

**TRANSMISSION TESTS**  
**USING AUTOMATIC PROGRESSION TRUNK TEST CIRCUIT SD-25938-01**  
**AND AUTOMATIC TRANSMISSION MEASURING SYSTEM**  
**NO. 5 CROSSBAR OFFICES**

**1. GENERAL**

**1.01** This section describes a control tape method and a particular circuit method of performing transmission loss and noise tests using the automatic progression trunk test frame (APTT) SD-25938-01, automatic transmission measuring system (ATMS) J94051A, and remote office test line (ROTL) SD-27698-01. Particular circuit tests can be made with APTTs of any vintage when the frame is equipped for this feature. ROTL tests can be made with APTTs of Issue 36D or later. The following types of trunks may be tested:

- Outgoing intertoll
- Outgoing interoffice
- Intraoffice
- Subscriber-to-subscriber or subscriber-to-trunk intermarker group
- Line link pulsing
- Centrex
- Data
- 4-wire 2-way intertoll
- 4-wire intraoffice
- Automatic intercept
- Common control switching arrangement (CCSA)
- Trunks associated with a remote office
- TSP(S) trunks.

**1.02** This section is reissued for the following reason:

- (a) To revise Fig. 1 through 4 to illustrate the new tab setting for trouble marks encountered during tests.
- (b) To add in Part 1 General, the provisions for by-passing a trunk group whenever unexpected audible ring is encountered during tests.
- (c) To add in Part 4 Method, new procedures for switch control of particular circuit tests when provided.
- (d) To make minor changes as required.

This reissue does not affect Equipment Test Lists.

**1.03** The tests covered are:

	<b>PAGE</b>
<b>A. Control Tape Test:</b> This test is an outgoing trunk transmission test using a control program tape, which is prepared as described in Section 218-220-304. .....	<b>12</b>
<b>B. Particular Circuit Test:</b> This test is an outgoing trunk transmission test performed by manually selecting a single trunk or trunks by use of keys or switches on the APTT. (Refer to the particular circuit chart prepared as described in Section 218-220-304.) This test can be performed using APTTs of any vintage when the frame is equipped for this feature. .....	<b>12</b>

**1.04** When the APTT is used to perform trunk tests using control tapes, a busy retest tape and/or printout will be produced if any trunk under

test fails to satisfactorily complete a test. When testing on a particular circuit basis, a printout of operational failure marks and/or transmission test results will be produced. See Fig. 1 through 4 and Tables A and B for interpretation of printout, operational failure marks, and transmission cues. See CD-25938-01 for explanation of busy retest tape.

**1.05** The APTT/ATMS may be arranged to provide any one of the following printout modes by operation of the APM switch to the proper position.

(1) **Full Printout—No Repeat:** All of the measurements are made on each trunk and the results are printed. The appropriate cue 1 or 2 is printed if any of the measurements exceed one of the limits contained in the control tape. None of the measurements are repeated.

(2) **Full Printout—Repeat on Cue 2:** All of the measurements are made and printed as above, and a cue 1 is printed if any of the measurements exceed the cue 1 limit. If any of the measurements exceed the cue 2 limit,

the cue is not printed, but all of the measurements on that trunk are repeated and the results are printed again. At this time, the appropriate cue 1 or 2 is printed.

(3) **Full Printout—Repeat on Cue 1 or Cue 2:** The sequence is the same as in (2) above. However, if any of the measurements exceed the cue 1 or cue 2 limit, the cue is not printed, but all of the measurements on that trunk are repeated and printed again. At this time, the appropriate cue 1 or 2 is printed.

(4) **Abbreviated Printout—Repeat on Cue 1 or Cue 2:** The results of the first set of measurements on each trunk are not printed. However, if any of the measurements exceed the cue 1 or cue 2 limit, all of the measurements on that trunk are repeated and the results of the repeat test are printed along with the appropriate cue.

