ADOSO II SYSTEM
(Automatic Distribution of Service Orders)

INSTALLATION AND MAINTENANCE TESTS FOR A COMPLETE ADOSO II SYSTEM
PSD-70010-01
PSD-70011-01
PSD-70012-01

1. GENERAL

1.01 This section describes installation and maintenance tests to be made on an ADOSO II System.

1.02 To make the tests correctly, the system must have a minimum of two branch circuits and one trunk circuit. Each branch circuit to be equipped with two stations, a business office (BO) PSD-70010-01, and a plant service center (PSC) PSD-70011-01. The trunk circuit to be equipped with three stations, traffic intercept (TI), directory (DI), and revenue accounting (RA), equipped with station sets per PSD-70005-01 or PSD-70013-01. One of the branch lines has associated with it the control unit PSD-70012-01. The plant service center having the control unit (controller) is known as the control plant service center.

1.03 In the control plant service center and associated with the control unit is a 28-type RO typing reperforator used as a monitor. If an additional monitor is required, certain considerations should be noted. See 4.05.

2. PRELIMINARY TESTS

2.01 All teletypewriter equipment, associated with and used as components in the ADOSO II System, shall be tested and adjusted according to Bell System Practices, and local instructions directly applicable.

2.02 All page machines will have paper handling equipment adjusted to fit the forms used.

3. LINE AND EQUIPMENT CONNECTIONS

3.01 Connect the branches, trunk, and ROTR monitor to the control unit as in the cable diagrams (CADs) associated with PSD-70012-01. Then strap the A terminal strip as in Note 102 and 107, and the spark killer networks for the L1-L4 relays per note 109 of drawing PSD-70012-01.

4. WORKING LIMITS

4.01 The ADOSO II System can work at either 75 or 100 words-per-minute (wpm) depending upon the station equipment. If the system is to be operated at 75 wpm, the trunk stations at traffic intercept, directory, and revenue accounting may be equipped with station set PSD-70005-01. When operated at 100 wpm, these locations must be equipped with station set PSD-70013-01.

4.02 The control plant service center with the control unit PSD-70012-01 should be in the same city or near its serving toll testroom.

4.03 The loops connected to the control unit for the branches and the trunk may be operated neutral, differential, or equivalent half-duplex circuits.

4.04 Operating loop current shall be 62.5 to 65 mils.

4.05 If a control plant service center requires an additional monitor teletypewriter in the trunk, and the trunk is being fed from a toll testroom using hub operation, the additional inductance of an extra polar relay in series with the line will be enough to cause bias trouble. In such cases, a separate loop and hub repeater should be provided for the additional monitor. In addition, refer to PSD-70012-01, Note 109.

5. GROUND AND SHORT TEST BEFORE APPLYING AC POWER TO THE CONTROL UNIT (PSD-70012-01)

5.01 Disconnect the D and E cord connectors associated with the 48 and 120 volt rectifiers.

5.02 Disconnect the F and G cord connectors on the 28 sequence selector and 28D distributor.

5.03 Place all keys of the control panel in their normal position.

5.04 Set a KS-14510-L1 or equivalent volt-ohm meter on the 1000 ohm scale.

5.05 Connect the negative (-) of VOM to terminal 123 of the A T.S.

5.06 Connect the positive (+) of the VOM to the frame of the unit. (Mounting plates).

5.07 VOM should read infinity.

5.08 Connect the (+) of VOM to terminal 130 of the A T.S.

5.09 VOM should read approximately 2000 ohms.

5.10 Set the VOM on the 10 ohm scale.

5.11 Connect the (+) of VOM to terminal 129 of the A T.S.

5.12 VOM should read approximately 300 ohms.

5.13 If in 5.09 or 5.12 the VOM reads .0 (zero), it indicates a short. Suggest that the 70A fuses be removed, one at a time, until the offending circuit is identified. Then clear the trouble, and replace the fuses.

5.14 Reconnect the D and E cords.

5.15 Reconnect the F and G cords.

5.16 Adjust 120V rectifier to 120 ±2 volts.

5.17 No adjustment provided on the 48-volt rectifier.

6. ORIENTATION AND DISTORTION TESTS FOR BO AND PSC STATIONS

6.01 The various teletypewriter sending and receiving station equipment shall meet the orientation and distortion tests given in Standard BSPs. The serving toll testroom may complete these tests as follows.

6.02 Terminate the stations loop in a 62.5-65 mil dummy.

6.03 Send the stations CDC followed by carriage return (CR) line feed (LF), then insert the source of test signals in the dummy. Example: LTRS LTRS JK LTRS CR LF FOX

6.04 After the optimum setting for the station has been established, remove the test signals and send FIGS H LTRS to the station. (This disconnects the station and prepares it to receive the transmitter start code (TSC).

