

TRUNK TRANSMISSION TESTS

STEP-BY-STEP

NOT PROVIDED WITH

MANUAL TRUNK TEST FRAME

1. GENERAL

PAGE

1.01 This section describes the methods of making transmission measurements on outgoing trunks and trunks to switchboards or plant or traffic operating desks in step-by-step offices not provided with a manual trunk test frame. This section also describes the method of assisting with transmission measurements on incoming trunks. The transmission measurements covered in this section include loss, message circuit noise, impulse noise, frequency response, and peak-to-average ratio (P/AR).

1.02 This section is reissued to:

- (a) Add paragraph 1.20.
- (b) Revise Tests A, B, D, E, AA, AB, and AC to No. 5 Crossbar ACD using a 2AB test set.
- (c) Revise Table A.
- (d) Add Table B.
- (e) Correct Fig. 2.

This reissue does not affect the Equipment Test List.

1.03 The tests covered are:

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- A. One-Way 1000-Hz Loss Measurement to 102-Type Test Line:** 12
- B. Message Circuit Noise Measurement to 100-Type Test Line:** 13

- C. Impulse Noise Measurement to 100-Type Test Line:** 14
- D. Two-Way 1000-Hz Loss Measurement and Noise Check to 104-Type Test Line:** 15
- E. Two-Way 1000-Hz Loss Measurement Using Loop-Around Test Line:** 17
- AA. Two-Way 1000-Hz Loss Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures:** 21
- AB. Two-Way Frequency Response Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures:** 23
- AC. Message Circuit Noise Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures:** 25
- AD. Impulse Noise Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures:** 27
- AE. Two-Way P/AR Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures:** 32

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Note: Tests BA through BE describe the methods of assisting the distant originating end in making transmission measurements on the trunk under test terminated at the 101-type test line at the near end.

BA. Two-Way 1000-Hz Loss Measurement to 101-Type Test Line—Terminating End Procedures:	33
BB. Two-Way Frequency Response Measurement to 101-Type Test Line—Terminating End Procedures:	35
BC. Message Circuit Noise Measurement to 101-Type Test Line—Terminating End Procedures:	35
BD. Impulse Noise Measurement to 101-Type Test Line—Terminating End Procedures:	36
BE. Two-Way P/AR Measurement to 101-Type Test Line—Terminating End Procedures:	40

1.04 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 letters of double-lettered tests and procedures identify companion procedures and tests. For example:

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

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 Transmission requirements for trunks are shown on circuit layout cards, on local trunk records, or in the appropriate section of Bell System Practices.

1.06 In each test, the measurement indicated by the transmission measuring set (TMS) includes the loss of the connecting circuits used to obtain access to the trunk.

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

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

1.09 If a milliwatt outlet is not available at the test location, the 71B milliwatt reference generator must be used.

1.10 The 2AB auxiliary transmission test set may be used for holding or dialing and holding on all tests. Tests using the 6A impulse counter, the 3A noise measuring set (NMS), and the J94742A portable auxiliary test set require the 2AB auxiliary transmission test set for holding and busying the trunk under test. The ground connected to binding post SM on the 2AB auxiliary transmission test set, the 23A TMS, and the S binding post of the 23D TMS is required to busy and hold the trunk under test. When the 2AB auxiliary transmission test set is used in test connections, a correction of 0.5 dB must be subtracted from a loss measurement or added to a noise measurement to obtain the actual measured loss or noise.

1.11 In Tests A through AE, the circuit layout card (or equivalent record) may require that the measurement be made with TP2 (2 dB test pad) at the measuring end. This requires that a 2AB test set with the 2-dB key operated to IN be connected between the measuring set and the trunk access point (except in Test E). In Test E, a 2-dB correction must be made to the results of the measurement.

1.12 When testing trunks at a selector frame, office records should be consulted to determine if selector having access to trunks under test is arranged for digit absorbing. If selector is arranged to absorb initial digit on level under test, an extra digit must be dialed before access to test level is obtained.

1.13 Procedures are given for testing from selectors, connectors, trunk finders, outgoing repeaters, or trunk circuit. Trunks terminating on a ROT switch must be tested from the outgoing repeater or trunk circuit. If ROT switches are not provided, trunks should be tested from selectors, connectors, or trunk finders. Trunks using simplex supervision are tested from the trunk circuit.

1.14 The transmission loss indicated by the TMS meter is the actual measured loss (AML) in dB of the circuit under test and is made under the same conditions as expected measured loss (EML) was computed. The loss from the selector to the outgoing repeater or trunk circuit (through the rotary out trunk switch, if provided) should be taken into consideration when comparing the AML to the EML for trunks not measured from the selector.

1.15 When testing trunks using simplex supervision, the loss through the testing and maintenance talking trunk and test (TMTTT) must be determined and the value posted for reference. This TMTTT circuit loss must be subtracted from a loss measurement or added to a noise measurement made through this circuit to obtain the actual measured loss or noise. This correction is in addition to the correction for the loss of the 2AB test set (see 1.10) when used with the TMTTT.

1.16 For Tests AB and BB, caution should be taken when using a continuously variable oscillator not to sweep through 2400 or 2600 Hz on a trunk that uses a single frequency signaling unit.

1.17 After the trunk under test has been connected to a 101-type test line, Tests AA through AE can be performed on the same trunk without releasing the trunk from the test line.

1.18 If so directed by the distant originating end, Tests BA through BE can be performed on the trunk under test before releasing it.

1.19 Test C is only applicable for trunks not containing N, O, or ON carrier.

1.20 ♦The TMS, NMS, and 2AB impedance and test pad should be set as determined by type of trunk under test. Table B illustrates the standard office trunk arrangement and the associated matching impedance value. To insure accurate measurements, use the impedance values indicated per office trunk-type under test.♦

1.21 **Lettered Steps:** A letter a, b, c, etc, added to a step number in Parts 3 and 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

2.01 The apparatus required for each test is shown in Table A. A more descriptive name and additional information on each item are covered in the paragraph indicated by the number in parentheses. Calibration and operating procedures for each set may be found in the section listed with each test set. ***It is important that the transmission test equipment is known to be accurately calibrated.***

2.02 101-type trunk transmission test line circuit, consisting of Item 74 of SD-98100-01 and jack and lamp designated TM1 and L1 respectively. For testing incoming local (Class 5) type trunks using loop supervision.

2.03 101-type trunk transmission test line circuit, where required, consisting of Item 70 or 72 of SD-98100-01 and jack and lamp designated TM2 and L2, respectively. For testing incoming CAMA trunks arranged for ANI, using simplex supervision.

2.04 101-type trunk transmission test line circuit, where required, consisting of Item 70 or 72 of SD-98100-01 and jack and lamp designated TM3 and L3 respectively. For testing incoming intertoll dialing type trunks other than those covered in 2.03, using simplex supervision.

Note: The TM_ and L_ jacks are normally mounted on a miscellaneous basis.

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- 2.05** 23A-D transmission measuring set (TMS) (Section 103-223-100 or 103-223-101).
- 2.06** 1014A handset (dial hand test set), equipped with a 2W38A cord assembly consisting of W2CK cord, 471A jack, and 310 plug or equivalent.
- 2.07** 2AB auxiliary transmission test set (2AB test set) J94002AB (Section 103-202-100).
- 2.08** 71B milliwatt reference generator (71B MW GEN) J94071B (Section 103-326-100).
- 2.09** 3A or 3C noise measuring set (NMS) J94003A or J94003C equipped with a 723A receiver (Section 103-611-100 or 103-611-101).
- Note:** The 3A set requires a 723 receiver with a special cord assembly (2W46A) which has a built-in 15,000-ohm resistor to reduce the bridging effect of the receiver on the meter indications. The cord (W2FS) used with the 723 receiver for the 3C set has no built-in resistor. Care should, therefore, be exercised to avoid the association of the wrong receiver and cord assembly with the 3A and 3C sets. Use of the receiver and cord of the 3C set with the 3A set will result in erroneous indications. Use of the receiver and cord of the 3A set with the 3C set will result in low receiver output.
- 2.10** 6A or 6H impulse counter (IC) J94006A or J94006H (Section 103-620-100 or 103-620-101).
- 2.11** KS-19353, L1 or L4 oscillator (OSC) (Sections 103-302-105 and 103-302-106, respectively).
- Note:** The oscillator should be adjusted to desired output level as measured with the 23-type TMS with the input key operated to 600 or 900 depending on the oscillator output jack used on the position of the oscillator function switch. With the KS-19353 L1 OSC the output should be checked after each change in frequency.
- 2.12** P/AR meter generator (P/AR GEN) J94027A (Section 103-110-110).
- 2.13** P/AR meter receiver (P/AR RCVR) J94027B (Section 103-110-110).
- 2.14** TMTTT circuit SD-64604-01, Fig. 8, 10, and 13 (for testing trunks with simplex supervision).
- 2.15** Patching cord, P3H cord, 10 feet long, equipped with a 310 plug and a 240A plug (3P2A cord).
- 2.16** Patching cord, P4K cord, 12 feet long, equipped with one 240B plug and one 289B plug (4P4B cord) for testing trunks with simplex supervision.
- 2.17** Testing cord, 893 cord, 6 feet long, equipped with two 360A tools (1W13B cord) and two KS-6278 connecting clips for connecting ground to 3A, 3C NMS, 2AB auxiliary transmission test set, and 23 TMS.
- 2.18** Patching cord, P2B cord, 6 feet long, equipped with two 310 plugs (2P4C cord). **Do not substitute; 6A IC must not be grounded.**
- 2.19** Patching cord, P3E cord, 6 feet long, equipped with two 310 plugs (3P7A cord).
- 2.20** Patching cord, P2AE cord, 4 feet long, equipped with a 310 plug and 289B plug (2P16A cord).
- 2.21** Testing cord, W2DL cord, 5 feet 6 inches long, equipped with a 310 plug and two 35 cord tips (2W42A cord).
- 2.22** 52S (replaces 52A) head telephone set.
- 2.23** J94742A portable auxiliary test set for initiating calls to the No. 5 crossbar automatic call distributor.
- 2.24** Patching cord, P2J cord, 6 feet long, equipped with two 310 plugs (2P9B cord).
- 2.25** Headset composed of one 716C receiver attached to a W2AB cord, 6 feet long, equipped with two 360A tools (2W21A cord), one 411A tool (test pick), and one KS-6780 connecting clip.
- 2.26** Testing cord, W3M cord, 15 feet long, equipped with a 310 plug, three 360 tools, and three KS-6278 connecting clips (3W4B cord).

