

ANSWERING TIME RECORDER — PERMANENT TYPE, SD-96235-01 EQUIPPED WITH TRAFFIC WEIGHTING APPLIQUE TESTS

1. GENERAL

1.01 This section describes a method of testing the SD-96235-01 answering time recorder (ATR) and SD-96497-01 traffic weighting applique (TWA) circuits, used for service observing. The tests also cover installations which include an associated SD-96360-01 answering time recorder switching circuit.

1.02 This section is reissued to expand Test A to include observation of the ability of the TWA circuit to ignore false signals; to revise Test C to make allowance for the decreased sensitivity of the TWA circuit, to include a check of the constant holding time feature of the ATR circuit, and to provide a more positive check on the accuracy of the timing circuit of the ATR; to completely change Test D to cover the replacement of the full-load sensitivity test feature by the variable sensitivity feature; to expand Test E to include verification of trunk assignments to particular ATR-TWA inputs; and to revise the section notes to cover the condition of the use of BC relays in the ATR circuit. Since this reissue covers a general revision, the arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

A. Counting and Storing: This test checks the ability of the TWA to count and store normal originated call signals on lines or trunks in service. It also checks the ability of the TWA to ignore false signals resulting from the following conditions. (1) Improper or undesirable subscriber action, such as dialing or switchhook flashing while the line or trunk lamp is lighted. (2) Undesirable trunk action, such as momentary preliminary seizure of the trunk on panel office trunk guard test signals. (3) AC interference or inductive "kicks" coupled through the observed lamp leads. The test thus provides a quick and simple observa-

tional check of the accuracy of the results obtained with the ATR-TWA. This test is primarily for verification and is not ordinarily made on a scheduled basis.

B. Concentrating: This test checks the following features. (1) That the timing circuit can be seized over each of the inputs to the ATR. (2) That only one line or trunk can be cut through to the timing circuit during a timing interval. (3) That a call cannot be partially timed.

C. Timing, Counting, and Registration: This test checks the operation of the timing and register control circuits, including the constant holding time feature of the timing circuit, and the operation of the N, D, and S registers. It also checks the count storage and read-out functions of the TWA circuit. Count storage refers to the stepping of the PC selector to store the count of total calls during timing of one call, and read out refers to the stepping of the RO selector as it transfers the count onto message registers.

D. Sensitivity Test: This test checks the sensitivity setting of the TWA circuit in terms of the response of the counting circuit to repeated signals on the same input.

E. Input Paths: This test checks the input circuits between the distributing frame pick-up points of the lamp leads, and the timing and counting circuits. It thus constitutes a check of the TST jack contacts of the ATR, of the lamp input circuits of the TWA, of the grouping relays if the switching circuit is furnished, and of the BC relays of the ATR, if provided.

F. Reseizure Prevention: This test checks that the lamp lead supervisory relay is not reoperated, and thus the answer time determination on the timed call is not interfered with, should a timed call be answered and served

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and the trunk released and reseized during the same timing interval. It also checks that this feature is delayed until after the first 2 seconds when the circuit is so arranged (Fig. 20 of ATR provided).

1.04 Test A will be facilitated if made in periods of heavy traffic, since the verifications required are directly related to the calling rate on the observed trunk group.

1.05 The performance of Tests B, C, and F in succession or in the same test periods will eliminate repetition of steps and unnecessary dummy plug handling under Part 3, Preparation.

1.06 When time transfer arrangements are provided in the ATR under control of the TT key, Test C should be made once with the TT key normal and once with it operated. The operation of the TT key adds 10 seconds to the timing interval obtained with the key normal.

1.07 If the switching circuit is furnished, Tests D and E require action to be performed at the location of the group transfer switch upon completion of testing on each group.

1.08 Test E requires actions to be performed at the distributing frame location of the line or trunk lamp leads. (Where the switching circuit is furnished, this refers to punchings on the line or trunk side of the grouping relays.)

1.09 The traffic department should be notified before starting and after completing these tests, so that any signals caused by performing these tests can be disregarded.

1.10 Where terminal room registers are provided, they should be connected to the timing circuit during these tests for checking circuit operation. The transfer is accomplished by the operation of the TR key. Test C provides for testing the functioning of the registers in the operating room location. Verifications will be required at the operating room location of the registers for this portion of Test C.

1.11 The BG key should remain nonoperated when the ATR is equipped with BC relays. When BC relays are not used, the BG key should be normal when the associated observed circuits

furnish battery signals to the ATR-TWA (for example, trunks with grounded lamps), and operated when ground signals are furnished (for example, sender circuits). When BC relays are not furnished and the switching circuit is used, this condition must be ascertained for each group.

1.12 Before making Test D (unless the ATR is equipped with BC relays, in which case 24-volt battery is always used) or E, the office records should be consulted to determine (for each group if the switching circuit is used) if ground or 24- or 48-volt battery is connected through contacts to light the line or trunk lamps associated with the ATR. The same potential should be used to perform the tests.

