

ORIGINATING REGISTERS, OUTPUTTING CONTROLLERS
PULSING TESTS
USING AUTOMATIC TEST CIRCUIT SD-32365-01
OR MANUAL TEST SET SD-32363-01
STEP-BY-STEP COMMON CONTROL OFFICES

1. GENERAL

1.01 This section describes a method of testing the originating register outputting controller pulse generator and pulse repeating relays using the automatic test circuit or manual test set.

1.02 This section is reissued to include the use of the manual test set SD-32363-01 (J34727). Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

A. Pulse Generator Loop Pulsing Using Automatic Test Circuit: This test checks the pulsing speed and percent break of the register pulse generator for loop pulsing operation.

B. Pulse Generator MF and KP Pulsing Using Automatic Test Circuit: This test checks the pulsing speed and percent break of the register pulse generator for multifrequency (MF) operation.

C. L1 Relay Pulse Repeat Using Automatic Test Circuit: This test checks that the register L1 relay will repeat dial pulses under nominal and marginal conditions.

D. Pulse Generator Loop and MF Pulsing Using Manual Test Set: This test checks the pulsing speed and percent break for loop and multifrequency (MF) operation.

E. L1 Relay Pulse Repeat Using Manual Test Set: This test checks that the register L1 relay will follow dial pulses under marginal loop and leak conditions.

1.04 **Tests A, B, C** — Apply to offices equipped with automatic test circuit.

Tests D, E — Apply to offices equipped with manual test set.

1.05 Test B applies only to offices equipped for controlled outputting.

1.06 Refer to Section 163-653-501 for pulse checking test set use and application, Section 040-012-711 for pulse repeating requirements for 221-type relays, and Section 040-236-701 for requirements and adjusting procedures for 221-type relays.

1.07 A particular originating register may be manually selected for testing by the automatic test circuit as follows:

(a) Determine register location from local records.

(b) Operate PC key.

(c) Operate S-PCS key sufficient times to select the desired pair of select magnets ORC and ORC', 0 to 9.

(d) Operate H-PCS key sufficient times to select the desired pair of hold magnets ORC and ORC', 0 to 9.

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(e) Operate XC-PCS key sufficient times to advance the crosspoint steering to the desired register location. Rapid selection of select and hold magnets may be accomplished in (c) and (d) above by holding operated S-PCR and H-PCR keys, respectively, until the desired locations are reached. Lamps associated with each select and hold magnet are provided at the test panel to facilitate the register selection.

1.08 In Test C, the automatic test circuit is used as a pulsing test set to drive the register L1 relay. A portable pulsing test set and pulse repeating test set may be used in a manner similar to the one shown in Fig. 3 for the manual test set. However, no patching would be needed between the automatic test circuit and the jack, key, and lamp circuit.

1.09 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.

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.

3. PREPARATION

STEP

ACTION

VERIFICATION

Tests A, B, and C

- 1 At automatic test circuit —
Connect test equipment as shown in Fig. 1.
- 2 Calibrate pulse checking test set in accordance with test set requirements or Section 163-653-501.

Test D

- 3 At jack, key, and lamp circuit —
Connect test equipment as shown in Fig. 2.

Note: Originating register under test is chosen by ORT- jack selected.

TABLE A

APPARATUS	TESTS				
	A	B	C	D	E
Test Circuit (2.02)	1	1	1		
Test Set (2.03)	1	1	1	1	1
Test Set (2.04)				1	1
Test Circuit (2.05)				1	1
Test Set (2.06)					1
Test Set (2.07)					1
Cord (2.08)	1	1	1	1	2
Cord (2.09)	1	1	1	2	4

2.02 Automatic test circuit, SD-32365-01.

2.03 Pulse checking test set J94723A (SD-96362-01).

2.04 Manual test set J38928 (SD-32363-01) equipped with two W35A connecting cables.

2.05 Manual test circuit, SD-32362-01.

2.06 Pulsing test set J34717A (SD-31481-01) and associated 36B test set.

2.07 Pulse repeating test set J34720A (SD-31667-01).

2.08 Patching cord, P2J cord, 6 feet long, equipped with two 310 plugs (2P9B cord) used to connect battery and ground to test equipment.

