

ANSWERING TIME RECORDER (ATR)—PERMANENT TYPE SD-96235-01 EQUIPPED WITH TRAFFIC WEIGHTING APPLIQUE (TWA)

TESTS

1. GENERAL

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

the trunk on panel office trunk guard test signals

(c) AC interference or inductive "kicks" coupled through the observed lamp leads.

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1.02 This section is reissued to clarify procedures in Test A and Test E.

C. Concentrating: This test checks the following features:

(a) That the timing circuit can be seized over each of the inputs to the ATR

(b) That only one line or trunk can be cut through to the timing circuit during a timing interval

(c) That a call cannot be partially timed.

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1.03 The following tests are covered:

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A. 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.

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B. Counting and Storing: This test provides a quick and simple observational 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. 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 disregard false signals resulting from the following conditions:

(a) Improper or undesirable customer action, such as dialing or switchhook flashing while the line or trunk lamp is lighted

(b) Undesirable trunk action, such as momentary preliminary seizure of

D. 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 readout 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 readout refers to the stepping of the RO selector as it transfers the count to message registers.

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E. Input Paths: This test checks the input circuits between the distributing frame pickup points of the lamp leads and the timing and counting

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circuits. It thus constitutes a check of the TST jack contacts of the ATR, the lamp input circuits of the TWA, the grouping relays if the switching circuit is furnished, and the BC relays of the ATR if provided.

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F. Reseizure Prevention: This test checks that the lamp lead supervisory relay is not reoperated. Thus, the answer time determination on the timed call is not interfered with should a timed call be answered and served and the trunk released and reseized during the same timing interval. It also checks that this feature is delayed after the first 2 seconds following the start of ATR timing when the circuit is so arranged (Fig. 20 of ATR provided).

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1.04 Test B 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 timing interval which is obtained by a connection on the TM selector bank of the ATR circuit should be determined for use in Tests C and D. When the switching circuit is used, the timing interval must be determined for each group.

1.06 When time transfer arrangements are provided in the ATR under control of the TT key, Test D 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 Where provided, terminal room registers 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 D 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 D.

1.08 Before performing Test E, the office records should be consulted to determine (for each group if the switching circuit is used) the potential used to light the line or trunk lamps to which the

ATR is connected. This same potential must be used to perform Test E.

1.09 If the switching circuit is furnished, Test E requires action to be performed at the location of the group transfer switch upon completion of testing on each group.

1.10 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.)

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

1.12 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 ground 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.

1.13 Lettered Steps: A letter a, b, c, etc, added to a step number in Part 3 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.

1.14 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

2.01 The apparatus required for each test is shown in Table A. The details for each item are covered in the paragraphs indicated by the numbers enclosed in parentheses.

TABLE A

APPARATUS	TESTS					
	A	B	C	D	E	F
258C Plugs (2.02)	*	—	*	*	—	*
Stopwatch (2.03)	1	—	—	1	—	—
Testing Cord (2.04)	1	—	—	—	1	—
Patching Cord (2.05)	—	—	2	2	—	1
Blocking Tools (2.06)	*	*	—	—	*	—

*As Required

2.02 258C plugs (dummy) or equivalent, as required (maximum 25).

2.03 KS-3008 stopwatch or equivalent.

2.04 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.

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

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

3. METHOD

STEP	ACTION	VERIFICATION
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A. Sensitivity Test

Note: If ATRs are being used to measure CAMA-ONI operator efficiency, the Sensitivity Test need not be performed. All that is required is that the sensitivity potentiometer be adjusted fully clockwise (most sensitive position).

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| 1 | At ATR—
Block P relay nonoperated. | |
| 2 | Manually operate SU relay. | |
| 3a | If requirement of Step 2 is not obtained—
Check CD, SD requirements. | |
| 4 | Insert 258C dummy plug into TST jack of
ATR associated with input under test. | |
| 5 | At TWA—
Connect test lead to D, E, or L2 lead associated
with plugged out input at terminal of
corresponding B lamp. | |

At TWA—
PC selector advances one step.

