VERIFICATION NO-TEST TRUNKS
TRANSMISSION TESTS USING (MODIFIED) MANUAL TEST FRAME SD-68587-01
NO. 4A TOLL SWITCHING SYSTEMS

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1. GENERAL

1.01 This section describes a method of making transmission measurements on verification no-test trunk equipment using the manual test frame (MTF) SD-68587-01. The trunks are equipped per PSD-68009-02 and the test frame is modified per PSD-68015-02.

1.02 (Reserved for future use)

1.03 This issue affects the Equipment Test List (ETL).

1.04 The tests covered are:

A. Two-Way 1000 Hz Loss Measurement to 101-Type Manual Test Line

B. Message Circuit Noise Measurement to 101-Type Manual Test Line

C. Return Loss and Office Balance Measurement to 100-Type Manual Test Line

1.05 Conventional transmission testing methods and end office transmission are not generally compatible with the verification no-test network. Transmission test lines in crossbar offices require machine ringing in order to function. End office verification no-test incoming trunks are arranged to provide controlled ringing. The network, however, cannot pass the ringing signals necessary to activate the ringing feature. Loop around test lines are equipped with syllabic filters that disconnect the looping feature when the interrupted 1400 Hz is received from the 4A verification no-test trunk.

1.06 When performing Tests A through C, a separate talking circuit is required for communication with the assistant at the end office test location.

1.07 These tests may affect no test service and utilization of end office personnel. Coordination with the personnel responsible for these functions is required.

1.08 Section 212-567-501 shows some of the trouble indicators that the MTF might display during testing and probable trouble conditions. The HIT trouble lamp indicates a cross-office check failure in addition to the condition listed in Section 212-567-501.

1.09 Some of the MTF key-lamp assemblies may either light steady or flash upon key operation. A steady lamp indicates the desired operation has taken place. A flashing lamp indicates that the desired operation did not take place. This is usually due to lockout conditions.

1.10 Certain keys have built-in lamps that light when the key is operated and extinguish when the key is released. The circuitry for these lamps is through the contacts of the key. The test steps marked with an asterisk (*) involve this type

of key. The lamp status should be observed during the use of the key. Some key lamps might be lighted and extinguished by other means when the key is used. The status of these lamps during the tests will be listed in the test verification column.

1.11 The HV key is provided by the PSD-68015-02 modification. When operated, it provides a 95 cross-office tone generator. This tone is required by the outgoing verification no-test trunks in order to complete a call. The key is located in the A-ACCESS key group, but is common to the A- and B-ACCESS circuits.

1.12 The RT keys A- and B-ACCESS are also provided by the PSD-68015-02 modification. When depressed momentarily, a ring forward signal is generated towards the trunk to disable the scrambler and start warning (beep) tone. All transmission tests are to be performed with the scrambler(s) disabled.

1.13 Trunk transmission requirements are shown on circuit layout record cards (CLRs) or local trunk records. CLRs should bear the following notation:

Type of Trunk	
4A Incoming	"Modified per PSD-68012-02"
4A Outgoing to End Office	"PSD-68009-02, options"

1.14 In each test, the transmission loss displayed by the transmission measuring circuit includes the loss through the connecting circuits used to provide the test connection.

1.15 Transmission loss displayed by the transmission measuring circuit is the actual measured loss (AML) in dB of the trunk under test made under the same conditions and configurations upon which the expected measured loss (EML) was calculated.

1.16 More than one test can be performed on the same trunk without releasing the trunk from the 101-type test line or the talking circuit.

1.17 Before performing any test in this section, all test sets to be used must be calibrated in accordance with standard instructions. Refer to the 103-2, 103-3, and 103-4 BSP division-layers. Office records of scheduled and completed test equipment calibrations are found in the appropriate 103 BSP division of the ETLs, Forms E 5450 and E 5451.

1.18 For detailed return loss and office balance procedures, refer to the 660-333 BSP division-layer.

1.19 The PSD-68009-02, outgoing trunk circuit, may be optionally either high or low loss. It is equipped with two sockets for 89-type resistor pads. With zero loss pads, and the scrambler disabled, the trunk unit has approximately 0.3 dBm loss in either direction of transmission. When enabled, the scrambler inserts 4 dB of loss in the receive direction.