2.09 Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord) used to interconnect test equipment.

STEP	ACTION	VERIFICATION
4a	If office is equipped for controlled out-pulsing — At manual test circuit — Operate TC- switch to position corresponding to desired class of service.	
5	At pulse checking test set — Calibrate test set in accordance with test set requirements or as covered in Section 163-653-501.	

Test E

6	At jack, key, and lamp circuit — Connect test equipment as shown in Fig. 3. <i>Note:</i> Originating register under test is chosen by ORT- jack selected.	
7a	If office is equipped for controlled out-pulsing — At manual test circuit — Operate TC- switch to position corresponding to desired class of service.	
8	At pulse checking test set — Calibrate test set in accordance with test set requirements or as covered in Section 163-653-501.	

4. METHOD

STEP	ACTION	VERIFICATION
A. Pulse Generator Loop Pulsing Using Automatic Test Circuit		
3	At automatic test circuit — Operate PG, PLK, and MAX keys.	
4a	If a particular register is to be tested — Operate PC key.	
5a	Operate S-PCS, H-PCS, XC-PCS keys to select particular register.	Corresponding SEL-, H-, XP- lamps light.
6	At pulse checking test set — Operate SCALE switch to 20.	
7	Operate PPS key.	
8	Check loop pulsing requirements as shown in timing requirements chart SD-32351-01.	

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STEP	ACTION	VERIFICATION
9	At automatic test circuit — Operate ST key.	At pulse checking test set — Loop pps requirements met.
10	Operate PCB key.	Loop percent break requirements met.
11	At automatic test circuit — Restore MAX key.	At pulse checking test set — Percent break meter indicates change.
12	Operate PPS key.	
13b	If automatic test circuit is to advance and test next register — At automatic test circuit — Momentarily operate CA key.	Automatic test circuit advances to next reg- ister.
14b	Repeat Steps 8 through 12.	
15c	If no further loop pulsing tests are to be made — Restore all keys.	
16d	If no further tests are to be made — Remove all cords.	

B. Pulse Generator MF and KP Pulsing Using Automatic Test Circuit

3	At automatic test circuit — Operate PG, MFP keys.	
4a	If a particular register is to be tested — Operate PC key.	
5a	Operate S-PCS, H-PCS, XC-PCS keys to select particular register.	Corresponding SEL-, H-, XP- lamps light.
6	At pulse checking test set — Operate SCALE switch to 20.	
7	Operate PPS key.	
8	Check MF pulsing requirements as shown in timing requirements chart SD-32351-01.	
9	At automatic test circuit — Operate ST key.	At pulse checking test set — MF pps requirements met.
10	Operate PCB key.	MF percent break requirements met
11	Operate PPS key.	
12	At automatic test circuit — Restore MFP key.	

STEP	ACTION	VERIFICATION
13	Check MFKP pulsing requirements as specified in timing requirements chart SD-32351-01.	
14	Operate MFKP key.	At pulse checking test set — MFKP pps requirements met.
15	Operate PCB key.	MFKP percent break requirements met.
16	Operate PPS key.	
17b	If automatic test circuit is to advance and test next register — At automatic test circuit — Momentarily operate CA key.	Automatic test circuit advances to next register.
18b	Repeat Steps 8 through 16.	
19c	If no other MF and KP pulsing tests are to be made — Restore all keys.	
20d	If no other tests are to be made — Remove all cords.	

