

THE ADOSO SYSTEM
(Automatic Distribution of Service Orders)
EQUIPMENT TESTING

DRAWINGS
PSD-70005-01 and PSD-70006-01

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1. GENERAL

1.01 This sub-section P65.924.01 is the second in a series of point sections on the ADOSO System. The main section, P65.924.00 described the system in general terms.

1.02 This one is a maintenance section in which a method of using tests tapes to check operation of the system is described.

1.03 When tests show some part of the equipment to be in trouble or when more detailed information is needed, reference should be made to sequence charts in drawings: PSC-70005-01 Station Unit for No. 15 TTY (Outlying Stations) and PSC-70006-01 Single Line Control (Plant Service Center).

2. TEST TAPES

2.01 Two continuous, and six torn tapes are used in testing. Tables showing key for abbreviations, codes and symbols and a list of Call Directing Characters used in the ADOSO System are included as an aid in making up test tapes. The test tape formats follow these tables.

TABLE A
Key for Abbreviations, Codes and Symbols
Used in Test Tape Preparation

- * LTRS - Letters Shift.
- FIGS - Figures Shift.
- FIGS H LTRS - End-of-order, form feed-out and tape feed-out code
- CR - Carriage Return - End-of-Address Code.
- * LF - Line Feed.
- PSC MONITOR - Plant Service Center Line Monitor - (ROTR). Makes tape of all transmissions on the line.
- 28RO - Plant Service Center Selective Receiving Only - Page Teletypewriter.
- ROTR - Plant Service Center Selective Receiving Only - Typing Reperforator.
- TI - Traffic Intercept - Selective Page Teletypewriter.
- DI - Directory - Selective Page Teletypewriter.
- RA - Revenue Accounting - Selective Page Teletypewriter.
- BO - Business Office - Selective Page Teletypewriter.

* *A number preceding these operational codes means that the code is to be repeated that many times.*

EXAMPLE: 10 LTRS means LTRS LTRS LTRS etc. repeated 10 times. 20 LF means LF LF LF etc. repeated 20 times.

TABLE B

CALL DIRECTING CHARACTERS

		BEFORE COMPLETION TRANSMIT FROM BUSINESS OFFICE						AFTER COMPLETION TRANSMIT FROM P.S.C. MODIFIED TRANSMITTER												
	CLASS OF ORDER	ORIGINAL CDC	P. S. C.		T	I	D	R	A	B	O	CONVERTED CDC	T	I	D	R	A	B	O	
			28	RO																RO
GROUP CODES	Connect	AU	●	●								JK	●	●	●	●				
	Add-Rem Extn.	AA	●	●								JJ		●	●	●				
	Chg. Instr.	EE	●	●								DD				●	●			
	Rest. Serv.	EU	●	●								DK	●			●	●			
	Susp. Serv.	KE	●	●	●							KD	●			●	●			
	Disc.	KA	●	●	●							KJ	●	●	●	●				
	Dir. Listing	JJ						●	●	●										
	Rec. Order	JX	●			●	●	●	●											
INDIVIDUAL CODES	Traffic	X			●							X	●							
	Directory	N				●						N		●						
	Rev. Acctg.	R						●				R				●				
	Bus. Ofc.	B								●		B							●	

2.02 CONTINUOUS TAPE USED IN TESTING FROM
BUSINESS OFFICE. Prepare one continuous tape
using the following format:

Label it as shown.

TEST TAPE A (Test Messages 1-12)

