

**CIVIL AIR DEFENSE WARNING SYSTEM SD-95332-01**

**TESTS**

1. GENERAL

1.01 This section describes a method of testing the central office control circuit (SD-95332-01) of the civil air raid warning system.

1.02 This section is reissued to add a test of the siren station line (Test (K)), a test of the resistances across the power leads (Test (L)), a test of false battery and ground on the leads to the control station (Test (M)) and a revision of the emergency battery supply test (Test (A)) and other miscellaneous changes.

1.03 The tests covered are:

- (A) Emergency Battery Supply Test
- (B) Open Control Station Line Alarm Test
- (C) Siren Station Line Alarm Test
- (D) Siren Station Line Plugged Out Alarm Test
- (E) RT Relay Operation Test
- (F) Timing Relays Alarm Test
- (G) TL Relay Non-Operate Alarm Test
- (H) Falsely Operated TL Relay Alarm Test
- (J) Falsely Operated RC Relay Alarm Test

- (K) Line Test - Siren Station
- (L) Resistance Test
- (M) False Ground and Battery Test
- (N) Key Test - Control Station

1.04 Before making any tests obtain approval of the control station. Each time one or more of tests (A) to (M) are made test (N) should be made as the final test. After making test (N) inform the control station that the tests are completed.

1.05 When making the tests covered herein, it is important that the sirens do not sound, therefore extreme care should be exercised to follow the exact procedures outlined herein when plugging into jacks, blocking or operating relays or making test connections.

1.06 An assistant is required at the siren station for test (K) and at the control station for tests (M) and (N).

2. APPARATUS

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

Apparatus	No. Reqd. For Tests												
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(J)	(K)	(L)	(M)	(N)
No. 258C (Make Busy) Plug (2.02)	-	1	1	1	x+1	x+1	x+1	x+1	x	-	2	x+3	x
No. 298A Plug	-	-	-	-	-	-	-	-	-	-	1	-	-
No. 893 Cord (2.03)	-	-	1	-	2	-	-	-	-	-	-	-	-
W2W Cord (2.04)	-	-	-	-	2	-	-	-	-	-	1	1	-
W2W Cord (2.05)	-	-	-	-	-	-	-	-	-	-	1	-	-
P3E Cord (2.06)	1	-	-	-	-	-	-	-	-	-	-	-	-
P3E Cord (2.07)	-	-	-	-	-	-	-	-	-	1	-	-	-
W1W Cord (2.08)	-	-	-	-	-	-	-	-	-	-	-	1	-
No. 35 Type Test Set	-	-	-	-	1	-	-	-	-	-	1	1	-

2.02 Where the letter x appears under a particular test for the number of plugs required it represents the number of L jacks provided.

2.03 No. 893 cord 6 feet long equipped with No. 360A tools (1W13B cord) and one No. 365 tool and one No. 419A tool.

2.04 W2W cord 6 feet long equipped with a No. 310 plug and a No. 360B and a No. 360C tool (2W17A cord) with 2 No. 365 tools.

2.05 W2W cord 6 feet long equipped with a No. 310 plug and a No. 360B and a No. 360C tool (2W17A cord) with 2 No. 361B tools.

2.06 P3E cord 1 foot long equipped with 2 No. 310 plugs (3P6A cord).

2.07 P3E cord 4 feet long equipped with 2 No. 310 plugs (3P7E cord).

2.08 W1W cord 12 feet long equipped with a No. 310 plug (1W11A cord).

3. PREPARATION

3.01 Before making any tests, inform all telephone company personnel who may be concerned and also inform them when the tests are completed.

4. METHOD

4.01 General: Where tests call for observing the lighting of the F (frame), SL (spare line) or L (line) lamps, also observe the multiple of these lamps, when provided, at the switchboard. If a series of tests is being made which involves the same lamp or lamps, it will only be necessary to make one check of the lamps at the switchboard.

(A) Emergency Battery Supply Test

4.02 Insert one plug of a P3E cord into the EB (emergency battery) jack. Observe that the A3 (Alarm 3) and F lamps light and that the office alarm bells ring. Momentarily operate the ACO (alarm out off) key and note that the office alarm bells are silenced and the lamps remain lighted. Remove and reinsert the plug and note that the above mentioned lamps light and alarm bells ring. Again operate the ACO key and silence the alarms.

4.03 Insert the other plug of the P3E cord into the BG (battery ground) jack and observe that the A3 and F lamps are extinguished. Note that no lamps other than those noted were lighted.

