TRUNK TRANSMISSION TESTS
USING TRUNK TEST PANEL
NO. 2 AND ▶NO. 2B◀ ELECTRONIC SWITCHING SYSTEMS

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1. GENERAL

1.01 This section describes trunk transmission tests using the Trunk Test Panel (TTP) in the No. 2 and No. 2B Electronic Switching Systems (ESS). Included are originating end procedures for outgoing trunk tests, and terminating end procedures for incoming trunk tests. The following transmission parameters are covered.

- 1000-Hz loss
- Frequency response—loss versus frequency
- Noise—Message circuit and impulse
- PAR—peak-to-average ratio
- Short-Circuit Termination Tests
- Open Circuit Termination Tests.

1.02 This section is reissued to include short-circuit and open-circuit termination tests, No. 2B ESS coverage, and changes due to the EF-2 and 2B-EF-2 generic programs.

1.03 The tests and procedures in this section are identified by a special designation plan. Single test letters A through Z are reserved for tests which require no assistance at the terminating end. Double test letters AA through AZ are reserved for near-end originated tests that require assistance at the far-end. Double lettered procedures BA through BZ are reserved for the assistance required on incoming tests to this office. The second letter of double lettered test and procedures identifies companion procedures and tests as follows:

NEAR END TEST	CORRESPONDING FAR-END PROCEDURE
AA	BA
AB	BB
. . .	. . .
AZ	BZ

1.04 The tests and procedures for the far-end offices are contained in the trunk transmission sections covering the particular type of far-end office involved.

1.05 Whenever the term TOUCH-TONE® telephone service is used, it refers to the equipment required to provide this service to the customer.

1.06 All tests are designed to be performed from the TTP. For detailed information about the TTP operation, refer to Section 232-130-301, Trunk Test Panel—Method of Operation. Table A is a list of abbreviations used in this section.

TABLE A

ABBREVIATIONS USED IN TESTS

ABBREVIATION	MEANING
DBM	Decibels above or below (±) a one milliwatt reference
VFO	Variable frequency oscillator
MEMN	Member number
MW	Milliwatt
PAR	Peak-to-average ratio
SD	Schematic drawing
ST	Start key on TOUCH-TONE set
TGN	Trunk group number
TMS	Transmission measuring set
TTP	Trunk test panel

Note: Trunk testing should be done during a light traffic period.

1.07 ***The transmission requirements for trunks are shown on circuit layout cards, in office records, and in various other sections. Determine the following for the trunk(s) to be tested.***

(a) Transmission requirements

(b) Trunk group number (TGN)

(c) Member number (MEMN)

(d) Number of the test line required.

1.08 The transmission loss indicated by the transmission measuring set meter is the actual measured loss in dB of the trunk under test. The amount of deviation between the actual measured loss and the expected measured loss will determine whether corrective action is required as discussed in other sections.

The results of tests made with the trunk in the local talk state, rather than the tandem state should be compared to the expected measured loss.

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

1.10 When performing these tests, take all necessary precautions to prevent normal traffic interruptions.

1.11 For Tests AB and BB, ***do not*** sweep a continuously variable oscillator through 2400 or 2600 Hz on a trunk that uses a single-frequency signaling unit.

1.12 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Parts 3 or 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 Key Operation: The procedures in this section require the operation of certain keys on the TTP. These keys may be either a locking or a nonlocking type. In order to differentiate between the two types of keys, the use of a locking type key shall be identified by the words "operate" and "release" and the use of a nonlocking type key shall be identified by the word "depress" in the ACTION column.

> ***Note:*** Nonlocking keys require a depression of at least one-half second to ensure system recognition.

1.14 The transmission test equipment must be accurately calibrated. If equipment other than the recommended test equipment is used it must be equivalent to the recommended equipment.

1.15 After outpulsing to a test line and depressing the VM or XMSN key at ACCESS TRUNK_CONTROL, the trunk will be placed in the bypass or tandem state. The local talk state can be obtained by operating the LTS_key.

2. APPARATUS

2.01 The No. 2 and No. 2B ESS TTP (SD-2H075) is required for every test.

2.02 If the TTP is ***not*** equipped with the proper test set, an external set must be provided as shown in 2.03. The following is a description of each external test set.

(a) Noise Measuring Set, 3C, J94003C, or equivalent with appropriate test leads. Equivalent apparatus must be capable of measuring noise in 900-ohm circuits in the range of 0 dBrn to 97 dBrn. Noise measurement accuracy ±1 dB (Section 103-611-101 or 103-611-102).

(b) Impulse Counter, 6H, J94006H, or equivalent with appropriate test leads. Equivalent apparatus must be capable of measuring noise hits in a 900-ohm circuits in the range of 40 dBrn to 99 dBrn. The balance must be greater than 80 dB at 1 kHz and greater than 55 dB at 25 kHz. The equivalent apparatus must have a bandwidth of 20 Hz to 80 kHz, a counting rate of 7 counts per second, and a counting capacity of 9999 counts. Accuracy must be ±0.5 dB at 1 kHz (Section 103-620-101).

(c) Variable Frequency Oscillator, KS-19353 L1 or KS-19353 L4, or equivalent with appropriate test leads. Equivalent apparatus must be capable of measuring power from -30 dBm to +10 dBm in 900-ohm circuits. The equivalent apparatus must have a frequency accuracy of ±0.2%, an output accuracy of ±0.5 dB, and a frequency range of 100 Hz to 9990 Hz (Section 103-102-105 or 103-102-106).

> ***Note:*** The VFO should be adjusted to the desired output level as measured with a 23D TMS, with the input key operated to 900 ohms. With KS-19353 L1 VFO, the output should be checked after each change in frequency.

(d) PAR meter generator, 27A, J94027A, or equivalent with appropriate test leads. Equivalent apparatus must be capable of generating 250 pulses per second (repetition rate) to 900-ohm circuit (Section 103-110-110).

(e) PAR meter receiver, 27B, J94027B, or equivalent with appropriate test leads.

Equivalent apparatus must be capable of measuring peak to average ratio in 900-ohm circuits and have a input attenuation range of 0 to 33 dB (coarse) and 0 to 3 dB (fine) (Section 103-110-110).

(f) Transmission Measuring Set (TMS), 23D, J94023D, or equivalent. Equivalent apparatus must be capable of measuring power in 900-ohm circuits between 300 Hz to 2800 Hz. The accuracy must be ±0.1 dB from -15 dBm to +10 dBm at 1 kHz.

2.03 Table B is a list of apparatus requirements for each test.

TABLE B

APPARATUS LIST

TEST	TTP	3NMS*	6H1C*	KS-19353L1*	27A PAR*	27B PAR*	23D TMS*
A	X						X
B	X	X					
C	X		X				
D	X						X
E	X						X
F	X						
G	X						
AA	X						X
AB	X			X			X
AC	X	X					
AD	X		X	X †			
AE	X				X	X	
BA	X						X
BB	X			X			X
BC	X	X					
BD	X		X	X †			
BE	X				X	X	

* Equivalent apparatus may be substituted for these items.

† Required if testing trunks containing N, O, or ON carrier.

2.04 The following is used when testing No. 5 Crossbar ACD trunk.

(a) Auxiliary trunk test set—J94742-A.

(b) Headset for receiving only, with 310 plug on end.

(c) A 3W4A cord assembly consisting of a W3M cord at least 4 feet long with a 310 plug on one end and two 59-type cord tips on the tip and sleeve (tip is white wire and sleeve is red wire) or equivalent.

(d) A 2P4A cord assembly consisting of a P2B cord 3 feet long and two 310 plugs or equivalent.

3. PREPARATION

SWITCHBOARD- OR DESK-ENDED TRUNKS

3.01 When testing switchboard- or desk-ended trunks, use procedures specified in tests performed using 101-type test line with the following changes (Fig. 1).

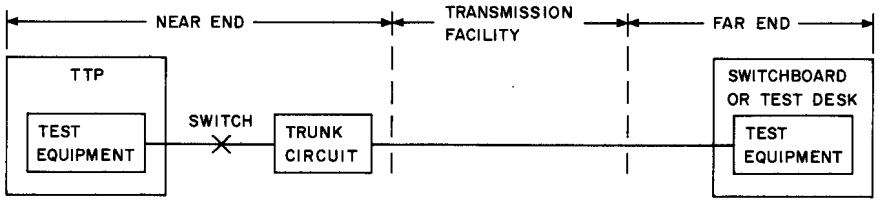

Fig. 1—Transmission Measurement to Switchboard- or Desk-Ended Trunk

(a) Dial 1 + TGN + MEMN + ST in place of dial 1 + TGN + MEMN + OP + 101-type test line number + ST for originating end procedures.

Note: The trunk will be placed in the idle state.

(b) Use local telephone facilities to set up procedures before dialing is performed since distant end will not be signaled unless audible ringing state is obtained by PERIPHERAL DECODER POINTS for originating end procedures.

(c) Use PERIPHERAL DECODER POINTS on TTP in place of LTS 1 key at TRANSMISSION MEASURING CONTROL for all tests. (Refer to trunk SD-.)

FOREIGN EXCHANGE TRUNKS

3.02 When testing foreign exchange (FX) trunks, use the following steps to connect TTP, FX and test line instead of the steps given in each test (Fig. 2).

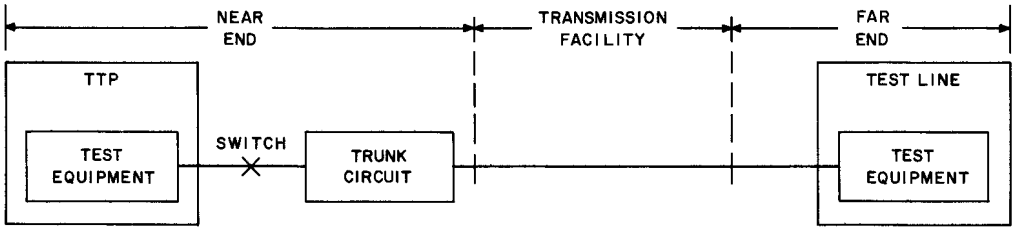

Fig. 2—Transmission Measurement to Foreign Exchange Trunk

Note: Set TMS INPUT to measure power in a 600-ohm circuit.

STEP	ACTION	VERIFICATION
1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + ST.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. *Note:* If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	At PERIPHERAL DECODER POINTS— Set PD GROUP switch and PERIPHERAL DECODER POINTS keys to positions corresponding to trunk seize state (refer to trunk SD- to determine settings).	
7	Depress AT 1 key.	At MISC TEST CONTROL— P & E lamp lighted steadily if state change was successful. At circuit under test— Circuit in seize state.
8	At PERIPHERAL DECODER POINTS— Set PD GROUP switch and PERIPHERAL DECODER POINTS keys to positions corresponding to trunk by-pass state (refer to trunk SD- to determine settings).	
9	Depress AT 1 key.	At MISC TEST CONTROL— P & E lamp lighted steadily if state change was successful.

STEP	ACTION	VERIFICATION
		At circuit under test— Circuit in by-pass state.
10	At TOUCH-TONE dial— Dial test line number.	
11	At PERIPHERAL DECODER POINTS— Set PD GROUP switch and PERIPHERAL DECODER POINTS keys to positions corresponding to trunk ***local talk state.***	
12	At ACCESS 1 CONTROL— Depress XMSN key and then depress AT 1 key immediately.	At MISC TEST CONTROL— P & E lamp lighted steadily if state change was successful. At circuit under test— Circuit in ***local talk state.***
13	Go to Step 7b in Tests A, B, C, E, F, or G. Go to Step 6 in Tests AA, AB, AC, AD, or AE.	

