

N3 CARRIER TELEPHONE SYSTEM
LINE TERMINATING UNIT (J99300AL)
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 the 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 three transistor repeaters in series with one 240-type amplifier in parallel (Table A) may be powered from a J99300AL 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. When unsoldered twisted cable splices are used, a small amount of direct current may be applied to the cable pairs in a similar manner in sections not transmitting repeater power to seal the splices. The section, which is fed sealing current, may be beyond the repeaters receiving power from the N3 terminal. Adjustments are made by setting screw-type switches in the line terminating unit for the various line current conditions. The J99300AL line terminating unit does not provide regulated line current.

This section is reissued to include power supply options for N1-H repeaters (electron-tube repeater modified for hybrid integrated networks) and to make other miscellaneous changes. 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 the following out-of-service test is to set the line terminating unit screw switches and the resistance in series with the power supplies to satisfy the line current conditions.

APPARATUS:

- 1—KS-14510 Volt-Ohm-Milliammeter (VOM) or equivalent (20,000 ohms per volt)
- 1—W1Y Cords (shorting straps) or equivalent

| STEP | PROCEDURE |
|-------------|---|
| 1 | Refer to the carrier layout record (CLR) card for the repeatered line power feed option and equipment arrangement. |
| 2 | Remove the line terminating unit (LTU) from the carrier terminal mounting. |
| 3 | If the CLR card specifies no power being transmitted, proceed to Part A or B as applicable; otherwise, proceed to Part C. |

| STEP | PROCEDURE |
|------|--|
| | <p>A. Power is not Transmitted to the High-Frequency Line</p> |
| 4 | At the S1, S2, and S3 switch blocks (Fig. 1) set screw switch E to the closed (down) position and all other screw switches to the open (up) position. |
| 5 | On the LTU faceplate (Fig. 2) print "E" in the space marked OPT SCR. |
| 6 | Momentarily, and in turn, short the terminal lugs of capacitors C3 and C4 (Fig. 1) with a W1Y cord. |
| 7 | On the VOM set the range selector switch to OHMS x 1. |
| 8 | Connect the VOM test leads to the bottom terminal lugs of C3 and C4 (Fig. 1). |
| 9 | Measure the loop simplex resistance of the LTU (see Fig. 3). |
| | <p>Requirement: Less than 1 ohm.</p> |
| 10 | If the requirement of Step 9 is met, proceed to Step 12. If it is not met, remove the LTU and check that screw switch E is firmly closed and that all others are in the open position. Repeat Steps 8 and 9. |
| 11 | If the requirement of Step 9 still is not met, replace the LTU and repeat Steps 4 through 9. |
| 12 | Remove the VOM test connections and replace the LTU in the terminal mounting. |
| | <p>B. Power is not Transmitted to the Repeatered Line—Adjacent 240-type Amplifier Powered from the Next Repeater Power Supply Point</p> |
| 13 | At the S1, S2, and S3 switch blocks (Fig. 1) set all screw switches to the open (up) position. |
| 14 | On the LTU faceplate (Fig. 2) print "None" in the space marked OPT SCR. |
| 15 | Reinsert the LTU in the carrier terminal mounting. |
| | <p>C. Power is Transmitted to the Repeatered Line</p> |
| 16 | At the S1, S2, and S3 switch blocks (Fig. 1) set screw switches as indicated in Table A for the repeatered line equipment arrangement and line power feed specified by the CLR card. |
| 17 | At the ALM PWR & MISC panel remove fuses listed in Table B in the order shown. |
| 18 | For the sealing current option only, proceed to Step 29. For all other power feed options, proceed to Step 19. |
| 19 | From the CLR card obtain the total resistance value of the terminal power adjust resistors. Enter this value in column 1, Table C (see example). |
| | <p>Example: Terminal resistance from CLR card is 380 ohms. Line power feed is 2 N1A repeaters (H-L + L-H); battery supply is +130 volts.</p> |