1.20 A warning (beep) tone of approximately one second duration is applied by the outgoing trunk circuit every 15 seconds while the scrambler is disabled. This tone will be superimposed on the transmission path causing periodic incursions of the measured levels on all tests. These incursions should be recognized, but not recorded. The measured levels between the 15 second incursions are those to be noted and recorded.

1.21 *Lettered Steps:* A letter a, b, c, etc, added to a step number in Part 4 of this section indicates an action is conditional 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. All steps governed by the same conditions are designated by the same letter within a test. When a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

2.01 Apparatus required for each test is listed in Table A.

2.02 Calibrating and operating procedures for most of the sets may be found or referenced in the section listed with each set.

TABLE A

APPARATUS	TESTS		
	A	B	C
TRANSMISSION MEASURING SET	X		
NOISE MEASURING SET		X	
RETURN LOSS MEASURING SET			X

3. PREPARATION

STEP	ACTION	VERIFICATION
1	Establish coordination with end office personnel responsible for requests to assist with manual test line transmission testing. Inform end office personnel that limitations in the verification no-test network prevent "ringing in" on the 101-type manual test line. Requests to answer the manual will be affected over a central office communication line.	Coordination is established with end office personnel. Testing schedule is agreed upon. End office personnel is prepared to respond to requests to answer the 101-type manual test line (also referred to as "jack-ended test line"), and assist in transmission loss measurements when requested over the preestablished communications line.

4. METHOD

STEP	ACTION	VERIFICATION
	A. Two-Way 1000 Hz Loss Measurement to 101-Type Manual Test Line	
2	Determine from the office records the location (on the trunk test connector) of the trunk to be tested.	
3	At the MTF, operate the TTH, TH, H, T, and U sections of the trunk selector switch to correspond to the location (on the trunk test connector) of the trunk to be tested.	
4	At the MTF, operate the CLASS key* required for the trunk under test and the HV key*.	
5	If the trunk under test is CX or LP class and requires dial pulsing delay, operate XDD key*.	
6	Operate ITT key* if trunk under test is on the intertoll (IT) train.	
7	If trunk under test has been made busy by means of a make-busy plug, operate M and SB-OVRD key*.	
8	If testing trunk using the trunk test connector, operate an OTRK___key* (A- or B-ACCESS).	

STEP	ACTION	VERIFICATION
	Trunks	
9a	Momentarily depress ST key.	KP lamp lighted.
10	Momentarily depress KP key.	
11	Keypulse digits required to reach 101-type test line.	
12	Momentarily depress ST-KS key.	KP lamp extinguished. Call completes to 101-type test line.
13	Operate TEL key*.	Trunk under test cut-through to handset on MTF.
14	Using communication lines, request end office to answer manual test line.	End office acknowledgement. Call is answered at end office.
15	Momentarily depress RT key (A- or B-ACCESS).	Scrambler is disabled. Undistorted speech is heard, with superimposed warning (beep) tone. End office can talk on test line.
16	Proceed with Step 25.	
	Dial Pulse Trunks	
17a	Momentarily depress ST key.	KP lamp lighted.
18	Operate DT key*.	KP lamp extinguished.
19	Dial digits required to reach 101-type test line.	
20	Momentarily depress ED key.	Call completes to 101-type test line and call answered.
21	Operate TEL key*.	Trunk under test cut-through to handset on MTF.
22	Using communication lines, request end office to answer manual test line.	End office acknowledgement. Call is answered at end office. SV lamp (A- or B-ACCESS) extinguished.
23	Momentarily depress RT key (A- or B-ACCESS).	Scrambler is disabled. Undistorted speech is heard, with superimposed warning (beep) tone. End office can talk on test line.
24	Proceed with Step 25.	

STEP	ACTION	VERIFICATION
25	Request transfer to supervisory circuit for contact with terminating end test assistant.	Call transferred to test assistant at terminating end.
26	Request terminating end to apply 1000 Hz tone at 0 dBm for an agreed upon interval.	
27	Restore TEL key*.	
28	Operate RCV key* and TMS key.	Far-to-near loss measurement registered on transmission measuring circuit provided.
29	Operate TEL key*.	
30	Request terminating end to measure 1000 Hz tone.	
31	Restore TEL key*.	
32	Operate SEND key for an agreed upon interval.	Terminating end TMS registers near-to-far loss measurement.
33	Operate TEL key*.	
34	Obtain and record near-to-far loss measurement from terminating end.	
35	Request terminating end to disconnect.	
36	Momentarily operate RN key*.	Trunk under test disconnected from MTF.
37	Restore all keys and switches.	All lamps extinguished.
	B. Message Circuit Noise Measurement to 101-Type Manual Test Line	
2	Determine from the office records the location (on the trunk test connector) of the trunk to be tested.	
3	At the MTF, operate the TTH, TH, H, T, and U sections of the trunk selector switch to correspond to the location (on the trunk test connector) of the trunk to be tested.	
4	At the MTF, operate the CLASS key* required for the trunk under test and the HV key*.	

