

## MULTIFREQUENCY SIGNALING

### RECEIVING CIRCUIT

#### FILAMENT ALARM AND EMERGENCY TRANSFER CIRCUIT TESTS

##### 1. GENERAL

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**1.01** This section describes a method of testing and locating trouble conditions associated with the filament supply circuit (SD-95676-01) for multifrequency signaling receiving circuits (SD-95536-01) and for the removal of the filament supply circuit.♦

fuse alarm circuits to function when a fuse has operated. . . . . 5

**1.02** This section is reissued to add Test F, to change the type of volt-ohm-milliammeter used in Test E to a KS-14510 volt-ohm-milliammeter, and to make changes in Test E and Table A. This reissue affects the Equipment Test List.

**E. Test of Filament Voltage at MF Receiver:** This test checks that the proper value of ac or dc filament voltage is applied to the MF receiver circuit. . . . . 6

**1.03** The tests covered are:

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**A. Test of Adjustment of Transfer Voltage:** This test checks that the filament supply circuit relay is adjusted so as to release when ac supply voltage falls below 90 percent of normal. . . . . 2

**F. Removing AC and Emergency DC Filament Supplies:** This procedure is performed when the filament supply circuit is no longer required because of the conversion to hybrid integrated network (HIN) operation of all MF receivers associated with the filament supply circuit.♦ . . . . . 7

**B. Test of Automatic Transfer Feature:** This test checks the automatic transfer of the filament supply circuit from ac to emergency dc supply voltage and that the proper lamps and alarms are operated. . . . . 3

**1.04** An assistant will be required in Test C.

**C. Test of Alarms for False Ground or Battery in Filament Circuit of Associated MF Receiver Circuits:** This test checks the ability of the filament supply circuits to detect false ground or battery in the filament circuits of associated MF receiving circuits and to prevent transfer from ac to emergency dc until the trouble condition is corrected. . . . . 3

**1.05 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 the letter should be omitted.♦

##### 2. APPARATUS

**D. Test of Individual Fuse Alarms:** This test checks the ability of the

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

**2.02** Volt-ohm-milliammeter (VOM), KS-14510 L11 (or equivalent), Section 100-520-101.♦

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**2.03** 716C test receiver attached to a W2AB cord, equipped with two 360A tools (2W21A cord), one KS-6278 connecting clip and one 411B tool (for applying battery or ground to apparatus as specified, and checking for simulated trouble condition in individual circuit).

**2.04** Testing cord, W1AF cord, 8 feet 6 inches long, equipped with KS-6278 connecting clips and 411B (test pick) tool.

**2.05** 3-inch C screwdriver.

**2.06** 136B tool (relay blocking tool).

**2.07** Sender make-busy plug.

◆ **TABLE A** ◆

APPARATUS	TESTS					
	A	B	C	D	E	F
VOM (2.02)					1	
Test receiver (2.03)			2			
Cord (2.04)				1		
Screwdriver (2.05)	1					
Blocking tool (2.06)	1					
Make-busy plug (2.07)			√			

√ As required

**3. METHOD**

<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
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**A. Test of Adjustment of Transfer Voltage**

- |   |   |                           |
|---|---|---------------------------|
| 1 | At filament supply bay—<br>Block B relay operated.              |                           |
| 2 | Turn rheostats (C) and (G) to their extreme clockwise position. | A relay remains operated. |
| 3 | Depress and hold ADJ key.                                       |                           |
| 4 | Turn (C) rheostat counterclockwise until A relay releases.      | A relay releases.         |
| 5 | Turn (C) rheostat clockwise until A relay just operates.        | A relay operated.         |
| 6 | Turn (G) rheostat counterclockwise until A relay releases.      | A relay releases.         |

**Note:** If A relay does not release in Step 6, momentarily operate TST key.

STEP	ACTION	VERIFICATION
7	Turn (G) rheostat clockwise until A relay just operates.	A relay operated.
8	Turn (G) rheostat clockwise 10 or 15 degrees.  <i>Note:</i> This will give the A relay some margin over minimum operating requirements.	
9	Release ADJ key.	
10	Remove blocking tool from B relay.	A and B relays remain operated.
<b>B. Test of Automatic Transfer Feature</b>		
1	At filament supply bay— Depress and hold TST key (simulates ac failure).	AC FAIL lamp lighted. AISLE PILOT lamp lighted. Alarm sounds. TR lamp lighted (one for each series group filament circuit).  <i>Note:</i> Operation of a TR lamp indicates that associated groups of 6 or less MF receivers in a series group filament circuit have a closed circuit to the dc supply voltage.
2	Momentarily depress ACO key.	AC FAIL lamp extinguished. DC PWR lamp lighted. AISLE PILOT lamp extinguished. Alarm silenced.
3	Release TST key.	When 95 percent of normal AC voltage is available— DC PWR lamp extinguished. TR lamp extinguished (one for each series group filament circuit).  <i>Note:</i> (B) resistance in the tube circuit due to B relay normal will not allow (V) tube to fire until approximately 95 percent of normal voltage is again available.
<b>C. Test of Alarms for False Ground or Battery in Filament Circuit of Associated MF Receiver Circuits</b>		
1	Make busy sender or register associated with the first MF receiver to be tested.  <i>Caution: Care should be taken in the following steps when applying trouble condition to terminal 4 of B terminal strip on rear of MF receiver to be tested, to</i>	

