	15	S	Service	Opr S. Rel	Trunk
CAMA Positions SD-95853	(B)	15	S	Total	Opr S Rel	Positions Circuit
SD-27002 With ANI	(A)	27	S	Total	Opr S Rel	Positions Circuit
W/O ANI	(B)	3	S	Total	Grd S Lead	Positions Circuit
Incoming Trks SD-25356	—	10	TB	Total	Opr D Rel	Trunk
SD-25357	(C) On Trk Fr	10	TB	Total	Opr D1 Rel	Trunk
INC Trk to CAMA Pos SD-27036	(A)	58	PB*	Total	Opr A. Rel	Trunk

TABLE K (Cont)

CROSSBAR TANDEM TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
SD-27061	(A)	58	PB*	Total	Opr T Rel	Trunk
SD-96482	(B)	23	S	Total	Opr PB Rel	Trunk
AMA Recorder SD-25872	UPPER (TRF)	1	TU	Service	Opr ON3 Rel	Recorder
INC Trk HF Pulsing SD-25909	—	9	PB*	Total	Opr T Rel	Trunk

\* Normally at ground potential

TABLE L

PANEL TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Subscriber Sender SD-21193	SDR Unit SDR Unit SDR Unit	SB MB SB	SB SBM SB	Service Maint Service	Call Plug Opr SB Rel	Test Fr Test Fr Sender
SD-21194	SDR Unit SDR Unit SDR Unit	SB MB SB	SB SBM SB	Service Maint Service	Call Plug Opr SB Rel	Test Fr Test Fr Sender
Auxiliary Sender SD-96479	(A) (A) (A)	19 19 10	SB SBM SB	Total Maint Service	Plug/Call Plug Opr ON Rel	Test Fr Test Fr Sender
Subscriber Link SD-21744	(TUR)	LB	LB	Total	Grd Link sw D4 Spring	Link
SD-21460	(TUR)	LB	AU	Total	Grd Link sw D4 Spring	Link
Decoder SD-21277	(ST) Rel (ST) Rel (ST) Rel	1L 1L 1L	MB MBM MB	Service Maint Service	Call Plug Opr ST Rel	Test Fr Test Fr Decoder
Identifier SD-95810	(G) (G) (G)	46 36 46	IB IBM IB	Service Maint Service	Call Plug Opr ON2 Rel	Test Fr Test Fr Identifier
Outpulser SD-95811	(B) (W) (B)	7 9 7	OPB OPBM OPB	Service Maint Service	Call Plug Opr ON Rel	Test Fr Test Fr Outpulser
3D Translator SD-96529	(HC) (HC) (HC)	12 22 12	DTB DTBM DTB	Total Maint Service	Plug/Call Plug Opr BY Rel	Translator Translator Translator
Code Compressor SD-96527	(C) (C) (B)	44 44 37	CBM CBM CB	Total Maint Service	Plug/Call Opr TM Rel Call	CC CC CC
Subscriber Line SD-21273	(TU) Jacks	00-19	S	Total	Grd SLU Lead	IDF

TABLE L (Cont)

PANEL TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Line Finder & Dist. Sel. SD-21627	T.S. on Dist. Fr	BR	TU	Total	Grd Dist. sw S4 Spring	Line Finder
SD-21077	T.S. on Dist. Fr	13	TU	Total	Grd Dist sw S4 Spring	Line Finder
ES-21030	—	—	TU	Total	Grd Dist sw S4 Spring	Line Finder
ES-21031	—	—	TU	Total	Grd Dist sw S4 Spring	Line Finder
Coin Control SD-21631	T.S. on Dist Fr	TU	TU	Total	Grd TU Lead	CC
District Selector SD-21784	T.S. on Dist Fr	BR Lead on Seq sw	PB*	Total	Opr SL Rel	Selector
Incoming Selector SD-21115	T.S. on Inc Fr	PB	PB*	Total	Recycle Selector	Selector

\* Normally at ground potential

TABLE M

SXS TUR BUSY TEST TABLE						
CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Line Finders SD-31530	—	9	S	Total	Grd SL Lead	Line Finder
SD-33013	—	9	S	Total	Grd SL Lead	Line Finder
Selectors SD-30200	—	9	S	Total	Grd SL Lead	Selector
SD-31745	—	9	S	Total	Grd SL Lead	Selector
Connectors SD-30228	—	9	S	Total	Grd SL Lead	Connector
Identifier SD-95810	(G) (G) (G)	46 36 46	IB IBM IB	Service Maint Service	Call Plug Opr ON 2 Rel	Test Fr Test Fr Identifier
Outputpser SD-95811	(B) (W) (B)	7 9 7	OPB OPBM OPB	Service Maint Service	Call Plug Opr ON Rel	Test Fr Test Fr Outputpser
Subscriber Line Usage T-95738-34	—	—	S	Total	Grd SLU Jk	VIDF/HIDF
AMA Sender SD-32207	(TF)	24	SB	Service	Opr ON1 Rel	Sender
Identifier SD-31957	(MISC-A) (MISC-A) (MISC-A)	38 37 38	IB IBM IB	Service Maint Service	Call Plug Opr DNT2 Rel	Test Fr Test Fr Identifier
Transverter SD-32203	MISC MISC MISC MISC	111 110 111 111	TB TBM TB TB	Total Maint Service Service	Plug/Call Plug Call Rls CH1 Rel	Test Fr Test Fr Test Fr Transverter
AMA Recorder SD-25872	Upper T.S.	1	TU	Service	Opr ON3 Rel	Recorder