6.05 The installer or repairman shall prepare a test tape, and place it in the transmitter. Then operate the station START key. Sample: 10 LTRS JK LTRS CR LF RYs or FOX FIGS H LTRS.

6.06 The serving toll testroom sends the stations TSC into the dummy.

(a) LTRS Z for PSC.

(b) LTRS Y for BO.

6.07 When testing the control PSC station equipment, the AC power for the control cabinet should be turned off. The telegraph loop connected to the control unit should not be disconnected from the loop feeding the PSC station equipment.

7. NORMAL ORIENTATION AND DISTORTION TESTS FOR THE CONTROL UNIT

7.01 The 28 ROTR monitor, 28D sequence selector (28DSS), and 28 distributor (28 DIS) shall meet the orientation and distortion tests given in standard BSPs.

7.02 After the control unit has been tested per Section 5, the teletypewriter components may be tested as follows: (Preferred Method).

7.03 Operate the BUSY OUT keys (BOA, BOB, BOC, and BOD), and remove the V2 ET tube. Leave the keys operated and the tube out until end of tests covered in 7.04 - 7.11.

7.04 28 ROTR monitor test.

(a) Toll testroom shall terminate the trunk in a 62.5-65 mil dummy.

(b) If the trunk is legged out of a hub or 43 type repeater, terminate the repeater in the approved manner.

(c) Leave the trunk terminated through 7.05 to 7.07.

(d) Insert a source of test signals in the dummy.

(e) After the optimum setting for the 28 ROTR has been established, remove the test signals and send FIGS H LTRS into the trunk via the dummy.

7.05 Turn on the control cabinet AC power. The ALARM lamp and BUZZER should operate and automatically retire.

7.06 28DSS tests. (See 7.03 and BSP Section on Orientation and Distortion Tests, Paragraph 3.10).

(a) Send RYs only into the trunk via the dummy from a good keyboard or transmitter, biased if possible.

(b) After the optimum setting for the 28D SS is established, remove the test signals and send FIGS H LTRS into the trunk.

7.07 Transmitting from the 28 DIS to the toll testroom. (See 7.03).

(a) Manually operate the CM1 relay. This will cause the 28 DIS to send CR LF VOID FIGS H LTRS to the toll testroom. To repeat this transmission, manually release the CM3 relay for each successive transmission required.

(b) When the 28 DIS test is completed, manually release the CM1 relay.

7.08 Transmission measurements to or from any business office or plant service center on a branch.

(a) Prepare tape similar to this sample and place it in the stations transmitter, and operate the start key. SAMPLE: LTRS 10 LTRS CR LF The quick brown fox jumped over the lazy dogs back FIGS 1234567890 (about eight lines as it will be used again in 7.10) FIGS H LTRS.

(b) When the tape is in the stations transmitter, the serving toll testroom shall send LTRS Z to start the plant service center transmitter, or LTRS Y to start the business office transmitter.

(c) When the serving toll testroom wishes to send to a station on a branch, proceed as follows:

(1) Send FIGS H LTRS on the branch.

(2) To test the business office the toll testroom will send LTRS B LTRS CR LF.

(3) To test the plant service centers 28 page RO and 28 ROTR, the toll testroom will send LTRS AU LTRS CR LF.

(4) Then insert a source of correctly biased signals in the branch circuit.

(5) When the test to the business office or plant service center is complete, the toll testroom will send FIGS H LTRS to the branch.

7.09 Transmission measurements to test the branch to trunk repeater, which is located in the control unit. (See 7.03).

(a) Operate the MASTER MANUAL (MM) key.

(b) Operate the MANUAL BRANCH (MBA, MBB, MBC, or MBD) key. Each operating branch shall be tested.

(c) If necessary the toll testroom may terminate the branch circuit in an approved dummy.

(d) The serving toll testroom inserts a source of ZNB test signals in the branch circuit.

(e) The serving toll testroom reads this signal in the trunk circuit.

(1) The margin received on the trunk should not exceed the algebraic sum of the two channels by 5%.

(f) The serving toll testroom inserts a source of 10% distorted signals in the branch circuit.

(1) The margin received on the trunk not to exceed the algebraic sum of the three elements received in 7.09 (e-1) by 10%.

(g) The serving toll testroom is to conclude these tests by sending FIGS H LTRS.

(h) Return the MASTER MANUAL (MM) and the MANUAL BRANCH (MBA, MBB, MBC, or MBD) keys to normal.

7.10 Transmission measurements to test the broadcast circuit which is located in the control unit.

(a) Make sure that the tapes are removed from all station transmitters.

(b) Place the BUSY OUT (BOA, BOB, BOC, and BOD) keys in their normal position.

(c) Operate the BROADCAST PREPARE (BP) key.

