

OUTGOING TRUNK CIRCUIT TO AIC SD-97570-01
TRANSMISSION TESTS
NO. 1 TRUNK CONCENTRATOR

1. GENERAL

PAGE

1.01 This section describes the methods of making transmission measurements on outgoing trunk circuits from the No. 1 trunk concentrator (No. 1 TC) to the automatic intercept center (AIC). The transmission measurements covered in this section include loss and message circuit noise.

~~AD.~~

1.02 This section is reissued to delete Tests C, AD, and AE. These tests are not applicable to this trunk circuit. This reissue affects the Equipment Test List.

~~AE.~~

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

1.03 The tests covered are:

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A. *One-Way 1000-Hz Loss Measurement to 102-Type Test Line* 5

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

B. *Message Circuit Noise Measurement to 100-Type Test Line* 6

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

C. ~~Deleted~~

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

AA. *Two-Way 1000-Hz Loss Measurement to 101-Type Test Line—Originating End Procedures.* 7

1.08 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 expected measured loss (EML) was computed.

AB. *Two-Way Frequency Response Measurement to 101-Type Test Line—Originating End Procedures* 9

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

AC. *Message Circuit Noise Measurement to 101-Type Test Line—Originating End Procedures* 11

1.10 After the trunk under test has been connected to a 101-type test line, Tests AA through

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AE can be performed on the same trunk without releasing the trunk from the test line.

1.11 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 parenthesis. Calibration and operating procedures for each test 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 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) 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 of 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.

2.05 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.

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

2.07 Testing cord, 898 cord, 6 feet long, equipped with two 360A tools (1W13B cord) and two KS-6278 connecting clips for connecting ground to 3A, 3C, NMS.

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

2.09 262B plug (600 ohm termination).

2.10 52M head telephone set.

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.)* Details of operation of the test sets can be found in those sections.

| STEP | ACTION | VERIFICATION |
|------|--------|--------------|
|------|--------|--------------|

All Tests

- | | | |
|---|---|--|
| 1 | At TC test set— Restore all keys and switches to normal. | |
| 2 | Plug head telephone set into TEL A and TEL B jacks. | |

STEP

ACTION

VERIFICATION

TABLE A

| APPARATUS | TESTS | | | | |
|----------------------------|-------|----|----|----|----|
| | A | B | AA | AB | AC |
| TC Test Set (2.02) | 1 | 1 | 1 | 1 | 1 |
| 23A TMS (2.03) | 1 | — | 1 | 1 | — |
| 3A or 3C NMS (2.04) | — | 1 | — | — | 1 |
| KS-19353 Oscillator (2.05) | — | — | — | 1 | — |
| Patching Cord (2.06) | 4 | 4* | 5 | 5 | 4† |
| Testing Cord (2.07) | — | 1 | — | — | 1 |
| Patching Cord (2.08) | — | 1* | — | — | 1† |
| 262B Plug (2.09) | — | — | — | — | 1 |
| Head Telephone Set (2.10) | 1 | 1 | 1 | 1 | 1 |

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

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

- 3 At outgoing trunk frame— MB_ lamp lighted.
Operate MB_ key associated with trunk to be tested.
- 4 Using 3P7A cord, connect RCV1 jack to RCV jack on outgoing trunk frame associated with trunk to be tested.
- 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.

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| STEP | ACTION | VERIFICATION |
|-------------|--|---------------------|
| 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 position. | |
| 10a | If outgoing trunk is associated with single frequency (SF) signaling— At TC test set— Operate SF key. | |

Tests A, AA, and AB

- 11 At TC test set—
Using 3P7A cord, connect RCV2 jack to 310
MEAS jack of 23A TMS.
- 12 At TMS—
Operate DIAL-MEAS-SLV key to MEAS.
- 13 Operate INPUT key to 600.
- 14 Set ADD DBM switch to -5.