10 LTRS X LTRS CR LF LTRS X LTRS CR 10 LF
TEST MESSAGE NO. 1

CR LF LF MESSAGE TO PSC MONITOR AND TI CR
20 LF FIGS H

10 LTRS N LTRS CR LF LTRS N LTRS CR 10 LF
TEST MESSAGE NO. 2

CR LF LF MESSAGE TO PSC MONITOR AND DI CR
20 LF FIGS H

10 LTRS R LTRS CR LF LTRS R LTRS CR 10 LF
TEST MESSAGE NO. 3

CR LF LF MESSAGE TO PSC MONITOR AND RA CR
20 LF FIGS H

10 LTRS B LTRS CR LF LTRS B LTRS CR 10 LF
TEST MESSAGE NO. 4

CR LF LF MESSAGE TO PSC MONITOR AND BO CR
20 LF FIGS H

10 LTRS AU LTRS CR LF LTRS AU LTRS CR 10 LF
TEST MESSAGE NO. 5

CR LF LF MESSAGE TO PSC MONITOR, 28RO AND
ROTR CR 20 LF FIGS H

10 LTRS AA LTRS CR LF LTRS AA LTRS CR 10 LF
TEST MESSAGE NO. 6

CR LF LF MESSAGE TO PSC MONITOR, 28RO AND
ROTR CR 20 LF FIGS H

10 LTRS EE LTRS CR LF LTRS EE LTRS CR 10 LF
TEST MESSAGE NO. 7

CR LF LF MESSAGE TO PSC MONITOR, 28RO AND
ROTR CR 20 LF FIGS H

10 LTRS EU LTRS CR LF LTRS EU LTRS CR 10 LF
TEST MESSAGE NO. 8

CR LF LF MESSAGE TO PSC MONITOR, 28RO AND
ROTR CR 20 LF FIGS H

10 LTRS KE LTRS CR LF LTRS KE LTRS CR 10 LF
TEST MESSAGE NO. 9

CR LF LF MESSAGE TO PSC MONITOR, 28RO, ROTR
AND TI CR 20 LF FIGS H

10 LTRS KA LTRS CR LF LTRS KA LTRS CR 10 LF
TEST MESSAGE NO. 10

CR LF LF MESSAGE TO PSC MONITOR, 28RO, ROTR
AND TI CR 20 LF FIGS H 10

10 LTRS JJ LTRS CR LF LTRS JJ LTRS CR 10 LF
TEST MESSAGE NO. 11

CR LF LF MESSAGE TO PSC MONITOR, DI, RA AND
BO CR 20 LF FIGS H

10 LTRS JX LTRS CR LF LTRS JX LTRS CR 10 LF
TEST MESSAGE NO. 12

CR LF LF MESSAGE TO PSC MONITOR, 28RO, TI,
DI, RA AND BO CR 20 LF FIGS H 10 LTRS

2.03 CONTINUOUS TAPE USED IN TESTING FROM PLANT SERVICE CENTER. Prepare one continuous tape using the following format:

Label it as shown.

TEST TAPE B (Test Messages 13-16)

10 LTRS X LTRS CR LF LTRS X LTRS CR 10 LF
TEST MESSAGE NO. 13

CR LF LF MESSAGE TO PSC MONITOR AND TI CR
20 LF FIGS H

10 LTRS N LTRS CR LF LTRS N LTRS CR 10 LF
TEST MESSAGE NO. 14

CR LF LF MESSAGE TO PSC MONITOR AND DI CR
20 LF FIGS H

10 LTRS R LTRS CR LF LTRS R LTRS CR 10 LF
TEST MESSAGE NO. 15

CR LF LF MESSAGE TO PSC MONITOR AND RA CR
20 LF FIGS H

10 LTRS B LTRS CR LF LTRS B LTRS CR 10 LF
TEST MESSAGE NO. 16

CR LF LF MESSAGE TO PSC MONITOR AND BO CR
20 LF FIGS H 10 LTRS

2.04 TORN TAPES USED IN TESTING FROM BUSINESS OFFICE. Prepare three torn tapes using the following format:

Label as shown.

TEST TAPE C (NC alarm)

10 LTRS CR LF N LTRS CR LF 10 LTRS

TEST TAPE D (Test Message 17)

10 LTRS B LTRS CR LF LTRS B LTRS CR 10 LF
TEST MESSAGE NO 17.

CR LF LF MESSAGE TO PSC MONITOR AND BO CR
18 LF FIGS H 10 LTRS.

TEST TAPE E (Clear Circuit - Align Forms)

10 LTRS JX LTRS CR LF LTRS 5 BELLS SET ALL
REGISTERS TO ZERO CR LF LF THIS IS A TEST
MESSAGE 5 BELLS CR 31 LF FIGS H 10 LTRS.

2.05 TORN TAPES USED IN TESTING FROM PLANT
SERVICE CENTER. Prepare three torn tapes
using the following format:

Label as shown.