TABLE N

SXS COMMON CONTROL TUR BUSY TEST TABLE

CIRCUIT	TERM STRIP	PCHG	USAGE LEAD	USAGE TYPE	MAKE-BUSY METHOD	MAKE-BUSY LOCATION
Originating Register SD-32351-01	(E) (E) (E) On Subscriber Dialing, Party Test and Tip and Ring Control Unit	28 38 18	TU TUM TUT	Service Maint Total	Opr RL Rel Plug Opr ON and RL Rel	OR Test FR OR
Translator SD-32355-01	(E) (E) On Seizure, Busy & Release Unit	24 14	TU TUM	Service Maint	Opr CB Rel Plug	Translator Test FR

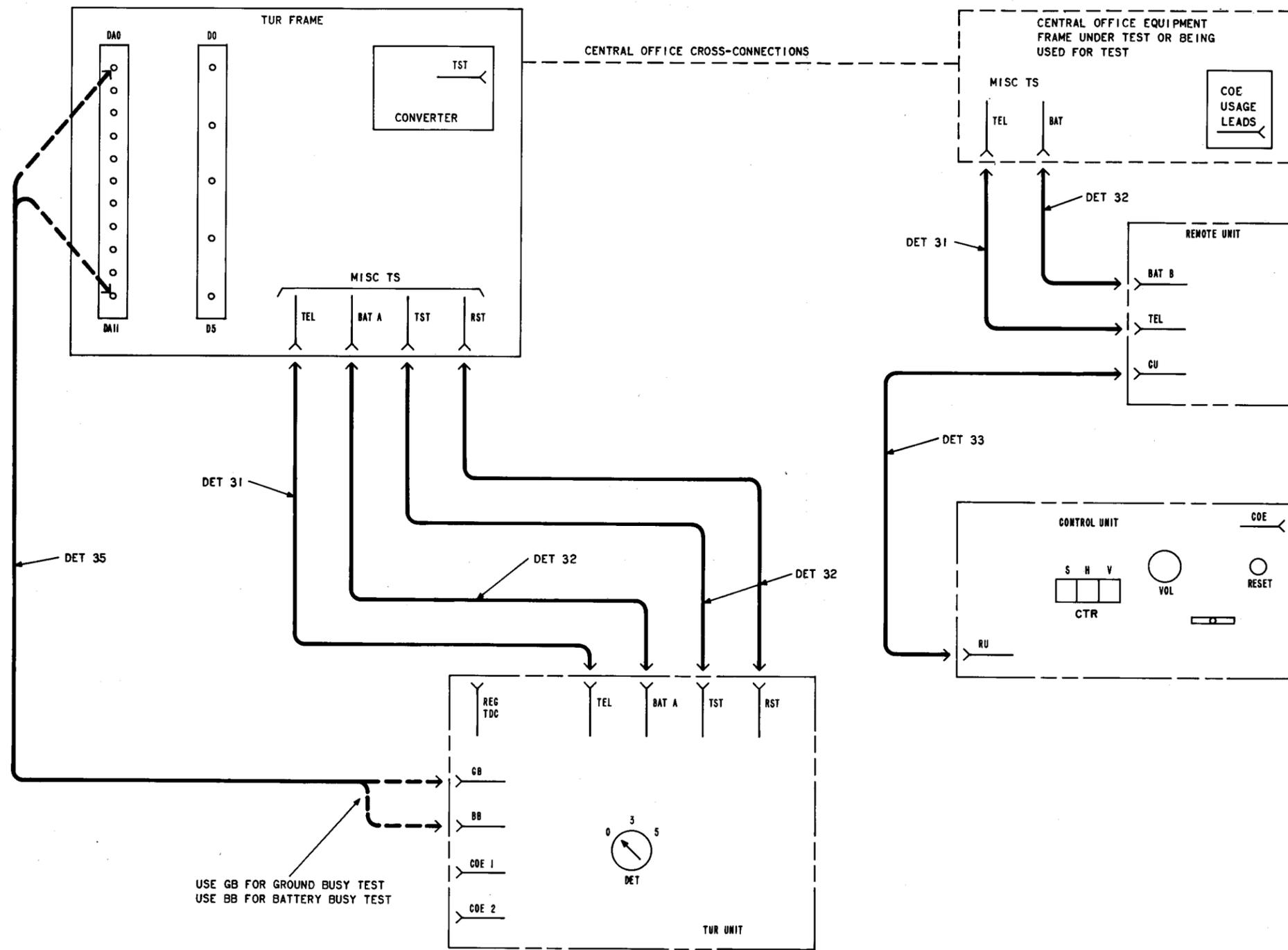


Fig. 2—Ground-Busy or Battery—Busy Detectors (Option 30G)