4.04 Remove the plug from the BG jack and observe that the A3 and F lamps light and that the alarm bells ring.

4.05 Remove the plug from the EB jack and observe that the A3 and F lamps are extinguished and that the alarm bells are silenced.

(B) Open Control Station Line Alarm Test

4.06 Insert a No. 258C plug into the T2 jack. Observe that the A3 and F lamps light and that the office alarm bells ring. → Silence the alarms by operating the ACO key.

4.07 Remove the plug from the T2 jack. Observe that the A3 and F lamps are extinguished.

4.08 Insert a No. 258C plug into the T3 jack. Observe that the A3 and F lamps light and that the office alarm bells ring. → Silence the alarms by operating the ACO key.

4.09 Remove the plug from the T3 jack and observe that the A3 and F lamps are extinguished.

(C) Siren Station Line Alarm Test

4.10 Insert a No. 258C plug into the SL jack of the spare siren station line circuit. Observe that the A4 (Alarm 4) and F lamps light and that the office alarm bells ring. → Silence the alarms by operating the ACO key.

4.11 Remove the plug from the SL jack. Observe that the A4 and F lamps are extinguished.

4.12 Block the TL relay of a regular siren station line circuit, non-operated.

4.13 Insert a No. 258C plug into the L jack of the siren station line circuit having the TL relay blocked. Observe that the A4 and F lamps light and that the office alarm bells ring. Silence the alarms by operating the ACO key.

4.14 Remove the plug from the L jack. Observe that the A4 and F lamps are extinguished.

4.15 Remove the tool from the TL relay.

4.16 Repeat 4.12 to 4.15 inclusive on each regular siren station line circuit.

4.17 Block the SR3 relay operated.

4.18 Insert a No. 258C plug into the SL jack and connect ground to the 2B spring of the RC relay associated with the spare line circuit, using the No. 893 cord. Observe that the A4 and F lamps light and that the office alarm bells ring. Silence the alarms by operating the ACO key.

4.19 Remove the ground, observe that the A4 and F lamps are extinguished. Remove the plug from the SL jack.

4.20 Block the TL relay, of a regular siren station line non-operated and insert a No. 258C plug into the associated L jack. Connect ground to the 2B spring of the RC relay associated with the TL relay blocked, using the No. 893 cord and observe that the A4 and F lamps light and that the office alarm bells ring. Silence the alarms by operating the ACO key.

4.21 Remove the ground and observe that the A4 and F lamps are extinguished. Remove the plug from the L jack and remove the tool from the TL relay.

4.22 Repeat 4.20 and 4.21 until all siren station lines have been checked.

4.23 Remove the tool from the SR3 relay.

(D) Siren Station Line Plugged Out Alarm Test

4.24 Insert a No. 258C plug into the L jack of a regular siren station line. Observe that the associated L lamp lights.

4.25 Manually operate the RC relay associated with the plugged L jack and observe that the A1 (Alarm 1), A4 and F lamps light and that the office alarm bells ring. → Silence the alarms by operating the ACO key.

Caution: Be sure to operate the RC relay which is associated with the plugged L jack, otherwise a false operation of the siren will occur.

4.26 Release the RC relay. Momentarily operate the AR key and observe that the A1, A4 and F lamps are extinguished.

4.27 Remove the plug from the L jack. Observe that the associated L lamp is extinguished.

4.28 Repeat 4.24 to 4.27 inclusive on each regular siren station line.

#### (E) RT Relay Operation Test

4.29 Block the A6 relay non-operated.

4.30 Insert No. 258C plugs into all the L jacks. Observe that all L lamps light.

Caution: If any L lamp fails to light, do not proceed with this test.

4.31 Insert a No. 258C plug into the SL jack and note that the A4 and F lamps light and that the alarm bells ring. Silence the alarms by operating the ACO key.

4.32 Insert a No. 258C plug into the EW (emergency white) jack and observe that the A1 lamp lights and that the A4 lamp is extinguished.

4.33 Connect the 2T spring of the RC relay associated with the spare line to one terminal of the AG resistance, using a No. 893 cord. Connect the 2B spring of the same RC relay to the other terminal of the AG resistance, using a No. 893 cord. Observe that the RT relay, associated with the RC relay operates. Disconnect the resistance from the springs of the RC relay.

Note: When testing the RT relay of the spare line the SL lamp should light when the RT relay is operated.