→TABLE A←

APPARATUS	TESTS														
	A	B	C	D	E	AA	AB	AC	AD	AE	BA	BB	BC	BD	BE
101-Type Test Line (2.02), (2.03) or (2.04)											1	1	1	1	1
23-Type TMS (2.05)	1			1	1	1	1				1	1			
Handset (2.06)	1	1	1	1	1	1	1	1	1	1					
2AB Test Set (2.07)	1*	1¶	1	1	1	1	1	1¶	1	1				1‡	
71B MW GEN (2.08)	1†	1†	1†	1				1†	1†		1				
3A or 3C NMS (2.09)		1						1					1		
6A or 6H IC (2.10)			1						1						
Oscillator (2.11)							1		1‡			1		1‡	
P/AR GEN (2.12)										1					1
P/AR RCVR (2.13)										1					1
TMTTT (2.14)†	1	1	1	1	2	1	1	1	1	1					
Patching Cord (2.15)	1	1	1	1	2	1	1	1	1	1					
Patching Cord (2.16)†	1	1	1	1	2	1	1	1	1	1					
Testing Cord (2.17)§ §	1	1		1	1	1	1	1							
Patching Cord (2.18)			1						1§					1§	
Patching Cord (2.19)	2	1**†	1†	3	3	3	3	1**†	1†	2	3	3	1**†		1
Patching Cord (2.20)	1†	2**	1†	1†	1†	1†	1†	2**	1†	1†			1**		
Testing Cord (2.21)									2††	1				2††	1
KS-6320 Orange Stick	1	1	1	1	1	1	1	1	1	1					
52S Head Telephone Set (2.22)											1	1	1	1	1
554A Filter ††									1					1	
J94742A Aux Test Set (2.23)‡ ‡	1	1		1	1	1	1	1							
Patching Cord (2.24)‡ ‡	1	1		1	1	1	1	1							
Test Receiver (2.25)§ §	1	1		1	1	1	1	1							
Testing Cord (2.26)§ §	1	1		1	2	1	1	1							

Notes:

* Required if 2 dB pad is required.

† Required if testing trunks with simplex supervision.

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

†† Required if testing trunks containing N, O, or ON carrier using 6A IC.

§ Required if testing trunks not containing N, O, or ON carrier, or if using 6H IC.

¶ Required if testing using 3C NMS with 2 dB pad required and if testing using 3A NMS.

** 2P16A cord required for connection to 3A NMS.

** 3P7A cord required for connection to 3C NMS.

‡‡ Required if testing trunks to No. 5 Crossbar ACD.

§ § Required if testing trunks to No. 5 Crossbar ACD from frame appearance.

3. PREPARATION

3.01 *Each test set should be calibrated before it is used in accordance with the appropriate section of Bell System Practices (see Part 2).* Details of operation can be found in those sections.

STEP	ACTION	VERIFICATION
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Calibration of TMTTT

- | | | |
|---|---|--|
| 1 | At TMS—
Operate DIAL-MEAS-SLV key to MEAS. | |
| 2 | Operate INPUT key to 600. | |
| 3 | Using P3E cord, connect MEAS jack to TST jack of TMTTT circuit. | |
| 4 | Using P2AE cord, connect 289B plug to SW jack of TMTTT circuit and 310 plug to OUTPUT 600 jack of 71B MW GEN. | |
| 5 | Record TMS meter reading and post it in a conspicuous place on the TMTTT circuit. | |
| | Note: This meter reading is the loss of TMTTT circuit and must be taken into consideration on all tests of trunks with simplex supervision (see 1.11). | |
| 6 | Disconnect all cords and equipment. | |

Tests A, B, C, D and AA through AE (Using 2 AB Test Set—see 1.10) Fig. 2

- | | | |
|-----|--|--|
| 7 | At 2AB test set—
Insert 310 plug of handset into DIAL jack. | |
| 8a | If testing trunks with simplex supervision—
Using P3E cord, connect MEAS jack of 2AB test set to TST jack of TMTTT. | |
| 9a | Operate TEST switch to REC 600. | |
| 10b | If testing trunks with loop supervision—
Insert 310 plug of P3H cord into MEAS jack. | |
| 11b | Connect SM binding post to ground. | |
| 12b | Operate TEST switch to REC 900. | |

STEP	ACTION	VERIFICATION
13c	If test requires TP2 (see 1.11)— Operate 2 dB key to IN.	
14	Operate DIAL-SLV key to DIAL.	

Tests A, E (Test A—not Using 2AB Test Set—see 1.10) Fig. 1 and 4

15	At TMS— Insert 310 plug of handset into DIAL jack.	
16a	If testing trunks with simplex supervision— Using P3E cord, connect MEAS jack of TMS to TST jack of TMTTT.	
17a	Operate INPUT key to 600.	
18b	If testing trunks with loop supervision— Insert 310 plug of P3H cord into MEAS jack.	
19b	Connect SM binding post to ground (S binding post on 23 D TMS).	
20b	Operate INPUT key to 900.	
21	Operate DIAL-MEAS-SLV key to DIAL.	

Test B and AC (Using 3C NMS, Without 2AB Test Set—see 1.10) Fig. 3

22	At 3C NMS— Insert 310 plug of handset into DIAL jack.	
23a	If testing trunks with simplex supervision— Using P3E cord, connect IN jack of NMS to TST jack of TMTTT.	
24b	If testing trunks with loop supervision— Insert 310 plug of P3H cord into IN jack.	
25b	Make sure that link between S and GRD is in place.	
26	Operate FUNCTION switch to DIAL.	

Tests A through AE

27	Operate handset switch to MON.	
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STEP	ACTION	VERIFICATION
Testing Trunks with Simplex Supervision		
28	At trunk circuit of trunk under test— Using P4K cord, connect 289B plug to SW jack of TMTTT and 240B plug to test jack of trunk circuit.	At TMTTT— If trunk is busy— SP lamp lighted.
29	When SP lamp extinguished— Operate handset switch to TALK.	If testing switchboard- and desk-ended trunks— At switchboard or desk— Call is answered and, if required, will be transferred to a supervisory telephone circuit.
Testing Trunk with Loop Supervision		
	Note: When testing CAMA trunks, extreme care should be taken to assure that the correct test line code is dialed to avoid false billing of the test call. When making test calls over CAMA trunks with ONI, and in some cases with ANI, the CAMA operator may come in on the connection. When this occurs, pass the number assigned to this office for these tests to the CAMA operator.	
30	At 2AB test set (when used)— Operate DIAL-SLV key to DIAL.	
31	At TMS (when used)— Operate DIAL-MEAS-SLV key to DIAL.	
32	At 3C NMS (when used)— Operate FUNCTION switch to DIAL.	
33d	If testing at selector frame— Insert 240A plug of P3H cord into test jack of idle selector having access to trunks under test.	
34d	Operate handset switch to TALK.	
35d	With handset, dial level on which trunks to be tested are located.	Selector steps to level dialed and rotates to first idle trunk. If testing switchboard- and desk-ended trunks— At switchboard or desk— Call is answered and, if required, will be transferred to supervisory telephone circuit.
36d	After test on trunk is completed— To test other trunks on same selector level— Operate handset switch to TALK, if not already in this position.	

STEP	ACTION	VERIFICATION
37d	Open and close off-normal springs of selector using KS-6320 orange stick applied to tip of off-normal finger.	Selector rotates to next idle trunk on same selector level. If testing switchboard- and desk-ended trunks— At switchboard or desk— Call is answered and, if required, will be transferred to supervisory telephone circuit.
38e	If testing at outgoing repeater frame or trunk circuit of trunk to be tested— Insert 240A plug of P3H cord into test jack of outgoing repeater or trunk circuit associated with trunk to be tested.	
39e	Monitor with handset; if trunk is idle, operate handset switch to TALK.	If testing switchboard- and desk-ended trunks— At switchboard or desk— Call is answered and, if required, will be transferred to supervisory telephone circuit.
Tests A, B, D, E, AA, AB, and AC to No. 5 Crossbar ACD		
40	At J94742A auxiliary test set— Restore all keys to normal.	
41	Place TRK TR switch in position 1.	
42	Using P2J cord, patch BAT jack to -48V battery and ground supply.	
Tests A, D, E, AA and AB to No. 5 Crossbar ACD (Not Using 2AB Test Set)		
43	At J94742A auxiliary test set— Using P3E cord, patch TRK 1 TST FAC jack to MEAS jack of TMS (see Fig. 1 or 4).	
44	Using P3H cord, patch TRK 1 TRK jack to test jack of trunk to be tested.	
45	Operate handset switch to monitor.	
46	At TMS— Using 1W13B cord, connect SM binding post to ground (S binding post on 23D TMS).	
47	Insert 310 plug of handset into DIAL jack.	Conversation heard if trunk is busy.
48f	If testing trunks to a No. 5 Crossbar ACD without test jacks— At frame appearance of trunk to be tested— Using test receiver with KS-6780 clip connected	No click heard in test receiver. Note: If click is heard in test receiver, the trunk is busy. Do not connect test equipment

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STEP	ACTION	VERIFICATION
	to test battery, touch 411 test pick to sleeve of trunk to be tested.	to busy trunk.
49f	Using 3W4B cord, connect T, R, S conductors to T, R, S terminals using KS-6278 connecting clips.	
50f	At J94742A auxiliary test set— Insert 310 plug of 3W4B cord into TRK 1 TRK jack.	
Tests A, B, D, E, AA, AB, and AC to No. 5 Crossbar ACD Using 2AB Test Set		
51	At J94742A auxiliary test set— Using P3E cord, patch TRK 1 TST FAC jack to MEAS jack of 2AB test set.	
52	◆Operate handset switch to MON.◆	
53	At 2AB test set— Using 1W13B cord, connect ground to SM binding post.	
54	Insert 310 plug of handset into DIAL jack.	
55	Operate DIAL-SLV key to DIAL.	
56	At J94742A auxiliary test set— Using P3H cord, patch TRK 1 TRK jack to test jack of trunk to be tested.	
57	Monitor with handset.	Conversation heard if trunk is busy.
58f	If testing trunks to a No. 5 Crossbar ACD without test jacks— At frame appearance of trunk to be tested— Using test receiver with KS-6780 clip connected to test battery, touch 411 test pick to sleeve of trunk to be tested.	No click heard in test receiver. Note: If click is heard in test receiver, the trunk is busy. Do not connect test equipment to busy trunk.
59f	Using 3W4B cord, connect T, R, S conductors to T, R, S terminals using KS-6278 connecting clips.	
60f	At J94742A auxiliary test set— Insert 310 plug of 3W4B cord into TRK 1 TRK jack.	