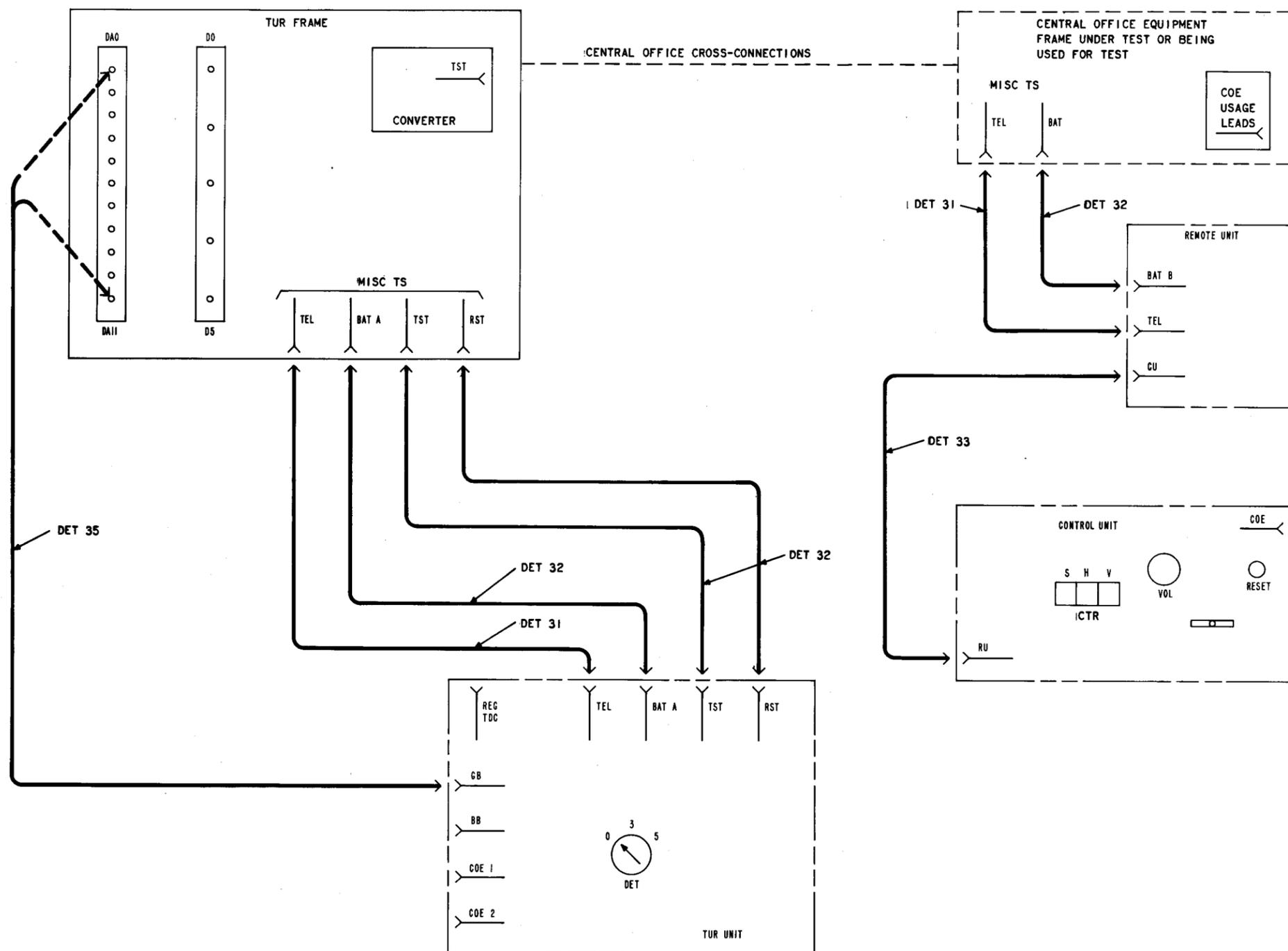


Fig. 3—Ground Idle—Open-Busy Detectors (Option 30H)

