

**N3 CARRIER TELEPHONE SYSTEM**  
**LINE TERMINATING UNIT (J99300AT)**  
**ADJUSTMENT OF REPEATER POWER SUPPLY**  
**WITH OR WITHOUT 240-TYPE AMPLIFIERS**  
**AND SEALING CURRENT OVER CABLE**

When a local power source is not available at a repeater point, dc power can be supplied to a repeater over the two cable pairs used for carrier transmission by means of simplex arrangements. In this manner, one electron-tube repeater or up to four transistorized repeaters in series may be powered from a J99300AT line terminating unit. The transmitting pair carries +130 volts (or ground when only 48-volt battery is required) and the receiving pair carries -48 volts, -130 volts, or ground, as required. The List 1 or List 3 unit will provide a constant current source, irrespective of normal battery fluctuations and cable resistance changes, to any repeatered line section containing up to four remote repeaters. The List 2 unit provides for transmitting 240-type amplifier power and/or sealing current. It must be used when power is neither transmitted nor received and is also used for receiving sealing current. Adjustments are made by setting screw-type switches in the line terminating unit for the various line current conditions.

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.

The purpose of this out-of-service test is to set the line terminating unit option screw switches to satisfy the line current conditions.

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| 1—Transmitting Repeater Power With or Without 240-Type Amplifiers and Sealing Current—J99300AT, List 1 or List 3 Line Terminating Unit . . . . .  | 2           |
| 2—Transmitting 240-Type Amplifier Power and/or Sealing Current—Receiving Sealing Current—Repeater Power Neither Transmitted Nor Received—J99300AT, List 2 Line Terminating Unit . . . . . | 4           |

CHART 1

TRANSMITTING REPEATER POWER WITH OR WITHOUT  
 240-TYPE AMPLIFIERS AND SEALING CURRENT—  
 J99300AT, LIST 1 OR LIST 3 LINE TERMINATING UNIT

APPARATUS:

1—KS-14510 Volt-Ohm-Milliammeter (VOM) with List 8 Test Leads or Equivalent

| STEP | PROCEDURE   |
|------|---|
|      | <p><i>Note:</i> Before performing the tests in this procedure, make sure that all line repeaters and 240-type amplifiers receiving power from the carrier terminal are installed and ready for turnup (Sections 362-400-300, 362-430-501, and 362-450-300).</p>   |
| 1    | Refer to the carrier layout record (CLR) card for the repeatered line power feed voltage(s).  |
| 2    | Remove the line terminating unit (LTU) from the carrier terminal mounting.  |
| 3    | <p>At the LTU (Fig. 1) close (down) the appropriate screw switch (−48, −130, or GRD) for the line power feed option specified by the CLR card. Make sure that only one of the screw switches is in the closed position.</p> <p><i>Note:</i> When only +130 volts is specified, close just the GRD screw switch.</p> |
| 4    | On the LTU close screw switches S8 and S9.  |
| 5    | Select from Table A, column 1, the line equipment arrangement specified by the CLR card.  |
| 6    | Determine the line current as given in column 2.  |
| 7    | Set screw switches as indicated in Table A for the equipment arrangement selected in Step 5.  |
| 8    | Reinstall the LTU. Check to insure that the proper fuses are installed in the ALM PWR & MISC panel at the top of the bay (Fig. 2).  |
| 9    | Set the VOM range selector switch to DC VOLTS 300.  |
| 10   | Insert the red VOM probe into the REG VOLTS + (red) and the black probe into the − (brown) test jacks on the faceplate of the LTU (Fig. 3).   |
| 11   | Measure the regulator voltage at the REG VOLTS test jacks. Reset the VOM range selector switch to maintain an indication as close as possible to full-scale deflection. From Table B, column 1, select the voltage range as determined by the VOM indication.   |