(d) When the BROADCAST READY (BR) lamp lights, operate the BROADCAST SEND (BSB, BSC, and BSD) keys. (This conditions branches B, C, and D to receive the broadcast.)

(e) Place the tape prepared in 7.08 (a) in the plant service center's A transmitter, and operate its START key.

(f) Operate the BROADCAST READY (BR) key. (This will cause the plant service center's transmitter to start).

(g) The toll testroom shall read the transmission in the various loops in this sequence.

(1) Branch A - Same results as in 7.08 (b) when the plant service center A was sending.

(2) Trunk - Same results as in 7.09 (e-1).

(3) Branch B - Should not exceed the results of 7.09 (e-1) by more than 3%.

(4) Branch C - Same limits as branch B.

(5) Branch D - Same limits as branch B.

7.11 Replace the V2 ET tube.

8. ALTERNATE ORIENTATION AND DISTORTION TESTS FOR CONTROL UNIT

(The method given in Section 7 should be used. This method is for trouble clearing and analyzing. The BO keys should be in their normal position for these tests and the V2 tube removed).

8.01 Operate the MASTER MANUAL (MM) key. This connects the 28D SS and 28 DIS into a built-in test dummy, which includes three jacks designated 28 SS, 28 DIS and LPG.

8.02 28D SS local test.

(a) Install a P2A patch cord between the LPG and TEST jack.

(b) In the TEST TRUNK jack of the 63C1 loop switchboard, insert any available PS&R TTY equipment of the same speed.

(c) Transmit from its keyboard or transmitter, RYs or any other test information required.

(d) Remove the patch cord.

8.03 28D SS toll Testroom test.

(a) Install a P2A patch cord between the 28SS and the TEST jacks.

(b) This connects the 28DSS select magnets to the TEST TRUNK jack in the 63C1 loop switchboard.

(c) Patch the TEST TRUNK jack to a toll testroom loop which will supply line current and test signals.

8.04 28 DIS toll testroom tests.

(a) Install a P2A patch cord between the 28 DIS and the TEST jack.

(b) This connects the 28 DIS to the TEST TRUNK jack in the 63C1 loop switchboard.

(c) Patch the TEST TRUNK jack to a toll testroom loop which will supply line current.

(d) Manually operate the CM1 relay which will cause the 28 DIS to send CR LF VOID FIGS H LTRS to the toll testroom. To repeat the transmission, manually release the CM3 relay for each successive transmission required.

(e) Remove the patch cords; release the MM key, and replace the V2 tube.

8.05 The LPG jack is at all times in series with the 28D SS and may be made use of in the following ways:

(a) A milliameter may be inserted into this jack to check the current. The reading should be about 65 mils.

(b) A 164C1 telegraph test set or equivalent may be inserted into this jack to check the signals being delivered to the 28D SS by the L5 relay.

9. TRANSMITTER START CODE (TSC) AND LTRS ASSURANCE SIGNAL TEST (SC 2)

9.01 Operate the BOA, BOB, BOC, and BOD keys.

9.02 Make sure that the AC power is turned on and that no tape is available at all the branch stations.

9.03 Place the BOA key in its normal position.

9.04 The control unit will step, light the AZ SEARCH lamp and send the TSC LTRS Z to branch A. Then if the station equipment is operating correctly a LTRS ASSURANCE signal will be received from station PSC A.

9.05 The control unit will step, put out the AZ lamp, light the AY lamp, then send TSC LTRS Y and receive a LTRS assurance signal from station BO A.

9.06 Allow this test to continue for about five minutes. Then operate the BOA key; the control unit will go to rest.

9.07 The above TSCs LTRS Z and LTRS Y will print on the 28 ROTR monitor and should look like this: LTRS Z LTRS LTRS Y LTRS LTRS Z LTRS LTRS, etc. The LTRS signal immediately following the TSC is the LTRS assurance signal from the station and there may be 2 or 3 other LTRS characters depending on speed of system.

9.08 Repeat 9.03-9.06 using the BO key for each branch connected to the system.

10. LTRS ASSURANCE SIGNAL NOT RECEIVED (SC 4)

NOTE: This test will be made using the control PSC A station on branch A only.

10.01 Turn off the AC power on the control PSC A station equipment.

10.02 Place the BOA key in its normal position.

10.03 The control unit will step, light the AZ lamp, and send LTRS Z.

10.04 No assurance signal being received, the control unit will alarm in approximately 3 seconds. The ALARM and NA lamps will light and the BUZZER operate.

10.05 Operate CLR key and the control unit will send CR LF VOID FIGS H LTRS to the line. (Check on monitor). The ALARM and NA lamps will go out and the BUZZER stop.