STEP	ACTION	VERIFICATION
Tests AA through AE		
61g	If testing at connector frame— Insert 240A plug of P3H cord into test jack of idle connector having access to trunks under test.	
62g	Operate handset switch to TALK.	
63g	Dial connector terminal on which trunk to be tested is located.	Connector steps to level dialed and rotates to terminal dialed. At switchboard or desk— Call is answered and, if required, will be transferred to supervisory telephone circuit.
64h	If testing at trunk finder— Select idle trunk finder and make busy as required.	
65h	Insert 240A plug of P3H cord into MON jack of trunk finder.	
66h	Step trunk finder to trunk to be tested.	At switchboard or desk— Call is answered and, if required, will be transferred to supervisory telephone circuit.

Tests BA Through BE

Note: In these tests, the distant office will originate the test call to one of the 101-type trunk transmission test lines, resulting in one of lamps L1, L2, or L3 flashing.

67	At 101-type test line— Connect 52S headset to TEL jack.	
68	When lamp L1, L2, or L3 flashes— Operate T_ key associated with lighted L_ lamp to TALK.	L_ lamp lights steadily.
69	Determine from originating end type of test to be made and the length of time to be allowed for each test.	

Note: Tests associated with L1 are made at 900 ohms. Tests associated with L2 or L3 are made at 600 ohms.

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STEP	ACTION	VERIFICATION
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4. METHOD

STEP	ACTION	VERIFICATION
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A. One-Way 1000-Hz Loss Measurement to 102-Type Test Line (Fig. 1 or 2)

61i	If 2AB test set is used— Using P3E cord, patch TMS jack of 2AB test to MEAS jack of TMS.	
62	◆At TMS— Operate INPUT key to 600 or 900 per Table B. (See 1.20.)◆	
63j	If testing trunks to a No. 5 Crossbar ACD using SF signaling— At J94742A auxiliary test set— Operate DEL key.	Interrupted dial tone heard in handset.
64k	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Operate START 1 key.	
65k	Restore START 1 key.	
66k	Press TOUCH-TONE® button 2 to select 102-type test line.	
67k	Operate CUT THRU 1 key.	
68	On handset— Dial number required to reach 102-type test line.	1000-Hz tone heard.
69l	If testing switchboard ended trunks— Request operator to connect to 1MW TEST jack.	
70	At TMS— Operate DIAL-MEAS-SLV key to MEAS.	
71i	If 2AB test set is used— At 2AB test set— Operate DIAL-SLV key to normal.	
72	Record TMS meter reading (see 1.10).	
73	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 64k through 72.	

STEP	ACTION	VERIFICATION
74m	If no further tests are to be made— Remove all patching cords; restore all keys.	
B. Message Circuit Noise Measurement to 100-Type Test Line (Fig. 2 or 3)		
61j	If 3A NMS is used— At 3A NMS— Using P2AE cord, connect 289B plug to IN jack and 310 plug to TMS jack of 2AB test set.	
62j	◆Operate FUNCTION switch to NM 600 or 900 per Table B (see 1.20).◆	
63k	If 3C NMS is used with 2AB test set— At 3C NMS— Using P3E cord, connect IN jack to TMS jack of 2AB test set.	
64k	Operate FUNCTION switch to NM-600/900.	
65l	If 3C NMS is used without 2AB test set— At 3C NMS, using 893 cord, connect GND binding post to ground.	
66	Connect 723A receiver to AC MON jack.	
67m	If testing trunks to a No. 5 Crossbar ACD using SF signaling— At J94742A auxiliary test set— Operate DEL key.	
68n	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Operate START 1 key.	Interrupted dial tone heard in handset.
69n	Restore START 1 key.	
70n	Press TOUCH-TONE button 0 to select 100-type test line.	
71n	Operate CUT THRU 1 key.	
72	On handset— Dial number required to reach 100-type test line.	
73o	If testing switchboard-ended trunks— Request operator to connect to balance test termination.	

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STEP	ACTION	VERIFICATION
74p	If 2AB test set is used— At 2AB test set— Restore DIAL-SLV key to normal.	Noise meter indicates noise at near end. Character of noise heard in 723A receiver.
75l	If 3C NMS is used without 2AB test set— Operate FUNCTION switch to NM-600/900 HOLD.	Noise meter indicates noise at near-end. Character of noise heard in 723A receiver.
76	Record NMS reading.	
77	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 68n through 76.	
78q	If no further tests are to be made— Remove all patching cords; restore all keys.	

C. Impulse Noise Measurement to 100-Type Test Line (Fig. 2)

Note: Test C is applicable only to trunks not containing N, O, or ON carrier.

40j	If using 6A IC— At 2AB test set— Using P2B cord, connect TMS jack to IN jack of 6A IC. 6A IC must not be grounded.
41j	On 6A IC— Set WTG switch to VOICE BAND.
42j	Set REF-LEV-DBRN key and switch to step nearest required noise reference level.
43k	If using 6H IC— At 2AB test set— Using P2B cord, connect TMS jack to MEAS jack of 6H IC.
44k	At 6H IC— Operate DIAL-MEAS switch to MEAS.
45k	Set DBRN control to required noise reference level.
46	On hand set— Dial number required to reach 100-type test line.
47l	If testing switchboard-terminated trunks— Request operator to connect to balance test termination.

STEP	ACTION	VERIFICATION
48	At 2AB test set— Restore DIAL-SLV key to normal.	
49j	If using 6A IC— At 6A IC— Operate timer switch to HOLD or to 5 minutes beyond required interval, then set to required timing interval.	
50k	If using 6H IC— At 6H IC— Operate TIMER switch to required interval.	
	Note: To insure accurate timing interval of 3 minutes or less, adjust TIMER to 5 minutes and return to desired interval.	
51	Momentarily operate RESET key.	
52	After timing interval— Record counter reading.	Counter shows impulse counts measured at near end minus corrections if required.
	Note: If distant end returns repetitive on-hook supervision, monitor connection with 723A receiver by connecting to impulse counter MON terminals and observe. Determine number of impulses per minute caused by changes in supervision and multiply by timing interval in minutes and subtract result from counter reading recorded in Step 52.	
53	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 46 through 52.	
54m	If no further tests are to be made— Remove all patching cords; restore all keys.	

**D. Two-Way 1000-Hz Loss Measurement and Noise
Check to 104-Type Test Line (Fig. 2)**

61	At 2AB test set— Using P3E cord, connect TMS jack to MEAS jack on TMS.
62	At TMS— Operate function key to MEAS.
63	◆Operate INPUT key to 600 or 900 per Table B. (See 1.20).◆

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STEP	ACTION	VERIFICATION
64	On hand set— Dial number required to reach 104-type transmission test line.	Test progress tone (2225 Hz) heard. Note: Removal of test progress tone within 30 seconds indicates that the far end measuring equipment is connected.
65j	If switchboard terminated trunk— Request operator to connect to 104-type test line.	
66k	If testing trunks to a No. 5 Crossbar ACD using SF signaling— At J94742A auxiliary test set— Operate DEL key.	
67l	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Operate START 1 key.	Interrupted dial tone heard in handset.
68l	Restore START 1 key.	
69l	Press TOUCH-TONE button 4 to select 104-type test line.	
70l	Operate CUT THRU 1 key.	
71	At 2AB test set— Restore DIAL-SLV key to normal.	Test progress tone (2225 Hz) heard. Note: Removal of test progress tone within 30 seconds indicates that the far end measuring equipment is connected.
72	After 2225-Hz tone removed— Operate TEST switch from REC-600Ω to SEND-600Ω or from REC-900Ω to SEND-900Ω	
73	Using P3E cord, connect OSC jack on 2AB test set to 1000/0/600 jack or to OUTPUT-600 jack on 71B MW GEN. Caution: When connecting to 1000/0/600 MW supply jack, the other end of the cord must be connected to a circuit that will provide a termination to avoid unterminating the 1000/0/600 MW supply.	Near-to-far transmission loss measured and data stored at distant transmission measuring circuit.
74	After 3-second period— Disconnect cord from 1000/0/600 jack, or 71B MW GEN.	
75	Restore TEST switch to its original position (REC-600Ω or REC-900Ω).	

STEP	ACTION	VERIFICATION
76	Operate DIAL-SLV key to DIAL.	Short burst of 2225-Hz tone or 10-second interval of 1000-Hz heard in hand set receiver.
77m	If short burst of 2225-Hz tone heard— Repeat Steps 58 through 63.	
78n	If 1000-Hz tone heard— At 2AB test set— Restore DIAL-SLV key to normal and record TMS reading (first 10-second period of 1000-Hz tone).	TMS indicates far-to-near loss.
79	At 2AB test set— Operate DIAL-SLV key to DIAL.	
	Note: If after first 10-second interval of 1000-Hz tone, 2225 Hz is heard in hand set receiver, add 10 dB to TMS reading recorded during second 10-second interval of 1000-Hz tone.	
80	When second 10-second burst of 1000-Hz tone heard in handset receiver— At 2AB test set— Restore DIAL-SLV key to normal.	TMS indicates sum of near-to-far and far-to-near transmission losses.
81	Subtract TMS reading in Step 78n from reading in Step 80.	Result is near-to-far transmission loss.
82o	If far-end noise check is required— After second 10-second tone disappears— Wait 5 seconds and then operate DIAL-SLV key to DIAL and listen for test progress tone.	If steady test progress tone heard— Far-end noise does not exceed 41 dBrnc. If interrupted test progress tone heard— Far-end noise exceeds 41 dBrnc.
83	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 64 through 82o.	
84p	If no further tests are to be made— Remove all patching cords; restore all keys.	

E. Two-Way 1000-Hz Loss Measurement Using Loop-Around Test Line (Fig. 4)

61	On handset— Dial number required to reach 102-type test line.	1000-Hz tone heard.
62j	If switchboard-terminated trunk— Request operator to connect to 1MW test line.	1000-Hz tone heard.