NO. 5 CROSSBAR ACD TRUNKS

3.03 ▶The following procedure is used to set up a connection to, and seize, a No. 5 crossbar ACD trunk (Fig. 3). This procedure applies to offices equipped with EF-1 or later generics only. The procedure can be used to connect only loop trunks in offices with the EF-1 generic program. However, both loop and E&M trunks can be connected in offices with the EF-2 generic program. Offices equipped with LO-1 should use the procedure in 3.04.◀

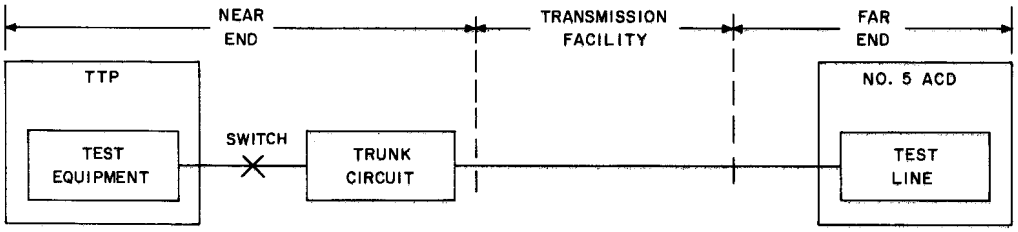

Fig. 3—Transmission Measurement to No. 5 Crossbar ACD

STEP	ACTION	VERIFICATION
1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.

STEP	ACTION	VERIFICATION
3	At TOUCH-TONE dial— Dial 6 + TGN + MEMN + OP + (0 or 1) + ST. ***Note:*** If the circuit being tested is using single frequency (SF) supervisory unit, a 200-ms delay between the trunk seizure and application of the TOUCH-TONE is needed. This delay is obtained by keying in a 1 after the OP key. If the circuit being tested is ***not*** using a SF supervisory unit, a 0 should be keyed in.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. At headset or handset— 1000-Hz tone present. ***Note:*** If the EQPT ST lamp is flashing and P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	At front of writing shelf— Use 2P4A cord to connect TRK 1-TRK jack on the auxiliary trunk test set to ACCESS TRK-1 jack. ***Note:*** The TOUCH-TONE pad on the TTP is disconnected.	
7	At power connections under writing shelf— Use 3W4A cord to connect BAT jack on the auxiliary trunk test set to -48 and GRD connections (-48V on tip-white wire and GRD on sleeve-red wire).	
8	At auxiliary trunk test set— Connect headset to TRK 1-TST FAC jack. ***Note:*** The headset will be necessary to monitor completion tone when returned from ACD.	
9	Operate START 1 key.	At headset— Special tone heard.
10	Depress AT 1 key. ***Note:*** This causes the program to automatically place the trunk under test into the proper local talk state, and then apply the tone after the proper delay. The state of the various PD points keys will be ignored the first time	At circuit under test— Trunk circuit is seized. At headset— Interrupted dial tone present. ***Note:*** If the ACD does not recognize the special tone, distant audible ring will be heard

STEP	ACTION	VERIFICATION
	the AT-1 key is depressed.	indicating that the call is being completed to an operator.
11b	If connection to ACD was not successful— Depress RLS key.	
12b	Repeat Steps 3 thru 11b until connection is successful.	
13	At auxiliary trunk test set— Release START 1 key.	
14	At TOUCH-TONE dial on auxiliary trunk test set— Dial digit assigned to appropriate test line. assigned digit—test line 0 — 100 1 — 101 2 — 102 ▶3 — 103◀ 4 — 104 ▶5 — 105◀ ▶6 — 106◀	At circuit under test— Trunk is connected to appropriate test line.
15	At front of writing shelf— Remove cord connecting TRK 1-TRK jack on the auxiliary trunk test set to ACCESS TRK-1 jack.	
16	Go to Step 7b in Tests A, B, ▶C, F, or G.◀ Go to Step 6 in Tests AA, AB, AC, AD, or AE.	

3.04 When testing No. 5 Crossbar ACD ▶loop◀ trunks in a Central Office equipped with LO-1 generic program, use the following steps to connect TTP, trunk, and test line instead of the steps given in each test (Fig. 3). In office with EF-1, ▶or later generics,◀ see 3.03.

STEP	ACTION	VERIFICATION
1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP is using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + ST.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at

STEP	ACTION	VERIFICATION
		a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	At front of writing shelf— Use 2P4A cord to connect TRK 1-TRK jack on the auxiliary trunk test set to ACCESS TRK-1 jack. ***Note:*** TOUCH-TONE pad on TTP is disconnected.	
7	At power connections under writing shelf— Use 3W4A cord to connect BAT jack on the auxiliary trunk test set to -48 and GRD connections (-48V on tip—white wire- and GRD on sleeve—red wire).	
8	At auxiliary trunk test set— Connect headset to TRK 1-TST FAC jack. ***Note:*** The headset will be necessary to monitor completion tone when returned from ACD.	
9	At PERIPHERAL DECODER POINTS— Set PD GROUP switch and PERIPHERAL DECODER POINTS keys to positions corresponding to trunk ***local talk state*** (refer to trunk SD- to determine setting).	
10	At auxiliary trunk test set— Operate START 1 key and then depress AT 1 key on TTP. ***Note:*** If a 200-ms delay is necessary between the trunk seizure and application of the TOUCH-TONE because of SF type supervisory unit, depress AT 1 key on TTP, then	At headset— Special tone heard followed by interrupted dial tone. At circuit under test— Trunk circuit is seized. ***Note:*** If the ACD does not recognize the special tone, distant audible ring will be heard

STEP	ACTION	VERIFICATION
	immediately operate START 1 key in Step 10, allowing a 200-ms delay between keys.	indicating that the call is being completed to an operator.
11b	If connection to ACD was not successful— Depress RLS key.	
12b	Repeat Steps 3 thru 11b until connection is successful.	
13	At auxiliary trunk test set— Release START 1 key.	
14	At TOUCH-TONE dial on auxiliary trunk test set— Dial digit assigned to appropriate test line.	At circuit under test— Trunk is connected to appropriate test line.
14	assigned digit—test line 0 — 100 1 — 101 2 — 102 ▶3 — 103◀ 4 — 104 ▶5 — 105◀ ▶6 — 106◀	
15	At front of writing shelf— Remove cord connecting TRK 1-TRK jack on the auxiliary trunk test set to ACCESS TRK-1 jack.	
16	Go to Step 7b in Tests A, B, or ▶C, F or G,◀ Go to Step 6 in Tests AA, AB, AC, AD, or AE. ***Note:*** The AT 1 key must be depressed when the XMSN key is depressed in test referred to in Step 16.	

4. METHOD

STEP	ACTION	VERIFICATION
	A. One-Way 1000-Hz Loss Measurement to 102-Type Test Line ***Note:*** Fig. 4 shows test configuration used in Test A. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and ▶later generics◀) or 3.04 (LO-1).	

STEP	ACTION	VERIFICATION

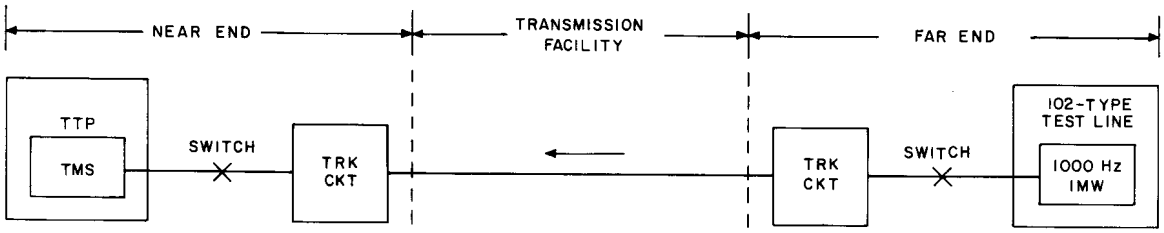

Fig. 4—One-Way 1000-Hz Loss Measurement to a 102-Type Test Line

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + 102-type test line number + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. At headset or handset— 1000-Hz tone present. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	Place handset on hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
7b	If TTP is equipped with TMS— At TRANSMISSION MEASURING CONTROL—	

STEP	ACTION	VERIFICATION
	Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to TMS position.	
8c	If external TMS is used— Connect TMS to TRANS MEAS—TM1 jack located on the front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used.	
9	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
10	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk placed in ***local talk state.***
11	At TMS— Set ADD DBM switch for on-scale reading.	At TMS— Actual measured loss should meet expected measured loss tolerance supplied by local trunk engineering organization. Record loss on proper form. ***Note:*** Actual measured loss is present 9 seconds of a 10-second cycle.
12	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
13	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
14c	If external TMS is used— Remove cord from TMS and TRANS MEAS—TM1 jack.	
15	At telephone set on TTP— Operate green release key.	

B. Message Circuit Noise Measurement to 100-Type Test Line

Note: Fig. 5 shows test configuration used in Test B. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and ▶later generics◀) or 3.04 (LO-1).

STEP	ACTION	VERIFICATION

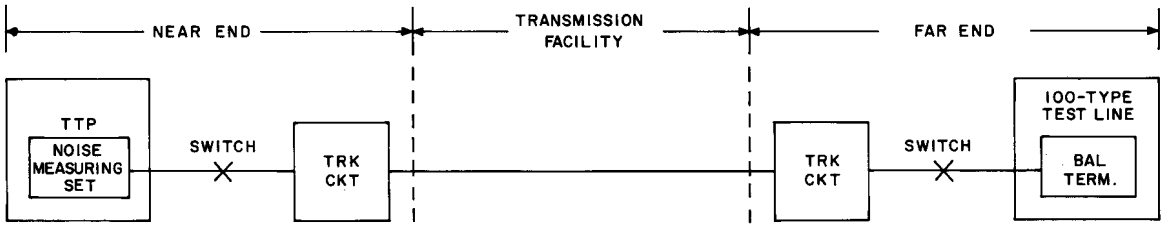

Fig. 5—Message Noise Measurement to 100-Type Test Line

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + 100-type test line number + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	Place handset on hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
7b	If TTP is equipped with noise measuring set— At TRANSMISSION MEASURING CONTROL—	

STEP	ACTION	VERIFICATION
	Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to NOISE position.	
8c	If external noise measuring set is used— Connect noise measuring set to TRANS MEAS—TM1 jack located on front of the TTP writing shelf. Use appropriate cord to connect GND post to ground. Set FUNCTION switch to BAT position.	At noise measuring set— Meter reads in BAT range if internal batteries are good.
9	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
10	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
11	At noise measuring set— Set FUNCTION switch to NM 600/900 position.	
12	Set DBRN switch for on-scale reading.	At noise measuring set— Measured noise should meet noise tolerances supplied by local trunk engineering organization. Record noise level on proper form.
13	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
14c	If external noise measuring set is used— Set FUNCTION switch to OFF position.	
15c	Remove cord from noise measuring set and TRANS MEAS—TM1 jack. Disconnect GND post from ground.	
16	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
17	At telephone set on TTP— Operate green release key.	

C. Impulse Noise Measurement to 100-Type Test Line

Note 1: Fig. 6 shows test configuration used in Test C. If testing a FX trunk, refer

STEP	ACTION	VERIFICATION

to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and ▶later generics◀) or 3.04 (LO-1).

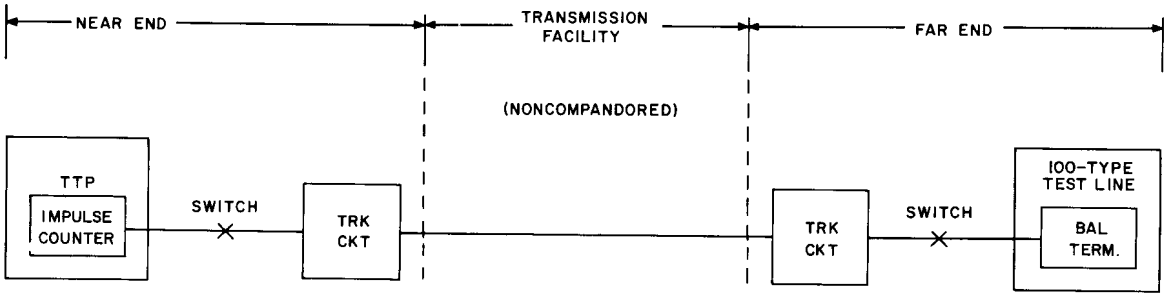

Fig. 6—Impulse Noise Measurement to 100-Type Test Line

Note 2: This test is applicable only to trunks not using N, O, or ON carrier.

1 At telephone set on TTP—
Operate access trunk 1 key.

2 Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.

At telephone set—
Access trunk 1 lamp lighted.
At ACCESS TRUNK 1 CONTROL—
SUPV lamp lighted.
At TEL CKT—
TRFR lamp lighted if TRFR key is operated.

