

CIVIL AIR DEFENSE WARNING SYSTEM SYSTEM DIALING AND PULSING TESTS BRANCH CIRCUIT DIALING TEST

1. GENERAL

1.01 This section describes methods for making one-way dialing or pulsing tests over an entire civil air defense warning network, or dialing tests on one-way branches.

1.02 In order to save words, the abbreviation CADW will be used hereafter for the phrase "civil air defense warning," and the phrase "dial pulse receiving unit" will be used as a generic expression covering the "code generator and dial pulse receiving unit" and the "dial pulse receiving and control units."

1.03 The tests and features covered are:

A. Dialing Test Over Entire System

This test checks the overall operation of a CADW system by dialing digit "9" from the central office nearest the control point (or the alternate control point) and observing that the proper alarm and lamp indications are obtained at every office having a dial pulse receiving unit.

B. Pulsing Test Over Entire System

This test checks the pulsing characteristics of a CADW system by sending continuous pulses from the central office nearest the control point (or the alternate control point) and measuring the percent break of the received pulses at as many offices having dial pulse receiving units as desired.

Note: It is not intended that Test B shall be used as an absolute measure of the performance of the system, since the limits given are merely the maximum and minimum to which the dial pulse receiving units will respond properly. However, a comparison of the results obtained from such a test against those previously obtained, and the readings at other offices, should provide valuable clues to assist in locating troubles.

C. Dialing Test on Branch Circuits

This test checks the operation of branch circuits using one-way sending circuits, or 2-way open-closed loop repeaters arranged for one-way operation, by dialing digit "9" into the one-way sending circuit or the 2-way repeater and observing that the proper alarm and lamp indications are obtained from the dial pulse receiving units at all offices beyond the sending point.

1.04 Caution: To promote prompt attention for trouble conditions on the system, the alarm facilities are now arranged to bring in the office alarms when ANY pulse is received by a dial pulse receiving circuit. It is important, therefore, that extreme care be exercised at all times to avoid introducing even a momentary false pulse while working on the lines or equipment associated with the system. The same care, should, of course, be taken to prevent the false transmission of any of the alert codes.

1.05 WARNING: When making Test B the entire network is out of service, when making Test C part of the network is out of service and when making Test A none of the network is out of service. Permission MUST be obtained from the Telephone Company CADW network control supervisor before any tests are performed on this equipment, in order that the control supervisor may take whatever action is necessary to provide warnings in the isolated areas if an alert should occur at that time. All other Telephone Company personnel who may be concerned shall be informed when tests are to be conducted, and both the control supervisor and other concerned Telephone Company personnel shall be informed when the tests are completed and the equipment is restored to service.

1.06 For the purposes of these tests the various offices of the system are classified as indicated below, and the services of an employee will be required at the CADW bay in each participating office.

| | <u>Sending Office</u> | <u>Receiving Office</u> |
|------------|--|---|
| For Test A | Office nearest control point (or alternate control point) | Every other office having a dial pulse receiving unit |
| For Test B | Office nearest control point (or alternate control point) | Any other office having a dial pulse receiving unit at which it is desired to make percent break measurements |
| For Test C | Any office having a one-way sending circuit, or a 2-way open-closed loop repeater arranged for one-way operation | Each dial pulse receiving office located farther out the branch than the sending office |

SECTION 201-305-501

1.07 When a dial pulse receiving unit is located in an unattended office, local practices for retiring the alarms and lamps there shall be followed.

1.08 Talking facilities are required for the use of the persons participating in Tests B and C, and some arrangement for reporting the results of Test A to the sending office must be provided.

1.09 Lettered Steps: The letters a, b, c, etc. are added to a step number to indicate that the step covers an action which may or may not be required, depending upon local conditions. The conditions under which a lettered step, or series of steps, should be made are given in the action column; and all steps governed by the same condition are designated by the same letter. Where a condition does not apply, the associated steps should be omitted.

