N3 CARRIER TELEPHONE SYSTEM
GROUP RECEIVER, TRANSMITTER, AND LINE TERMINATING UNITS
CHECK OF SLOPE EQUALIZERS, SPAN PADS, AND LOCAL CABLING

Slope equalizers are used in the N3 carrier terminal to compensate for slope in the repeatered high-frequency line characteristics. Screw-connected 377-type equalizers are located in the group receiver and transmitter units. These equalizers provide nominal slope changes of −9 to +9 dB in 3-dB steps. In addition, the group receiver unit achieves a fine slope adjustment of −1, 0, or +1 dB by the closing of a screw switch on the unit faceplate.

This section is reissued to include the J99300AT, List 3 line terminating unit. Since this revision is of a general nature, arrows ordinarily used to indicate changes have been omitted. This reissue does not affect Equipment Test Lists.

Span pads are provided at terminals to build out the cable loss of the receiving pair to the nominal values for the system and to reduce signal power applied to the transmitting pair for transmission coordination with other systems in the same cable. The pads are available in 2-dB steps from 0 to 44 dB.

The purpose of this out-of-service test is to make an inspection of slope equalizer and span pad installations and to measure the loop simplex resistance of the local office cabling and bay carrier pairs.

APPARATUS:

1—KS-14510 Volt-Ohm-Milliammeter (VOM), or equivalent

3—W1Y Cords (shorting straps), or equivalent

STEP	PROCEDURE
	A. Inspection of Slope Equalizer and Span Pad Installations *Note:* In some cases, for coordination with office arrangements providing increased interconnecting flexibility, line buildout for the N3 terminals may be located in a high-frequency cross-connecting and line build-out cabinet or in a line build-out bay. The line buildout may be slope networks and/or span pads. In these cases, 377D slope equalizers (0-dB loss) will still be required in the group units, and 49A pads (0-dB loss) will be

STEP	PROCEDURE
	required in the line terminating unit. Where line buildout that is external to the N3 terminal is provided, refer to the 440 subdivision of Bell System Practices.
1	From the carrier layout record (CLR) card or equipment assignment record (EAR) card obtain the cable number, and transmitting and receiving pair assignments.
2	At the cable terminal, terminal block, or high-frequency cross-connection cabinet, identify the carrier terminal and outside cable transmitting and receiving pairs.
3	Verify that the cable pairs assigned to the carrier system do not have heat coils for protection and that where they have been removed, permanent straps have been soldered in their place. When 300-type connectors are used, they should be equipped with metal dummy heat coils and carbon-block protectors.
4	At the cable terminal or protector block check that the transmit and receive pairs have been connected through to the outside cable pairs. If the carrier terminal high-frequency pairs are cabled to a high-frequency cross-connection cabinet, check that the transmit and receive pairs have been cross-connected to the outside cable pairs.
5	At the carrier terminal bay remove the group receiver (GRP RCVR) and group transmitter (GRP TRMTR) plug-in units.
6	On the GRP RCVR unit (Fig. 1) verify that the 377-type slope equalizer conforms with the CLR card for the system (see Table A). Check that the equalizer terminal and bracket screws are firmly seated. ***Caution: Do not use excessive force in seating the screws.***
7	On the GRP RCVR faceplate enter the dB value of slope correction in the space marked SLOPE NET_____. ***Note:*** Bell System Transfer Stenciling Kit "B" or felt tipped pen may be used.

TABLE A

377-TYPE SLOPE EQUALIZERS

*INPUT EQUIPMENT	SLOPE NETWORK	SLOPE (DB)
−9A	377A	−9
−6B	377B	−6
−3C	377C	−3
0D	377D	0
+3E	377E	+3
+6F	377F	+6
+9G	377G	+9

* From CLR card.

STEP	PROCEDURE
8	Check that the slope adjustment (SLOPE ADJ) screw switch is set to the value specified by the CLR card and the slope adjustment option entered in the space marked SLOPE ADJ_____ .
9	Enter the word "TERM" (terminal) in the space marked USE_____.
10	Reinsert the GRP RCVR unit in the terminal mounting.
11	On the GRP TRMTR unit (Fig. 2) verify that the 377-type slope equalizer conforms with the CLR card for the system (see Table A). Check that the equalizer terminal and bracket screws are firmly seated.
12	On the GRP TRMTR faceplate enter the dB value of slope correction in the space marked SLOPE NET_____(see Note, Step 7 of Test A).
13	Enter the word "TERM" (terminal) in the space marked USE_____ .
14	Reinsert the GRP TRMTR unit in the terminal mounting.
15	Remove the line terminating unit (LINE TERM) from the carrier terminal mounting.
16	On the LINE TERM unit (Fig. 3) verify that the AT1 TRMTG and AT2 RCVG span pads conform with the CLR card for the system (see Table B). Check that the 39- or 49-type pads are seated in their respective sockets and the retaining clamps or screws are firmly seated.
17	On the LINE TERM faceplate (Fig. 3) enter the dB value of the RCVG pad in the space marked IN P(AD)_____ and TRMTG pad in the space marked OUT P(AD)_____(see Note, Step 7 of Test A).
18	Reinsert the LINE TERM unit in the terminal mounting.