3 At TOUCH-TONE dial—
Dial 1 + TGN + MEMN + OP + 100-type test line number + ST.

Note: If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.

At ACCESS TRUNK 1 CONTROL—
EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute.
At MISC TEST CONTROL—
P & E lamp lighted if connection was sucessful.

Note: If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.

4a If the P & E lamp is not lighted steadily—
At ACCESS TRUNK 1 CONTROL—
Depress RLS key.

STEP	ACTION	VERIFICATION
5a	Repeat Steps 3 and 4a until connection is successful.	
6	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
7b	If TTP is equipped with impulse counter— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to CTR position.	
8c	If external impulse counter is used— Connect impulse counter to TRANS MEAS—TM1 jack located on the front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used. Set DIAL-MEAS switch to MEAS position.	
9	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
10	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk placed in ***local talk state.***
11	At impulse counter— Set DBRN dial to the required noise threshold level in accordance with local procedures.	
12	Turn MINUTES control to required time in accordance with local procedures. ***Note:*** To ensure accurate timing in intervals of 3 minutes or less, first adjust the timer to at least 5 minutes and then return it to the desired value.	
13	Momentarily operate reset lever located directly beneath counter.	At impulse counter— Counter should indicate 0000.
14	When MINUTES control indicates 0— Read counter. ***Note:*** If far-end test line returns repetitive on-hook supervision, monitor connection; observe impulse counter to determine the number of impulse counts per minute caused by changes in supervision; multiply the number by the	Counter reading indicates impulse counts during present time interval. Record counter reading on proper form.

STEP	ACTION	VERIFICATION
	time interval Step 12, and subtract result from recorded counter reading Step 14.	
15c	If external impulse counter is used— Remove cord from impulse counter and TRANS MEAS—TM1 jack.	
16	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
17	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
18	At telephone set on TTP— Operate green release key.	

D. Two-Way 1000 Hz Loss Measurement and Noise Check to 104-Type Test Line.

Note 1: Fig. 7 shows test configuration used in Test D. ▶If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and later generics) or 3.04 (LO-1).◀

Note 2: Before proceeding, read Test D. Vary timing in Step 10 if test fails.

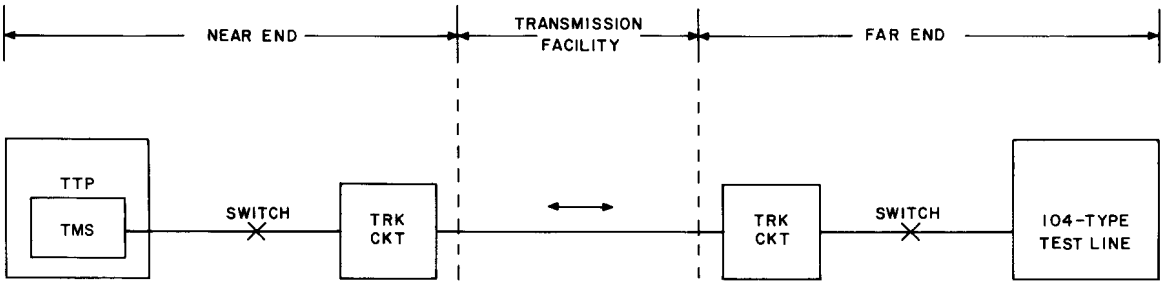

Fig. 7—Two-Way 1000-Hz Loss Measurement and Noise Check to 104-Type Test Line

STEP	ACTION	VERIFICATION
1	At TRANSMISSION MEASURING CONTROL— Set SEND switch to 0 DBM 1 kHz position. Set MEASURE switch to MEAS 1 position. Set TEST SET switch to TMS position. Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted.
2a	If external TMS is used— Connect TMS to TRANS MEAS—TM1 jack located on front of the TTP writing shelf. Insert the plug into TM1 jack only half way so connection is not yet made. Insert the plug all the way in Step 10 instead of turning SEND switch to OFF.	
3	At telephone set on TTP— Operate access trunk 1 key.	
4	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
5	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + 104-type test line number + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. At TRANSMISSION MEASURING CONTROL— CS lamp lighted. At telephone set on TTP— On-hook and/or 2225-Hz test progress tone received. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the trunk to be tested.
6b	If P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
7b	Repeat Steps 5 and 6b until connection is successful.	
8	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished. After 104-type test line transmission measuring circuit is connected at far-end, on-hook and/or

STEP	ACTION	VERIFICATION
		2225-Hz test progress tone removed. At TRANSMISSION MEASURING CONTROL— CS lamp extinguished.
9	When CS lamp is extinguished— At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted. ***Note:*** ***Near-to-far*** actual measured loss is measured and stored by far-end 104-type test line transmission measuring circuit.
10	In 3 to 6 seconds after CS lamp is extinguished— Set SEND switch to OFF position. ***Note:*** If external TMS is used, insert plug into TRANS MEAS—TM1 jack all the way.	At TMS— Set ADD DBM for on-scale reading. Meter indicates ***far-to-near*** actual measured loss for a 10-second period. Record reading. Meter indicates ***far-to-near plus near-to-far*** AML for a second 10-second period. Record reading.
11c	If TMS does not indicate reading— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
12c	Repeat Steps 1 through 10.	
13d	If CS lamp lighted momentarily between the first and the second TMS readings— Add 10 dB to Step 14.	
14	The ***near-to-far*** actual measured loss is the difference between the first and second reading in Step 10 plus 10 dB if 13d applies.	Record both ***far-to-near*** actual measured loss and ***near-to-far*** actual measured loss on proper form.
15e	If ***near-to-far*** noise check is desired— Monitor CS lamp for 5 seconds after second 10-second period.	If CS lamp lights— ***Near-to-far*** noise does not exceed 41 dBrnc. If CS lamp does not light or flashes— ***Near-to-far*** noise exceeds 41 dBrnc.
16	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
17	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
18a	If external TMS is used— Remove cord from TMS and TRANS MEAS—TM1 jack.	

STEP	ACTION	VERIFICATION
19	At telephone set on TTP— Operate green release key.	

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

Note: Fig. 8 shows test configuration used in Test E.

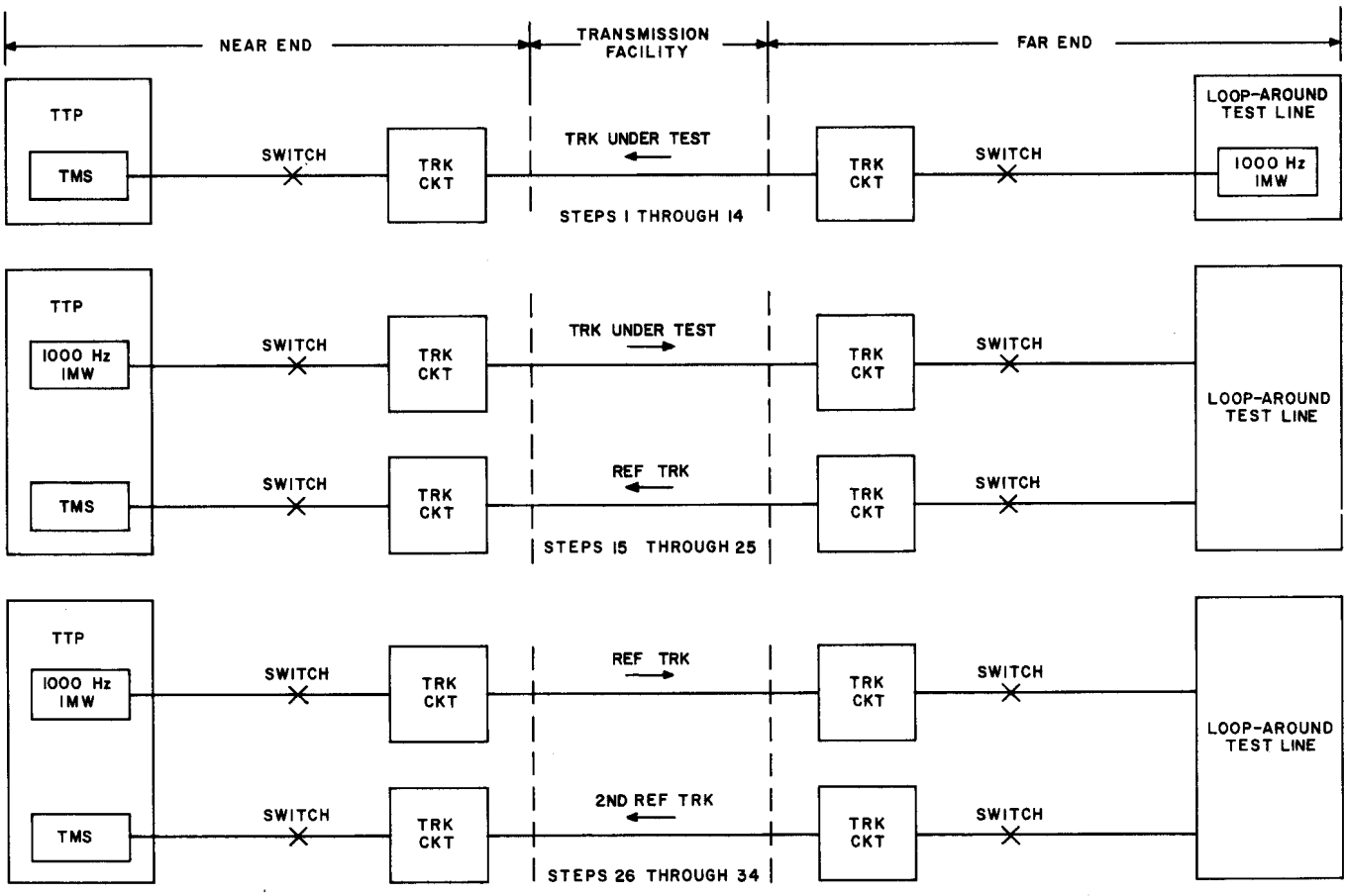

Fig. 8—Two-Way 1000-Hz Loss Measurement Using Loop-Around Test Line

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.

STEP	ACTION	VERIFICATION
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + directory number of first appearance of loop-around test line + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. At headset or handset— 1000-Hz tone present. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
7b	If TTP is equipped with TMS— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to TMS position.	
8c	If external TMS is used— Connect TMS to TRANS MEAS—TM1 jack located on front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used.	
9	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
10	At TMS— Set ADD DBM switch for on-scale reading.	At TMS— Meter indicates ***far-near*** loss. Actual measured loss should meet expected measured loss tolerance supplied by local trunk engineering organization. Record loss on proper form.
11	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished.

STEP	ACTION	VERIFICATION
		EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
12c	If external TMS is used— Remove cord from TMS and TRANS MEAS—TM1 jack.	
13	At telephone set on TTP— Operate green release key.	
14	When all trunks in the trunk group have been tested— Select one trunk as a reference trunk. Obtain far-near loss from proper form (Step 10).	
Reference Trunk Seizure		
15	Repeat Steps 1 through 6 for ACCESS TRUNK 2 to connect reference trunk to loop-around test line designated by outpulse directory number for first appearance of the test line.	Same as Steps 1 through 8.
16b	If TTP is equipped with TMS— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 2 position.	
17c	If external TMS is used— Connect TMS to TRANS MEAS—TM2 jack located on the front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used.	
18	At ACCESS TRUNK 2 CONTROL— Depress XMSN key.	At ACCESS TRUNK 2 CONTROL— XMSN lamp lighted.
Seizure and *Near-Far* Measurement for Remaining Trunks		
19	Repeat Steps 1 through 6 for ACCESS TRUNK 1 to connect trunk under test to loop-around test line designated by outpulse directory number for second appearance of the test line.	At TRANSMISSION MEASURING CONTROL— CS lamp extinguished. At headset or handset— Tone not present.
20	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted. ***Note:*** Trunk under test is placed in ***tandem state.***

STEP	ACTION	VERIFICATION
21	At TRANSMISSION MEASURING CONTROL— Set SEND switch to 0 dBm position.	At TMS— Meter indicates ***loop-around*** actual measured loss.
22	Calculate ***near-far*** loss of trunk under test by subtracting ***far-near*** loss of reference trunk (Step 10) from ***loop-around*** actual measured loss (Step 21).	Loss measurement should meet expected measured loss tolerance supplied by local engineering department.
23	At TRANSMISSION MEASURING CONTROL— Set SEND switch to OFF position.	
24	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished.
25	Repeat Steps 19 through 24 on each remaining trunk to be tested.	
	Near-Far **Measurement of Reference Trunk**	
26	Repeat Steps 1 through 6 for ACCESS TRUNK 1 to connect SECOND reference trunk to loop-around test line designated by outpulse directory number for second appearance of the test line.	
27	At TRANSMISSION MEASURING CONTROL— Operate REV TST key.	At TRANSMISSION MEASURING CONTROL— REV TST lamp lighted.
28	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
29	At TRANSMSSION MEASURING CONTROL— Set SEND switch to 0 DBM position.	At TMS— Meter indicates ***loop-around*** actual measured loss.
30	Calculate ***near-far*** loss of reference trunk by subtracting ***far-near*** loss of SECOND reference trunk from ***loop-around*** actual measured loss (Step 29).	Loss measurement should meet expected measured loss tolerance supplied by local engineering department.
31	At TRANSMISSION MEASURING CONTROL— Set SEND switch to OFF position.	
32	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— Depress RLS keys.	At ACCESS TRUNK 1 CONTROL and ACCESS TRUNK 2 CONTROL— XMSN lamps extinguished. SUPV lamps extinguished. EQPT ST lamps extingushed.

