

**TRUNK TRANSMISSION TESTS**  
**CIRCUITS TERMINATED AT COMMERCIAL ACD**  
**USING MASTER TEST FRAME**  
**NO. 5 CROSSBAR OFFICES**

**1. GENERAL**

**PAGE**

**1.01** This section describes the method of making transmission measurements on lines terminating at Commercial Automatic Call Distributor (C/ACD) offices (Western Electric 2A, 2B and 3A or Vendor commercial automatic call distributors) having 2-wire connections to Bell System trunks from No. 5 crossbar offices using the master test control circuit SD-25800-01. Tests are performed through an auxiliary transmission test set (ATS) at the central office (CO) and an ATS at the C/ACD office. For the tests covered in this section, the following are required:

- (a) The ACDC jack, APP. Fig. 441 in SD-25762-01
- (b) The T1 jack in either SD-25762-01 or SD-25792-01
- (c) The TMDW key, option ZD in SD-25792-01.

**1.02** This section affects the Equipment Test Lists.

**1.03** The tests covered are:

**AA. 1004-Hz Loss Measurement (CO to C/ACD):** This test provides a 1004-Hz signal of -10 dBm at the CO for measurement of line loss to the C/ACD. Refer to paragraph 1.06. . . . .

**8**

**AB. Gain-Slope Measurements (CO to C/ACD):** This test provides 404-, 1004-, and 2804-Hz signals of -10 dBm at the CO for measurement of line loss for three frequencies to the C/ACD. . . . .

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**AC. Noise Measurements at CO (Quiet Termination):** This test

measures the line noise: (1) at the central office (CO) with the line termination of 900-ohms at the C/ACD, or (2) simultaneously at the CO and C/ACD. . . . .

**10**

**AD. Return Loss Balance (at CO):**

This test to a termination at the C/ACD is to verify balance requirements to assure echo control and singing margins for connections to the C/ACD. Refer to paragraph 1.05. . . . .

**12**

**BA. 1004-Hz Loss Measurement (C/ACD to CO):** This test provides a 1004-Hz signal of -10 dBm at the C/ACD for measurement of line loss to the CO. Refer to paragraph 1.06. . . . .

**12**

**BB. Gain-Slope Measurements (C/ACD to CO):** This test provides 404-, 1004-, and 2804-Hz signals of -10 dBm at the C/ACD for measurement of line loss for three frequencies to the CO. . . . .

**13**

**BC. Noise Measurements at C/ACD (Quiet Termination):**

This test measures the line noise at the CO and ACD, and noise to ground at the C/ACD with the line termination of 900-ohms at the CO. . . . .

**14**

**BD. Return Loss Balance (At C/ACD):** This test to a termination at the CO is to verify balance requirements to assure echo control and singing margins for connections to the C/ACD. Refer to paragraph 1.05. . . . .

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**BE. Verification of Seizure Signal from C/ACD to CO:** Refer to paragraph 1.20 . . . . .

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**NOTICE**

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**Note:** If the requirements in these tests are not met, turn down the circuit and report the condition to the transmission engineer.

**1.04** Tests AA, AB, AC, and AD are used for central office originated tests and procedures, while Tests BA, BB, BC, BD, and BE are used for C/ACD office originated tests and procedures. The second letter of the double-lettered tests identify companion tests, such as Tests AA and BA give test procedures for 1004-Hz loss measurements from the central office and the C/ACD office respectively. The noise-to-ground measurement (part of Test BC), is only made from the C/ACD office.

**1.05** Tests AD and BD are not required when the office and C/ACD are in the same metro area and the C/ACD has no overflow or transfer connection. Only Test BD is required when the office and C/ACD are in the same metro area but the C/ACD has overflow and/or transfer connections. Both Tests AD and BD are required when the office is outside the metro area where the C/ACD is located and with or without overflow or transfer.

**1.06** Tests AA and BA require different limits dependent on whether tests AD and BD are required. With no gain, the limits are  $-12.0$  to  $-13.5$  dBm if tests AD and BD are not required. With gain, the received signal should be  $-13.0$  dBm regardless. Note: the 2A C/ACD has the transfer feature, not overflow.

**1.07** Transmission requirements for lines to C/ACDs are given on circuit layout cards or in local office records.

**1.08** General information and requirements for trunk transmission testing can be found in Section 660-000-000.

**1.09** At the C/ACD office, it is necessary that the tip and ring of the transmission facility to be measured is disconnected from the customer premises switching equipment and that the circuit is made busy in the proper manner to avoid annoyance to the customer, interruption of customer service, or unnecessary seizure of the attendant.