TABLE B

38- AND 49-TYPE SPAN PADS

CODE	LOSS (DB)	CODE	LOSS (DB)
A	0	N	24
B	2	P	26
C	4	R	28
D	6	S	30
E	8	T	32
F	10	U	34
G	12	W	36
H	14	Y	38
J	16	AA	40
K	18	AB	42
L	20	AC	44
M	22		

STEP	PROCEDURE
	B. Check of Local Cabling
	Caution: Prior to performing this out-of-service test, make busy, turn down, or patch off all working circuits assigned to Groups 1 and 2 of the system.
1	At the carrier terminal mounting remove the plug-in LINE TERM unit.
	Note: Removal of the LINE TERM unit causes SYS FAIL alarms at both terminals.
2	Note the screw switch settings of the LINE TERM unit. The settings should agree with those determined from previous adjustments (Sections 362-904-502, J99300AL unit and 362-904-504, J99300AT unit) and those listed on the unit faceplate in the space marked OPT SCR_____.
3	Reset the LINE TERM unit screw switch settings per Table C.

TABLE C

LINE TERMINATING UNIT – SWITCH SETTINGS

LINE TERM UNIT (J SPECIFICATION)	SCREW SWITCH SETTINGS	
	DOWN	UP
J99300AL, List 1	A	B, C, D, E, F, G, H, J
J99300AT, List 1 or List 3	S7	S5, S6
J99300AT, List 2	S13	S11, S12, S16

4	If the LINE TERM unit is J99300AL or J99300AT, List 1 or 3, proceed to Step 5. If the LINE TERM unit is J99300AT, List 2, proceed to Step 6.
5	At the ALM PWR & MISC panel remove the +130V fuse for the carrier terminal to be tested.
	Caution: Check bay designations and terminal number for positive identification of the terminal under test. Removal of the wrong + 130 volt fuse will cause a system failure.

+130 VOLT FUSE ASSIGNMENTS	
TERMINAL NO.	FUSE DESIGNATION
1	R1
2	R2

STEP	PROCEDURE
6	Reinsert the LINE TERM unit into the carrier terminal mounting.
7	From the carrier layout record (CLR) card or equipment assignment record (EAR) card obtain the cable number and transmitting and receiving pair assignments.
8	At the cable terminal, terminal block, or high-frequency cross-connection cabinet, identify the transmitting and receiving cable pairs.
9	At the cable terminal or terminal block short the transmitting and receiving cable pairs with W1Y cords. (See Fig. 4.)
10	Set the VOM selector switch to DC VOLTS 300.
11	Connect one VOM test probe to the shorted transmitting pair and the other probe to the receiving pair. ***Note:*** If the meter deflects to the left, reverse the VOM test probes.
12	Measure the dc voltage between the shorted transmitting and receiving pairs. Set the VOM selector switch to the lowest range to maintain an on-scale indication. ***Requirement:*** 0.0 volts.
13	If the requirement of Step 12 is met, proceed to Step 14. If it is not met, recheck the screw switch settings on the LINE TERM unit. Also check that the +130 volt fuse is removed and that measurement is being made at the correct transmitting and receiving pairs.
14	Disconnect the VOM test probes from the shorted transmitting and receiving pairs.
15	If the LINE TERM unit is J99300AT, List 2 proceed to Step 16. If it is not, strap the transmitting pair to the receiving pair with a W1Y cord. (See Fig. 4 or 5.)
16	Set the VOM selector switch to OHMS $\times$ 1.
17	Connect the VOM test probes to the test points listed in Table D and measure the dc loop simplex resistance of the shorted cable pairs. ***Requirement:*** Between 0 and 6 ohms.
18	If the requirement of Step 17 is met, proceed to Step 19. If it is not met, check the office cable path for external line build-out equipment and high resistance joints. Also to ensure that the LINE TERM unit is functioning properly, replace it with another unit. At this time, inspect the 903A connector jack for bent or broken pins.
19	When the requirement of Step 17 is met, remove the W1Y shorting cords from the cable terminal or terminal block.
20	Remove the LINE TERM unit from the carrier terminal mounting.

STEP	PROCEDURE
	TABLE D **LINE TERMINATING UNIT – TEST POINTS**

LINE TERM UNIT (J SPECIFICATION)	MEASURE BETWEEN TEST POINTS	TEST SETUP
J99300AL	SX CUR (—) and chassis ground	Fig. 6
J99300AT, List 1 or List 3	SX CUR (—) and chassis ground	Fig. 7
J99300AT, List 2	Transmit and receive cable pairs	Fig. 8

21	At the LINE TERM unit remove the screw switch settings made in Step 3, Test B.
22	Restore the power feed screw switch settings noted in Step 2, Test B. The settings should agree with the CLR card and Sections 362-904-502 and 362-904-504. Reinsert the LINE TERM unit in the carrier terminal mounting.
23	At the ALM PWR & MISC panel reinsert the +130 volt fuse removed in Step 5, Test B.