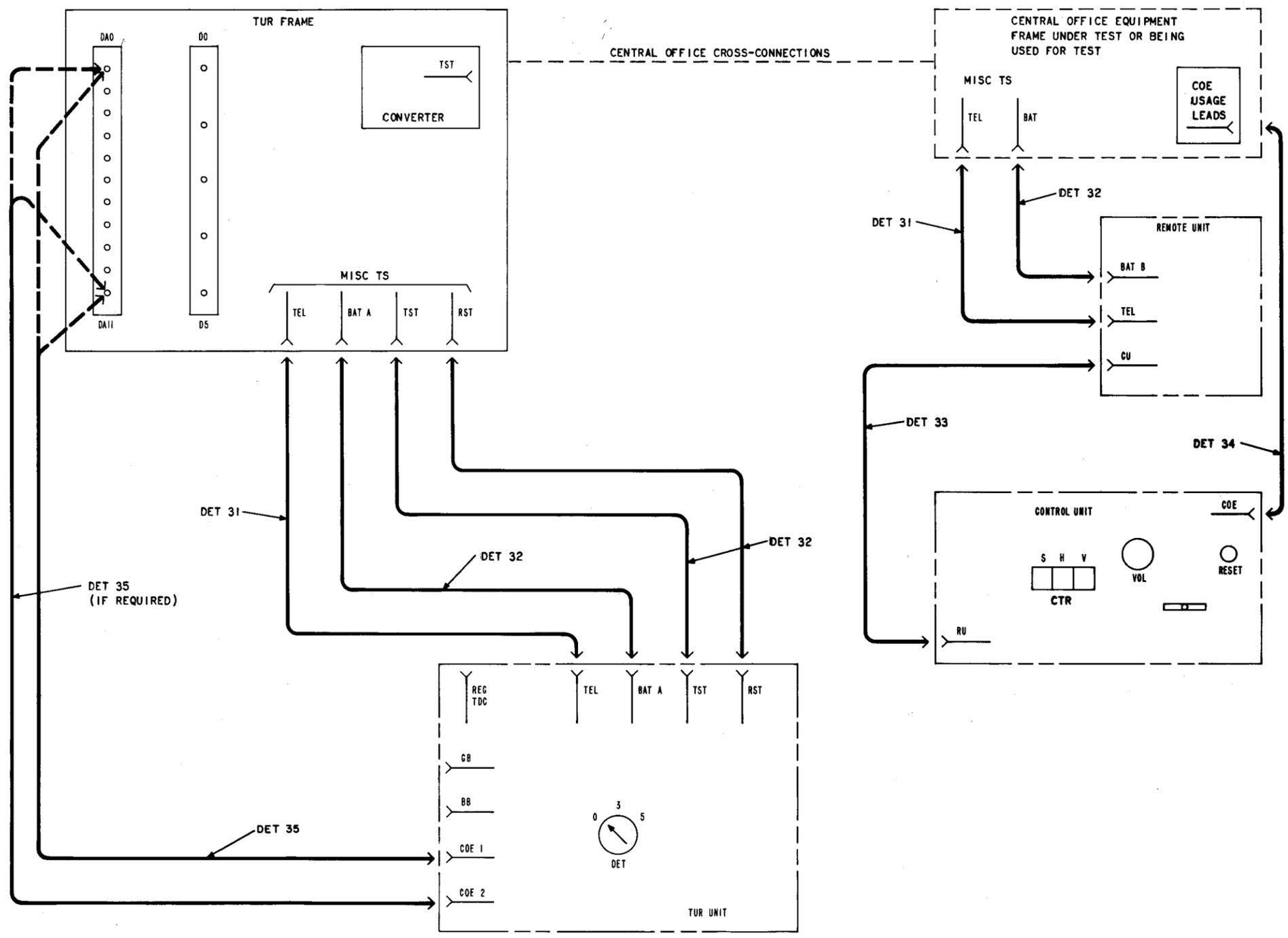


Fig. 4—Terminal Finder

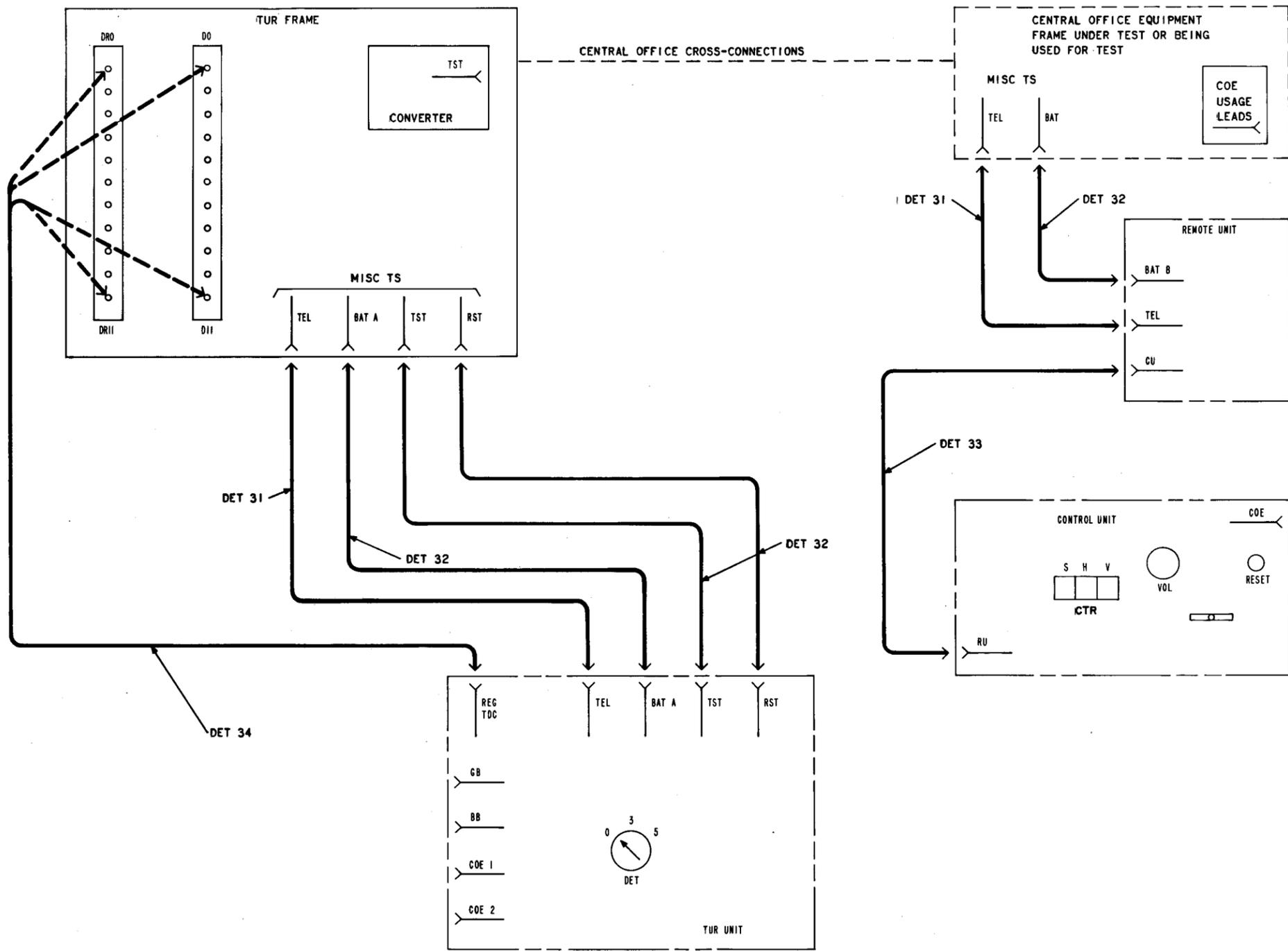


Fig. 5—Traffic Register Verification