Tests B and AC

- 15b If using 3C NMS—
At TC test set—
Using 3P7A cord, connect RCV2 jack to IN
jack of 3C NMS.
- 16b At 3C NMS—
Set FUNCTION switch to NM 600/900.
- 17c If using 3A NMS—
At TC test set—
Using 2P16A cord, connect RCV2 jack to IN
jack of 3A NMS.
- 18c Set FUNCTION switch to NM 600.
- 19 At 3A or 3C NMS—
Using 893 cord, connect GND binding post to
ground.
- 20 Connect 723A receiver to AC MON jack (see
2.04).

| STEP | ACTION | VERIFICATION |
|---|---|--|
| 4. METHOD | | |
| A. One-Way 1000-Hz Loss Measurement to 102-Type Test Line (Fig. 1) | | |
| 15 | At TC test set— Operate OGT key. | OGT lamp lighted. After AIC equipment is ready to receive digits— OH lamp lighted. |
| 16 | Operate TONE key. | MFT lamp lighted. |
| 17 | Key in digits KP-3-1-0-2-ST. | After far-end switching equipment makes connection to 102-type test line— 1000-Hz tone heard in head telephone set. |
| 18 | Restore TONE key to normal. | MFT lamp extinguished. |
| 19b | If TC is colocated with the AIC— At TC test set— Operate RCV1 key. | RCV1 lamp lighted. TMS indicates -5 dBm (far-to-near transmission loss). |
| 20c | If TC is remotely located from the AIC— At TC test set— Operate 10 DB key. | 10 DB lamp lighted. |
| 21c | Operate RCV2 key. | RCV2 lamp lighted. TMS indicates -5 dBm (far-to-near transmission loss). |
| 22 | Record TMS indication on proper form per local instructions. | |
| 23 | Restore RCV1 or RCV2 key to normal. | RCV1 or RCV2 lamp extinguished. |
| 24 | Restore OGT key to normal. | OGT and OH lamps extinguished. |
| 25 | At outgoing trunk frame— Remove 3P7A cord from RCV jack associated with trunk under test. | |
| 26 | Restore MB_ key to normal. | MB_ lamp extinguished. |
| 27d | If other trunks are to be tested— At outgoing trunk frame— Operate MB_ key associated with next trunk to be tested. | |
| 28d | Using 3P7A cord, connect RCV jack of trunk made busy in Step 27d to RCV1 jack on TC test set. | |

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| STEP | ACTION | VERIFICATION |
|--|---|---|
| 29d | Repeat Steps 4 and 5 in PREPARATION and 15 through 28d for other trunks to be tested. | |
| 30e | If no other tests are to be made— Remove all cords; restore all keys. | |
| B. Message Circuit Noise Measurement to 100-Type Test Line (Fig. 1) | | |
| 21 | At TC test set— Operate OGT key. | OGT lamp lighted. After AIC equipment is ready to receive digits— OH lamp lighted. |
| 22 | Operate TONE key. | MFT lamp lighted. |
| 23 | Key in digits KP-3-1-0-0-ST. | After far-end switching equipment completes connection to 100-type test line— 1000-Hz tone heard in head telephone set for 5.5 seconds, then goes quiet. |
| 24 | Restore TONE key to normal. | MFT lamp extinguished. |
| 25d | If TC is colocated with the AIC— At TC test set— Operate RCV1 key. | RCV1 lamp lighted. 3A or 3C NMS indicates near-end noise. Character of noise heard in 723A receiver. |
| 26e | If TC is remotely located from the AIC— At TC test set— Operate RCV2 key. | RCV2 lamp lighted. 3A or 3C NMS indicates near-end noise. Character of noise heard in 723A receiver. |
| 27 | Record noise measurement in accordance with local instructions. | |
| 28 | Restore RCV1 or RCV2 key to normal. | RCV1 or RCV2 lamp extinguished. |
| 29 | Restore OGT key to normal. | OGT lamp extinguished. |
| 30 | At outgoing trunk frames— Remove 3P7A cord from RCV jack associated with trunk under test. | |
| 31 | Restore MB_ key to normal. | MB_ lamp extinguished. |
| 32f | If other trunks are to be tested— At outgoing trunk frame— Operate MB_ key associated with next trunk to be tested. | |
| 33f | Using 3P7A cord, connect RCV jack of trunk made busy in Step 32f to RCV1 jack on TC test set. | |

