OUTGOING TOLL CONNECTING TRUNKS
OVER-ALL 1000-CYCLE TRANSMISSION TESTS
NO. 4A AND 4M TOLL SWITCHING SYSTEMS AND
NO. 5 TOLL SWITCHBOARDS

1. GENERAL

1.01 This section describes a method of performing over-all 1000-cycle transmission tests of toll switching and miscellaneous outgoing trunks from No. 4A and 4M toll switching systems and outgoing trunks from No. 5 toll switchboards.

1.02 This section is reissued for the following reasons:

(a) To change the title to be more indicative of the tests contained in the section.

(b) To provide procedures for testing trunks which employ carrier facilities or hybrid type voice repeaters.

(c) To remove the singing point tests which are now contained in another section.

(d) To generally bring the section up to date.

Since this reissue is a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

A. No. 5 Toll Switchboard Trunks: This test provides a method for checking the over-all 1000-cycle loss of outgoing trunks to the switches or to other switchboards.

Trunks From Switches Not Employing Carrier Facilities or Hybrid Type Voice Repeaters

B. To 1000-Cycle, 1 Milliwatt Test Line.

Trunks From Switches Employing Carrier Facilities or Hybrid Type Voice Repeaters

C. To Far-End Automatic Transmission Test Line.

D. To Loop-Around Test Line.

E. To Jack Ended Test Trunk At OGT Frame or Equivalent, or To Switchboard Not Provided With Loop-Around Test Line.

1.04 Before performing the tests in this section the transmission measuring set (TMS) used should be calibrated in accordance with standard instructions.

1.05 *Lettered Steps:* A letter a, b, c, etc, added to a step number in Part 3 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

Test A

2.01 Head telephone set.

2.02 One of the following is required:

(a) No. 12-type transmission measuring set and a patching cord, P3F cord, 4 feet long, equipped with one No. 309 plug and one No. 310 plug (No. 3P12A cord).

(b) No. 13A transmission measuring set and a patching cord, W2BB cord, 5 feet long, equipped with one No. 309 plug and two No. 35 cord tips (No. 2W25A cord).

(c) No. 21A transmission measuring set and a patching cord, P2AM cord, 8 feet long, equipped with one No. 309 plug and one No. 327A plug (No. 2P22A cord).

(d) Mobile 40B transmission measuring system and a patching cord, P2AM cord, 8 feet long, equipped with one No. 309 plug and one No. 327A plug (No. 2P22A cord).

2.03 No. 277B plug. (Provides 600-ohm termination between T & R.)

Tests B through E

2.04 Automatic outgoing toll connecting trunk test frame SD-68076-01 (ATCT) or SD-68373-01 (AOCT).

Note: To perform Tests C, D, and E it is necessary that the test circuit be arranged per Fig. 20 when using SD-68076-01 and per Fig. 70 when using SD-68373-01.

2.05 One of the following is required:

(a) No. 12-type transmission measuring set and a patching cord, P3F cord, 4 feet long, equipped with one No. 309 plug and one No. 310 plug (No. 3P12A cord).

(b) No. 13A transmission measuring set and a patching cord, W2BS cord, 5 feet long, equipped with one No. 310 plug and two No. 35 cord tips (No. 2W33A cord).

(c) No. 21A transmission measuring set and a patching cord, P3N cord, 6 feet long, equipped with one No. 310 plug and one No. 241A plug (No. 3P17B cord).

(d) Mobile 40B transmission measuring system and a patching cord, P3N cord, 6 feet long, equipped with one No. 310 plug and one No. 241A plug (No. 3P17B cord).

