

**TRAFFIC USAGE RECORDER (TUR) SD-95738-01
AND OPTIONAL AUXILIARY SCANNER UNIT
(FAST SCAN UNIT)
TESTS**

1. GENERAL	PAGE
<p>1.01 This section describes a method of making operational tests of the traffic usage recorder (TUR) SD-95738-01 and optional auxiliary scanner unit (fast scan unit).</p> <p>1.02 This section is reissued for the following reasons:</p> <p style="margin-left: 20px;">(a) Transfer to Section 252-122-502 all tests involving continuity checks, verification of assignments, and cross-connections. The tests involved are Tests A, B, E, H, I, J, N, and Q.</p> <p style="margin-left: 20px;">(b) Revise Tests D, R, V, and W.</p> <p style="margin-left: 20px;">(c) Revise apparatus Table A and Part 2.</p> <p style="margin-left: 20px;">(d) Generally update the section.</p> <p>Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted. This reissue affects the Equipment Test List.</p> <p>1.03 The following tests are covered.</p>	<p>(2) Quarter-hour, half-hour, and 1-hour photograph of registers. 5</p> <p>D. Trouble Alarms: This test checks the alarm features of the TUR frame. 10</p> <p>E. Deleted</p> <p>F. Test of Steering Controls: This test checks the proper operation of the switch, select magnet, and hold magnet steering circuits. 12</p> <p>G. Miscellaneous Tests: This test checks:</p> <p style="margin-left: 20px;">(1) Idle trunk test feature in No. 4 Crossbar Systems</p> <p style="margin-left: 20px;">(2) Detector group usage feature. 14</p> <p>H. Deleted</p> <p>I. Deleted</p> <p>J. Deleted</p> <p>K. Automatic Cross Detection: This test checks that the automatic cross detection feature is functioning properly. 15</p> <p>L. Auxiliary Measuring Circuit-Operation Test: This test checks that the auxiliary measuring circuit is functioning properly. 16</p>
<p style="margin-left: 20px;">A. Deleted</p> <p style="margin-left: 20px;">B. Deleted</p> <p style="margin-left: 20px;">C. Camera Control, Cycle Timing, and Cycle Count: This test checks:</p> <p style="margin-left: 40px;">(1) Duration of one scanning cycle.</p>	<p style="text-align: center;">PAGE</p>

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	PAGE	PAGE
M. Response Test of Remote Control Program Receiver Unit: This test checks that the remote control receiver and circuit will correctly respond to the timed pulses of scan, turn-on, and reset.	17	
N. Deleted		
O. Verification of Traffic Data Recording System (TDRS) Traffic Data Converter Identity Code: This test checks that the proper identity code is outpulsed.	20	
P. EADAS TDC TUR Control: This test checks the ability of the EADAS traffic data converter (TDC) to generate control commands and checks that the command generated performs its required task.	24	
Q. Deleted		
R. Auxiliary Fast Scan Feature: This test checks the operation of the auxiliary fast scan feature which allows for a separate scanning unit of the TUR to handle fast scan inputs.	25	
S. Limited Scan Feature: This test checks the operation of the limited scan feature.	26	
T. Alternate Scan Feature: This test checks the operation of the alternate scan feature for the following: (a) Paired TUR frames not associated with the TDRS or the auxiliary scanner unit. (b) A single TUR not equipped with the auxiliary scanner unit. (c) Paired TUR frames associated with the TDRS or remote recorder.	27	
U. Detector Test of the Auxiliary Scanner Unit: This test verifies the detectors and the detector test circuitry.	29	
V. Timing Test (Auxiliary Scanner Unit): This test verifies that the TMFS timer provides the proper time delay, that the SQ ₁ relays operate in sequence, and that the reed relays are operating within the proper time interval.		30
W. PG Relay Timing Test: This test checks the timing requirements of the 4A TUR frame.		33
	1.04	For Test M, the summarizer should not seize control of the TUR.
	1.05	Test M is intended for use with either the Traffic Data Recording System or the Engineering Administrative Data Acquisition System <i>not</i> arranged for individual circuit usage recording applications.
	1.06	For Test P, it is important that consideration be given to the data which is blocked while the EADAS TDC is being tested. The maintenance personnel at the EADAS central unit (CU) location should be informed of any testing which is done at the TDC location prior to beginning tests.
	1.07	The tests of this section should not be performed until the TUR has been released by the Traffic Department.
	1.08	Local instructions should be followed with reference to recording any register operations caused by performing these tests.
	1.09	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 details of each item

are covered in the paragraph indicated by the number in parentheses.

- 2.02** KS-19353, L1 or L4, oscillator (calibrate and operate in accordance with Section 103-302-100 or 103-302-105, respectively).
- 2.03** Test set for timing tests (timing test set) SD-25707-01 (J24753A).
- 2.04** Traffic data converter test set (TDC test set) SD-99313-01 (J94734).
- 2.05** Pulse checking test set SD-96362-01 (J94723A). Calibrate and operate in accordance with Section 100-234-101.
- 2.06** KS-14510 portable volt-ohm-milliammeter (or equivalent).
- 2.07** Tektronix 545 oscilloscope equipped with type C-A dual trace plug-in unit.
- 2.08** Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B) and two KS-6278 connecting clips.
- 2.09** Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord) and two 419A tools.
- 2.10** Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord), one 360A tool equipped with a KS-6278 connecting clip, and the other 360A tool equipped with a 419A tool.
- 2.11** Testing cord, W2W cord, 6 feet long, equipped with one 310 plug, one 360B tool, and one 360C tool (2W17A), both 360 tools equipped with two 419A tools.
- 2.12** Testing cord, W3M cord, 6 feet long, equipped with one 310 plug, one 360A tool, one 360B tool, and one 360C tool (3W4A cord) each 360-type tool equipped with a 419A tool.
- 2.13** Patching cord, P1Y cord, 1 foot long, equipped with two 360A tools.
- 2.14** Patching cord, P3K cord, 6 feet long, equipped with two 310 plugs (3P15A cord).
- 2.15** Testing cord, W1W cord, 12 feet long, equipped with one 310 plug.
- 2.16** 365 tool used with 360 tools of P1Y cord.
- 2.17** KS-6278 connecting clip used with 1W13B cord.
- 2.18** 419A tool used in conjunction with 1W13B cord and 2W17A cord.

TABLE A

APPARATUS	C	D	F	G	K	L	M	O	P	R	S	T	U	V	W
Oscillator (2.02)							1								
Test Set (2.03)							1								
Test Set (2.04)								1							
Test Set (2.05)															1
VOM (2.06)											1				
Oscilloscope (2.07)							1							1	
32A (remote control) Test Set			1												
KS-3008 Stopwatch (or equivalent)	1							1	1	1		1			
Testing Cord (2.08)				1											
Testing Cord (2.09)					1										
Testing Cord (2.10)	1					2									
Testing Cord (2.11)							1								
Testing Cord (2.12)							1								
Testing Cord (2.13)														1	
Testing Cord (2.14)															1
Testing Cord (2.15)															1
365 Tool (2.16)														2	
KS-6278 Connecting Clip (2.17)	1			2		2									
419A Tool (2.18)	1				2	2	5								
Blocking & Insulating Tools	√	√		√			√			√	√	√	√	√	√

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.

