FUSE ALARMS

TESTS

NO. 1 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes a method of testing fuse alarms in No. 1 crossbar offices.

1.02 This section is reissued for the following reasons:

(a) Test A replaced by Tests A through J. Test B is relettered K. Old Test C has been deleted.

(b) Ten paragraphs and Fig. 1 are added to Part 1 explaining the correct procedure for testing 70-type fuse alarms and general information on fuse alarms.

(c) Test of fuse alarms for DID translator frames and for MF receiver (SD-99493-01) frames are included in Test C.

This reissue affects the Equipment Test List.

1.03 The tests covered are:

1.04 Methods for testing general purpose diodes are covered in Section 032-173-301. The

protective diodes for battery bus bars supplying circuits containing transistors should be tested accordingly.

1.05 During these tests, action is required at various fuse mountings and verification at the fuse alarm locations. Circuit busy verification is also required in Tests A through F.

1.06 ▶An unusually bright lamp in any test may indicate a shorted series resistor.

1.07 Test K should be made when an alarm lamp is found burned out and when scheduled. Reference to the SD- drawing will be required to determine the resistance designation and which lamps are associated with a series-shunt arrangement.◀

1.08 ***Caution: If a regular alarm originates during these tests, the tests should be immediately discontinued so that the alarm will sound in the normal manner. Notify the proper persons that a regular alarm is sounding.***

1.09 ▶Many of the frames to be tested are duplicated and vary in number for each office. The test described for each frame is applicable for all frames of that type.

1.10 ***Caution: When the office is equipped with only two equipments of a type which is made busy when a fuse operates, both equipments should be in operation before testing of either is commenced.***

1.11 The 22-volt —60 Hz fuse panel may be located on a fuse bay or a miscellaneous relay rack bay. In either case the steps in Test H will apply.

1.12 The later design of fuse caps for 70-type fuses contain an aperture or slot adjacent to the hole for the colored bead, providing access to the alarm test point with a 411C tool. The P-344900 fuse cap assembly is for use on non-modular fuse blocks (18A, 19A, and 21A) and the P-11F667 fuse cap assembly is for use on modular fuse blocks (22-through 27-type). This style cap should be used when testing fuse alarms. Due to the hazards involved, the former procedure of testing fuse alarms by inserting a 411C tool or a 266C tool (wire burnisher) held in a 265C tool (contact burnisher holder) beside the colored bead on older caps without the slot or aperture should be discontinued.

1.13 The fuse alarm associated with 70-type fuses should be tested by inserting the tip of the 411C tool (attached to the W1AF cord) into the aperture of the fuse cap (Fig. 1) and touching the exposed alarm test point for a fuse position at each end of each row of fuses on the fuse panel.

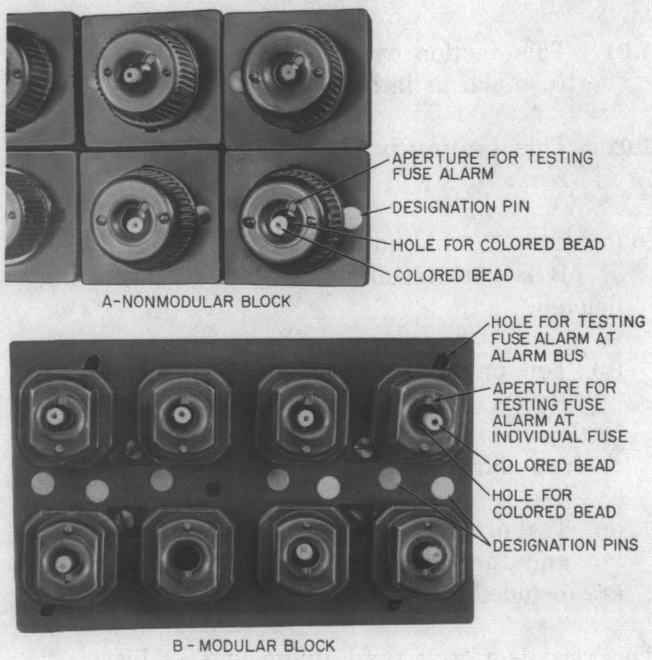

Fig. 1

1.14 On modular type fuse blocks (Fig. 1B) there is an aperture in each corner of each block providing access to the alarm bus bar. Test made from these apertures will check the alarm bus bar. Tests made from the aperture in the fuse cap will also check the contact between the fuse cap and the alarm bus bar.

1.15 When a frame or fuse panel is equipped with more than one 20-amp fuse, the test described for that frame should be repeated for each 20-amp fuse on the frame or fuse panel.