4.34 Repeat 4.33 inclusive until all RT relays have been checked.

4.35 Disconnect the resistance from the springs of the last RC relay and remove the plug from the SL and EW jacks.

4.36 Remove all plugs from the L jacks. Remove the tool from the A6 relay. Operate the AR key and after the timing circuit has functioned, observe that all the L and SL lamps and the A1 and F lamps are extinguished.

4.37 Block an RC relay non-operated.

4.38 Move all sliders of the 35 type test set to the extreme right, so that the resistance will be a maximum. Keys 1 to 4

should be open and the BAT & GRD CO key and the REV key should be normal.

4.39 Connect the BAT & GRD jack of the test set to battery and ground terminals, using the W2W cord with No. 365 tools. Insert the plug of another W2W cord to which No. 365 tools are connected into the T and R jack of the test set. Connect the tip of the cord to the top winding terminal and the ring of the cord to the bottom winding terminal of the RT relay associated with the blocked RC relay.

4.40 Close the I key and adjust the I sliders of the test set until the milliammeter reads the test operate value of current for the RT relay. Observe that the SL or L lamp associated with the RT relay under test, lights.

4.41 Remove the connections to the winding terminals of the RT relay and observe that the associated lamp is extinguished. Remove the tool from the RC relay.

4.42 Block another RC relay non-operated and connect the W2W cord to the winding terminals of the associated RT relay. Observe that the associated lamp lights.

4.43 Remove the connections to the winding terminals of the RT relay and observe that the associated lamp is extinguished. Remove the tool from the RC relay.

4.44 Repeat 4.42 and 4.43 until all RT relays have been checked.

#### (F) Timing Relays Alarm Test

4.45 Insert No. 258C plugs into all L jacks and observe that all L lamps are lighted and that the SL lamp remains extinguished.

Caution: If any L lamp fails to light, do not proceed with this test.

4.46 Block the RL and A6 relays non-operated.

4.47 Insert a No. 258C plug into the ER (emergency red) jack. Observe that the SL lamp lights. After a period of 15 to 30 seconds observe that the A2 (Alarm 2) and F lamps light and that the office alarm bells ring. Silence the alarms by operating the ACO key.

4.48 Remove the tool from the RL relay and then remove the plug from the ER jack. After the time required to operate the timing relays, observe that the SL lamp is extinguished.

4.49 Momentarily operate the AR key and observe that the A2 and F lamps are extinguished.

4.50 Remove the tool from the A6 relay and the plugs from the L jacks.

(G) TL Relay Non-Operate Alarm Test

4.51 Block the A6 relay and the TL relay of a regular siren station line circuit non-operated, and insert No. 258C plugs into all L jacks. Observe that the A4 and F lamps light and that the office alarm bells ring. Silence the alarm by operating the ACO key. Observe that all L lamps except the one associated with the blocked TL relay light steadily.

Caution: If any other L lamp fails to light, do not proceed with this test.

4.52 Insert a No. 258C plug into the EW jack and observe that the A1 lamp and the SL lamp lights. Observe that the A4 lamp lights. Observe that the A4 lamp is extinguished.

4.53 Remove the tools from the TL and A6 relays and observe that the associated L lamp lights.

4.54 Remove the plug from the EW jack and operate the AR key. After the time required to operate the timing relays, observe that the A1 and F lamps are extinguished. Remove the plugs from the L jacks.

(H) Falsely Operated TL Relay Alarm Test

4.55 Insert No. 258C plugs into all L (line) jacks and observe that all L lamps are lighted and the SL lamp remains extinguished.

Caution: If any L lamps fail to light, do not proceed with this test.

4.56 Block the A6 relay non-operated.

4.57 Insert a No. 258C plug into the ER jack. Observe that the SL lamp lights. Block the TL relay of the spare siren station line, operated.

4.58 Remove the plug from the ER jack and after the time required to operate all of the timing relays, observe that the A4 and F lamps light and that the office alarm bells ring. Silence the alarm by operating the ACO key.

4.59 Momentarily operate the AR key and observe that the A4 and F lamps remain lighted.

4.60 Block operated the TL1 relay.

4.61 Remove the plugs from all L jacks and remove the tool from the TL relay. Observe that the SL lamp and all L lamps except the one associated with the blocked TL1 relay are extinguished.