| CHART 1 (Cont) |  |
|----------------|--|
| STEP           | PROCEDURE  |
| 12             | From the voltage measured in Step 11 and the line current value determined in Step 6, derive from Table B, column 3, the required condition of screw switches S8 and S9.   |
| 13             | Remove the LTU from the terminal mounting. Set screw switches S8 and S9 as determined in Step 12.  |
| 14             | Reinsert the LTU into the terminal mounting. Measure the voltage at the REG VOLTS + and - jacks.<br><br><b>Requirement:</b> Within the voltage limits specified in Table C.  |
| 15             | If the requirement of Step 14 is met, proceed to Step 17. If it is not met, make sure that all line repeaters and 240-type amplifiers receiving power from the carrier terminal are installed and connected to the repeated line. Repeat Steps 1 through 14, making sure that all screw switches in the down position are securely seated and that all switches in the up position are not making contact. |
| 16             | If the requirement of Step 14 still is not met, replace the LTU and repeat Steps 1 through 14.   |
| 17             | List all screw switch options used in the space marked SCR _____ on the LTU faceplate (Fig. 3).<br><br><b>Note:</b> Use a felt-tipped pen or Bell System transfer stencil kit "A".   |
| 18             | Disconnect the VOM from the REG VOLTS jacks.   |
| 19             | Insert the VOM red test probe into the SX CUR + (brown) jack and the black test probe into the SX CUR - (black) jack (Fig. 4).   |
| 20             | Set the VOM range selector switch to DC VOLTS 12.  |
| 21             | Measure the voltage at the SX CUR jacks. Reset the VOM range selector switch to obtain an indication as close as possible to full-scale deflection.<br><br><b>Requirement:</b> Within the voltage limits of Table A, column 4.   |
| 22             | If the requirement of Step 21 is met, proceed to Step 23. If it is not met, replace the LTU and repeat Steps 1 through 21.   |
| 23             | When the requirement of Step 21 is met, disconnect the VOM from the SX CUR jacks.  |

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## CHART 2

**TRANSMITTING 240-TYPE AMPLIFIER POWER AND/OR  
SEALING CURRENT—RECEIVING SEALING CURRENT—  
REPEATER POWER NEITHER TRANSMITTED NOR  
RECEIVED—(99300AT, LIST 2) LINE  
TERMINATING UNIT**

**APPARATUS:**

1—KS-14510 Volt-Ohm-Milliammeter (VOM) with List 8 Test Leads or Equivalent

| STEP | PROCEDURE   |
|------|---|
|      | <p><i>Note:</i> Before performing the tests in this procedure, make sure that all 240-type amplifiers receiving power from the carrier terminal are installed and ready for turnup (Section 362-430-501).</p>   |
| 1    | Refer to the carrier layout record (CLR) card for the line power arrangement.   |
| 2    | Remove the line terminating unit (LTU) from the carrier terminal mounting.  |
| 3    | Select from Table D, column 1, the line power arrangement determined in Step 1.   |
| 4    | Set screw switches (Fig. 5) as indicated in Table D for the line power arrangement selected in Step 3.  |
| 5    | Reinstall the LTU in the carrier terminal mounting.   |
| 6    | Refer to Table D. For line power arrangements 1 through 3, proceed to Step 7. For line power arrangements 4 through 7, proceed to Step 12.  |
| 7    | Set the VOM range selector switch to DC VOLTS 12.   |
| 8    | Insert the red VOM test prod into the SX CUR + (brown) jack and the black test prod into the SX CUR - (black) jack (Fig. 4).  |
| 9    | Measure the voltage at the SX CUR test jacks. Reset the VOM range selector switch to obtain an indication as close as possible to full scale deflection.  |
|      | <p><b>Requirement:</b> Within the voltage limits specified in Table D, column 5.</p>  |
| 10   | If the requirement of Step 9 is met, proceed to Step 11. If it is not met, repeat Step 4, making sure that all screw switches in the down position are securely seated and that all switches in the up position are not making contact. If transmitting power to a 240-type amplifier, make sure that the amplifier is installed and ready for service (Section 362-430-501). |

| CHART 2 (Cont) |  |
|----------------|--|
| STEP           | PROCEDURE  |
| 11             | Disconnect the VOM from the SX CUR jacks.  |
| 12             | List all screw switch options used in the space marked SCR _____ on the LTU faceplate (Fig. 4).<br><br><b>Note:</b> Use a felt-tipped pen or Bell System Transfer Stencil Kit "A". |

