MANUAL TRUNK TRANSMISSION TESTS
USING AUTOMATIC PROGRESSION TRUNK TEST CIRCUIT SD-25938-01
NO. 5 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes the method of making manual transmission measurements on trunks using the automatic progression trunk test frame (APTT) SD-25938-01 of any vintage, when the frame is equipped for this feature. The transmission measurements include loss, message circuit noise, and impulse noise.

1.02 This issue affects Equipment Test Lists.

1.03 The tests covered are:

1.04 Transmission requirements for trunks are given on circuit layout cards, in local trunk records, or in appropriate sections.

1.05 General information and requirements for trunk transmission can be found in Division 660. (See 660-000-000.)

1.06 Preparation of particular circuit charts are covered in the section titled "Preparation of Control Tapes for Transmission Testing of Outgoing Trunks Automatic Progression Trunk Test Frame and Automatic Transmission Measuring System No. 5 Crossbar Offices."

1.07 In each test, the transmission loss indicated by the transmission measuring set (TMS) meter includes the loss of the connecting circuits used to complete the test connection.

1.08 The transmission loss indicated by the TMS meter is the actual measured loss (AML) in dB of the circuit under test and is made under the same conditions as the expected measured loss (EML) was computed.

1.09 The results of these tests should be entered on the appropriate form.

1.10 Precautions should be taken when performing these tests so that normal traffic will not be adversely affected.

1.11 Test C is applicable only to trunks not using an N, O, or ON carrier facility.

1.12 ***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 a test. Where a condition does not

apply, all steps designated by that letter should be omitted.

1.13 A statement between asterisks (*__*) is added after action statements to clarify the readings obtained in the test procedures of Part 4.

1.14 The APTT is equipped with a monitoring amplifier (SD-96516-01) which includes a VF amplifier (SD-95112-01). The GAIN P1 potentiometer, when turned in a clockwise direction, will increase the gain of the monitoring amplifier. Patch the MWC jack to the CALA jack to provide a 1000 Hz tone to be used for adjustments. The APTT also is equipped with a 106D loudspeaker set. It may be controlled by means of the VCI potentiometer. Since the output of the monitoring amplifier is connected to the input of the 106D loudspeaker set, the gain of the monitoring amplifier should be set very low, and the control of volume may be set with the loudspeaker set. The monitoring amplifier is equipped with IN and OUT jacks for precise measurements. Refer to SD-96516-01; notes 302, 303, and 304 for precise adjustments.

1.15 The 23C TMS, which is mounted in the APTT frame, may be calibrated by patching the MWC jack (1000 Hz, 900Ω at 0 DBM) to the CALM jack. For other information about the 23C TMS, refer to Section 103-223-101.

2. APPARATUS

2.01 The apparatus required for each test is listed in Table A. The details of each item are covered in the paragraph indicated by the number in parentheses. The calibration and operating procedure for each test set may be found in the section listed with each test set.

2.02 Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord).

2.03 Patching cord, P2B cord, 6 feet long, equipped with two 310 plugs (2P4C cord).

2.04 Automatic progression trunk test circuit (APTT) SD-25938-01.

2.05 3C noise measuring set (NMS) equipped with C-message weighting (C-MESSAGE) network (Section 103-611-101).

2.06 6H impulse counter (IC) J94006H equipped with C-notched weighting filter (Section 103-620-101).

2.07 716D test receiver, equipped with a 310 plug.

TABLE A

APPARATUS	TESTS				
	A,F	B	C	D	E
APTT (2.04)	1	1	1	1	1
Noise Measuring Set (2.05)		1			
Impulse Counter (2.06)			1		
Test Receiver (2.07)		1			
Cord, 3P7A (2.02)		1		1	1
Cord, 2P4C (2.03)			1		

3. PREPARATION

STEP	ACTION	VERIFICATION
	Note: All test equipment shall be known to be correctly calibrated. Refer to 1.14 and 1.15.	
All Tests		
1	At APTT— Restore all keys and switches.	
2	Momentarily operate RL key.	All lamps extinguished.
3	Operate LP key.	DW lamp lighted.
4	Restore LP key.	DW lamp extinguished.
5	Set MKR switch to select marker.	
6	Operate LP key.	
7a	If audible trouble alarm is ***not*** desired— Operate TTAL key.	TTAL lamp lighted.
8	Operate PCS key.	
9	Operate PTMA key.	If test is two-way 1000-Hz loss measurement to loop around test line— PTMA lamp lighted.
10	Set switches for trunk under test using information listed on particular circuit chart. (Refer to 1.06).	Lamps lighted corresponding to switch settings for priming information.
Tests A Through D and F		
11b	If testing to 100-, 102-, or 104-type test line— Operate NLTM key.	PTMA lamp extinguished. PTMB lamp lighted.

