

LINE INSULATION TEST FRAMES
MODIFIED TO MEASURE NOISE ON SUBSCRIBER LINES
NO. 1 CROSSBAR SWITCHING SYSTEMS
(GA6123)

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1. GENERAL

1.01 This appendix provides measurement procedures for locating noise on subscriber lines using the modified (per GA 6123) line insulation test frame (LIT) and a noise measuring set (NMS).

1.02 The noise measuring set used is the 3A NMS or the Northeast Electronics TTS-37B or -37C test set.

1.03 The noise measuring set converts subscriber line noise to a dc voltage. The sensitivity of the noise measuring set can be adjusted to detect noise above any desired level. The lines with excessive noise are printed on the LIT teletypewriter and are identified by equipment location.

Caution: Do not use this procedure to derive noise measurements for the noise component of the Subscriber Plant Transmission Index.

2. CALIBRATION - 3A NMS

2.01 Set the function switch on the 3A NMS at NM 900 and the DBRN switch at 70. The filter should be C message weighting.

2.02 Supply 1000 Hz at the 0-dB level through a 5A attenuator to the input jack of the 3A NMS. The 3A NMS should read 10 dBm with a 10-dB loss cut in on the 5A attenuator.

2.03 Patch the 3A MON DC jack to the MON DC jack on the LIT frame. Use the cord described in the note below. The 3A meter will not show a reading when a plug is in the MON DC jack.

Note: The cord that plugs into the MON DC jack on the LIT frame is equipped with a 310 plug on one end and a 347A, 347B, or Mallory No. 75 plug on the other end. This cord must be made locally by connecting the tip of the 310 plug to the tip of the 347 or Mallory No. 75 plug. The ring of the 310 plug is attached to the sleeve of the 347 or Mallory plug.

2.04 Start the LIT frame using Test 9. The tubes take about one minute to warm up before the frame will start testing subscriber lines.

2.05 Insert a phenol plug into the IN jack on the LIT frame. This removes subscriber lines while calibrating.

(a) Adjust the sensitivity potentiometer of the LIT frame until the TT tube fires (TT relay operates) on each line and the LIT teletype prints out the office code, 922 and the line identification.

(b) Set the loss in the 5A attenuator at 11 dB.

(c) Remove the plug momentarily from the MON DC jack on the 3A NMS. The 3A NMS meter should read 9 dBm.

Caution: To prevent damage to the NMS meter needle, do not pull the MON DC plug out of the jack until the DBRN switch is set to a higher reading.

(d) Replace the plug in the MON DC jack. The LIT frame should not stop.

(e) Set the loss in the 5A attenuator at 10 dB, 9 dB, 8 dB, 7 dB etc. At each setting check that the LIT frame stops and prints the office code, a nine-hundred number, (922 to 900) and the line equipment number. Record the setting and the nine-hundred number (900-922). Repeat for each setting. Save this information for decoding noise printouts.

2.06 Remove the phenol plug.

2.07 Operate the LIT frame RN key.



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3. OPERATION – 3A NMS

- 3.01 Connect the 3A IN jack to the LIT frame IN jack using a 3P17B cord.
- 3.02 Set the DBRN switch on the 3A NMS, 10 dBrn lower than the level of noise to be detected. For example, set the switch to 10 when noise levels of 20 dBrn or higher are to be detected.
- 3.03 Restart the LIT frame using Test 9.
- 3.04 Ground start PBX lines will read as noisy lines if the LIT frame is not arranged to bypass them.
- 3.05 Complete the LIT test cycle.
- (a) The LIT teletypewriter printout is decoded by using the information obtained in 2.06 (e).

4. CALIBRATION – TTS-37B or C

- 4.01 Patch the MW (milliwatt) jack into the LINE jack of the TTS-37B or C test set.
- 4.02 Turn the switches on the TTS-37B or C to a 900 ohm termination and C message weighting.
- 4.03 Check that the MW level is 90 dBrn.
- 4.04 Set the controls on the TTS-37B or C to 90 dBrn on the right switch and 10 dBrn on the left switch using dBrn scales (blue).
- 4.05 Patch the MON DC jack of the TTS-37B or C to the MON DC jack of the LIT frame using a straight cord equipped with 310 plugs.