| STEP | PROCEDURE |
|------|--|
| 20 | From Table A obtain the resistance value of the line power feed option screw switch settings. Enter this value in Table C, column 2. |
| 21 | Subtract the value entered in column 2 from the value in column 1. Record in column 3 the difference as the R1 resistor setting. |
| 22 | At the LTU remove the two machine screws and cover plate assembly from the R1 resistor (Fig. 4). |
| 23 | Set the VOM range selector switch to OHMS x 10. |
| 24 | Connect the VOM to the slider and terminal lugs of the R1 resistor. |
| 25 | Measure the value of the R1 resistor setting. Requirement: The resistance value as computed in Step 21. |
| 26 | If the requirement of Step 25 is met, proceed to Step 27. If it is not met, adjust the R1 resistance value by loosening the slider clamping screw and moving the slider to obtain the desired value. When the correct setting has been made, tighten the slide clamping screw and recheck the resistance reading. |
| 27 | Remove the VOM test connections and replace the R1 resistor cover plate assembly. Secure the assembly with the two machine screws. |
| 28 | On the LTU faceplate print the R1 resistance value in the space marked R1 RES (Fig. 2). |
| 29 | With a W1Y cord strap together the bottom pins of capacitors C3 and C4 (Fig. 4). |
| 30 | Reinsert the LTU in the carrier terminal mounting. |
| 31 | At the ALM PWR & MISC panel (Fig. 5) locate the appropriate line feed battery supply fuse holder(s). |
| 32 | If only one battery voltage is specified (from CLR card), connect one VOM test prod to the equipment side of the appropriate fuse holder and the other prod to panel ground. If two battery voltages are specified, connect the VOM test prods to the equipment sides of the appropriate fuse holders. Caution: <i>To prevent damage to the VOM when inserting or removing the test prod into or from the fuse holder, set the VOM range selector switch to DC VOLTS 300. When the test prods are in place, change the selector switch to the desired OHMS position.</i> |
| 33 | Set the VOM range selector switch to OHMS x 10. |
| 34 | Measure the resistance value of the total power feed circuit (see Fig. 3). Requirement: The resistance value as specified by the CLR card. Note: For sealing current only, the total resistance may be between 1900 and 2700 ohms. |

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| STEP | PROCEDURE |
|-------------|---|
| 35 | If the requirement of the carrier layout card is met, proceed to Step 38. If the requirement is not met, remove the LTU from the carrier terminal mounting. Recheck the screw switch settings made in Step 16. Make sure the screw switches in the closed (down) position are making contact and that all others are in the open (up) position. |
| 36 | Replace the LTU in the terminal mounting and repeat Step 34. |
| 37 | If the requirement of Step 34 still is not met, replace the LTU and repeat Steps 16 through 35 as required. |
| 38 | See Caution, Step 32. Remove the VOM test prods from the fuse holder(s). |
| 39 | Remove the LTU from the carrier terminal mounting and disconnect the W1Y shorting cord from capacitors C3 and C4. |
| 40 | Make sure the final option selected is printed on the faceplate of the LTU. Reinsert the LTU in the carrier terminal mounting. |
| 41 | At the ALM PWR & MISC panel restore in reverse order, listed in Table B, the fuses removed in Step 17. |

