OUTGOING TRUNK CIRCUIT TO NO. 23-DESK SD-97578-01

TRANSMISSION TESTS

NO. 1 TRUNK CONCENTRATOR

1. GENERAL

1.01 This section describes the methods used when making transmission measurements on outgoing trunks from the No. 1 trunk concentrator (No. 1 TC) to the No. 23 operating room desk (No. 23-desk). The transmission measurements covered in this section include loss, message circuit noise, and frequency response. The originating end procedures are intended for use at the No. 1 trunk concentrator outgoing trunks and the terminating end procedures are for use at the No. 23-desk incoming trunk circuits.

1.02 This issue affects the Equipment Test List.

1.03 The tests covered are:

1.04 The tests and procedures in this section are identified by a special designation plan. Double test letters AA through AZ are reserved for originating and test procedures that require assistance at the terminating end. Double test letters BA through BZ are reserved for the terminating end test procedures to give assistance as required by the originating end.

1.05 Test Procedures AA, AB, and AC cover the general methods of making transmission tests on outgoing trunks from the No. 1 trunk concentrator to a No. 23 operating room desk. Tests on these trunks will normally be originated at the No. 1 trunk concentrator and would normally use originating end procedures found in the associated trunk transmission sections for that office. As an interim arrangement, generalities of these procedures are provided in Tests AA, AB, and AC of this section. They should be used in conjunction with the associated section for that office for test frame set up and operation. Procedures to be followed at the No. 23 operating room desk are found in Terminating End Procedures BA, BB, and BC of this section.

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

1.07 The transmission loss indicated by the transmission measuring set (TMS) meter is the actual measured loss (AML) in dB of the circuit under test and is made under the same conditions as the expected measured loss (EML) was computed.

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

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

1.10 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.

1.11 After a trunk has been connected for testing, all tests in this section can be performed on the trunk before releasing it.

1.12 ***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 performed at the originating end 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 parenthesis. Because of the variety of test circuits and option in the local offices, the apparatus required is omitted for the terminating end procedures. The calibration and operating procedures for each test set listed may be found in the section listed with the test set. It is important that the transmission test equipment is known to be accurately calibrated.

2.02 TC portable trunk test set SD-97576-01.

2.03 23A transmission measuring set (TMS) (Section 103-223-100).

2.04 3A or 3C noise measuring set (NMS) (Sections 103-611-100 or 103-611-101).

2.05 KS-19353, L1 or L4 oscillator (OSC) (Sections 103-302-105 or 103-302-106).

2.06 Patching cord, P3E cord, 6 feet long, equipped with 310 plugs on each end (3P7A cord).

2.07 Patching cord, P2AE cord, 4 feet long, equipped with a 310 plug and a 289B plug (2P16A cord).

2.08 Patching cord, P3E cord, 3 feet long, equipped with 310 plugs on each end (3P7B cord).

2.09 Testing cord, 893 cord, 6 feet long, equipped with two 360A tool (1W13B cord) and two KS-6298 connecting clips for connecting ground to 3A, 3C NMS.

2.10 52M head telephone set.

2.11 262B plug (600-ohm termination).

3. PREPARATION

3.01 Each test set should be calibrated in accordance with the appropriate Bell System Practice before it is used (see Part 2).

STEP	ACTION	VERIFICATION
TEST AA, AB, and AC		
1	At TC test set— Restore all keys and switches to normal.	
2	Plug head telephone set into TEL A and TEL B jacks.	
3	At outgoing trunk frame— Operate MB_ key associated with trunk to be tested.	MB_ lamp lighted.
4	Using 3P7A cord, connect RCV1 jack to RCV jack on outgoing trunk frame associated with trunk to be tested.	

STEP	ACTION	VERIFICATION

TABLE A

APPARATUS	TESTS		
	AA	AB	AC
TC Test Set (2.02)	1	1	1
23A TMS (2.03)	1	1	
3A or 3C NMS (2.04)			1
KS-19353 Oscillator (2.05)		1	
Patching Cord (2.06)	6	5	5
Patching Cord (2.07)			1*
Patching Cord (2.08)	1	2	1*
Testing Cord (2.09)			1
Head Telephone Set (2.10)	1	1	1
262B Plug (2.11)			1

*2P16A cord required for connection to 3A NMS.
3P7A cord required for connection to 3C NMS.

5	Using 3P7A cord, connect TRT2 jack to TRMT jack on outgoing trunk frame associated with trunk to be tested. ***CAUTION: To avoid possible grounding of battery supply lead, connect cord to test set first and when disconnecting, remove cord from test set last.***	
6	Using 3P7A cord, connect -48V jack to -48V supply jack on outgoing trunk frame.	
7	At outgoing trunk frame— Operate BCO key.	BCO lamp lighted.
8	At TC test set— Operate -48V key.	-48V lamp lighted.
9	Rotate TTS switch to OGT.	