4.62 Momentarily operate the AR key and observe that the A4 and F lamps remain lighted.

4.63 Block operated the next higher numbered TL relay and then remove the tool from the previously blocked TL relay. Observe that the L lamp associated with the higher numbered TL relay is lighted and that all other L lamps are extinguished.

4.64 Momentarily operate the AR key and observe that the A4 and F lamps remain lighted.

4.65 Repeat 4.63 and 4.64 until all TL relays have been blocked operated.

4.66 Remove the tool from the last TL relay. Observe that the associated L lamp is extinguished.

4.67 Momentarily operate the AR key. Observe that the A4 and F lamps are extinguished.

4.68 Remove the tool from the A6 relay.

(J) Falsely Operated RC Relay Alarm Test

4.69 Insert No. 258C plugs into all L jacks and observe that the associated L lamps light and the SL lamp remains extinguished.

Caution: If any L lamp fails to light, do not proceed with this test.

4.70 Block the A6 relay non-operated.

4.71 Manually operate the RC relay of the spare siren station line circuit. Observe that the A4, F and SL lamps light and that the office alarm bells ring. Silence the alarm by operating the ACO key.

4.72 Release the RC relay and observe that the SL lamp is extinguished.

4.73 Momentarily operate the AR key. Observe that the A4 and F lamps are extinguished.

4.74 Manually operate the RC relay of a regular siren station line circuit. Observe that the A4 and F lamps light and that the office alarm bells ring. Silence the alarms by operating the ACO key.

4.75 Release the RC relay.

4.76 Momentarily operate the AR key. Observe that the A4 and F lamps are extinguished.

4.77 Repeat 4.74 to 4.76 inclusive on each regular siren station line circuit.

4.78 Remove the tool from the A6 relay.

(K) Line Test - Siren Station

4.79 When the assistant at a siren station bridges the line with a test set, the A4 and F lamps light and the office alarm bells ring. Silence the alarms by operating the ACO key.

4.80 Insert the P3E cord into the L jack associated with the station at which the assistant is originating the call and into the TT jack. Note the associated L lamp lights.

4.81 Operate and hold operated the TT key in order to talk to the assistant over the emergency handset and proceed as follows.

4.82 Instruct the assistant to operate the PC switch to the "OFF" position and to report back when it has been so operated.

4.83 Inform the assistant that after he is told to disconnect his test set that the SG relay at the siren station will be caused to operate and that he shall then manually operate the CK relay and hold it operated until such time as the SG relay is released, that he shall then reconnect his test set to the siren station line.

4.84 Instruct the assistant to disconnect. Note that he has disconnected and then restore the TT key.

Caution: Make sure that this sequence of operation is followed or the MG relay will be falsely operated.

4.85 Remove the P3E cord from the L jack and note the lamps are extinguished. Manually operate the RC relay associated with the station under test. Note that the L lamp lights.

Caution: The operation of any RC relay other than that associated with the line under test will cause the siren at that associated station to operate. Take care, therefore, that an RC relay is not operated in error.

4.86 Release the RC relay and reinsert the P3E cord into the L jack and associated with the line being tested and operate and hold operated the TT key.

4.87 Instruct the assistant to disconnect his test set and after doing so to restore the PC switch to the "ON" position and to then proceed to the next station to be tested and repeat 4.80.

4.88 After the assistant has disconnected, restore the TT key and remove the plug from the L jack.

Note: A momentary alarm may be introduced between these tests but it may be disregarded.

4.89 Extinguish the A4 and F lamps by operating the AR key.

#### (L) Resistance Test

4.90 Insert No. 258C plugs into the EB and TL jacks. Silence the audible alarms by operating the ACO key.

4.91 Move the sliders of the 35 type test set to the extreme right so that the resistance will be a maximum. Note that keys 1 to 4 are open and BAT & GRD CO key and the REV key are normal.

4.92 Connect 48V battery and ground to the BAT & GRD jack of the test set using the W2W cord with No. 365 tools. Insert a No. 298A plug into the T & R jack of the test set.

4.93 Close the 1 key and adjust the 1 slider of the test set until the reading on the milliammeter is 50 milliamperes. Remove the No. 298A plug from the T & R jack and insert a W2W cord to which the No. 361B tools are connected into that jack. Connect the No. 361B tools to the winding terminals 2T and 2B of the A resistance. Note the reading in the milliammeter. If it is approximately 4 milliamperes the resistances are satisfactory, if less than 3 milliamperes, one resistance is open and if much higher than 4 milliamperes one or both resistances is shorted.