**1.06** ♦The APTT may be arranged to pass by a trunk group under test whenever unexpected

TABLE A  
OPERATIONAL FAILURE MARKS

MARK	DEFINITION
0	Trunk to be tested is busy
1	Trouble condition encountered
2	Senders busy
3	APTT locked out by MTF
4	Test circuit received reorder from far end
5	Test circuit encountered a busy condition at far end
6	Data ringing polarity failure or CAMA incoming trunk circuit plugged busy
7	Trouble condition during centrex trunk test
8	Test circuit receives a recorded announcement
9	Ringing customer line

TABLE B  
TRANSMISSION CUES

CUE	DEFINITION
0	ATMS director and responder self-check successful
1	Loss or noise measurement exceeded deviation limit
2	Loss or noise measurement exceeded immediate action limit
3 through 6	Spares
7	ATMS failed to complete its normal functions for a transmission test
8	ATMS director did not receive data signal from responder (105-type test) or receive a repeat signal from the TMAC (104-type test)
9	ATMS director and responder self-check failed

audible ring is received on any two trunks in the group. If a voice announcement is received, only that trunk under test is by-passed and the next trunk in the group is tested. A new arrangement may be provided for the APTT to pass by the trunk group whenever unexpected audible ring is detected on one trunk and voice announcement on another, or, voice announcement is detected on any two trunks, or, unexpected audible ring is detected on any two trunks.♦

**1.07 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.

## 2. APPARATUS

### All Tests

**2.01** KS-8483 L1 perforator tape.

**2.02** 5C tape winder.

**2.03** Western Apparatus TU2 tape unwinder.

**2.04** 1A45 paper winder.

**2.05** TP193950 copy display rod.

**2.06** KS-1920 teletypewriter paper.

## 3. PREPARATION

**3.01** Loading the reperforator with tape is accomplished as follows:

- (1) At the test frame and teletypewriter (TTY), restore all keys and switches.
- (2) At the TTY, open the center top door and tear off old tape at the tape chute.
- (3) Operate the PMC key. At the test frame, the PMC lamp is lighted.
- (4) At the TTY, feed out the remaining tape by repeated operation of the LTRS key and lift used roll of tape out of the holder.

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See Note 1.	MIAMFLMA642	T1	06/10/71		
See Note 2.	MIAMFLMA642	DD	MIAMFLGB448	HU55IE	
See Note 3.	NI	101N1	MIAMFLGB		
	””				
See Note 4.	000	448	000	2596	00119 4 0000
See Note 5.	2	0141	20	23	0400
See Note 6.	-0	1		0	
See Note 7.	-0	2			1 0300# 01”
See Note 7.	+0	1			2 0716# 02”
See Note 8.					1 3 1212# 04”
See Note 9.					0 4 2414# 06”
See Note 10.	+1	1			
See Note 11.	+1	1	1		5 0614# 08”
See Note 7.	-0	1			6 1301# 10”

**NOTES:**

1. Preamble.
2. Caption
3. Facility identification.
4. Marker priming.
5. Transmission priming.
6. ATMS self-check result O.K.
7. Loss test result followed by traffic assigned trunk number and trunk location.
8. Trouble encountered, operational failure mark 1, followed by traffic assigned trunk number, and trunk location. →(TTY tabs to position 41)←
9. Trunk busy, operational failure mark 0, followed by traffic assigned trunk number, and trunk location. →(TTY tabs to position 41)←
10. Loss exceeds deviation limit.
11. Retest of same trunk, loss result, followed by cue 1, traffic assigned trunk number, and trunk location.

**Fig. 1—Example of Loss-Only Transmission Test to 102-Type Test Line**

See Note 1.	MIAMFLMA642	T2	06/10/71		
See Note 2.	MIAMFLMA642	DD	MIALFLGR446	HU55IE	
See Note 3.	N1	102N1	MIAMLGR		
	””				
See Note 4.	000 446	000 2597	0 0117 3	00000	
See Note 5.	4 0 042	10 30 0 42	1		
See Note 6.	+0 1-0 9	+00		4200 1701# 02”	
See Note 6.	+0 3+1 4	-??		4201 2717# 03”	
See Note 7.	-0 1-0 5	+01			
See Note 8.	-0 2-0 4	+00 1		4202 2011#05”	
See Note 9.					2 4203 1917# 06”
See Note 6.	-0 1+1 3	+00		4204 0409#08”	
See Note 10.					0 4203 0114# 10”

## NOTES:

1. Preamble.
2. Caption.
3. Facility identification.
4. Marker priming.
5. Transmission priming.
6. Loss test result and noise check result, followed by traffic assigned trunk number and trunk location.
7. Loss or noise exceeds deviation limit.
8. Retest of same trunk, loss test result, noise check result, followed by cue 1, traffic assigned trunk number, and trunk location.
9. Senders busy, operational failure mark 2, followed by traffic assigned trunk number, and trunk location. →(TTY tabs to position 41) ←
10. Trunk busy, operational failure mark 0, followed by traffic assigned trunk number, and trunk location. →(TTY tabs to position 41)←

**Fig. 2—Example of Printout of Loss and Noise Transmission Test to 104-Type Test Line**

- (5) Place a new roll of tape on the spindle in holder with tape feeding out from the top of the roll.
- (6) Open the center front door and thread the tape through the tape guide arm and down into tape chute.
- (7) As paper is eased through the chute, repeatedly operate LTRS key until tape goes through the punch head.
- (8) Close the center top and front doors.
- (9) Depress and hold the REPT key and momentarily operate the space bar.