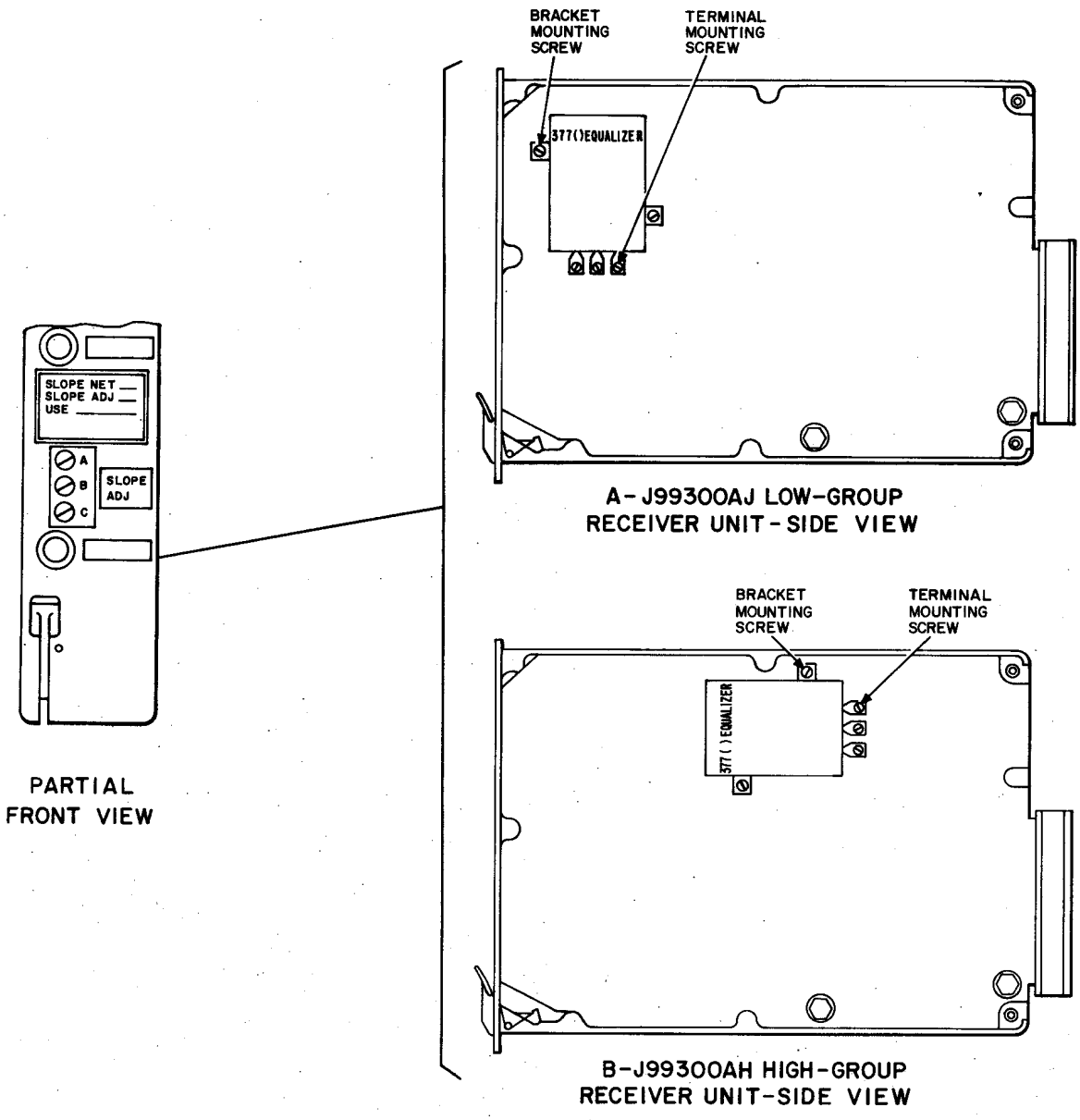


Fig. 1—Group Receiver Units