STEP	ACTION	VERIFICATION
5	If the trunk under test is CX or LP class and requires dial pulsing delay, operate XDD key*.	
6	Operate ITT key* if trunk under test is on the IT train.	
7	If trunk under test has been made busy by means of a make-busy plug, operate M and SB-OVRD key*.	
8	If testing trunk using the trunk test connector, operate an OTRK___key* (A- or B-ACCESS).	
	MF Trunks	
9	Momentarily depress ST key.	KP lamp lighted.
10	Momentarily depress KP key.	
11	Keypulse digits required to reach 101-type test line.	
12	Momentarily depress ST-KS key.	KP lamp extinguished. Call completes to 101-type test line.
13	Operate TEL key*.	Trunk under test cut-through to handset on MTF.
14	Using communication lines, request end office to answer manual test line.	End office acknowledgement. Call is answered at end office. SV lamp (A-or B-ACCESS) extinguished.
15	Momentarily depress RT key (A- or B-ACCESS).	Scrambler is disabled. Undistorted speech is heard, with superimposed warning (beep) tone. End office can talk on test line.
16	Proceed with Step 25.	
	Dial Pulse Trunks	
17	Momentarily depress ST key.	KP lamp lighted.
18	Operate DT key*.	KP lamp extinguished.
19	Dial digits required to reach 101-type test line.	
20	Momentarily depress ED key.	Call completes to 101-type test line and call answered.

STEP	ACTION	VERIFICATION
21	Operate TEL key*.	Trunk under test cut-through to handset on MTF.
22	Using communication lines, request end office to answer manual test line.	End office acknowledgement. Call is answered at end office. SV lamp (A- or B-ACCESS) extinguished.
23	Momentarily depress RT key (A- or B-ACCESS).	Scrambler is disabled. Undistorted speech is heard, with superimposed warning (beep) tone. End office can talk on test line.
24	Proceed with Step 25.	
25	If only near-end noise measurement is required, request connection to a balance termination for interval agreed upon.	Circuit noise heard on handset on MTF.
26	If both near-end and far-end noise measurements are required, request connection to a noise measuring set.	Circuit noise heard on handset on MTF.
27	Restore TEL key*	
28	If office is equipped with transmission and noise measuring circuit SP-95900-01, operate NSE (A+40) key* and RCV key*.	Far-to-near noise measurement registered on noise measuring circuit provided.
29	If office is not equipped with transmission and noise measuring circuit SD-95900-01, operate NSE key* and RCV key*.	Far-to-near noise measurement registered on 3CR noise measuring circuit.
30	Record near-end noise measurement and character of noise.	
31	Restore NSE (A+40) key* or NSE key* and RCV key*.	
32	Operate TEL key*.	
33	If both near-end and far-end noise measurement is required, obtain and record far-end noise measurement and character of noise.	
34	Request terminating end to disconnect from trunk under test.	
35	Operate RN key*.	Trunk under test disconnected from MTF.
36	Restore all keys and switches.	All lamps extinguished.

STEP	ACTION	VERIFICATION
	C. Return Loss and Office Balance Measurement to 101-Type Manual Test Line	
2	Determine from the office records the location (on the trunk test connector) of the trunk to be tested.	
3	At the MTF, operate the TTH, TH, H, T, and U sections of the trunk selector switch to correspond to the location (on the trunk test connector) of the trunk to be tested.	
4	At the MTF, operate the CLASS key* required for the trunk under test and the HV key*.	
5	If the trunk under test is CX or LP class and requires dial pulsing delay, operate XDD key*.	
6	Operate ITT key* if trunk under test is on the IT train.	
7	If trunk under test has been made busy by means of a make-busy plug, operate M and SB-OVRD key*.	
8	If testing trunk using trunk test connector, operate an OTRK___key* (A- or B-ACCESS).	
	MF Trunks	
9	Momentarily depress ST key.	KP lamp lighted.
10	Momentarily depress KP key.	
11	Keypulse digits required to reach 101-type test line.	
12	Momentarily depress ST-KS key.	KP lamp extinguished. Call completes to 101-type test line.
13	Momentarily depress RT key* (A- or B-ACCESS).	Scrambler is disabled. Circuit noise, if any, heard.
14	Operate BAL key* (A- or B-ACCESS).	The return loss measuring set is connected and is simultaneously transmitting and receiving an internally generated white noise signal.