STEP	ACTION	VERIFICATION
		At MISC TEST CONTROL— P & E lamp extinguished.
33c	If external TMS is used— Remove cord from TMS and TRANS MEAS—TM2 jack.	
34	At telephone set on TTP— Operate green release key.	

F. ◗Short-Circuit Termination Test

Note: Fig. 9 shows test configuration used in Test F. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and later generics) or 3.04 (LO-1).

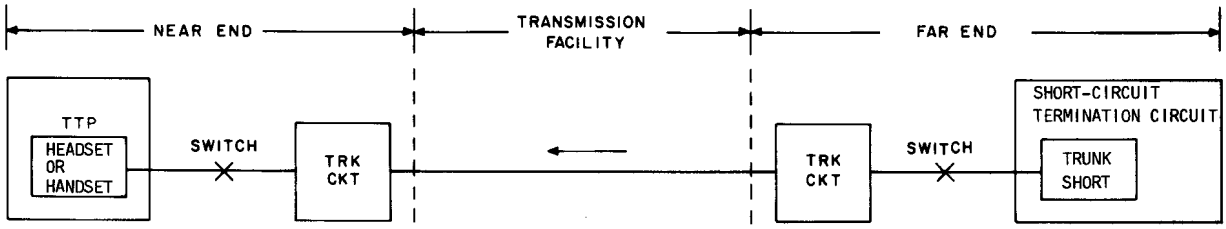

Fig. 9—◗Short-Circuit Termination Test◖

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + short-circuit termination number + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. At headset or handset— 1000-Hz tone present. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp lamp is not lighted steadily, the TTP is not connected to the circuit to be

STEP	ACTION	VERIFICATION
	encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	At ACCESS TRUNK 1 CONTROL— Depress TALK key.	At ACCESS TRUNK 1 CONTROL— TALK lamp lighted.
7	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk placed in ***local talk state.***
8	At headset or handset— Listen for signing on trunk.	At headset or handset— Trunk is quiet.
9	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
10	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
11	Place handset on hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
12	At telephone set on TTP— Operate green release key.	

G. Open-Circuit Termination Test

Note: Fig. 10 shows test configuration used in Test G. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and later generics) or 3.04 (LO-1).

STEP	ACTION	VERIFICATION

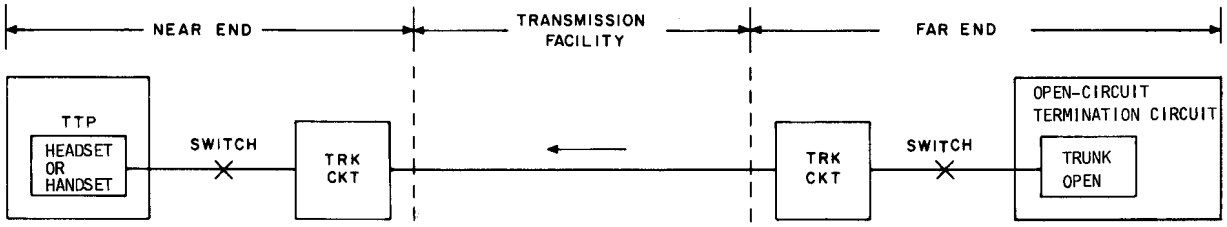

Fig. 10—Open-Circuit Termination Test

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP is using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + open-circuit termination number + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. At headset or handset— 1000-Hz tone present. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
7	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted.

STEP	ACTION	VERIFICATION
		Note: Trunk placed in ***local talk state.***
8	At headset or handset— Listen for singing on trunk.	At headset or handset— Trunk is quiet.
9	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
10	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
11	Place handset on hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
12	At telephone set on TTP— Operate green release key.◀	

AA. Two-Way 1000-Hz Loss Measurement to 101-Type Test Line, Switchboards, Plant- or Traffic-Operating Desks—Originating End Procedures

Note: Fig. ▶11◀ shows test configuration used in Test AA. If testing a switchboard- or desk-ended trunk, refer to 3.01. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and ▶later generics◀) or 3.04 (LO-1).

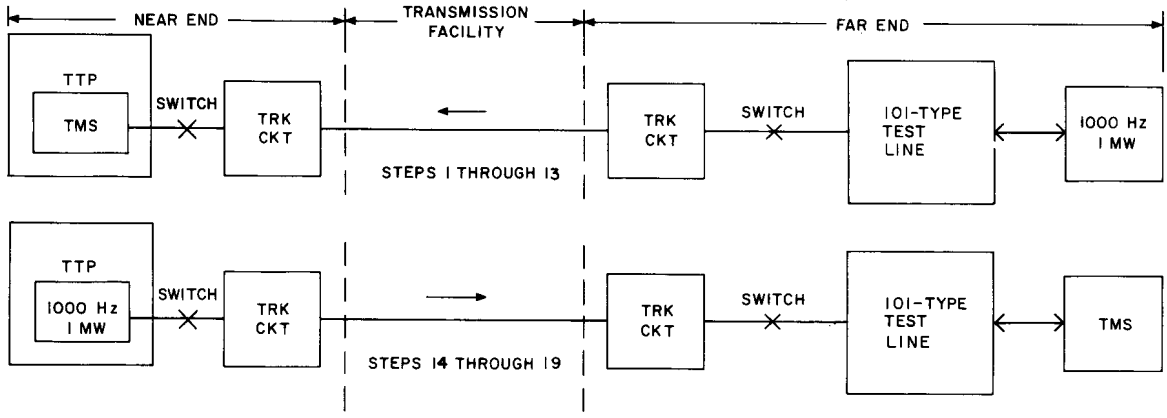

Fig. 11—Two-Way 1000-Hz Loss Measurement to 101-Type Test Line—Originating End Procedures

STEP	ACTION	VERIFICATION
1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH TONE dial— Dial 1 + TGN + MEMN + OP + 101-type test line number + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	When distant end answers— Set up procedure for ***far-near*** and ***near-far*** actual measured loss test. Establish external talking link with distant end in order to coordinate the test. Use local telephone facilities.	
7	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
8	Request distant end to send 1000 Hz at 0 dBm level.	
9b	If TTP is equipped with TMS— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set TEST SET switch to TMS position. Set SEND switch to OFF position.	

STEP	ACTION	VERIFICATION
10c	If external TMS is used— Connect TMS to TRANS MEAS—TM1 jack located on front of TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used.	
11	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
12	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
13	At TMS— Set ADD DBM switch for on-scale reading.	At TMS— Meter indicates ***far-near*** actual measured loss of trunk in ***local talk state.*** Actual measured loss should meet expected measured loss tolerance supplied by local trunk engineering organization. Record loss on proper form.
14	At TRANSMISSION MEASURING CONTROL— Set SEND switch to 0 dBm 1 kHz position.	
15	Request distant end to measure loss.	At distant end— Meter indicates ***near-far*** actual measured loss of trunk in ***local talk state.*** Record loss on proper form.
16	At TRANSMISSION MEASURING CONTROL— Set SEND switch to OFF position. Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
17c	If external TMS is used— Remove cord from TMS and TRANS MEAS—TM1 jack.	
18	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
19	At telephone set on TTP— Operate green release key.	

STEP	ACTION	VERIFICATION

AB. Two-Way Frequency Response Measurement to 101-Type Test Line, Switchboards, Plant- or Traffic-Operating Desks—Originating End Procedures

Note: Fig. ▶12◀ shows test configuration used in Test AB. If testing a switchboard- or desk-ended trunk, refer to 3.01. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and ▶later generics◀) or 3.04 (LO-1).

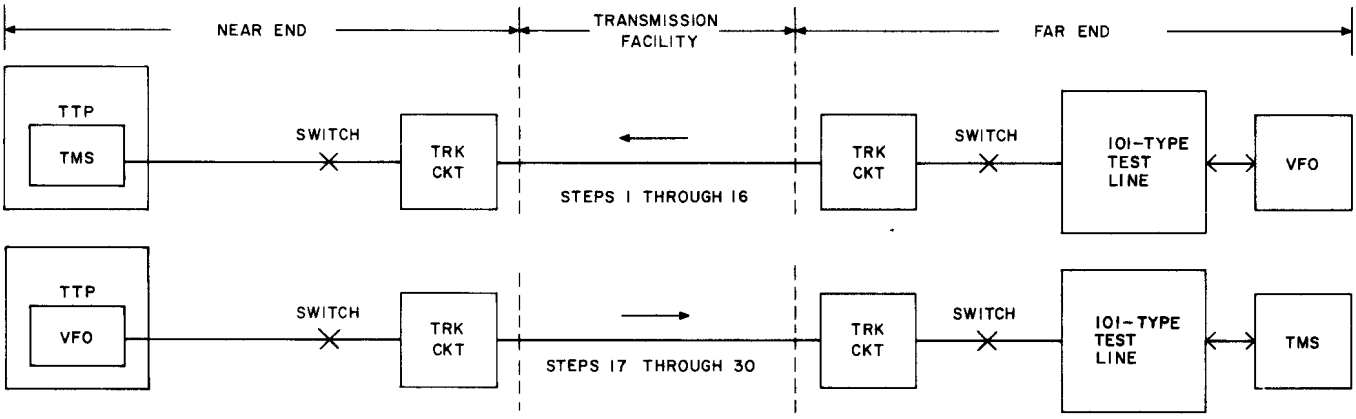

Fig. 12—Two-Way Frequency Response Measurements to 101-Type Test Line—Originating End Procedures

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + 101-type test line number + ST. *Note:* If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. *Note:* If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.

STEP	ACTION	VERIFICATION
	encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	When distant end answers— Set up procedure for ***far-near*** (and ***near-far*** if required) frequency response measurement. Establish external talking link with distant end in order to coordinate the test. Use local telephone facilities.	
7	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
8	Request distant end to send 1000 Hz at 0 dBm level. ***Note:*** Normal frequency response measurement range for voice frequency lines is 300 Hz to 2800 Hz.	
9b	If TTP is equipped with TMS— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set TEST SET switch to TMS position. Set SEND switch to OFF position.	
10c	If external TMS is used— Connect TMS to TRANS MEAS—TM1 jack located on the front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used.	
11	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
12	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk placed in ***local talk state.***
13	At TMS— Set ADD DBM switch for on-scale reading.	At TMS— Meter indicates ***far-near*** actual measured

STEP	ACTION	VERIFICATION
		loss of trunk at transmitted frequency. Record loss on proper form.
14	Repeat Step 13 for ***each*** remaining frequency required from circuit layout card.	
15c	If external TMS is used— Remove cord from TMS and TRANS MEAS—TM1 jack.	
16d	If ***near-far*** frequency response measurement is not required— Proceed to Step 28h.	
17e	If external TMS and external VFO is used— Connect TMS to VFO using appropriate cord.	
18f	If TTP is equipped with TMS and external VFO is used— Connect VFO to TRANS MEAS—TMS jack located on front of the TTP writing shelf. Use appropriate cord.	
19g	If TTP is equipped with TMS and VFO— At TRANSMISSION MEASURING CONTROL— Operate TR key. Operate CAL key. Set SEND switch to VFO position.	At TRANSMISSION MEASURING CONTROL— TR lamp lighted. CAL lamp lighted.
20	At VFO— Set FREQUENCY to 1000 Hz. Set OUTPUT LEVEL to 0 position.	
21	At TMS— Set ADD DBM switch to 0 position.	At TMS— Meter reads 0 dBm.
22g	If TTP is equipped with VFO and TMS— At TRANSMISSION MEASURING CONTROL— Release CAL key. Release TR key.	At TRANSMISSION MEASURING CONTROL— CAL lamp extinguished. TR lamp extinguished.
23e	If external TMS and external VFO is used— Move cord from external TMS to TRANS MEAS—TM1 jack located at front of TTP writing shelf.	
24f	If TTP is equipped with TMS and external VFO is used— Move VFO connection from TMS jack to TRANS MEAS—TM1 jack located at front of TTP writing shelf.	