TEST TAPE F (NC Alarm)

10 LTRS CR LTRS N LTRS CR LF 10 LTRS

TEST TAPE G (Test Message 18)

10 LTRS N LTRS CR LF N LTRS CR 10 LF TEST
MESSAGE NO 18 CR LF LF THIS MESSAGE TO PSC
MONITOR AND DI 18 LF FIGS H 10 LTRS

TEST TAPE H (Clearing Circuit)

10 LTRS CR 5 LF VOID LF LF VOID LF LF VOID
LF LF VOID CR LF FIGS H 10 LTRS

3. PREPARATION FOR TESTING

3.01 All associated teletypewriter equipment: transmitters, page teletypewriters and typing reperforators shall be adjusted and maintained in accordance with the applying Bell System Practices.

3.02 Rectifiers shall be adjusted to 120V DC under LOAD Conditions according to instructions.

3.03 All standard transmission tests shall be made at each installation in accordance with Bell System Practices Section P30.002.

3.04 The control circuit between the Plant Service Center and the Business Office is a single conductor operating from battery supplied at the Plant Service Center to ground at the Business Office. Current requirements are: On a circuit using multiple transmitters - 90 mils minimum, 105 mils maximum. To adjust, strap R20 Resistor (PSD-70006-01).

3.05 Operating loops shall be 62.5 mils.

3.06 Turn on power. All PWR ON lamps (white) at TI, DI, RA, and BO should light. The Plant Service Center does not have a PWR ON lamp. All machines should run closed.

3.07 Line up forms so a line feed will start the printing 1/2 inch from the top of form, immediately under the word ROUTE. Reset knob to start position. Printing should be 3/4 inch from left of form.

3.08 Set all message registers to zero.

3.09 Refer to block diagram of ADOSO stations on last page of this section as an aid in visualizing traffic flow. Room circuits and Plant Circuit have been omitted.

4. TESTING PROCEDURE

<u>OPERATION</u>	<u>RESULTS</u>
4.01 With circuit closed and idle, adjust signal generator per Note 109 in PSD-70006-01.	Signal generator sends V to line at approx. 10 second intervals as long as circuit is idle.
4.02 At BO, place TEST TAPE E in transmitter.	(Test preparation - clear circuit and align forms).
4.03 At BO, operate and release START key. (See Fig. 1).	Transmitter starts and all stations take copy. Registers advance one digit.
4.04 Reset all registers to zero. Check to see if forms have aligned per Par. 3.07.	
4.05 Remove all printed forms, and tapes except PSC monitor.	
4.06 Observe PSC monitor with circuit idle.	The letter V should print approx. every 10 seconds.
4.07 At BO, remove TEST TAPE E. Place TEST TAPE A in transmitter.	(Preparation for test run).
4.08 At PSC - Place TEST TAPE B in transmitter.	(Preparation for test run).
4.09 At PSC - operate & release TBL-ST key.	Transmitter will not start.

<u>OPERATION</u>	<u>RESULTS</u>
4.10 At PSC - operate ALM and STOP key to STOP position.	ALM and STOP lamp lights.
4.11 At PSC - operate and release START key.	Transmitter will not start.
4.12 At BO - operate and release START key.	Transmitter will not start.
4.13 At BO and PSC, remove and replace tapes in transmitters.	Releases relays so circuit is ready for further tests.
4.14 At PSC - restore ALM and STOP key to NORM position.	ALM and STOP lamp OFF.
4.15 At BO - operate START key.	Transmitter starts sending MESSAGE NO. 1.
4.16 At PSC - while BO transmitter is still sending MESSAGE No. 1, operate and release START key.	PSC transmitter will withhold transmission until MESSAGE NO. 1 is finished and forms fed out. It starts sending MESSAGE NO. 13 following form alignment.

NOTE: BO transmitter started sending first - it got first bid. The PSC transmitter can send following FIGS H LTRS at end of MESSAGE NO. 1 - following form feedout. The BO and PSC transmitters send alternately as long as tape is available. When all tape has cleared the 6th pin on one transmitter, the other will continue to send until it too runs out of tape. FIGS H LTRS following each message causes form and tape feed-out.

4.17

SUMMARY OF FIRST RUN TEST TAPES A & B

Messages Received - Register Readings

Station and PSC Registers Shall Agree as Shown:

STATIONS	MESSAGE NO.	TOTAL MESSAGES	REGISTERS	
			STATION	PSC
BO	4, 11, 12, 16	4	4	4
TI	1, 9, 10, 12, 13	5	5	5
DI	2, 11, 12, 14	4	4	4
RA	3, 11, 12, 15	4	4	4
PSC 28RO	3, 11, 12, 15	4		
PSC MON	1-16	16		
PSC ROTR	5, 6, 7, 8, 9, 10	6		

OPERATION

RESULTS

4.18 At BO and PSC -
remove TEST TAPES
A and B - retain for fur-
ther tests.

4.19 At PSC - remove
tape from ROTR
(not monitor) received from
circuit on first run (Pars.
4.15 - 4.16) and place in PSC
transmitter.