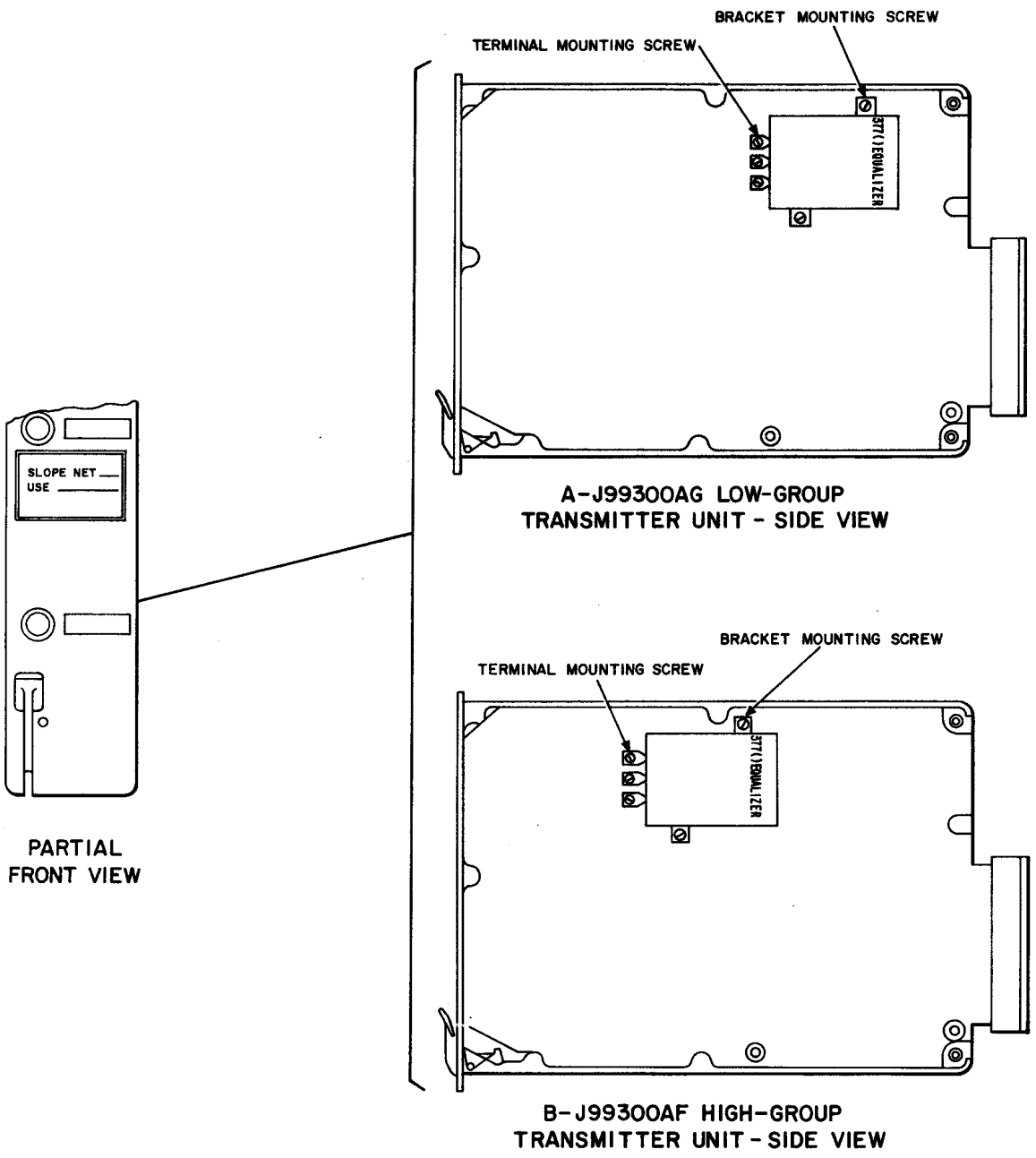


Fig. 2—Group Transmitter Units

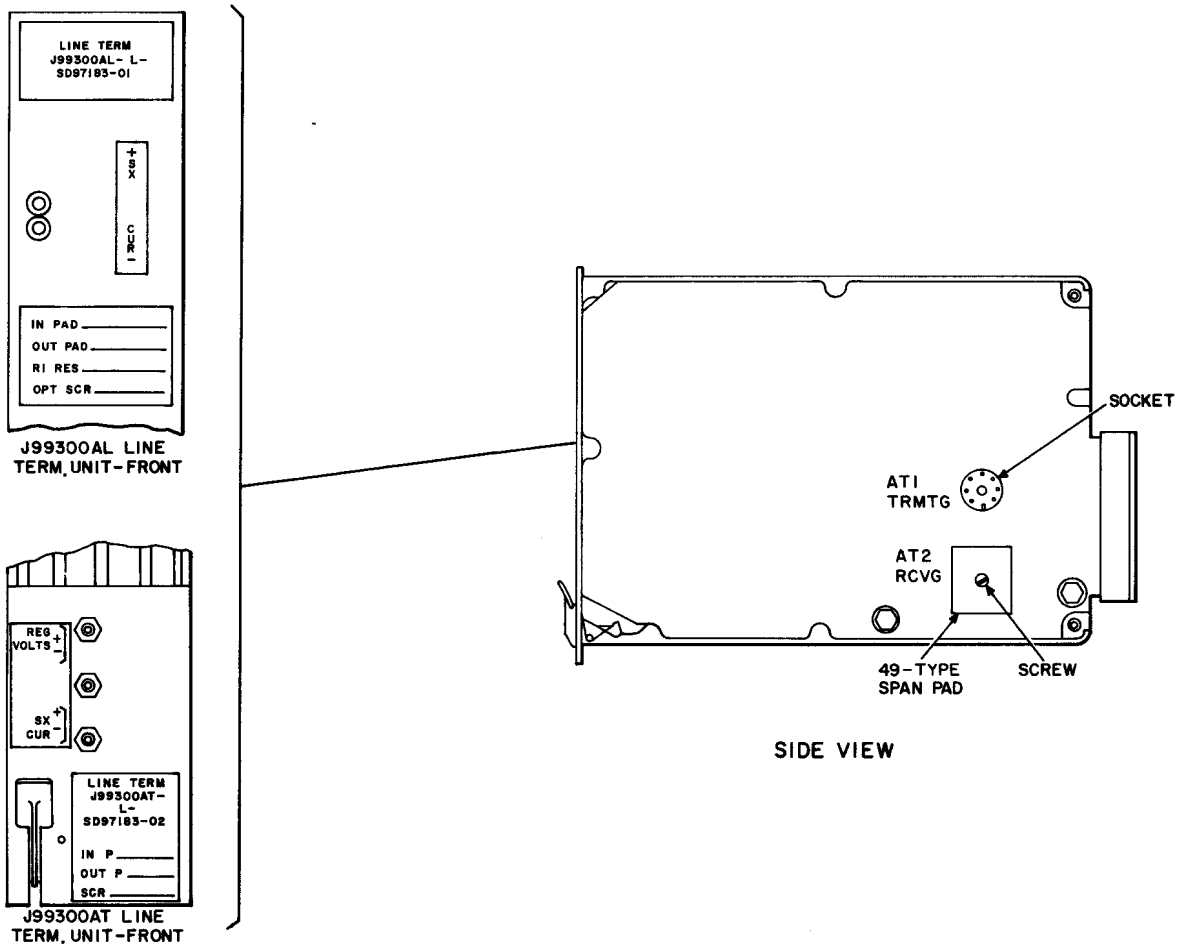