4. METHOD

STEP	ACTION	VERIFICATION
A. Deleted		
B. Deleted		
C. Camera Control, Cycle Timing, and Cycle Count		
1	At control panel— Note position of all keys and switches.	
2	Restore all keys and switches to normal.	
3	At control panel— Operate RG1 key or set RG switch to RG1 position for frame 0.	
4	Operate MAN-AUTO key to MAN; <i>start timing.</i>	At control panel— ON lamp lighted. CS timer motor operated. Approximately 98 to 100 seconds after operation of MAN key— CYC message register at control panel operates. 98 to 100 seconds later— CYC message register at control panel operates again. When paired frame operation is provided— At second TUR frame of pair— Frame scans for approximately 98 to 100 seconds. After 100-second scan period— At control panel— CYC register at control panel operates again.
5	After CYC registration— Operate STOP key.	READ lamp lighted. When scanning cycle completed— READ lamp extinguished.
6	When READ lamp is extinguished— Restore MAN key.	ON lamp extinguished.

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STEP	ACTION	VERIFICATION
7	Restore all keys and switches to position noted in Step 1.	
8	At frame 0— Block operated CT relay; <i>start timing</i> .	Between 5 and 7 seconds after CT relay is operated— CT1 relay operates.
9	Remove block from CT relay.	Approximately 100 seconds after CT relay is operated— CT and CT1 relays release.
10	Using 1W13B cord, connect ground to 9B of ON relay.	
11	For each condition in column 1 of Table B— Perform corresponding action specified in column 2. Apply each condition in succession starting with condition 1.	Proper relays operate and release for each condition as specified in column 3 of Table B.
12a	If cameras are provided— At control panel— Operate 1/4 HR key.	
13a	Operate RG1 key or set RG switch to RG1 position.	
14a	Operate MAN key; <i>start timing</i> .	96 to 98 seconds after MAN key is operated— Lights flash in camera.
15a	Operate STOP key.	READ lamp lighted. When cycle is completed— READ lamp extinguished.
16a	When READ lamp is extinguished— Restore MAN key.	
17a	Restore 1/4 HR and STOP keys and RG1 key or RG switch.	
18a	Repeat Step 11.	
19a	At control panel— Operate 1/2 HR key.	
20a	Repeat Steps 13a through 16a.	
21a	Restore 1/2 HR and STOP keys and RG1 key or RG switch.	
22a	Repeat Step 11.	

STEP	ACTION	VERIFICATION
23a	At control panel— Operate 1 HR key.	
24a	Repeat Steps 13a through 16a.	
25a	Restore 1 HR and STOP keys and RG1 key or RG switch.	
26b	If cameras are not provided— For each condition in column 1 of Table C— Perform corresponding action specified in column 2. Apply each condition in succession, starting with condition 1.	Proper relays operate and release for each condition specified in column 3 of Table C.
27	Remove ground from 9B of ON relay.	
28	Restore all keys and switches to position noted in Step 1.	
29c	If register grouping is provided— Operate RG_ keys or set RG switches and repeat in turn Steps 4 through 7 for each equipped register group.	

TABLE B

COLUMN 1 TEST CONDITION	COLUMN 2 GROUND AT 1T CT3	COLUMN 3 RELAYS
1	ON	W OPERATED
2	OFF	Z, A, ASA OPERATED
3	ON	W RELEASED
4	OFF	Z, ASA RELEASED
5	ON	W, B OPERATED
6	OFF	Z, ASA OPERATED
7	ON	W RELEASED
8	OFF	Z, A, ASA RELEASED
9	ON	W, C OPERATED
10	OFF	Z, ASA OPERATED
11	ON	W, B RELEASED
12	OFF	Z, ASA RELEASED
13	ON	W OPERATED
14	OFF	Z, A, ASA OPERATED
15	ON	W RELEASED
16	OFF	Z, ASA RELEASED
17	ON	W, B OPERATED
18	OFF	Z, D, ASA OPERATED
19	ON	W RELEASED
20	OFF	Z, A, ASA RELEASED
21	ON	W OPERATED
22	OFF	Z, ASA OPERATED
23	ON	W, B RELEASED
24	OFF	Z, ASA RELEASED
25	ON	W OPERATED
26	OFF	Z, A, ASA OPERATED C RELEASED
27	ON	W RELEASED
28	OFF	Z, ASA RELEASED
29	ON	W, B OPERATED
30	OFF	Z, ASA OPERATED
31	ON	W RELEASED
32	OFF	Z, A, ASA RELEASED
33	ON	W OPERATED
34	OFF	Z, ASA OPERATED

TABLE C

COLUMN 1 TEST CONDITION	COLUMN 2 GROUND AT 1T CT3	COLUMN 3 RELAYS
1	ON	E OPERATED W, B RELEASED
2	OFF	F OPERATED Z, D, ASA RELEASED
3	ON	W OPERATED
4	OFF	Z, A, ASA OPERATED
5	ON	W RELEASED
6	OFF	Z, ASA RELEASED
7	ON	W, B OPERATED
8	OFF	Z, ASA OPERATED
9	ON	W RELEASED
10	OFF	Z, A, ASA RELEASED
11	ON	W, C OPERATED
12	OFF	Z, ASA OPERATED
13	ON	W, B RELEASED
14	OFF	Z, ASA RELEASED
15	ON	W OPERATED
16	OFF	Z, A, ASA OPERATED
17	ON	W RELEASED
18	OFF	Z, ASA RELEASED
19	ON	W, B OPERATED
20	OFF	Z, D, ASA OPERATED
21	ON	W RELEASED
22	OFF	Z, A, ASA RELEASED
23	ON	W OPERATED
24	OFF	Z, ASA OPERATED
25	ON	W, B RELEASED
26	OFF	Z, ASA RELEASED
27	ON	W OPERATED
28	OFF	Z, A, ASA OPERATED C RELEASED
29	ON	W RELEASED
30	OFF	Z, ASA RELEASED
31	ON	W, B OPERATED
32	OFF	Z, ASA OPERATED
33	ON	W RELEASED
34	OFF	Z, A, ASA RELEASED
35	ON	W OPERATED
36	OFF	Z, ASA OPERATED
37	ON	W, E RELEASED
38	OFF	Z, D, F, ASA RELEASED