10.06 In approximately 6 seconds, the control unit will send the same TSC LTRS Z to the line again.

10.07 The AC power still being off on the PSC A station, no LTRS assurance signal will be received again.

10.08 In approximately 3 seconds, the control unit will alarm. The ALARM and BO lamps will light and the BUZZER operate.

10.09 Operate the BOA key. The AZ, ALARM, and BO lamps will go out and the BUZZER stop. The control unit will step to the idle position and stop.

10.10 Turn on the AC power switch on the PSC A station.

11. TRUNK LTRS GENERATOR TEST (SC 15)

11.01 Any time the BOA, BOB, BOC, and BOD keys are operated (if there are only two branches, A and B, connected to the system, it would only be necessary to operate the BOA and BOB keys, as the BOC and BOD keys are strapped out), or all the branches are busy within themselves. The control unit connects to the trunk and transmits two LTRS signals into the trunk approximately every 10 seconds.

11.02 Manually operate and block operated, the BR1A, BR1B, BR1C, and BR1D.

11.03 Place the BOA D keys in their normal position.

11.04 The control unit should remain connected to the trunk and continue transmitting the two LTRS signals to the trunk.

11.05 Unblock and release the BR1A relay. (There is one BR1 relay for each branch, the final character indicates the branch).

11.06 The control unit will release from the trunk, step to position 1, light AZ lamp, and send the TSC LTRS Z to the A branch.

11.07 Reoperate and block the BR1A relay.

11.08 The control unit will re-connect to the trunk and resume sending two LTRS signals to the trunk at 10 second intervals.

11.09 Repeat 11.05-11.08 using each of the BR1 relays that will be used in the system. In 11.06, the control unit will step to the branch associated with the released BR1 relay.

11.10 Operate all the BO keys, and release the BR1 relays.

12. BLANK OR CARRIAGE RETURN BEFORE A VALID CDC (SC 3)

12.01 Prepare a piece of tape per sample and place in transmitter of PSC A. Then operate the station's START key.

Sample: LTRS LTRS LTRS CR LTRS 10 LTRS

12.02 Place BOA key in its normal position.

12.03 The control unit will send the TSC LTRS Z and start the transmitter at PSC A sending the CR to the line. (Check monitor).

12.04 The transmitter at PSC A will stop before the 10 LTRS clear the tape-out pin (6th pin) and alarm.

12.05 The control unit will send FIGS H LTRS to the branch and trunk, step position 1 (AZ) to position 2 (AY). Then send TSC LTRS Y to the branch and trunk.

12.06 Operate BOA key and control unit will go to rest.

12.07 Release the alarm on the PSC A station by removing the tape from the transmitter and operating the START key.

12.08 Repeat 12.01-12.07 with a blank punched in the tape instead of CR. The results should be the same.

12.09 Repeat 12.01-12.08 with every station on the system. The results should be the same at all stations as well as the controller.

13. TRANSMISSION ON BRANCH STOPS AFTER A VALID CDC, BUT BEFORE CR WAS SENT

NOTE: The sending station and the control unit shall react as follows:

13.01 Each station of the system shall prepare an individual tape for each of the valid CDCs per sample:

(a) LTRS LTRS AA LTRS 7 LTRS) the CDC when (JJ
(b) LTRS LTRS AU LTRS 7 LTRS) sent from (JK
(c) LTRS LTRS EE LTRS 7 LTRS) PSC will (DD
(d) LTRS LTRS EU LTRS 7 LTRS) convert to (DK

(e) LTRS LTRS JJ LTRS 7 LTRS

(f) LTRS LTRS JX LTRS 7 LTRS

(g) LTRS LTRS KA LTRS 7 LTRS) the CDC when)KJ
(h) LTRS LTRS KE LTRS 7 LTRS) sent from PSC) will convert to)KD

(j) LTRS LTRS XX LTRS 7 LTRS

(k) LTRS LTRS NN LTRS 7 LTRS

(l) LTRS LTRS RR LTRS 7 LTRS

(m) LTRS LTRS BB LTRS 7 LTRS

13.02 Place tape (a) in the PSC A transmitter, and operate its START key.

13.03 Place the BOA key in its normal position. The control unit will send TSC LTRS Z starting the PSC A station transmitter.

13.04 When transmission stops, the control unit will time for approximately 1.5 or 3 seconds dependent on the CDC sent, then alarm.

13.05 Operate AR (ALARM RELEASE) key. BUZZER will stop.

13.06 Remove tape (a) from the PSC A transmitter, and operate its START key to retire its alarm.

13.07 Place tape (b) in the PSC A transmitter, and operate its START key.

13.08 Operate the CLR key of the control unit. It will send the VOID message to the branch and trunk.

13.09 In approximately 6 seconds, the control unit will send the TSC LTRS Z again.

13.10 The PSC A transmitter will start sending tape (b) stop and alarm again.

13.11 When the transmission stops, the control unit will time out again and alarm.

13.12 Repeat 13.02-13.11 sending all the tapes (c) through (m) from the PSC A transmitter.

13.13 Repeat pars. 13.02 - 13.12 with every station of the system excluding tape (m) at the BO stations.

13.14 Tape (m) may be sent from the BO stations if the option note 108 has been applied to the PSD-70012-01 control unit.