See Note 1.	MIAMFLMA642 T1 06/11/71		
See Note 2.	MIAMFLMA642 DD MIAMFLGB448 HU55IE		
See Note 3.	N1 101N1 MIAMFLGB		
	”		
See Note 4.	000 448 000 2599 0 0118 4 0000(		
See Note 5.	5 0 025 08 28 0 4 1		
See Note 6.	-00-00 +00+000		
See Note 7.	-01-01 -??-??	7	1705# 03”
See Note 8.	-01-01 +01-01 1	8	1305# 04”
See Note 6.	-03-00 -01-02	1	1405# 05”
See Note 9.			0 2 1505# 06”
See Note 8.	-08+1 0 -03-01 1	3	1605# 09”
See Note 8.	-09+01 -02-04 1	4	1805# 10”

NOTES:

1. Preamble.
2. Caption.
3. Facility identification.
4. Marker priming.
5. Transmission priming.
6. ATMS self-check result O.K.
7. Two-way loss and noise test result, followed by traffic assigned trunk number and trunk location.
8. Retest of trunk 2-way loss and noise test result, followed by cue 1, traffic assigned trunk number, and trunk location.
9. Trunk busy, operational failure mark 0, followed by traffic assigned trunk number, and trunk location. →(TTY tabs to position 41)←

Fig. 3—Example of Loss and Noise Transmission Test to 105-Type Test Line

- |                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(10) When a sufficient length of leader is perforated to permit threading into the tape winder, release the REPT key.</p> <p>(11) Remove the outside reel from the tape winder.</p> <p>(12) Raise the tape arm (Fig. 5) until it is secured by the latch.</p> | <p>(13) Thread approximately 6 inches of tape through any post in the center of the tape reel, and manually wind two or more turns to secure tape. (Tape should be wound so that tape winds on top of the reel with the chads facing outward.)</p> <p>(14) Replace reel in the tape winder and thread the tape through the tape arm and guides as shown in Fig. 5 and 6. Release latch.</p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

See Note 1.	MIAMFLMA642 T3 06/12/71
See Note 2.	MIAMFLMA642 DD MIAMFL2S826 MI5-LL LLPPBX
See Note 3.	T1 101T1 MIAMFLMA
	””
See Note 4.	2 00 642 000 2456 4 1719 1 1314(
See Note 5.	2 0 141 20 36 0 42 1
See Note 6.	-0 1 0
See Note 7.	-0 2 14 1 0412# 02”
See Note 8.	1 22 2 0410# 03”
See Note 9.	+1 1
See Note 10.	+1 1 1 21 24 0307# 05”
See Note 11.	0 34 161 2413# 07”
See Note 7.	-0 1 42 176 0417# 08”

**NOTES:**

1. Preamble.
2. Caption.
3. Facility identification.
4. Marker priming.
5. Transmission priming.
6. ATMS self-check O.K.
7. Loss test result, followed by sleeve lead identification, traffic assigned trunk number, and trunk location.
8. Trouble encountered, operational failure mark 1, followed by sleeve lead identification, traffic assigned trunk number, and trunk location. →(TTY tabs to position 41)←
9. Loss exceeds deviation limit.
10. Retest of same trunk, loss result followed by cue 1, sleeve lead identification, traffic assigned trunk numbers, and trunk location.
11. Trunk busy, operational failure mark 0, followed by sleeve lead identification, traffic assigned trunk number, and trunk location. →(TTY tabs to position 41)←