4.20 At PSC - operate
and release START
key.

Preparation for checking
PSC code converter. (Re-
fer to TABLE B for con-
verted codes).

Transmitter starts - sends
one message - stops forms
and tapes feed-out. Sends
other messages until all
tape has cleared the 6th
pin.

4.21

SUMMARY OF MESSAGES AND REGISTER READINGS

FOLLOWING TAPE RUN FROM PSC

(Includes previous totals)

Station and PSC Registers Shall Agree as Shown:

STATIONS	MESSAGE NO.	TOTAL MESSAGES	REGISTERS	
			STATION	PSC
BO	5,6,7,8,9, 10	10	10	10
TI	5, 8, 9, 10	9	9	9
DI	5, 6, 10	7	7	7
RA	5,6,7,8,9, 10	10	10	10
PSC 28RO	*3, 11, 12, 15	*4		
PSC MON	*1-16, 5-10	22		
PSC ROTR	*5,6,6,8,9, 10	*6		

**NOTE: On first tape run (Par. 4.17), the PSC MON received MESSAGES 1-16, the second run 5-10. On second run from PSC, the PSC 28RO, and PSC ROTR were not selected, so their message totals did not change from previous figures.*

OPERATIONRESULTS

4.22 Check to see if forms are aligning correctly (Par. 3.07). Refer to sequence charts if necessary.

If any station has form out of alignment, clear circuit by sending TEST TAPE E (Par. 4.02).

4.23 At all stations - reset registers to zero, remove used forms and tapes.

Preparation for repeating test run of continuous tapes.

4.24 At BO and PSC place TEST TAPES A & B in transmitters - operate and release START keys. Repeat complete series of tests several times to ensure equipment is functioning correctly.

Breakdown test of equipment.

If trouble is found - refer to sequence charts.

NOTE: When running continuous TEST TAPES A and B, alternate operating the START keys at the BO and PSC so the BO will not always send first.

<u>OPERATION</u>	<u>RESULTS</u>
4.25 At all points - re-move used tapes and forms - set all registers to zero - check alignment of forms.	Preparation for further tests.
4.26 At BO - place TEST TAPE C in transmitter.	Preparation for alarm test.
4.27 At BO - operate START key.	Transmitter starts sending. CR sent. Transmitter stops PSC alarmed - Buzzer sounds - NC lamp ON. ALARM lamp ON.
4.28 At PSC - operate ALM & STOP key to STOP position.	ALM & STOP lamp ON. Buzzer stops.
4.29 At BO - remove TEST TAPE C. If multiple transmitter is used - restore START key to no-tape-available position.	Clearing tape having incorrect message format. <i>NOTE: Alarm action caused by no code preceding CR. (NC - No code)</i>
4.30 At PSC - place TEST TAPE H in transmitter.	Preparation for clearing alarm.

OPERATION

RESULTS

- | | |
|---|--|
| 4.31 At PSC - operate
TBL-ST key. | Transmitter starts.
All stations locked out by
CR.
FIGS H LTRS sent.
Transmitter stops.
NC lamp OFF. ALARM
lamp OFF.
Registers all show zero. |
| 4.32 At PSC - remove
TEST TAPE H and
place TEST TAPE F in
transmitter. | Preparation for testing
alarm. |
| 4.33 At PSC - operate
ALM & STOP key to
NORM position. | ALM & STOP lamp OFF. |
| 4.34 At PSC - operate
and release START
key. | Transmitter starts.
CR transmitted.
Transmitter stops.
PSC alarmed - Buzzer
sounds -
NC lamp ON.
ALARM lamp ON. |
| 4.35 At PSC - operate
ALM & STOP key to
STOP position. | ALM & STOP lamp ON.
Buzzer stops. |
| 4.36 At PSC - remove
TEST TAPE F and
place TEST TAPE H in
transmitter. | Preparation for clearing
alarm. |
| 4.37 At PSC - operate
TBL-ST key. | Transmitter starts.
All stations locked out by
CR.
FIGS H LTRS sent.
Transmitter stops.
NC lamp OFF. ALARM
lamp OFF.
Registers all show zero. |

