

MULTIFREQUENCY SIGNALING
RECEIVING CIRCUIT
FILAMENT ALARM AND EMERGENCY TRANSFER CIRCUIT TESTS

1. GENERAL

PAGE

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).

1.02 This section is reissued to add the note after Step 6 in Test A and to revise the method of testing fuse alarms in Test D. This reissue does not affect the Equipment Test List.

1.03 The tests covered are:

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.

5

1.04 An assistant will be required in Test C.

2. APPARATUS

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

PAGE

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

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

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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

D. Test of Individual Fuse Alarms: This test checks the ability of the fuse alarm circuits to function when a fuse has operated.

4

TABLE A

APPARATUS	TESTS				
	A	B	C	D	E
Voltmeter (2.02)					1
Test receiver (2.03)			2		
Burnishing tool (2.04)				1	
Screwdriver (2.05)	1				
Blocking tool (2.06)	1				
Make-busy plug (2.07)			✓		

✓ As required

2.02 Volt-ohm-milliammeter, KS-14510, List 1.

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).

SECTION 179-612-501

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

2.06 136B tool (relay blocking tool).

2.05 "H" cabinet 3-inch screwdriver.

2.07 Sender make-busy plug.

3. METHOD

STEP	ACTION	VERIFICATION
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A. Test of Adjustment of Transfer Voltage

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|----|--|---------------------------------|
| 1 | At filament supply bay—
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. |
| | <i>Note:</i> If A relay does not release in step 6, momentarily operate TST key. | |
| 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. Test of Automatic Transfer Feature

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|---|---|---|
| 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). |
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Note: Operation of a TR lamp indicates that associated groups of 6 or less MF receivers

STEP	ACTION	VERIFICATION
		in a series group filament circuit has 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).
		Note: (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.
C. Test of Alarms for False Ground or Battery in Filament Circuit of Associated MF Receiver Circuits		
1	Make busy sender associated with the first MF receiver to be tested.	
	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 avoid contacting the 110 volts ac potential on terminals 1 and 2 of B terminal strip.	
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.	

SECTION 179-612-501

STEP	ACTION	VERIFICATION
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.) <i>Note 1:</i> B relay will remain locked up to C relay until trouble is cleared from filament circuit. <i>Note 2:</i> The automatic transfer, in event of an ac failure, to emergency dc can not occur and all the receivers associated with the filament supply circuit are out of service until the trouble condition is cleared.	GRD ACO lamp remains lighted. AC FAIL lamp lighted.
12	Release TST key.	AC FAIL lamp extinguished.
13	Remove ground from terminal 4 or 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 of 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.	

STEP	ACTION	VERIFICATION
	<i>Note:</i> One (A) 1/2 AMP fuse is provided for each six or less MF receivers.	
	Test of (K) Fuse—Ac Supply to MF Receiver	
	<i>Note:</i> The (K) fuse may be located on the miscellaneous relay rack or on the MF receiver bay.	
4	◆Using W1AF cord, connect one end to test battery and insert 411B tool into aperture of (K) fuse block cap until it touches alarm test point.◆	AC lamp lighted. AISLE lamp lighted. Alarm sounds.
5	Withdraw 411B tool.	All lamp extinguished and alarm silenced.
6	Repeat Steps 4 and 5 for all equipped (K) fuses.	
	<i>Note:</i> One (K) fuse is provided for each MF receiver.	
7	◆Disconnect W1AF cord.◆	
	E. Test of Filament Voltage at MF Receiver	
1	At filament supply bay— Block A relay nonoperated.	AC FAIL lamp lighted. TR lamp lighted. Alarm sounds.
2	Momentarily depress ACO key.	AC FAIL lamp extinguished. DC PWR lamp lighted. Alarm silenced.
3	Using KS-14510 voltmeter, set switch to 60-volt dc scale— Check voltage on terminal 1 of the B terminal strip on rear of filament supply bay to ground.	Meter indicates 45 to 52 volts dc.
	<i>Caution: Care should be taken when making measurements at the MF receiver B terminal strip to avoid contacting the 110-volt ac potential on terminals 1 and 2 of this terminal strip.</i>	
4	At MF receiver bay— Using KS-14510 voltmeter, set switch to 12 volt dc scale— Check voltage across terminals 3 and 4 of B terminal strip on rear of one receiver in a series group filament circuit.	Meter indicates 5.7 to 7.3 volts dc. <i>Note:</i> These test limits allow for the normal battery supply fluctuation from 45 to 52 volts dc. A voltage outside these limits would indicate a defective or wrong code resistor in associated emergency supply.

SECTION 179-612-501

STEP	ACTION	VERIFICATION
5	Repeat Step 4 for one MF receiver in each remaining series group filament circuit.	
6	Remove blocking tool from A relay of the filament supply transfer circuit.	DC PWR lamp extinguished. TR lamp extinguished.
7	At MF receiver bay— Using KS-14510 voltmeter, set switch to 12-volt ac scale— Check voltage across terminals 4 and 5 of B terminal strip on rear of receiver.	Meter indicates 6.3 volts ± 0.3 volt ac.
8	Repeat Step 7 for each MF receiver.	