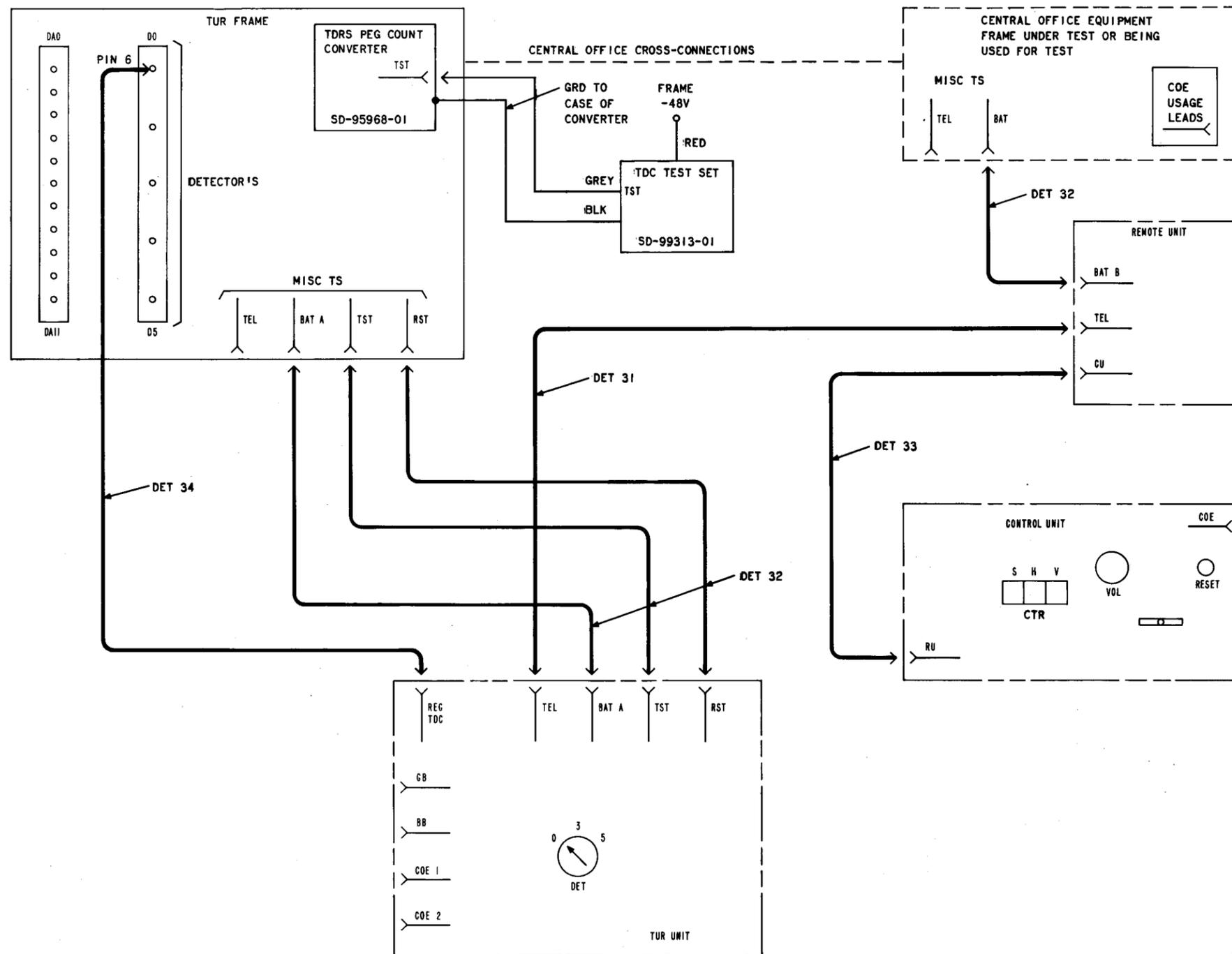


Fig. 6—Verification of Traffic Data Converter Input Assignment

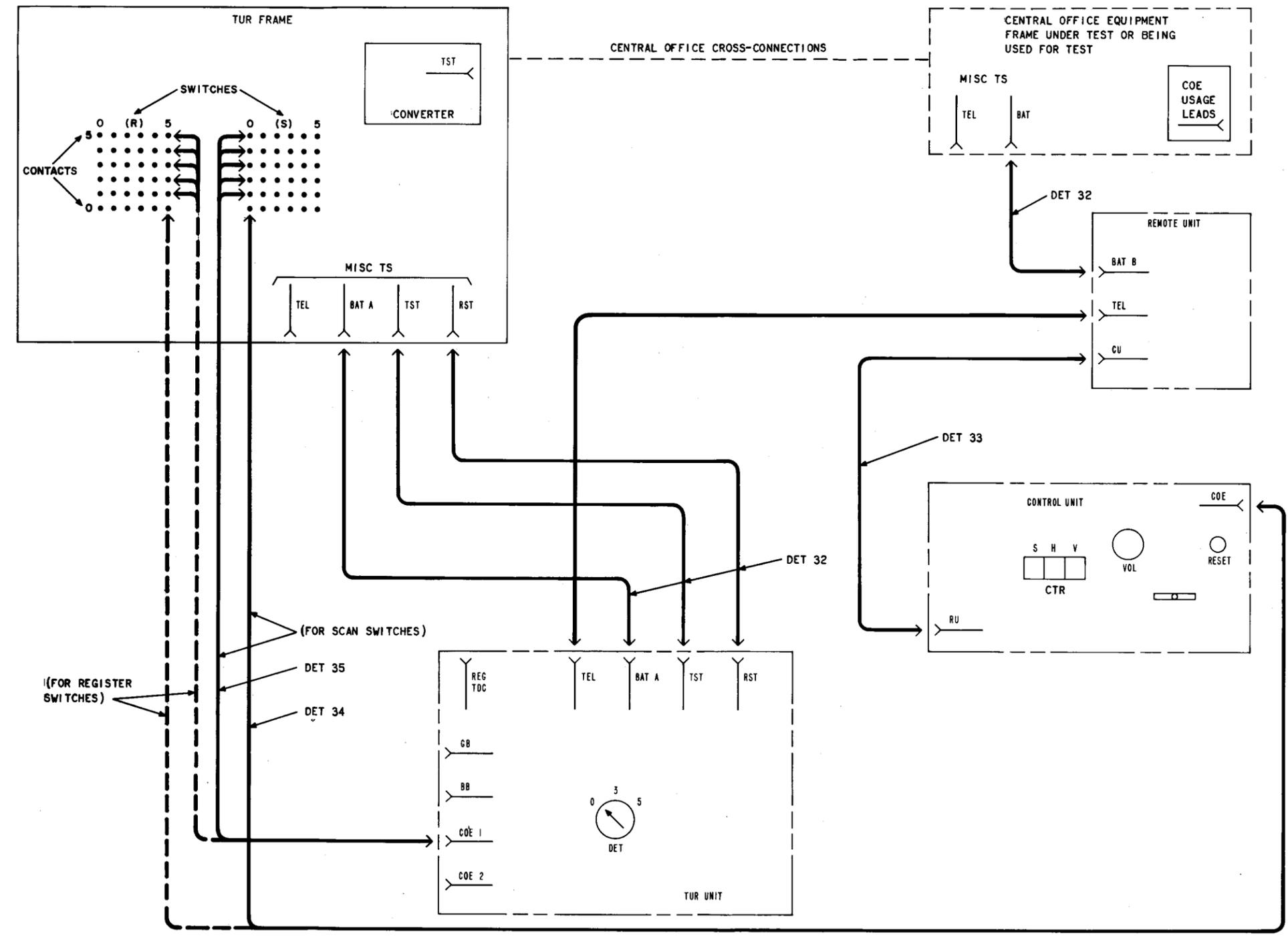