13.15 Operate the proper BO key to stop the control unit.

14. TRANSMISSION ON A BRANCH STOPS AFTER A VALID TRUNK CDC AND CR LF HAS BEEN SENT, BUT NO FIGS H LTRS (SC 10)

14.01 Each station of the system shall prepare an individual tape using JK as the CDC and identify itself in the text of the message.

LTRS LTRS JK LTRS CR LF PSC A Sending LTRS 7 LTRS

NOTE: The Business Office on Branch A shall put BO A in its tape. The plant service center on branch B shall put PSC B in its tape. Etc.

14.02 Have all the stations of the system place the above tape in their respective transmitters and operate the START key. The sending station and the control unit shall operate as follows: (14.03 - 14.08).

14.03 Place all the BO keys in the normal position starting with the BO A key. The control unit will step to position 1 and send the TSC LTRS Z to branch A, starting the PSC A transmitter.

14.04 The sending station's transmitter will stop and alarm. To retire the station alarm, remove the tape from transmitter and operate its START key.

14.05 Operate the CLR key of the control unit. This will retire its alarms and cause the control unit to send the VOID message to the branch and trunk.

14.06 In approximately 6 seconds, the control unit will send the same TSC again.

14.07 No tape being available at the station, its equipment will send a LTRS assurance signal to the control unit.

14.08 The control unit will step to the next position and send the proper TSC.

14.09 As all the BO keys are in their normal position, 14.04 - 14.08 will be repeated for each station on the system.

14.10 When all the stations have been tested, operate all the BO keys.

15. TRANSMISSION ON A BRANCH STOPS AFTER A VALID BRANCH CDC AND CR LF HAS BEEN SENT, BUT NO FIGS H LTRS (SC 14)

15.01 Each of the BO stations on the system shall prepare an individual tape using AA as the CDC.

LTRS LTRS AA LTRS CR LF BO A sending RYs (one line) CR LF LTRS 7 LTRS (BO B on branch B etc.)

15.02 Have all the BO stations place the above tape in their transmitters, and operate the START key.

NOTE: The sending station and the control unit shall operate as follows: (15.03 - 15.08).

15.03 Place all the BO keys in the normal position starting with the BO A key. The control unit will step to position 1 and send the TSC LTRS Z to Branch A.

15.04 Tape not being available at any of the PSC stations, each of them, when searched will give the LTRS assurance signal. This signal will cause the control unit to step and send the BO TSC LTRS Y starting the BO transmitter.

15.05 When the control unit receives the CR, it will disconnect from the branch and the BY A, B, C or D lamps will flash as long as the BO sends.

15.06 The control unit will attach to the trunk, and send FIGS H LTRS to clear the 28 sequence selector and stations on the trunk.

15.07 The control unit will then step to the next branch and send the TSC Z, receive a LTRS assurance signal, then step to the next position and send TSC Y.

15.08 Repeat 15.05 - 15.08 for each branch connected to the system.

15.09 When the control unit cycles back to branch A and sends the TSC LTRS Z, it will not receive the LTRS assurance signal as the PSC A station is in a selected condition. The ALARM and NA lamps will light and the BUZZER operates.

15.10 Operate the CLR key of the control unit. This will retire its alarms and cause it to send the VOID message to branch and trunk.

15.11 In approximately 6 seconds, the control unit will send the same TSC again.

15.12 No tape being available at the station, its equipment will send a LTRS assurance signal stepping the control unit to the next position where it will send the TSC LTRS Y.

15.13 The BO A station having no tape available will also send a LTRS assurance signal again stepping the control unit to the next branch.

15.14 Repeat 15.10 - 15.14 for each branch circuit.

15.15 When this test is completed, operate all the BO keys again to stop the control unit.

16. LINE OPEN ON A BRANCH (SC 18)

16.01 Place an open plug or cord in branch A LOOPING jack of the 63-C-1 switchboard.

16.02 Place the BO, B, C, and D keys in their normal position.

16.03 The control unit will start sending TSCs to these branches. (No tape available at the stations; it will step around to Branch A).

16.04 Place the BO A key in its normal position.

16.05 When the control unit connects to branch A, the alarm and OL (OPEN LINE) lamps will light, the SEARCH lamp AZ will be lit and the BUZZER operated.