TABLE A

## LINE CURRENT ADJUSTMENTS – J99300AT, LIST 1 OR LIST 3 LINE TERMINATING UNIT

|   | ①<br>LINE<br>EQUIPMENT<br>ARRANGEMENT  | ②<br>LINE<br>CURRENT<br>(NOTE 1) | ③<br>SCREW SWITCH SETTINGS |                          | ④<br>VOLTAGE LIMITS<br>AT SX CUR JACKS |
|---|--|----------------------------------|----------------------------|--------------------------|--|
|   |  |                                  | DOWN                       | UP                       |  |
| 1 | ①, 2, 3, or 4 N2 repeaters<br><i>COG &amp; CLDG -48</i>                                      | 85 mA                            | None                       | S1, S2, S3,<br>S4, & S10 | 1.9 to 2.2<br>_____                    |
| 2 | 1, 2, or 3 N1A repeaters;<br>1 N2 and 1 or 2 N1A repeaters;<br>1 or 2 N2 and 1 N1A repeaters | 95 mA                            | S1                         | S2, S3,<br>S4, S10       | 2.2 to 2.4                             |
| 3 | 1 or 2 N2 repeaters with one 240-type<br>amplifier (Note 2)                                  | 110 mA                           | S2                         | S1, S3,<br>S4, S10       | 2.5 to 2.7                             |
| 4 | 1 or 2 N1A repeaters with one 240-type<br>amplifier (Note 2)                                 | 120 mA                           | S1, S2                     | S3, S4,<br>S10           | 2.8 to 3.0                             |
| 5 | 1 or 2 N2 repeaters with two 240-type<br>amplifiers (Note 2)                                 | 135 mA                           | S3                         | S1, S2,<br>S4, S10       | 3.1 to 3.4                             |
| 6 | 1 or 2 N1A repeaters with two 240-type<br>amplifiers (Note 2)                                | 145 mA                           | S1, S3,<br>S10             | S2, S4                   | 3.4 to 3.6                             |
| 7 | 1 N1 repeater without sealing current  | 155 mA                           | S4, S10                    | S1, S2, S3               | 3.6 to 3.9                             |
| 8 | 1 N1 repeater with sealing current or<br>one 240-type amplifier                              | 180 mA                           | S2, S4,<br>S10             | S1, S3                   | 4.2 to 4.6                             |
| 9 | 1 N1 repeater with sealing current<br>and one 240-type amplifier                             | 205 mA                           | S3, S4<br>S10              | S1, S2                   | 4.6 to 5.1                             |

**Note 1:** When N1A and N2 repeaters are powered on same power string, power requirements for N1A repeater should be used.

**Note 2:** Subtract 25 mA from Line Current value when 240-type amplifier is connected beyond last N1A or N2 repeater on same power string.

TABLE B

| VOLTAGE MEASURED AT REG VOLTS<br>① | LINE CURRENT DETERMINED IN STEP 6, CHART 1<br>② | SCREW SWITCHES<br>③ |                |
|------------------------------------|---|---------------------|----------------|
|                                    |   | UP                  | DOWN           |
| 10 to 40                           | Any   | —                   | S8 & S9        |
| 41 to 45                           | 140 or less<br>145 to 160                       | S9<br>—             | S8<br>S8 & S9  |
| 46 to 50                           | 140 to 160<br>160 or more                       | S9<br>—             | S8<br>S8 & S9  |
| 51 to 60                           | 140 to 160<br>160 or more                       | S9<br>S8            | S8<br>S9       |
| 61 up                              | 140 or less<br>140 to 160<br>160 or more        | S8<br>S9<br>S8      | S9<br>S8<br>S9 |

TABLE C

| LINE CURRENT (mA) | VOLTAGE LIMITS AFTER ADJUSTMENT |
|-------------------|---------------------------------|
| 135 or less       | 10-40                           |
| 145 and 155       | 10-45                           |
| 180 or more       | 10-50                           |