STEP	ACTION	VERIFICATION
25	Request distant end to measure loss.	At distant end— Meter indicates ***near-far*** loss of trunk. Record loss on proper form.
26	Set VFO for ***each*** remaining frequency required from circuit layout card and request distant end to measure loss. Record loss on proper form.	
27	At VFO— Set FREQUENCY to OFF.	
28h	If external VFO is used— Remove cord from VFO and TRANS MEAS—TM 1 jack.	
29	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
30	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
31	At telephone set on TTP— Operate green release key.	

AC. Message Circuit Noise Measurement to 101-Type Test Line, Switchboards, Plant- or Traffic-Operating Desks—Originating End Procedures

Note: Fig. ▶13◀ shows test configuration used in Test AC. If testing a switchboard- or desk-ended trunk, refer to 3.01. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and ▶later generics◀) or 3.04 (LO-1).

STEP	ACTION	VERIFICATION

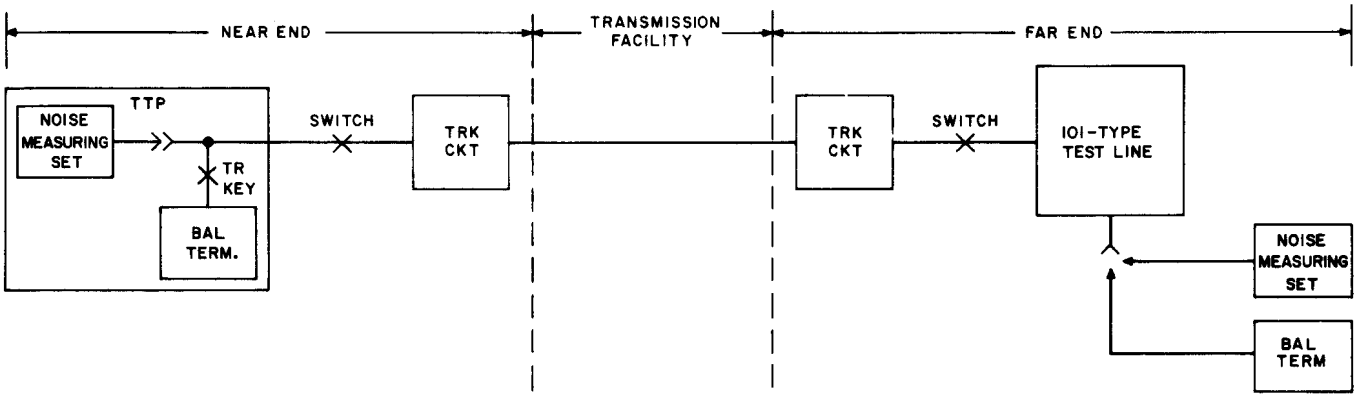

Fig. 13—Message Circuit Noise Measurement to 101-Type Test Line—Originating End Procedures

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + 101-type test line number + ST. ***Note:*** If seven or more digits are outpulsed the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	

STEP	ACTION	VERIFICATION
6	When distant end answers— Set up procedure for ***near-end*** (and ***far-end*** if required) noise measurement. Establish separate talking link with distant end in order to coordinate the test. Use local telephone facilities.	
7	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
8b	If TTP is equipped with noise measuring set— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to NOISE position.	
9c	If external noise measuring set is used— Connect noise measuring set to TRANS MEAS—TM1 jack located on front of the TTP writing shelf. Use appropriate cord to connect GND post to ground. Set FUNCTION switch to BAT position.	At noise measuring set— Meter reads in BAT range.
10	Request distant end to connect 900-ohms balanced termination to trunk.	
11	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
12	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
13	At noise measuring set— Set FUNCTION switch to NM 600/900 position. Set DBRN switch for on-scale reading.	At noise measuring set— Meter indicates ***near-end*** noise of trunk. Measured noise should meet noise tolerance supplied by local trunk engineering organization. Record noise level on proper form.
14c	If external noise measuring set is used— Remove cord from noise measuring set and TRANS MEAS—TM1 jack. Set FUNCTION switch to OFF position.	
15d	If ***far-end*** noise measurements is not required— Proceed to Step 20.	

STEP	ACTION	VERIFICATION
16	Request distant end to connect noise measuring set to trunk.	
17	At TRANSMISSION MEASURING CONTROL— Operate TR key.	At TRANSMISSION MEASURING CONTROL— TR lamp lighted.
18	Request distant end to measure noise.	At distant end— Meter indicates ***far-end*** noise of trunk. Measured noise should meet noise tolerance supplied by local trunk engineering organization. Record noise level on proper form.
19	At TRANSMISSION MEASURING CONTROL— Release TR key.	At TRANSMISSION MEASURING CONTROL— TR lamp extinguished.
20	Release LTS 1 key.	LTS 1 lamp extinguished.
21	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
22	At telephone set on TTP— Operate green release key.	

AD. Impulse Noise Measurement to 101-Type Test Line, Switchboards, Plant- or Traffic-Operating Desks—Originating End Procedures

Note: Fig. ▶14◀ shows test configuration used in Test AD. If testing a switchboard- or desk-ended trunk, refer to 3.01. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and ▶later generics◀) or 3.04 (LO-1).

STEP	ACTION	VERIFICATION

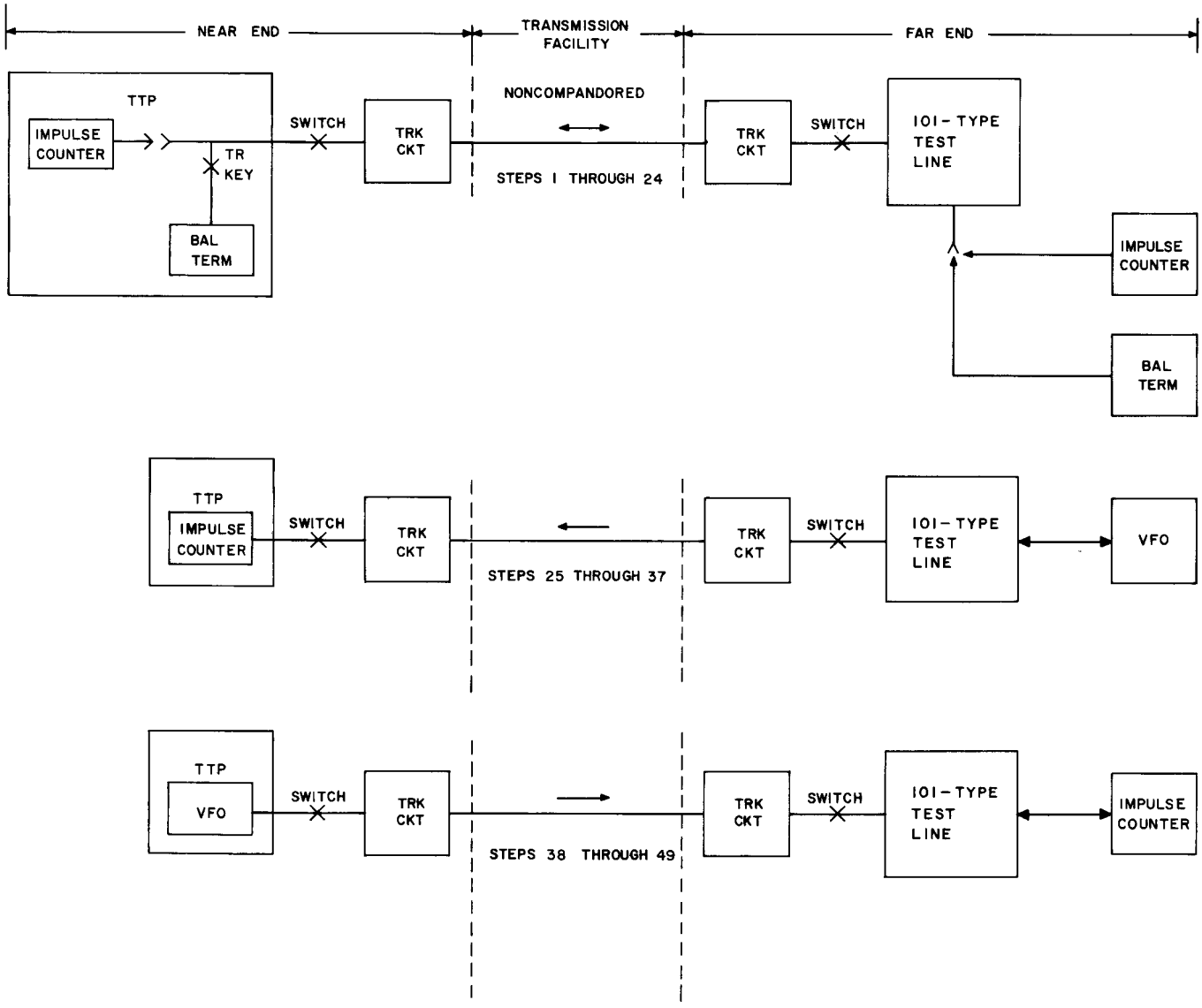

Fig. 14—Impulse Noise Measurement to 101-Type Test Line—Originating End Procedures

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted. At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.

STEP	ACTION	VERIFICATION
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + 101-type test line number + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	When distant end answers— Set up procedure for ***near-end*** (and ***far-end*** if required) impulse noise measurement. Establish separate talking link to coordinate the test. Use local telephone facilities.	
7	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
8b	If TTP is equipped with impulse counter— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to CTR position.	
9c	If external impulse counter is used— Connect impulse counter to TRANS MEAS—TM1 jack located on the front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used. Set DIAL/MEAS switch to MEAS position.	
10d	If trunk contains N, O, or ON carrier— Proceed to Step 25.	
11	Request distant end to connect 900-ohms balance termination to trunk.	

STEP	ACTION	VERIFICATION
12	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
13	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
14	At impulse counter— Set DBRN dial to the required noise threshold level from circuit layout card.	
15	Turn MINUTE control to required time from circuit layout card. ***Note:*** To ensure accurate timing in intervals of 3 minutes or less, first adjust the timer to at least 5 minutes and then return it to the desired value.	
16	Momentarily operate reset lever located directly beneath the counter.	At impulse counter— Counter indicates 0000.
17	When MINUTES control indicates 0— Read counter.	Counter indicates ***near-end*** impulse counter during preset time period. Record counter reading on proper form.
18c	If external impulse counter is used— Remove cord from impulse counter and TRANS MEAS—TM1 jack.	
19e	If ***far-end*** impulse noise measurement is not required— Proceed to Step 47.	
20	Request distant end to connect impulse counter to trunk.	
21	At TRANSMISSION MEASURING CONTROL— Operate TR key.	At TRANSMISSION MEASURING CONTROL— TR lamp lighted.
22	Request distant end to set-up and read impulse counter.	At distant end— Counter indicates ***far-end*** impulse count during preset period. Record count on proper form.
23	At TRANSMISSION MEASURING CONTROL— Release TR key.	At TRANSMISSION MEASURING CONTROL— TR lamp extinguished.
24	Proceed to Step 47.	

