

LINE MESSAGE REGISTER TESTS AND REGISTER ASSIGNMENTS
LINE SWITCH EQUIPMENT
STEP-BY-STEP SYSTEMS

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1. GENERAL

1.01 This appendix:

- Establishes a method of reporting initial and final register readings. This procedure applies to offices where message register records are maintained by Revenue Accounting electronic data processing (EDP) computer operation.
- Shows the particular register test to make under various conditions.

- Explains how to test message registers in offices where register lead continuity is verified through the test distributor train.
- Explains how to verify the continuity of register leads associated with PBX one-way trunks or "sending lines", which do not have connector multiple and cannot be tested through the test distributor train in the usual manner. It also covers the procedure for call-through tests of the register associated with these "sending lines".

1.02 It is reissued to:

- Revise and simplify section format.
- Add an optional test set, SS 31171-01, which is equivalent to HS 1711.
- Delete the requirement for a 100 operation test on service order work.

Note: Marginal arrows used to indicate changes are omitted.

1.03 Care should be exercised in connecting to terminals in order not to operate the register.

1.04 The message register reading on a working subscriber line should be read and recorded on the proper form just before starting and immediately after completing an individual test.

1.05 Reliability of registers associated with subscriber lines so directly concerns the subscriber that its operating features are of unusual importance. Should any register fail to meet the various tests outlined in this appendix, it must be replaced with one that will meet test requirements.

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1.06 Under the EDP computer operation, Accounting provides a monthly print-out (two copies) of the vacant message registers for each CO code with their readings.

- One copy is for the Plant Service Center (PSC). It serves as their vacant register assignment list.
- The other copy is available for the Central Office (CO) forces. It may be used to make a physical check of the vacant registers, if desired.

1.07 Since the Accounting EDP computer maintains records of all working and nonworking message registers, it is no longer necessary to:

- Maintain a message register book in the PSC.
- Compile CO register assignment lines.
- Paper-out registers when they are disconnected.
- Wait until after the next billing round before reusing disconnected registers.

2. DEFINITIONS

2.01 The term "regular subscriber lines", as used in various subheadings of this appendix, includes all lines in line switch groups having message registers associated with them. It does not include lines which do not have connector multiple, which are used for PBX one-way trunks to the CO. These one-way lines are covered under the sub-heading of "sending lines".

2.02 Message register readings, as used in this appendix, means:

- **ORIGINAL Readings** — The reading on the register before the register is assigned.
- **INITIAL Reading** — The reading when service is established and tested. It is the original reading plus the test registrations.
- **FINAL Reading** — The register reading when service is disconnected, the register is changed, or service is changed.

2.03 **Test Registrations** — A test applied to the register after CO connections (frame work) are completed which causes the register to operate and ensures that the register is working properly.

2.04 **Register Reading List** — Form P548 is used for listing service orders requiring message register readings. (See Exhibit 1.)

3. MESSAGE REGISTER TESTS

(A) GENERAL

3.01 Message Register Tests using Test Sets ES-360006, HS-1171 or SS-31171-01, and Dial Handset — Use these procedures in offices where register lead continuity is verified through the test distributor train. The tests covered in this appendix are:

- Checking Continuity of Cross-Connections. (See Part 4 (A).)
- Operate, Nonoperate, and Hold Tests. (See Part 4 (B).)
- Interrupter Tests. (See Part 4 (C).)
- Call-Through Tests. (See Part 4 (D).)

3.02 These tests have the following applications:

- For new service orders, use the test described in Part 4 (D).
- For line message register rearrangements, use the tests described in Part 4 (A) and/or (D) to test newly assigned registers.
- Request for register investigation, Form K-3343, use the tests described in Part 4 (A) or (B) and (C).
- Request for register investigation, Form A-1960-E, use the test described in Part 4 (D).

(B) Apparatus

Regular Subscriber Lines

3.03 Apparatus for regular subscriber lines includes:

- Message register test set per ES-360006.
- Message register checking set per drawings HS-1171 or SS 31171-01.
- Three No. P3E cords equipped with No. 310 plugs (3P7A).
- One No. W1C cord — 12-feet long, equipped with a No. 116 plug and a No. 360-B tool, and one 419-A tool, or equivalent. (IW6A cord is equipped with a 419-A tool.)
- One operator telephone set or one handset.