| STEP | ACTION | VERIFICATION |
|---|---|---|
| 34f | Repeat Steps 4 and 5 in PREPARATION and 10 through 33f for other trunks to be tested. | |
| 35g | If no other tests are to be made— Remove all cords; restore all keys. | |
| AA. Two-Way 1000-Hz Loss Measurement to 101-Type Test Line—Originating End Procedures (Fig. 2) | | |
| 15 | At TC test set— Using 3P7A cord, connect TRT1 jack to MW0 jack on outgoing trunk frame. | |
| 16 | At TC test set— Operate OGT key. | OGT lamp lighted. After AIC equipment is ready to receive digits— OH lamp lighted. |
| 17 | Key in digits KP-3-1-0-1-ST. | After far-end switching equipment completes connection to 101-type test line— Maintenance personnel at far end answers call. |
| 18 | Operate TALK key. | TALK lamp lighted. |
| 19 | Request terminating end to connect 0 dBm 1000-Hz tone to trunk under test for agreed upon interval. | 1000-Hz tone heard in head telephone set. |
| 20 | Restore TALK key to normal. | TALK lamp extinguished. |
| 21b | If TC is colocated with the AIC— At TC test set— Operate RCV1 key. | RCV1 lamp lighted. 23A TMS indicates far-to-near transmission loss. |
| 22c | If TC is remotely located from the AIC— Operate 10 DB key. | 10 DB lamp lighted. |
| 23c | Operate RCV2 key. | RCV2 lamp lighted. 23A TMS indicates far-to-near transmission loss. |
| 24 | Record TMS indication. | |
| 25 | Restore RCV1 or RCV2 key to normal. | RCV1 or RCV2 lamp extinguished. |
| 26 | Operate TALK key. | TALK lamp lighted. |
| 27 | Request terminating end to measure. | |

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| STEP | ACTION | VERIFICATION |
|------|---|--|
| | <i>Note:</i> If far-end talk level is too low, momentarily restore 10 DB key to normal during talking. | |
| 28 | Restore TALK key. | TALK lamp extinguished. |
| 29d | If TC is colocated with the AIC— At TC test set— Operate TRT1 key. | TRT1 lamp lighted. 1000-Hz tone transmitted toward far end. |
| 30e | If TC is remotely located from the AIC— At TC test set— Operate TRT2 key. | TRT2 lamp lighted. 1000-Hz tone transmitted toward far end. |
| 31 | After agreed upon time interval— Restore TRT1 or TRT2 key to normal. | TRT1 or TRT2 lamp extinguished. |
| 32 | Operate TALK key. | TALK lamp lighted. |
| 33 | Obtain and record near-to-far transmission loss from distant end. | |
| 34 | Restore TALK key to normal. | TALK lamp extinguished. |
| 35 | At TC test set— Restore OGT key to normal. | OGT and OH lamps extinguished. |
| 36 | At outgoing trunk frame— Remove 3P7A cord from RCV jack associated with trunk under test. | |
| 37 | Restore MB_ key to normal. | MB_ lamp extinguished. |
| 38f | If other trunks are to be tested— At outgoing trunk frame— Operate MB_ key associated with next trunk to be tested. | |
| 39f | Using 3P7A cord, connect RCV jack of trunk made busy in Step 38f to RCV1 jack on TC test set. | |
| 40f | Repeat Steps 4 and 5 in PREPARATION and 15 through 39f for other trunks to be tested. | |
| 41g | If no other tests are to be made— Remove all cords; restore all keys. | |