**1.10** A talking path must be established between the CO and the C/ACD office prior to applying the procedures given in this section.

**1.11** All tests covered in this section require an assistant at the C/ACD office.

**1.12** Figures 1 and 2 present an overview of the cabling required to connect the auxiliary transmission test set (ATS) at the No. 5 central office and the C/ACD office respectively.

**1.13** **Lettered Steps:** A letter a, b, c, etc, added to a step number in Parts 3 and 4 of this section indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within the test. Where a condition does not apply, all steps designated by that letter should be omitted.

**1.14** The manner of selecting some circuits and test conditions at the master test frame (MTF) and its associated circuits varies depending on the apparatus options furnished with these circuits. Therefore, where variable means of selection are provided, precise instructions for the selection of circuits and test conditions are not given. Precise instructions for the use of these variable means are given in Section 218-106-301.

**1.15** The location statement, At MTF-, is used to refer to all apparatus located on the four basic bays of the MTF.

**1.16** The statement between asterisks (\*\_\_\_\*) is added after action statements to clarify the actions being performed in Part 4.

**1.17** When tests are made on trunks equipped with auxiliary line circuit SD-99439-01 the customer should be advised: (a) in order for the customer to receive credit if justified and (b) to explain possible traffic reductions registered by traffic registers or FADS registrations if provided. Refer to Section 010-250-001 for information relative to crediting charges on test calls.

**1.18** When ringing is being applied to the line under test from the ATS, lamp indications may vary due to the type of ringing provided in the central office for C/ACD testing.

**1.19** When the line under test is seized at the CO, it is made busy to incoming service calls.

**1.20** Test BE is required only if calls can be originated from the C/ACD to the CO.

## 2. APPARATUS

**2.01** The apparatus required for each test is given below. The details of each item are covered in the paragraph indicated. The calibration and operating procedure for each test set may be found in the section listed with each test set.

**Note:** If another type of measuring set is used in lieu of the recommended set, it should be ascertained that its accuracy is good or better than that recommended. If another type of set is used, reference should be made to the manufacturer's instruction manual for operating and calibrating procedures pertaining to the set.

### At Central Office

- 2.02** Master test control circuit, SD-25800-01.
- 2.03** Trunk test circuit, SD-25918-01.
- 2.04** Jack, lamp, and key circuit, SD-25762-01.
- 2.05** Telephone, key, and lamp circuit, SD-25744-01.
- 2.06** Voltmeter test circuit, SD-25792-01.
- 2.07** Test termination circuit (TTC), SD-96540-01.
- 2.08** Wilcom Model T309 auxiliary transmission test set (ATS).
- 2.09** Portable transmission measuring set (TMS), Hewlett-Packard 3551A or equivalent.
- Note:** Items in paragraphs 2.10, 2.11, and 2.12 are to be used when the portable transmission set is not available.
- 2.10** KS-19353 L1, KS-19353 L4, or KS-19260 L1 oscillator or equivalent (Section 103-302-105, 103-302-106, or 103-302-100).
- Note:** The KS-19353 L1 oscillator should be adjusted to desired output level before using and after each change in frequency.
- 2.11** 3A or 3C noise measurement set (NMS) or equivalent, equipped with C-message weighting (C-MESSAGE) network (Section 103-611-100 or Section 103-611-101).
- 2.12** 23A, 23B, 23C, or 23D transmission measuring set (TMS), J94023A or J94023D (Section 103-223-100), J94023B or J94023C (Section 103-223-101),
- 2.13** Patching cords, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cords) as required (see Fig. 1).
- 2.14** 1014B hand test set, equipped with 310 plug.
- 2.15** 262C plug (900-ohm termination).
- 2.16** Connect one 900-ohm resistor in series with one 2.16 microfarad capacitor to be used as termination in Test BD.
- 2.17** Return loss measuring set (RLMS) KS-20501 or equivalent.

### At ACD Office

- 2.18** Wilcom Model T309 auxiliary transmission test set (ATS).
- 2.19** Portable transmission measuring set (TMS) Hewlett-Packard 3551A or equivalent.
- 2.20** Return loss measuring set (RLMS) KS-20501 or equivalent. (Section 103-106-115)
- 2.21** Incoming trunk circuits:
- (a) Western Electric:
- SD-66777-01—No. 2A ACD
- SD-1E088-01—No. 2B ACD
- SD-65961-01—No. 3A ACD
- (b) Vendor manufactured
- 2.22** 1014B hand test set, equipped with 310 plug.
- 2.23** Patching cords, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord), as required. (See Fig. 2.)
- 2.24** For 2A C/ACD office: Patching cord, W2C cord, equipped on one end with 310 plug and on other end, two 59 cord tips (2W6A cord). (See Fig. 2.)
- 2.25** Two patching cords, W1AP cord, equipped with Mueller 30 mini-gator clips or equivalent, as required to connect C/ACD frame ground to the ATS and to the TMS.
- 2.26** 262C plug (900-ohm termination).