Tests C through E

2.06 Patching cord, P3E cord, 3 feet long, equipped with two No. 310 plugs (No. 3P7B cord).

3. METHOD

STEP	ACTION	VERIFICATION
	A. No. 5 Toll Switchboard Trunks	
1	Select vacant position to be used for testing.	
2	Insert plug of head telephone set into position telephone jacks.	
3	Insert plug of front cord, of any cord pair, into multiple jack for trunk to be tested and operate associated TALK key.	
4a	If trunk under test terminates at switches — Momentarily depress keyset KP (front) key.	KP (front) lamp lighted. When sender is attached to trunk under test — Cord lamp and keyset S lamp lighted.
5a	Key code 102.	
6a	Momentarily depress keyset ST key.	S and KP lamps extinguished. When trunk under test is connected to test line — Cord lamp extinguished. 1000-cycle tone heard in head telephone set.
7b	If trunk under test terminates at switchboard — When trunk under test is answered or order tone is heard — Request operator to complete call to 1 milliwatt, 1000-cycle test line and restore TALK key.	1000-cycle tone heard in head telephone set.
8	Restore TALK key.	
9	At adjacent position — Insert No. 277B plug into lower multiple jack associated with trunk under test.	
10	Using appropriate patching cord — Connect MEAS-110 jack of 12-type TMS, IN terminals of 13A TMS, DET-IN jack of 21A TMS, or REC jack of 40B TMS to upper multiple jack which is mate to jack of Step 9.	Transmission loss registered on TMS meter.
11	Remove No. 277B plug from lower multiple jack and patching cord from upper jack.	
12	Repeat Step 9, substituting upper jack for lower jack.	
13	Repeat Step 10, substituting lower jack for upper jack.	
14	Remove plugs and cords placed during test and restore positions to normal.	

STEP	ACTION	VERIFICATION

Trunks From Switches Not Employing Carrier Facilities or Hybrid Type Voice Repeaters