1.16 The 20-amp fuse associated with a fuse panel using 35-type fuses may be located in a K-5556 fuse mounting at either end of the fuse panel. This fuse mounting may also be used for talking battery filter fuse alarms. The alarm may be checked by inserting the tip of the 411C into a

hole in the side of the fuse mounting; thus applying battery to the alarm contact.◀

1.17 When testing fuse alarms, exit pilot (EP) lamps are lighted on all floors other than the floor on which the test is made. If the alarm grouping keys (SW) are operated, the other floor (OF) pilot lamps will also be lighted.

1.18 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Parts 3 and 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.

1.19 ▶When testing a fuse panel with 70-type fuses and no external battery supply is readily available, the 720A tool (battery pick up) can be used by placing a 1 1/3 amp fuse (maximum) in a spare fuse mounting position of the potential the same as the fuses being tested and connecting the 720A tool to this fuse.

2. APPARATUS

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

2.02 Testing cord, W1AF cord, 8 feet 6 inches long, equipped with a KS-6278 connecting clip and a 411C (test pick) tool (for applying battery to apparatus associated with 35-type fuses.

2.03 Testing cord, W1AF cord, 8 feet 6 inches long, equipped with one 411C tool and one 141 cord tip (used for connecting battery to apparatus associated with 70-type fuses where connection to battery for testing is to be made using the 720A battery pickup tool).

2.04 Test receiver, 716C receiver, attached to a W2AB cord, equipped with two 360A tools (2W21A cord), one KS-6278 connecting clip, and one 411C (test pick) tool.

2.05 3-inch C screwdriver.

2.06 ▶720A tool (battery pickup) equipped with 70A fuse, 360A tool and fuse cap.

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

TABLE A

APPARATUS	TEST										
	A	B	C	D	E	F	G	H	I	J	K
Testing cord (2.02)	1			1	1	1	1	1	1	1	1
Testing cord (2.03)								1			
Test receiver (2.04)	1	1	1	1			1		1		1
Screwdriver (2.05)									1		
319B (lamp cap extractor) tool											1
553A (lamp extractor) tool											1

3. PREPARATION

STEP	ACTION	VERIFICATION
All Tests		
1a	If office is arranged for alarm sending and alarms are transferred— At sending circuit— Operate alarm transfer key to NTR position.	TR lamp lighted.
2a	Momentarily operate RS key.	TR lamp extinguished. If equipped— LO lamp momentarily lighted.

4. METHOD

STEP	ACTION	VERIFICATION
A. Originating and Terminating Marker Fuse Alarm		
35-Type Fuses Provided		
3	At fuse panel— Using W1AF cord connected to proper potential, touch 411C tool to alarm bus bar or stud.	20A or FA lamp lighted. Aisle pilot lamp lighted Major alarm sounds. Marker CBR relay operated.
4	Disconnect 411C tool.	Frame guard and floor alarm frame guard lamps lighted. 20A or FA lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.
5	Momentarily operate AR key.	Guard lamps extinguished. Marker CBR relay released.
70-Type Fuses Provided		
6	Remove pilot fuse for 20 amp fuse.	
7	Test for battery on spring upon which base of fuse normally resets.	Battery present.
8	Test for battery on contact nearest small slot in fuse block.	Battery present.
9	Replace pilot fuse.	
10	Using W1AF cord connected to proper potential, insert tip of 411C tool into aperture of fuse cap and touch alarm test point.	FA lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. Marker CBR relay operated.

STEP	ACTION	VERIFICATION
11	Disconnect 411C tool.	Frame guard and floor alarm frame guard lamps lighted. FA lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.
12	Momentarily operate AR key.	Guard lamps extinguished. Marker CBR relay released.
13	Apply battery to individual fuse alarm bus.	Same as Step 10.
14	Repeat Steps 11 and 12.	Same as Steps 11 and 12.
15b	If terminating marker auxiliary digit registration and translation circuit (SD-27960-01) is provided— At TTI— Insert make-busy plug in DB jacks.	
16b	At SD-27960-01 equipment frame— Remove fuse A.	FA lamp lighted.
17b	At terminating marker— Using 716C receiver, test for ground at 3T contact of DB relay.	Ground present.
18b	At SD-27960-01 equipment frame— Replace fuse A.	FA lamp extinguished.
19b	Repeat Steps 16b, 17b, and 18b using fuse B instead of fuse A.	
20b	At TTI— Remove make-busy plug from DB jack.	