TABLE D

LINE CURRENT ADJUSTMENTS — 199300AT, LIST 2 LINE TERMINATING UNIT

| ①<br>LINE POWER ARRANGEMENT  | ②<br>LINE CURRENT (NOTE 1) | ③<br>BATTERY SUPPLY (VOLTS) | ④<br>SCREW SWITCH SETTINGS |                              | ⑤<br>VOLTAGE LIMITS AT SX CUR JACKS |
|--|----------------------------|-----------------------------|----------------------------|------------------------------|-------------------------------------|
|  |                            |                             | DOWN                       | UP                           |                                     |
| 1<br>Transmitting sealing current only   | 20 mA                      | -48                         | S11, S16                   | S12, S13, S14, S15           | 0.4 to 0.6                          |
| 2<br>Transmitting power to one 240-type amplifier without sealing current                            | 25 mA                      | +130                        | S12, S16                   | S11, S13, S14, S15           | 0.5 to 0.7                          |
| 3<br>Transmitting power to one 240-type amplifier with sealing current                               | 45 mA                      | +130                        | S12, S16                   | S11, S13, S14, S15           | 0.9 to 1.2                          |
| 4<br>Receiving sealing current from N-type repeater  | None                       | None                        | S13                        | S11, S12, S14, S15, S16      | 0.0                                 |
| 5<br>Receiving sealing current from 240-type amplifier preceded by N1A or N2 repeater                | None                       | None                        | S14                        | S11, S12, S13, S15, S16      |                                     |
| 6<br>Receiving sealing current from 240-type amplifier or 240-type amplifier preceded by N1 repeater | None                       | None                        | S15                        | S11, S12, S13, S14, S16      |                                     |
| 7<br>No power transmitted or received  | None                       | None                        | None                       | S11, S12, S13, S14, S15, S16 |                                     |