B. To 1000-Cycle, 1 Milliwatt Test Line

1 Connect TMS to test circuit as shown in Fig. 1.

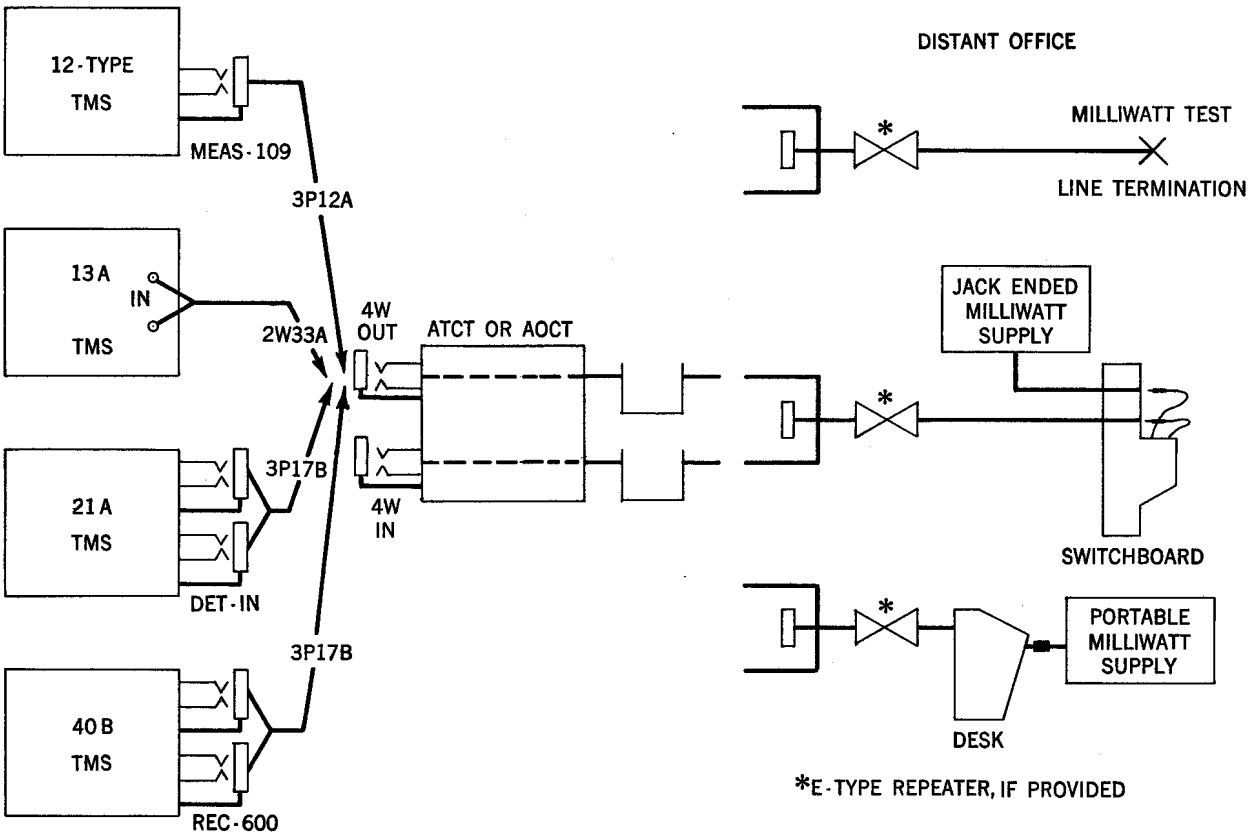

Fig. 1 — To 1000-Cycle, 1 Milliwatt Test Line

2 Select particular trunk to be tested and establish connection to 1 milliwatt, 1000-cycle test line in distant office using procedure described in one of the following sections:

Test circuit SD-68076-01 or SD-68373-01 — Section 212-566-501 or 212-566-502.

Note: When testing a trunk to a switchboard, the operator should restore the TALK key to normal.

1000-cycle tone heard in head telephone set.

STEP	ACTION	VERIFICATION
3	Operate TMT key.	Transmission loss registered on TMS meter.
4	Remove patching cord from 4W OUT jack and connect to 4W IN jack.	If test circuit is not provided with TMS1 key — Transmission loss registered on TMS meter.
5a	If test circuit is provided with TMS1 key — Operate TMS1 key.	Transmission loss registered on TMS meter.
6a	Restore TMS1 key.	
7	Remove patching cord from 4W IN jack and restore test circuit to normal.	