B. Terminating Marker Applique Fuse Alarm

3	Remove pilot fuse for 20 amp fuse.	
4	Test for battery on spring upon which base of fuse normally rests.	Battery present.
5	Test for battery on contact nearest small slot in fuse block.	Battery present.
6	Replace pilot fuse.	
7	Using W1AF cord connected to proper potential, insert tip of 411C tool into aperture of fuse cap and touch alarm test point.	20A lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. Associated marker CBR relay operated.

STEP	ACTION	VERIFICATION
8	Disconnect 411C tool.	Applique circuit and floor alarm frame guard lamps lighted. 20A lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.
9	Momentarily operate AR key.	Guard lamps extinguished. Marker CBR relay released.
10	Apply battery to individual fuse alarm bus.	FA lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. Associated marker CBR relay operated.
11	Remove battery.	Applique circuit and floor alarm frame guard lamps lighted. FA lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.
12	Momentarily operate AR key.	Guard lamps extinguished. Marker CBR relay released.
C.	**MF Receiver (SD-99493-01), AIS Frame, DID Translator Fuse Alarm**	
3	Remove pilot fuse for 20 amp fuse.	
4	Test for battery on spring upon which base of fuse normally rests.	Battery present.
5	Test for battery on contact nearest small slot in fuse block.	Battery present.
6	Replace pilot fuse.	
7	Using W1AF cord connected to proper potential, insert tip of 411C tool into aperture of fuse cap and touch alarm test point.	20A lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. If DID translator frame fuse alarm is being tested— Associated TMB_ relay in translator preference control circuit operated.
8	Disconnect 411C tool.	Frame guard and floor alarm frame guard lamps lighted. 20A lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.
9	Momentarily operate AR key.	Guard lamps extinguished. If DID translator frame fuse alarm is being

STEP	ACTION	VERIFICATION
		tested— Associated TMB_ relay in translator preference control circuit released.
10	Apply battery to individual fuse alarm bus.	FA lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. If DID translator frame fuse alarm is being tested— Associated TMB_ relay in translator preference control circuit operated.
11	Remove battery.	Frame guard and floor alarm frame guard lamps lighted. FA lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.
12	Momentarily operate AR key.	Guard lamps extinguished. If DID translator frame fuse alarm is being tested— Associated TMB_ relay in translator preference control circuit released.
13c	Repeat Steps 3 through 12 for other 20-amp fuses on frame.	
D.	**Outpulser, Identifier Frame Fuse Alarm**	
3	Remove pilot fuse for 20 amp fuse.	
4	Test for battery on spring upon which base of fuse normally rests.	Battery present.
5	Test for battery on contact nearest small slot in fuse block.	Battery present.
6	Replace pilot fuse.	
7	Using W1AF cord connected to proper potential, insert tip of 411C tool into aperture of fuse cap and touch alarm test point.	FA lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. At outpulser or identifier circuit— MB relay operated.
8	Disconnect 411C tool.	Frame guard and floor alarm frame guard lamps lighted. FA lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.

STEP	ACTION	VERIFICATION
9	Momentarily operate AR key.	Guard lamps extinguished. At outpulser or identifier circuit— MB relay released.
10	Apply battery to individual fuse alarm bus.	Same as Step 7.
11	Remove battery.	Same as Step 8.
12	Momentarily operate AR key.	Same as Step 9.
E. Tranverter Frame Fuse Alarm		
3	At 20 amp fuse— Apply battery to alarm stud.	20A lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. At transverter circuit— CBR relay operated. In 14 to 29 seconds— TA lamp lighted.
4	Remove battery.	Frame guard and floor alarm guard lamps lighted. 20A lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.
5	Momentarily operate AR key.	Guard lamps extinguished. TA lamp extinguished. CBR relay released.
6	At individual fuse— Apply battery to alarm bar.	FA lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. At transverter circuit— CBR relay operated. In 14 to 29 seconds— TA lamp lighted.
7	Remove battery.	FA lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced. Frame guard and floor alarm guard lamps lighted.
8	Momentarily operate AR key.	Guard lamps extinguished. TA lamp extinguished. TA lamp extinguished. CBR relay released.
9	Insulate 2-3B contacts RB relay.	CBR relay operated. In 14 to 29 seconds—

STEP	ACTION	VERIFICATION
		TA lamp lighted. Major alarm sounds.
10	Remove insulator.	CBR relay released.
11	Momentarily operate AR key.	TA lamp extinguished. Major alarm silenced.