Note: Disregard the meter readings when the cord is plugged into the MON DC jack.

- 4.06 Start the LIT frame on Test 9.
- 4.07 Insert a phenol plug into the IN jack on the LIT frame.
- 4.08 Adjust the sensitivity pot on the LIT frame so the teletypewriter will print out at 90 dBrn and 9 dBrn but not at 90 dBrn and 10 dBrn.
- 4.09 Check the calibration of the LIT frame.

EXAMPLE:

90 + 10 = No LIT teletypewriter printout

90 + 9,8,7,6 or 5 = 922

90 + 4,3,2 or 1 = 912

80 + 10, 9,8,7,6 or 5 = 911

80 + 4,3,2 or 1 = 901

Note: These values are not the same on all LIT frames.

4.10 During the calibration check, record the LIT teletypewriter test entries in the calibration printout column in Table A. These figures are used for decoding information during an actual test and are valid only for the LIT frame that was calibrated.

4.11 Remove the cord connected to the MW jack and the LINE jack of the TTS-37B or C.

4.12 Remove the phenol plug from the IN jack on the LIT frame.

5. OPERATION – TTS-37B or C

- 5.01 Leave the switches on the TTS-37B or C set at the 900-ohm termination and C message weighting.
- 5.02 To select the range of noise readings desired on the teletypewriter printout, set the left and right switches on the TTS 37B or C in one of the following combinations: 10 and 9, 20 and 9, 30 and 4 or 30 and 9. See Table A for the actual noise range determined by the TTS-37B or C setting. For example, the setting 20 and 9 gives an actual noise range of 20 to 38 dBrn.
- 5.03 Start the LIT frame using Test 9 and complete the test cycle.
- 5.04 To decode the teletypewriter printout information, see Table A and proceed as follows:

- (a) Locate the printout test number in the calibration printout column. (See 4.10.)
- (b) Then, reading across, locate the TTS-37B or C switch setting column. This gives the actual noise in dBrn for the printout number.

6. VERIFICATION OF NOISY LINES

Plant Service Center

6.01 Measure suspected noisy lines from the local test desk (if equipped for noise measuring).

Crossbar Offices

6.02 Manually operate the line hold magnet of the line to be tested. Take a reading of the line. If the reading is out of limits proceed to the MDF.

6.03 Remove the heat coils from the cable pair to isolate the noise.

6.04 Take corrective measures.

Step-By-Step Offices

6.05 Manually operate the cutoff relay of the line to test. Take a reading of the line. If the reading is out of limits proceed to the MDF.