STEP	ACTION	VERIFICATION
TEST AA and AB		
10	At TC test set— Using 3P7A cord, connect RCV2 jack to 310 MEAS jack on 23A TMS.	
11	At TMS— Operate DIAL-MEAS-SLV key to MEAS.	
12	Operate INPUT key to 600.	
13	Set ADD DBM switch to -5.	
TEST BA, BB, and BC		
	Note: Refer to 1.05.	
14	Using the appropriate apparatus and test measuring equipment, set up to perform the transmission tests on the No. 1 TC outgoing trunks to the No. 23-desk.	
15	Check the trunk to be tested for idle condition.	
16	Contact maintenance personnel at the No. 1 TC (originating end).	
17	Request originating end to prepare for trunk transmission tests to the No. 1 TC outgoing trunks.	
18	Connect a telephone set to the trunk to be tested.	

4. METHOD

AA. Two-Way 1000-Hz Loss Measurement—Originating End Procedures

STEP	ACTION	VERIFICATION
14	At TC test set— Using 3P7A cord, connect TRT1 jack to MWO jack on outgoing trunk frame.	
15	At TC test set— Operate OGT key.	OGT lamp lighted.
16	Operate TALK key.	TALK lamp lighted.
17	Request terminating end to prepare for reception of 1000-Hz tone.	

STEP	ACTION	VERIFICATION
18	Restore TALK key to normal.	TALK lamp extinguished.
19a	If TC is colocated with No. 23-desk— At TC test set— Operate TRT1 key.	TRT1 lamp lighted. 1000-Hz tone transmitted to terminating end.
20b	If TC is remotely located from the No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.
21b	Operate TRT2 key.	TRT2 lamp lighted. 1000-Hz tone transmitted to terminating end.
22	After predetermined interval— Restore TRT1 or TRT2 key to normal.	TRT1 or TRT2 lamp extinguished.
23	Operate TALK key.	TALK lamp lighted.
24	Request terminating end to send 1000-Hz tone for a predetermined interval.	
25	Restore TALK key to normal.	TALK lamp extinguished.
26a	If TC is colocated with No. 23-desk— At TC test set— Operate RCV1 key.	RCV1 lamp lighted. 23A TMS indicates transmission loss from terminating end.
27b	If TC is remotely located from No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.
28b	Operate RCV2 key.	RCV2 lamp lighted. 23A TMS indicates transmission loss from terminating end.
29	Record TMS indication.	
30	After predetermined interval— Restore RCV1 or RCV2 key to normal.	RCV1 or RCV2 lamp extinguished.
31	Operate TALK key. ***Note:*** If talk level is too low, restore 10 DB key to normal (if operated).	TALK lamp lighted.
32	Acknowledge receipt of 1000-Hz tone.	
33	Restore TALK key to normal.	TALK lamp extinguished.
34	Momentarily operate RL key.	All lamps extinguished.

STEP	ACTION	VERIFICATION
35	At outgoing trunk frame— Remove 3P7A cord from RCV jack associated with trunk under test.	
36	Restore MB_ key.	MB_ lamp extinguished.
37c	If other trunks are to be tested— At outgoing trunk frame— Operate MB_ key associated with next trunk to be tested.	MB_ lamp lighted.
38c	Using 3P7A cord, connect RCV jack of trunk made busy in Step 37c to RCV1 jack on TC test set.	
39c	Repeat Steps 4 and 5 in PREPARATION and Steps 15 through 38c for other trunks to be tested.	
40d	If no other tests are to be made— Remove all cords; restore all keys.	
AB.	**Two-Way Frequency Response Measurement—Originating End Procedures**	
14	At TC test set— Using 3P7A cord, connect TRT1 jack to OUTPUT 310 jack of portable oscillator.	
15	At portable oscillator— Set FUNCTION switch to 600.	
16	At TC test set— Operate OGT key.	OGT lamp lighted.
17	Operate TALK key.	TALK lamp lighted.
18	Request terminating end to prepare for reception of first required frequency at 0 dBm for an agreed upon length of time.	
19	Restore TALK key to normal.	TALK lamp extinguished.
20	Adjust oscillator to send first required frequency.	
21a	If TC is colocated with No. 23-desk— At TC test set— Operate TRT1 key.	TRT1 lamp lighted. Test tone transmitted to terminating end.
22b	If TC is remotely located from No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.