2. APPARATUS

2.01 The apparatus required for each test is shown in Table A. For Test B, use apparatus per columns I to VI as follows:

| <u>If Test Set Available Is</u> | <u>At Sending Office Use</u> | <u>At Receiving Office* Use</u> |
|---------------------------------|------------------------------|---------------------------------|
| SXS Pulse Rep Test Set (2.04) | Col I | Col IV |
| Toll Pulse Rep Test Set (2.05) | Col II | Col V |
| 2A or 2B Sig Test Set (2.06) | Col III | Col VI |

*Each office at which percent break measurements are to be made

For Test C, use apparatus per column VII when a dial is available in the CADW bay, and per column VIII when a dial is not available in the bay. The details for each item are covered in the indicated paragraphs.

2.02 Test equipment in the CADW bay - including (as required) a dial circuit, test jack circuits and battery supply circuits for the test sets - as shown on SD-95683-01.

2.03 SXS pulsing test set SD-31481-01 (J34717A).

2.04 SXS pulse repeating test set SD-31667-01 (J34720A).

2.05 Toll pulse repeating test set SD-64540-01 (J64722A).

2.06 2A signaling test set SD-56134-01 (J64730A) or 2B signaling test set SD-56134-02 (J64730B).

2.07 36B test set (remote control).

2.08 P3E cord, 6 feet long, equipped with two No. 310 plugs (3P7A cord).

2.09 P3E cord, 10 feet long, equipped with two No. 310 plugs (3P6F cord).

2.10 P2J cord, 6 feet long, equipped with two No. 310 plugs (2P9B cord).

2.11 P2J cord, 9 feet long, equipped with two No. 310 plugs (2P9A cord).

2.12 P3K cord, 12 feet long, equipped with two No. 310 plugs (3P15B cord).

2.13 P4N cord, 4 feet long, equipped with two No. 289B plugs (4P8A cord).

2.14 P3E cord, 1 foot long, equipped with two No. 310 plugs (3P6A cord).

2.15 No. 310 plug with tip and ring shorted.

Table A

| | No. Required for Test | | | | | | | | |
|--------------------------------|-----------------------|-----------------------|------------|-----------|-------------------------|-----------|------------|-----------------------|--|
| | A | B (See 2.01) | | | | | | C (See 2.01) | |
| | <u>Sending Office</u> | <u>Sending Office</u> | | | <u>Receiving Office</u> | | | <u>Sending Office</u> | |
| | <u>I</u> | <u>II</u> | <u>III</u> | <u>IV</u> | <u>V</u> | <u>VI</u> | <u>VII</u> | <u>VIII</u> | |
| Test Eqpt in Bay (2.02) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| SXS Pulsing Test Set (2.03) | - | 1 | 1 | - | - | - | - | - | |
| SXS Pulse Rep Test Set (2.04) | - | 1 | - | - | 1 | - | - | - | |
| Toll Pulse Rep Test Set (2.05) | - | - | 1 | - | - | 1 | - | - | |
| 2A or 2B Sig Test Set (2.06) | - | - | - | 1 | - | - | 1 | - | |
| 36B Test Set (2.07) | - | 1 | 1 | - | - | - | - | - | |
| Patching Cord (2.08) | - | 1 | - | - | 1 | - | 1 | 1 | |
| Patching Cord (2.09) | - | - | 2 | - | - | 1 | - | - | |
| Patching Cord (2.10) | - | 1 | 1 | - | - | - | - | - | |
| Patching Cord (2.11) | - | - | 1 | - | - | 1 | - | - | |
| Patching Cord (2.12) | - | 2 | - | 1 | 1 | - | 1 | - | |
| Patching Cord (2.13) | - | - | 1 | - | - | - | - | - | |
| Patching Cord (2.14) | 1 | - | - | - | - | - | 1 | - | |
| Shorted Plug (2.15) | - | 1 | 1 | - | 1 | 1 | 1 | - | |
| Dial Hand Test Set (2.16) | - | - | - | - | - | - | - | 1 | |
| Solid Plug (2.17) | - | - | - | - | - | - | 1 | 1 | |
| Dummy Plug (2.18) | - | 1 | 1 | 2 | - | - | 1 | - | |

2.16 No. 1011G dial hand test set, equipped with W2CK cord, a No. 471A jack, and a No. 310 plug (2W38A cord).

2.17 No. 349A plug (solid).

2.18 No. 258D plug (dummy).

3. METHOD

3.01 When extension lamp circuits are used to obtain a multiple appearance of the CADW lamp indications at a testboard or switchboard, the employee at the office involved shall verify that those lamps light when the main lamps light.