C. L1 Relay Pulse Repeat Using Automatic Test Circuit

3	At automatic test circuit — Operate DPR, PLK, and MAX keys.	
4a	If a particular register is to be tested — Operate PC key.	
5a	Operate S-PCS, H-PCS, XC-PCS to select particular register.	Corresponding SEL-, H-, XP- lamps light.
6	At pulse checking test set — Operate SCALE switch to 20.	
7	Operate PPS key.	
8	Check pps and percent break timing requirements chart SD-32365-01.	
9	At automatic test circuit — Operate ST key.	At pulse checking test set — 10 pps nominal pulsing requirements met.
10	Operate PCB key.	10 pps nominal percent break requirements met.
11	At automatic test circuit — Restore MAX key.	At pulse checking test set — Percent break meter indicates change.

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STEP	ACTION	VERIFICATION
12	Operate PPS key.	
13	At automatic test circuit — Operate LP, MAX keys.	
14	Check pps and percent break requirements chart SD-32365-01.	At pulse checking test set — 12 pps loop pulsing requirements met.
15	Operate PCB key.	12 pps loop pulsing percent break requirements met.
16	At automatic test circuit — Restore MAX key. At automatic test circuit — Restore LP key.	At pulse checking test set — Percent break meter indicates change.
18	Operate MAX key.	
19	At pulse checking test set — Operate PPS key.	
20	Check leak pps and percent break requirements chart SD-32365-01.	
21	At automatic test circuit — Operate LK key.	At pulse checking test set — Leak pulsing requirements met.
22	Operate PCB key.	Leak percent break requirements met.
23	At automatic test circuit — Restore MAX key.	At pulse checking test set — Percent break meter indicates change.
24	Operate PPS key.	
25b	If automatic test circuit is to advance and test next register — Momentarily operate CA key.	Automatic test circuit advances to next register.
26b	Repeat Steps 8 through 24.	
27c	If no other pulse repeat tests are to be made — Restore all keys.	
28d	If no other tests are to be made — Remove all cords.	

D. Pulse Generator Loop and MF Pulsing Using Terminal Test Set

6 At manual test set —
Operate XTMG key.

STEP	ACTION	VERIFICATION
7	Operate PLK key.	
8	At pulse checking test set — Operate SCALE switch to 20.	
9	Operate PPS key.	
10	At manual test set — Operate TST key.	If register is busy — BY lamp lights. If register is idle — DT lamp lights.
11	After DT lamp lights — Operate PG key.	DT lamp extinguishes. Register pulse generator pulses continuously.
12	Check loop pulsing requirements as specified in timing requirements chart SD-32351-01.	At pulse checking test set — Loop pps requirements met.
13	Operate PCB key.	Loop percent break requirements met.
14a	If office is equipped for controlled out- pulsing — Operate PPS key.	
15a	At manual test set — Operate MFP key.	
16a	Check MF pulsing requirements as specified in timing requirements chart SD-32351-01.	At pulse checking test set — MF pps requirements met.
17a	Operate PCB key.	MF percent break requirements met.
18a	Operate PPS key.	
19a	At manual test set — Operate MFKP key.	
20a	Check MFKP pulsing requirements as speci- fied in timing requirements chart SD- 32351-01.	At pulse checking test set — MFKP pps requirements met.
21a	Operate PCB key.	MFKP percent break requirements met.
22a	Restore PCB key.	
23	At manual test set — Restore TST key.	All lamps extinguish.
24c	If no further tests are to be made — Remove all cords and restore all keys.	

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STEP	ACTION	VERIFICATION
E. L1 Relay Pulse Repeat Using Manual Test Set		
9	At manual test set — Operate XTMG, PLK, and MAX keys.	
10	Operate TST key.	If register is busy — BY lamp lights. If register is idle — DT lamp lights.
11	After DT lamp lights — Operate PR key.	
12	At pulsing test set — Operate PR key.	
13	At pulse repeating test set — Operate SL key.	
14	At 36B test set — Momentarily operate LP key.	
15	Check loop and leak requirements (A1) for 221-type relays as listed in Section 040-012-711.	At pulse checking test set — Zero loop percent break requirements met.
16	At manual test set — Restore MAX key.	At pulse checking test set — Percent break meter indicates change.
17	At manual test set — Operate MAX key.	
18	At pulsing and pulse repeating test sets — Operate R- keys to equal 1200 ohms.	At pulse checking test set — Percent break requirements met.
19	At 36B test set — Momentarily operate RLS key.	
20	At pulsing test set — Operate LKA key.	
21	At 36B test set — Momentarily operate LK key.	At pulse checking test set — Leak percent break requirements met.
22	At manual test set — Restore MAX key.	At pulse checking test set — Percent break meter indicates change.
23b	If no further tests are to be made — Remove all cords and restore all keys.	