4. METHOD

A. One-Way 1000-Hz Loss Measurement to 102-Type Test Line

12	Momentarily operate ST key.	When marker is primed with last digit— EOD lamp lighted. If trunk being tested in subscriber mode— AS lamp lighted.

STEP	ACTION	VERIFICATION
		If trunk being tested in toll or tandem mode— CS lamp lighted. Ringing may be heard momentarily. 1000-Hz heard over loudspeaker. ***Note:*** Ringing may or may not be heard depending on the interval at which the test line is seized.
13	Operate PTTM key.	23C TMS meter indicates transmission loss of trunk under test.
14	Record transmission loss on appropriate forms as required. *Far-to-near trunk loss.*	
15	Release PTTM key.	
16c	If trunk under test arranged for coin operation— Momentarily operate CNRL key.	CC or CR lamp lighted. AS lamp extinguished.
17	Momentarily operate RL key.	
18	Repeat Steps 10 through 17 for remainder of trunks to be tested.	
19	Restore all keys and switches.	All lamps extinguished.
B. Message Circuit Noise Measurement to 100-Type Test Line		
13	Operate ST key.	When marker is primed with last digit— EOD lamp lighted. If trunk being tested in subscriber mode— AS lamp lighted. If trunk being tested in toll or tandem mode— CS lamp lighted. Ringing may be heard momentarily over loudspeaker. After five seconds of 1000-Hz tone— Quiet termination placed on line. ***Note:*** Ringing may or may not be heard depending on the interval at which the test line is seized.
14	At 3C NMS— Set FUNCTION switch to NM 600/900.	
15	Connect ground to GRD post on NMS, using 893 cord.	

STEP	ACTION	VERIFICATION
16	Set DBRN switch to 85.	
17	At APTT— Patch IN jack on NMS to TNMS jack on APTT using P3E cord.	
18	Operate PTTM key.	
19	At 3C NMS— Adjust DBRN switch for a meter indication between +2 and +9.	
20	Record noise measurement and character of noise on appropriate forms as required. ***Note:*** Noise measurement indicates near-end noise; character of noise heard in test receiver or over loudspeaker, as applicable.	
21	Release PTTM key.	
22c	If trunk under test arranged for coin operation— Momentarily operate CNRL key.	CC or CR lamp lighted. AS lamp extinguished.
23	Momentarily operate RL key.	Connection released.
24	Repeat Steps 10 through 23 for remainder of trunks to be tested.	
25	Restore all keys and switches and remove all patching cords.	All lamps extinguished.

C. Impulse Noise Measurement to 100-Type Test Line

Note: Refer to 1.11.

12	Operate ST key.	When marker is primed with last digit— EOD lamp lighted. If trunk being tested in subscriber mode— AS lamp lighted. If trunk being tested in toll or tandem mode— CS lamp lighted. Ringing momentarily heard over loudspeaker. Quiet termination placed on line. ***Note:*** Ringing may or may not be heard depending on the interval at which the test line is seized.

STEP	ACTION	VERIFICATION
13	At 6H IC— Set DIAL-MEAS switch to MEAS.	
14	Set DBRN dial to the required noise reference level.	
15	Patch from MEAS jack to TNMS jack on APTT using P2B cord.	
16	At APTT— Operate PTTM key.	
17	At 6H IC— Turn MINUTES control to desired time.	
18	Momentarily operate reset level.	
19	After timing interval (MINUTES control in 0 position)— Record counter reading. ***Note:*** If distant test line returns repetitive on-hook supervision, monitor connection with 716D receiver or loudspeaker, as applicable, observe 6H IC, and determine number of impulses per minute caused by changes in supervision. Multiply by timing interval in minutes and subtract result from recorded counter reading. *Counter reading, as corrected when required, indicates impulse counts measured at near end.*	
20	Release PTTM key.	
21c	If trunk under test arranged for coin operation— Momentarily operate CNRL key.	CC or CR lamp lighted. AS lamp extinguished.
22	Operate RL key.	
23	Repeat Step 10 through 22 for remainder of trunks to be tested.	
24	Restore all keys and switches and remove all patching cords used for test.	All lamps extinguished.