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STEP	ACTION	VERIFICATION
D. Trouble Alarms		
With Frames Scanning Together		
1	At TUR frame 0— Block MSC relay operated.	
2	Block ON relay operated.	
3	At TUR frame under test— Block IS and SC1 relays operated.	At control panel— TBL lamp lighted. At TUR frame under test— TBL lamp lighted. When provided with option ZJ— TBL-FA or TBL lamp lighted. Minor alarm sounded. When provided with option ZF— Scanning ceased on frame under test. When provided with option ZE— Scanning ceased on all frames of TUR group.
4	Remove blocks from IS and SC1 relays.	
5a	If provided with ZE wiring option— Momentarily operate AR key.	TBL lamp on TUR frame extinguished. Minor alarm silenced. If provided with ZJ wiring option— TBL-FA or TBL lamp on first frame extinguished.
6a	At control panel— Momentarily restore AUTO or MAN key.	At control panel— TBL lamp extinguished.
7b	If provided with ZF wiring option— Momentarily operate AR key.	TBL lamp on TUR frame extinguished. Minor alarm silenced. If provided with ZJ wiring option— TBL-FA or TBL lamp on first frame extinguished. At control panel— TBL lamp remains lighted. At TUR frame— ARG lamp lighted.
8b	At TUR frame 0— Block CT1 and SPC relays operated in order named.	
9b	Remove block from CT1 and SPC relays in order named.	ARG lamp extinguished. At control panel— TBL lamp extinguished.
10b	Remove block from ON relay.	
11	Remove block from MSC relay.	

STEP	ACTION	VERIFICATION
12c	If other frames are to be tested— Repeat Steps 1 through 11 for all equipped frames to be tested.	
13	Momentarily restore AUTO or MAN key.	
With Frames Scanning Alternately		
14	At TUR frame 0— Block MSC relay operated.	
15	Block ON relay operated.	
16	At TUR frame under test— Block IS and SC1 relays operated.	At control panel— TBL lamp lighted. At TUR frame under test— TBL lamp lighted. When provided with option ZJ— TBL-FA or TBL lamp lighted. Minor alarm sounds. When provided with option ZF— Scanning ceased on frame under test. When provided with option ZE— Scanning ceased on all frames of TUR group.
17	Remove blocks from IS and SC1 relays.	
18a	If provided with ZE wiring option— Momentarily operate AR key.	TBL lamp on TUR frame extinguished. Minor alarm silenced. When provided with ZJ wiring option— TBL-FA or TBL lamp on first frame extinguished.
19a	At control panel— Momentarily restore AUTO or MAN key.	At control panel— TBL lamp extinguished.
20b	If provided with ZF wiring option— Momentarily operate AR key.	TBL lamp on TUR frame extinguished. Minor alarm silenced. When provided with ZJ wiring option— TBL-FA or TBL lamp on first frame extinguished. At control panel— TBL lamp remains lighted. At TUR frame— ARG lamp lighted.
21	At frame 0— (To test frame 1) Block IS relay operated.	
22	At frame under test— Block SC1 relay operated.	

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STEP	ACTION	VERIFICATION
23	At frame 0— Block AS relay operated.	At control panel— TBL lamp lighted. At TUR frame under test— TBL lamp lighted. When provided with option ZJ— TBL-FA or TBL lamp lighted. Minor alarm sounded. When provided with option ZF— Scanning ceased on frame under test. When provided with option ZE— Scanning ceased on all frames of TUR group.
24	Remove blocks from IS and SC1 relays.	
25a	If provided with ZE wiring option— Momentarily operate AR key.	TBL lamp on TUR frame extinguished. Minor alarm silenced. If provided with ZJ wiring option— TBL-FA or TBL lamp on first frame extinguished.
26a	At control panel— Momentarily restore AUTO or MAN key.	At control panel— TBL lamp extinguished.
27b	If provided with ZF wiring option— Momentarily operate AR key.	TBL lamp on TUR frame extinguished. Minor alarm silenced. When provided with ZJ wiring option— TBL-FA or TBL lamp on first frame extinguished. At control panel— TBL lamp remains lighted. At TUR frame— ARG lamp lighted.
28	Remove block from MSC relay.	
29c	If other paired frames are to be tested— Repeat Steps 14 through 28.	
30	Momentarily restore AUTO or MAN key.	

E. Deleted

F. Test of Steering Controls

1	Operate and lock white button of 32A test set.	
2	At TUR frame— Insert plug of 32A test set into TST jack.	Select magnets 0 on scan and register switches operate. At control panel— TBL lamp lighted.
3	Step circuit (one operation of red button) by means of 32A test set to close crosspoint 000	Hold magnets 0 on scan and register switch 0 operate.

STEP	ACTION	VERIFICATION
	(switch number, horizontal number, vertical number).	
	Note 1: Each crosspoint on the scan and register switches is assigned a 3-digit number derived as follows:	
	Note 2: The frame can be advanced step by step by operating the red button on the 32A test set, one operation per step.	
4	Step circuit (one operation of red button) to close crosspoint 001.	Hold magnets 0 release and hold magnets 1 operate on scan and register switch 0.
5	Repeat Step 4 for crosspoints 002 through 009.	Hold magnets 2 through 9 operate and release on scan and register switch 0.
6	Step circuit (two operations of red button) to crosspoint 010.	On scan and register switch 0— Select magnets 0 release, select magnets 1 operate, hold magnets 0 operate.
7	Repeat Steps 2 and 3 for crosspoints 011 through 099.	Proper select and hold magnets operate and release.
8	Step circuit (two operations of red button) to crosspoint 100.	On scan and register switch 1— Select magnets 0 and hold magnets 0 operate.
9	Repeat Steps 3 through 6 for crosspoints 101 through 199.	Proper select and hold magnets operate and release.
10	Repeat Steps 1 through 7 for crosspoints 200 through 599.	Proper select and hold magnets operate and release.
11	Operate red button once.	TUR frame does not advance to 000.
12	Remove and insert plug of 32A test set from TST jack.	At control panel— TBL lamp extinguished while plug is removed.
13	Operate red button once.	TUR frame advanced to 000.
14	Remove plug of 32A test set from TST jack.	At control panel— TBL lamp extinguished.

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STEP	ACTION	VERIFICATION
G. Miscellaneous Tests		
1a	If T_ relays are provided— Operate ITT key.	
2a	Block operated LP and LP1 relays.	
3a	One at a time and in turn, for each T_ relay specified in column 1 of Table D— Connect battery or ground of column 2 to DA— terminal of column 3.	Proper D_ or DA_ lamp lighted as shown in column 4 of Table D.
4a	Remove block from LP and LP1 relays.	
5a	Restore ITT key to normal.	
6b	If detector group usage feature is provided— From office records determine DR_ terminals that are cross-connected to A, B, or DGU_ terminals and traffic registers.	
7c	If DR_ terminal is cross-connected to DGU_ terminals— Momentarily connect ground in turn to each D_ or DA_ terminal having a correspondingly numbered DR_ terminal cross-connected.	Proper DGU_ register operates and all other DGU_ registers do not operate.
8d	If DUA_ and DUB_ terminals cross-connect to DGU_ terminals— Momentarily connect ground in turn to each D_ or DA_ terminal having a correspondingly numbered DUA_ or DUB_ terminal cross-connected.	Proper DGU_ register operates and all other DGU_ registers do not operate.
9d	Repeat Step 8d with DGU_ relay blocked operated.	Proper DGU_ register operates and all other DGU_ registers do not operate.
10e	If DR_ terminal cross-connects to A terminal— Connect ground to each D_ or DA_ terminal having a correspondingly numbered DR_ terminal cross-connected.	
11e	One at a time and in turn, manually operate and release each HMC_ relay.	Proper DGU_ register operates once for each A terminal cross-connected.
12e	Remove ground connected in Step 10e.	
13f	If DR_ terminal cross-connects to B terminal— Connect ground to each D_ or DA_ terminal having a correspondingly numbered DR_ terminal cross-connected.	