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STEP	ACTION	VERIFICATION
63k	If testing trunks to a No. 5 Crossbar ACD using SF signaling— At J94742A auxiliary test set— Operate DEL key.	
64l	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Operate START 1 key.	Interrupted dial tone heard in handset.
65l	Restore START 1 key.	
66l	Press TOUCH-TONE button 2 to select 102-type test line.	
67l	Operate CUT THRU 1 key.	
68	At TMS— Operate function key to MEAS.	TMS meter indicates far-to-near transmission loss.
69	Record TMS reading.	
70	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 61 through 69.	
71	When all of the trunks in group being measured have been tested— Select one trunk out of the group as a reference trunk (Section 660-501-500).	
72	Repeat appropriate steps in PREPARATION to connect TMS, and TMTTT if used, to reference trunk.	
73	At TMS— Operate function key to DIAL.	
74	On handset— Operate MON-TALK switch to TALK.	
75	At 2AB test set— Operate DIAL-SLV key to DIAL.	
76a	If testing trunks with simplex supervision— Operate TEST switch to SEND-600Ω.	
77b	If testing trunks with loop supervision— Operate TEST switch to SEND-900Ω.	
78a	If testing trunks with simplex supervision— Using P3E cord, connect MEAS jack to TST jack of second TMTTT circuit.	

STEP	ACTION	VERIFICATION
79b	If testing trunks with loop supervision— Using P3H cord, connect 310 plug to MEAS jack and 240A plug to first trunk to be tested (near-to-far).	
80	At TMS— On trunk selected as reference trunk— Using handset, dial code of first appearance of loop-around test termination circuit.	If first appearance of loop-around test termination is also a 102-type test line— 1000-Hz tone heard.
81j	If switchboard terminated trunk— Request operator to connect to first appearance of loop-around test termination circuit.	If first appearance of loop-around test termination is also a 102-type test line— 1000-Hz tone heard.
82m	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Operate START 1 key.	Interrupted dial tone heard in handset.
83m	Restore START 1 key.	
84m	Press TOUCH-TONE button 6 to select first appearance of loop-around test line.	
85m	Operate CUT THRU 1 key.	
86	On TMS— Operate DIAL-MEAS-SLV key to MEAS.	If first appearance of loop-around circuit is also a 102-type test line— TMS meter indicates far-to-near transmission loss of reference trunk which should be the same as value determined earlier in test.
87	Disconnect handset from DIAL jack of TMS and connect to DIAL jack on 2AB test set.	
88	On handset— Dial code of second appearance of loop-around test termination circuit.	
89j	If switchboard-terminated trunk— Request operator to connect to second appearance of loop-around test line.	
90m	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Using P3E cord, patch TRK 2 TST FAC jack to MEAS jack of 2AB test set.	
91m	Using P3H cord, patch TRK 2 TRK jack to test jack of trunk to be tested.	
92f	If testing trunks to a No. 5 Crossbar ACD without test jacks—	No click heard in test receiver.

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STEP	ACTION	VERIFICATION
	At frame appearance of trunk to be tested— Using test receiver with KS-6780 clip connected to test battery, touch 411 test pick to sleeve of trunk to be tested.	Note: If click is heard in test receiver, the trunk is busy. Do not connect test equipment to busy trunk.
93f	Using 3W4B cord, connect T, R, S conductors to T, R, S, frame terminals using KS-6278 connecting clips.	
94f	At J94742A auxiliary test set— Insert 310 plug of 3W4B cord into TRK 2 TRK jack.	
95m	Operate TRK TR switch to Position 2.	
96m	Operate START 2 key.	Interrupted dial tone heard in handset.
97m	Restore START 2 key.	
98m	Press TOUCH-TONE button 7 to select second appearance of loop-around test line.	
99m	Operate CUT THRU 2 key.	
100n	◆If per Table B a 600 line impedance is required— At 2AB test set— Using P3D cord, connect OSC jack of 2AB test set to 1000/0/600 jack, or to OUTPUT 600 jack of 71B MW GEN.◆	
101o	◆If per Table B a 900 line impedance is required— At 2AB test set— Using a P3D cord, connect OSC jack of 2AB test set to OUTPUT 900 jack of 71B MW GEN.◆	
	Caution: When connecting to 1000/0/600 jack, the other end of the cord must be connected to a circuit that will provide a termination to avoid unterminating the 1000/0/600 MW supply.	
102	On 2AB test set— Restore DIAL-SLV key to normal.	
103	On TMS— Record loop-around test transmission loss.	

STEP	ACTION	VERIFICATION
	Note: Difference between loop-around reading and far-to-near reading of reference trunk is near-to-far loss of trunk under test.	
104	For other trunks to be tested— Repeat Steps 75 through 102.	
	Note: If first appearance of loop-around circuit is also a 102-type test line, the far-to-near loss of the reference trunk may be checked each time the second appearance of the loop-around circuit is released.	
105	When all trunks have been tested— Select another trunk in the group as a second reference trunk (Section 660-501-500).	
106	Disconnect cord from first reference trunk and connect to second reference trunk.	
107	Disconnect cord from trunk just tested and connect to first reference trunk.	
108	Repeat Steps 72 through 103 considering “reference trunk” to be trunk under test and substituting “second reference trunk” when reference is made to reference trunk.	
109	If no further tests are to be made— Remove all patching cords; restore all keys.	
AA. Two-Way 1000-Hz Loss Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures (Fig. 2)		
67	At 2AB test set— Using P3E cord, connect TMS jack to MEAS jack on TMS.	
68	At TMS— Operate DIAL-MEAS-SLV key to MEAS.	
69	◆Operate INPUT key to 600 or 900 per Table B (see 1.20).◆	
70j	If testing nonswitchboard-ended or nondesk-ended trunks— On handset— Dial number required to reach 101-type test line.	

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STEP	ACTION	VERIFICATION
71k	If testing switchboard-terminated trunks— Request operator to connect to 101-type test line.	
72l	If testing trunks to a No. 5 Crossbar ACD using SF signaling— At J94742A auxiliary test set— Operate DEL key.	
73m	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Operate START 1 key.	Interrupted dial tone heard in handset.
74m	Restore START 1 key.	
75m	Press TOUCH-TONE button 1 to select 101-type test line.	
76m	Operate CUT THRU 1 key.	
77	Request terminating end to connect 0-dBm 1000-Hz tone to trunk under test for agreed upon interval.	
78	At 2AB test set— Restore DIAL-SLV key to normal.	TMS indicates far-to-near loss of trunk.
79	Record TMS meter reading. (Refer to 1.10.)	
	Note: If only one-way test required, omit Steps 80 through 89.	
80	At 2AB test set— Operate DIAL-SLV key to DIAL.	
81	Request terminating end to measure.	
82	Restore DIAL-SLV key to normal.	
83	Operate TEST switch from REC-600Ω to SEND-600Ω or from REC-900Ω to SEND-900Ω.	
84	Using P3E cord, connect OSC jack of 2AB test set to 1000/0/600 jack, or to OUTPUT 600 jack of 71B MW GEN.	
	Caution: When connecting to 1000/0/600 jack, the other end of the cord must be connected to a circuit that will provide a termination to avoid unterminating the 1000/0/600 MW supply.	

STEP	ACTION	VERIFICATION
85	After agreed upon interval— Disconnect plug from 1000/0/600 jack or 71B MW GEN.	
86	At 2AB test set— Operate DIAL-SLV key to DIAL.	
87	Obtain and record TMS reading from distant end.	
88n	If no further tests are to be made on this trunk— Request distant end to disconnect.	
89	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 70j through 88n.	
90o	If no further tests are to be made— Remove all patching cords; restore all keys.	

AB. Two-Way Frequency Response Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures (Fig. 2)

67	At TMS— Operate DIAL-MEAS-SLV key to MEAS.
68	Operate INPUT key to 600.
69	Using P3E cord, connect MEAS jack of TMS to TMS jack of 2AB test set.
70	At oscillator— Using P3E cord, connect OUTPUT jack to OSC jack of 2AB test set.
71	Set FUNCTION switch to 600.
72	At 2AB test set— Operate TEST switch to REC-600Ω or REC-900Ω.
73j	If testing nonswitchboard-ended trunks— At handset— Dial number required to reach 101-type test line.
74k	If testing switchboard-terminated trunks— Request operator to connect to 101-type test line.

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STEP	ACTION	VERIFICATION
75l	If testing trunks to a No. 5 Crossbar ACD using SF signaling— At J94742A auxiliary test set— Operate DEL key.	
76m	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Operate START 1 key.	Interrupted dial tone heard in handset.
77m	Restore START 1 key.	
78m	Press TOUCH-TONE button 1 to select 101-type test line.	
79m	Operate CUT THRU 1 key.	
80	Request distant end to send first required frequency at 0 dBm for agreed upon length of time.	Tone heard in handset receiver.
81	At 2AB test set— Restore DIAL-SLV key to normal.	TMS indicates far-to-near loss of first frequency.
82	Record TMS reading.	
83	Operate DIAL-SLV key to DIAL and request distant end to send next required frequency.	Tone heard in handset receiver.
84	Restore DIAL-SLV key to normal.	TMS indicates far-to-near loss of second frequency.
85	Record TMS reading.	
86	Repeat Steps 83 through 85 for other required frequencies. Note: If only one-way test required, omit Steps 87 through 96.	
87	At 2AB test set— Operate DIAL-SLV key to DIAL and request distant end to measure loss at required frequencies over trunk under test.	
88	Adjust oscillator to send first required frequency at 0dBm.	
89	At 2AB test set— Restore DIAL-SLV key to normal.	

STEP	ACTION	VERIFICATION
90	Operate TEST key from REC-600Ω to SEND-600Ω or from REC-900Ω to SEND-900Ω.	
91	After agreed upon length of time— Operate DIAL-SLV key to DIAL.	
92	Obtain and record TMS reading from distant end.	
93	Adjust oscillator to send next required frequency at 0 dBm. Note: DIAL-SLV key must be operated to DIAL while changing frequencies. This is particularly important when passing through 2400 through 2600 Hz.	
94	Repeat Steps 89 through 93 for other required frequencies.	
95n	If no further tests are to be made on this trunk— Request distant end to disconnect.	
96	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 72 through 95n.	
97o	If no further tests are to be made— Remove all patching cords; restore all keys.	
AC. Message Circuit Noise Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures (Fig. 2 or 3)		
67j	If 3A NMS is used— Using P2AE cord, connect 289A plug to IN jack and 310 plug to TMS jack of 2AB test set.	
68j	◆Operate FUNCTION switch to NM 600 or 900 per Table B (see 1.20)◆	
69k	If 3C NMS is used with 2AB test set— At 3C NMS— Using P3E cord, connect IN jack to TMS jack of 2AB test set.	
70k	◆Operate FUNCTION switch to NM 600/900 per Table B.◆	

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STEP	ACTION	VERIFICATION
71l	If 3C NMS is used without 2AB test set— At 3C NMS— Using 893 cord, connect GND binding post to ground.	
72	Connect receiver furnished with NMS to AC MON jack.	
73m	If testing nonswitchboard-ended or nondesk-ended trunks— On handset— Dial number required to reach 101-type test line.	
74n	If testing switchboard-ended or desk-ended trunks— Request operator to connect to 101-type test line.	
70o	If testing trunks to a No. 5 Crossbar ACD using SF signaling— At J94742A auxiliary test set— Operate DEL key.	
76p	If testing trunks to a No. 5 Crossbar ACD with or without SF signaling— Operate START 1 key.	Interrupted dial tone heard in handset.
77p	Restore START 1 key.	
78p	Press TOUCH-TONE button 1 to select 101-type test line.	
79p	Operate CUT THRU 1 key.	
80	Request terminating end to provide a balance termination or if a far-end noise measurement is also desired, to connect measuring equipment at far-end.	
81q	If 2AB test set is used— On 2AB test set— Operate DIAL-SLV key to normal.	Noise meter indicates noise measured at originating end. Character of noise heard in 723A receiver.
82l	If 3C NMS is used without 2AB test set— Operate FUNCTION switch to NM-600/900 HOLD.	Noise meter indicates noise measured at originating end. Character of noise heard in 723A receiver.
83	Record noise reading and character of noise (Refer to 1.10).	