2.27 268 plug (dummy)

2.28 Connect one 900 ohm resistor in series with a 2.16 microfarad capacitor to be used as a termination in test AD.

### 3. PREPARATION

**Note 1:** Refer to paragraphs 1.04, 1.09, and 1.12

**Note 2:** See paragraph 1.01 for required circuits and options.

STEP	ACTION	VERIFICATION
<i>Preliminary Preparations At Central Office (CO)</i>		
1	At MTF— Restore all keys and switches.	
2	Momentarily operate RL key.	All lamps extinguished.
3	Select LT class of test.	
4	Select completing marker.	
5	Select A—D digits to direct call to line to be tested.	
6a	If line to be tested is in a hunt group— Operate NTLS, PBXH keys.	
7a	Select units digit in selected tens block (S switch).	
8	Operate TLK key.	
9	Select INC class of call with OA or OB translator indication.	
10	Insert the ATS BATT cord 310 plug into the —48-volt jack on the test frame miscellaneous circuit.	
11	At the ATS— Operate BATT key to NORM position. *—48 volts on RING, ground on tip*	
12	Operate DC FEED-DISCONNECT-HOLD key to DC FEED position.	NORM lamp lighted.
13	Operate TEL JACK-MEASURE key to TEL JACK position.	TIP GND lamp lighted. *Indicates correct polarity on tip and ring leads.*

STEP	ACTION	VERIFICATION
14	At CO ATS— Operate TEL JACK-MEASURE key to MEASURE position.	TIP GND lamp extinguished.
15	Operate TEL JACK-MEASURE key to TEL JACK position. *Verifies correct lamp operation*	TIP GND lamp lighted. NORM lamp extinguished.
16	Connect hand test set (MON-TALK key in MON position) to TEL JACK on ATS.	
17	Establish communications with craft at C/ACD office. (Do not use line to be tested.)	
18	Advise craft at C/ACD which line has been selected for testing.	

***Preliminary Preparations at C/ACD***

19	At ATS— Operate BATT key to NORM position. *-48 volts on RING, ground on TIP*	
20	Operate DC FEED-DISCONNECT-HOLD key to DISCONNECT position.	
21	Operate TEL JACK-MEASURE key to TEL JACK position.	
22	Connect GRD pin on ATS to C/ACD frame ground. (W1AP cord)	
23	Connect TMS ground terminal to C/ACD frame ground. (W1AP cord)	
24	Connect hand test set (MON-TALK key in MON position) to TEL JACK jack on ATS.	

***Continue Preparation at CO and ACD***

25	At MTF— Momentarily operate ST key.	MRL lamp lighted. *Line under test found idle and seized for testing*
26	Patch T1 jack of voltmeter test circuit to LINE jack on ATS. (Use 3P7A cord).	

STEP	ACTION	VERIFICATION
27	Patch ACDC (new C/ACD ringing) jack to RINGING jack on ATS.	
28	Advise craft at ACD that line under test has been seized for testing.	
29b	If at 2A ACD office— At incoming trunk— Insert dummy plug into TRK jack associated with line under test.	
30b	Using 2W6A cord— Insert end of cord with 310 plug into LINE jack on ATS.	
31c	If option K is provided— Clip TIP and RING ends of cord to terminals 5 and 3 respectively on TRK jack.	
32d	If option Q is provided— Clip TIP and RING ends of cord to terminals 7 and 5 respectively on TRK jack.	
	<b>Note:</b> It may be preferable to clip the 2W6A T and R ends to appropriate terminals on the distributing frame.	
33e	If at 2B ACD office— At incoming trunk— Patch L jack of line under test to LINE jack on ATS, using 3P7A cord, and insert a dummy plug into the TRK jack.	
34f	If at 3A ACD office— At incoming trunk— Patch OUT jack of line under test to LINE jack on ATS, using 3P7A cord, and insert a dummy plug into the IN jack.	
35g	If at a vendor-provided C/ACD interface— Disconnect incoming tip and ring leads and connect to LINE jack on ATS.	
36	At MTF— Operate TMDW key.	At C/ACD ATS— TIP GRD lamp lighted.
37	At C/ACD ATS— Operate TEL JACK-MEASURE key to MEASURE position.	At C/ACD ATS— TIP GRD lamp extinguished.