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STEP	ACTION	VERIFICATION
	<i>avoid contacting the 110 volts ac potential on terminals 1 and 2 of B terminal strip.</i>	
2	At MF receiver bay— Using test receiver, connect KS-6278 connecting clip to 48-volt battery.	
3	At MF receiver under test— Apply 411B tool of test receiver to terminal 4 of B terminal strip on the MF receiver to be tested.	At filament supply bay— GRD lamp lighted. AISLE PILOT lamp lighted. Alarm sounds.
4	Remove test pick from terminal 4.	GRD lamp extinguished. AISLE PILOT lamp extinguished. Alarm silenced.
5	Restore MF receiver tested to service and make busy next MF receiver.	
6	Remove test receiver KS-6278 clip from 48-volt battery and connect clip to ground and repeat Steps 3 through 5 for all remaining MF receivers, except last receiver.	

**Trouble Condition on Last MF Receiver**

7	On last receiver to be tested— Hold ground on terminal 4 until Steps 7 through 12 have been completed.	GRD lamp lighted. AISLE PILOT lamp lighted. Alarm sounds.
8	At filament supply bay— Momentarily depress ACO key.	GRD lamp extinguished. GRD ACO lamp lighted. Alarm silenced.
9	To locate filament circuit in trouble— Using another test receiver, connect KS-6278 clip to any terminal on the bottom row of the TP terminal strip and with the 411B tool, test each terminal on the top row of the TP terminal strip or strips.	When click is heard in the headset this will indicate the MF receiver with a trouble condition in its filament circuit.
10	Remove connection from the TP terminal.	
11	Depress and hold operated TST key. (Simulates ac supply failure.)	GRD ACO lamp remains lighted. AC FAIL lamp lighted.

**Note 1:** B relay will remain locked up to C relay until trouble is cleared from filament circuit.

**Note 2:** The automatic transfer, in event of an ac failure, to emergency dc can not occur

STEP	ACTION	VERIFICATION
	and all the receivers associated with the filament supply circuit are out of service until the trouble condition is cleared.	
12	Release TST key.	AC FAIL lamp extinguished.
13	Remove ground from terminal 4 of MF receiver.	GRD ACO lamp extinguished.
14	Restore last MF receiver to service.	

#### D. Test of Individual Fuse Alarms

##### Test of (A) Fuse—Dc Emergency Supply Battery

1	Using W1AF cord, connect one end to test battery and insert 411B tool into aperture of (A) fuse block cap until it touches alarm test point.	FA lamp lighted. AISLE lamp lighted. Alarm sounds.
2	Withdraw 411B tool.	All lamps extinguished and alarm silenced.
3	Repeat Steps 1 and 2 for all equipped (A) fuses on the panel.	

**Note:** One (A) 1/2 AMP fuse is provided for each six or less MF receivers.

##### Test of (K) Fuse—Ac Supply to MF Receiver

**Note:** The (K) fuse may be located on the miscellaneous relay rack or on the MF receiver bay.

4	Busy out MF Receiver per local instructions.	
5	Remove the (K) fuse.	
6	Insert a known blown fuse.	AC lamp lighted. AISLE lamp lighted. Alarm sounds.
7	Withdraw the blown fuse.	All lamps extinguished and alarm silenced.
8	Remount the good (K) fuse removed in Step 5.	
9	Repeat Steps 4 through 8 for all equipped (K) fuses.	

**Note:** One (K) fuse is provided for each MF receiver.



STEP	ACTION	VERIFICATION
<b>F. Removing AC and Emergency DC Filament Supplies</b>		
1	Remove fuses A (6.25 amperes, Fusetron) and 70G (1/2 amperes) in Fig. 4 of SD-95676-01.	
2	Remove ground lead from 5T and 7T of B relay in Fig. 1 of SD-95676-01.	
3	Remove fuses B, C, D, E, F, G, and H in Fig. 1 of SD-95676-01.	
4	Remove fuse AC (15 amperes, Fusetron) originally assigned by the operating company (one per Fig. 1 of SD-95676-01).	
5	Remove fuse L in Fig. 5 of SD-95676-01.	
6	Remove fuse K in Fig. 6 of SD-95676-01 (one per MF receiver).	
7	Remove fuse J in Fig. 7 of SD-95676-01.	
8	Cap or tape and label the fuse openings so that they cannot be accidentally filled with fuses.	
9a	If the filament supply circuit is to remain on the frame, this procedure is satisfactory for shutting it down.	
10b	If the filament supply circuit is to be removed from the frame, <i>extra caution</i> should be taken when disconnecting the ac supply at its source.♦	