STEP	ACTION	VERIFICATION
	Note: If only one-way test required, omit Steps 84q and 85l.	
84q	If 2AB test set is used— At 2AB test set— Operate DIAL-SLV key to DIAL.	Obtain noise measurement and character of noise from distant end.
85l	If 3C NMS is used without 2AB test set— Operate FUNCTION switch to DIAL.	
86r	If no further tests are to be made on this trunk— Request distant end to disconnect.	
87	For other trunks to be tested, repeat appropriate steps in PREPARATION and Steps 73m through 86r.	
88s	If no further tests are to be made— Remove all patching cords; restore all keys.	

AD. Impulse Noise Measurement To 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures (Fig. 2)

For Trunks Not Containing N, O, or ON Carrier

67j	If using 6A IC— At 2AB test set— Using P2B cord, connect TMS to IN jack of 6A IC.
68j	At 6A IC— Set WTG switch to VOICE BAND.
69j	Set REF-LEV-DBRN key and switch to step nearest required noise reference level.
70k	If using 6H IC— At 2AB test set— Using P2B cord, connect TMS jack to MEAS jack of 6H IC.
71k	At 6H IC— Operate DIAL-MEAS switch to MEAS.
72k	Set DBRN control to required noise reference level.
73l	If testing nonswitchboard-ended or nondesk-ended trunks— On handset—

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STEP	ACTION	VERIFICATION
	Dial number required to reach 101-type test line.	
74m	If testing switchboard-terminated trunks— Request operator to connect to 101-type test line.	
75	Request terminating end to provide a balance termination, or if a far-end impulse noise measurement is desired to connect an impulse counter.	
76	At 2AB test set— Restore DIAL-SLV key to normal.	
77j	If using 6A IC— At 6A IC— Operate timer switch to HOLD or to 5 minutes beyond required interval, then set to required timing interval.	
78k	If using 6H IC— At 6H IC— Operate TIMER switch to required interval.	
	Note: To insure accurate timing intervals of 3 minutes or less, adjust TIMER to 5 minutes and return to desired interval.	
79	Momentarily operate RESET key.	
80	After timing interval— Record counter reading.	Counter indicates impulse counts measured at originating end.
	Note: If only one-way test required, omit Step 81.	
81	At 2AB test set— After agreed upon interval— Operate DIAL-SLV key to DIAL and obtain counter reading from distant end.	After timing interval— Counter at terminating end indicates impulse counts measured at terminating end.
82l	If no further tests are to be made on this trunk— Request terminating end to disconnect.	
83	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 67j through 81.	
84n	If no further tests are to be made— Remove all patching cords; restore all keys.	

STEP	ACTION	VERIFICATION
For Trunks Containing N, O, or ON Carrier		
85	At 2AB test set— Using P3E cord, connect OSC jack to OUTPUT jack on KS-19353 oscillator.	
86	At KS-19353 OSC— Operate FUNCTION switch to 600.	
87j	If using 6A IC— At 2AB test set— Using W2DL cord, connect 310 plug to TMS jack and 35 cord tips to terminals 1 and 2 of 554A filter.	
88j	Using W2DL cord, connect 310 plug to IN jack of 6A IC and 35 cord tips to terminals 7 and 8 of 554A filter.	
	Note: 6A IC must not be grounded.	
89j	At 6A IC— Set WTG switch to VOICE BAND.	
90j	Set REF-LEV-DBRN key and switch to 57 dBm.	
91k	At 2AB test set— If using 6H IC— Using P2B cord, connect TMS jack to MEAS jack of 6H IC.	
92k	At 6H IC— Operate DIAL-MEAS switch to MEAS.	
93k	Set DBRN control to 57 DBRN.	
94l	If testing nonswitchboard-ended trunks— On handset— Dial number required to reach 101-type test line.	
95m	If testing switchboard-terminated trunks— Request operator to connect to 101-type test line.	
96j	If using 6A IC— Request terminating end to connect oscillator adjusted for 600 Hz at -10 dBm.	

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STEP	ACTION	VERIFICATION
97k	If using 6H IC— Request terminating end to connect oscillator adjusted for 2800 Hz at -10 dBm.	
98	At 2AB test set— Restore DIAL-SLV key to normal.	
99	At impulse counter— Set TIMER switch at least 5 minutes beyond required interval.	
100	Momentarily operate RESET key.	
101o	If impulse counter does not count continuously— Proceed immediately to Step 104.	
102p	If impulse counter counts continuously— Call terminating end test location over order wire or DDD connection.	
103p	Request terminating end to adjust oscillator above or below frequency setting until impulse counter stops counting; output of distant oscillator should remain at -10 dBm.	
	Note: If no oscillator setting can be found to stop the impulse counter from counting continuously, repeat Step 103p with the impulse counter adjusted to the next higher DBRN setting. Use successively higher settings until an oscillator frequency can be found to stop the impulse counter from counting continuously.	
104	At 2AB test set— Operate DIAL-SLV key to DIAL.	
105j	If using 6A IC— At 6A IC— Set REF-LEV-DBRN key and switch to the nearest required noise reference level. (Refer to 1.10.)	
106k	If using 6H IC— At 6H IC— Set DBRN control to required noise reference level.	
107	At 2AB test set— Restore DIAL-SLV key to normal.	

STEP	ACTION	VERIFICATION
108	At impulse counter— Operate timer switch to 5 minutes beyond required interval; then set to required interval.	
109	Momentarily operate RESET key.	
110	After timing interval— Record counter reading.	Counter indicates impulse counts measured at originating end.
111	At 2AB test set— Operate DIAL-SLV key to DIAL.	
112	Request terminating end to disconnect oscillator. Note: If only near-end test desired, omit Steps 113 through 121.	
113	Request terminating end to connect impulse counter as described in Test BD, steps 81j through 87 and 93 through 101. Also request terminating end to notify near-end over a separate communication circuit if impulse counter counts continuously.	
114q	If using 6A IC at terminating end— Adjust oscillator OUTPUT for 600 Hz at -10 dBm.	
115r	If using 6H IC at terminating end— Adjust oscillator output for 2800 Hz at -10 dBm.	
116	At 2AB test set— Restore DIAL-SLV key to normal; then operate TEST switch from REC-600Ω to SEND-600Ω or from REC-900Ω to SEND-900Ω.	
117s	If required by terminating end— Adjust frequency of oscillator slowly above or below original frequency until distant end indicates impulse counter has stopped counting continuously. Oscillator OUTPUT should remain at -10 dBm.	
118t	If distant end has not indicated need for change in frequency or after the oscillator has been adjusted to the proper frequency as per Step 117s— Operate DIAL-SLV key of 2AB test set to DIAL and request distant office to adjust impulse counter to required reference level and to measure impulse noise.	

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STEP	ACTION	VERIFICATION
119	Restore DIAL-SLV key to normal.	Counter at terminating end indicates impulse counts measured at terminating end.
120	After required timing interval— Operate DIAL-SLV key to DIAL.	
121	Obtain and record impulse noise measurements from distant office.	
122u	If no further tests on this trunk— Request distant end to disconnect.	
	Note: For other trunks to be tested, do not change oscillator frequency setting from that used in Steps 114q through 117s on first trunk tested.	
123	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 94l through 122u.	
124v	If no further tests are to be made— Remove all patching cords; restore all keys.	

AE. Two-Way P/AR Measurement to 101-Type Test Line, Switchboards, or Plant or Traffic Operating Desks—Originating End Procedures (Fig. 2)

67	At 2AB test set— Using W2BS cord, connect 35 cord tips to INPUT binding post on P/AR receiver and 310 plug to TMS jack.
68	Using P3E cord, connect OSC jack to 600 jack on P/AR GEN.
69	On P/AR receiver— Operate IMPEDANCE key to 600.
70j	If testing nonswitchboard-ended or nondesk-ended trunks— At handset— Dial number required to reach 101-type test line.
71k	If testing switchboard-terminated trunks— Request operator to connect to 101-type test line.
72	Request terminating end to connect a P/AR GEN.

STEP	ACTION	VERIFICATION
73	At 2AB test set— Restore DIAL-SLV key to normal.	
74	At P/AR receiver— Adjust COARSE and FINE RECEIVED LEVEL ADJ controls for a RECEIVED LEVEL meter reading at REF LEVEL.	P/AR meter indicates near-end P/AR measurement.
75	Record P/AR meter reading.	
76	After agreed upon interval— At 2AB test set— Operate DIAL-SLV key to DIAL.	
77	Request terminating end to prepare to make P/AR measurement.	
78	Restore DIAL-SLV key to normal.	
79	Operate TEST switch from REC-600Ω to SEND-600Ω or from REC-900Ω to SEND-900Ω.	
80	After agreed upon interval— Operate DIAL-SLV key to DIAL.	P/AR meter at far end indicates P/AR measurement.
81	Obtain and record P/AR measurement from distant end.	
82l	If no further tests are to be made on this trunk— Request distant end to disconnect.	
83	For other trunks to be tested— Repeat appropriate steps in PREPARATION and Steps 70j through 82l.	
84m	If no further tests are to be made— Remove all patching cords; restore all keys.	
BA. Two-Way 1000-Hz Loss Measurement to 101-Type Test Line Terminating End Procedures (Fig. 5)		
Note: Tests associated with L1 are made at 900 ohms. Tests associated with L2 or L3 are made at 600 ohms.		
70j	If call received on L1— When requested by originating end to connect 0 dBm, 1000-Hz tone— Using P3E cord, connect TM1 jack to OUTPUT-900 jack of 71B MW GEN or to 1000/0/900 jack if used.	TMS meter at originating end indicates far-to-near loss (refer to 1.10).