STEP	ACTION	VERIFICATION
38	Operate TEL JACK-MEASURE key to TEL JACK position. *Verifies correct ATS lamp operation*	TIP GRD lamp lighted.
39	At CO— Operate TEL JACK-MEASURE key to MEASURE position.	TIP GND lamp extinguished.
40	At CO ATS— Hold depressed RINGING pushbutton switch. *Ringing signal sent to C/ACD*	At CO ATS— RINGING lamp flashes. At C/ACD ATS— TIP GRD lamp flashes. Ringing tone heard in hand test set.
41	At C/ACD ATS— When TIP GRD lamp is flashing— Operate MON-TALK key on hand test set to TALK position. *Trip ringing*	At CO ATS— RINGING lamp extinguished. At C/ACD ATS— TIP GRD lamp stops flashing and lights at reduced intensity. Ringing tone not heard in hand test set.
42	At CO ATS— Release RINGING pushbutton switch.	
43	At CO ATS— Operate MON-TALK key on hand test set to TALK position.	
44	Operate TEL JACK-MEASURE key to TEL JACK position.	TIP GRD lamp is lighted at reduced intensity. NORM lamp extinguished.
45	Verify verbal communications between CO and C/ACD using hand test sets.	CO and C/ACD craft should be able to talk to one another over the line under test.
46	At CO ATS and C/ACD ATS— Operate MON-TALK key on hand test set to MON position.	At both CO and ACD ATS— TIP GRD lamp lighted at full intensity.
47	At C/ACD ATS— Operate TEL JACK-MEASURE key to MEASURE position.	NORM lamp lighted. TIP GRD lamp extinguished.
48	At CO ATS— Operate DC FEED-DISCONNECT-HOLD key to DISCONNECT position. *Verifies correct response to simulated calling customer disconnect*	At C/ACD ATS— TIP GRD lamp extinguished.
49	At CO ATS— Operate DC FEED-DISCONNECT-HOLD key to DC FEED position.	At C/ACD ATS— TIP GRD lamp lighted.

STEP	ACTION	VERIFICATION
50	At CO ATS— Operate DC FEED-DISCONNECT-HOLD key to HOLD position.	At C/ACD ATS— TIP GRD lamp extinguished.

#### 4. METHOD

**Note:** For Tests AA through BD, maintain the following settings on the ATS at the CO and C/ACD:

KEY/CORD	CO ATS	C/ACD ATS
BATT	NORMAL	NORMAL
DC FEED-DISCONNECT-HOLD	DC FEED	HOLD
TEL JACK-MEASURE	MEASURE	MEASURE
BATT CORD	CONNECTED	(NOT USED)

#### AA. 1004-Hz Loss Measurement (CO to C/ACD)

- 51 At C/ACD—  
Apply power to TMS.
- 52 Adjust TMS to RECV at 900 ohms.
- 53 Patch TMS INPUT jack to TMS jack on ATS using 3P7A cord.
- 54h At CO—  
If frame-mounted oscillator is used, adjust output for 1004-Hz signal at -10 dBm level.
- 55h Patch OSC 900 jack on TTC to TMS jack on ATS using 3P7A cord.
- 56i If portable TMS is used, patch OUTPUT jack on TMS to TMS jack on ATS using 3P7A cord.
- 57i Adjust TMS for 1004-Hz signal at -10 dBm level at 900 ohms.
- 58 At C/ACD TMS—  
Measure the received signal level.
- 59j If no further tests are to be performed—  
At MTF—  
Restore TMDW key.

Received signal level should be -13 dBm with gain or within the limits of -12.0 to -13.5 dBm without gain. Refer to paragraph 1.06. Record this value.

STEP	ACTION	VERIFICATION
60j	At C/ACD— Remove patch from line under test to LINE jack on ATS.	
61j	At MTF— Momentarily operate RL key.	All lamps extinguished.
62j	At CO and C/ACD— Remove all patching cords, and the dummy plug.	

#### AB. Gain-Slope Measurements (CO to C/ACD)

**Note:** The gain-slope measurements are deviations from the 1004-Hz signal measurement. A 404-Hz loss is measured between the central office and the C/ACD which should be within 3.0 dB more and 1.0 dB less than the 1004-Hz signal loss. Then a 2804-Hz loss is measured whose limits should be within 4.5 dB more and 1.0 dB less than the 1004-Hz loss.