16.06 The OL lamp indicates an open line, and the SEARCH lamps indicate which branch is open.

16.07 Operate the AR key; the BUZZER will stop.

16.08 Operate the BO A key.

16.09 The control unit will step from the A branch to the BZ position of the B branch.

16.10 The control unit will send FIGS H LTRS to the B branch then step to the BY position and send the TSC LTRS Y.

16.11 Remove the open plug or cord from the LOOPING jack of the A branch.

16.12 Place the BO A key in its normal position.

17. OPEN LINE ON THE TRUNK (SC 19)

17.01 Place an OPEN plug or cord in the LOOPING jack of the trunk.

17.02 The ALARM and OL lamps light and the BUZZER operates.

17.03 One of the SEARCH lamps will be lit indicating which branch is connected to the open trunk.

17.04 Operate the AR key which stops the BUZZER.

17.05 Operate the BO key for the branch connected to the trunk. The alarms will retire, and the control unit will step to the next branch.

17.06 The control unit will re-alarm and show this branch open also. This will repeat as each BO key is operated, indicating that the trunk is open.

17.07 Place all BO keys back in their normal position.

17.08 Remove the open plug or cord from the LOOPING jack of the trunk circuit.

17.09 The control unit will step to the next position, send FIGS H LTRS to that branch, then step to the next position and send the next TSC.

18. TRUNK GOES OPEN WHILE IN USE. (PSC A Sending a Valid Message and Trunk Goes Open During Text)

18.01 Prepare a tape for PSC A as follows:

LTRS LTRS AA LTRS CR LF RYs (two full lines) FIGS H LTRS.

18.02 Place the tape in the PSC A transmitter, and operate its START key.

18.03 After the transmitter starts sending the RYs, place an OPEN plug or cord into the LOOPING jack of the trunk.

18.04 The PSC A transmitter will stop and alarm.

18.05 Remove the tape from the transmitter, and operate the START key to retire the station alarm.

18.06 The ALARM, OL, T, and AZ lamps are lit, and the BUZZER will operate.

18.07 Operate the AR key - BUZZER will stop.

18.08 Operate and release the BO A key - should have no effect.

18.09 Operate the CLR key - should have no effect.

18.10 Remove the OPEN plug from the LOOPING jack of the trunk. The trunk will close.

18.11 Operate the CLR key. The control unit will transmit the VOID message to the branch and trunk.

18.12 The VOID message will clear the ALARM lamp, and control unit will send TSC Z to PSC A, receive an answer-back, then step to position BO A and send TSC Y.

NOTE: In all the preceding tests, the message registers have been disregarded due to possible trouble.

19. NORMAL MESSAGE TRANSMISSION AND MESSAGE REGISTER READINGS

NOTE: Pars. 19 and 20 shall be repeated a minimum of four times after the last case of trouble is cleared. If No. 15 TTY equipment is used on the trunk, increase the number of LTRS after FIGS H LTRS from 10 to 40 in the tapes prepared in 19.03 and 19.06.

19.01 Have all the message registers in the system returned to 0 (zero).

19.02 Operate all the BO keys to stop the control unit.

19.03 Each business office location shall prepare one continuous tape containing 17 test messages. Each test message shall be separated by at least 10 LTRS signals (LTRS 10 LTRS).

(a) LTRS 10 LTRS AA LTRS CR LF BOA sending test message 1 to PSC A making a page and tape copy CR LF FIGS H LTRS 10 LTRS

(b) LTRS 10 LTRS AU LTRS CR LF BOA sending test message 2 to PSC A making a page and tape copy CR LF FIGS H LTRS 10 LTRS

(c) LTRS 10 LTRS EE LTRS CR LF BOA sending test message 3 to PSC A making a page and tape copy CR LF FIGS H LTRS 10 LTRS

(d) LTRS 10 LTRS EU LTRS CR LF BOA sending test message 4 to PSC A making a page and tape copy CR LF FIGS H LTRS 10 LTRS

(e) LTRS 10 LTRS JX LTRS CR LF BOA sending test message 5 to TI, DI, RA, BOA, monitor and making a page copy at PSC A CR LF FIGS H LTRS 10 LTRS

(f) LTRS 10 LTRS KS LTRS CR LF BOA sending test message 6 to TI, monitor and making a page and tape copy at PSC A CR LF FIGS H LTRS 10 LTRS

(g) LTRS 10 LTRS KA LTRS CR LF BOA sending test message 7 to TI, monitor and making a page copy at PSC A CR LF FIGS H LTRS 10 LTRS

(h) LTRS 10 LTRS XX LTRS CR LF BOA sending test message 8 to TI and monitor CR LF FIGS H LTRS 10 LTRS

(j) LTRS 10 LTRS NN LTRS CR LF BOA sending test message 9 to DI and monitor CR LF FIGS H LTRS 10 LTRS

(k) LTRS 10 LTRS RR LTRS CR LF BOA sending test message 10 to RA and monitor CR LF FIGS H LTRS 10 LTRS

(l) LTRS 10 LTRS BB LTRS CR LF BOA sending test message 11 to BOA only CR LF FIGS H LTRS 10 LTRS