STEP	ACTION	VERIFICATION
	Caution: When connecting to 1000/0/900 jack, the other end of the cord must be connected to a circuit that will provide a termination to avoid unterminating the 1000/0/900 MW supply.	
71k	If call received on L2 or L3— When requested by originating end— Using P3E cord, connect TM2 or TM3 jack, as appropriate, to OUTPUT-600 jack of 71B MW GEN or 1000/0/600 jack if used.	TMS meter at originating end indicates far-to-near loss (refer to 1.10).
	Caution: When connecting to 1000/0/600 jack, the other end of the cord must be connected to a circuit that will provide a termination to avoid unterminating the 1000/0/600 MW supply.	
72	After agreed upon interval— Remove plug from OUTPUT jack of 71B MW GEN or 1000/0/600 or 900 jack and meet distant end on 52S headset.	
73	When requested by distant end to measure— Using P3E cord, connect MEAS jack of TMS to appropriate TM_ jack.	
74l	If connection made to TM1— At TMS— Operate INPUT key to 900.	
75m	If connection made to TM2 or TM3— At TMS— Operate INPUT key to 600.	
76	At TMS— Operate DIAL-MEAS-SLV key to MEAS.	
77	Read TMS meter, remove patch from TM_ jack and report TMS reading to distant end over 52S headset.	
78n	If no further tests are to be made— Remove head telephone set and all patching cords; restore all keys.	

STEP	ACTION	VERIFICATION
BB. Two-Way Frequency Response Measurement to 101-Type Test Line—Terminating End Procedures (Fig. 5)		
70	When requested by originating end to send frequency— Adjust oscillator to 0 dBm at desired frequency. Note: Oscillator must be disconnected from TM_ jack when changing frequency.	
71	At oscillator— Using P3E cord, connect TM_ jack to OUTPUT jack of oscillator.	
72	After agreed upon interval— Remove plug from TM_ jack and meet distant end on 52S headset.	
73j	If connection was made to TM1— At TMS— Operate INPUT key to 900.	
74k	If connection was made to TM2 or TM3— At TMS— Operate INPUT key to 600.	
75	Using P3E cord, connect appropriate TM_ jack to MEAS jack of TMS.	
76	At TMS— Operate DIAL-MEAS-SLV key to MEAS.	TMS indicates near-to-far loss at desired frequency.
77	After agreed upon interval— Disconnect plug from TM_ jack and report TMS reading to distant end.	
78l	If no further tests are to be made— Remove head telephone set and all patching cords; restore all keys.	
BC. Message Circuit Noise Measurement to 101-Type Test Line—Terminating End Procedures (Fig. 5)		
70j	If connection was made to TM1— When originating end requests a balance termination— Insert 262C plug (900-ohm termination) in TM1 jack.	NMS at originating end indicates noise on trunk.
71k	If connection was made to TM2 or TM3— When originating end requests a balance	NMS at originating end indicates noise on trunk.

STEP	ACTION	VERIFICATION
	termination— Insert 262B plug (600-ohm termination) in appropriate TM2 or TM3 jack.	
72	After agreed upon interval— Remove plug from TM_ jack and meet distant end on 52S headset.	
73	When requested by originating end to make a noise measurement— At 3A or 3C NMS— Connect 723A receiver to AC MON jack.	
74l	If 3A NMS is used— Using P2AE cord, connect 310 plug to appropriate TM_ jack and 289A plug to IN jack of 3A NMS.	
75m	If 3C NMS is used— Using P3F Cord, connect IN jack of 3C NMS to appropriate TM_ jack.	
76j	If connection was made to TM1— Operate FUNCTION switch on 3A NMS to NM-900 or to NM-600/900 on 3C NMS.	NMS meter at terminating end indicates noise. Character of noise heard in 723A receiver.
77k	If connection was made to TM2 or TM3— Operate FUNCTION switch on 3A NMS to NM-600 or to NM-600/900 on 3C NMS.	NMS meter at terminating end indicates noise. Character of noise heard in 723A receiver.
78	After agreed upon interval— Remove plug from TM_ jack and report noise reading and character of noise to originating end over 52S headset.	
79n	If no further tests are to be made— Remove head telephone set and all patching cords; restore all keys.	

BD. Impulse Noise Measurement to 101-Type Test Line—Terminating End Procedures (Fig. 5)

For Trunks Not Containing N, O, or ON Carrier

70	When requested by originating end to make an impulse noise measurement— At impulse counter— Set WTG switch to VOICE BAND.
71j	If using 6A IC— Set REF-LEV-DBRN key and switch to step nearest required noise reference level.

STEP	ACTION	VERIFICATION
72k	If using 6H IC— Set DBRN control to required noise reference level.	
73	At 101-type test line termination— Using P2B cord, connect TM_ jack associated with lighted T_ lamp to IN jack on impulse counter.	
74	At impulse counter— Operate timer switch to 5 minutes beyond required interval; then set to required timing interval.	
75	Momentarily operate RESET key.	
76	After timing interval— Record counter reading.	Counter indicates impulse counts measured at terminating end.
77	Remove plug from TM_ jack and report counter reading to originating end over 52S headset.	
78l	If no further tests are to be made— Remove head telephone set and all patching cords; restore all keys.	

For Trunks Containing N, O, or ON Carrier

79	At 2AB test set— Using P3E cord, connect OSC jack to OUTPUT jack on KS-19353 oscillator.	
80	At OSC— Operate FUNCTION switch to 600.	
81j	If using 6A IC— At 2AB test set— Using W2DL cord, connect 310 plug to TMS jack and 35 cord tips to terminals 1 and 2 of 554A filter.	
82j	Using W2DL cord, connect 310 plug to IN jack of 6A IC and 35 cord tips to terminals 7 and 8 of 554A filter. 6A IC must not be grounded.	
83k	If using 6H IC— At 2AB test set— Using P3E cord, connect TMS jack to IN jack of 6H IC.	

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STEP	ACTION	VERIFICATION
84	Using P3E cord, connect MEAS jack to TM_ jack of 101-type test line associated with operated T_ key.	
85l	If connection in Step 84 was made to TM1 jack— At 2AB test set— Operate TEST switch to REC-900Ω.	
86m	If connection was made to TM2 or TM3 jack— At 2AB test set— Operate TEST switch to REC-600Ω.	
87	At 2AB test set— Operate DIAL-SLV key to normal.	
88j	If using 6A IC— When requested by originating end to provide test termination— Adjust oscillator output for 600 Hz at -10 dBm.	
89k	If using 6H IC— When requested by originating end to provide test termination— Adjust oscillator output for 2800 Hz at -10 dBm.	
90	Operate TEST switch from REC-600Ω to SEND-600Ω or from REC-900Ω to SEND-900Ω.	
91n	If required by originating end— Adjust oscillator frequency above or below frequency setting at -10 dBm until originating end indicates that impulse counter has stopped counting continuously.	
92	After agreed upon interval— Remove plug from TM_ jack and meet distant end on 52S headset.	
93	When requested by originating end to measure— At impulse counter— Set WTG switch to VOICE BAND.	
94j	If using 6A IC— Set REF-LEV-DBRN key and switch to 57 dBrn.	
95j	Originating end will connect oscillator adjusted for 600 Hz at -10 dBm.	

STEP	ACTION	VERIFICATION
96k	If using 6H IC— Set DBRN control to 57 dBrn.	
97k	Originating end will connect oscillator adjusted for 2800 Hz at -10 dBm.	
98	At 101-test line termination— Replace plug removed in Step 92.	
99	At 2AB test set— Restore TEST switch to its original position (REC-600Ω or REC-900Ω).	
100	At impulse counter— Operate timer switch to at least 5 minutes beyond required interval.	
101	Momentarily operate RESET key.	
102o	If impulse counter does not count continuously— Proceed immediately to Step 105.	
103p	If impulse counter counts continuously— Call originating end over order wire or DDD connection.	
104p	Request originating end to adjust oscillator above or below frequency setting at -10 dBm until impulse counter stops counting continuously. Note: If no oscillator setting can be found which will stop the impulse counter from counting continuously, repeat Step 104p with the impulse counter adjusted to the next higher setting. Use successively higher settings until an oscillator frequency can be found to cause the impulse counter to stop counting continuously.	
105	At 101-test line termination— Remove plug from TM_ jack.	
106j	If using 6A IC— Set REF-LEV-DBRN key and switch to step nearest required noise reference level.	
107k	If using 6H IC— Set DBRN control to required noise reference level.	
108	At 101-test line termination— Replace plug that was removed in Step 105.	

STEP	ACTION	VERIFICATION
109	At impulse counter— Operate timer switch to 5 minutes beyond required interval; then set to required timing interval.	
110	Momentarily operate RESET key.	
111	After timing interval— Record counter reading.	
112	Remove cord from TM_jack and report counter reading to originating end over 52S headset.	
113q	If no further tests are to be made— Remove head telephone set and all patching cords; restore all keys.	

BE. Two-Way P/AR Measurement to 101-Type Test Line—Terminating End Procedures (Fig. 5)

Originating End-P/AR Measurement

70j	If connection to 101-type line termination is associated with TM1— Using P3E cord, connect TM1 jack to 900 jack on P/AR generator.	P/AR receiver at originating end indicates P/AR measurement.
71k	If connection to 101-type line termination is associated with TM2 or TM3— Using P3F cord, connect TM2 or TM3 jack on P/AR generator.	P/AR receiver at originating end indicates P/AR measurement.
72	After agreed upon interval— Remove plug from TM_jack and meet distant end on 52S headset.	

Terminating End-P/AR Measurement

73	At P/AR receiver— Using W2BS cord, connect 35 cord tips to INPUT terminals on P/AR receiver and 310 plug to appropriate TM_jack.	
74j	If connection to 101-test line termination is associated with TM1— At P/AR receiver— Operate IMPEDANCE switch to 900.	
75k	If connection to 101-test line termination is associated with TM2 or TM3— At P/AR receiver— Operate IMPEDANCE switch to 600.	

STEP	ACTION	VERIFICATION
76	At P/AR receiver— Adjust coarse and fine RECEIVE LEVEL ADJ controls to obtain received level meter reading at reference level.	P/AR meter indication is P/AR measurement at terminating end.
77	Read P/AR meter; remove plug from TM_ jack and report P/AR measurement to distant end over 52S headset.	
781	If no further tests are to be made— Remove head telephone set and all patching cords; restore all keys.	