51	At C/ACD— Apply power to TMS.	
52	Adjust TMS to RECV at 900 ohms.	
53	Patch TMS INPUT jack to TMS jack on ATS using 3P7A cord.	
54h	At CO— If frame-mounted oscillator is used, adjust output for 1004-Hz signal at -10 dBm level at 900 ohms.	
55h	Patch OSC 900 jack on TTC to TMS jack on ATS using 3P7A cord.	
56i	If portable TMS is used, patch OUTPUT jack on TMS to TMS jack on ATS using 3P7A cord.	
57i	Adjust TMS for 1004-Hz signal at -10 dBm level at 900 ohms.	
58	At C/ACD TMS— Measure the received signal level.	Received signal level should be -13 dBm with gain, or within the limits of -10.0 to -13.5 or -12.0 to -13.5 dBm without gain. Refer to paragraph 1.06. Record this value.
59	Repeat Steps 54h or 57i, adjusting output signal for 404-Hz at -10 dBm level at 900 ohms.	

STEP	ACTION	VERIFICATION
60	At C/ACD TMS— Measure the received signal level.	Received signal deviation from 1004-Hz (Step 57) should be within the loss limits 3.0 dB more and 1.0 dB less.
61	Repeat Steps 54h or 57i, adjusting output signal for 2804-Hz at -10 dBm level at 900 ohms.	
62	At C/ACD TMS— Measure the received signal level.	Received signal deviation from 1004-Hz (Step 57) should be within the loss limits 4.5 dB more and 1.0 dB less.
63j	If no further tests are to be performed— At MTF— Restore TMDW key.	
64j	At C/ACD— Remove patch from line under test to LINE jack on ATS.	
65j	At MTF— Momentarily operate RL key.	All lamps extinguished.
66j	At CO and C/ACD— Remove all patching cords, and the dummy plug.	

**AC. Noise Measurement at CO (Quiet Termination)*****Circuit Noise***

**Note:** Two methods for performing the circuit noise measurement are given. The first method may be used when separate noise measurements are desired (Tests AC and BC). The second method may be used to make simultaneous measurements at the C/ACD and the central office, thus eliminating the use of Test BC.

**First Method (at CO)**

- |     |   |  |
|-----|---|--|
| 51  | At C/ACD—<br>Insert 262C plug (900-ohm termination) into TMS jack on ATS. |  |
| 52h | At CO—<br>If frame-mounted NMS is used—<br>Apply power to NMS.            |  |
| 53h | Patch INPUT jack on NMS to TMS jack on ATS.                               |  |
| 54h | Adjust NMS for 900-ohm termination, Message Circuit Noise—C Message.      |  |

STEP	ACTION	VERIFICATION
55i	If portable TMS is used— Apply power to TMS.	
56i	Patch INPUT jack of NMS to TMS jack on ATS.	
57i	Adjust TMS for 900-ohm termination, Message Circuit Noise—C Message.	
58	At CO NMS or portable TMS— Obtain noise measurement.	Refer to Table A for limits, depending on facility and length of circuit.
59	At C/ACD— Remove 262C plug from TMS jack on ATS.	
60	Proceed to Step 68i.	
<b>Second Method (at CO and ACD)</b>		
61	At C/ACD— Apply power to TMS.	
62	Patch TMS jack on ATS to INPUT jack on TMS.	
63	Adjust for 900-ohm termination and Message Circuit Noise—C Message.	
64	At CO— Apply power to TMS or NMS, as provided.	
65	Patch TMS jack on ATS to INPUT jack on TMS or NMS.	
66	Adjust for 900-ohm termination and Message Circuit Noise—C Message.	
67	At both CO and C/ACD— Obtain noise measurement.	Refer to Table A for limits, depending upon facility and length of circuit.
68j	If no further tests are to be performed— At MTF— Restore TMDW key.	
69j	At C/ACD— Remove patch from line under test to LINE jack on ATS.	
70j	At MTF— Momentarily operate RL key.	All lamps extinguished.

STEP	ACTION	VERIFICATION
71j	At CO and C/ACD— Remove all patching cords, and the dummy plug.	
<b>AD. Return Loss Balance (At CO)</b>		
<i>Note:</i> See paragraph 1.05.		
51	At C/ACD— At the ATS TMS jack terminate the line under test with a 900 ohm resistor in series with a 2.16 microfarad capacitor termination.	
52	At CO— Set up RLMS for a 2-wire measurement (Section 103-106-115).	
53	Patch RLMS to TMS jack on ATS.	
54	Measure ERL, SRL and SRL-HI.	ERL should read 18 dB or greater. SRL and SRL-HI should read 10 dB or greater.
55h	If no further tests are to be performed— At MTF— Restore TMDW key.	
56h	At C/ACD— Remove patch from line under test to LINE jack on ATS.	
57h	At MTF— Momentarily operate RL key.	
58h	At CO and C/ACD— Remove all patching cords, and the dummy plug.	
<b>BA. 1004-Hz Loss Measurement (C/ACD to CO)</b>		
51h	At CO— If frame-mounted TMS is used— Apply power to TMS.	
52h	Patch MEAS(900) jack on TTC to TMS jack on ATS.	
53i	If portable TMS is used— Apply power to portable TMS.	
54i	Adjust TMS to RECV at 900 ohms.	