| STEP | ACTION | VERIFICATION |
|------------|---|---|
| AB. | Two-Way Frequency Response Measurement to 101-Type Test Line—Originating End Procedures (Fig. 2) | |
| 15 | At TC test set— Using 3P7A cord, connect TRT1 jack to OUTPUT 310 jack of portable oscillator. | |
| 16 | At portable oscillator— Set FUNCTION switch to 600. | |
| 17 | At TC test set— Operate OGT key. | OGT lamp lighted. After AIC equipment is ready to receive digits— OH lamp lighted. |
| 18 | Key in digits KP-3-1-0-1-ST. | After far-end switching equipment completes connection to 101-type test line— Maintenance personnel at far end answers call. |
| 19 | Operate TALK key. | TALK lamp lighted. |
| 20 | Request distant end to send first required frequency at 0 dBm for agreed upon length of time. | Tone heard in head telephone set. |
| 21 | Restore TALK key to normal. | TALK lamp extinguished. |
| 22b | If TC is colocated with the AIC— At TC test set— Operate RCV1 key. | RCV1 lamp lighted. 23A TMS indicates far-to-near transmission loss of first frequency. |
| 23c | If TC is remotely located from the AIC— Operate 10 DB key. | 10 DB lamp lighted. |
| 24c | Operate RCV2 key. | RCV2 lamp lighted. 23A TMS indicates far-to-near transmission loss of first frequency. |
| 25 | Record TMS indication. | |
| 26 | Restore RCV1 or RCV2 key to normal. | RCV1 or RCV2 lamp extinguished. |
| 27 | Operate TALK key. | TALK lamp lighted. |
| | Note: If far-end talk level is too low, momentarily restore 10 DB key to normal during talking. | |
| 28 | Request distant end to send next frequency at 0 dBm for agreed upon length of time. | |

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| STEP | ACTION | VERIFICATION |
|------|--|--|
| 29 | Restore TALK key to normal. | TALK lamp extinguished. |
| 30d | If TC is colocated with the AIC— At TC test set— Operate RCV1 key. | RCV1 lamp lighted. 23A TMS indicates far-to-near transmission loss. |
| 31c | If TC is remotely located from the AIC— At TC test set— Operate RCV2 key. | RCV2 lamp lighted. 23A TMS indicates far-to-near transmission loss. |
| 32 | Record TMS indication. | |
| 33 | Restore RCV1 or RCV2 key to normal. | RCV1 or RCV2 lamp extinguished. |
| 34 | Repeat Steps 27 through 33 for other frequencies to be tested. | |
| 35 | Operate TALK key. | TALK lamp lighted. |
| 36 | Request distant end to prepare to measure frequencies. | |
| 37 | Adjust oscillator to send first required frequency at 0 dBm. | |
| 38 | Restore TALK key to normal. | TALK lamp extinguished. |
| 39b | If TC is colocated with the AIC— At TC test set— Operate TRT1 key. | TRT1 lamp lighted. Test tone transmitted to AIC office. |
| 40c | If TC is remotely located from the AIC— At TC test set— Operate TRT2 key. | TRT2 lamp lighted. Test tone transmitted to AIC office. |
| 41 | After agreed upon length of time— Restore TRT1 or TRT2 key to normal. | |
| 42 | Operate TALK key. | TALK lamp lighted. |
| | Note: If far-end talk level is too low, momentarily restore 10 DB key to normal during talking. | |
| 43 | Obtain near-to-far transmission loss indication from distant end; record reading. | |
| 44 | Adjust oscillator to send next required frequency at 0 dBm. | |
| 45 | Request distant end to prepare to measure next frequency. | |