STEP	ACTION	VERIFICATION
23b	Operate TRT2 key.	TRT2 lamp lighted. Test tone transmitted to terminating end.
24	After agreed upon length of time— Restore TRT1 or TRT2 key to normal.	TRT1 or TRT2 lamp extinguished.
25	Operate TALK key.	TALK lamp lighted.
	Note: If talk level is too low, restore 10 DB key to normal (if operated).	
26	Request terminating end to prepare to measure second required frequency.	
27	Restore TALK key to normal.	TALK lamp extinguished.
28	Adjust oscillator to send second required frequency.	
29a	If TC is colocated with No. 23-desk— At TC test set— Operate TRT1 key.	TRT1 lamp lighted. Test tone transmitted to terminating end.
30b	If TC is remotely located from No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.
31b	Operate TRT2 key.	TRT2 lamp lighted. Test tone transmitted to terminating end.
32	After agreed upon length of time— Restore TRT1 or TRT2 key to normal.	TRT1 or TRT2 lamp extinguished.
33	Operate TALK key.	TALK lamp lighted.
	Note: If talk level is too low, restore 10 DB key to normal (if operated).	
34	Request terminating end to prepare for next required frequency.	
35	Restore TALK key to normal.	TALK lamp extinguished.
36	Adjust oscillator for next required frequency at 0 dBm.	
37a	If TC is colocated with No. 23-desk— At TC test set— Operate TRT1 key.	TRT1 lamp lighted. Test tone transmitted to terminating end.

STEP	ACTION	VERIFICATION
38b	If TC is remotely located from No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.
39b	Operate TRT2 key.	TRT2 lamp lighted. Test tone transmitted to terminating end.
40	After agreed upon interval— Restore TRT1 or TRT2 key to normal.	TRT1 or TRT2 lamp extinguished.
41	Operate TALK key.	TALK lamp lighted.
42	Request terminating end to prepare for next frequency.	
43	Repeat Steps 19 through 42 for other frequencies to be tested.	
44	Operate TALK key.	TALK lamp lighted.
45	Request terminating end to send first required frequency at 0 dBm for an agreed upon length of time.	
46	Restore TALK key to normal.	TALK lamp extinguished.
47a	If TC is colocated with No. 23-desk— At TC test set— Operate RCV1 key.	RCV1 lamp lighted. 23A TMS indicates transmission loss.
48b	If TC is remotely located from No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.
49b	Operate RCV2 key.	RCV2 lamp lighted. 23A TMS indicates transmission loss.
50	Record TMS indication.	
51	After agreed upon length of time— Restore RCV1 or RCV2 key to normal.	RCV1 or RCV2 lamp extinguished.
52	Operate TALK key. ***Note:*** If talk level is too low, restore 10 DB key to normal (if operated).	TALK lamp lighted.
53	Request terminating end to send next required frequency at 0 dBm for agreed upon length of time.	
54	Restore TALK key to normal.	TALK lamp extinguished.

STEP	ACTION	VERIFICATION
55a	It TC is colocated with No. 23-desk— At TC test set— Operate RCV1 key.	RCV1 lamp lighted. 23A TMS indicates transmission loss.
56b	If TC is remotely located from No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.
57b	Operate RCV2 key.	RCV2 lamp lighted. 23A TMS indicates transmission loss.
58	Record TMS indication.	
59	After agreed upon length of time— Restore RCV1 or RCV2 key to normal.	RCV1 or RCV2 lamp extinguished.
60	Repeat Steps 44 through 59 for other frequencies to be tested.	
61	Momentarily operate RL key.	All lamps extinguished.
62	At outgoing trunk frame— Remove 3P7A cord from RCV jack associated with trunk under test.	
63	Restore MB_ key to normal.	MB_ lamp extinguished.
64c	If other trunks are to be tested— At outgoing trunk frame— Operate MB_ key associated with next trunk to be tested.	MB_ lamp lighted.
65c	Using 3P7A cord, connect RCV jack of trunk made busy in Step 64c to RCV1 jack on TC test set.	
66c	Repeat Steps 4 & 5 in PREPARATION and Steps 16 through 65c for other trunks to be tested.	
67d	If no other trunks are to be tested— Remove all cords; restore all keys.	

AC. Message Circuit Noise Measurement—Originating End Procedures

10a	If using 3C NMS— At TC test set— Using 3P7A cord, connect RCV2 jack to IN jack of 3C NMS.	