◆TABLE B◆

TEST LINES AVAILABLE BY OFFICE

WHEN TESTING INTO			TMS/NMS/2AB	
OFFICE		TRUNKS	LINE IMPED- ANCE	TEST PAD
SXS	Toll	Intertoll	600	2
		CAMA		0 or 2
	Tandem	Incoming Tandem	900	0 or 2
	Class 5	Toll COMPL, TDM COMPL, Interlocal		0
Panel		TDM COMPL Toll COMPL Interlocal		
Crossbar Tandem		Intertoll, INC TDM, DDD Access (AMA)		0 or 2
		CAMA		
No. 1 Crossbar		TDM COMPL, Toll COMPL, Interlocal		0
No. 4 Crossbar		Intertoll	600	2
		CAMA, INC Tandem, DDD Access (AMA)		0 or 2
No. 5 Crossbar, 2W	Toll	Intertoll		2
	Tandem	Incoming Tandem & CCSA	900	0 or 2
	Toll	CAMA	600	
	Class 5	TDM COMPL, Toll COMPL, Interlocal, CCSA	900	0 or 2*
No. 5 Crossbar, 4W		Incoming Trunks & Station Lines	600	2
No. 1, 3, 3C, or 3CL Toll Switchboard		All Incoming Trunks to Switchboard		0 or 2

* Used for testing CCSA trunks only.