- | | |
|--|---|
| 4.38 At PSC - remove TEST TAPE H and place TEST TAPE G in transmitter. | Preparation for next test. |
| 4.39 At BO - place TEST TAPE D in transmitter. | Preparation for next test. |
| 4.40 At PSC - operate and release START key. | Transmitter starts. |
| 4.41 At BO - when PSC transmitter starts, operate START key. | BO transmitter withholds transmission until message from PSC ends- forms and tapes feed out. BO transmitter starts. Tape sent. Transmitter stops. Forms and tapes feed out. PSC transmitter starts. Tape runs out. Transmitter stops. BO transmitter starts immediately. Tape runs out. Transmitter stops. (Clears out LTRS in tape). |
| 4.42 At BO and DI - check teletypewriters. | One message printed and one registered on each. |
| 4.43 At PSC - check registers and monitor ROTR. | Two messages on monitor and one message each on BO and DI registers. |
| 4.44 At BO - place TEST TAPE D in transmitter. | Preparation for "No end-of-message code" alarm. |

OPERATION

RESULTS

- | | |
|--|---|
| <p>4.45 At BO - operate START key. Then, during text of message lift tape gate.</p> | <p>Transmitter starts.
BO selected - others disconnected.
Transmitter stops.</p> |
| <p>4.46 At PSC - alarm condition.</p> | <p>ALARM lamp ON.
Buzzer sounds.</p> |
| <p>4.47 At PSC - operate ALM & STOP key.</p> | <p>ALM & STOP lamp ON.
Buzzer stops.</p> |
| <p>4.48 At PSC - place TEST TAPE H in transmitter.</p> | <p>Preparation for clearing circuit.</p> |
| <p>4.49 At PSC - operate and release START key.</p> | <p>Testing for false start.
Transmitter does not start.</p> |
| <p>4.50 At PSC - lift tape gate and re-insert TEST TAPE H. Operate and release TBL-ST key.</p> | <p>Transmitter starts.
Sends TEST TAPE H (VOID message)
Sends FIGS H LTRS.
ALM lamp goes out.
Transmitter stops.
BO and PSC (BO) registers show two messages. (BO received one in Par. 4.43).</p> |
| <p>4.51 At BO - remove TEST TAPE D.</p> | <p>Preparation for further tests.</p> |
| <p>4.52 At PSC - remove TEST TAPE H, and place TEST TAPE G in transmitter.</p> | <p>Preparation for next test.</p> |