STEP	ACTION	VERIFICATION
14f	One at a time and in turn, manually operate and release each HMC_ relay.	Proper DGU_ register operates once for each B terminal cross-connected.
15f	Remove ground connected in Step 13f.	

TABLE D

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
T-RELAY	CONNECT TO TERM. DA-	TERM. DA-	DO TO D5 DA6 TO DA11 LAMP LIGHTED
T0	-48V	0	D0
T1	-48V	1	D1
T2	-48V	2	D2
T3	-48V	3	D3
T4	-48V	4	D4
T5	-48V	5	D5
TA6	GRD	6	DA6
TA7	GRD	7	DA7
TA8	GRD	8	DA8
TA9	GRD	9	DA9
TA10	GRD	10	DA10
TA11	GRD	11	DA11

H. Deleted

I. Deleted

J. Deleted

K. Automatic Cross Detection

- 1 At control panel—
Note position of all keys and switches.
- 2 Restore all keys and switches to normal.
- 3 At TUR frame 0—
Using testing cord, connect R00 punching to R10 punching (associated with register switch 0).
- 4 At control panel—
Operate RG1 key or set RG switch to RG1 position.
- 5 Operate MAN key. At control panel—
ON lamp lighted.

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STEP	ACTION	VERIFICATION
		When one cycle of scanning is completed— TBL lamp lighted. At TUR frame 0— TBL-FA and XV lamps lighted. Minor alarm sounds.
6	At TUR frame 0— Remove testing cord.	
7	At control panel— Restore all keys and switches to normal.	
8	At TUR frame 0— Momentarily operate AR key.	All lamps extinguished. Minor alarm silenced.
9	Repeat Steps 3 through 8 for remaining TUR frames.	
 L. Auxiliary Measuring Circuit-Operation Test		
1	At control panel— Note position of all keys and switches.	
2	Restore all keys and switches to normal.	
3	From office records obtain the predetermined number N for which the CT0-5 selectors have been strapped.	
4	At traffic register bay— Record readings of usage register associated with auxiliary measuring circuit.	
5	At the auxiliary measuring circuit— Connect ground to punching 44.	
6	Momentarily connect ground to punching 37 N times in succession.	
7	Momentarily connect ground to punching 35.	At traffic register bay— Proper usage register operates one time.
8	Repeat Steps 6 and 7, respectively, for punchings 47 and 45, 18 and 16, 28 and 26, 38 and 36, and 48 and 46.	
9	Remove ground from punching 44.	At auxiliary measuring circuit— All selectors return to their normal position.

STEP	ACTION	VERIFICATION
M. Response Test of Remote Control Program Receiver Unit		
1	At control panel— Note position of all keys and switches.	
2	Restore all keys and switches to normal.	
3	At oscillator— Ascertain POWER switch is set to OFF.	
4	Set FUNCTION switch to 600.	
5	Set FREQ RANGE switch to X10.	
6	Rotate FREQUENCY VERNIER control to OUT.	
7	Rotate FREQUENCY CPS control to 260.	
8	Set OUTPUT LEVEL control to -26 DBM.	
9	Adjust OUTPUT VERNIER control to its approximate midpoint.	
10	Using 2W17A cord, connect 310 plug to OUTPUT jack.	
11	Operate POWER switch to ON.	
12a	If 2-wire facility provided— At terminal strip B of receiver unit— Using 2W17A cord, connect 419A tool attached to 360C (white) tool to terminal 21 and connect 419A tool attached to 360B (black) tool to terminal 22.	
13b	If 4-wire facility provided— At terminal strip B of receiver unit— Using 2W17A cord, connect 419A tool attached to 360C (white) tool to terminal 13 and connect 419A tool attached to 360B (black) tool to terminal 14.	
14c	If PD relay is operated at remote control circuit— At remote control signal receiver— Rotate SS potentiometer counterclockwise until PD relay releases.	At remote control circuit— PD relay released.

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STEP	ACTION	VERIFICATION
15c	At remote control signal receiver— Rotate SS potentiometer clockwise until PD relay just operates.	At remote control circuit— PD relay just operated.
16d	If PD relay is not operated at remote control circuit— At remote control signal receiver— Rotate SS potentiometer clockwise until PD relay just operates.	At remote control circuit— PD relay just operated.
17	Disconnect 2W17A cord from oscillator and receiver unit.	PD relay released.
18	At timing test set— Operate SEND key to MK.	
19	Set REC switch to START →OC, STOP →48V.	
20	Set MIL SEC switch to 0-500.	
21	Using 3W4A cord, connect 310 plug to TST1 jack.	
22	At receiver unit— Insulate contact 12 of TM2 relay.	
23	Using 3W4A cord, connect 419A tools attached to 360A (red), 360C (white), and 360B (black) tools to contacts 1, 4 of TM relay and terminal 7 of TM timer, respectively.	
24	Block operated PD relay.	At timing test set— Meter indicates 90 to 110 ms.
25	Remove blocking tool from PD relay.	
26	Remove insulation from contact 12 of TM2 relay.	
27	Move 419A tools from contacts 1, 4 of TM relay to contact 2L of TM1 relay and contact 6 of TM relay, respectively.	
28	At timing test set— Set MIL SEC switch to 0-5000.	
29	Block operated PD relay.	At timing test set— Meter indicates 1000 to 1350 ms.
30	Remove blocking tool from PD relay.	