Fig. 7—Crossed Contact

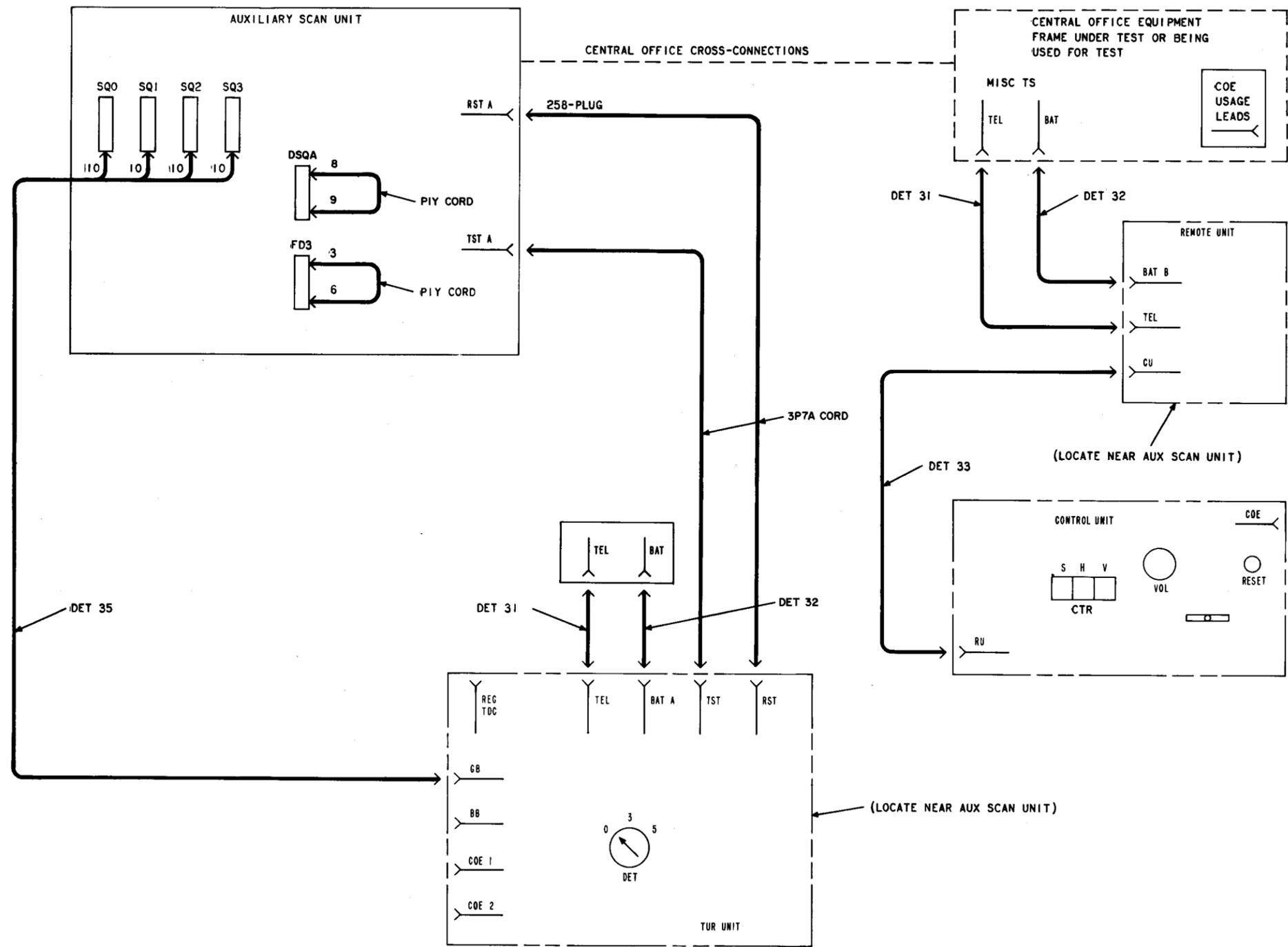


Fig. 8—Scan Lead Verification (Auxiliary Scanner Unit)