3.02 When Test B is made, all offices having dial pulse receiving units except the sending office and the receiving offices (those that are making the percent break measurements), will get the following alarm indications when the pulses are transmitted:

MAJOR alarm sounds
 ALM lamp on dial pulse receiving unit lights
 WD lamp on dial pulse checking unit lights

These indications may be retired upon the completion of pulsing by:

- (a) Operating the CA key on the dial pulse receiving unit
- (b) Operating the WD key on the dial pulse checking unit

If the test should be lengthy, however, the alarms may be retired while the pulsing is in progress by inserting a dummy plug in the PLS jack on the dial pulse receiving unit and operating the keys. If this is done, the CO lamp on the unit will light as a guard signal until the dummy plug is removed.

Caution: No alerts can be received while the dummy plug is in the PLS jack. Be sure to remove it as soon as the test is finished.

STEP

ACTION

VERIFICATION

A. Dialing Test Over Entire System

At Sending Office - See 1.06

- 1 Patch DIAL jack to DIAL 9 jack on test and alarm cut-off unit, using P3E cord
- 2 Operate SYS TST key and hold it through Step 3
- 3 Dial digit "9"
Note: In case a digit other than "9" is dialed by mistake, immediately dial digit "2" in order to clear the circuit. Then proceed with the test.

MAJOR alarm sounds
 ALM lamp on one-way receiving unit lights
 ALM lamp on dial pulse receiving unit lights
 TST lamp on dial pulse checking unit lights

At all receiving offices - See 1.06 -
 MAJOR alarm sounds
 ALM lamp on dial pulse receiving unit lights
 TST lamp on dial pulse checking unit lights

- 4 Remove patching cord

At Sending Office and at Each Receiving Office

- 5 Momentarily operate CA key on dial pulse receiving unit
- 6 Momentarily operate TST key on dial pulse checking unit

MAJOR alarm is silenced
 ALM lamp on dial pulse receiving unit is extinguished

TST lamp on dial pulse checking unit is extinguished

At Sending Office

- 7 Momentarily operate CA key on one-way receiving unit

ALM lamp on one-way receiving unit is extinguished

SECTION 201-305-501

| <u>STEP</u> | <u>ACTION</u> | <u>VERIFICATION</u> |
|-------------|---------------|---------------------|
|-------------|---------------|---------------------|

B. Pulsing Test Over Entire System

At Sending Office Having SXS Pulse Repeating Test Set - See 1.06

- | | | |
|----|--|---|
| 1 | Patch BAT G jack of pulsing test set to a TST BAT 48V jack on test and alarm cut-off unit, using P2J cord; and patch BAT G jack of pulse repeating test set to other TST BAT 48V jack, using P3K cord <u>Caution: To avoid blowing fuses, connect to the test sets first.</u> | |
| 2 | Insert plug of 36B test set (remote control) into A and B jacks of pulsing test set | |
| 3 | Check that PERCENT BREAK meter on pulse repeating test set reads 100 on the scale (This is its no current position) If necessary, bring the reading to 100 by means of the zero adjusting screw on the meter | |
| 4 | Patch TL jack of pulsing test set to PLS CHK jack of pulse repeating test set, using P3K cord | |
| 5 | Insert shorted plug in SW jack of pulsing test set | |
| 6 | Adjust R1 control of pulse repeating test set to make PERCENT BREAK meter read 0 | |
| 7a | If pulsing test set has a PR key - Operate it | |
| 8b | If pulsing test set does not have a PR key - Operate CHK PLS key | |
| 9 | Remove shorted plug from SW jack | |
| 10 | Start pulses by momentarily operating LK key of remote control test set | PERCENT BREAK meter reads 60-61 If Step 8b has been used, BY lamp on pulsing test set flashes, and will continue to do so until Step 17 is performed |
| 11 | Move plug from PLS CHK jack to INT jack of pulse repeating test set | |
| 12 | Patch CF jack of pulse repeating test set to DIAL 9 jack on test and alarm cut-off unit, using P3E cord | |
| 13 | Insert dummy plug in PLS jack of dial pulse receiving unit | CO lamp on dial pulse receiving unit lights |
| 14 | When requested by a receiving office, send pulses over system by operating and holding SYS TST key as long and as often as necessary for the receiving office to obtain a satisfactory meter reading, <u>but never less than 2 seconds at a time</u> | ALM lamp on one-way receiving unit lights At receiving office - Meter reads as called for in Step 63, 72, or 81 At all other offices having dial pulse receiving units - See 3.02 |
| 15 | When test is completed, remove dummy plug from PLS jack | CO lamp is extinguished |