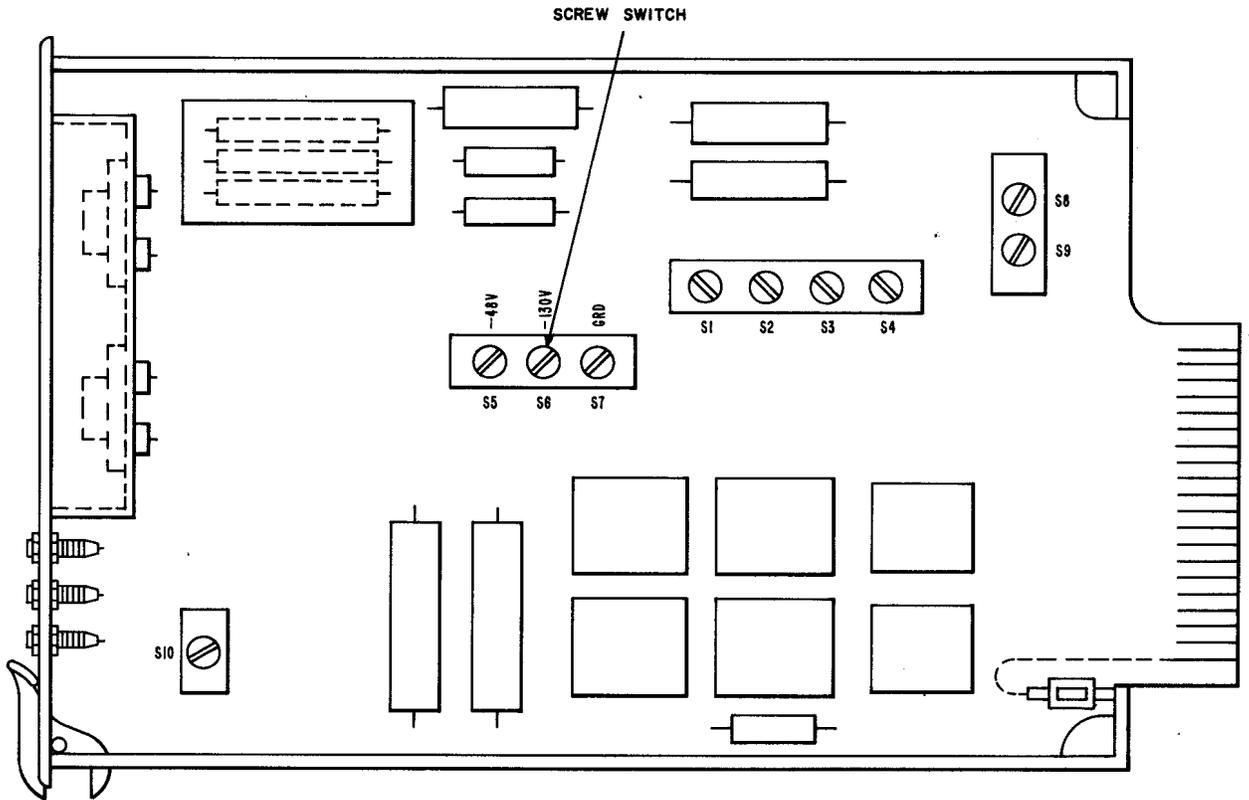
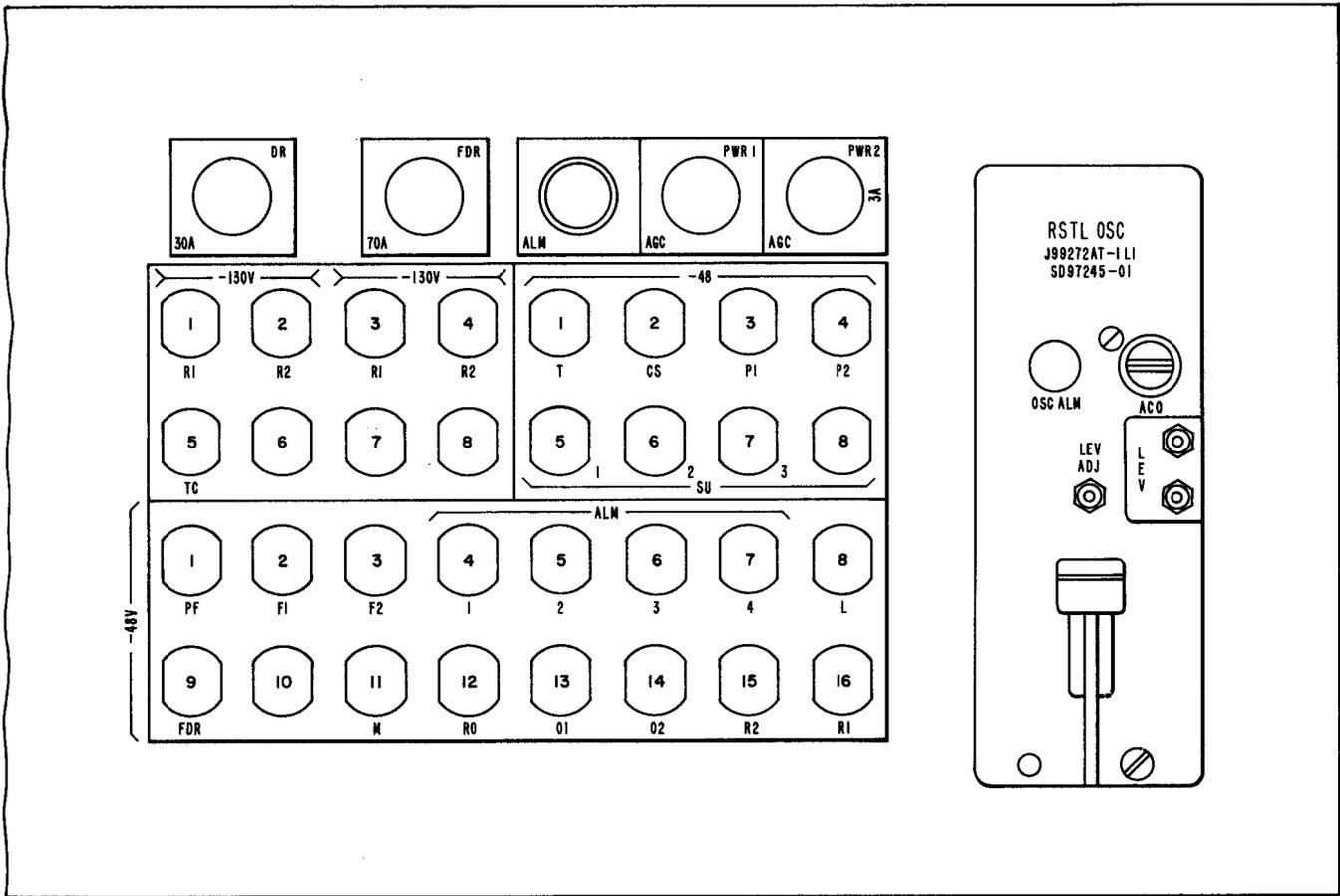