Sending Lines

3.04 Apparatus for sending lines includes:

- All apparatus specified in 3.03.
- An additional operator telephone set or E2A-3 handset (for use by assistant at the intermediate distributing frame [IDF] when testing sending lines).
- One No. P4L cord equipped with one No. 289A and one No. 234 plug (4P6A).
- One 1011G handset, or equivalent.

(C) Test Set Preparation

Regular Subscriber Lines

3.05 For regular subscriber lines, prepare the test set (located at the message register rack) by making the following connections between the test set and the rack.

STEP	PROCEDURE
------	-----------

Note: DISC-ST key should be in a normal position throughout this test.

- | | |
|---|---|
| 1 | Connect 48V jack of test set ES-360006 to the 48-volt battery and ground jack on the register rack, using P3E cord. |
|---|---|

- | | |
|---|---|
| 2 | Connect TEST jack of the checking set to the TEST jack on the register rack, using P3E cord. |
| 3 | Connect OPER jack of the checking set to the OPER jack on the register rack, using P3E cord. |
| 4 | Connect T-1 jack of the test set to the message register under test. (Clip directly onto back of register, using W1C cord.) |
| 5 | Connect hand test set or operator telephone set to the TEL jack of the checking set. |

Sending Lines

3.06 For sending lines, make the following preparations:

- | STEP | PROCEDURE |
|---|---|
| 1 | Connect cords as specified in 3.05, Steps 1 through 5. |
| 2 | If there is an assistant at the IDF, connect the operator telephone set or the E2A-3 handset to the TEL jacks at the IDF and at the register rack. |
| 3 | With the P4C cord, connect jacks T and T1 of the test line located at the VIDF to the tip, ring, sleeve, and meter terminals of the line circuit associated with register under test. |
| <i>Note:</i> The No. 289A plug should be inserted in the jacks so that the plug designation is on top. If using older type plugs, connect the plug nearest the notched portion of the plug shell to jack "T". | |
| 4 | Connect T and R terminals of the hand test set 240A plug to the top two springs of the HS jack on the register rack. |

4. TESTS

(A) Checking Continuity of Cross-Connections

4.01 To check cross-connections of message registers for regular subscriber lines, perform the following steps:

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- | STEP | PROCEDURE |
|------|--|
| 1 | Operate CT key on test set momentarily. CT lamp should light while the CT key is operated. (If lamp does not light, test line for busy as outlined in 4.03 and 4.04.) |
| 2 | Operate DIAL key on checking set. |
| 3 | Dial the multiple number of the message register under test. Operate the HOLD and then the TEST TR keys. |
| | <i>Note:</i> This verifies continuity of the message register circuit from connector multiple to message register. |
| 4 | Recheck by operating the CT key momentarily and note that the CT lamp DOES NOT LIGHT. If the CT lamp lights while the TEST TR key is operated, the circuit is open between the register and the multiple. Recheck by restoring the TEST TR key and momentarily operating the CT key. |
| 5 | Restore all keys. |
| 4.02 | To check the cross-connections of registers for sending lines: |

- | STEP | PROCEDURE |
|------|---|
| 1 | Depress the CT key of the test set momentarily. The CT lamp should remain lighted while the key is operated. |
| 2 | Operate the hold switch of the hand test set and momentarily short-circuit the two lower springs of the HS jack on the register rack. When dial tone is received again, depress the CT key of the test set momentarily. The CT lamp should not light. |
| 3 | Restore switch of hand test set. |

Busy Line Condition – Regular Subscriber Lines

4.03 Individual Line Making Outgoing Call – If the line under test is busy (subscriber making an outgoing call), the CT lamp will not light when the CT key is first operated. In this case:

- | STEP | PROCEDURE |
|------|---|
| 1 | Check for actual conversation on line by operating DIAL key on message register checking set. |
| 2 | Dial multiple number. |
| 3 | Operate LIST key and listen for conversation. |
| 4 | If the line is actually in use, restore all keys and remove the clip from the register. |
| 5 | Proceed with test when line becomes idle. |

4.04 Individual Line Connector on Multiple – If the line is busy (due to a connector on the multiple), the CT lamp will light when the CT key is operated. It will remain lighted when the number has been dialed on the message register checking set and the HOLD and TEST TR are operated. To check for this condition:

- | STEP | PROCEDURE |
|------|---|
| 1 | Operate DIAL key on message register checking set. |
| 2 | Dial multiple number. |
| 3 | Operate LIST key and listen for conversation on the line. |
| 4 | If the line is actually in use, restore all keys and remove clip from the register. |
| 5 | Proceed with test when line becomes idle. |

Busy Line Condition – Sending Lines

4.05 If line under test is busy, CT lamp will not light when CT key is first operated.

- | STEP | PROCEDURE |
|------|---|
| 1 | Check for actual conversation on the line by listening in the receiver of the hand test set which is connected to the HS jack on the register rack. |
| 2 | If the line is actually in use, wait until the line becomes idle as indicated by the CT lamp lighting when CT key is operated. |
| 3 | Proceed with test. |

(B) Operation Tests

4.06 Operation tests of registers associated with PBX "sending lines" are the same as for registers associated with regular lines.

STEP	PROCEDURE
	Operate Test
1	Operate OPR key.
2	Set OPR resistance slide for the specified test "operate" value of the register.
3	Restore OPR key; then operate it two or three times to ensure that the register operates once, and only once , for each time the key is operated.
	Nonoperate Test
4	Operate NO key.
5	Set NO resistance slide for the specified test "nonoperate" value of the register.
6	Restore the NO key. Then operate it two or three times to ensure that register does not operate.
	Hold Test
7	Operate HOLD key.
8	Set HOLD resistance slide for the specified test "hold" value of the register.
9	With HOLD key operated, operate OPR key. Observe that register operates.
10	Restore OPR key to normal.
11	With HOLD key still operated, re-operate OPR key. Observe that register does not advance.

Note: This indicates that the armature remains in an operated position.

STEP PROCEDURE

12 Restore HOLD and OPR keys to normal.

(C) Interrupter Test

4.07 Interrupter tests of registers associated with PBX "sending lines" are the same as for registers associated with regular lines.

STEP	PROCEDURE
1	Operate OPR key.
2	Set OPR resistance slide for the specified test "operate" value of the register.
3	Restore OPR key to normal.
4	Record register reading.
5	Operate interrupter key lever of the test set to its extreme downward position; then release it and do not interfere with its return movement.

Note: Check that the register operates 100 times.

(D) Call-Through Test

Regular Subscriber Lines

STEP	PROCEDURE
1	With the No. 419 tool of the W1C cord connected to the winding of the register under test momentarily operate CT key on test set. CT lamp should light while the CT key is operated.
2	Operate DIAL key on checking set.
3	Dial multiple number of register under test.
4	Operate HOLD and TEST TR keys. Dial tone should be heard in receiver.

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APPENDIX 1

- | STEP | PROCEDURE |
|------|---|
| 5 | Operate the CT key. The CT lamp should not light. |
| 6 | Dial a test number to obtain a reversal of battery. When buzzer tone is heard in the receiver, the register should advance one digit. |

Sending Lines

- | STEP | PROCEDURE |
|------|--|
| 1 | Connect P4C cord to line under test at the IDF as described in 3.06, Step 3. |
| 2 | Connect hand set plug to HS jack on register rack. |
| 3 | Operate CT key of test set. CT lamp should light. |
| 4 | Operate the switch of hand test set and momentarily short-circuit the two bottom springs of HS jack. |
| 5 | When dial tone is heard, depress the CT key. The CT lamp should not light. |
| 6 | Dial a test number in reverse battery group. |
| 7 | When buzzer tone is heard in receiver, release switch. Register should advance one digit. |
| 8 | Release switch; remove hand set. |

Reports

- 4.08 Enter the required record of this routine on the proper form and forward according to local instructions.

5. FORM P548

(A) Description

- 5.01 The "Register Reading List", Form P548 (Exhibit 1), is a two-part snap-out, 5-1/2 inches by 8-inches. It is printed in color on a white background.

STEP	PROCEDURE
------	-----------

- PR (black) — PSC copy.
- F (red) — Frame copy.

(B) Preparation

- 5.02 This form is prepared by the CO forces. The PR copy is sent to the PSC; the F copy is retained by the CO.