(m) LTRS 10 LTRS AA LTRS X LTRS CR LF BOA sending test message 12 to PSC A making a page and tape copy, CR LF to TI and trunk monitor CR LF FIGS H LTRS 10 LTRS

(n) LTRS 10 LTRS AU LTRS N LTRS CR LF BOA sending test message 13 to PSC A making a page and tape copy, CR LF to DI and trunk monitor CR LF FIGS H LTRS 10 LTRS

(o) LTRS 10 LTRS EE LTRS R LTRS CR LF BOA sending test message 14 to PSC A making a page and tape copy, CR LF to RA and trunk monitor CR LF FIGS H LTRS 10 LTRS

(p) LTRS 10 LTRS EU LTRS L LTRS CR LF BOA sending test message 15 to PSC A making a page and tape copy CR LF and to the trunk monitor FIGS H LTRS

NOTE: This much of message No. 15 will be printed on the trunk monitor -- LTRS EU LTRS L LTRS CR LF LTRS

(q) LTRS 10 LTRS AA LTRS G LTRS CR LF BOA sending test message 16 to PSC A making a page and tape copy CR LF and to the trunk monitor FIGS H LTRS

NOTE: This much of message No. 16 will be printed on the trunk monitor -- LTRS AA LTRS G LTRS CR LF LTRS

(r) LTRS 10 LTRS CC LTRS CR LF BOA sending test message 17 to PSC A monitor only CR LF FIGS H LTRS 10 LTRS

NOTE: Message number 17 will not operate a message register.

19.04 When the business office on branch B prepares the tapes (19.03), it will read "BOB sending test message to PSC B". Exception: Test message 17 will read "BOB sending test message 17 PSC A." etc.

19.05 Business office tapes for branches C and D will follow the same pattern.

19.06 Each plant service center location shall prepare one continuous tape containing 11 test messages. Each test message shall be separated by at least 10 LTRS signals (LTRS 10 LTRS).

(a) LTRS 10 LTRS AU LTRS CR LF PSC A sending test message 1 to TI, DI, RA, BOA, and the monitor CR LF FIGS H LTRS 10 LTRS

(b) LTRS 10 LTRS AA LTRS CR LF PSC A sending test message 1 to DI, RA, BOA and the monitor CR LF FIGS H LTRS 10 LTRS

(c) LTRS 10 LTRS EE LTRS CR LF PSC A sending test message 3 to RA, BOA and monitor CR LF FIGS H LTRS 10 LTRS

(d) LTRS 10 LTRS EU LTRS CR LF PSC A sending test message 4 to TI, RA, BOA and monitor CR LF FIGS H LTRS 10 LTRS

(e) LTRS 10 LTRS KE LTRS CR LF PSC A sending test message 5 to TI, RA, BOA and monitor CR LF FIGS H LTRS 10 LTRS

(f) LTRS 10 LTRS KA LTRS CR LF PSC A sending test message 6 to TI, DI, RA, BOA and monitor CR LF FIGS H LTRS 10 LTRS

(g) LTRS 10 LTRS XX LTRS CR LF PSC A sending test message 7 to TI and monitor CR LF FIGS H LTRS 10 LTRS

(h) LTRS 10 LTRS NN LTRS CR LF PSC A sending test message 8 to DI and monitor CR LF FIGS H LTRS 10 LTRS

(j) LTRS 10 LTRS RR LTRS CR LF PSC A sending test message 9 to RA and monitor CR LF FIGS H LTRS 10 LTRS

(k) LTRS 10 LTRS BB LTRS CR LF PSC A sending test message 10 to BOA and monitor CR LF FIGS H LTRS 10 LTRS

(l) LTRS 10 LTRS CC LTRS CR LF PSC A sending test message 11 to PSC A monitor CR LF FIGS H LTRS 10 LTRS

NOTE: Test message number 10 will be fully printed on monitor if note 108 is used. Test message number 11 will not operate a message register.

19.07 When the plant service center on branch B prepares the above tapes, it will read "PSC B sending test message to BOB " and elsewhere as required. Test message 11 will read "PSC B sending test message 11 to PSC A monitor CR LF FIGS H LTRS 10 LTRS".

19.08 Plant service centers on branch C and D will follow the same pattern.

19.09 Have all the business offices and plant service centers place their tapes in their respective transmitters and operate their START keys. The START (white) lamps at all locations should remain lit. After the complete tape has been sent, it shall not be reinserted in the transmitter until told to do so by the control plant service center.

19.10 Place the BO keys in their normal position. The control unit will sequentially search and start each transmitter subject to the flow of traffic.

19.11 After all the messages have been transmitted, the control PSC personnel shall prepare a broadcast message giving the controller message register count plus 1 count for each station on the system.