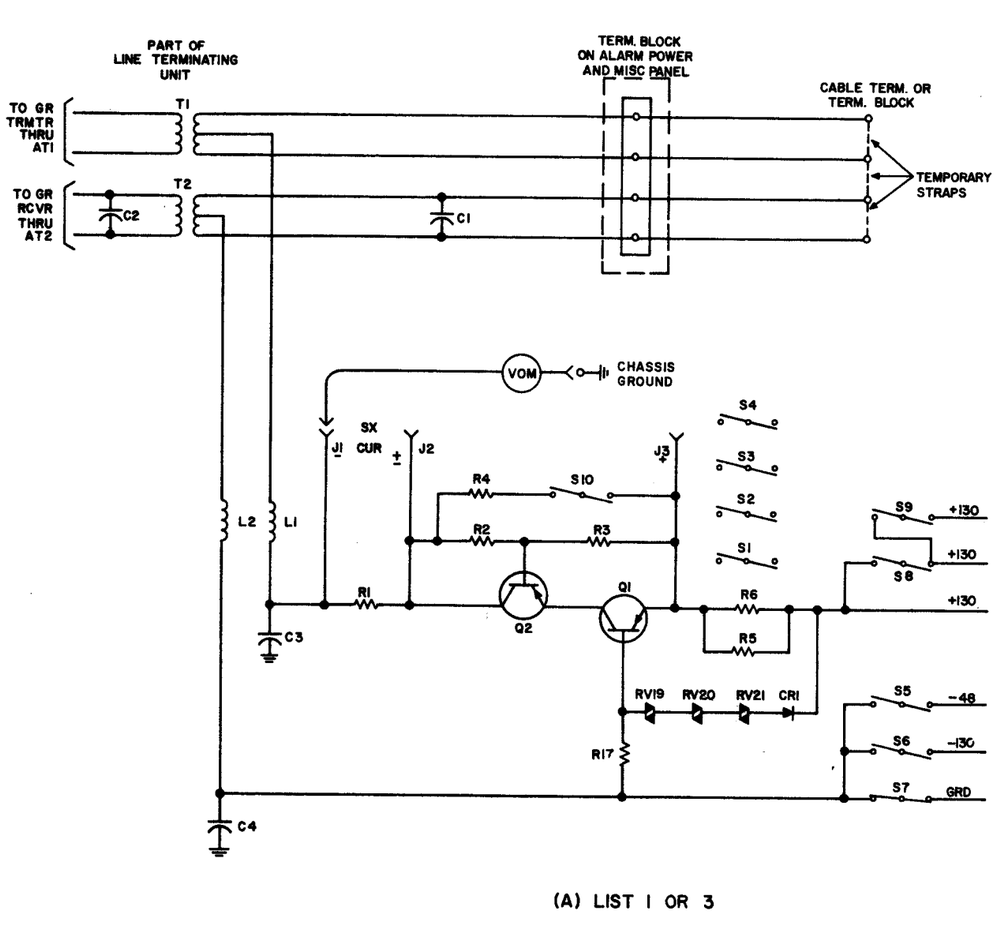
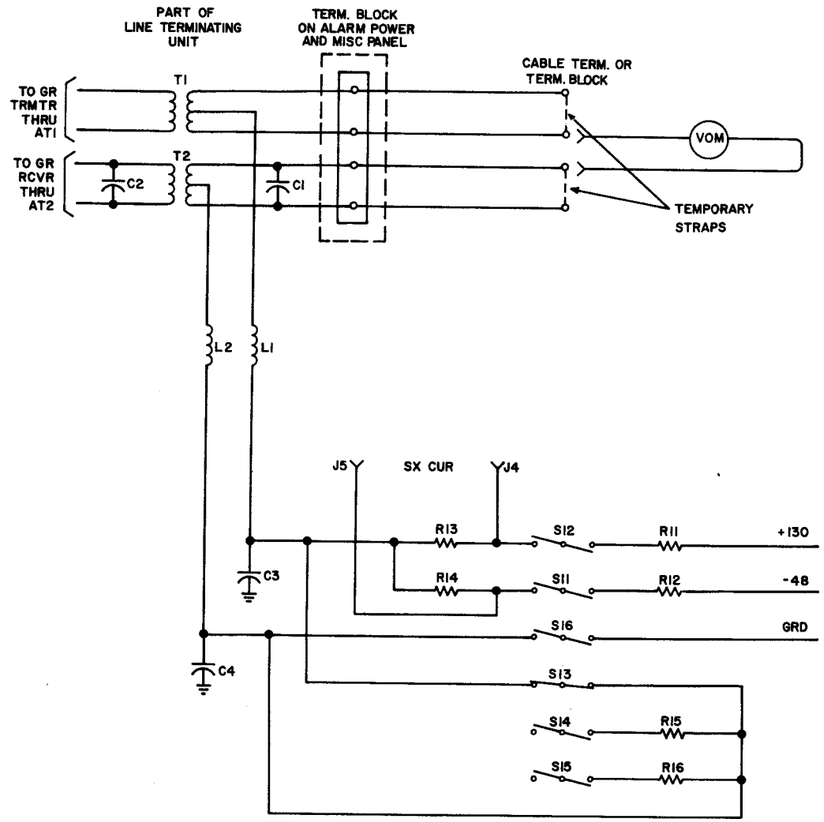