- 5.03 It is imperative that Form P548 be sent to the PSC at regular intervals throughout the day. The PSC forces must have the final and/or initial register readings to enter on the service order before these orders can be put on the Service Order Completion Network. If the PSC is remote from the CO, these readings may be called to the PSC.

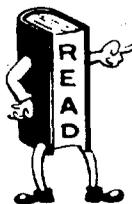
- 5.04 COs that call in these readings should mail the PSC copy of Form P548 to the PSC at the close of each day.

- 5.05 Immediately upon completion of a service order for new service, or any change in CO facilities involving message registers, perform tests to verify cross-connections and register operations.

- 5.06 Enter initial register readings on Form P548 as shown in Exhibit 1 after completion of the register test. The CO will also enter the initial register reading in the READING column of the service order. (See Exhibit 2.)

Note: Initial reading includes original reading plus test registrations.

- 5.07 Enter final register readings from disconnect or change of service orders on Form P548 as shown in Exhibit 1. The CO will also enter the final register reading in the READING column of the service order as shown in Exhibit 2.



Caution: Do not make disconnect entries on Form P548 or the service order until after the register jumper is removed. This assures that the correct register number appeared on the service order.

5.08 If the service order is canceled or is changed to flat rate service after the register is assigned, the PSC will recover the register assignment for future use. No entry need be made on Form P548.

5.09 If the register fails to meet the various tests, replace the register with one that will meet the test requirements. If the register cannot be replaced immediately, call the PSC and request another register assignment.

5.10 On all service orders that disconnect and reconnect message rate service within the same CO, such as T & F or In and Out service orders, make two entries on Form P548.

1. List the first entry as "D" (disconnect), showing the register number and its final reading.

2. List the second entry as "C" (connect), showing the register number and its initial reading.

Note: Message rate service orders that involve no message register jumper work on the frame must still have a disconnect and a connect entry on Form P548 because the bills are prepared by EDP.

5.11 Reporting register readings in connection with register rearrangements and register investigations involving Forms K-3343 or A-1960-E shall be handled as described in:

- Section 680-895-937PT — Register Rearrangements.
- Section 002-591-913PT, Appendix 2 — Forms K-3343 and A-1960-A.

REGISTER READING LIST							P548 (4-66)
DATE _____		CENTRAL OFFICE _____			PSC _____		
ORDER NO.	CONN. DISC.	TEL. NO.	REG. NO.	READING	POSTED		REMARKS
					FRAME	PSC	
373452	C ¹	1-6371	2468	8226 ²	H ³	JD ⁴	
T372153	C	2-7373	3121	0018	LM	JH	
F374651	D	583-1242	5612	0531	CD	AB	
451323	D	583-1676	6172	9311	H	JH	

ACTUAL SIZE 5½" x 8"

- 1 "C" or "D" — is entered when register is connected or disconnected.
- 2 Initial or final reading — depending on type of order.
- 3 Initials of originator posting entries. (CO)
- 4 Initials of the individual who transcribed required information to service order. (PSC)

Typical Entries on Register Reading Form
Exhibit 1

SECTION 225-115-500PT
APPENDIX 1

F										TRANSMITTED	
TYPE ORG	NC	108:20	108:24	295-1234							
EXPLANATIONS										P-2358 2-72	
E 011MB BC										14206 0529	
										1 3	
										0528	
										2	

F										P 2028 (11-68) L			
										TELEPHONE OR CIRCUIT NO.			
										SO NO.			
										SHEET _____ OF _____ SHEETS			
										CLASS OF SERVICE <u>IMB</u>			
										PREPARED BY _____ DATE DUE _____			
										COMPLETION DATE _____			
ITEM NO	AC TION	LINE	C. O. EQUIPMENT	REG	READ	TIE OR TK	PR	REMARKS	REF	FEED PR	FEED/BF SP/BDR-PR	DIST SP/BDR-PR	DIST TERM
1		295-1234		14207	3997			3996					
				1	3			2					

- 1 Register number may be 4 or 5 digits and is taken from the corrected message register assignment list (printout).
- 2 Original reading taken from printout. This is always a 4-digit number.
- 3 Initial reading — register reading when service is established and is the original reading plus the test registration.

Typical Entries on Service Orders
Exhibit 2