STEP	ACTION	VERIFICATION
55i	Patch INPUT jack on TMS to TMS jack on ATS.	
56	At C/ACD— Patch OUTPUT jack on TMS to TMS jack on ATS.	
57	Adjust TMS for 1004-Hz signal at -10 dBm at 900 ohms.	
58	At CO TMS— Measure the received signal level.	Received signal level should be -13 dBm with gain or within the limits of -10.0 to -13.5 or -12.0 to -13.5 dBm without gain. Refer to para- graph 1.06. Record this value.
59j	If no further tests are to be performed— At MTF— Restore TMDW key.	
60j	At C/ACD— Remove patch from line under test to LINE jack on ATS.	
61j	At MTF— Momentarily operate RL key.	All lamps extinguished.
62j	At CO and C/ACD— Remove all patching cords.	

**BB. Gain-Slope Measurements (C/ACD to CO)**

**Note:** The gain-slope measurements are deviations from the 1004-Hz signal measurement. A 404-Hz loss is measured between the central office and the ACD which should be within 3.0 dB more and 1.0 dB less than the 1004-Hz signal loss. Then a 2804-Hz loss is measured whose limits should be within 4.5 dB more and 1.0 dB less than the 1004-Hz loss.

51	At C/ACD— Apply power to TMS.	
52	Patch TMS OUTPUT jack to TMS jack on ATS.	
53h	At CO— If frame-mounted TMS is used— Apply power to TMS.	
54h	Patch MEAS(900) jack on TTC to TMS jack on ATS.	
55i	If portable TMS is used— Apply power to portable TMS.	

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STEP	ACTION	VERIFICATION
56i	Patch INPUT jack on TMS to TMS jack on ATS.	
57	At C/ACD TMS— Adjust TMS for 1004-Hz signal at -10 dBm at 900 ohms.	
58	At CO TMS— Measure the received signal level.	Received signal level should be -13 dBm with gain or within the limits of -10.0 to -13.5 or -12.0 to -13.5 dBm without gain. Refer to paragraph 1.06. Record this value.
59	At C/ACD— Adjust output signal for 404-Hz at -10 dBm at 900 ohms.	
60	At CO TMS— Measure the received signal level.	Received signal deviation from 1004-Hz (Step 57) should be within the loss limits 3.0 dB more and 1.0 dB less.
61	At C/ACD— Adjust output signal for 2804-Hz at -10 dBm at 900 ohms.	
62	At CO TMS— Measure the received signal level.	Received signal deviation from 1004-Hz (Step 57) should be within the loss limits 3.0 dB more and 1.0 dB less.
63j	If no further tests are to be performed— At MTF— Restore TMDW key.	
64j	At C/ACD— Remove patch from line under test to LINE jack on ATS.	
65j	At MTF— Momentarily operate RL key.	All lamps extinguished.
66j	At CO and C/ACD— Remove all patching cords.	

**BC. Noise Measurement at C/ACD (Quiet Termination)**

***Circuit Noise***

51	At CO— Insert 262C plug (900-ohm termination) into TMS jack of ATS.	
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STEP	ACTION	VERIFICATION
52	At C/ACD— Apply power to TMS.	
53	Patch INPUT jack on TMS to TMS jack on ATS.	
54	Adjust TMS for 900-ohm termination and Message Circuit Noise—C Message.	
55	At C/ACD TMS— Measure noise level.	Refer to Table A for limits depending on facility and length of circuit.
56	At CO— Remove 262C plug from TMS jack on ATS.	

### ***Circuit Noise to Ground***

**Note:** Add 40 dBrnC to readings obtained on Western Electric No. 3 type Noise Measuring Set (NMS), if used instead of H.P. 3551A TMS.

57	Repeat Steps 51 through 56 under CIRCUIT NOISE, adjusting the TMS at the ACD for noise measurement to ground.	The noise reading should be 80 dBrnC or less.
58h	If no further tests are to be performed— At MTF— Restore TMDW key.	
59h	At C/ACD— Remove patch from line under test to LINE jack on ATTS.	
60h	At MTF— Momentarily operate RL key.	All lamps extinguished.
61h	At CO and C/ACD— Remove all patching cords, and the dummy plug.	