STEP	ACTION	VERIFICATION
	D. Two-Way 1000-Hz Loss Measurement and Noise Check to 104-Type Test Line	
12	Momentarily operate ST key.	When marker is primed with last digit— EOD lamp lighted. If trunk being tested in subscriber mode— AS lamp lighted. If trunk being tested in toll or tandem mode— CS lamp lighted. Ringing may be heard momentarily. 2225-Hz heard over loudspeaker. CS/AS lamp lighted for toll or tandem mode or subscriber mode, respectively. ***Note:*** Ringing may or may not be heard depending on the interval at which the test line is seized.
13	Operate PTTM key.	
14	After 2225 Hz tone is removed— Operate MWTM key for a minimum of three seconds. ***Note:*** Near-to-far transmission loss measured and stored at distant transmission measuring circuit.	1000-Hz tone heard for ten-seconds.
15c	If short burst of 2225-Hz is heard or the CS/AS lamp is momentarily lighted before hearing the ten-second burst of 1000-Hz tone— Repeat Step 14.	
16	When 1000-Hz tone is heard— Record TMS reading during ten-second interval. *Far-to-near transmission loss.*	
17	When second ten-second 1000-Hz tone is heard— Record TMS reading during second ten-second interval. *Far-to-near plus near-to-far transmission loss.*	
18d	If short burst of 2225-Hz is heard or the CS/AS lamp is momentarily lighted after the ten-second 1000-Hz tone— Add -10dB to TMS reading for second ten-second tone.	
19e	If a far-end noise check is desired— Monitor test call for 5-seconds.	If steady 2225-Hz tone is heard— Far-end noise does ***not*** exceed 41 dBrnc. If interrupted 2225-Hz tone is heard— Far-end noise exceeds 41 dBrnc.

STEP	ACTION	VERIFICATION
20	Subtract reading recorded in Step 16 from reading recorded in Step 17. *Remainder is near-to-far transmission loss.*	
21	Release PTTM key.	
22	Operate RL key.	
23	Repeat Steps 12 through 22 for remainder of trunks to be tested.	
24	Restore all keys and switches.	All lamps extinguished.

E. Two-Way 1000-Hz Loss Measurement Using Loop-Around Test Line

11	Momentarily operate ST key.	When markeris primed with last digit— EOD lamp lighted. Ringing may be heard momentarily. If trunk under test is being tested in subscriber mode of operation— AS lamp lighted. If trunk under test is being tested in toll or tandem mode of operation— CS lamp lighted. 1000-Hz tone heard over loudspeaker. ***Note:*** Ringing may or may not be heard depending on the interval at which the test line is seized.
12	Operate PTTM key.	1000-Hz tone silenced.
13c	If trunk under test is arranged for coin operation— Operate CNTM key.	
14	At TMS— Record far-to-near transmission loss.	
15	Momentarily operate RL key.	
16	Repeat Steps 10 through 13c as required to reach the second appearance of loop-around test line of trunk under test.	If trunk under test is being tested in subscriber mode of operation— Ringing may be heard momentarily. TS lamp lighted. If trunk under test is being tested in toll or tandem mode of operation—

STEP	ACTION	VERIFICATION
		Ringing may be heard momentarily. CS2 lamp lighted. ***Note:*** Ringing may or may not be heard depending on the interval at which the test line is seized.
17	Operate MWTM key.	
18	At TMS— Record loop-around transmission loss. *Near-to-far plus far-to-near transmission loss.*	
19	Subtract reading recorded in Step 14 from reading recorded in Step 18. *Near-to-far transmission loss of trunk under test.*	
20	Release MWTM key.	
21	Release PTTM key.	If trunk under test is ***not*** arranged for coin operation— TS/CS2 lamp extinguished. If trunk under test is arranged for coin operation— CC/CR lamp momentarily lighted. TS, AS lamps extinguished.
22c	If trunk under test is arranged for coin operation— Release CNTM key.	
23c	Momentarily operate CNRL key.	CND lamp lighted.
24	Momentarily operate RL key.	
25	Repeat Steps 10 through 24 as required for all trunks in trunk group under test.	
26	Release PTMA key.	PTMA lamp extinguished.
27	Restore all keys and switches.	All lamps extinguished.
F.	**One-Way 1000-Hz Loss Measurement to 100-Type Test Line**	
12	Operate ST key.	When marker is primed with last digit— EOD lamp lighted. If trunk under test is being tested in subscriber mode of operation— AS lamp lighted.

STEP	ACTION	VERIFICATION
		If trunk under test is being tested in toll or tandem mode of operation— CS lamp lighted. Ringing may be heard momentarily over loudspeaker. 1000-Hz tone placed on line for five seconds. ***Note:*** Ringing may or may not be heard depending on the interval at which the test line is seized.
13	Operate PTTM key.	23C TMS meter indicates transmission loss of trunk under test.
14	Record transmission loss on appropriate forms as required. *Far-to-near trunk loss.*	
15	Release PTTM key.	
16c	If trunk under test is arranged for coin operation— Momentarily operate CNRL key.	CC or CR lamp lighted. AS lamp extinguished.
17	Operate RL key.	
18	Repeat Steps 10 through 17 for remainder of trunks to be tested.	
19	Restore all keys and switches.	All lamps extinguished.