| STEP | ACTION | VERIFICATION |
|---|---|--|
| 46 | Restore TALK key to normal. | TALK lamp extinguished. |
| 47b | If TC is colocated with the AIC— At TC test set— Operate TRT1 key. | TRT1 lamp lighted. Test tone transmitted to AIC office. |
| 48c | If TC is remotely located from the AIC— At TC test set— Operate TRT2 key. | TRT2 lamp lighted. Test tone transmitted to AIC office. |
| 49 | Restore TRT1 or TRT2 key to normal. | TRT1 or TRT2 lamp extinguished. |
| 50 | Operate TALK key. | TALK lamp lighted. |
| 51 | Obtain near-to-far transmission indication from distant end; record reading. | |
| 52 | Repeat Steps 44 through 51 for other frequencies to be tested. | |
| 53 | Restore TALK key to normal. | TALK lamp extinguished. |
| 54 | At TC test set— Restore OGT key to normal. | OGT and OH lamps extinguished. |
| 55 | At outgoing trunk frame— Remove 3P7A cord from RCV jack associated with trunk under test. | |
| 56 | Restore MB_ key to normal. | MB_ lamp extinguished. |
| 57d | If other trunks are to be tested— At outgoing trunk frame— Operate MB_ key associated with next trunk to be tested. | |
| 58d | Using 3P7A cord, connect RCV jack of trunk made busy in Step 57d to RCV1 jack on TC test set. | |
| 59d | Repeat Steps 4 and 5 in PREPARATION and 14 through 58d for other trunks to be tested. | |
| 60e | If no other tests are to be made— Remove all cords; restore all keys. | |
| AC. Message Circuit Noise Measurement to 101-Type Test Line—Originating End Procedure (Fig. 2) | | |
| 21 | At TC test set— Insert 262B plug into TRT1 jack. | |

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| STEP | ACTION | VERIFICATION |
|------|--|---|
| 22 | At TC test set— Operate OGT key. | OGT lamp lighted. After AIC equipment is ready to receive digits— OH lamp lighted. |
| 23 | Key in digits KP-1-0-1-ST. | After far-end switching equipment completes connection to 101-type test line— Maintenance personnel at far end answers call. |
| 24 | Operate TALK key. | TALK lamp lighted. |
| 25 | Request distant end to connect far-end noise measuring equipment for agreed upon time interval. | |
| 26 | Restore TALK key to normal. | TALK lamp extinguished. |
| 27d | If TC is colocated with the AIC— At TC test set— Operate TRT1 key. | TRT1 lamp lighted. Noise meter at far-end indicates noise measurement and character of noise. |
| 28e | If TC is remotely located from the AIC— At TC test set— Operate 10 DB key. | 10DB lamp lighted. |
| 29e | Operate TRT2 key. | TRT2 lamp lighted. Noise meter at far-end indicates noise measurement and character of noise. |
| 30 | Restore TRT1 or TRT2 key to normal. | TRT1 or TRT2 lamp extinguished. |
| 31 | At TC test set— Operate TALK key. | TALK lamp lighted. |
| | Note: If far-end talk level is too low, momentarily restore 10 DB key to normal during talking. | |
| 32 | Obtain near-end noise measurement and character of noise from distant end; record indication. | |
| 33 | Request distant end to provide a balance termination for agreed upon time interval. | |
| 34 | Restore TALK key to normal. | TALK lamp extinguished. |
| 35d | If TC is colocated with the AIC— At TC test set— Operate RCV1 key. | RCV1 lamp lighted. 3A or 3C NMS indicates noise measurement. Character of noise heard in 723A receiver. |

| STEP | ACTION | VERIFICATION |
|------|---|---|
| 36e | If TC is remotely located from the AIC— At TC test set— Operate RCV2 key. | RCV2 lamp lighted. 3A or 3C NMS indicates noise measurement. Character of noise heard in 723A receiver. |
| 37 | Record noise measurement and character of noise. | |
| 38 | Restore RCV1 or RCV2 key to normal. | RCV1 or RCV2 lamp extinguished. |
| 39 | At TC test set— Restore OGT key to normal. | OGT and OH lamps extinguished. |
| 40 | At outgoing trunk frame— Remove 3P7A cord from RCV jack associated with trunk under test. | |
| 41 | Restore MB_ key to normal. | MB_ lamp extinguished. |
| 42f | If other trunks are to be tested— At outgoing trunk frame— Operate MB_ key associated with next trunk to be tested. | |
| 43f | Using 3P7A cord, connect RCV jack of trunk made busy in Step 42f to RCV1 jack on TC test set. | |
| 44f | Repeat Steps 4 and 5 in PREPARATION and 21 through 43f for other trunks to be tested. | |
| 45g | If no other tests are to be made— Remove all cords; restore all keys. | |