TABLE A
POWER FEED OPTIONS

| POWER FEATURE OR OPTION | | BATTERY SUPPLY (VOLTS) | POWER CONNECTION SCREWS USED (SEE NOTE 1) | SUBTRACT FROM TOTAL TERMINAL RESISTANCE FOR REQUIRED R1 RESISTANCE (OHMS) |
|--|---------------------------------------|------------------------|---|---|
| Power to N1A or N2 Transistorized Repeaters And 240-Type Amplifiers (Note 2) | 1 H-L Rptr <i>or DC B.S.D.</i> | -48 | D + J | 58.7 |
| | | +130 | A + (G or H) | 384 or 130 |
| | 1 L-H Rptr | +130 | A + (G or H) | 384 or 130 |
| | 2 Rptrs (H-L + L-H) | +130 | A + H | 130 |
| | | +130 and -48 | D + (G or H) | 48.7 + (384 or 130) |
| | 3 Rptrs (2 H-L + 1 L-H) | +130 and -48 | D + H | 178.7 |
| | | +130 and -130 | B + (G or H) | 130 + (384 or 130) |
| | 3 Rptrs (2 L-H + 1 H-L) | +130 and -130 | B + (G or H) | 130 + (384 or 130) |
| | 240-Type Ampl | +130 | A + (G or H) | 384 or 130 |
| | 240-Type Ampl + L-H Rptr | +130 | A + (G or H) | 384 or 130 |
| | 240-Type Ampl + H-L Rptr | +130 | A + (G or H) | 384 or 130 |
| | 240-Type Ampl + 2 Rptrs (H-L and L-H) | +130 and -48 | D + (G or H) | 48.7 + (384 or 130) |
| | | +130 and -130 | B + (G or H) | 130 + (384 or 130) |
| | 2 Rptrs (H-L and L-H) + 240-Type Ampl | +130 and -130 | B + (G or H) | 130 + (384 or 130) |
| | H-L Rptr + 240-Type Ampl + L-H | +130 and -48 | D + (G or H) | 48.7 + (384 or 130) |
| | | +130 and -130 | B + (G or H) | 130 + (384 or 130) |
| | L-H Rptr + 240-Type Ampl + H-L Rptr | +130 and -48 | D + (G or H) | 48.7 + (384 or 130) |
| | | +130 and -130 | B + (G or H) | 130 + (384 or 130) |
| 240-Type Ampl + 3 Rptrs (2 H-L + 1 L-H) | +130 and -130 | B + (G or H) | 130 + (384 or 130) | |
| Power to Electron Tube-Type Repeater | +130 and -130 | B + (G or H) | 130 + (384 or 130) | |
| Power to 240-Type Amplifier and 1 Electron Tube-Type Repeater | +130 and -130 | B + (G or H) | 130 + (384 or 130) | |

TABLE A (Cont)
POWER FEED OPTIONS

| POWER FEATURE OR OPTION | | BATTERY SUPPLY (VOLTS) | POWER CONNECTION SCREWS USED (SEE NOTE 1) | SUBTRACT FROM TOTAL TERMINAL RESISTANCE FOR REQUIRED R1 RESISTANCE (OHMS) |
|--|-------------------------|------------------------|---|---|
| Power to N1-H Repeaters And 240-Type Amplifier | 1 Rptr | +130 | A + (G or H) | 384 or 130 |
| | 1 Rptr + 240-Type Ampl | +130 | A + (G or H) | 384 or 130 |
| | 2 Rptrs | +130 and -130 | B + (G or H) | 130 + (384 or 130) |
| | 2 Rptrs + 240-Type Ampl | +130 and -130 | B + (G or H) | 130 + (384 or 130) |
| Sealing Current Only No Power Transmitted | | -48 - | C + J E(Note 3) | 2010 - |

Note 1: When (G or H) option is specified, always use G, if possible, to minimize the heat generated in the line terminating unit.

Note 2: The J99300AT line terminating unit is recommended for feeding power to N2 repeaters mounted in N2 cabinets because of heat dissipation restrictions (see Section 362-450-100).

Note 3: Except when an adjacent 240-type amplifier is powered from the next repeater power supply point.

TABLE B
REPEATER POWER ADJUSTMENT - FUSE REMOVALS

| TERMINAL NO. | FUSE DESIGNATION | | | | | | | |
|--------------|------------------|----|------------------|------------------|--------|----|--------|----|
| | -48 V | | PWR 1 (SEE NOTE) | PWR 2 (SEE NOTE) | +130 V | | -130 V | |
| | 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 -48 V P1 and P2 fuse holders are utilized with a larger fuse.

TABLE C

| TERMINAL RESISTANCE (FROM CLR) | RESISTANCE OF SWITCH SETTINGS | R1 RESISTANCE SETTING (OHMS) |
|--------------------------------|-------------------------------|------------------------------|
| ① | ② | ③ |
| 380Ω | 130Ω | 250Ω |
| | | |