| <u>STEP</u> | <u>ACTION</u> | <u>VERIFICATION</u> |
|-------------|--|--------------------------|
| 16 | Momentarily operate CA key on one-way receiving unit | ALM lamp is extinguished |
| 17 | Remove all patching cords and restore all keys <u>Caution: To avoid blowing fuses, disconnect power cords from supply jacks before disconnecting them from test sets.</u> | |

At Sending Office Having Toll Pulse Repeating Test Set - See 1.06

| | | |
|-----|--|---|
| 18 | Patch BAT G jack of pulsing test set to a TST BAT 48V jack on test and alarm cut-off unit, and patch BAT jack of pulse repeating set to other TST BAT 48V jack, using P2J cords <u>Caution: To avoid blowing fuses, connect to the test sets first.</u> | |
| 19 | Patch A and B jacks of pulse repeating test set to A and B jacks, respectively, of pulsing test set, using P4N cord | |
| 20 | Insert plug of 36B test set (remote control) into A1 and B1 jacks of pulse repeating test set | |
| 21 | Check that PERCENT BREAK meter reads 100 on the scale. (This is its no current position.) If necessary, bring the reading to 100 by means of the zero adjusting screw on the meter | |
| 22 | Patch TL jack of pulsing test set to INT jack of pulse repeating test set, using P3E cord | |
| 23c | If pulsing test set has a PR key - Operate it | |
| 24d | If pulsing test set does not have a PR key - Operate CHK PLS key | |
| 25 | Insert shorted plug in SW jack of pulsing test set | |
| 26 | Operate DS and PLS CHK keys of pulse repeating test set | |
| 27 | Adjust ADJ control of pulse repeating test set to make PERCENT BREAK meter read 0 | |
| 28 | Remove shorted plug from SW jack | |
| 29 | Start pulses by momentarily operating LK key of remote control test set | If Step 24d has been used, BY lamp on pulsing test set flashes, and will continue to do so until Step 37 is performed |
| 30 | Adjust LK control of pulse repeating test set to make PERCENT BREAK meter read 50 | |
| 31 | Release PLS CHK key on pulse repeating test set | |
| 32 | Patch RLY jack of pulse repeating test set to DIAL 9 jack on test and alarm cut-off unit, using P3E cord | |