Fig. 3—Line Terminating Units



(A) LIST 1 OR 3



(B) LIST 2

Fig. 4—Local Cable Path—J99300AT Line Terminating Unit

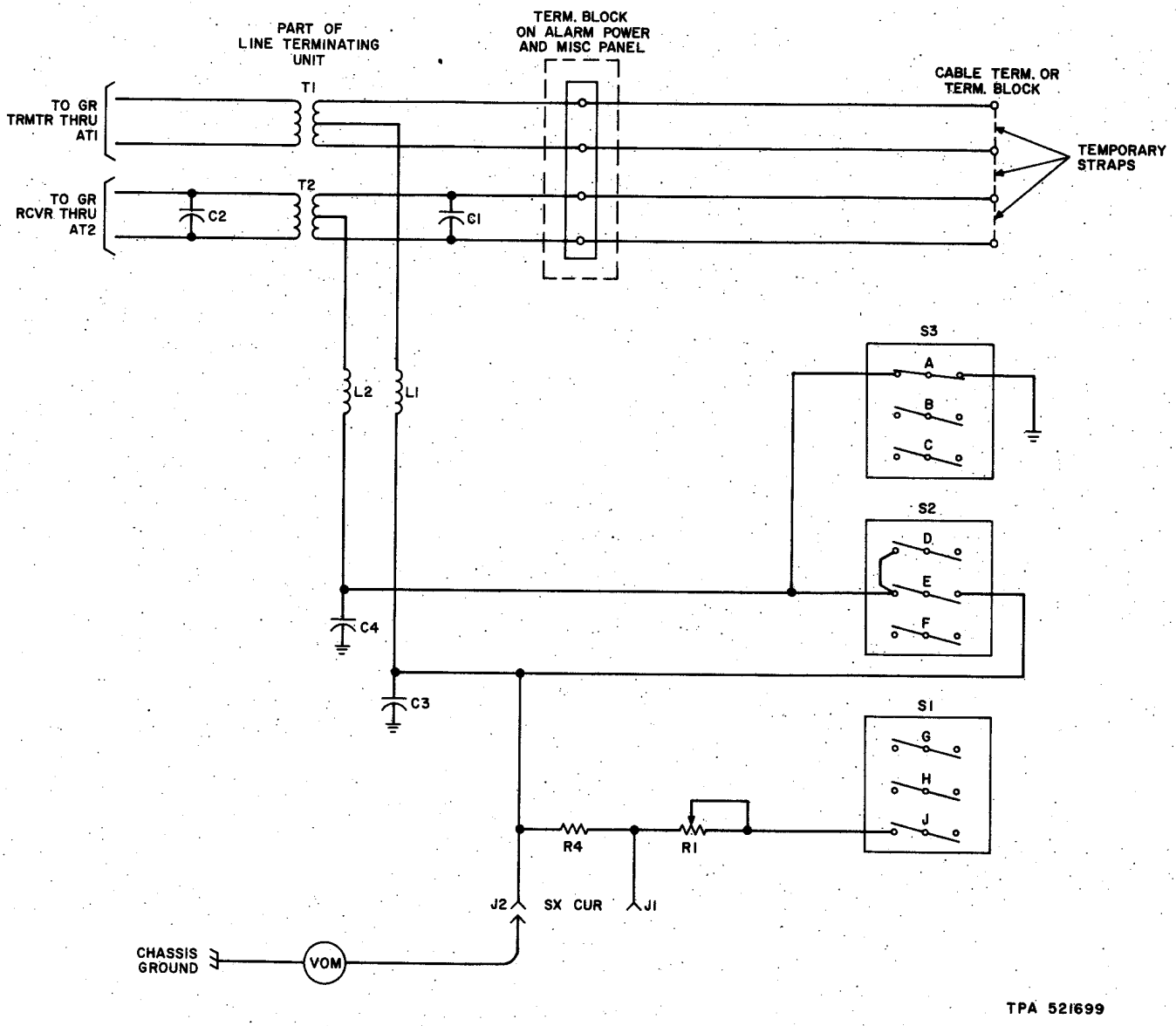