STEP	ACTION	VERIFICATION
11a	At 3C NMS— Set FUNCTION switch to NM 600/900.	
12b	If using 3A NMS— At TC test set— Using 2P16A cord, connect RCV2 jack to IN jack of 3A NMS.	
13b	At 3A NMS— Set FUNCTION switch to NM 600.	
14	At 3A NMS or 3C NMS— Using 893 cord, connect GRD binding post to ground.	
15	Connect 723A receiver to AC MON jack.	
16	At TC test set— Insert 262B plug into TRT1 jack.	
17	Operate TALK key.	TALK lamp lighted.
18	Request terminating end to connect noise measuring equipment for agreed upon interval of time.	
19	Restore TALK key to normal.	TALK lamp extinguished.
20c	If TC is colocated with No. 23-desk— At TC test set— Operate TRT1 key.	TRT1 lamp lighted. Noise meter at terminating end indicates noise measurement and character of noise.
21d	If TC is remotely located from No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.
22d	Operate TRT2 key.	TRT2 lamp lighted. Noise meter at terminating end indicates noise measurement and character of noise.
23	After agreed upon length of time— Restore TRT1 or TRT2 key to normal.	TRT1 or TRT2 lamp extinguished.
24	Operate TALK key. ***Note:*** If talk level is too low, restore 10 DB key to normal (if operated).	TALK lamp lighted.
25	Request noise measurement and character of noise from terminating end; record indication and character.	

STEP	ACTION	VERIFICATION
26	Request terminating end to provide a balance termination for an agreed upon interval of time.	
27	Restore TALK key to normal.	TALK lamp extinguished.
28c	If TC is colocated with No. 23-desk— At TC test set— Operate RCV1 key.	RCV1 lamp lighted. 3A NMS or 3C NMS indicates noise measurement. Character of noise heard in 723A receiver.
29d	If TC is remotely located from No. 23-desk— At TC test set— Operate 10 DB key.	10 DB lamp lighted.
30d	Operate RCV2 key.	RCV2 lamp lighted. 3A NMS or 3C NMS indicates noise measurement. Character of noise is heard in 723A receiver.
31	Record noise measurement and character of noise.	
32	Restore RCV1 or RCV2 key to normal.	RCV1 or RCV2 lamp extinguished.
33	Momentarily operate RL key.	All lamps extinguished.
34	At outgoing trunk frame— Remove 3P7A cord from RCV jack associated with trunk under test.	
35	Restore MB_ key to normal.	MB_ lamp extinguished.
36e	If other trunks are to be tested— At outgoing trunk frame— Operate MB_ key associated with next trunk to be tested.	MB_ lamp lighted.
37e	Using 3P7A cord, connect RCV jack of trunk made busy in Step 36e to RCV1 jack of TC test set.	
38e	Repeat Steps 4 and 5 in PREPARATION and Steps 17 through 37e for other trunks to be tested.	
39f	If no other tests are to be made— Remove all cords; restore all keys.	
BA.	**Two-Way 1000-Hz Loss Measurement—Terminating End Procedures**	
19	When talk circuit has been established on the trunk to be tested—	

STEP	ACTION	VERIFICATION
	Request originating end to send 1000-Hz test tone for an agreed upon interval of time.	
20	Connect a transmission measuring set (TMS) to the trunk.	
21	Read and record TMS indication.	
22	After agreed upon interval of time, reestablish talk circuit and request originating end to receive and measure the 1000-Hz test tone for an agreed upon interval of time.	
23	Connect a 1000-Hz at 0 dBm, test tone to the trunk.	
24	After the agreed upon interval, reestablish talk circuit and request the TMS indication received at the originating end.	
25	Record TMS indication received at originating end.	
26	Repeat Steps 2 through 25 for other trunks to be tested.	
27a	If no other tests are to be performed— Inform originating end that the tests are complete; remove all test equipment.	

BB. Two-Way Frequency Response Measurement—Terminating End Procedures

19	When the talk circuit has been established, on the trunk to be tested— Request originating end to send first required frequency for an agreed upon interval of time.	
20	Connect a transmission measuring set (TMS) to the trunk under test.	
21	Read and record TMS indication.	
22	After agreed upon interval of time, reestablish talk circuit and request next required frequency to be sent.	
23	Repeat Steps 8 and 9 for other frequencies to be tested.	

STEP	ACTION	VERIFICATION
24	When the talk circuit has been reestablished— Request originating end to receive and measure the required frequencies to be sent for an agreed upon time.	
25	Connect an oscillator adjusted for the first required frequency to be sent.	
26	After agreed upon length of time— Reestablish talk circuit and request the TMS indication received at the originating end.	
27	Record the TMS indication.	
28	Repeat Steps 11 through 14 for other required frequencies.	
29	Repeat Steps 2 through 15 for other trunks to be tested.	
30a	If no other tests are to be performed— Inform originating end that tests are complete; remove all test equipment.	