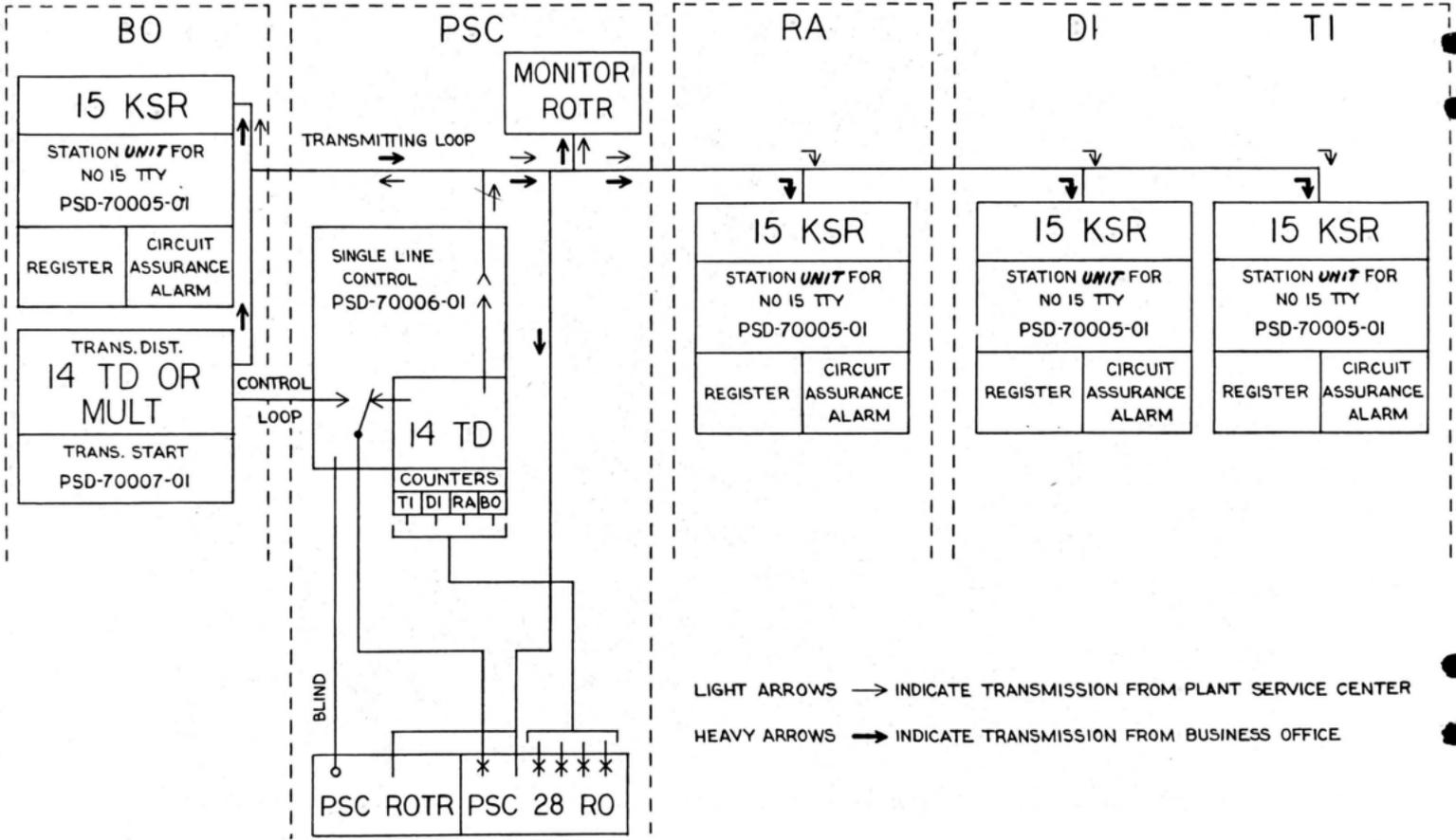
- 4.53 At PSC - restore ALM & STOP key to NORM position. Operate START key, then during text of message, lift the tape gate.
- ALARM lamp OFF.
Transmitter start.
DI selected - others disconnected.
Transmitter stops.
ALARM lamp ON.
Buzzer sounds.
- 4.54 At PSC - remove TEST TAPE G, and place TEST TAPE H in transmitter.
- Preparation for clearing alarm.
- 4.55 At PSC - operate ALM & STOP key to STOP position.
- ALM & STOP lamp ON.
Buzzer OFF.
- 4.56 At PSC - observe signal generator for several mins.
- P relay should operate and release at approx. 10 second intervals. PSC (ROTR) monitor prints Vs.
DI prints Vs. Other stations read Vs blinded.
No. alarms sounding.
- 4.57 At PSC - operate TBL-ST key.
- Transmitter starts.
VOID message sent.
FIGS H LTRS sent.
ALARM lamp OFF.
DI and PSC register two messages.
- 4.58 At PSC - remove TEST TAPE H - restore ALM & STOP key to NORM position.
- ALM & STOP lamp OFF.
- 4.59 At PSC - turn off PSD-70006-01 Single Line Control. (Opening line will accomplish same purpose.)
- ALARM lamps ON at all PSD-70005-01 STATION UNITS in approx. 25-30 seconds. Also Buzzer alarm at all stations.

<u>OPERATION</u>	<u>RESULTS</u>
4.60 At all stations - operate BZ-RLS keys.	Buzzers should stop as each key is operated.
4.61 At PSC - restore PSD-70006-01 Single Line Control to normal operation. (Or close line, if open).	At all stations - As Signal Generator starts sending Vs to line, all ALARM lamps will go out.
4.62 At each station - turn AC switch OFF.	Testing rectifier. PWR lamps will gradually go out. (Due to capacitor discharge).
4.63 At each station - turn AC switch ON.	PWR lamps ON.
4.64 At PSC transmitter table - turn AC power switch OFF.	Preparation for next test.
4.65 At BO - place TEST TAPE D in transmitter and operate the START key.	Transmitter will not start.
4.66 At BO - remove TEST TAPE D. (Reset START key if mult transmitter is being used).	Restoring BO transmitter to normal.
4.67 At PSC - observe signal generator.	P relay should operate and release approx. every 10 seconds.
4.68 End of test. Restore circuit to normal operation.	