Fig. 5—Local Cable Path—J99300AL Line Terminating Unit

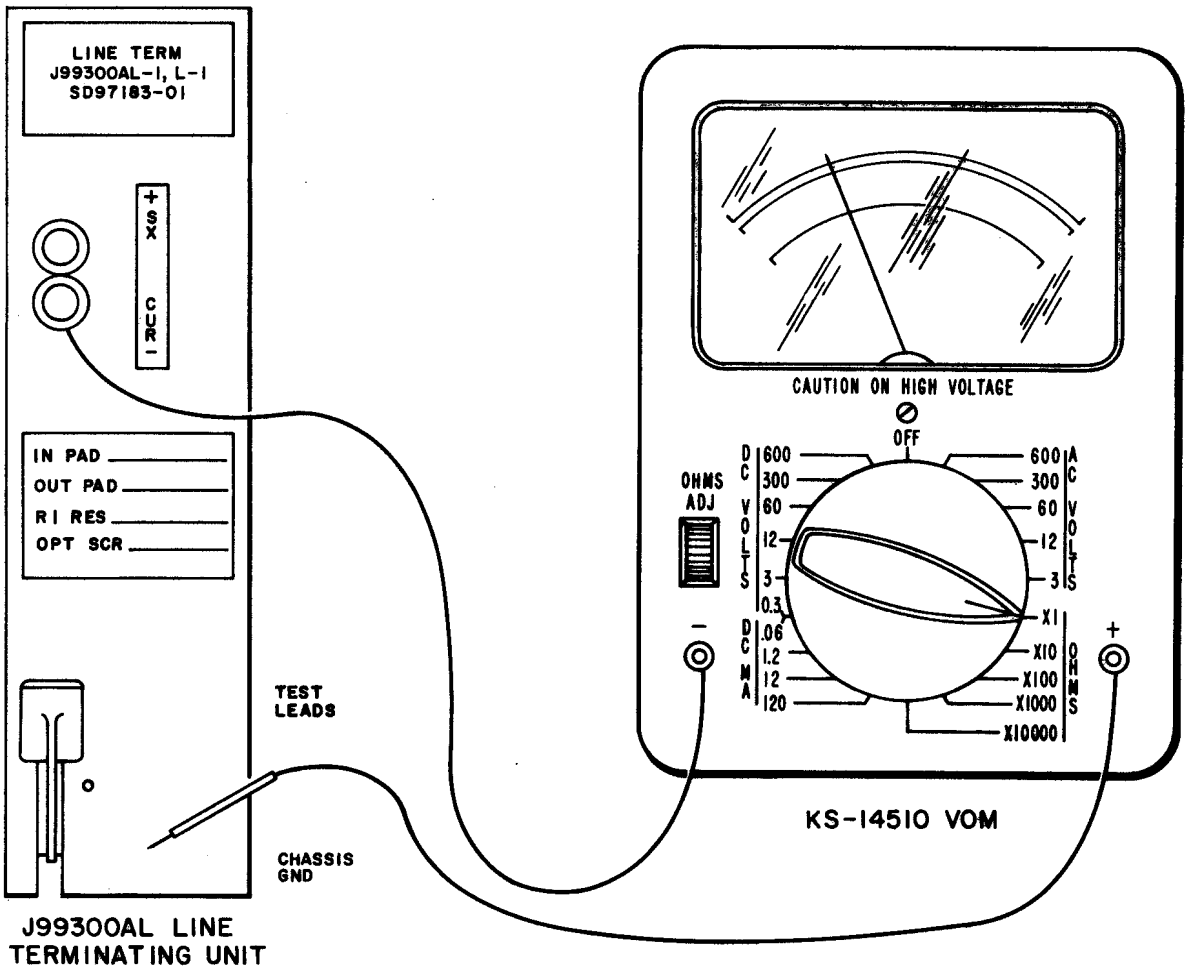


Fig. 6—J99300AL Line Terminating Unit—Measurement of Loop Simplex Resistance