Trunks From Switches Employing Carrier Facilities or Hybrid Type Voice Repeaters

C. To Far-End Automatic Transmission Test Line

1 Connect TMS and 1 milliwatt, 1000-cycle supply to test circuit as shown in Fig. 2.

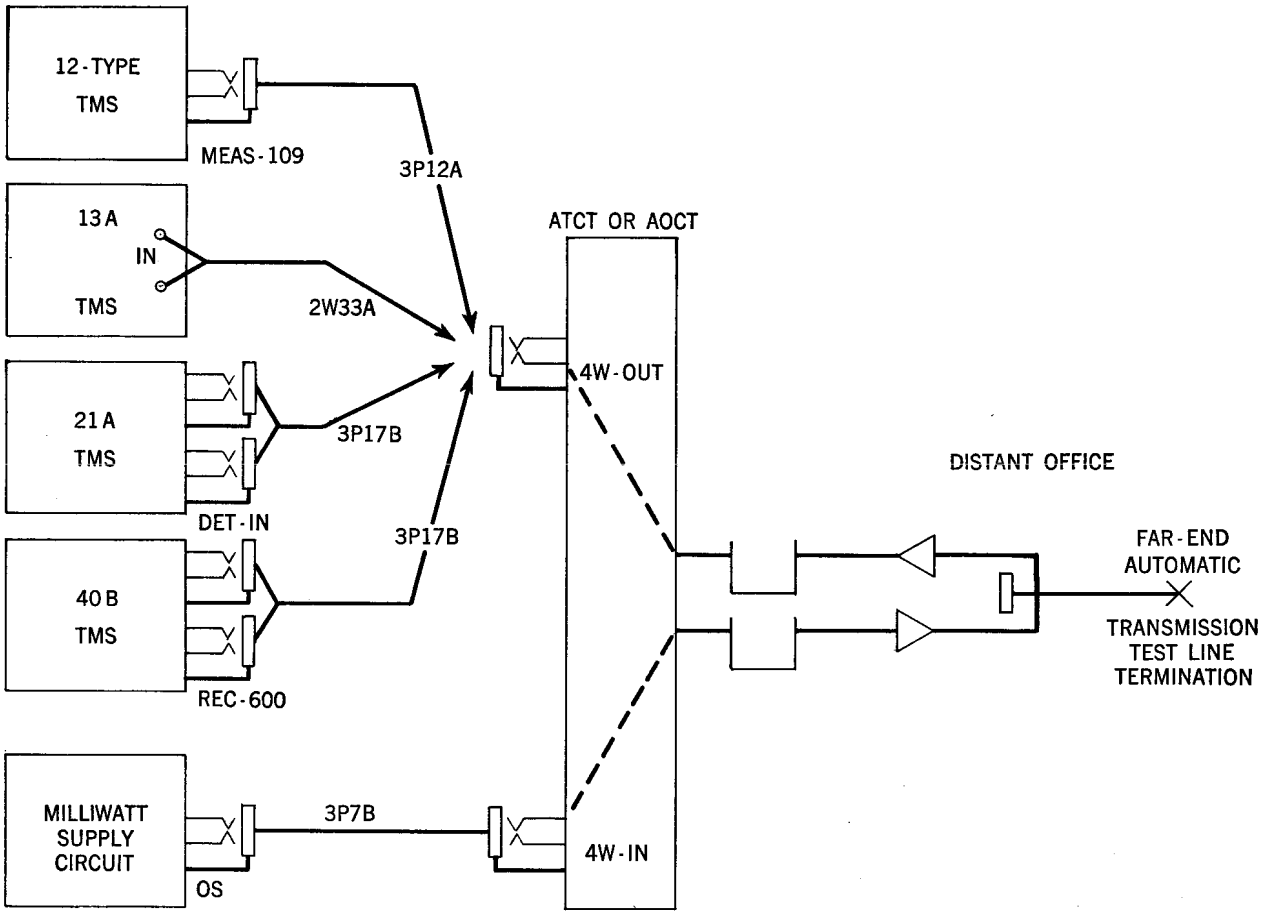

Fig. 2 — To Far-End Automatic Transmission Test Line

STEP	ACTION	VERIFICATION
2	Select particular trunk to be tested and establish connection to far-end automatic transmission test line termination using procedure described in one of the following sections: Test circuit SD-68076-01 or SD-68373-01 — Section 212-566-501 or 212-566-502.	SUP lamp extinguished.
3	Immediately after SUP lamp is extinguished — Operate TMT key and proceed to next step without delay.	
4	Operate TMS1 key for approximately 4 seconds (not more than 8 seconds). *Note:* If the SUP lamp lights momentarily immediately after the TMS1 key is restored, an unsuccessful measurement is indicated and the step should be repeated. If during the step the SUP lamp starts flashing at 120 ipm, repeat Steps 2, 3, and 4.	Approximately 2 seconds after TMS1 key is restored — Transmission loss registered on TMS for trunk far-near loss. TMS meter restores to normal. If SUP lamp lights momentarily — Increase loss indicated by next reading by 10 db. After approximately 2 seconds — TMS meter registers new reading. Difference between second and first readings is trunk near-far loss.
5a	If trunk under test is equipped with single or split "A" pad — Operate 500 key.	
6a	Repeat Steps 2 through 4.	Trunk near-far loss remains same as first measured in Step 4.
7a	Restore 500 key.	