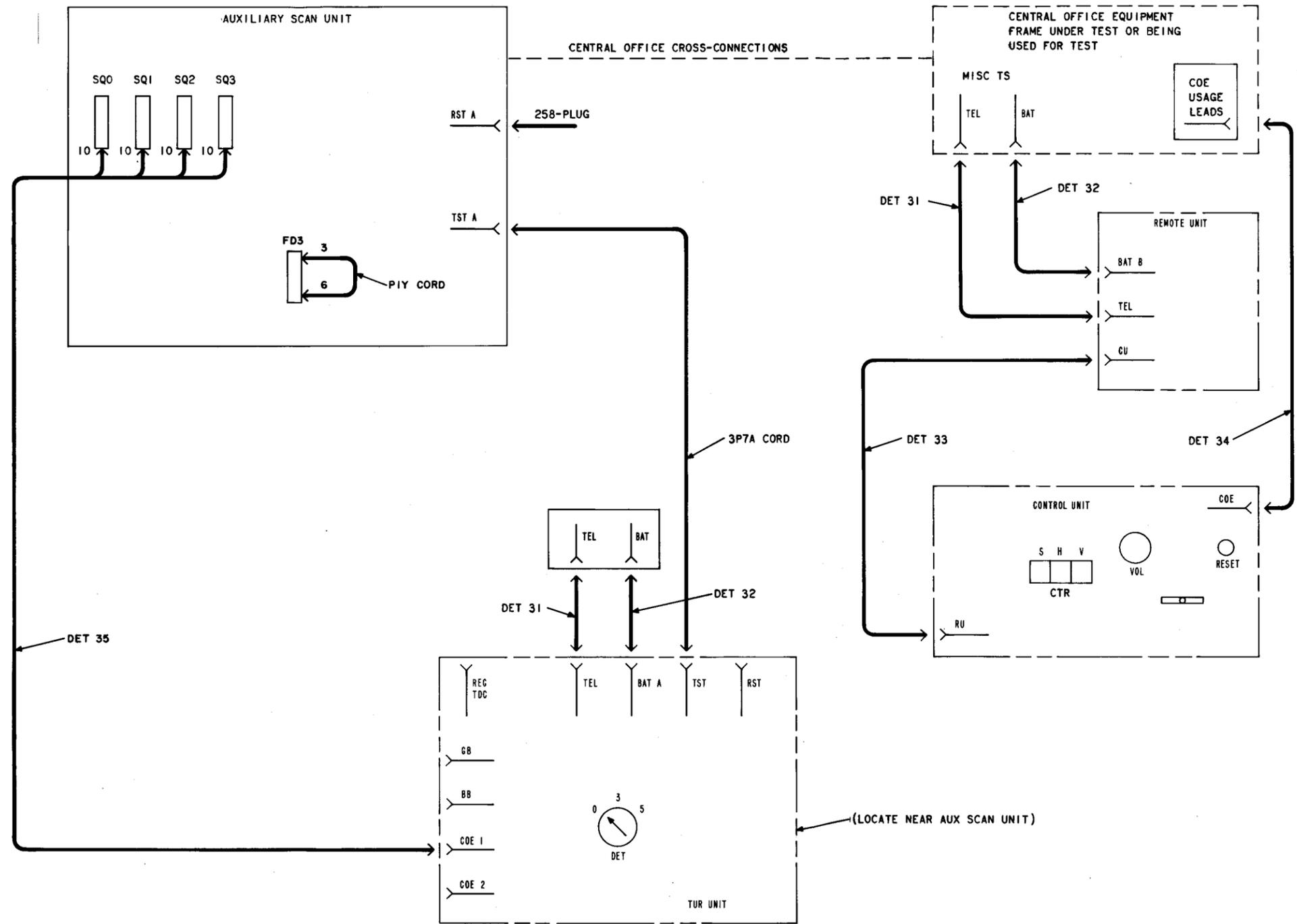


Fig. 9—Terminal Finder (Auxiliary Scanner Unit)

