CONCENTRATOR TRUNK USAGE RECORDER SD-96549-01
MISCELLANEOUS TESTS

1. GENERAL

1.01 This section describes a method of testing the concentrator trunk usage recorder.

1.02 This section is reissued to provide testing of the auxiliary registration feature which has been added to this circuit.

1.03 The tests covered are:

A. Detection of Crosses Among Trunk-Busy Leads: The following features are checked. (1) Absence of false grounds on trunk-busy leads to the concentrator trunk usage recorder. (2) Absence of crosses among trunk-busy leads.

B. Detection of Crosses Among Traffic Register Leads: The following features are checked. (1) Absence of false grounds on traffic register leads. (2) Absence of crosses among traffic register leads.

C. Combination Continuity Test, Cycle Timing Test, and Cycle Count Verification: The following features are checked. (1) Continuity of the trunk-busy leads to the concentrator trunk usage recorder. (2) Continuity test of traffic register leads from the concentrator trunk usage recorder to the traffic registers. (3) Test of the starting of the recorder. (4) Duration test of one scanning cycle. (5) Verification of cycle count and recycling operation.

1.04 Test A requires that each concentrator trunk be idle at some time during test before the test can be considered to be complete.

1.05 Tests A, B, and C require action at the line concentrator control circuit.

1.06 Tests B and C require action at the concentrator trunk usage recorder circuit.

1.07 Test C requires action at the traffic registers at a register rack or cabinet.

1.08 *Lettered Steps:* A letter a, b, c, etc, added to a step number in Part 3 or 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is 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.

1.09 Local instructions should be followed for recording and reporting any register operations caused by performing these tests.

2. APPARATUS

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

TABLE A

APPARATUS	TESTS A	B	C
Cord (2.02)	19	23	19
Cord (2.03)	1	2	1
Tool (2.04)	1	1	—
Tool (2.05)	—	√	—
KS-3008 Stop Watch, or Equivalent (2.06)	—	—	√

√ As required

2.02 Testing cord, No. 893 cord, 3 feet long, equipped with two No. 360A tools (No. 1W13A cord), one No. 360A tool equipped with a No. 639A tool, and the other No. 360A tool equipped with a KS-6278 connecting clip, with No. 651D relay contact connector holder.

2.03 Testing cord, No. 893 cord, 6 feet long, equipped with two No. 360A tools (No. 1W13B cord), and each No. 360A tool equipped with a KS-6278 connecting clip, with two No. 651D relay contact connector holders.

2.04 Tool, No. 442A tool, equipped with a No. 2Y lamp (or an equivalent arrangement with a No. 2Y lamp). This tool has one clip connected to 48-volt test battery. The other test clip is replaced with a No. 411A tool which is used as a probe.

2.05 Blocking and insulating tools, as required. Use tools and apply, as covered in Section A502.031.

2.06 KS-3008 stop watch or equivalent should be used when performing tests requiring the observation of intervals of time.

3. PREPARATION

STEP	ACTION	VERIFICATION
Tests A and C		
1	At No. 1A line concentrator control frame (SD-96536-01) — Replace removable covers on wire-spring TB00-19 relays with No. 651D tools.	
2	Insert No. 639A tools into contact 8 of each TB00-19 relay with No. 651D tool.	
Test A		
3	At No. 1A line concentrator control frame — Connect test lamp to 48-volt test battery.	
Test C		
4	Determine from office records list of registers associated with each set of concentrator trunk group-busy leads assigned to usage recorder under test.	
5a	If traffic registers are arranged for patching — At register cabinet — Patch register according to standard procedure. ***Note:*** Refer to section covering preparation of tests and inspection of traffic registers. For example, Section A128.002 lists Section A275.816 — No. 5 Traffic Registers, No. 5 Crossbar Offices.	
6b	If OFF key is operated — At concentrator trunk usage recorder — Release OFF key. ***Note:*** Concentrator trunk usage recorder is in normal starting position when the CC selector is in position 44 (22 on indicator wheel).	

4. METHOD

STEP	ACTION	VERIFICATION
	A. Detection of Crosses Among Trunk-Busy Leads	
	Caution: Concentrator trunk circuits are not removed from service for this test. Exercise caution not to interfere with service on a busy trunk. If a trunk is seized for service while being tested, discontinue the test until the trunk is idle.	
4	At first No. 1A line concentrator control frame associated with concentrator trunk usage recorder — Probe No. 639A tools attached to contact 8 of TB00-19 relays one at a time.	At No. 1A line concentrator control frame — Test lamp lights when associated TB relay is operated.
5c	If TB- relay is operated — Note this, perform Step 4 when trunk becomes idle.	Same as Step 4.
6	Connect ground to contact 8 of TB00 relay, using cord with KS-6278 connecting clip.	
7	Probe No. 639A tool attached to contact 8 of TB01 relay with test lamp.	Test lamp does not light unless TB01 relay is operated.
8d	If TB01 relay is operated — Note this condition, repeat Step 7 when trunk becomes idle.	Same as Step 7.
9	Probe No. 639A tools attached to contact 8 of TB02-TB19 relays.	Test lamp does not light each time unless respective TB- relay is operated.
10e	If any TB02-TB19 relay is operated — Note this condition, repeat Step 9 when respective trunk becomes idle.	Same as Step 9.
11	Connect No. 360A tools of jumper cord from TB00 relay contact 8 to TB01 relay contact 8.	
12	Probe No. 639A tools of relays TB03-TB19.	Test lamp does not light each time unless respective TB- relay is operated.
13	Repeat Steps 10e, 11, 12 to test remaining trunks for crosses.	Same as Step 12.
14f	If Test B or C is to be omitted — Remove connections, replace relay covers, disconnect test lamp.	
	B. Detection of Crosses Among Traffic Register Leads	
1	At concentrator trunk usage recorder — Connect test lamp to test battery.	
→ 2	Probe TR0-9, TRA0-9 leads for absence of ground at terminal strip punchings (see SD-96549-01 for punching information).	Test lamp does not light.