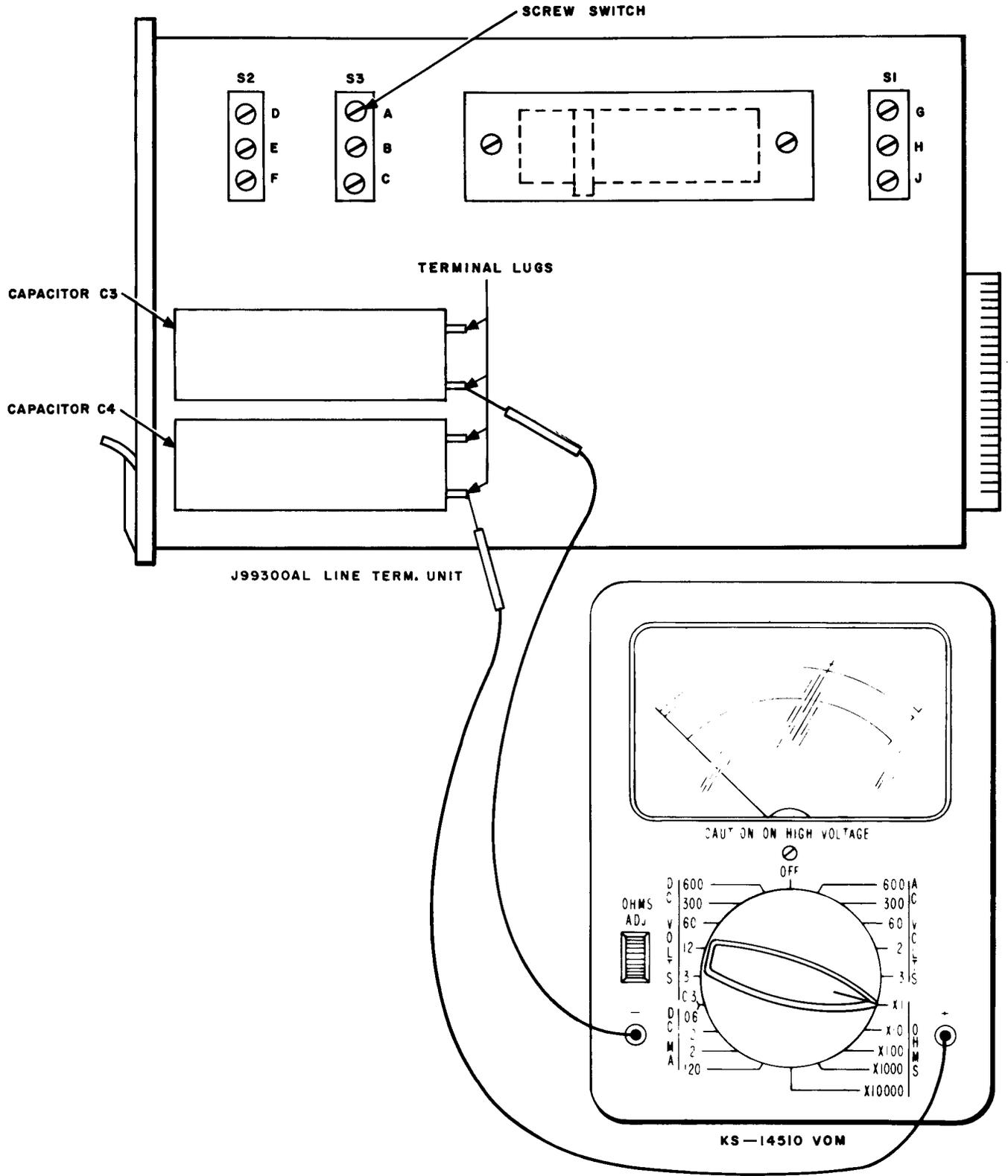


Fig. 1—J99300AL Line Terminating Unit—Measurement of Loop Simplex Resistance