STEP	ACTION	VERIFICATION
15	Using communication lines, request end office to terminate manual test line (101).	End office acknowledgement. Call is answered at end office. SV lamp (A- or B-ACCESS) extinguished. End office can talk on test line.
16	Return loss and office balance measurement and adjustment procedures are performed according to the appropriate practice(s) in the 660-333 BSP division-layer.	Return loss and office balance objectives are obtained.
17	Operate RN key*.	Trunk under test disconnected from MTF.
18	Restore all keys and switches.	All lamps extinguished.
	Dial Pulse Trunks	
19	Momentarily depress ST key.	KP lamp lighted.
20	Operate DT key*.	KP lamp extinguished.
21	Dial digits required to reach 101-type test line.	
22	Momentarily depress ED key.	Call completes to 101-type test line and call answered.
23	Operate TEL key*.	Trunk under test cut-through to handset on MTF.
24	Proceed with Step 13.	

5. REFERENCES

5.01 With the implementation of the verification no-test networks into No. 4A/4M Toll Systems and Class 5 end office supportive Bell System Practices are provided. These practices augment existing practices both of which are listed as follows:

SECTION	TITLE
201-010-900	Standard Test Numbers for Plant Test and Administrative Circuits
212-517-101	Manual Test Frame SD-68587-01 — Description
212-517-501	Manual Test Frame SD-68587-01 — Tests
212-517-901PT	Manual Test Frame SD-68587-01 — Tests of Verification No-Test Features
212-530-501	Incoming (One-Way) Intertoll Trunk Circuit — Tests using Test Circuit SD-68359-01

SECTION	TITLE
212-534-501	Incoming Toll Tandem Trunk Circuits — Test using Test Circuit SD-68359-01
212-560-501	Outgoing (One-Way) Intertoll Trunk Circuit — Tests using Test Circuit SD-68359-01
212-567-901PT	Verification No-Test — Operational Tests using Manual Test Frame SD-68587-01
212-570-101	Intertoll or Integrated Manual Test Frame SD-99601-01 — Description — No. 4A Toll Switching System
212-570-102	Outgoing Trunk Test Connector Frame SD-68748-01 — Description
212-570-501	Intertoll or Integrated Manual Test Frame SD-99604-01 — Tests
212-570-900PT	Integrated Manual Test Frame SD-99604-01 — Tests of Verification No-Test — Test Features — 4A Switching Systems
212-571-900PT	Verification No-Test Trunks — Operational Tests using Integrated Manual Test Frame SD-99604-01
212-571-901PT	Verification No-Test Trunks — Transmission Tests using Integrated Manual Test Frame SD-99604-01
212-571-902PT	Verification No-Test Intertoll Trunks — Operational Tests using Integrated Manual Test Frame SD-99604-01
212-571-903PT	Verification No-Test Intertoll Trunks — Transmission Tests using Integrated Manual Test Frame SD-99604-01
212-502-900PT	Verification No-Test Trunks — Test using Trunk Test Set SD-68597-01
216-736-900PT	No. 1 Crossbar — Incoming Verification No-Test Trunks — Tests
218-252-900PT	No. 5 Crossbar — Incoming Verification No-Test Trunks — Tests
250-103-501	Delayed Call Trunk and Operator Service Trunk — Operational and Transmission Tests
331-100-100	Message Circuit Noise — General Information
660-402-010	Forms for Recording Transmission Measurements and Measurement Schedules
660-402-300	Transmission Maintenance — Overall 1000-Hz Loss Measurements on Message Trunks
660-430-012	Control of 1 KHz Trunk Loss Deviations
660-440-010	Codes — Test Line Circuits and Communication Trunks Nationwide Distance Dialing Plan
660-450-301	Circuit Order or Trunk Order Tests — All Types of Message Trunks
664-500-900PT	No. 17C Testboard (Modified) — No. 4-Type Switching System — Operating and Testing Methods for Verification No-Test Intertoll Trunks