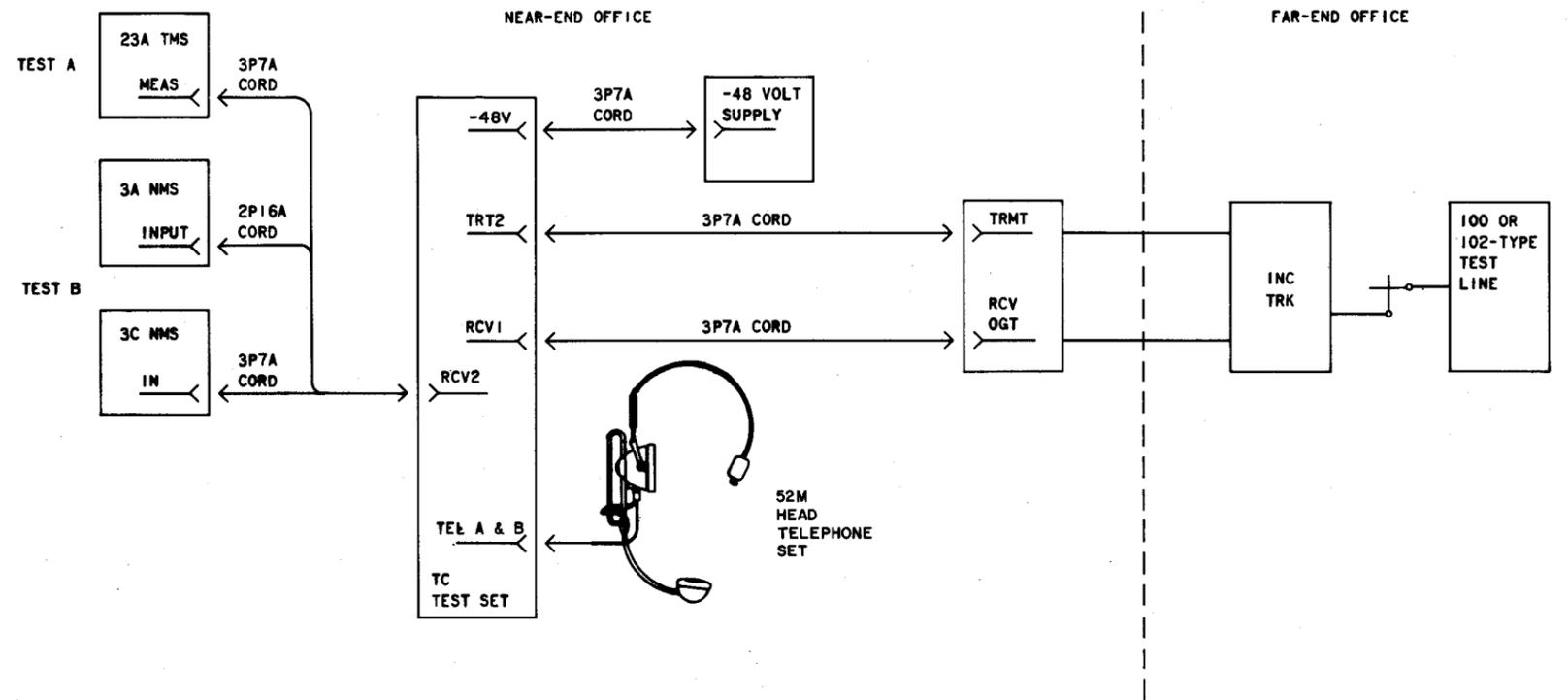


Fig. 1—Test Connections—Tests A and B