STEP	ACTION	VERIFICATION
31	Move 419A tools from contact 2L of TM1 relay and contact 6 of TM relay to contact 2U of TM2 relay and contact 9 of TM2 relay, respectively.	
32	Block operated PD relay.	At timing test set— Meter indicates 2400 to 3000 ms.
33	Remove blocking tool from PD relay.	
34	Disconnect 3W4A cord from test set and receiver unit.	
35	Manually operate PD relay for approximately 1 to 2 seconds.	At receiver unit— TM1 relay operates and releases. W1, Z1 relays operated. At control TUR frame— ON relay operated. At control panel— ON lamp lighted. At control TUR frame— CT, CTC relays operated. After 98 seconds— CT, CTC relays released. CT3 relay operates.
36	After CT3 relay operates— At receiver unit— Momentarily operate PD relay for less than 1 second.	At receiver unit— XR relay operated. PTA, PTB relays operate and release. At control TUR frame— MSC relay operates and releases. CT, CTC relays operate. After 98 seconds— CT, CTC relays release. If paired frame operation provided— At first TUR frame of pair— AS relay operates.
37e	If paired frame operation provided— After AS relay of pair operates— At receiver unit— Momentarily operate PD relay for less than 1 second.	At receiver unit— PTA, PTB relays operate and release. At control TUR frame— MSC relay operates and releases. CT, CTC relays operate. At second TUR frame of pair— Frame scans for 98 seconds. After 98-second scan period— At first TUR frame of pair— AS relay releases. At control TUR frame— CT, CTC relays release.

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STEP	ACTION	VERIFICATION
		Note: All nonpaired frames will scan when either the first or second frame of a pair scans.
38	After CT, CTC relays release— At receiver unit— Manually operate PD relay for more than 3 seconds.	At receiver unit— TM1, TM2 relays operate and release. W1, Z1 relays release.
39	Manually operate PD relay for less than 1 second.	At control panel— TST lamp lights. At TUR frame— DTA, DTB relays operate.
40	Repeat Steps 35, 36, and 38.	When paired frame operation provided— The second frame automatically scans after the first frame finishes.
41	Restore all keys and switches on control panel to position noted in Step 1.	

N. Deleted

O. Verification of TDRS Traffic Data Converter Identity Code

- 1 At TDC test set—
Connect test set red (-48 volt) lead to test battery.
- 2 Connect test set black (GRD) lead to frame ground on the converter.
- 3 Operate BS 0 through 10 keys for identity code assigned to converter according to Table E.

Note: Each TUR converter associated with the same summarizer is assigned a separate identity number. Each identity number is assigned a specific converter G terminal. This specific G terminal assignment allows a unique identity code to be sent to the summarizer. Table E gives the following information.

(a) Identify Number—a complete list of identity numbers 0 through 79

(b) TUR G Terminal—a complete list of each G terminal assignment for each identity number

STEP	ACTION	VERIFICATION
	(c) Operate Test Set BS_ Keys—a list of BS_keys which must be operated to test each identity number.	
4	At receiver unit— Manually operate PD relay for more than 3 seconds.	TUR is off.
5	At TUR frame— Connect test set gray TST cable to TST jack on converter.	Each 100 seconds— At TDC test set— Register scores.
6a	If paired frame operation using two converters provided— After register scores— At first TUR frame of pair— Disconnect test set gray TST cable and connect to TST jack on converter of second TUR frame of pair.	
7a	After register scores— At second TUR frame of pair— Disconnect test set gray TST cable and connect to TST jack on converter of first TUR frame of pair.	Each 100 seconds— At TDC test set— Register scores.
8	After register scores— At receiver unit— Manually operate PD relay for approximately 1 to 2 seconds.	TUR is on.
9	After 100 seconds— At receiver unit— Manually operate PD relay for less than 1 second.	At TDC test set— Register scores and TUR frame starts to scan.
10a	If paired frame operation using two converters provided— After register scores and first frame of pair completes scan— At first TUR frame of pair— Disconnect test set gray TST cable and connect to TST jack on converter of second TUR frame of pair.	
11b	If paired frame operation provided— After register scores— At receiver unit— Manually operate PD relay for less than 1 second.	At TDC test set— Register scores and second TUR frame of pair scans.

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STEP	ACTION	VERIFICATION
12	After register scores and second TUR frame of pair completes scan— At receiver unit— Manually operate PD relay for more than 3 seconds.	
13	Disconnect TDC test set. <i>Note:</i> Disconnect battery first.	

TABLE E

IDENTITY NUMBER	TUR G TERM	OPERATE TEST SET BS- KEYS	IDENTITY NUMBER	TUR G TERM	OPERATE TEST SET BS- KEYS
0	1023	9, 10	32	797	0, 1, 4, 7, 9, 10
1	783	3, 7, 9, 10	33	1005	0, 1, 3, 4, 9, 10
2	799	4, 7, 9, 10	34	829	0, 1, 5, 7, 9, 10
3	1007	3, 4, 9, 10	35	973	0, 1, 3, 5, 9, 10
4	831	5, 7, 9, 10	36	989	0, 1, 4, 5, 9, 10
5	975	3, 5, 9, 10	37	813	0, 1, 3, 4, 5, 7, 9, 10
6	991	4, 5, 9, 10	38	893	0, 1, 6, 7, 9, 10
7	815	3, 4, 5, 7, 9, 10	39	909	0, 1, 3, 6, 9, 10
8	895	6, 7, 9, 10	40	775	2, 7, 9, 10
9	911	3, 6, 9, 10	41	1015	2, 3, 9, 10
10	769	0, 7, 9, 10	42	999	2, 4, 9, 10
11	1009	0, 3, 9, 10	43	791	2, 3, 4, 7, 9, 10
12	993	0, 4, 9, 10	44	967	2, 5, 9, 10
13	785	0, 3, 4, 7, 9, 10	45	823	2, 3, 5, 7, 9, 10
14	961	0, 5, 9, 10	46	807	2, 4, 5, 7, 9, 10
15	817	0, 3, 5, 7, 9, 10	47	983	2, 3, 4, 5, 9, 10
16	801	0, 4, 5, 7, 9, 10	48	903	2, 6, 9, 10
17	977	0, 3, 4, 5, 9, 10	49	887	2, 3, 6, 7, 9, 10
18	897	0, 6, 9, 10	50	1017	0, 2, 9, 10
19	881	0, 3, 6, 7, 9, 10	51	777	0, 2, 3, 7, 9, 10
20	771	1, 7, 9, 10	52	793	0, 2, 4, 7, 9, 10
21	1011	1, 3, 9, 10	53	1001	0, 2, 3, 4, 9, 10
22	995	1, 4, 9, 10	54	825	0, 2, 5, 7, 9, 10
23	787	1, 3, 4, 7, 9, 10	55	969	0, 2, 3, 5, 9, 10
24	963	1, 5, 9, 10	56	985	0, 2, 4, 5, 9, 10
25	819	1, 3, 5, 7, 9, 10	57	809	0, 2, 3, 4, 5, 7, 9, 10
26	803	1, 4, 5, 7, 9, 10	58	889	0, 2, 6, 7, 9, 10
27	979	1, 3, 4, 5, 9, 10	59	905	0, 2, 3, 6, 9, 10
28	899	1, 6, 9, 10	60	1019	1, 2, 9, 10
29	883	1, 3, 6, 7, 9, 10	61	779	1, 2, 3, 7, 9, 10
30	1021	0, 1, 9, 10	62	795	1, 2, 4, 7, 9, 10
31	781	0, 1, 3, 7, 9, 10	63	1003	1, 2, 3, 4, 9, 10