BC. Message Circuit Noise Measurement—Terminating End Procedures

19	When the talk circuit has been established on the trunk to be tested— Request originating end to provide a balance termination on the trunk for an agreed upon interval of time.	
20	Connect a noise measuring test set with a test receiver to the trunk to be tested.	
21	Record the noise measurement and character of noise received.	
22	When the talk circuit has been reestablished— Request originating end to make a noise measurement on the trunk under test for an agreed upon interval of time.	
23	Provide a balance termination on the trunk to be tested.	
24	After agreed upon interval— Reestablish talk circuit and request the noise measurement and character of noise received.	

STEP	ACTION	VERIFICATION
25	Record noise measurement and the character of noise received.	
26	Repeat Steps 2 through 11 for other trunks to be tested.	
27a	If no other tests are to be performed— Inform originating end that tests are complete; remove all test equipment.	

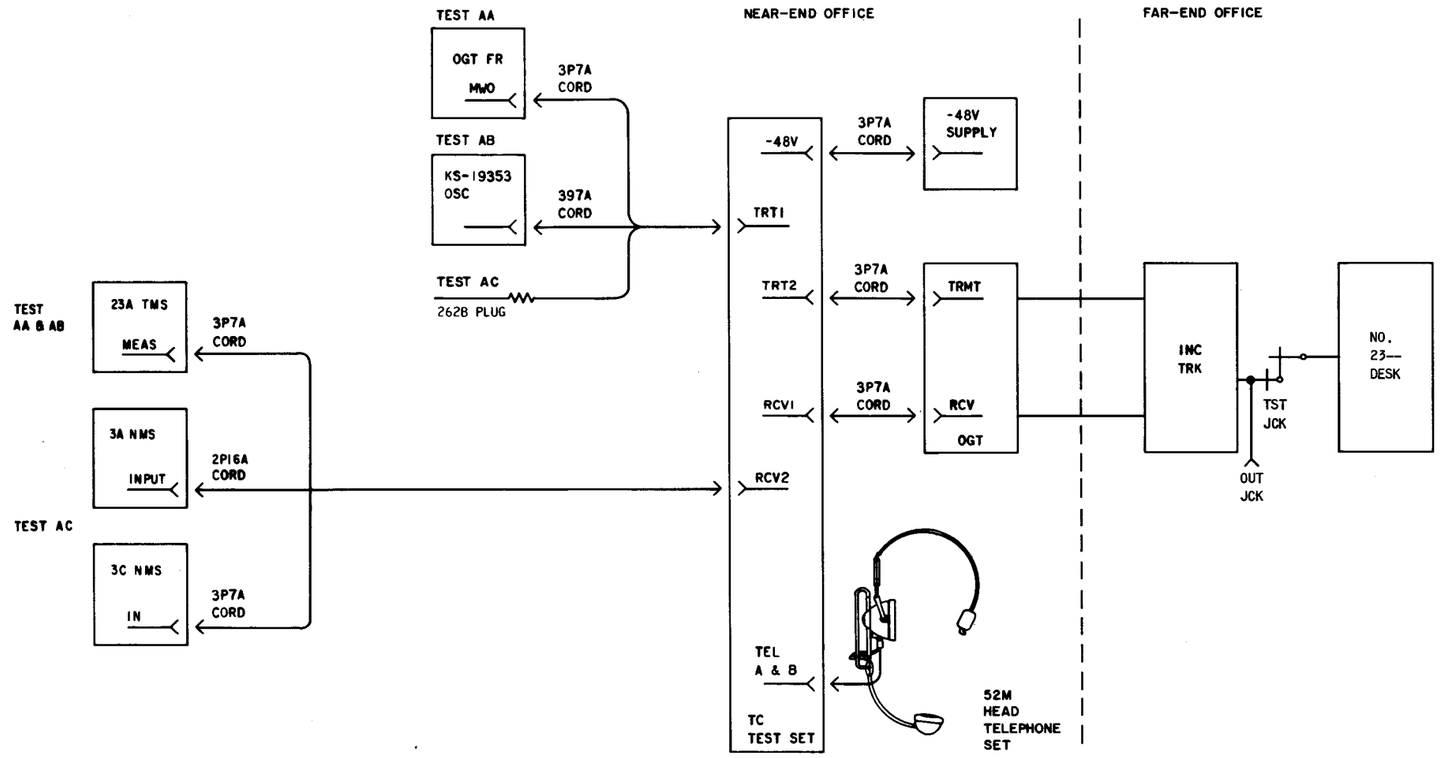

Fig. 1—Test Connections—Tests AA Through AC