STEP	ACTION	VERIFICATION
25	Request distant end to connect VFO to trunk. Set frequency to 2750 Hz and output level to -10 dBm.	
26	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
27	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
28	At impulse counter— Set DBRN dial to 57.	
29	Turn MINUTES control to 15 minutes.	
30	Momentarily operate reset lever located directly beneath the counter.	At impulse counter— Counter indicates 0000.
31f	If impulse counter does not count continuously— Proceed to Step 33.	
32g	If impulse counter counts continuously— Request distant end to adjust VFO above 2750 Hz until impulse counter stops counting. ***Note:*** If no VFO setting can be found that will stop the impulse counter from counting continuously, adjust OUTPUT LEVEL to -13 dBm and repeat Step 32g. Insert successively more loss until a frequency is found that causes the impulse counter to stop counting continuously.	
33	At impulse counter— Set DBRN dial to the required noise threshold level from circuit layout card.	
34	Turn MINUTES control to required time from circuit layout card. ***Note:*** To ensure accurate timing in intervals of 3 minutes or less, first adjust the timer to at least 5 minutes and then return it to the desired value.	
35	Momentarily operate reset lever located directly beneath the counter.	At impulse counter— Counter indicates 0000.

STEP	ACTION	VERIFICATION
36	When MINUTES control indicates 0— Read counter.	Counter reading indicates ***near-end*** impulse count during preset time period. Record count on proper form.
37e	If ***far-end*** impulse noise measurement is not required— Proceed to Step 47.	
38h	If TTP is equipped with VFO— At TRANSMISSION MEASURING CONTROL— Set SEND switch to VFO position.	
39i	If external VFO is used— Connect VFO to TRANS MEAS—TM1 jack located on the front of the TTP writing shelf. Use appropriate cord.	
40	At VFO— Set FREQUENCY to 2750 Hz OUTPUT LEVEL to -10 dBm.	
41	Request distant end to set impulse counter DBRN dial to 57, turn MINUTE control to 15 minutes and momentarily operate reset lever located directly beneath the counter.	
42f	If impulse counter does not count continuously— Proceed to Step 44.	
43g	If impulse counter counts continuously— Adjust VFO above 2750 Hz until impulse counter stops counting. ***Note:*** If no VFO setting can be found that will stop the impulse counter from counting continuously, adjust OUTPUT LEVEL to -13 dBm and repeat Step 43g. Insert successively more loss until a frequency is found that causes the impulse counter to stop counting continuously.	
44	Request distant end to set impulse counter DBRN dial to the required noise threshold level. Turn MINUTE control to required time and momentarily operate reset lever.	At distant end— Impulse counter indicates 0000.
45	When MINUTES control indicate 0— Read counter.	Counter indicates ***far-end*** impulse count during preset time period. Record count on proper form.

STEP	ACTION	VERIFICATION
46i	If external VFO is used— Remove cord from VFO and TRANS MEAS—TM1 jack.	
47	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
48	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
49	At telephone set on TTP— Operate green release key.	

AE. Two-Way PAR Measurement to 101-Type Test Line, Switchboards, Plant- or Traffic-Operating Desks—Originating End Procedures

Note: Fig. ▶15◀ shows test configuration used in Test AE. If testing a switchboard- or desk-ended trunk, refer to 3.01. If testing a FX trunk, refer to 3.02. If testing a No. 5 ACD trunk, refer to 3.03 (EF-1 and ▶later generics◀) or 3.04 (LO-1).

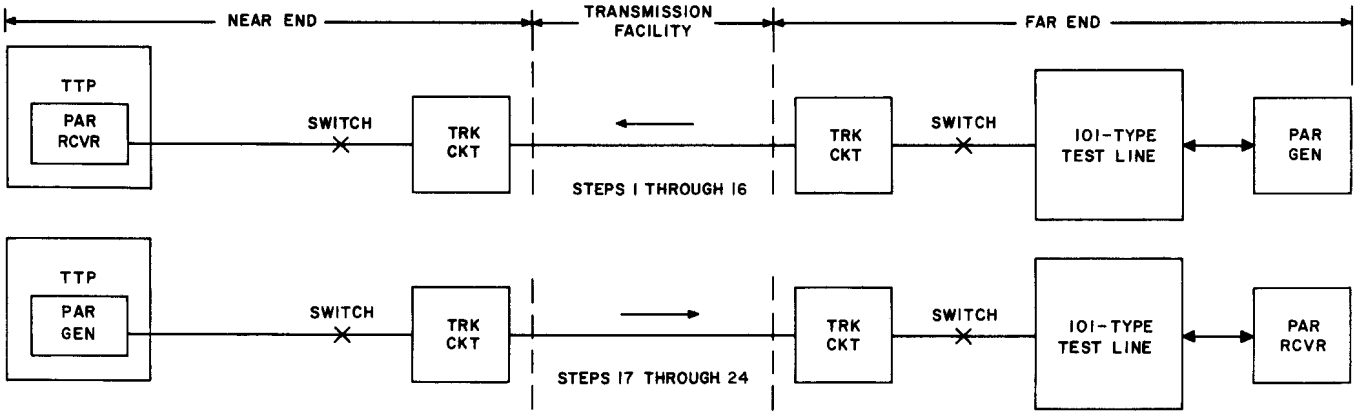

Fig. 15—Two-Way PAR Measurement to 101-Type Test Line—Originating End Procedures

1	At telephone set on TTP— Operate access trunk 1 key.	
2	Lift handset off-hook, or operate TRFR key at TEL CKT on TTP if using headset.	At telephone set— Access trunk 1 lamp lighted.

STEP	ACTION	VERIFICATION
		At ACCESS TRUNK 1 CONTROL— SUPV lamp lighted. At TEL CKT— TRFR lamp lighted if TRFR key is operated.
3	At TOUCH-TONE dial— Dial 1 + TGN + MEMN + OP + 101-type test line number + ST. ***Note:*** If seven or more digits are outpulsed, the P & E lamp will flash at 120 interruptions per minute during outpulsing if the digits dialed don't normally route to the trunk group dialed. If the P & E lamp is dark during outpulsing, the digits dialed normally route to that trunk group. If no errors are encountered, the P & E lamp will light steadily after the ST digit is outpulsed.	At ACCESS TRUNK 1 CONTROL— EQPT ST lamp lighted steadily or flashing at a rate of 120 interruptions per minute. At MISC TEST CONTROL— P & E lamp lighted if connection was successful. ***Note:*** If the EQPT ST lamp is flashing and the P & E lamp is not lighted steadily, the TTP is not connected to the circuit to be tested.
4a	If the P & E lamp is not lighted steadily— At ACCESS TRUNK 1 CONTROL— Depress RLS key.	
5a	Repeat Steps 3 and 4a until connection is successful.	
6	When distant end answers— Set up procedure for ***far-near*** (and ***near-far*** if required) PAR measurement establish separate talking link to coordinate test. Use local telephone facilities.	
7	Place handset on-hook or release TRFR key.	At telephone set— Access trunk 1 lamp extinguished. At TEL CKT— TRFR lamp extinguished.
8	Connect PAR receiver to TRANS MEAS— TM1 jack located on front of TTP writing shelf. Use appropriate cord. Set IMPEDANCE switch to 900 position.	
9	Momentarily operate BAT CHK key.	At PAR receiver— Meter indicates above BAT MIN.
10	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.
11	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted.

STEP	ACTION	VERIFICATION
		Note: Trunk is placed in ***local talk state.***
12	Request distant end to send PAR signal.	
13	Adjust COARSE and FINE RECEIVED LEVEL ADJ controls until RECEIVED LEVEL meter reads REF LEVEL.	At REF LEVEL meter— Average value of the received signal is established. At PAR meter— Meter indicates the ratio of the received signal peak pulse power to its average value. The scale (0 to 100) indicates the ***far-near*** PAR, which is the degree of received signal distortion.
14	At PAR receiver— Set PWR switch to OFF position.	
15	Remove cord from PAR receiver and TRANS MEAS—TM1 jack.	
16b	If ***near-far*** PAR measurement is not required— Proceed to Step 22.	
17	Request distant end to connect PAR receiver to circuit.	
18	Connect PAR generator to TRANS MEAS—TM1 jack located on the front of the TTP writing shelf. Use 900-ohm jack on PAR generator. Use appropriate cord.	
19	Momentarily operate BAT CHK key on PAR generator.	BAT CHK lamp lighted momentarily.
20	Request distant end to set reference level and read ***near-far*** PAR of signal transmitted from TTP.	
21	Remove card from PAR generator and TRANS MEAS—1 jack.	
22	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
23	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.

STEP	ACTION	VERIFICATION
24	At telephone set on TTP— Operate green release key.	

BA. Two-Way 1000 Hz Loss Measurement to 101-Type Test Line, Switchboard, Plant- or Traffic-Operating Desks—Terminating End Procedures

Note: Fig. 16 shows test configuration used in Test BA.

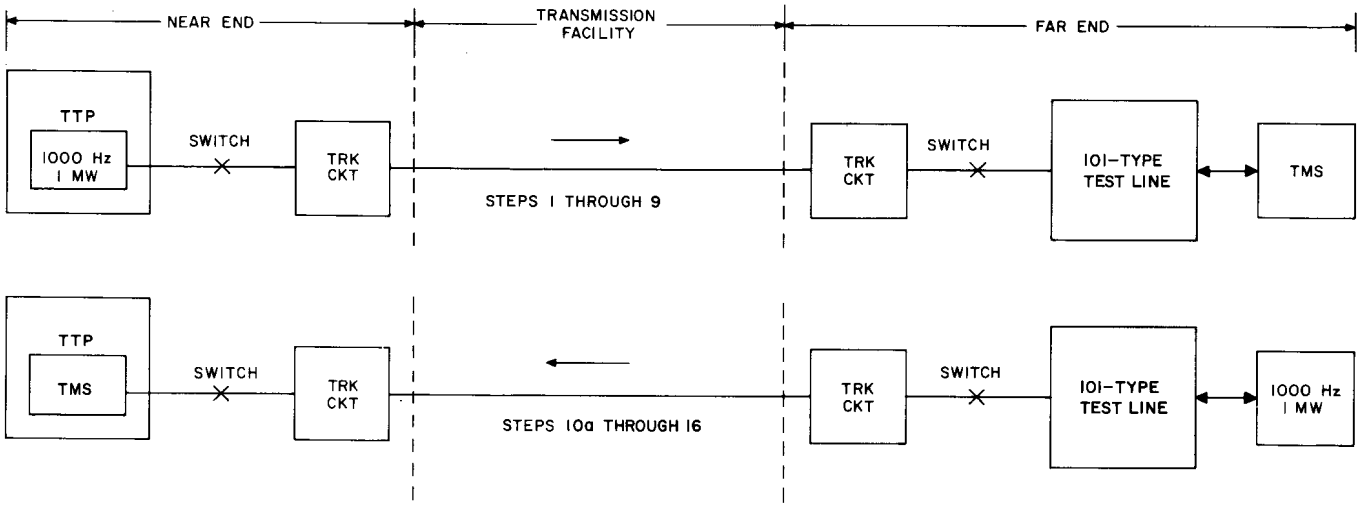

Fig. 16—Two-Way 1000-Hz Loss Measurement to 101-Type Test Line—Terminating End Procedures

1	When incoming call is connected to access trunk 1— Audible buzzer heard. At telephone set on TTP— Access trunk 1 lamp flashing.	
2	At telephone set— Operate access trunk 1 key.	
3	Place handset off-hook.	Perform voice verification with distant end.
4	Set up procedures with distant end for ***near-far*** and ***far-near*** actual measured loss test. Establish external talking link with distant end in order to coordinate test. Use local telephone facilities. Place handset on-hook.	

STEP	ACTION	VERIFICATION
5	Request distant end to connect TMS to trunk under test.	
6	At TRANSMISSION MEASURING CONTROL— Set SEND switch to 0 DBM 1 kHz position.	
7	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted. ***Note:*** Trunk is placed in ***tandem state.***
8	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
9	Request distant end to read actual measured loss on TMS.	At distant end— Meter indicates ***near-far*** loss.
10a	If TTP is equipped with TMS— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to TMS position.	
11b	If external TMS is used— Connect TMS to TRANS MEAS—TM1 jack located on the front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used.	
12	Request distant end to send 1000 Hz at 0 dBm level.	
13	At TMS— Set ADD DBM switch for on-scale reading.	At TMS— Meter indicates ***far-near*** loss.
14	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
15	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
16b	If external TMS is used— Remove cord from TMS and TRANS MEAS—TM1 jack.	