STEP	ACTION	VERIFICATION
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TABLE E (Cont)

IDENTITY NUMBER	TUR G TERM	OPERATE TEST SET BS- KEYS	IDENTITY NUMBER	TUR G TERM	OPERATE TEST SET BS- KEYS
64	827	1, 2, 5, 7, 9, 10	71	997	0, 1, 2, 4, 9, 10
65	971	1, 2, 3, 5, 9, 10	73	789	0, 1, 2, 3, 4, 7, 9, 10
66	987	1, 2, 4, 5, 9, 10	74	965	0, 1, 2, 5, 9, 10
67	811	1, 2, 3, 4, 5, 7, 9, 10	75	821	0, 1, 2, 3, 5, 7, 9, 10
68	891	1, 2, 6, 7, 9, 10	76	805	0, 1, 2, 4, 5, 7, 9, 10
69	907	1, 2, 3, 6, 9, 10	77	981	0, 1, 2, 3, 4, 5, 9, 10
70	773	0, 1, 2, 7, 9, 10	78	901	0, 1, 2, 6, 9, 10
71	1013	0, 1, 2, 3, 9, 10	79	885	0, 1, 2, 3, 6, 7, 9, 10

P. EADAS TDC TUR Control

- | | | |
|----|---|---|
| 1 | Obtain release of EADAS TDC from personnel at EADAS CU. | |
| 2 | Operate A0, A1, A2, and A3 keys to position 0. | |
| 3 | Operate LT1 switch to LCL. | |
| 4 | Operate LT2 switch to LCL. | EADAS TDC removed from control of central control unit (CCU). |
| 5 | Operate A0 key to position 1. | |
| 6 | Operate A2 key to position 1. | |
| 7 | Momentarily operate TST key. | At 4A TUR—verify ON, CT, DTA and DTB relays released. |
| 8 | Operate A2 key to position 0. | |
| 9 | Momentarily operate TST key. | At 4A TUR—
ON relay operated. |
| 10 | Operate A0 key to position 0. | |
| 11 | Operate A1 key to position 1. | |
| 12 | Momentarily operate TST key. | At 4A TUR—
CT relay operated. |

STEP	ACTION	VERIFICATION
		In approximately 98 seconds— CT relay released.
13	After CT relay released— At EADAS TDC— Operate A0 key to position 1.	
14	Momentarily operate TST key.	At 4A TUR— DTA and DTB relays operated in all associated frames.
15	At EADAS TDC— Operate A0 key to position 0.	
16	Momentarily operate TST key.	At 4A TUR— TUR starts scanning. When paired frames are provided— Each frame scans in turn.
17	At EADAS TDC— Operate A1 key to position 0.	
18	Operate A0 and A2 keys to position 1.	
19	Momentarily operate TST key.	At 4A TUR— ON, CT, DTA, DTB relays released.
20	At EADAS TDC— Operate A0, A1, A2, and A3 keys to position 0.	
21	Operate LT2 key to position RMT.	
22	Operate LT1 key to position RMT.	EADAS TDC returned to CCU control.

Q. Deleted**R. Auxiliary Fast Scan Feature****Single Frame 100 Second Scanning**

1	At TUR frame— Block ON and CT relay operated.	IS relay operated. CS timer on (running). In approximately 6 seconds after ON relay was operated— CT1 and CT2 relays operated. In approximately 94 seconds after CT2 relay operates— TUR and auxiliary scanner scan together.
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Single or Paired Frame 200 Second Scanning

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STEP	ACTION	VERIFICATION
2	At TUR frame— Block ON and CT relay operated.	IS relay operated. CS timer on (running). In approximately 6 seconds after ON relay was operated— CT1 and CT2 relays operated. In approximately 94 seconds after CT2 relay operates— First frame of pair begins to scan or if single frame 200 second scan provided, TUR begins scanning. ASA relay remains normal.
3	Observe scanning of TUR.	TUR scans beginning with second interval. ASA relay operated only during 100 seconds when TUR is not scanning. At auxiliary scanner unit— SQ_ lamps repeatedly flashing during every 100 second interval.
S. Limited Scan Feature		
1	Using a KS-14510 VOM— Check for ground on terminal 1 but not on terminal 2 of CL1 timer.	Ground present on terminal 1 but not on terminal 2 of CL1 terminal.
2	Set CL1 timer so contacts 1 and 2 are closed.	
3	Using KS-14510 VOM— Check for ground on terminal strip (MISC) terminal 77.	Ground present on terminal strip (MISC) terminal 77.
4	At TUR containing master control circuitry— Verify LSC relay not operated.	LSC relay not operated.
5	Momentarily operate MSC relay.	MSC1 and LSC relays momentarily operated. LS lamp flashes.
6	At first TUR— Momentarily operate LSC relay.	At all other TURs— LS relay momentarily operated.
7	At first TUR— Block ON1 and CT1 relays operated.	
8	Momentarily operate LSC relay.	LSC relay locked operated.
9	Remove block from ON1 and CT1 relays.	LSC relay released.
10	Using KS-14510 VOM— Check for open between pairs of terminals LS0 and D0 to LS5 and D5 at terminal strip DET on the TUR that contains the master control circuitry (or the TUR under test).	Open exists between pairs of terminals LS0 and D0 to LS5 and D5.

STEP	ACTION	VERIFICATION
11	Block operated LSC relay.	
12	Using KS-14510 VOM— Check for continuity between pairs of terminals LS0 and D0 to LS5 and D5.	Continuity exists between pairs of terminals LS0 and D0 to LS5 and D5.
13	Remove block from LSC relay.	At all other TURs— LS relay released.
14a	If other TUR frames are to be tested— Repeat Steps 1 through 13 to all other frames by blocking the LS relay (in frame under test) operated or nonoperated instead of LSC relay for Steps 9 through 12.	
15	Return circuit to normal.	

T. Alternate Scan Feature

Alternate Scanning for Paired TUR Frames Not Associated With the Traffic Data Recording System or the Auxiliary Scanner Unit

1	At TUR frame— Block ON relay operated.	IS, CT relays operated. CS timer on (running). In approximately 6 seconds after ON relay was operated— CT1 and CT2 relays operated. In approximately 94 seconds after relay CT2 operated— First frame of pair begins scanning. At end of scanning of first frame pair— AS relay operated and remains operated during scanning of second frame. At end of scanning of second frame— AS relay released. First frame of pair begins to scan. At auxiliary scanner unit— SQ lamps repeatedly flashing during every 100-second interval.
2	Block STP relay operated or operate STOP key at control panel.	TUR ceases scanning at end of current 100-second interval.
3	Remove blocks from ON and STP relays and/or released STOP key.	All relays released.