8b	If trunk under test is equipped with split "A" pad — Operate 11,500 key.	
9b	Repeat Steps 2 through 4.	Trunk near-far loss remains same as first measured in Step 4.
10	Remove patching cords placed in Step 1 and restore test circuit to normal.	

D. To Loop-Around Test Line

1	Connect TMS to test circuit as shown in Fig. 1.	

STEP	ACTION	VERIFICATION
2	Connect test circuit to first trunk to be tested and establish connection to 1 milliwatt, 1000-cycle test line in distant office using procedure described in one of the following sections: Test circuit SD-68076-01 or SD-68373-01 — Section 212-566-501 or 212-566-502. *Note:* When testing a trunk to a switchboard, the operator should restore the TALK key to normal.	1000-cycle test tone heard in head telephone set.
3	Operate TMT key.	Trunk far-near transmission loss registered on TMS meter.
4a	If trunk under test is equipped with single or split "A" pad — Operate 500 key.	Measured far-near loss of trunk remains same as in Step 3.
5a	Restore 500 key.	
6b	If trunk under test is equipped with split "A" pad — Operate 11,500 key.	Measured far-near loss of trunk remains same as in Step 3.
7b	Restore 11,500 key.	
8	Restore TMT key.	
9	Repeat Steps 2 through 8 for each remaining trunk to be tested in same trunk group.	
10	Select a trunk in trunk group to serve as reference trunk and repeat Steps 2 through 8 for selected trunk.	Measured far-near loss of trunk within ±0.25 db of previous reading.
11c	If testing to combination loop-around and milliwatt test line — Operate HOLD key.	
12c	Operate OLA key.	
13d	If not testing to combination loop-around and milliwatt test line — Operate REP key.	