STEP	ACTION	VERIFICATION
17	At telephone set on TTP— Operate green release key.	

BB. Two-Way Frequency Response Measurement to 101-Type Test Line, Switchboard, Plant- or Traffic-Operating Desks—Terminating End Procedures

Note: Fig. ▶17◀ show test configuration for Test BB.

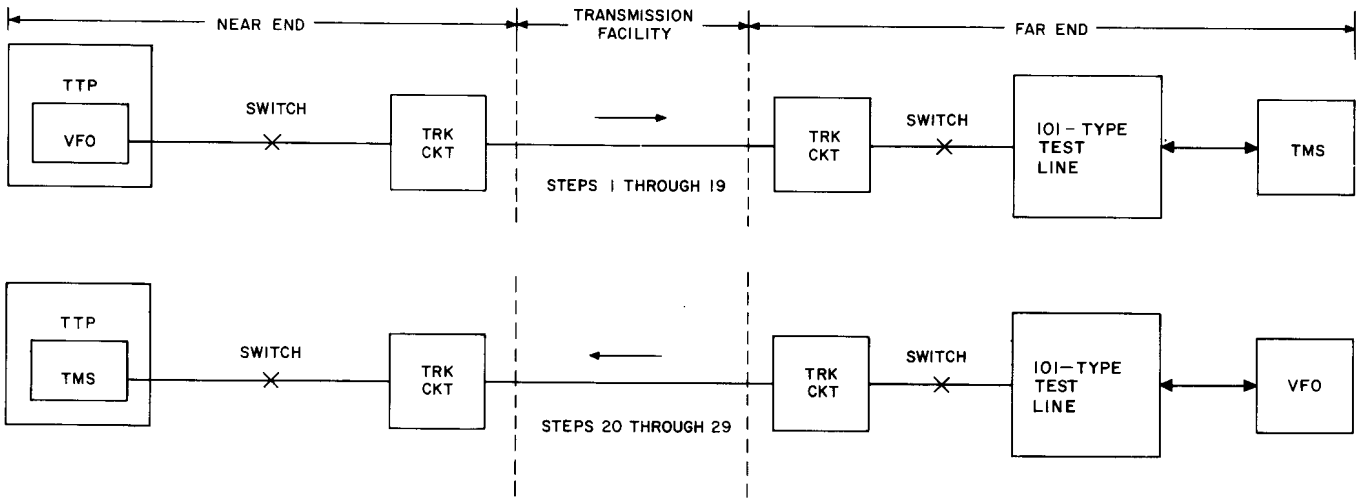

Fig. 17—Two-Way Frequency Response Measurement to 101-Type Test Line—Terminating End Procedures

1	When incoming call is connected to access trunk 1— Audible buzzer heard. At telephone set on TTP— Access trunk 1 lamp flashing.	
2	At telephone set— Operate access trunk 1 key.	
3	Place handset off-hook.	
4	Set up procedure with distant end for ***near-far*** (and ***far-near*** if required) frequency response measurement. Establish separate talking link with distant end in order to coordinate the test. Use local telephone facilities. Place handset on-hook.	Perform voice verification distant end.

STEP	ACTION	VERIFICATION
5a	If external TMS and external VFO is used— Connect TMS to VFO using appropriate cord.	
6b	If TTP is equipped with TMS and external VFO is used— Connect VFO to TRANS MEAS—TMS jack located on front of the TTP writing shelf. Use appropriate cord.	
7c	If TTP is equipped with VFO and external TMS is used— Connect TMS to TRANS MEAS—VFO jack located on front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used.	
8	At TRANSMISSION MEASURING CONTROL— Operate CAL key. Set MEASURE switch to MEAS 1 position. Set SEND switch to VFO position. Set TEST SET switch to TMS position.	At TRANSMISSION MEASURING CONTROL— CAL lamp lighted.
9	At VFO— Set FREQUENCY to 1000 Hz. Set OUTPUT LEVEL to 0 position.	
10	At TMS— Set ADD DBM switch to 0 position.	At TMS— Meter reads 0 dBm.
11	At TRANSMISSION MEASURING CONTROL— Release CAL key.	At TRANSMISSION MEASURING CONTROL— CAL lamp extinguished.
12	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted. ***Note:*** Trunk is placed in ***tandem state.***
13	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** TRUNK is placed in ***local talk state.***
14a	If external TMS and external VFO is used— Move cord from external TMS to TRANS MEAS—TM1 jack located at front of TTP writing shelf.	
15b	If TTP is equipped with TMS and external VFO is used— Move VFO connection from TRANS MEAS—TMS	

STEP	ACTION	VERIFICATION
	jack to TRANS MEAS—TM1 jack located at front of TTP writing shelf.	
16c	If TTP is equipped with VFO and external TMS is used— Remove cord from TMS and TRANS MEAS—VFO jack.	
17	Request distant end to measure loss with TMS.	At distant end— Meter indicates near-far loss of trunk at transmitted frequency.
18	Set VFO for ***each*** remaining frequency required from circuit layout card and request distant end to measure loss.	
19d	If external VFO is used— Remove cord from VFO and TRANS MEAS—TM1 jack.	
20e	If ***far-near*** frequency response measurement is not required— Proceed to Step 27.	
21	At TRANSMISSION MEASURING CONTROL— Set SEND switch to OFF position.	
22	Request distant end to connect VFO to trunk. Set output level to 0 dBm and frequency for first frequency to be measured.	
23f	If external TMS is used— Connect TMS to TRANS MEAS—TM1 jack at front of writing shelf on TTP.	
24	At TMS— Set ADD DBM switch for on-scale reading.	At TMS— Meter indicates ***far-near*** loss at transmitted frequency.
25	Repeat Step 24 for each remaining frequency required from circuit layout card.	
26f	If external TMS is used— Remove cord from TMS and TRANS MEAS—TM1 jack.	
27	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
28	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished.

STEP	ACTION	VERIFICATION
		EQPT ST lamp extinguished. At MIC TEST CONTROL— P & E lamp extinguished.
29	At telephone set on TTP— Operate green release key.	

BC. Message Circuit Noise Measurement to 101-Type Test Line, Switchboard, Plant- or Traffic-Operating Desks—Terminating End Procedures

Note: Fig. ▮18◖ shows test configuration for Test BC.

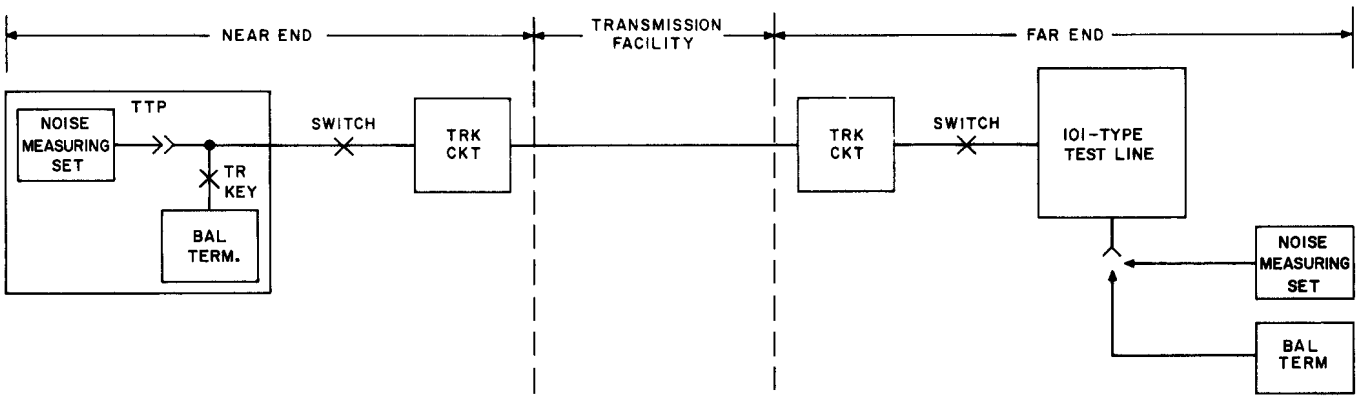

Fig. 18—Message Circuit Noise Measurement to 101-Type Test Line—Terminating End Procedures

1	When incoming call is connected to access trunk 1— Audible buzzer heard. At telephone set on TTP— Access trunk 1 lamp flashing.	
2	At telephone set— Operate access trunk 1 key.	
3	Place handset off-hook.	Perform voice verification with distant end.
4	Set up procedure with distant end for ***far-end*** (and ***near-end*** if required) noise measurement. Establish external talking link in order to coordinate the test. Use local telephone facilities. Place handset on-hook.	

STEP	ACTION	VERIFICATION
5	At TRANSMISSION MEASURING CONTROL— Operate TR key.	At TRANSMISSION MEASURING CONTROL— TR lamp lighted.
6	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted. ***Note:*** Trunk is placed in ***tandem state.***
7	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
8	Request distant end to measure noise.	At distant end— Meter indicates ***far-end*** noise of trunk.
9	At TRANSMISSION MEASURING CONTROL— Release TR key.	At TRANSMISSION MEASURING CONTROL— TR lamp extinguished.
10a	If ***near-end*** noise is not to be measured— Proceed to Step 16c.	
11	Request distant end to connect 900-ohms balanced termination to trunk.	
12b	If TTP is equipped with noise measuring set— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to NOISE position.	
13c	If external noise measuring set is used— Connect noise measuring set to TRANS MEAS—TM1 jack located on front of the TTP writing shelf. Use appropriate cord to connect GND post to ground.	
14c	Set FUNCTION switch to BAT position.	At noise measuring set— Meter reads in the BAT range.
15	At noise measuring set— Set FUNCTION switch to NM 600/900 position. Set DBRN switch for on-scale reading.	At noise measuring set— Meter indicates ***near-end*** noise of trunk.
16c	If external noise measuring set is used— Remove cord from noise measuring set and TRANS MEAS—TM1 jack. Set FUNCTION switch to OFF position.	
17	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.

STEP	ACTION	VERIFICATION
18	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
19	At telephone set on TTP— Operate green release key.	

BD. Impulse Noise Measurement to 101-Type Test Line, Switchboard, Plant- or Traffic-Operating Desks—Terminating End Procedures

Note: Fig. ▶19◀ shows test configuration for Test BD.