Alternate Scanning for a Single TUR Not Equipped With the Auxiliary Scanner Unit

4	At TUR frame— Block ON relay operated.	IS, CT relays operated. CS timer on (running).
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STEP	ACTION	VERIFICATION
		In approximately 6 seconds after ON relay was operated— CT1 and CT2 relays operated. In approximately 94 seconds after relay CT2 operated— First frame of pair begins scanning. ASA relay remains released.
5	Observe that TUR scans during every other 100-second interval beginning with second interval.	ASA relay operated only during 100 seconds when TUR is not scanning.
6	Block STP relay operated or operate STOP key at control panel.	TUR ceases scanning at end of current 100-second interval.
7	Remove blocks from ON and STP relays and/or release STOP key.	All relays released.

Alternate Scanning for Paired TUR Frames Associated With the Traffic Data Recording System or the Remote Recorder

8	At remote control unit— Block W1, Z1, and PTA relays operated.	ON, IS, CT relays operated. CS timer operated. In approximately 6 seconds after W1, Z1, PTA relays were operated— CT1, CT2 relays operated. In approximately 92 seconds after relay CT2 operated— Low-numbered frames of all paired TURs containing master control circuitry begins scanning. At end of scanning of first frame— High-numbered frames of all paired TURs begin scanning.
9	Observe scanning of each frame of pair.	Each frame of pair scans once every 200 seconds after first frame begins to scan.
10	At TUR that contains master control circuitry— Block STP relay operated.	TUR that is scanning completes its 98-second scan interval. Other frame of pair does not begin to scan.
11	Remove blocks from Z1, W1, PTA, and STP relays.	All relays in paired TURs nonoperated.
12	Hold PD relay operated for minimum of 5 seconds.	System restored to normal.

STEP	ACTION	VERIFICATION
U. Detector Test of the Auxiliary Scanner Unit		
1a	When paired frame operation provided— If auxiliary scanner unit is associated with low-(even-) numbered TUR frame— Block AS relay nonoperated.	
2b	When paired frame operation provided— If auxiliary scanner unit is associated with high- (odd-) numbered TUR frame— Block AS relay operated.	
3	Record readings of all registers associated with auxiliary scanner unit.	
4	At TUR control panel— Operate TST key.	At TUR frame— ASB, DTA, DTB relays operated.
5	At TUR control panel— Operate MAN key.	At TUR frame— In approximately 100 seconds after MAN key operated— Frame begins scanning.
	Note: When 200 second scanning is used, detector testing will be performed during second 100 second scan interval. When 100 second scanning is used, detector testing will be performed during first 100 second scan interval.	
6	While TUR frame is scanning— At TUR control panel— Operate STOP key.	
7	When TUR frame stops scanning— Release MAN key.	
8	Release STOP key.	At TUR frame— DTA, DTB, ASB relays operated.
9	At TUR control panel— Release TEST key.	DTA, DTB, ASB relay released.
10	Record readings of all registers associated with auxiliary scanner unit.	Totaled difference between the two series of readings should be equal numerically to the sum of the cross-connections to all registers associated with the auxiliary scanner unit.
11c	If AS relay was blocked in Step 1a or 2b— Remove block from AS relay.	

STEP	ACTION	VERIFICATION
V. Timing Test (Auxiliary Scanner Unit)		
TMFS Timer Test		
1	At 4A TUR auxiliary scanner unit— Block IS relay operated.	
2	Block MSC relay nonoperated.	
3	Block ASA relay nonoperated.	
4	Block SWS1 relay nonoperated.	
5	Block SWS0 relay operated.	
6	Block SC relay operated.	At TUR frame— TUR starts scanning on switch 0. SC1 relay operated. At auxiliary scanner unit— SQ_ lamps at auxiliary scanner unit flash repeatedly.
7	Using an oscilloscope capable of obtaining signals shown in Fig. 1 through Fig. 4— Connect oscilloscope trigger input to terminal 8 of DSQA relay. <i>Note:</i> Trigger mode should be DC with slope—external.	
8	Connect oscilloscope probe to relay SQ3 terminal 4.	Waveform on oscilloscope appears as that of Fig. 1.
9	Remove oscilloscope connection from relay SQ3 terminal 4.	
TMLT Timer Test		
10	Connect oscilloscope probe to terminal 2 of TMLT timer.	Waveform of oscilloscope appears as that of Fig. 2.
11	Remove oscilloscope connection from terminal 2 of TMLT timer.	
TMGD Timer		
12	Connect oscilloscope probe to terminal 6 of TMGD timer.	Waveform on oscilloscope appears as that of Fig. 3.
13	Remove oscilloscope connections.	

STEP	ACTION	VERIFICATION
SQ Relays Sequencing		
14	Connect oscilloscope trigger input to terminal 6 of TMGD timer. <i>Note:</i> Trigger mode should be DC with slope + external.	
15	At TUR— Block ASB relay operated. <i>Note:</i> This makes all auxiliary scanner inputs busy.	
16	Connect oscilloscope probe to SQ0 relay terminal 10.	Waveform on oscilloscope appears as that of Fig. 4A.
17	Remove oscilloscope connection from terminal 10 of SQ0 relay.	
18	Connect oscilloscope probe to SQ1 relay terminal 10.	Waveform on oscilloscope appears as that of Fig. 4B.
19	Remove oscilloscope connection from terminal 10 of SQ1 relay.	
20	Connect oscilloscope probe to SQ2 relay terminal 10.	Waveform on oscilloscope appears as that of Fig. 4C.
21	Remove oscilloscope connection from terminal 10 of SQ2 relay.	
22	Connect oscilloscope probe to SQ3 relay terminal 10.	Waveform on oscilloscope appears as that of Fig. 4D.
23a	If any figures of this test are not observed— A trouble exists. Clear trouble.	
24	Unblock all relays and remove all oscilloscope connections.	