### **BD. Return Loss Balance (At ACD)**

**Note:** Refer to paragraph 1.05.

51	At CO— Terminate the line under test with a 900-ohm resistor in series with a 2.16 microfarad capacitor termination.	
52	At C/ACD— Set up RLMS for a 2-wire measurement (Section 103-106-115).	

STEP	ACTION	VERIFICATION
53	Patch RLMS to TMS jack on ATS.	
54	Measure ERL, SRL, and SRL-H1.	ERL should read 18 dB or greater. SRL and SRL-H1 should read 10 dB or greater.
55h	If no further tests are to be performed— At MTF— Restore TMDW key.	
56h	At C/ACD— Remove patch from line under test to LINE jack on ATS.	
57h	At MTF— Momentarily operate RL key.	All lamps extinguished.
58h	At CO and C/ACD— Remove all patching cords, and the dummy plug.	

**BE. SEIZURE OF CO FROM C/ACD**

1	At the Western Electric C/ACD main distributing frame (or at the Vendor manufactured C/ACD interface)— Connect hand test set (MON-TALK key in MON position) to T and R (Tip and Ring) of the line under test, and listen.	At hand test set— Conversation heard indicates a busy line; no conversation indicates an idle line.
2	When the line under test is found to be idle— Operate the hand test set key to TALK and momentarily ground the R of the line.	Dial-tone should be heard in the hand test set receiver.
3	Disconnect the hand test set from the line under test.	