**Fig. 4—Example of Printout of Line Link Pulsing With Trunk Terminated in 102-Type Test Line**

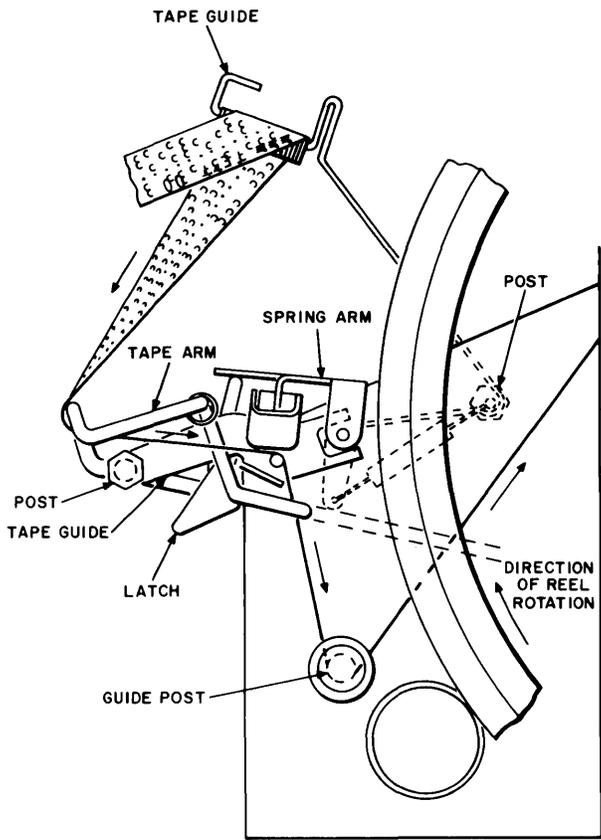


Fig. 5—Table Threading Method for 5C Tape Winder

- (15) Set tape winder switch to ON position; tape slack is taken up and reel stops turning.

**Note:** If tape winds too tightly (chads interlocking between layers of tape on the reel), or too loosely, adjust tension by moving the weight mounted on tape guide arm.

**3. PREPARATION (Cont)**

STEP	ACTION	VERIFICATION
<b>All Tests</b>		
1	At APTT— Restore all keys and switches.	
2	Momentarily operate RL key.	All lamps extinguished.
3	Operate LP key.	DW lamp lighted.

**3.02** Loading the TTY with paper is accomplished as follows:

- (1) At the test frame and TTY, restore all keys and switches.
- (2) At the TTY, open right front and top doors and move paper release lever back.
- (3) Lift paper fingers, pull paper out from under platen, and lift out used roll.
- (4) Remove spindle from core of used roll and insert it into new roll.
- (5) Place new roll in TTY with spindle in spindle grooves and with roll positioned so that paper feeds from underneath roll toward platen.
- (6) Feed paper over paper straightener rod, under platen, and up between platen and paper fingers.
- (7) Pull paper up a few inches beyond the top of the platen and straighten the paper. Move paper release lever forward.

**Note:** Do not disturb ribbon or type box.

- (8) Close right top door. Bring end of paper up so that it feeds out between doors and close right front door.
- (9) When page copy is of sufficient length, place paper over display rod and thread into paper winder.
- (10) Set paper winder switch to ON.



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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
6	Set K-KT-T switch to KT.	
7	Determine that teletypewriter has sufficient supply of paper and paper is engaged in paper winder (3.02).	
8	Determine that reperforator has sufficient supply of tape and tape is threaded and engaged in outside (left) tape winder (3.01).	
9	At APTT— Set MKR switch to select marker for test.  <i>Note:</i> Select a marker not associated with line insulation test circuit.	
10	Set TST switch to TM.	
11	Set APM switch to desired position.	
12	Operate LP key.	
13a	If audible trouble alarm is <i>not</i> desired— Operate TTAL key.	TTAL lamp lighted.
14b	If 4-wire trunks are to be tested— Operate 4W key.	
15c	If testing trunks via ROTL— Operate ROT key.	
16d	If provided and data tape is desired— Operate PDT key.	
17e	If provided and remote printout is desired— Operate RTU key.	
<b>Test A</b>		
18	At teletypewriter— Select control tape containing trunks to be tested. Place tape on unwinder.	
19	Unwind sufficient tape leader from inner side of tape roll to permit attachment at tape winder.	
20	Set tape read switch of transmitter-distributor to STOP.	

STEP	ACTION	VERIFICATION
	<i>Caution: Pin will tear tape if switch is in RUN position when tape is placed in transmitter-distributor.</i>	
21	Open tape gate of transmitter-distributor.	
22	Place tape feed holes over feed pins of transmitter-distributor. Align first printed character or symbol associated with first trunk to be tested with engraved guide line.	
23	Close tape gate.	
24	Set tape read switch to RUN.	
25	Install tape on inside (right) reel of tape winder.	
26	Set tape winder switch to ON.	
27	At APTT— Operate BRT key.	
28f	If busy retest tape is <i>not</i> to be made— Operate BPB key to pass busies without any indication.	
29g	If second trial to test busy trunks is to be made in 4 or 6 minutes— Operate BY4 or BY6 key as required.	
30h	If made-busy trunks are to be tested— Operate NTTS key.	
31i	If transmission results are to be perforated on data tape— Operate POT key.	
32j	If second reperforator is provided and second data tape is desired— Operate PDT key.	
33k	If blocking from tape reading failure is <i>not</i> desired— Operate CFB key.	
34l	If RAP key is provided and page printout on unexpected audible ring or announcement is desired— Operate RAP key.	RAP lamp lighted.