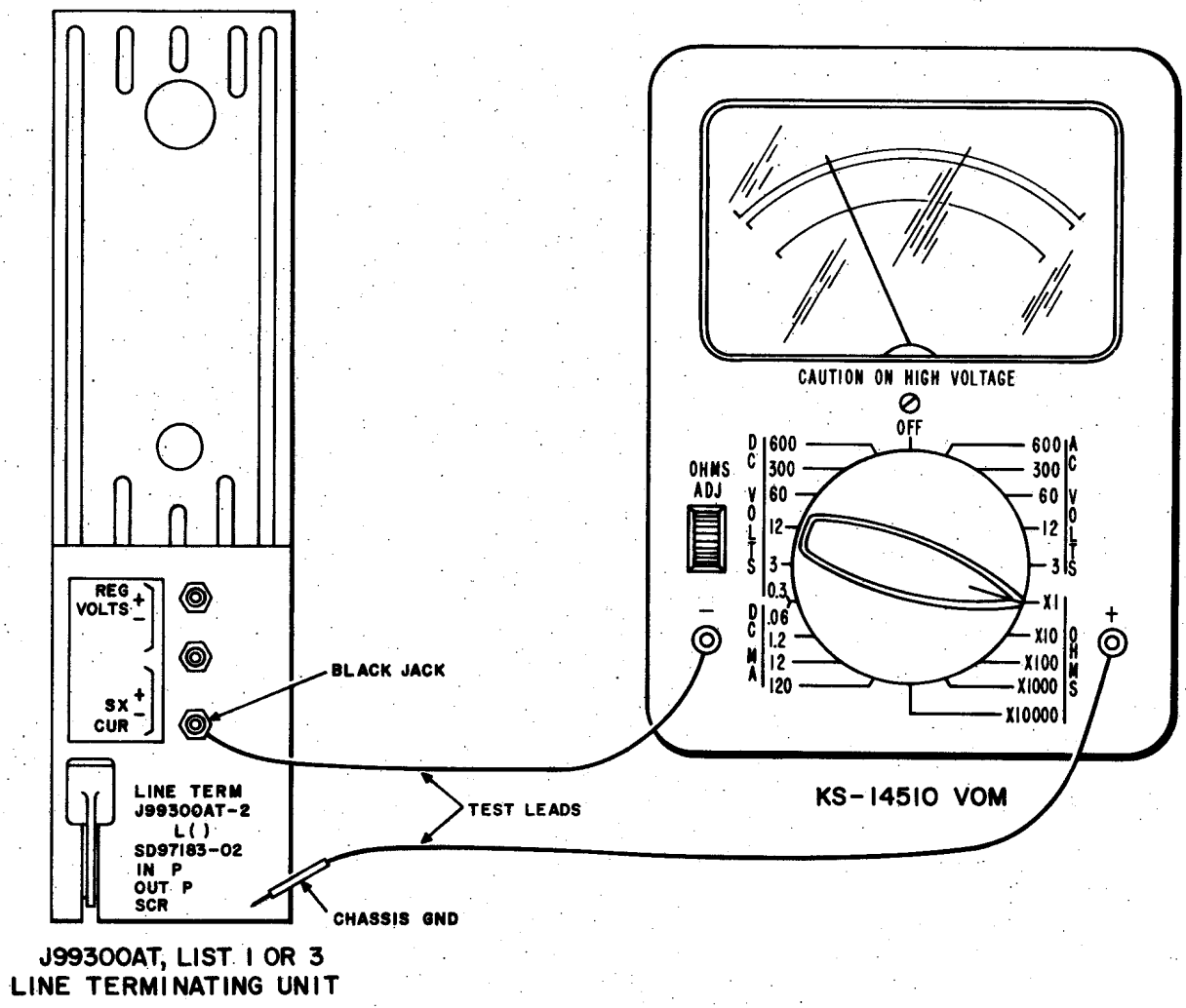


Fig. 7—J99300AT, List 1 or 3 Line Terminating Unit

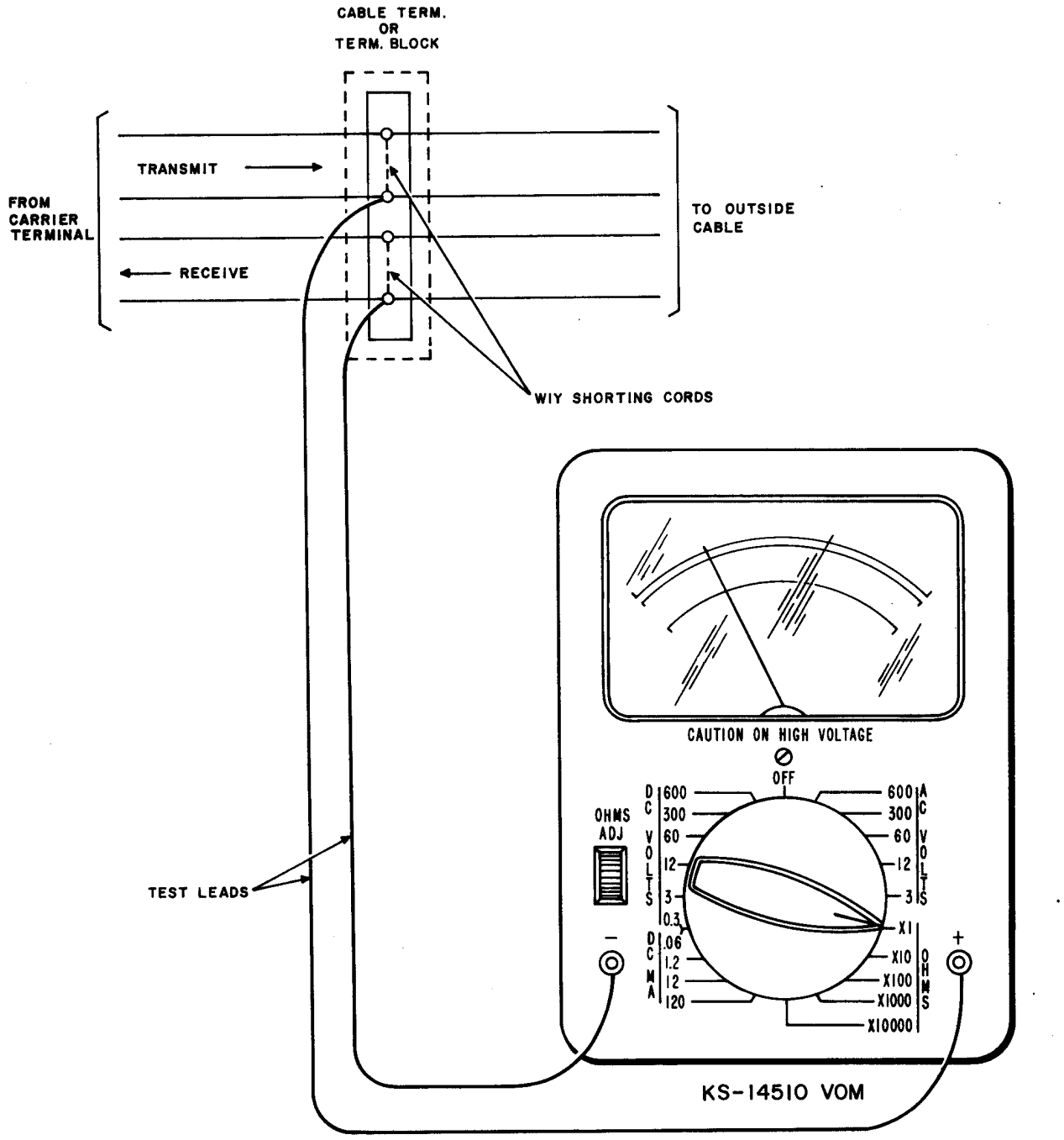


Fig. 8—J99300AT, List 2 Line Terminating Unit