ADOSO BLOCK DIAGRAM

SECTION
P65.924.01
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THE ADOSO SYSTEM
EQUIPMENT TESTING
DRAWINGS



PLANT SERVICE CENTER
SINGLE LINE CONTROL PANEL

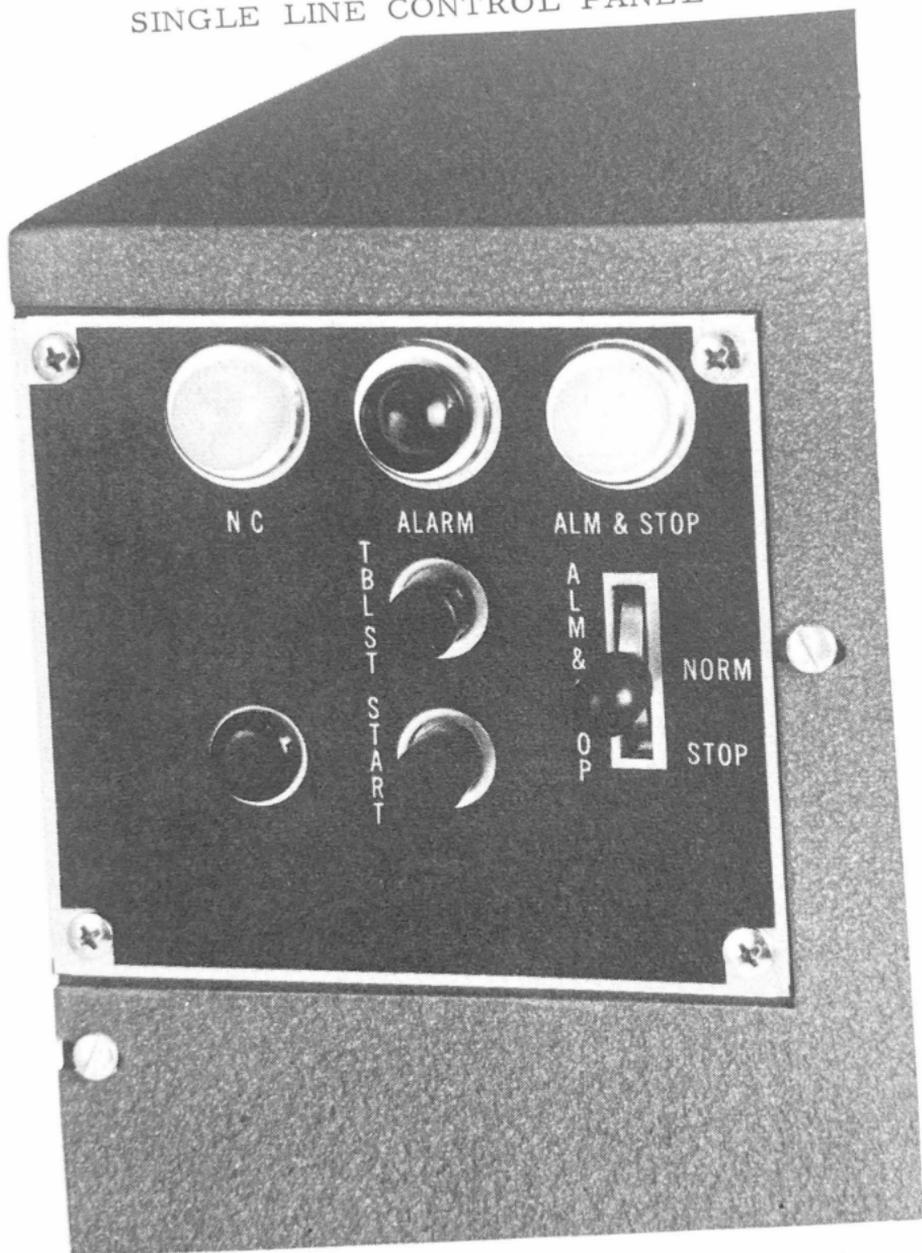


Figure 1

OUTLYING STATION
CONTROL PANEL



Figure 2