STEP	ACTION	VERIFICATION
3	Replace removable covers on wire-spring ST, TR relays with No. 651D tools. *Note:* Fixed contacts of ST1, 2, 3, 4, 10 are wired to fixed contacts of TR1, 2, 3, 4, 9, respectively.	
→ 4	Block operated STA relay.	
5	Connect No. 639A tools to contacts 1, 3, 10 of ST relay.	
6	Connect No. 639A tools to contacts 2, 4 of TR relay.	
7	Connect ground to contact 1 of ST relay, using cord with KS-6278 connecting clip.	
8	Probe contacts 3, 10 of ST relay, 2, 4 of TR relay.	Test lamp does not light.
9	Connect No. 360A tool of jumper cord from ST relay contact 1 to TR relay contact 2.	
10	Repeat Steps 7, 8 on ungrounded contacts of ST, TR relays, patching each to ground once tested.	Same as Step 8.
11	Remove four grounding jumper cords of Steps 9, 10.	
12	Block operated TR relay.	
13	Repeat Steps 8, 9, 10 to test make contacts of TR relay.	Same as Step 8.
14	Remove all grounding jumper cords of Step 13 from ST, TR relays.	
→ 15	Remove blocking tools from TR, STA relays.	
16	Replace covers on ST, TR relays, remove test lamp connections.	

C. Combination Continuity Test, Cycle Timing Test, and Cycle Count Verification

→ *Note:* Do not perform Test C until ON lamp is extinguished.

7c	If traffic register camera control circuit (SD-95797-01) controls start of concentrator trunk usage recorder — At traffic register camera control circuit — Determine whether ST key or setting of CL program timer has been made. Tests can be made provided recordings have not started or by following Step 8c when test is to be independent of regular program of camera control circuit.	

STEP	ACTION	VERIFICATION
8c	Release all CA- keys, recording keys operated so that they may be reoperated when tests are finished.	
9c	Operate CA- key associated with concentrator trunk usage recorder.	
10d	If traffic usage recorder circuit (SD-95738-01) controls start of concentrator trunk usage recorder — Determine whether ON lamp is lighted.	
→ 11e	If ON lamp is not lighted — Operate PC key.	
12f	If 24-hour PT program timer is furnished with concentrator trunk usage recorder — Program recorder for three consecutive hours by setting tabs on PT timer. ***Note:*** Example of three consecutive hours of program would include tabs set for 1:00 p.m., 1:45 p.m., 2:00 p.m., 2:45 p.m., 3:00 p.m. Tabs set at 1:45 p.m., 2:45 p.m. will assure that no interruptions occur between hours.	
13g	If tests are performed on day for which skip-a-day pin is set — Remove pin on PT timer for present day.	
14c	If traffic register camera control circuit (SD-95797-01) controls start of concentrator trunk usage recorder — At traffic register camera control circuit — Operate ST key.	
15c	Program CL timer for three consecutive hours of operation.	
16d	If traffic usage recorder circuit (SD-95738-01) controls start of concentrator trunk usage recorder — At traffic usage recorder circuit — Operate AUTO key.	
17d	Set CL timer to furnish three consecutive hours of timing.	ON lamp lights.
18	At concentrator trunk usage recorder — CL or PT timer, set to furnish three consecutive hours of timing, starts the recorder.	AC relay operates.

STEP	ACTION	VERIFICATION
19	At concentrator trunk usage recorder — Time interval between beginning of two scan cycles as determined by advance of SC selector.	Interval will be 98 to 100 seconds.
→ 20	Operate OFF key to right after beginning of second hour of operation. ***Note:*** At traffic registers at end of 2 hours, each regular register under test will read exactly 720 additional counts. Each auxiliary register under test will read either 144, 216, or 288 additional counts, respectively, depending upon whether the last two, three, or four trunks of each group have been arranged for auxiliary registration. Peg count register CC (cycle count) reads 72 additional counts. ***Note:*** After all relays have released, CS timer cam, as viewed through hole in end plate near shaft, is stopped on 97 to 0.	
→ 21	At concentrator trunk usage recorder — Turn OFF key to left to release.	AC relay operates. Recorder starts operation for third hour.
22f	If 24-hour PT program timer is furnished with concentrator trunk usage recorder — Restore PT program settings.	
23	At No. 1A line concentrator control frame — Remove jumper, ground cords on TB00-19 relays.	
24	Replace wire-spring relay covers on TB00-19 relays.	
25c	If traffic register camera control circuit (SD-95797-01) controls start of concentrator trunk usage recorder — At traffic register camera control circuit — Restore all keys, settings on CL timer.	
26d	If traffic usage recorder circuit (SD-95738-01) controls start of concentrator trunk usage recorder — Restore all keys, settings on CL timer.	