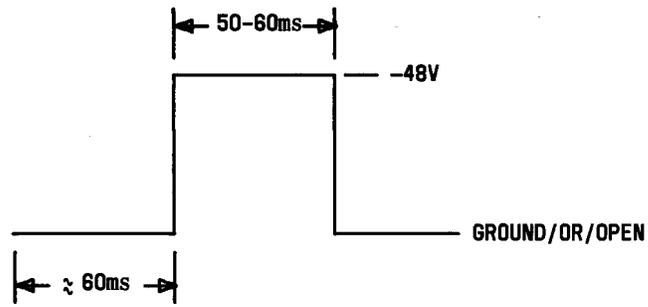


Fig. 1—SQ3 Terminal 4

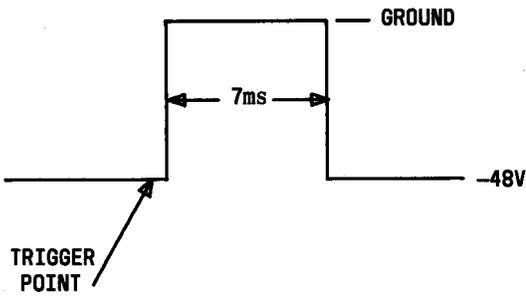


Fig. 2—TMLT Timer Terminal 2

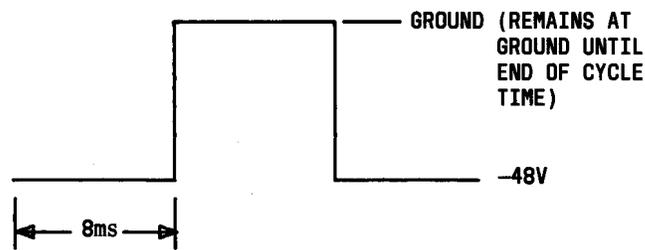


Fig. 3—TMGD Timer Terminal 6

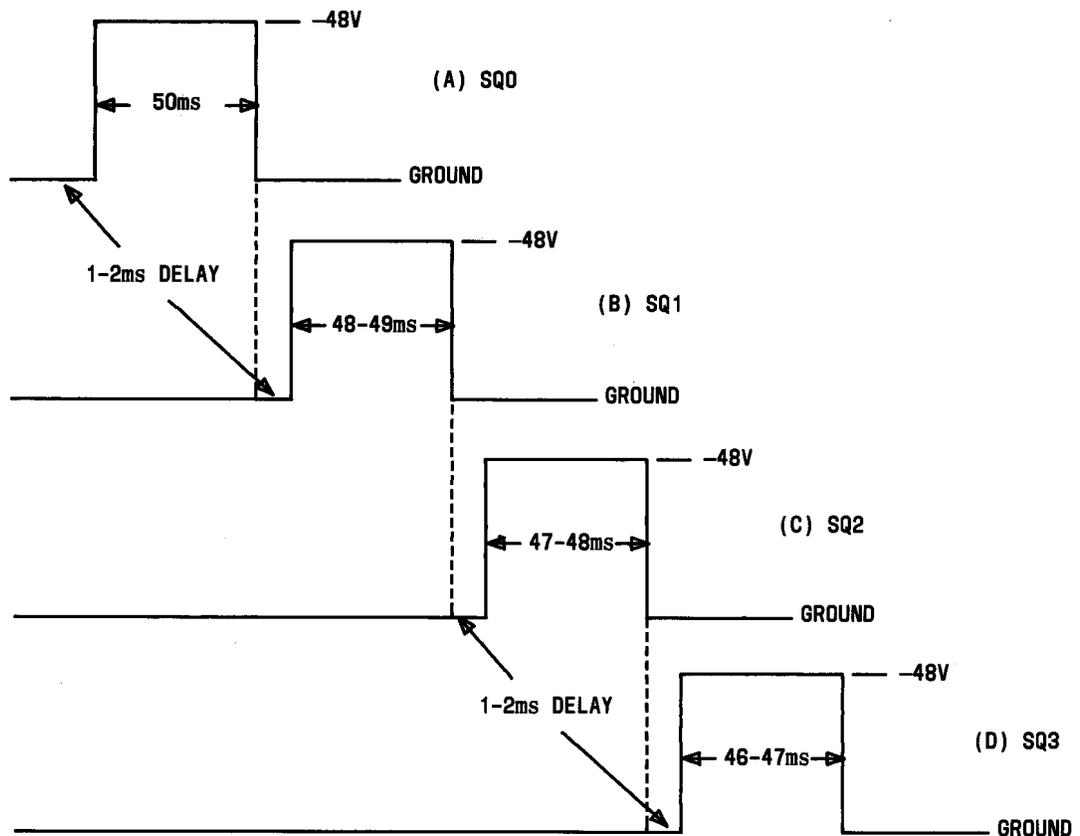


Fig. 4—SQ-Relay Sequencing

W. PG Relay Timing Test

- 1 At control panel—
Note position of all keys and switches.
- 2 Restore all keys and switches to normal.
- 3 At pulse checking test set SD-96362-01 (J-94723A)—
Position PPS-PCB lever key to normal (center position).
- 4 Adjust screw on top of meter so pointer is on 100-percent break scale division.
- 5 Rotate CAL 0-500 potentiometer in a counterclockwise direction to limit of its travel (zero position).

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STEP	ACTION	VERIFICATION
	<p>Note: This action prevents the needle from moving off scale when battery and ground are connected to the test set.</p>	
6	<p>Using 3P15A cord— Connect BAT G jack on test set to BAT jack on nearby frame.</p>	
	<p>Note: To ensure proper accuracy of the pulse checking test set, it should be set in a level position.</p>	
7	<p>Adjust CAL 0-500 potentiometer in clockwise direction as required to bring pointer to 0 percent break.</p>	
8	<p>At TUR frame under test— Block ADV relay operated.</p>	
9	<p>Using a 1W7A cord— Connect plug end to P jack of test set.</p>	
10	<p>Using clip end of 1W7A cord— Connect clip to 2T of ADV relay.</p>	
11	<p>At TUR frame under test— Block IS and SC relays operated.</p>	Pulsing starts.
12	<p>At pulse checking test set— Operate SCALE key to 40 position.</p>	
13	<p>Operate PPS—PCB lever key to PCB position.</p> <p>Note: The circuit of test set is now connected so an intermittent ground is applied from the interrupter.</p>	<p>When provided with Apparatus Figure 55 provided with option ZP or ZQ or when provided with Apparatus Figure 56— Meter deflected indicating percent break of 35 (Min) to 40 (Max).</p>
14a	<p>If provided with Apparatus Figure 55 and verification of Step 13 is not obtained— At TUR frame— To increase percent break, increase resistors RA, RB, or RC. To decrease percent break, decrease resistors RA, RB, or RC.</p>	
15a	<p>Repeat Steps 13 and 14a, as required, until percent break meets necessary requirements.</p>	
16b	<p>If provided with Apparatus Figure 56 and verification of Step 13 is not obtained— At TUR frame— Replace PG relay and repeat this test.</p>	

STEP	ACTION	VERIFICATION
17	Operate SCALE key to 20 position.	
18	Operate PPS—PCB lever key to PPS position.	
19	When meter movement has stabilized— Record pulse speed reading indicated on 0-40 scale.	When provided with Apparatus Figure 55 provided with ZP option— Pulse speed 7.1 (Min) to 8.1 (Max). When provided with Apparatus Figure 55 provided with ZQ option— Pulse speed 6.8 (Min) to 7.2 (Max). When provided with Apparatus Figure 56— Pulse speed 6.8 (Min) to 7.2 (Max).
20c	If verification of Step 19 is not obtained— At TUR frame— When provided with Apparatus Figure 55— To increase pulses per second, decrease resistors RD, RE, or RF. To decrease pulses per second, increase resistors RD, RE, or RF. When provided with Apparatus Figure 56— Strap RJ resistor as required to provide approximately 7 pulses per second. Note: For Apparatus Figure 56 average PG relay will require a 50 ohm strapping.	
21c	Repeat Steps 19 and 20c, as required, until pulse speed meets necessary requirements.	
22	Remove all test connections and blocks from relays.	
23	Restore all keys and switches to positions of Step 1.	