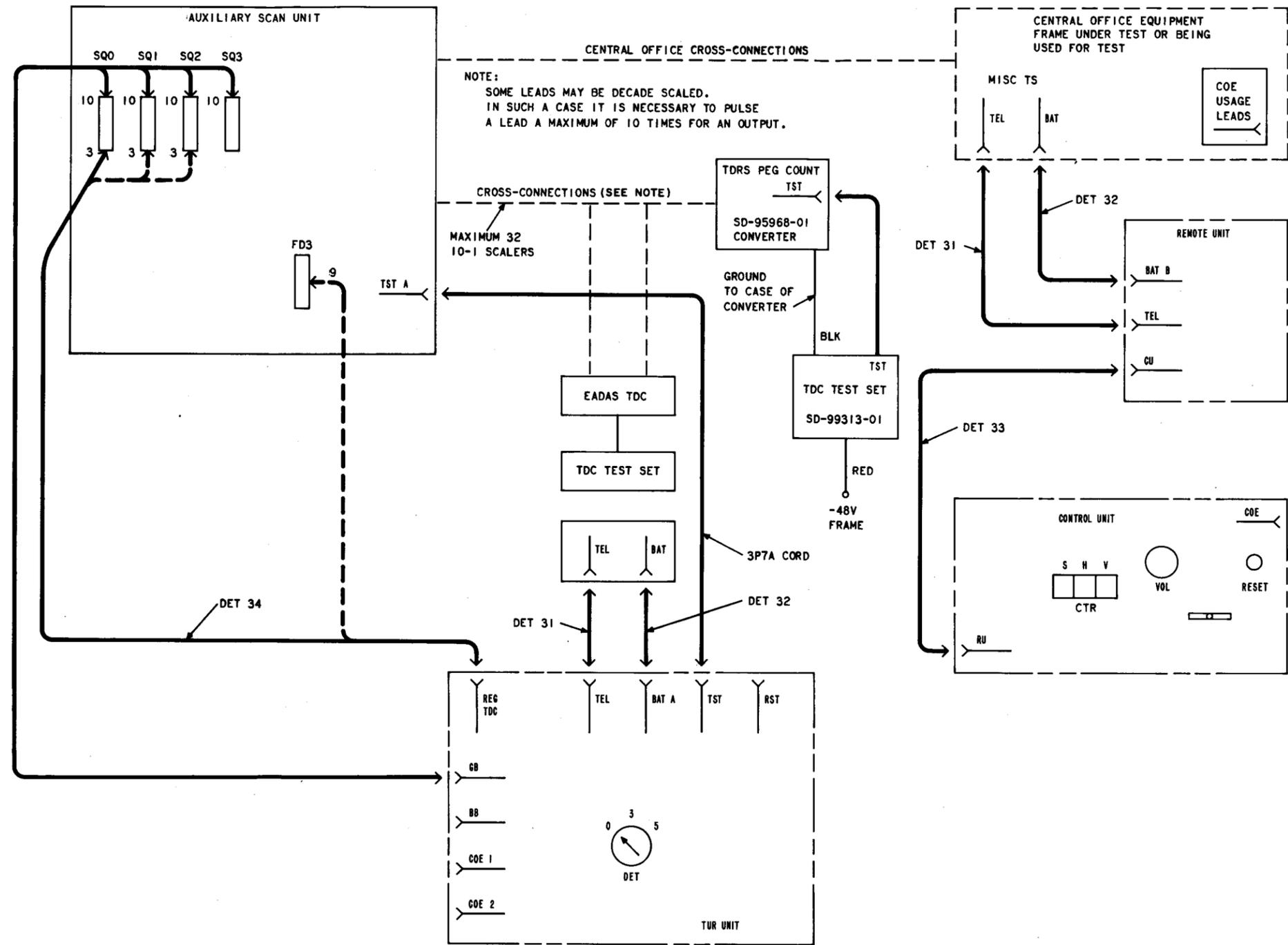


Fig. 10—Auxiliary Scanner Verification of Encoder Input Leads Associated with Peg Count Converter (SD-95968-01)

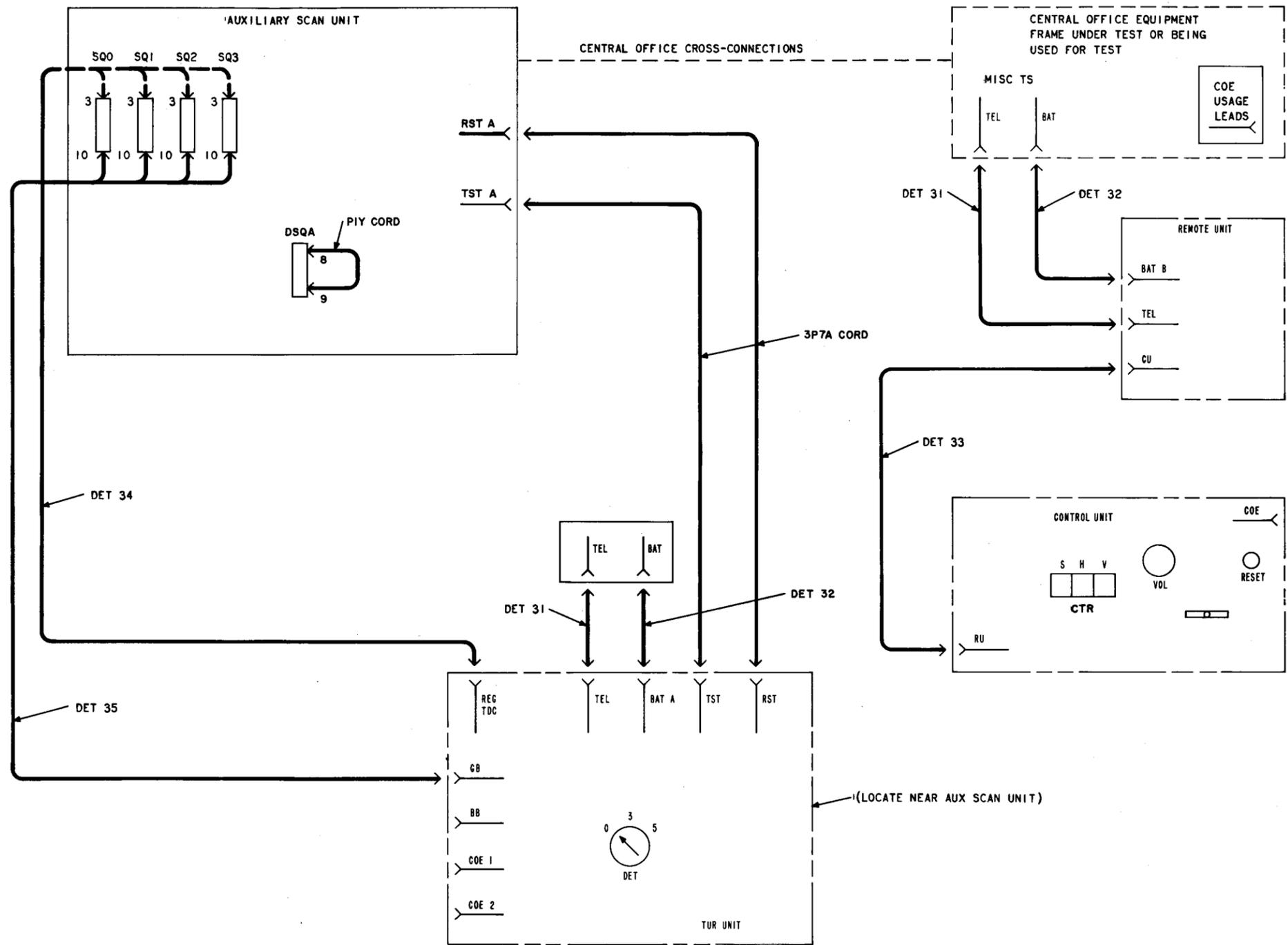


Fig. 11—Traffic Register Verification (Auxiliary Scanner Unit)