SECTION 201-305-501

| <u>STEP</u> | <u>ACTION</u> | <u>VERIFICATION</u> |
|--|--|---|
| 33 | Insert dummy plug in PLS jack of dial pulse receiving unit | CO lamp on dial pulse receiving unit lights |
| 34 | When requested by a receiving office, send pulses over system by operating and holding SYS TST key as long and as often as necessary for the receiving office to obtain a satisfactory meter reading, <u>but never less than 2 seconds at a time</u> | ALM lamp on one-way receiving unit lights At receiving office - Meter reads as called for in Step 63, 72, or 81 At all other offices having dial pulse receiving units - See 3.02 |
| 35 | When test is completed, remove dummy plug from PLS jack | CO lamp is extinguished |
| 36 | Momentarily operate CA key on one-way receiving unit | ALM lamp is extinguished |
| 37 | Remove all patching cords and restore all keys <u>Caution: To avoid blowing fuses, disconnect power cords from supply jacks before disconnecting them from test sets.</u> | |
| <u>At Sending Office Having 2A or 2B Signaling Test Set - See 1.06</u> | | |
| <u>Note:</u> It is assumed that the 2A or 2B signaling test set meets the requirements in BSP 100-263-501. | | |
| 38 | Insert plugs of TST A and TST B cords which are part of the test set in TST BAT A and TST BAT B jacks, respectively, on test and alarm out-off unit | If 2B set is being used, L and D lamps light |
| 39 | Set SCALE SEL switch to PPS | PULSES PER SECOND meter reads other than 0 |
| 40 | Allow test set to warm up for one minute | |
| 41e | If 2B set is being used - Operate DIAL PLS key | PULSES PER SECOND meter reads 0 PERCENT BREAK meter reads 0 on its <u>black</u> scale |
| 42f | If 2A set is being used - Operate DIAL SUPV key | If necessary, bring each reading to 0 by means of the adjusting screw on the meter involved |
| 43 | Insert dummy plug in P jack | PERCENT BREAK meter reads 100 on its <u>black</u> scale If necessary, unlock CAL % BK control and adjust it to obtain meter reading of 100. Then relock the control and recheck the meter reading. |
| 44 | Remove dummy plug from P jack | |
| 45e | If 2B set is being used - Restore DIAL PLS key to normal | |
| 46f | If 2A set is being used - Restore DIAL SUPV key to normal | |
| 47 | Adjust ADJ PPS control to obtain reading of 10 on 0-20 scale of PULSES PER SECOND meter | |
| 48 | Set ADJ % BK switch to M | |
| 49 | Adjust ADJ % BK control to obtain reading of 50 on PERCENT BREAK meter | |
| 50 | Operate PLS key to LINE | |

| <u>STEP</u> | <u>ACTION</u> | <u>VERIFICATION</u> |
|-------------|--|---|
| 51 | Patch L jack of test set to TS1 jack on test and alarm cut-off unit, using P3K cord | |
| 52 | Insert dummy plug in PLS jack of dial pulse receiving unit | CO lamp on dial pulse receiving unit lights |
| 53 | When requested by a receiving office, send pulses over system by operating and holding SYS TST key as long and as often as necessary for the receiving office to obtain a satisfactory meter reading, <u>but never less than 2 seconds at a time</u> | ALM lamp on one-way receiving unit lights At receiving office - Meter reads as called for in Step 63, 72, or 81 At all other offices having dial pulse receiving units - See 3.02 |
| 54 | When test is completed, remove dummy plug from PLS jack | CO lamp is extinguished |
| 55 | Momentarily operate CA key on one-way receiving unit | ALM lamp is extinguished |
| 56 | Disconnect all cords and restore all keys | If 2B set is being used, L and D lamps are extinguished |

At Receiving Office Having SXS Pulse Repeating Test Set - See 1.06

| | | |
|----|---|---|
| 57 | Patch BAT G jack of pulse repeating test set to TST BAT 48V jack on test and alarm cut-off unit, using P3K cord <u>Caution: To avoid blowing fuses, connect to test set first.</u> | |
| 58 | Check that PERCENT BREAK meter reads 100 on the scale | |
| 59 | Insert shorted plug in PLS CHK jack | |
| 60 | Adjust R1 control of test set to make PERCENT BREAK meter read 0 | |
| 61 | Remove shorted plug from PLS CHK jack | |
| 62 | Patch PLS CHK jack to PLS jack on dial pulse receiving unit, using P3E cord | |
| 63 | Request sending office to send pulses | PERCENT BREAK meter reads between 20 and 80 <u>Note:</u> Because of the circuit arrangement this reading is actually percent make. To change it to percent break, subtract it from 100. Record the corrected value for future reference. |
| 64 | Remove patching cords <u>Caution: To avoid blowing fuses, disconnect power cord from supply jack before disconnecting it from test set.</u> | |

At Receiving Office Having Toll Pulse Repeating Test Set - See 1.06

| | | |
|----|---|--|
| 65 | Patch BAT jack of pulse repeating test set to TST BAT 48V jack on test and alarm cut-off unit, using P2J cord <u>Caution: To avoid blowing fuses, connect to test set first.</u> | |
|----|---|--|