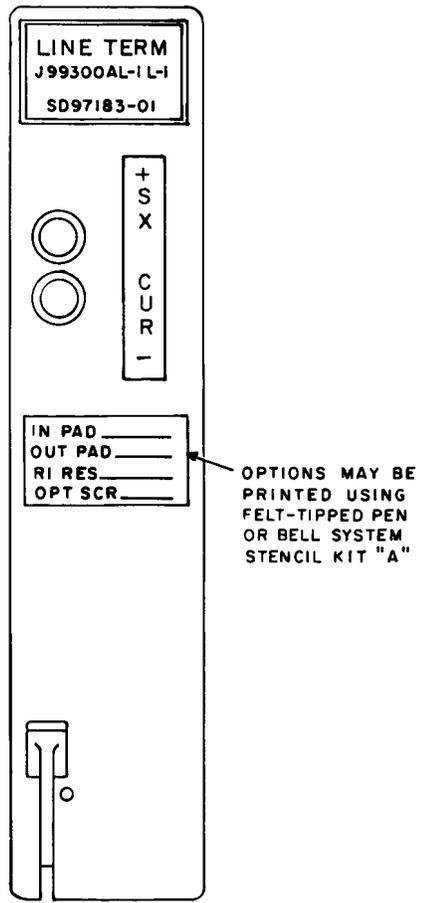


Fig. 2—J99300AL Line Terminating Unit—Front View

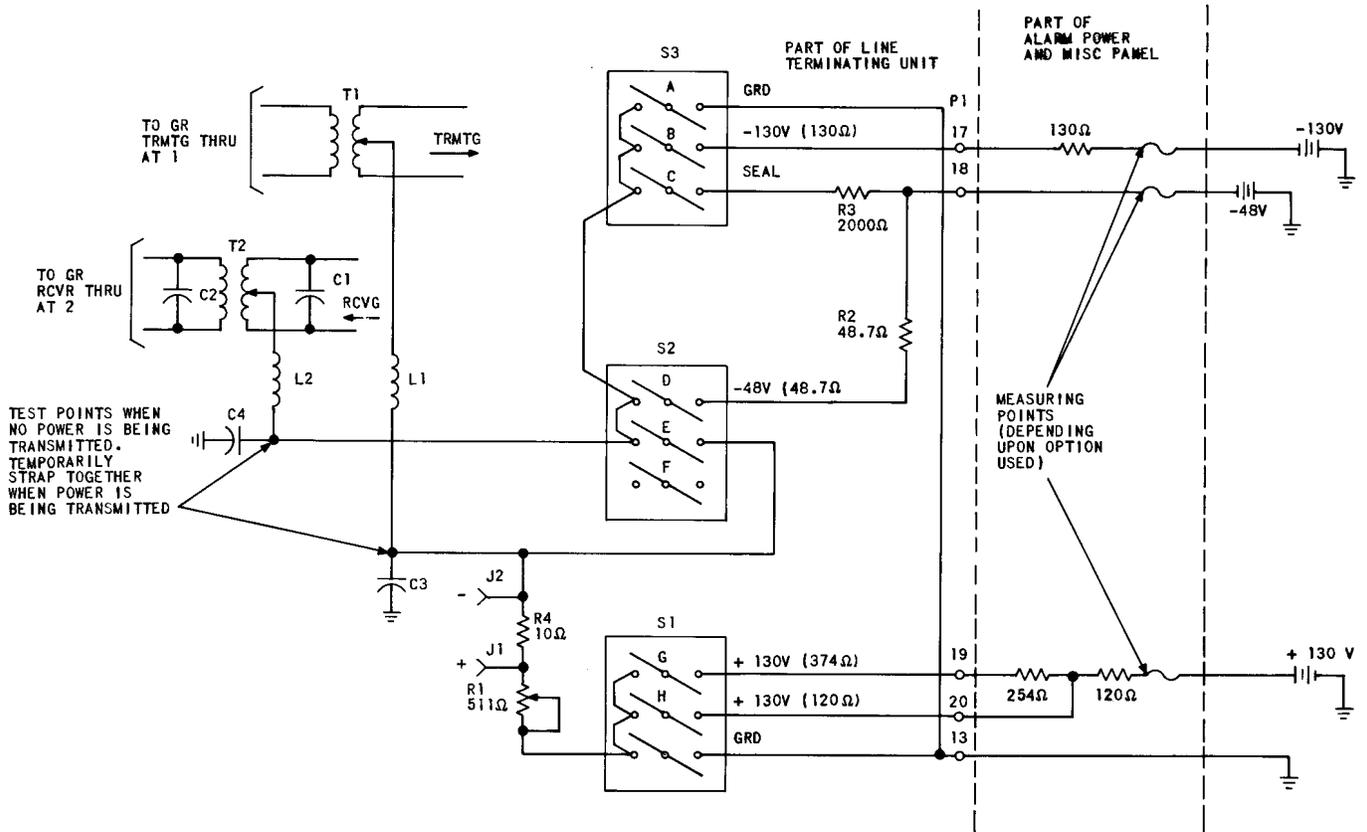