STEP	ACTION	VERIFICATION
14d	Establish connection to first termination of loop-around test line using procedure described in one of the following sections: Test circuit SD-68076-01 or SD-68373-01 — Section 212-566-501 or 212-566-502. *Note:* When testing a trunk to a switchboard, the operator should restore the TALK key to normal.	
15d	Operate HOLD key.	
16d	Operate OLA key.	
17d	Restore REP key.	
18	Reconnect TMS to test circuit as shown in Fig. 3.	
19	Connect milliwatt supply circuit to test circuit as shown in Fig. 3.	

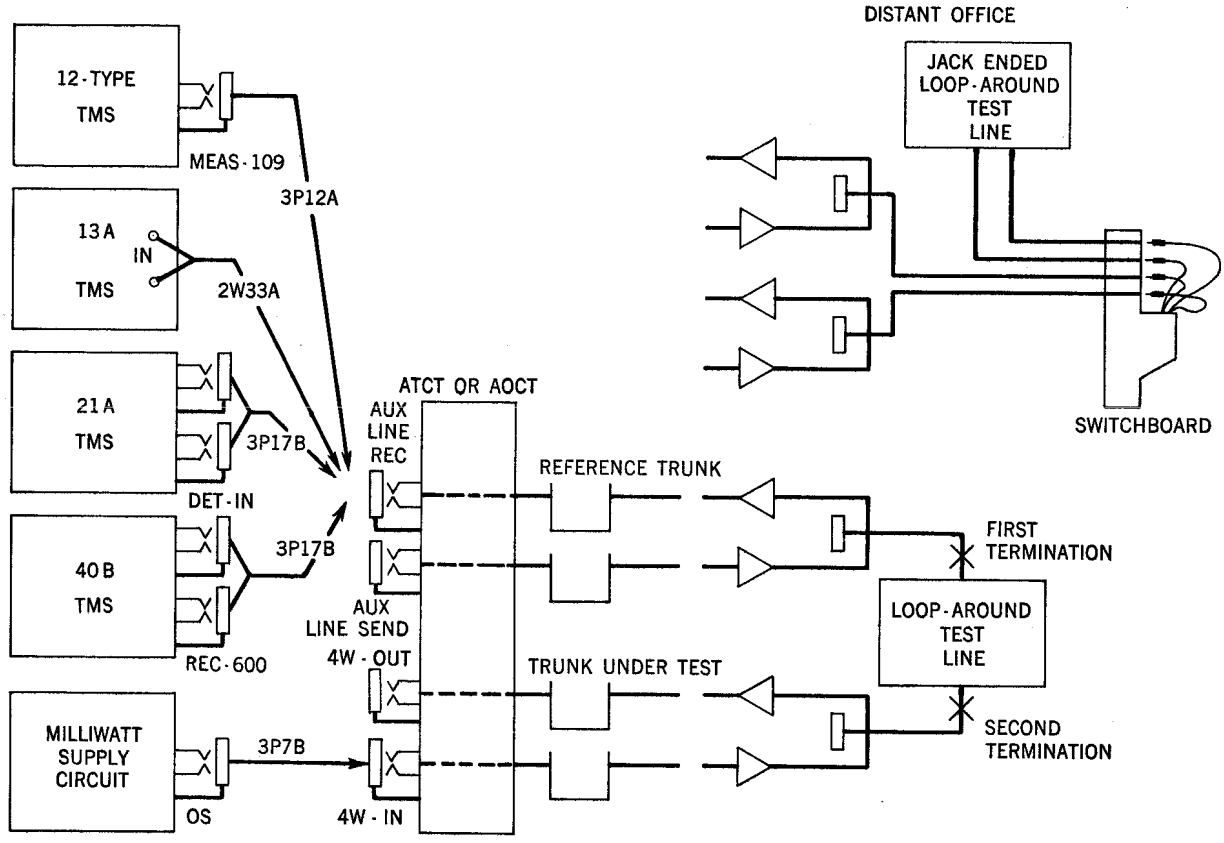

Fig. 3 — To Loop-Around Test Line

STEP	ACTION	VERIFICATION
20	Connect test circuit to first trunk to be tested and establish connection to second termination of loop-around test line using procedure described in one of the following sections: Test circuit SD-68076-01 or SD-68373-01 — Section 212-566-501 or 212-566-502. *Note:* When testing a trunk to a switchboard, the operator should restore the TALK key to normal.	SUP lamp extinguished.
21	Operate TMT and TMS1 keys.	Round trip transmission loss registered on TMS meter. Difference between round trip loss and loss of reference trunk measured in Step 10 is near-far loss of trunk under test.
22	Restore TMS1 key.	
23a	If trunk under test is equipped with single or split "A" pad — Operate 500 and TMS1 keys.	Round trip loss registered on TMS meter same as in Step 21.
24a	Restore TMS1 and 500 keys.	
25b	If trunk under test is equipped with split "A" pad — Operate 11,500 and TMS1 keys.	Round trip loss registered on TMS meter same as in Step 21.
26b	Restore TMS1 and 11,500 keys.	
27	Restore TMT key.	
28	Repeat Steps 20 through 27 for each remaining trunk to be tested. *Note:* When testing to a combination loop-around and milliwatt test line the TMS meter will register the reference trunk far-near loss between each succeeding test and this loss should be used in computing the near-far loss of the next trunk tested.	

STEP	ACTION	VERIFICATION
29e	If near-far loss of reference trunk is required — With test circuit still connected to last trunk tested — Remove patching cord for TMS from AUX LINE REC jack and connect to 4W OUT jack.	
30e	Remove patching cord from 4W IN jack and connect to AUX LINE SEND jack.	
31e	Operate TMT and TMS2 keys.	Round trip transmission loss registered on TMS meter. Difference between round trip loss and far-near loss of last trunk tested is near-far loss of reference trunk.
32e	Restore TMS2 key.	
33f	If reference trunk is equipped with single or split "A" pad — Operate 500A and TMS2 keys.	Round trip loss registered on meter same as in Step 31e.
34f	Restore TMS2 and 500A keys.	
35g	If reference trunk is equipped with split "A" pad — Operate 11,500A and TMS2 keys.	Round trip loss registered on meter same as in Step 31e.
36g	Restore TMS2 and 11,500A keys.	
37	Restore TMT key.	
38d	If not testing to combination loop-around and milliwatt test line — Repeat Steps 1 through 8 for reference trunk.	Measured far-near loss of trunk within ±0.25 db of loss measured in Step 10. ***Note:*** In the event that the far-near loss of the reference trunk has deviated more than ±0.25 db it is necessary to remeasure all of the trunks in the trunk group tested at this time.
39	Restore HOLD and OLA keys.	
40	Remove patching cords and restore test circuit to normal.	