F. Master Timing Circuit Fuse Alarms

Note: The 48-volt fuse panel is located at the top of the outgoing trunk test frame when nearby, either in the 0 jack bay or the jack bay nearest the master timing frame. When the outgoing trunk test frame is not nearby or when the master timing frame is located elsewhere than in the maintenance center, the fuse panels are located at the top of the nearest miscellaneous relay rack.

Even Master Timer Fuses.

3	At master timing frame— Operate CMBE key.	CMBE lamp lighted.
4	At even master timer −48 volt fuse panel— Apply −48 volt battery to 20 amp fuse alarm contact.	20A lamp lighted for even master timer. Major alarm sounds. Red aisle pilot lamp lighted.
5	At fuse panel— Remove battery.	20A and aisle pilot lamps extinguished. Floor alarm guard lamp lighted. Major alarm silenced. At master timing frame— AL lamp for even master timer lighted.
6	At master timing frame— Momentarily operate AR key.	AL and floor guard lamps extinguished.
7	At even master timer −48 volt fuse panel— Apply −48 volt battery to individual fuse alarm bar.	At master timing frame— FA lamp lighted for even master timer. Major alarm sounds. Red aisle pilot lamp lighted.
8	At fuse panel— Remove battery.	At master timing frame— FA lamp extinguished. AL lamp for even timer lighted. Major alarm silenced. Red aisle pilot lamp extinguished. Floor alarm guard lamp lighted.
9	At master timing frame— Momentarily operate AR key.	AL and floor guard lamps extinguished.

STEP	ACTION	VERIFICATION
10	At master timing frame— Restore CMBE key.	CMBE lamp extinguished.
Odd Master Timer Fuses		
11	At master timing frame— Operate CMBO key.	CMBO lamp lighted.
12	Repeat Steps 4 through 9 for odd master timing circuit.	Same as Steps 4 through 9 using odd timer in place of even timer.
13	At master timing frame— Release CMBO key.	CMBO lamp extinguished.
G. Frame Fuse Alarms		
35-Type Fuses Provided		
3	Apply battery to 20 amp fuse alarm stud.	20A lamp lighted. Aisle pilot lamp lighted. Major alarm sounds. ***Note:*** In some circuits the FA lamp may also light.
4	Remove battery.	20A and aisle pilot lamp extinguished. Major alarm silenced.
5d	If filter unit is provided— Using W1AF cord, apply battery to 20 amp fuse alarm stud by inserting tip of 411C tool into hole of fuse mounting.	FC1 and FC2 lamp lighted. Aisle pilot lamp lighted. Major alarm sounds.
6d	Remove battery.	FC1 or FC2 lamp extinguished. Aisle pilot lamp extinguished. Major alarm silenced.
7	Apply battery to individual fuse alarm bar.	FA and aisle pilot lamps lighed. Major alarm seconds. ***Note:*** On certain equipment, minor alarm may be sounded instead of major alarm.
8	Remove battery.	FA and aisle pilot lamps extinguished. Alarm silenced.
70-Type Fuses Provided		
9	Remove pilot fuse for 20 amp fuse.	
10	Test for battery on spring upon which base of fuse normally rests.	Battery present.

STEP	ACTION	VERIFICATION
11	Test for battery on contact nearest small slot in fuse block.	Battery present.
12	Replace pilot fuse.	
13	Using W1AF cord connected to proper potential, insert tip of 411C tool into aperture of fuse cap and touch alarm test point.	FA and aisle pilot lamps lighted. Major alarm sounds.
14	Disconnect 411C tool.	FA and aisle pilot lamps extinguished. Major alarm silenced.
15	Using W1AF cord connected to proper potential, touch 411C tool to test point of individual fuse.	Same as Step 13.
16	Disconnect 411C tool.	Same as Step 14.

H. Fuse Bay Fuse Alarms

LT1, LT2, LT4, TT1 Tone

3	Apply tone to alarm bar.	FA and aisle pilot lamps lighted. Minor alarm sounds.
4	Remove tone.	FA and aisle pilot lamps extinguished. Minor alarm silenced.