1.13 The timing interval in use in the office, which is obtained by a connection on the TM selector bank of the ATR circuit, should be ascertained from office records for use in Tests B and C. When the switching circuit is used, the timing interval must be ascertained for each group.

1.14 *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.

1.15 Where operating room registers are used in these tests, local instructions should be followed for recording and reporting any register operations caused by performing these tests.

2. APPARATUS

Tests A, D, and E

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

Tests B and C

2.02 Two patching cords, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord).

Tests B, C, D, and F

2.03 258C plugs (dummy) or equivalent, as required (maximum 25).

Tests C and D

2.04 KS-3008 stop watch, or equivalent.

Tests D and E

2.05 Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), one 411A (test pick) tool, and one KS-6278 connecting clip.

Test F

2.06 Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord).

3. PREPARATION

STEP	ACTION	VERIFICATION
Tests B, C, and F		
1	Operate or restore BG key, as required (see 1.11).	
2	Insert 258C dummy plugs into all TST jacks of ATR.	

4. METHOD

STEP	ACTION	VERIFICATION
A. Counting and Storing		
1	With all selector switches at rest — Block nonoperated P relay of ATR.	
2	Observe lamp panel and PC selector in TWA until sufficient call signals have been received to verify proper operation.	PC selector advances one terminal each time pair of A and B lamps is lighted due to seizure of associated trunk; never advances without simultaneous lighting of pair of A and B lamps; and advances one terminal only, should a pair of lamps display pulsing, flashing, or interrupted signals, such as might result from dial pulses, switchhook flashing, TG test pulses, etc.
3	Remove blocking tool from P relay.	RO selector advances until it reaches terminal numbered same as that on which PC selector is standing.
B. Concentrating		
3	Remove dummy plugs from first two TST jacks.	
4	Patch first TST jack to T1 jack.	
5	Patch second TST jack to T2 jack.	
<i>Note:</i> Steps 6, 7, and 8 must be made within one timing interval (see 1.13).		
6	Operate T1 key.	BY lamp lights. TM selector starts stepping.

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STEP	ACTION	VERIFICATION
7	Operate T2 key.	
8	Restore T1 key.	BY lamp extinguished, does not relight at expiration of timing interval.
9	Restore T2 key.	
10	Remove patching cords from TST jacks.	
11	Move dummy plug from third TST jack to first TST jack.	
12	Patch second TST jack to T1 jack.	
13	Patch third TST jack to T2 jack.	
14	Repeat Steps 6 through 9, then advance each patching cord by one TST jack in same manner as in Steps 10 through 13 for first shift, continuing in this manner until all TST jacks have been used, making last test using last TST jack and first TST jack.	
15	Remove all dummy plugs (see 1.05).	
16	Remove patching cords from TST, T1, T2 jacks.	

C. Timing, Counting, and Registration

3a	If terminal room registers are provided — Operate TR key.	KP lamp lights.
4	Remove dummy plugs from any two TST jacks.	
5	Patch unplugged TST jacks to T1, T2 jacks.	
	<i>Note:</i> Steps 6 and 7 must be made within one timing interval (see 1.13).	
6	Operate T1 key, start timing with stop watch.	BY lamp lights. TM selector starts stepping.
7	Restore T1 key after any elapsed time within timing interval.	BY lamp extinguished. TM selector continues stepping until end of timing interval, when N, S registers score once.
	<i>Note:</i> Steps 8, 9, and 10 must be made within one timing interval. The following is a typical procedure, assuming 10-second setting of timing circuit. Operate T1; operate momentarily T2 at 2 and 8 seconds of timing interval; restore T1 at 9 or 9.5 seconds of timing interval.	
8	Operate T1 key, start timing with stop watch.	BY lamp lights. TM selector starts stepping.

STEP	ACTION	VERIFICATION
9	Operate momentarily T2 key one or more times during timing interval resulting from previous step. <i>Note:</i> Allow minimum 5 seconds between operations of T2 key.	
10	Restore T1 key at least 0.5 second before end of timing interval.	N register scores once for operation of T1 key plus once for each operation of T2 key. D register does not score. S register scores once. BY lamp extinguished.
	<i>Note:</i> Steps 11 and 12 must be performed within one timing interval, and Step 13 shortly thereafter. The following is a typical procedure, assuming 10-second setting of timing circuit. Operate T1; operate momentarily T2 at 2 and 8 seconds of timing interval; restore T1 key 11.5 or 12 seconds after start of timing interval.	
11	Operate T1 key, start timing with stop watch.	BY lamp lights. TM selector starts stepping.
12	Operate momentarily T2 key one or more times during timing interval resulting from previous step. <i>Note:</i> Allow minimum 5 seconds between operations of T2 key.	
13	Restore T1 key no sooner than 1.5 seconds after end of timing interval.	N, D registers score once for operation of T1 key plus once for each operation of T2 key. S register scores once. BY lamp extinguished.
	<i>Note:</i> Steps 14 and 15 must be performed within one timing interval, and Step 16 shortly thereafter. The following is a typical procedure, assuming 10-second setting of timing circuit. Operate T1 key; operate momentarily T2 key at 1 and 6 seconds of timing interval, and then again when N and D registers start to score.	
14	Operate T1 key, start timing with stop watch.	BY lamp lights. TM selector starts stepping.
15	Operate momentarily T2 key one or more times during timing interval resulting from previous step. <i>Note:</i> Allow minimum 5 seconds between operations of T2 key.	
16	Operate momentarily T2 once again during register scoring activity which follows timing interval, but no sooner than 5 seconds after its last operation in Step 15.	N, D registers score once for operation of T1 key plus once for each operation of T2 key, including one score for T2 operation during register scoring activity. S register scores once. BY lamp extinguished.