SECTION 201-305-501

| <u>STEP</u> | <u>ACTION</u> | <u>VERIFICATION</u> |
|--|--|---|
| 66 | Check that PERCENT BREAK meter reads 100 on the scale. (This is its no current position.) If necessary, bring the reading to 100 by means of the zero adjusting screw on the meter | |
| 67 | Operate SL key | |
| 68 | Insert shorted plug in LP IN jack | |
| 69 | Adjust ADJ control to make PERCENT BREAK meter read 0 on the scale | |
| 70 | Remove shorted plug from LP IN jack | |
| 71 | Patch LP IN jack to PLS jack on dial pulse receiving unit, using P3E cord | |
| 72 | Request sending office to send pulses | PERCENT BREAK meter reads between 20 and 80 Note: Because of the circuit arrangement this reading is actually percent make. To change it to percent break, subtract it from 100. Record the corrected value for future reference. |
| 73 | Remove patching cords <u>Caution: To avoid blowing fuses, disconnect power cord from supply jack before disconnecting it from test set.</u> | |
| <u>At Receiving Office Having 2A or 2B Signaling Test Set - See 1.06</u> | | |
| | <u>Note:</u> It is assumed that the 2A or 2B signaling test set meets the requirements in BSP 100-263-501. | |
| 74 | Insert plug of TST BAT A cord which is part of the test set in TST BAT A jack on test and alarm cut-off unit | If 2B set is being used, L and D lamps light |
| 75 | Operate MEAS % BK key to LINE | PERCENT BREAK meter reads 0 on its <u>black</u> scale If necessary, bring reading to 0 by means of adjusting screw on the meter |
| 76g | If 2B set is being used - Insert dummy plug in M jack | D lamp is extinguished |
| 77 | Operate TWD D key to OFF HK and MEAS % BK key to DROP | |
| 78 | Insert shorted plug in D jack | PERCENT BREAK meter reads 100 on its <u>black</u> scale If necessary, unlock CAL % BK control and adjust it to obtain meter reading of 100. Then relock the control and recheck the meter reading |
| 79 | Remove shorted plug from D jack | |
| 80 | Patch D jack to PLS jack on dial pulse receiving unit, using P3K cord | |
| 81 | Request sending office to send pulses | PERCENT BREAK meter reads between 20 and 80 on the <u>black</u> scale. Record the reading for future reference. |
| 82 | Remove dummy plug, disconnect all cords and restore all keys | If 2B set is being used, L lamp is extinguished |

| <u>STEP</u> | <u>ACTION</u> | <u>VERIFICATION</u> |
|---|---|---|
| <u>C. Dialing Test On Branch Circuits</u> | | |
| <u>At Sending Office - See 1.06</u> | | |
| 1a | If test and alarm out-off unit is equipped with a dial - Patch DIAL jack to TS2 jack, using 1-foot P3E cord | |
| 2b | If test and alarm out-off unit is not equipped with a dial - Insert plug of dial hand test set in TS2 jack | |
| 3b | Operate TALK switch on dial hand test set | |
| 4 | Insert solid plug in LP jack associated with one-way sending circuit or 2-way open-closed loop repeater of circuit under test | At each receiving office - See 1.06 - MAJOR alarm sounds ALM lamp on dial pulse receiving unit lights ALM lamp on alarm unit lights (if office has 2-way repeater) |
| 5 | Patch PLS OUT jack of test and alarm cut-off unit to EQ2 jack associated with one-way sending circuit or 2-way open-closed loop repeater, using 6-foot P3E cord | At each receiving office - WF lamp on dial pulse checking unit lights |
| 6 | Dial digit "9" <u>Note:</u> In case a digit other than "9" is dialed by mistake, immediately dial digit "2" in order to clear the circuit. Then proceed with the test. | At each receiving office - TST lamp on dial pulse checking unit lights |
| 7 | Remove patch between PLS OUT jack and EQ2 jack | |
| 8 | Remove solid plug from LP jack | |
| 9 | Remove remaining connections | |
| <u>At Each Receiving Office</u> | | |
| 10 | Operate CA key on dial pulse receiving unit | MAJOR alarm is silenced ALM lamp on dial pulse receiving unit is extinguished |
| 11 | Operate WD and TST keys on dial pulse checking unit | WD and TST lamps on dial pulse checking unit are extinguished |
| 12 | Operate CA key on alarm unit (if provided) | ALM lamp on alarm unit is extinguished |