4.94 Remove the connections to the winding terminals of the A resistance and remove the plugs from the EB and TL jacks.

#### (M) False Ground and Battery Test

4.95 Insert No. 258C plugs into all L jacks and observe that the associated L lamps light.

4.96 Block the SRI relay operated.

4.97 Move the sliders of the 35 type test set to the extreme right so that the resistance will be a maximum. Note that keys 1 to 4 are open and BAT & GRD CO key and the REV key are normal.

4.98 Connect 48V battery and ground to the BAT & GRD jack of test set using the W2W cord with the No. 365 tools. Insert the plug of the W1W cord into the T & R jack. Close the 1 key of the test set.

4.99 Connect the connecting clip of the W1W cord to one of the No. 7 terminals of the No. 93G repeating coil. Note whether in either case there is a deflection of the needle of the milliammeter. If there is no deflection reduce the resistance in the test set by adjusting the 1 sliders. It may be necessary to use the 15 mil scale on the meter, in which case the MIL-AMP key should be operated to the 15 mil position.

4.100 Operate the REV key and note whether there is a deflection. If necessary, adjust the sliders as outlined in 4.99.

4.101 If no deflection is noted in either 4.99 or 4.100 there is neither a false battery nor a ground on any of the leads. If a deflection is noted proceed as follows.

4.102 Insert No. 258C plugs into the T2 and T3 jacks. Silence the alarms by operating the ACO key.

4.103 Repeat 4.99 and 4.100. If no deflection is noted, the false ground or battery is in the wiring of the control circuit between the T2 and T3 jacks and the control relays. If there is a deflection proceed as follows.

4.104 Insert a No. 258C plug into the EB jack and repeat 4.99 and 4.100. If no deflection is noted, the false ground or battery is external to the control circuit in which case remove the plug from the EB jack.

4.105 Call the assistant at the control station and request him to operate the control key to the red position. Repeat 4.99 or 4.100 as required to test for ground or battery on the red signal leads. If with the key operated to the red position, there is no deflection of the needle, ground or battery is on the white alarm (T2 and R2) leads. If there is a deflection the ground or battery is on the red alarm (T1 and R1) or common (T and R) leads.

4.106 Request the assistant at the control station to operate the control key to the white position. Repeat 4.99 or 4.100 as required to test for grounds or battery on the white signal leads. If with the key operated to the white position, there is no deflection of the needle, the ground or battery is on the red alarm (T1 and R1) leads. If there is a deflection, the ground or battery is on the common (T and R) leads.

4.107 Request the assistant at the control station to restore the key to normal.

4.108 Remove the connection from the No. 7 terminal of the No. 93G repeating coil, the tool from the SR1 relay and the plugs from the T2 and T3 jacks. Remove the plugs from the L jacks.

#### (N) Key Test - Control Station

4.109 Insert No. 258C plugs into all L jacks. Observe that all L lamps light steadily and that the SL lamp remains extinguished.

Caution: If any L lamp fails to light, do not proceed with this test.

→ 4.110 Block the A6 relay and the TL relay associated with the spare line non-operated.

4.111 Call the assistant at the control station and request him to operate the control key to the red position.

4.112 Check that the bell in the control station key box starts to ring and then stops and that the A1 lamp lights and the office alarm bells ring. Remove the tool from the TL relay. Note that the SL lamp lights steadily, that the A1 lamp is extinguished and the office alarm bells are silenced. After a short interval of time note that the bell in the control station key box rings intermittently.

4.113 Request the assistant at the control station to restore the control key to normal and observe that the bell stops ringing. After the time required to operate the timing relays observe that the SL lamp is extinguished.

→ 4.114 Again block the TL relay associated with the spare line non-operated.

4.115 Request the assistant at the control station to operate the control key to the white position.

4.116 Check that the bell at the control station starts to ring and then stops and that the A1 lamp lights and the office alarm bells ring. Remove the tool from the TL relay and note that the SL lamp lights steadily and the A1 lamp is extinguished. After a short interval of time note that the bell in the control station box rings steadily.

4.117 Request the assistant at the control station to restore the control key to normal and observe that the bell stops ringing.

4.118 After the time required to operate the timing relays, observe that the SL lamp is extinguished.

4.119 Remove the No. 258C plugs from the L jacks and observe that all L lamps are extinguished. Remove the tool from the A6 relay.

#### 5. REPORTS

5.01 The required record of these tests should be entered on the proper form.