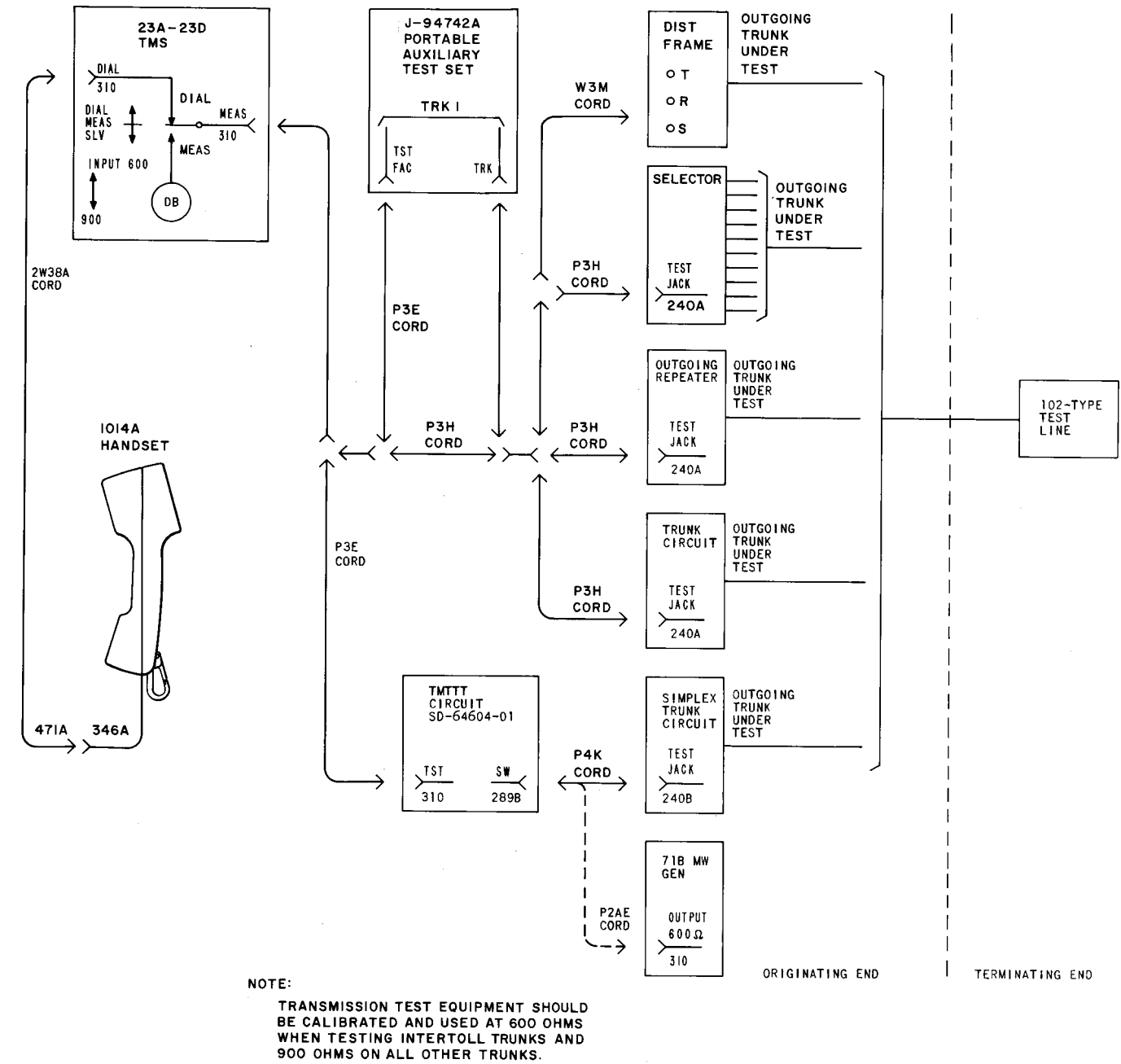


Fig. 1—Test A Equipment Connections Not Using 2AB Test Set

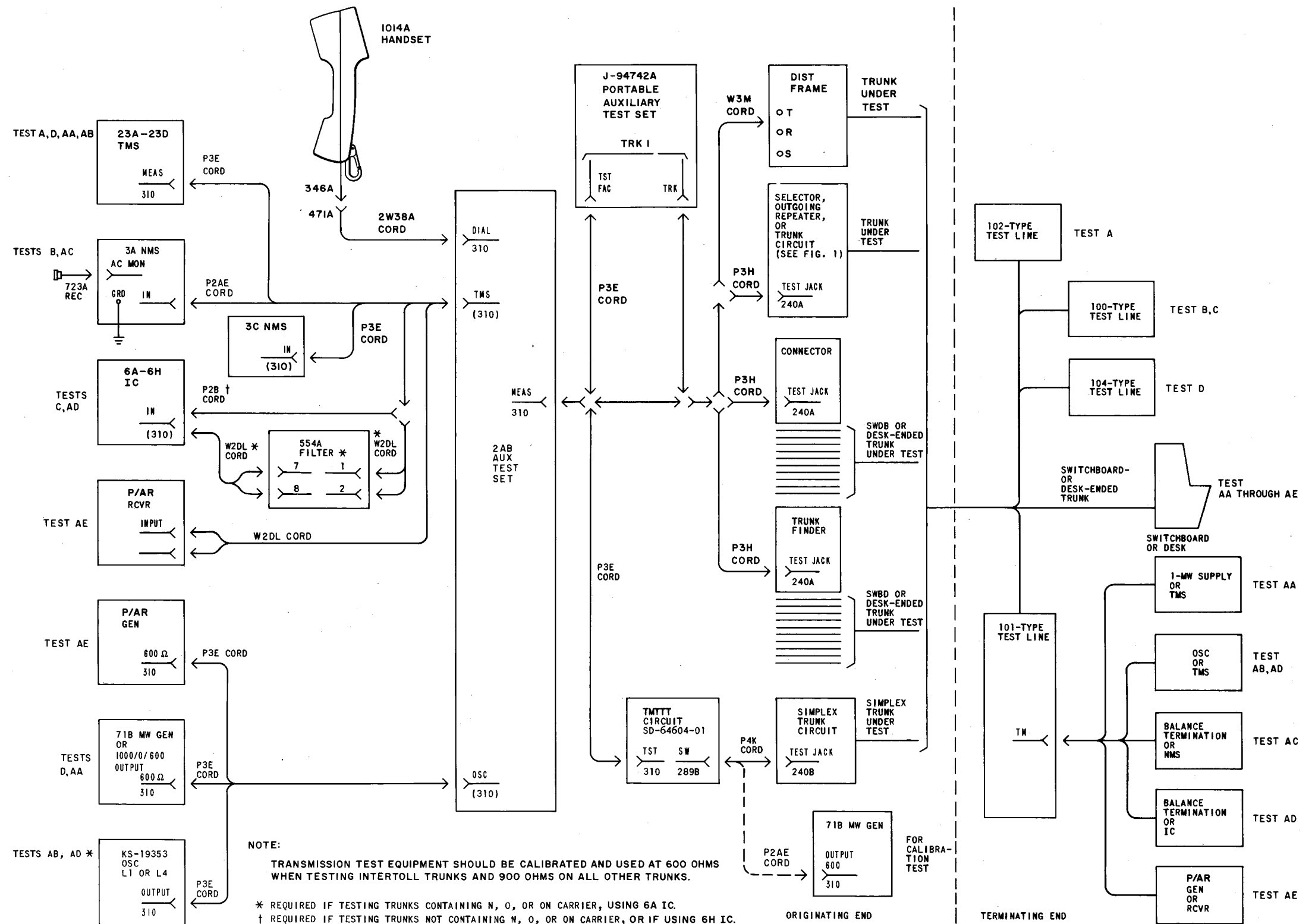


Fig. 2—Tests A, B, C, D, AA through AE, Using 2AB Test Set Equipment Diagram

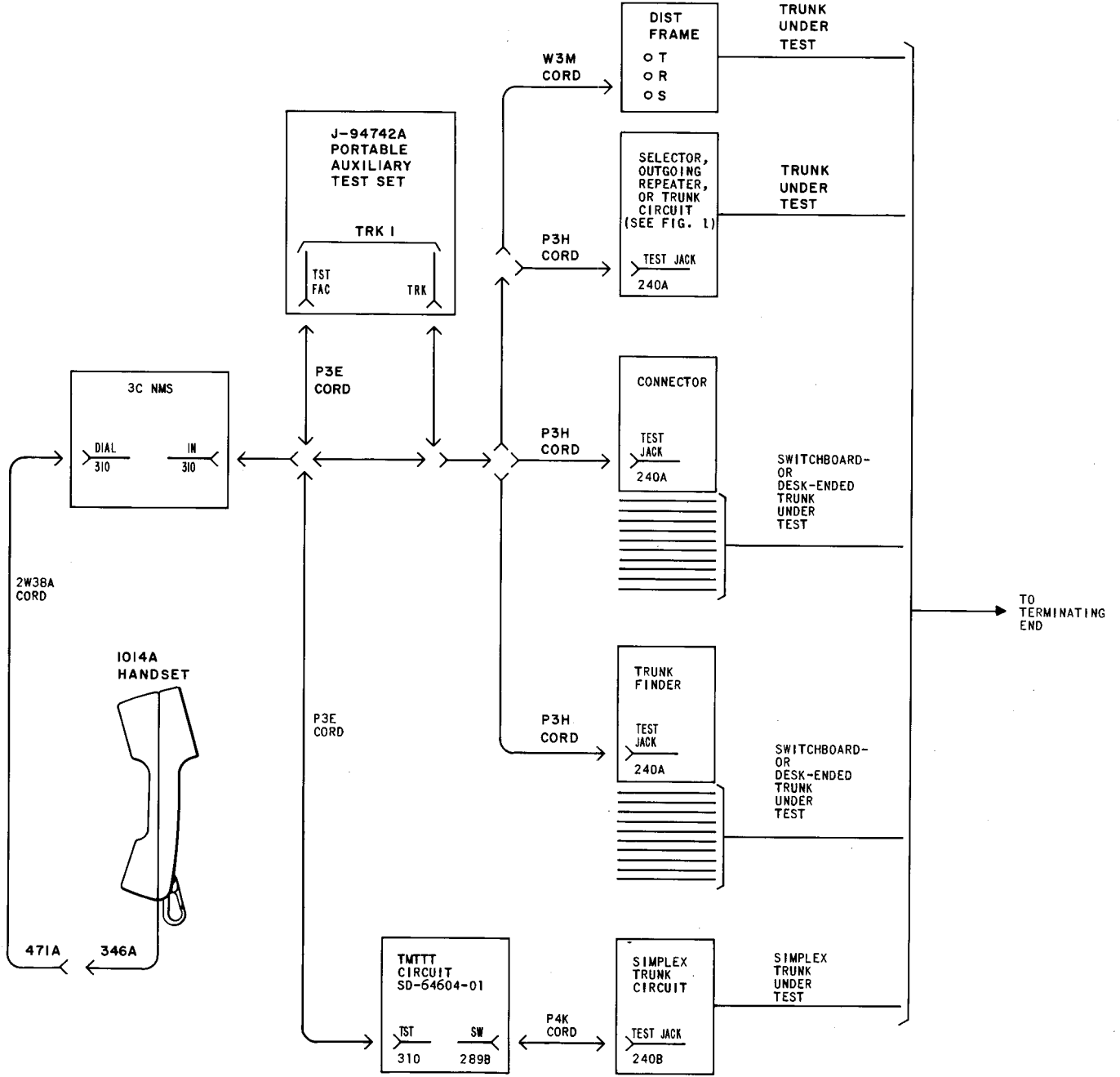


Fig. 3—Tests AC, B, and Using 3C NMS, Without 2AB Test Set

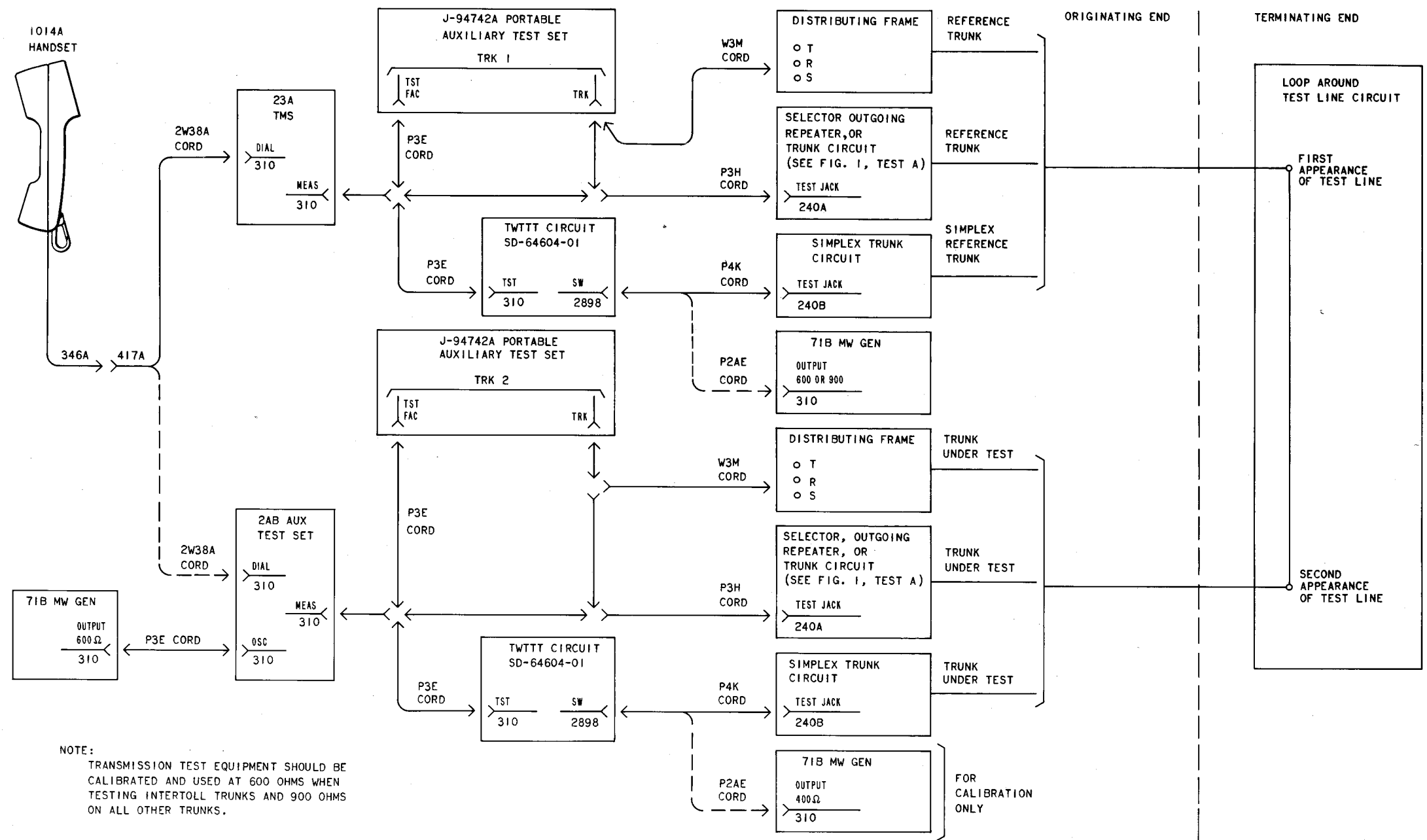


Fig. 4—Test E—Equipment Diagram

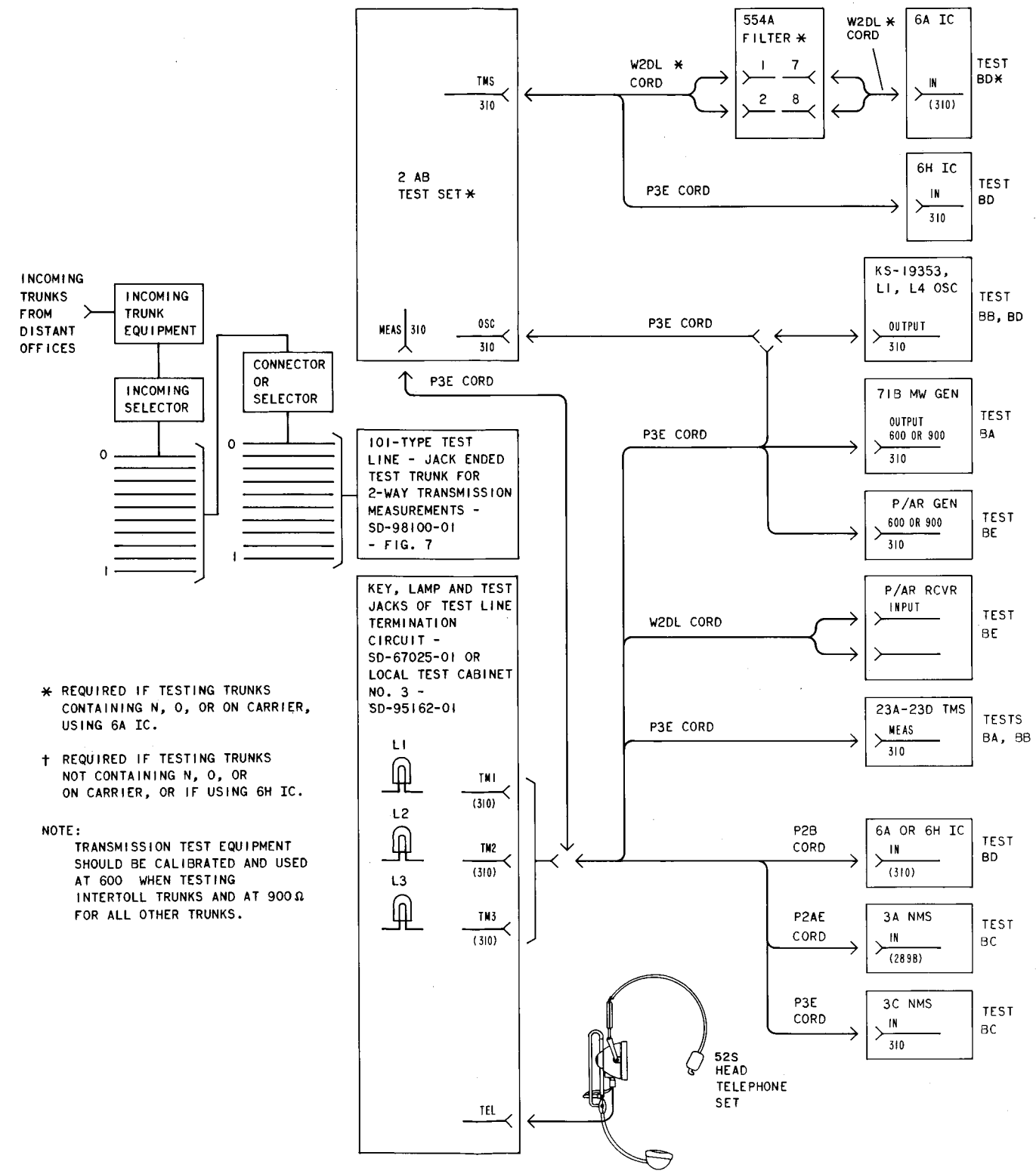


Fig. 5—Tests BA through BE