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STEP	ACTION	VERIFICATION
17	Restore T1 key.	
18b	If TT key is provided — Change position of TT key.	
19b	Repeat Steps 6 through 17, using new timing interval (see 1.06 and 1.13).	
20b	Restore TT key to original position.	
21a	If terminal room registers are provided — Restore TR key to normal.	KP lamp extinguished.
22a	Repeat Steps 6 through 17, noting register operations in operating room location.	
23	Remove patching cords.	
24	Remove dummy plugs (see 1.05).	

D. Sensitivity Test

1	Insert dummy plug in any TST jack.	
2	Block nonoperated P relay of ATR.	
3	Operate manually SU relay of ATR.	PC selector advances one step.
4	Apply 24- or 48-volt battery, or ground, as required (see 1.12), through testing cord to D, E, or L2 lead of TWA circuit associated with input plugged open in Step 1, at repeated intervals of 1.5 seconds on, 1.5 seconds off. <i>Note:</i> Signals may be conveniently inserted at appropriate terminal of B lamp, in TWA circuit lamp panel, associated with input selected for test. This terminal may be identified as that of pair of A and B lamps having single wire connection, other than strapping wire.	PC selector advances one step for first pulse, does not follow succeeding pulses.
5a	If PC selector follows 1.5 second pulses — Adjust sensitivity of TWA circuit per CD-96497-01.	
6	Repeat Step 4, except that pulse intervals shall be 5 seconds on, 5 seconds off.	PC selector advances one step for each application of test signal.
7b	If PC selector does not follow 5-second pulses — Adjust sensitivity of TWA circuit per CD-96497-01.	
8	Remove blocking tool from P relay of ATR.	ATR advances to time out, restores to normal. TWA reads out, restores to normal.

STEP	ACTION	VERIFICATION
9c	If switching circuit is provided and other groups are to be tested — In operating room — Move group transfer switch to position of next group to be tested.	
10c	Repeat Steps 2 through 9c, until each group is tested.	
11c	Restore group transfer switch to working position.	
12	Remove dummy plug from TST jack.	

E. Input Paths

1	At ATR — Block nonoperated P relay of ATR.	
2	At distributing frame — Apply momentarily 24- or 48-volt battery, or ground, as required (see 1.12), through testing cord to each lamp lead terminal cross connected or switched into ATR.	For each application of potential, pair of A, B lamps associated with lamp lead being tested lights, PC selector advances one step. <i>Note:</i> If two pairs of lamps light in the TWA circuit when the selector steps, repeat test on that terminal.
3	Repeat Step 2 on first terminal tested.	
4	At ATR — Remove blocking tool from P relay.	ATR advances to time out, restores to normal.
5a	If switching circuit is provided and other groups are to be tested — In operating room — Move group transfer switch to position of next group to be tested.	
6a	Repeat Steps 1 through 5a until each group is tested.	
7a	Restore group transfer switch to working position.	

F. Reseizure Prevention

3	Remove dummy plug from any TST jack.	
4	Patch TST jack to T1 jack.	
5	Operate T1 key.	BY lamp lights. TM selector starts stepping.
6	When TM selector reaches terminal 4 — Restore T1 key.	BY lamp extinguished.
7	When TM selector reaches terminal 8 — Operate T1 key.	BY lamp does not relight.

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STEP	ACTION	VERIFICATION
8	Restore T1 key.	
9a	If circuit is arranged for 2-second delay before reseizure prevention becomes effective. Operate T1 key.	BY lamp lights. TM selector starts stepping.
10a	When TM selector reaches terminal 4 — Restore T1 key.	BY lamp extinguished.
11a	When TM selector reaches terminal 6 — Operate T1 key.	BY lamp lights.
12a	Restore T1 key.	BY lamp extinguished. <i>Note:</i> If timing interval ends before T1 key is restored, BY lamp will go out at that time.
13	Remove patching cord.	
14	Remove all dummy plugs.	