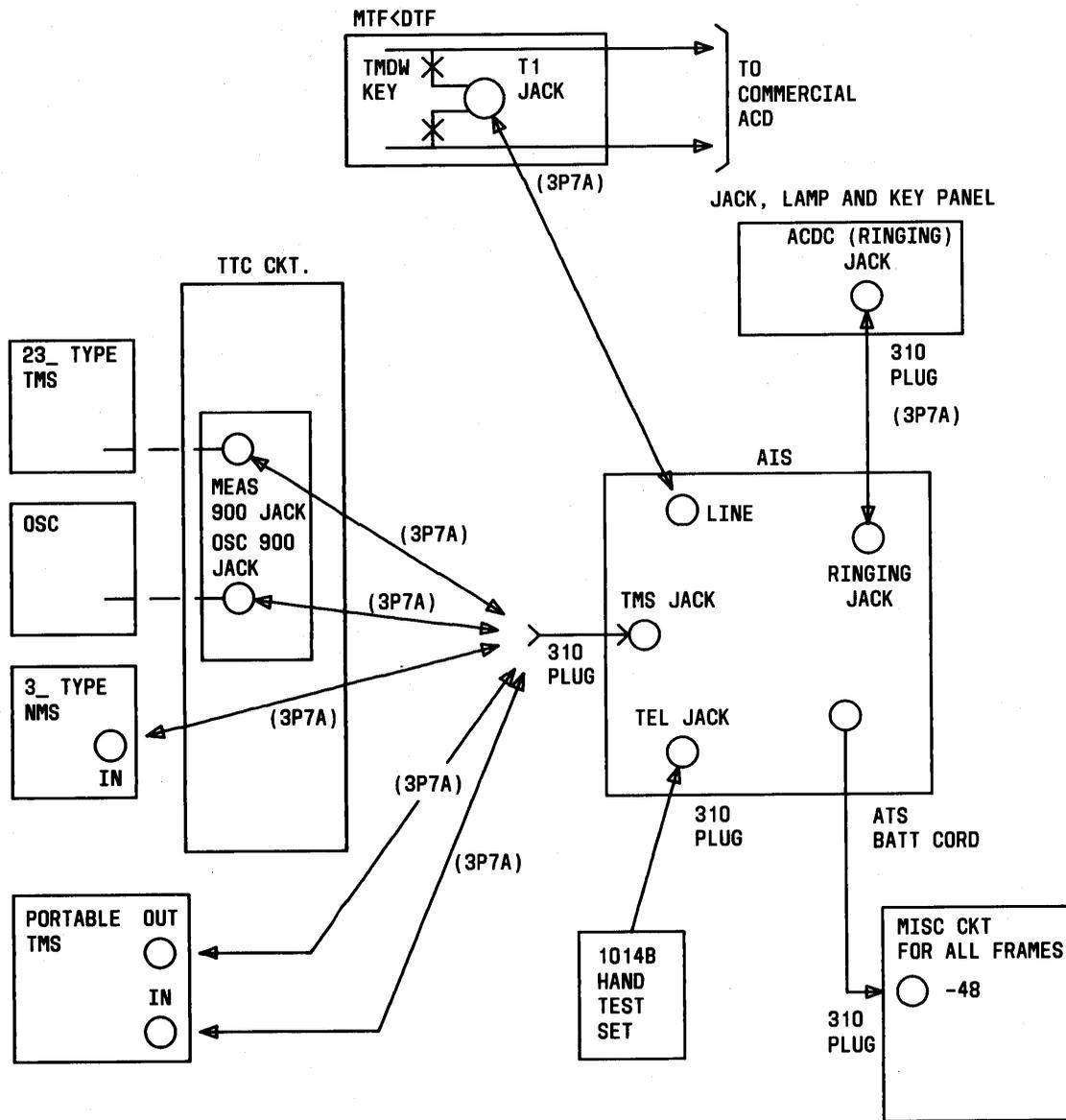


Fig. 1—Transmission Testing Arrangements in No. 5 Crossbar Offices With MTF

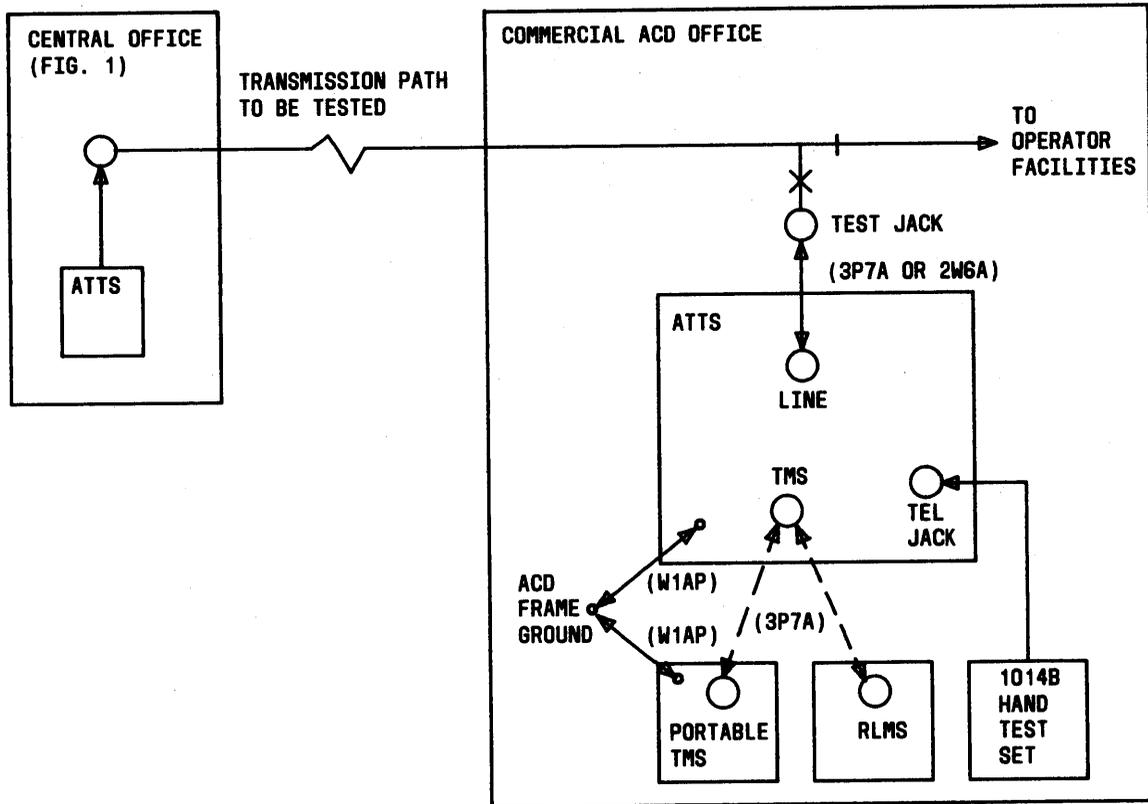


Fig. 2—Transmission Testing Arrangements at Commercial ACD

**TABLE A**  
**CIRCUIT NOISE LIMITS (A/B)\***

FACILITY	ROUTE MILEAGE				
	0-50	51-100	101-200	201-400	401-1000
METALLIC	25/36	—	—	—	—
ANALOG CARRIER NON-COMPANDED (L-Type)	28/36	30/36	32/36	34/38	37/42
ANALOG CARRIER COMPANDED. (N-Type)	23/30	25/30	27/32	—	—
DIGITAL CARRIER	25/30	25/30	25/30	25/30	25/30

\*A/B

A — circuit order and maintenance limit in dBrnC

B — immediate action limit in dBrnC