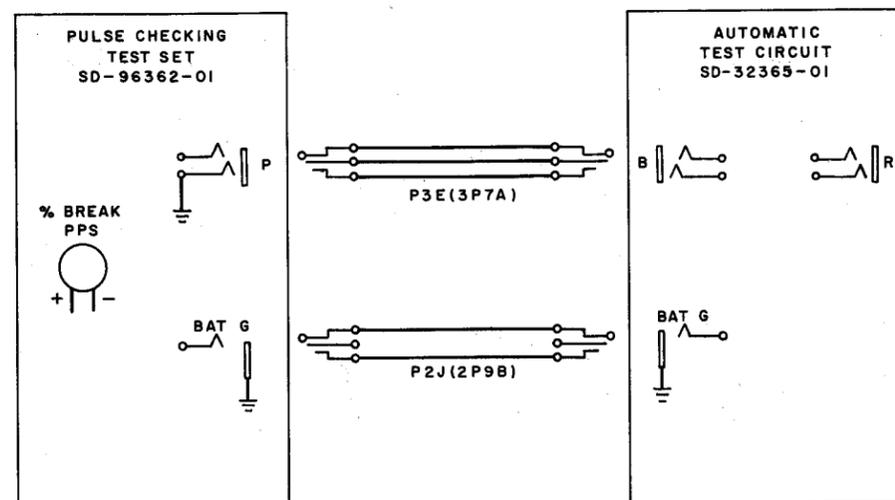


FIG. 1 PATCHING FOR TESTS A, B, AND C

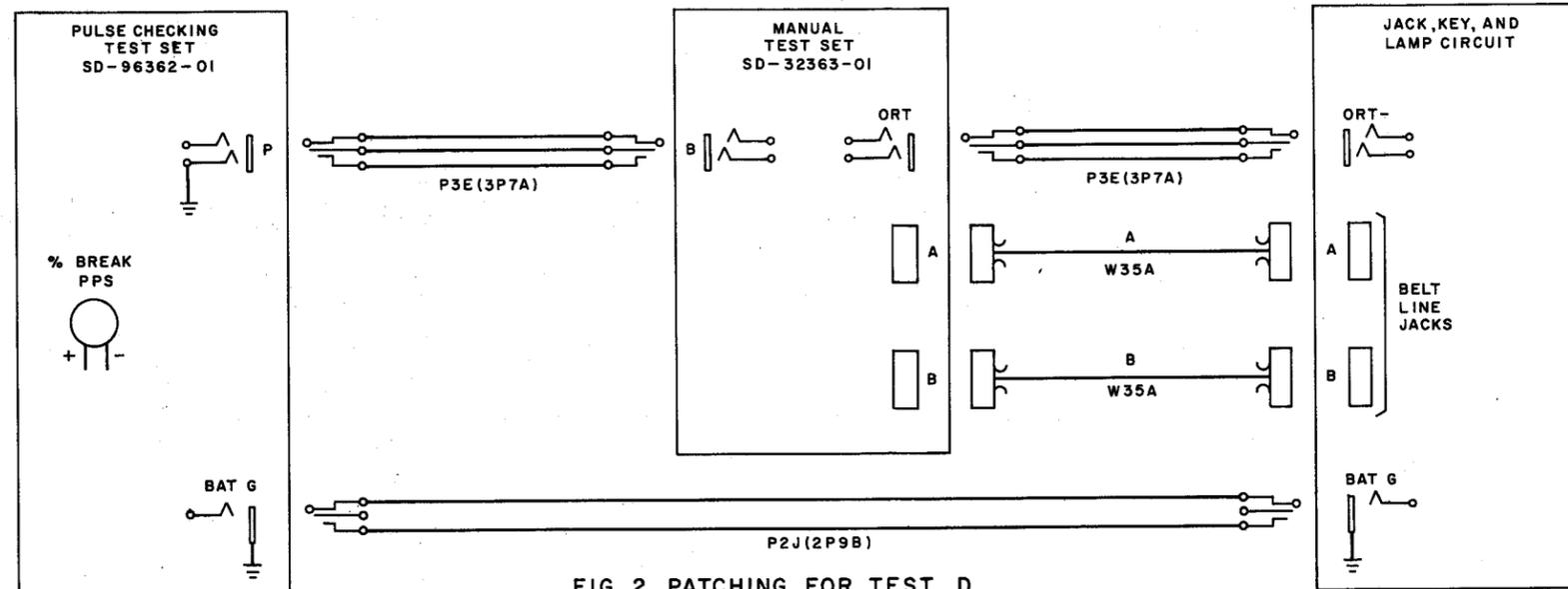