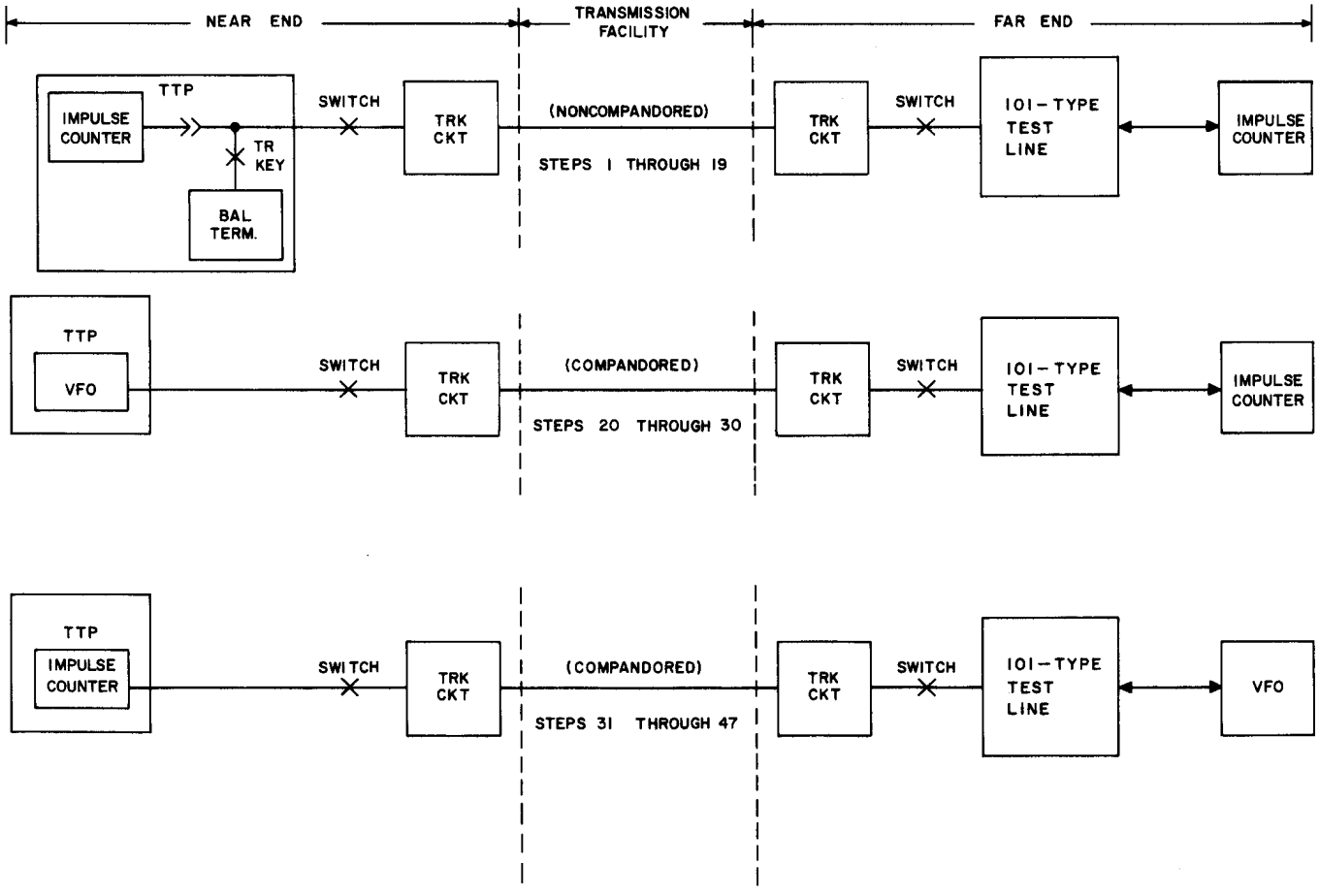

Fig. 19—Impulse Noise Measurement to 101-Type Test Line—Terminating End Procedures

STEP	ACTION	VERIFICATION
1	When incoming call is connected to access trunk 1— Audible buzzer heard. At telephone set on TTP— Access trunk 1 lamp flashing.	
2	At telephone set— Operate access trunk 1 key.	
3	Place handset off-hook.	Perform voice verification with distant end.
4	Set up procedure with distant end for ***far-end*** (and ***near-end,*** if required) impulse noise measurement. Establish separate talking link to coordinate the test. Use local telephone facilities. Place handset on-hook.	
5a	If trunk contains N, O, or ON carrier— Proceed to Step 20e.	
6	At TRANSMISSION MEASURING CONTROL— Operate TR key.	At TRANSMISSION MEASURING CONTROL— TR lamp lighted.
7	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted. ***Note:*** Trunk is placed in ***tandem state.***
8	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
9	Request distant end to set-up and read impulse counter.	At distant end— Counter indicates ***far-end*** impulse count during preset period.
10	At TRANSMISSION MEASURING CONTROL— Release TR key.	At TRANSMISSION MEASURING CONTROL— TR lamp extinguished.
11b	If ***near-end*** impulse noise is not required— Proceed to Step 45.	
12c	If TTP is equipped with impulse counter— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to CTR position.	

STEP	ACTION	VERIFICATION
13d	If external impulse counter is used— Connect impulse counter to TRANS MEAS—TM1 jack located on front of the TTP writing shelf. Use appropriate cord. Ensure 900-ohm input impedance is used. Set DIAL—MEAS switch to MEAS position.	
14	At impulse counter— Set DBRN dial to the required noise threshold level from distant-end records.	
15	Turn MINUTE control to required time from distant end records. ***Note:*** To ensure accurate timing in intervals of 3 minutes or less, first adjust the timer to at least 5 minutes and then return it to the desired value.	
16	Momentarily operate reset lever located directly beneath the counter.	At impulse counter— Counter indicates 0000.
17	When MINUTES control indicates 0— Read counter.	Counter indicates ***near-end*** impulse count during preset time period.
18d	If external impulse counter is used— Remove cord from impulse counter and TRANS MEAS—TM1 jack.	
19	Proceed to Step 45.	
For N, O, or ON Carriers Only		
20e	If TTP is equipped with VFO— At TRANSMISSION MEASURING CONTROL— Set SEND switch to VFO position.	
21f	If external VFO is used— Connect VFO to TRANS MEAS—TM1 jack located on the front of the TTP writing shelf. Use appropriate cord.	
22	At VFO— Set FREQUENCY to 2750 Hz and OUTPUT LEVEL to -10 dBm.	
23	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted.

STEP	ACTION	VERIFICATION
		Note: Trunk is placed in ***tandem state.***
24	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
25	Request distant end to set impulse counter DBRN dial to 57, turn MINUTE control to 15 minutes and momentarily operate reset lever located directly beneath the counter.	
26g	If impulse counter does not count continuously— Proceed to Step 28.	
27h	If impulse counter counts continuously— Adjust VFO above 2750 Hz until impulse counter stops counting. ***Note:*** If no VFO setting can be found that will stop the impulse counter from counting continuously, adjust OUTPUT LEVEL to -13 dBm and repeat Step 27h. Insert successively more loss until a frequency is found that causes the impulse counter to stop counting continuously.	
28	Request distant end to set impulse counter DBRN dial to the required noise threshold level. Turn MINUTE control to required time and momentarily operate reset lever.	
29	When MINUTE control indicates 0— Read counter.	Counter indicates ***far-end*** impulse count during preset time period.
30f	If external VFO is used— Remove cord from VFO and TRANS MEAS—TM1 jack.	
31i	If distant office ***near-end*** impulse noise measurement is not desired— Proceed to Step 45.	
32c	If TTP is equipped with impulse counter— At TRANSMISSION MEASURING CONTROL— Set MEASURE switch to MEAS 1 position. Set SEND switch to OFF position. Set TEST SET switch to CTR position.	
33d	If external impulse counter is used— Connect impulse counter to TRANS MEAS—TM1 jack located on front of the TTP writing shelf.	

STEP	ACTION	VERIFICATION
	Use appropriate cord. Ensure 900-ohm input impedance is used. Set DIAL-MEAS switch to MEAS position.	
34	Request distant end to connect VFO to trunk. Set frequency to 2700 Hz and output level to -10 dBm.	
35	At impulse counter— Set DBRN dial to 57.	
36	Turn MINUTES control to 15 minutes.	
37	Momentarily operate reset lever located directly beneath the counter.	At impulse counter— Counter indicates 0000.
38g	If impulse counter does not count continuously— Proceed to Step 40.	
39h	If impulse counter counts continuously— Request distant end to adjust VFO above 2750 Hz until impulse counter stops counting. ***Note:*** If no VFO setting can be found that will stop the impulse counter from counting continuously, request distant end to adjust output level to -13 dBm and repeat Step 39h. Insert successively more loss until a frequency is found that causes the impulse counter to stop counting continuously.	
40	At impulse counter— Set DBRN dial to the required noise threshold level from distant end records.	
41	Turn MINUTES control to required time from distant end records. ***Note:*** To ensure accurate timing in intervals of 3 minutes or less, first adjust the timer to at least 5 minutes and then return it to the desired value.	
42	Momentarily operate reset lever located directly beneath the counter.	At impulse counter— Counter indicates 0000.
43	When MINUTES control indicates 0— Read counter.	Counter reading indicates ***near-end*** impulse count during preset time period.
44d	If external impulse counter is used— Remove cord from impulse counter and TRANS MEAS—TM1 jack.	

STEP	ACTION	VERIFICATION
45	At TRANSMISSION MEASURING CONTROL Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
46	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
47	At telephone set on TTP— Operate green release key.	

BE. Two-Way PAR Measurement to 101-Type Test Line, Switchboard, Plant- or Traffic-Operating Desk—Terminating End Procedures

Note: Fig. ▶20◀ shows test configuration for Test BE.

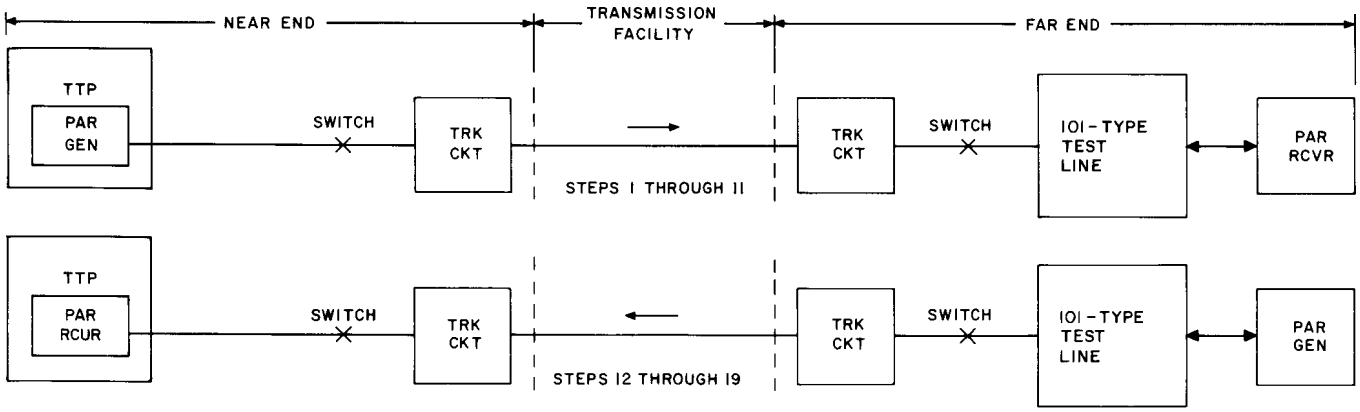

Fig. 20—Two-Way PAR Measurement to 101-Type Test Line—Terminating End Procedures

1	When incoming call is connected to access trunk 1— Audible buzzer heard. At telephone set on TTP— Access trunk 1 lamp flashing.	
2	At telephone set— Operate access trunk 1 key.	
3	Place handset off-hook.	Perform voice verification with distant end.

STEP	ACTION	VERIFICATION
4	Set up procedure with distant end for ***near-far*** (and ***far-near*** if required) PAR (peak-average —ratio) measurement. Establish separate talking link in order to coordinate the test. Use local telephone facilities. Place handset on-hook.	
5	Connect PAR generator to TRANS MEAS—TM1 jack located on front of TTP writing shelf. Use appropriate cord. Use 900-ohm jack on PAR generator.	
6	Momentarily operate BAT CHK key on PAR generator.	At PAR GENERATOR— BAT CHK lamp lighted momentarily.
7	At ACCESS TRUNK 1 CONTROL— Depress XMSN key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp lighted. ***Note:*** Trunk is placed in ***tandem state.***
8	At TRANSMISSION MEASURING CONTROL— Operate LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp lighted. ***Note:*** Trunk is placed in ***local talk state.***
9	Request distant end to set reference level and read near-far PAR measurement on PAR receiver.	
10	Remove cord from PAR generator and TRANS MEAS—TM1 jack.	
11a	If ***far-near*** PAR measurement is not required— Proceed to Step 17.	
12	Connect PAR receiver to TRANS MEAS—TM1 jack located on front of the TTP writing shelf. Use appropriate cord.	
13	At PAR receiver— Set IMPEDANCE switch to 900 position.	
14	Momentarily operate BAT CHK key.	At PAR receiver— Meter indicates above BAT MIN.
15	Adjust COARSE and FINE RECEIVED LEVEL ADJ controls until RECEIVED LEVEL meter reads REF LEVEL.	At REF LEVEL METER— Average value of the received signal is established. At PAR meter— Meter indicates the ratio of the received signal peak pulse power to its average value.

STEP	ACTION	VERIFICATION
		Scale (0 to 100) indicates far-near PAR, which is the degree of received signal distortion.
16	Remove cord from PAR receiver and TRANS MEAS—TM1 jack.	
17	At TRANSMISSION MEASURING CONTROL— Release LTS 1 key.	At TRANSMISSION MEASURING CONTROL— LTS 1 lamp extinguished.
18	At ACCESS TRUNK 1 CONTROL— Depress RLS key.	At ACCESS TRUNK 1 CONTROL— XMSN lamp extinguished. SUPV lamp extinguished. EQPT ST lamp extinguished. At MISC TEST CONTROL— P & E lamp extinguished.
19	At telephone set on TTP— Operate green release key.	