20. BROADCAST

NOTE: The work operations in this paragraph are set up in respect to 19. The normal operation would start at 20.02 A, B, and C.

20.01 Read the control message registers and prepare a tape similar to this sample using the correct count. LTRS 10 LTRS JX LTRS CR LF Broadcast, message register readings for PSC A 10, BOA 8, PSC B 9, BOB 11, PSC C 14, BOC 6, etc.

Please verify count and report via a message coded for station CC. Reset all message registers to 0 (zero) after sending your reply.

20.02 When the system is operating normally, the following operation and results will occur:

(a) Operate the BP key. The BP lamp will light.

(b) When the system becomes idle, the BR lamp will light and the BUZZER operate.

(c) Read the control message registers, and prepare the broadcast tape.

20.03 Operate the BSB, BSC, and BSD keys. (Broadcast send-to branch B, C, and D). The BSB, BSC, and BSD lamps will light.

20.04 Place the broadcast tape in the PSC A transmitter, and operate its START key.

20.05 Operate the BR (BROADCAST READY) key. The BP lamp will go out, the BUZZER will stop, and the control unit will start the PSC A transmitter.

20.06 At the conclusion of the broadcast message, the BR, BSB, BSC, and BSD lamps will go out. The control message registers will all take one count and now agree with the broadcast message. The control unit will return to its normal search pattern.

20.07 After the station's confirmation messages have been received, operate the BO keys to stop the control unit, and reset the control message registers to 0 (zero).

20.08 Repeat 19.09 - 19.11 and 20.01 - 20.07 until at least 4 trouble free runs have been made.

21. PSC TRANSMITTING A BREAK TO BO WHICH IS SENDING

21.01 Each business office location shall prepare a tape per this sample using its own branch CDCs.

LTRS 10 LTRS AA LTRS CR LF BOA sending break test tape to PSC A. FIGS Bell Bell LTRS RYs (about two lines) CR LF FIGS H LTRS 10 LTRS.

21.02 The business offices are to place the tapes in their transmitters and operate their START keys.

21.03 Place the BO keys in their normal position. The control unit will start the normal search.

21.04 The receiving PSC shall operate its BREAK key after receiving the two bells.

21.05 The sending BO's transmitter will stop and alarm. The alarm can be retired only by removing the tape from the transmitter and operating the START key. (Do not reinsert the tape).

21.06 As the control unit re-connects to the various branches and attempts to start the PSC stations, it will alarm and give a no answer-back indication. (The FIGS H LTRS was not sent so the PSC station is in a selected condition and can not send the LTRS assurance signal).

21.07 Operate the CLR key which will send the VOID message and clear the control unit's alarms as each branch is searched.

21.08 Operate the BO keys to stop the control unit.

22. BO TRANSMITTING A BREAK TO PSC WHICH IS SENDING (Not using option Note 108 of PSD-70012-01)

22.01 Each plant service center shall prepare a tape per this sample using its own branch identification CDCs.

LTRS 10 LTRS BB LTRS CR LF PSC A sending break test tape to BOA FIGS Bell Bell LTRS RYs (about two lines) FIGS H LTRS 10 LTRS.

22.02 The plant service centers are to place the tapes in their transmitters and operate their START keys.

22.03 Place the BO keys in their normal position. The control unit will start the normal search.

22.04 The receiving BO shall operate its BREAK key after receiving the two bells.

22.05 The sending PSC transmitter will stop and alarm. The alarm can be retired only by removing the tape from the transmitter and operating the START key. (Do not reinsert the tape).

22.06 As the control unit re-connects to the various branches and attempts to start the PSC station, it will alarm and give a no answer-back indication. (The FIGS H LTRS was not sent so the PSC station is in a selected condition and cannot send the LTRS assurance signal).

22.07 Operate the CLR key which will send the VOID message and clear the control units alarm as each branch is searched.

22.08 Operate the BO keys to stop the control unit when all the branch circuits are operating normally.

22.09 Send a broadcast message per 20 to check the message register after completing 21 and 22. The registers shall be in step.

23. BO TRANSMITTING A BREAK TO PSC WHICH IS SENDING (Using Option Note 108 of PSD-70012-01)

23.01 Repeat 22.01 - 22.05.

23.02 The option Note 108 converts the BB code from a branch connect to a trunk connect code. This being the case, the control unit will, for the duration of this call, keep the branch connected to the trunk.

23.03 After 22.05, the control unit, already being connected, will remain connected and alarm. The VOID message must be sent.

23.04 Repeat 22.07 - 22.09.

23.05 Upon completion of tests, restore all units to normal.

24. RELATED MATERIAL

24.01 Test procedures in this section are also published for the Western Electric Company under the title, "ADOSO II Multi-Line Installation Test No. 21 for PSD-70010-01 and PSD-70012-01."