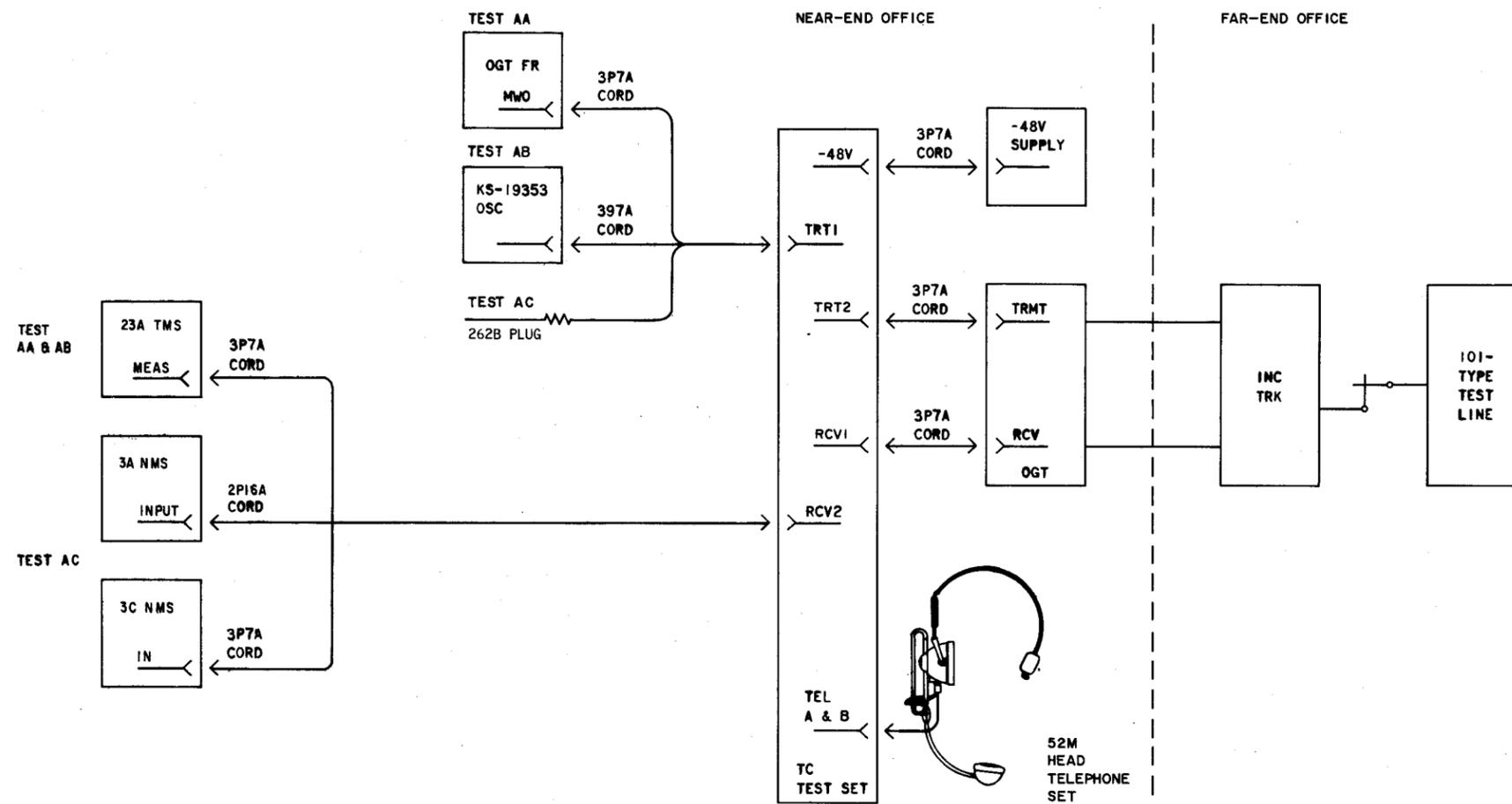


Fig. 2—Test Connections—Test AA through TC