6.06 Remove the heat coils of the cable pair to isolate the noise outside or inside of the office.

6.07 Take corrective measures.

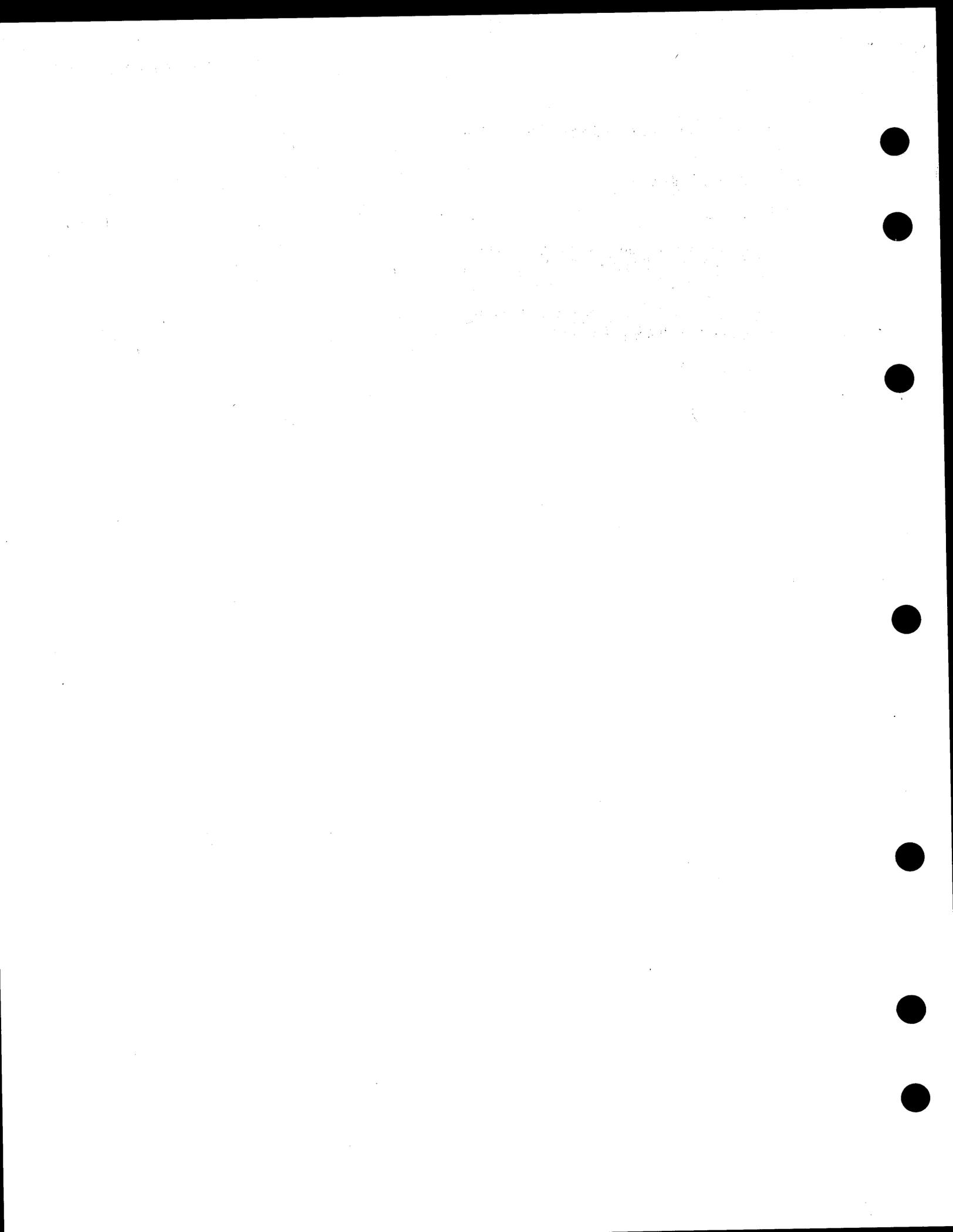


TABLE A
NOISE MEASUREMENTS MADE WITH THE MODIFIED LIT FRAME
AND TTS-37B OR C TEST SET

CALIBRATION		ACTUAL NOISE IN dBrn			
TTS-37B SETTING	PRINTOUT	SWITCH SETTING TTS-37B or C			
		10 + 9	20 + 9	30 + 4	30 + 9
90 + 9	922	10 dBrn	20 dBrn	25 dBrn	30 dBrn
90 + 8		11	21	26	31
90 + 7		12	22	27	32
90 + 6		13	23	28	33
90 + 5		14	24	29	34
90 + 4		15	25	30	35
90 + 3		16	26	31	36
90 + 2		17	27	32	37
90 + 1		18	28	33	38
80 + 10		19	29	34	39
80 + 9		20	30	35	40
80 + 8		21	31	36	41
80 + 7		22	32	37	42
80 + 6		23	33	38	43
80 + 5		24	34	39	44
80 + 4		25	35	40	45
80 + 3		26	36	41	46
80 + 2		27	37	42	47
80 + 1	900	28+	38+	43+	48+

NOTE: The teletypewriter printout numbers recorded during the calibration test correspond to the actual noise in the TTS-37B or C switch setting column (10 + 9, 20 + 9, etc.).