24V and 48V PBX Battery

5	Apply battery to alarm bar.	Same as Step 1.
6	Remove battery.	Same as Step 2.

105V PBX Ringing

7	Apply 105-volt battery to alarm bar.	Same as Step 1.
8	Remove battery.	Same as Step 2.

+CC (+130V), −CC (−130V) Coin Control

9	Apply 130-volt battery to alarm bar.	Same as Step 1.
10	Remove battery.	Same as Step 2.

ABS Alarm Battery Supply

11	Apply battery to alarm bar.	Same as Step 1.
12	Remove battery.	Same as Step 2.

STEP	ACTION	VERIFICATION
22V—60 Hz		
13	Apply 22-volt battery to alarm bar.	Same as Step 1.
14	Remove battery.	Same as Step 2.
Timed Release Sender Disc. Tone		
15	Apply interrupted tone to alarm bar.	Same as Step 1.
16	Remove tone.	Same as Step 2.
+130V, −130V, +165V		
17	Apply +130 volt, −130 volts, or +165 volt battery to alarm bar.	Same as Step 1.
18	Remove battery.	Same as Step 2.
No-Such-Number Tone		
19	Apply no-such-number tone to alarm bar.	Same as Step 1.
20	Remove tone.	Same as Step 2.
Clock Circuit		
21	Connect 48-volt battery to alarm bar.	Same as Step 1.
22	Remove battery.	

I. 24V and 48V Battery Distributing Power Circuit Fuse Alarm

35-Type Fuses Provided		
3	Remove pilot fuse. ***Caution: When testing alarm-type pilot fuses, every precaution should be taken to avoid accidental grounding of the test equipment since the battery sides of alarm type pilot fuses are directly connected to main distributing fuses.***	
4	Connect one pilot fuse post to associated alarm stud.	FA lamp lighted. Aisle pilot lamp lighted. Major alarm sounds..
5	Remove connection.	FA and aisle pilot lamps extinguished. Major alarm silenced.

STEP	ACTION	VERIFICATION
6	Repeat Steps 3 through 5 using other pilot fuse post.	
7	Replace pilot fuse.	
70-Type Provided		
8	Remove pilot fuse.	
9	Test for battery on spring upon which base of fuse normally rests.	Battery present.
10	Test for battery on contact nearest small slot in fuse block.	Battery present.
11	Replace fuse.	
12	Using W1AF cord connected to proper potential, insert tip of 411C tool into aperture of fuse cap and touch alarm test point.	FA lamp lighted. Aisle pilot lamp lighted. Major alarm sounds.
13	Disconnect 411C tool.	FA and aisle pilot lamps extinguished. Major alarm silenced.
J. +24V Charge and Discharge Circuit Fuse Alarm		
3	Apply +24 volt battery to alarm bar.	FP lamp lighted. Aisle pilot lamp lighted. Minor alarm sounds.
2	Remove battery.	FP and aisle lamps extinguished. Minor alarm silenced.
K. Series-Shunt Resistors Associated With Alarm Lamp		
Series-Shunt Resistors Associated with Alarm Lamp for Individual Circuit Fuse or Battery Distributing Fuse		
3	At the equipment frame— Remove FA lamp that is in parallel with shunt resistor to be tested.	
4	Using W1AF cord connected to proper potential, touch 411C tool to alarm bus bar or stud.	Aisle pilot lamp lighted. Audible alarm sounds.
5	Disconnect 411C tool.	Aisle pilot lamp extinguished. Audible alarm silenced. If an associated fuse guard lamp lighted— Circuit made busy.
6	Replace FA lamp.	

STEP	ACTION	VERIFICATION
7	Using W1AF cord connected to proper potential, touch 411C tool to alarm bus bar or stud.	FA lamp lighted. Aisle pilot lamp lighted. Audible alarm sounds.
8	Disconnect 411C tool.	FA lamp extinguished. Aisle pilot lamp extinguished. Audible alarm silenced.
9e	If fuse guard lamp lighted in Step 5— At equipment frame— Momentarily operate AR key.	Fuse guard lamp extinguished.
	Series-Shunt Resistors Associated with Alarm Lamp for Frame Fuse or Talking Battery Filter Fuse	
10	At equipment frame— Remove 20A, FC1, or FC2 lamp that is in parallel with shunt resistor to be tested.	
11	Using W1AF cord connected to proper potential, touch 411C tool to alarm bus bar or stud.	Aisle pilot lamp lighted. Audible alarm sounds.
12	Disconnect 411C tool.	Aisle pilot lamp extinguished. Audible alarm silenced. If an associated fuse guard lamp lighted— Circuit made busy.
13	Replace 20A, FC1, or FC2 lamp.	
14	Using W1AF cord connected to proper potential, touch 411C tool to alarm bus bar or stud.	20A, FC1, or FC2 lamp lighted. Aisle pilot lamp lighted. Audible alarm sounds.
15	Disconnect 411C tool.	20A, FC1, or FC2 lamp extinguished. Aisle pilot lamp extinguished. Audible alarm silenced.
16f	If fuse guard lamp operated in Step 14— At equipment frame— Momentarily operate AR key.	Fuse guard lamp extinguished.