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STEP	ACTION	VERIFICATION
<b>4. METHOD</b>		
<b>A. Control Tape Test</b>		
35	Momentarily operate ST key.  <i>Note:</i> Test may be started automatically by setting AST timer to desired starting time and operating AST key.	Tests of trunk started. FG lamp lighted. If troubles or busy trunks are encountered— Busy retest tape, page printout, or both, produced. Data tape produced. When all trunks on tape have been tested or passed— EC lamp lighted. Minor alarm sounds.
36	Momentarily operate RL key.	FG, EC lamps extinguished.
37	At teletypewriter and APTT— Restore all keys and switches.	
38	At teletypewriter— Remove tapes from tape winders and paper from paper winder.	
<b>B. Particular Circuit Test</b>		
18	At teletypewriter— Set tape winder switch to ON.	
19	At APTT— Operate PC, REP keys.	
20	Operate ST key.	DW lamp momentarily lighted. FG lamp lighted. KEY lamp lighted.
21	Momentarily operate PM key.	KEY lamp momentarily extinguished.
22	Operate FIG key.	KEY lamp momentarily extinguished. MKG (steering) lamp lighted.
33	Operate 0, 1, 2 keys for first marker priming digit of trunk to be tested using information listed on particular circuit chart.	MKG0-2 (registration) lamps lighted corresponding to key operated. MKG (steering) lamp extinguished. TMT lamp lighted. KEY lamp momentarily extinguished.
24	Repeat Step 23 for each marker priming digit listed on particular circuit chart.	Steering lamp lighted for next marker priming digit to be keyed. Steering lamp for preceding digit extinguished. Registration lamps 0 through 7 lighted

STEP	ACTION	VERIFICATION
		corresponding to key operated. KEY lamp momentarily extinguished.
25	Momentarily operate PT key.	KEY lamp momentarily extinguished.
26	Operate FIG key.	KEY lamp momentarily extinguished. FE (steering) lamp lighted.
27	Operate 0 through 5 keys for first transmission priming digit of trunk to be tested using information listed on particular circuit chart.	FE (steering) lamp extinguished. TPL lamp lighted. KEY lamp momentarily extinguished.
28	Repeat Step 27 for each transmission priming digit listed on particular circuit chart.	Steering lamp lighted for next transmission priming digit to be keyed. Steering lamp for preceding digit extinguished. KEY lamp momentarily extinguished.
29	Momentarily operate FIG key.	Steering lamp for first trunk priming digit lighted. KEY lamp momentarily extinguished.
30	Operate 0 through 9 keys for first trunk priming digit of trunk to be tested using information listed on particular circuit chart.	Registration lamps 0 through 7 lighted corresponding to key operated. Steering lamp for first trunk priming digit extinguished. Steering lamp for second trunk priming digit lighted. KEY lamp momentarily extinguished.
31	Repeat Step 30 for each trunk priming digit listed on particular circuit chart.	Steering lamp lighted for next trunk priming digit to be keyed. Steering lamp for preceding digit extinguished. Registration lamps 0 through 7 lighted corresponding to digit keyed. KEY lamp momentarily extinguished. After last digit of trunk priming is keyed— KEY lamp extinguished. EOD lamp lighted. TC lamp flashes at completion of each repeated test. Transmission test results printed.
32f	If more than one trunk in same group with same transmission priming is to be tested— Operate CA key.	
33f	Momentarily operate FIG key.	KEY lamp lighted.
34f	Repeat Steps 30 and 31 for additional trunk to be tested.	

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<b>STEP</b>	<b>ACTION</b>	<b>VERIFICATION</b>
35f	Restore CA key.	TC lamp flashes at completion of each repeated test. Transmission test results printed.
36	When desired number of repeat tests have been made— Restore REP key.	When test in process is complete— KEY, MKG lamps lighted.
37	Momentarily operate RL key.	
38	Restore all keys and switches.	All lamps extinguished.