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STEP	ACTION	VERIFICATION
6	Connect other end of test lead to ground, 24V, 38V, or 48V battery, as required, to simulate an incoming lamp signal in continuous 1 second on, 1 second off sequence.	At TWA— PC selector advanced one step for first application and did not follow succeeding applications of test lead.
7b	If verification of Step 6 is not obtained— Tag make-busy plug associated with input that failed (tag A).	
8b	Connect test lead as described in Steps 5 and 6 and simulate an incoming lamp signal in continuous 1.5 seconds on, 1.5 seconds off sequence.	
9b	Adjust SENS potentiometer counterclockwise (decreasing sensitivity) until the PC selector just fails to step with each on pulse.	
10	Repeat Steps 4 through 6 or 9b for all inputs.	Same as Steps 4 through 6 or 9b.
11	At TWA— Connect test lead to D, E, or L2 lead associated with plugged out input at terminal of corresponding B lamp.	
12	Connect other end of test lead to ground, 24V, 38V, or 48V battery, as required, to simulate an incoming lamp signal in continuous 5 seconds on, 5 seconds off sequence.	At TWA— PC selector advanced one step for each application of test signal.
13c	If Steps 7b through 9b were not performed— Adjust SENS potentiometer slowly clockwise (increasing sensitivity) until the PC selector just steps with each on pulse.	
14c	If requirement of Step 12 is not obtained— Tag make-busy plug associated with input that failed (tag B).	Same as Steps 11 through 13c.
15d	If more than five inputs were tagged B— Replace A and B lamps associated with last input tagged A.	
16e	If less than five inputs were tagged B— Replace A and B lamps associated with inputs tagged B.	
17	Repeat Test A beginning at Step 6.	
18	Remove dummy plug from TST jack.	

STEP	ACTION	VERIFICATION
B. Counting and Storing		
1	With all selector switches at rest— At ATR— Block P relay nonoperated.	
2	At TWA and lamp panel— Observe lamp panel and PC selector of TWA until sufficient call signals have been received to verify proper operation.	PC selector advances one terminal each time a pair of A and B lamps is lighted due to seizure of associated trunk; never advances without simultaneous lighting of a 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	At ATR— Remove blocking tool from P relay.	At TWA— RO selector advances until it reaches terminal numbered same as that on which PC selector is standing.
C. Concentrating		
1	Operate or restore BG key, as required. (See paragraph 1.12.)	
2	Insert 258C dummy plugs into all TST jacks of ATR.	
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.	
	Note: Steps 6, 7, and 8 must be made within one timing interval. (See paragraph 1.05.)	
6	Operate T1 key.	BY lamp lighted.
7	Operate T2 key.	
8	Restore T1 key.	BY lamp extinguished. BY lamp does not relight at expiration of timing interval.
9	Restore T2 key.	
10	Remove patching cords from TST jacks.	

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STEP	ACTION	VERIFICATION
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.	
16	Remove patching cords from TST, T1, T2 jacks.	
D. Timing, Counting, and Registration		
1	Operate or restore BG key, as required. (See paragraph 1.12.)	
2	Insert 258C dummy plugs into all TST jacks of ATR.	
3a	If terminal room registers are provided— Operate TR key.	KP lamp lighted.
4	Remove dummy plugs from any two TST jacks.	
5	Patch unplugged TST jacks to T1, T2 jacks.	
	Note: Steps 6 and 7 must be made within one timing interval. (See paragraph 1.05.)	
6	Operate T1 key; start timing.	BY lamp lighted. 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.
8	Reset stopwatch.	
	Note: Steps 9, 10, and 11 must be made within one timing interval. The following is a typical procedure, assuming 10-second setting of timing circuit. Operate T1; operate T2	