STEP	ACTION	VERIFICATION

E. To Jack Ended Test Trunk At OGT Frame or Equivalent, or To Switchboard Not Provided With Loop-Around Test Line

1 Connect TMS and 1 milliwatt, 1000-cycle supply to test circuit as shown in Fig. 4.

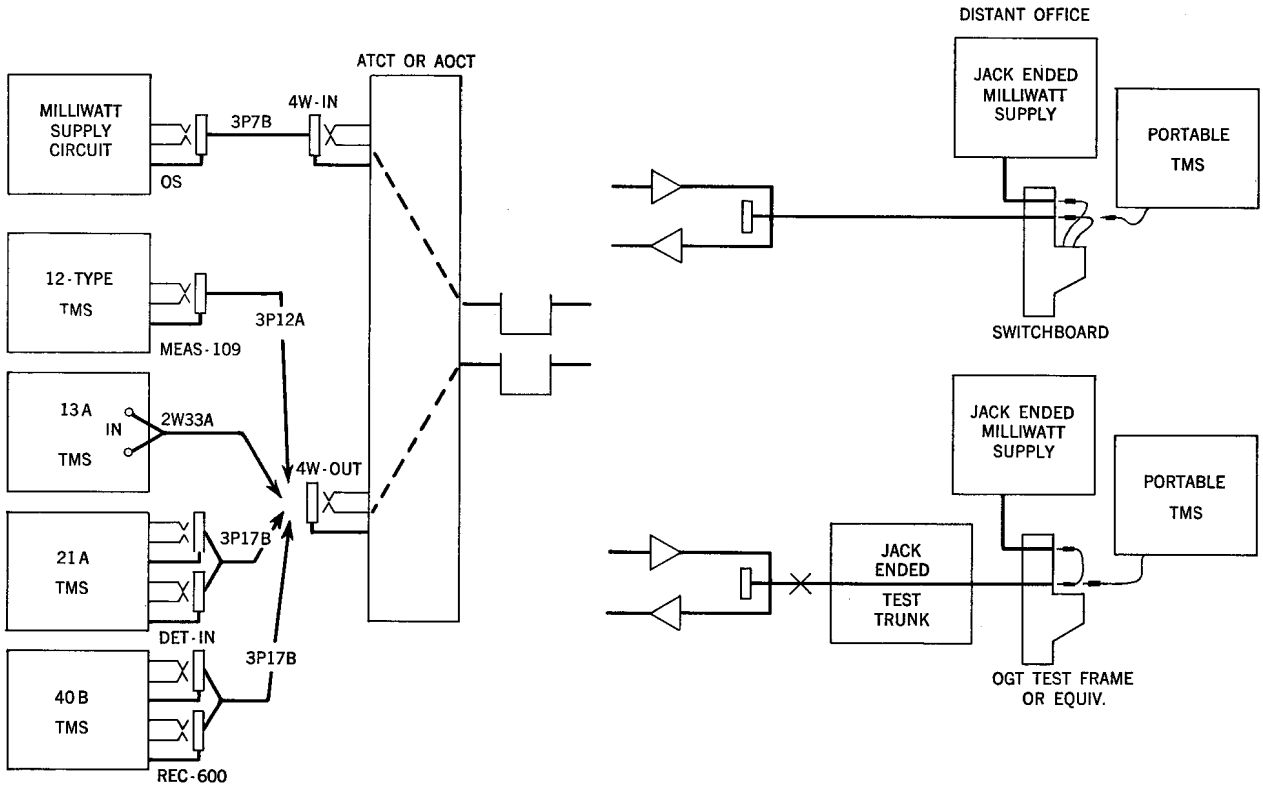

Fig. 4 — To Jack Ended Test Trunk At OGT Frame or Equivalent, or To Switchboard Not Equipped With Loop-Around Test Line

2 Select particular trunk to be tested and establish connection to maintenance personnel at switchboard or OGT frame in distant office using procedure described in one of the following sections:

Test circuit SD-68076-01 or SD-68373-01 — Section 212-566-501 or 212-566-502.

3a If testing to switchboard —
Request distant office personnel to connect to 1 milliwatt, 1000-cycle test line and to restore TALK key for approximately 10 seconds.

SUP lamp extinguished.

STEP	ACTION	VERIFICATION
4b	If testing to jack ended test trunk — Request distant office personnel to connect 1 milliwatt, 1000-cycle testing power to TM jack for approximately 10 seconds.	
5	Operate TMT key.	Trunk far-near transmission loss registered on TMS meter.
6c	If trunk under test is equipped with single or split "A" pad — Operate 500 key.	Measured far-near loss of trunk remains same as in Step 5.
7c	Restore 500 key.	
8d	If trunk under test is equipped with split "A" pad — Operate 11,500 key.	Measured far-near loss of trunk remains same as in Step 5.
9d	Restore 11,500 key.	
10	Restore TMT key.	
11	Request distant office personnel to measure test power to be sent by test circuit.	
12	Operate TMT key.	
13	Operate TMS1 key for a period of approximately 10 seconds.	Trunk near-far transmission loss registered by TMS meter in distant office.
14	Restore TMT key.	
15c	If trunk under test is equipped with single or split "A" pad — Operate 500 key.	
16c	Repeat Steps 11 through 14.	Measured near-far loss of trunk remains same as in Step 13.
17c	Restore 500 key.	
18d	If trunk under test is equipped with split "A" pad — Operate 11,500 key.	
19d	Repeat Steps 11 through 14.	Measured near-far loss of trunk remains same as in Step 13.
20d	Restore 11,500 key.	
21	Remove patching cords and restore test circuit to normal.	