Fig. 1—J99300AT, List 1 or 3 Line Terminating Unit—Side Views



| TERMINAL NUMBER | FUSE DESIGNATION |    |                     |                     |       |    |       |    |
|-----------------|------------------|----|---------------------|---------------------|-------|----|-------|----|
|                 | -48V             |    | PWR 1<br>(SEE NOTE) | PWR 2<br>(SEE NOTE) | +130V |    | -130V |    |
|                 | P1               | P2 |                     |                     | R1    | R2 | R1    | R2 |
| 1               | X                |    | X                   |                     | X     |    | X     |    |
| 2               |                  | X  |                     | X                   |       | X  |       | X  |

NOTE:  
 IN LATER EQUIPMENT THE PWR 1 AND PWR 2 FUSES ARE NOT USED AND THE -48V P1 AND P2 FUSE HOLDERS ARE UTILIZED WITH A LARGER FUSE.

Fig. 2—Alarm Power and Miscellaneous Panel—Front View

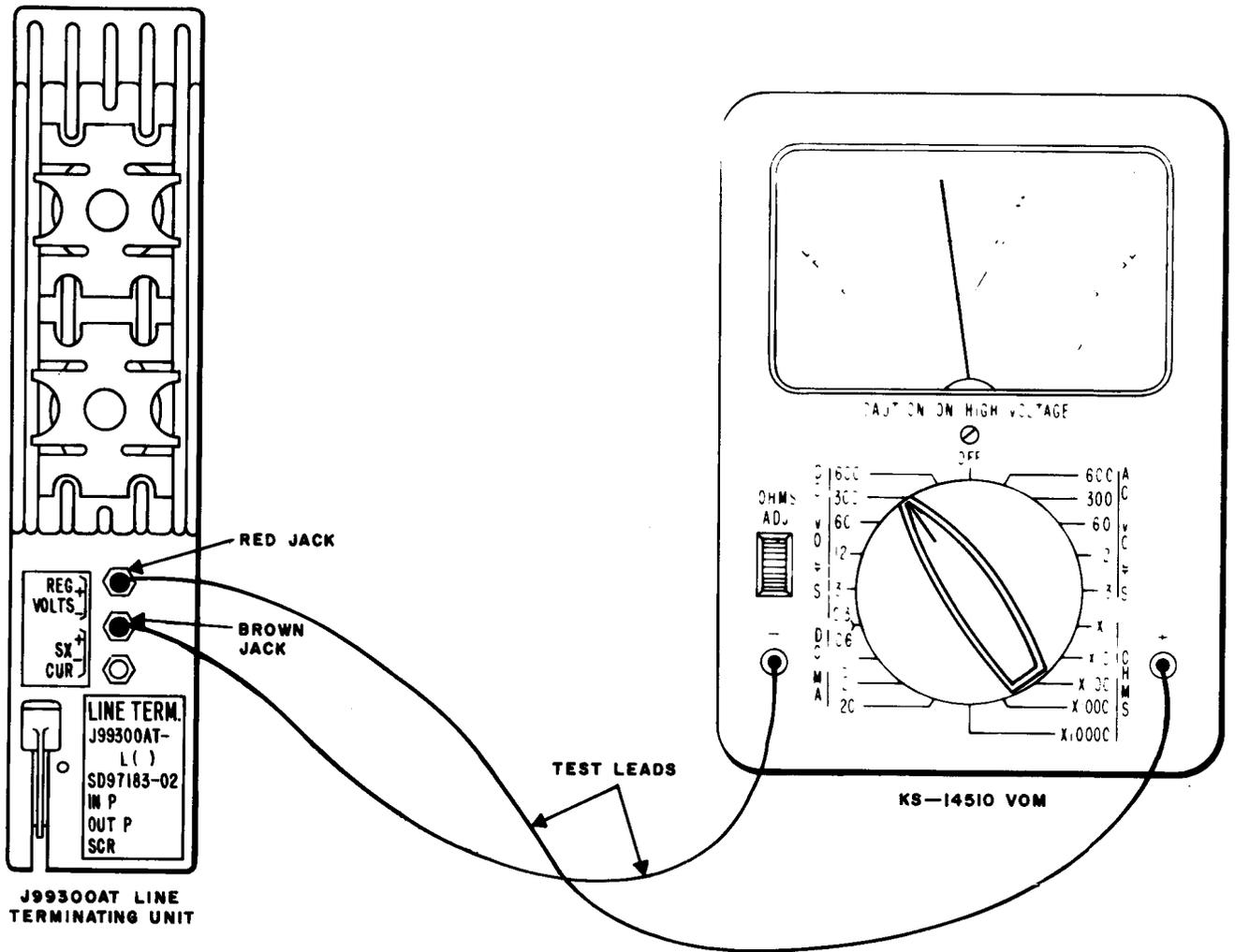


Fig. 3—J99300AT Line Terminating Unit—Measurement of Regular Voltage

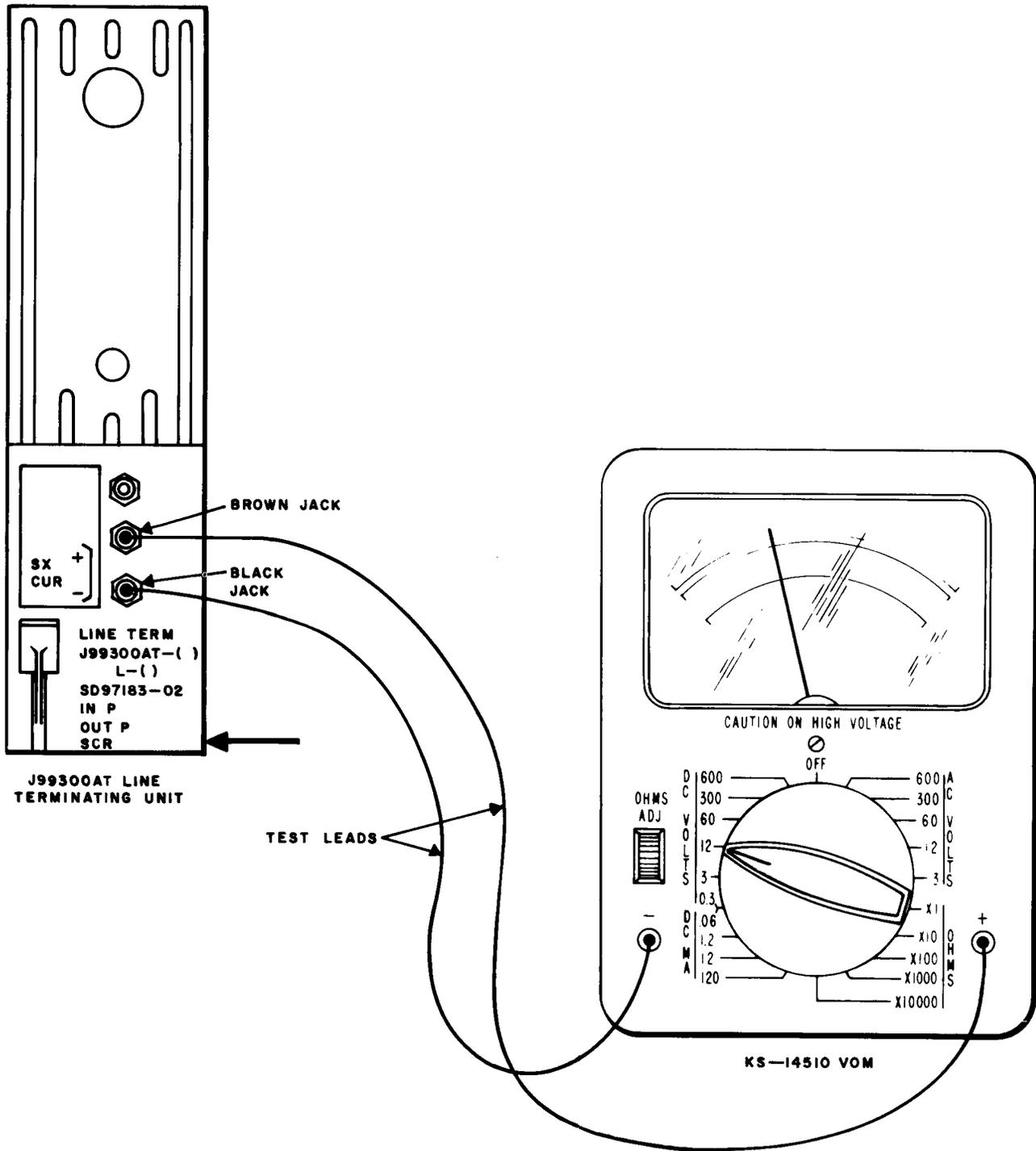


Fig. 4—J99300AT Line Terminating Unit—Measurement of Simplex Current

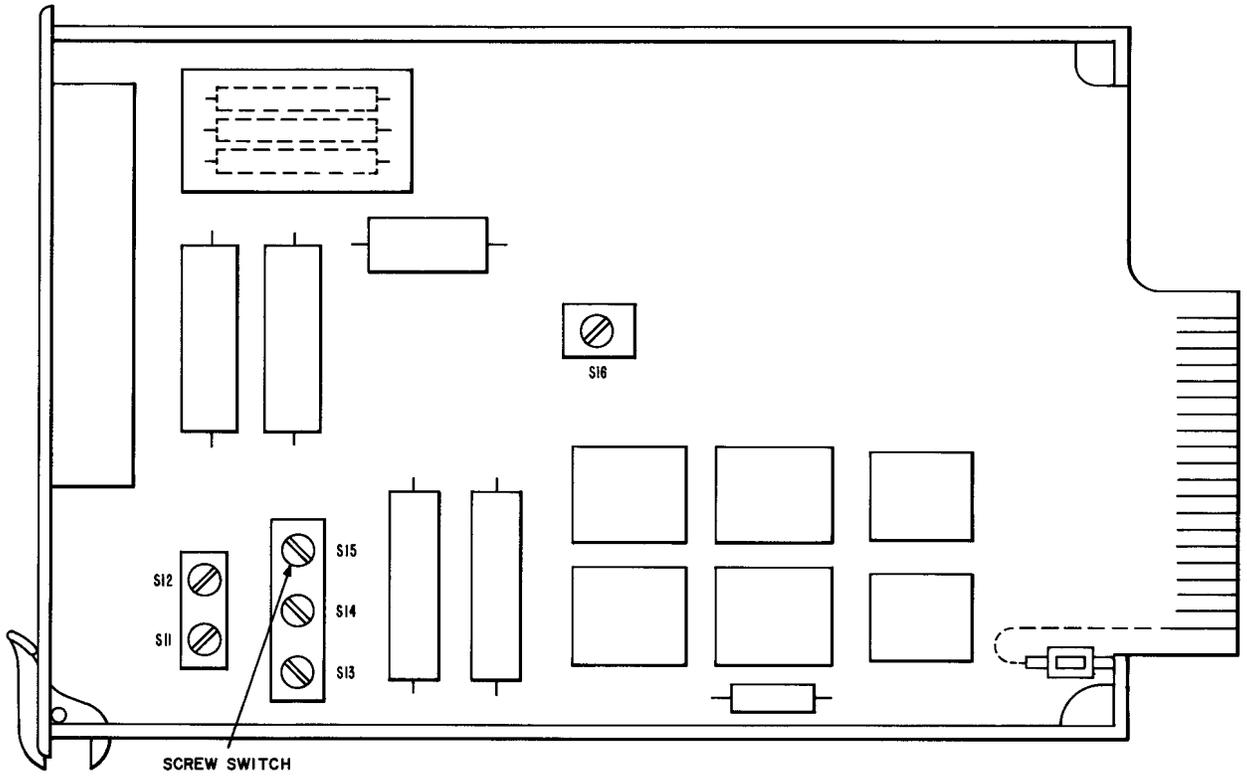


Fig. 5—J99300AT, List 2 Line Terminating Unit—Side View