FIG. 2 PATCHING FOR TEST D

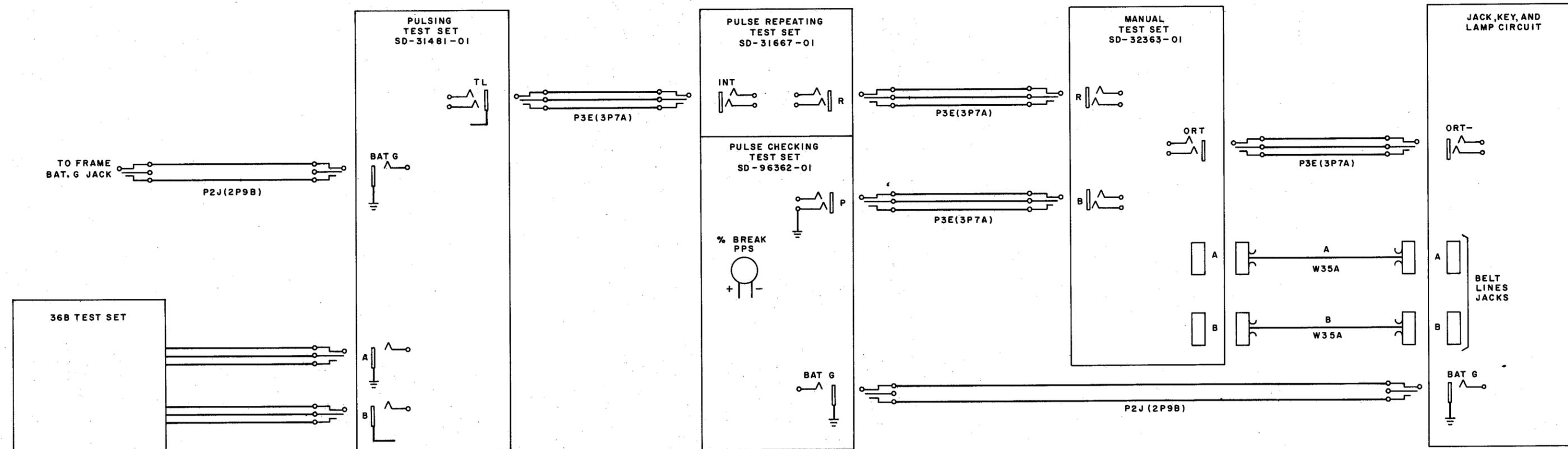


FIG. 3 PATCHING FOR TEST E

Fig. 1, 2 and 3