STEP	ACTION	VERIFICATION
	momentarily at 2 and 8 seconds of timing interval; and restore T1 at 9 or 9.5 seconds of timing interval.	
9	Operate T1 key; <i>start timing</i> .	BY lamp lighted. TM selector starts stepping.
10	Momentarily operate T2 key one or more times during timing interval resulting from previous step. <i>Note:</i> Allow 5 seconds minimum between operations of T2 key. With 5-second setting of timing circuit, operate T2 key only once.	
11	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.
12	Reset stopwatch. <i>Note:</i> Steps 13 and 14 must be performed within one timing interval and Step 15 shortly thereafter. The following is a typical procedure, assuming 10-second setting of timing circuit. Operate T1; operate T2 momentarily at 2 and 8 seconds of timing interval; restore T1 key 11.5 or 12 seconds after start of timing interval.	
13	Operate T1 key; <i>start timing</i> .	BY lamp lighted. TM selector starts stepping.
14	Momentarily operate T2 key one or more times during timing interval resulting from previous step. <i>Note:</i> Allow 5 seconds minimum between operation of T2 key. With 5-second setting of timing circuit, operate T2 key only once.	
15	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.
16	Reset stopwatch. <i>Note:</i> Steps 17 and 18 must be performed within one timing interval and Step 19 shortly thereafter. The following is a typical procedure,	

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STEP	ACTION	VERIFICATION
	<p>assuming 10-second setting of timing circuit. Operate T1 key; operate T2 key momentarily at 1 and 6 seconds of timing interval; operate T2 key again when N and D registers start to score.</p>	
17	Operate T1 key; <i>start timing</i> .	BY lamp lighted. TM selector starts stepping.
18	Momentarily operate T2 key one or more times during timing interval resulting from previous step.	
	<p><i>Note:</i> Allow 5 seconds minimum between operations of T2 key. With 5-second setting of timing circuit, operate T2 key only once.</p>	
19b	<p>If testing ATR SD-96235-01, Fig. 20, equipped with TWA circuit— Momentarily operate T2 key once again during register scoring activity which follows timing interval but no sooner than 5 seconds after its last operation in Step 18.</p> <p><i>Note:</i> With 5-second setting of timing circuit, allow a minimum of 3 seconds between successive T2 operations.</p>	<p>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.</p>
20	Restore T1 key.	
21	Reset stopwatch.	
22c	<p>If TT key is provided— Change position of TT key.</p>	
23c	<p>Repeat Steps 6 through 21 using new timing interval. (See paragraphs 1.05 and 1.06.)</p>	
24c	Restore TT key to original position.	
25a	<p>If terminal room registers are provided— Restore TR key to normal.</p>	KP lamp extinguished.
26a	Repeat Steps 6 through 21 noting register operations in operating room location.	
27	Remove patching cords.	
28	Remove dummy plugs.	

STEP	ACTION	VERIFICATION
E. Input Paths		
1	At ATR— Block P relay nonoperated.	
2	At distributing frame— Apply required potential momentarily. (see paragraph 1.08) 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 lighted. PC selector advances one step with first application of potential only.
Note: If two pairs of lamps lighted in the TWA circuit when the selector stepped, repeat test on that terminal.		
3	Repeat Step 2 on first terminal tested.	
4	At ATR— Remove blocking tool from P relay.	ATR advanced to time-out; then restored 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 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		
1	Operate or restore BG key, as required. (See paragraph 1.12.)	
2	Insert 258C dummy plugs into all TST jacks of ATR.	
3	Remove dummy plug from any TST jack.	
4	Patch TST jack to T1 jack.	
5	Operate T1 key.	BY lamp lighted. 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 lighted. 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 lighted.
12a	Restore T1 key.	BY lamp extinguished.
		Note: If timing interval ends before T1 key is restored, BY lamp will be extinguished at that time.
13	Remove patching cord.	
14	Remove all dummy plugs.	