Fig. 3—Power Feed Circuit

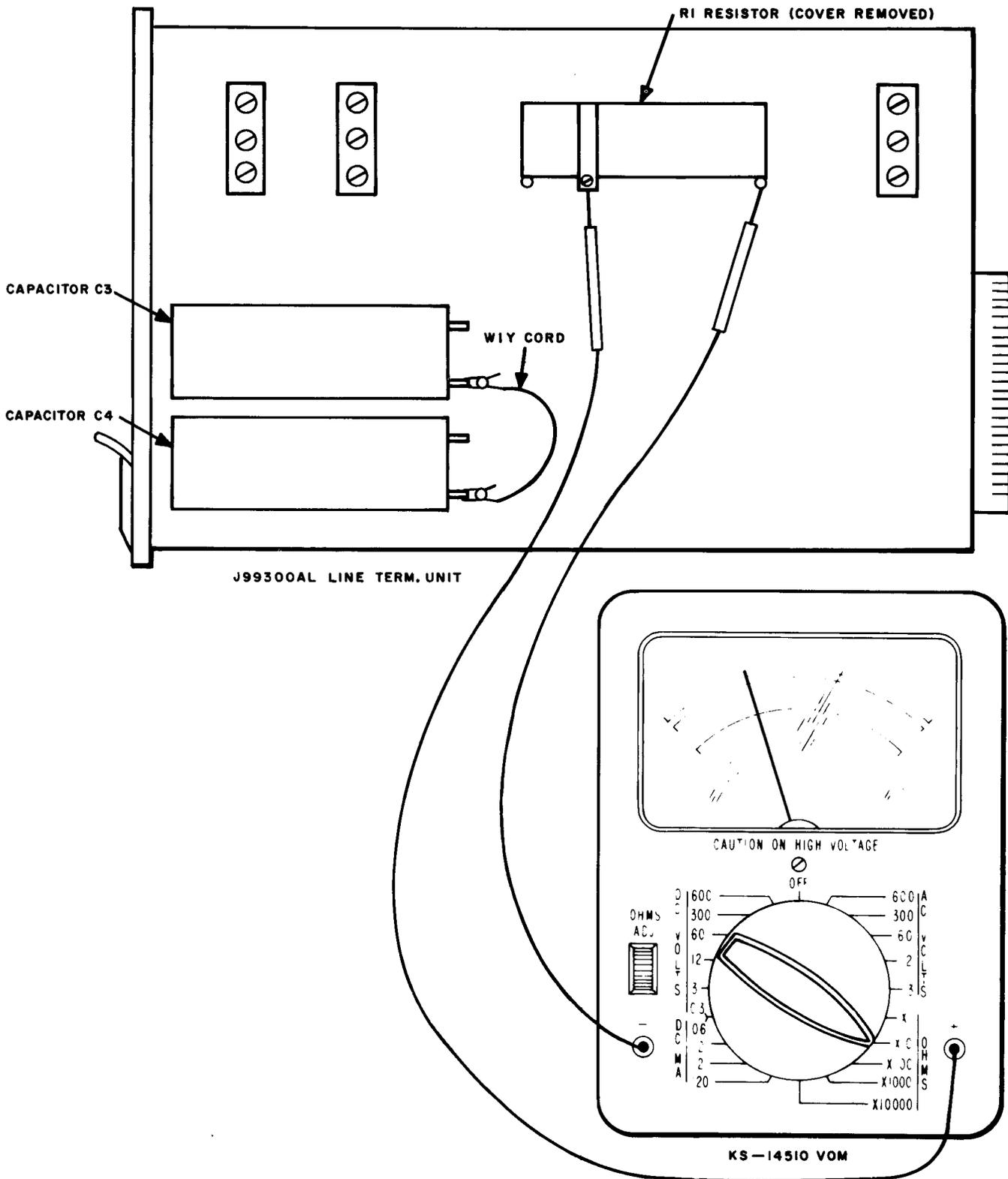


Fig. 4—J99300AL Line Terminating Unit—Measurement of R1 Resistor Setting

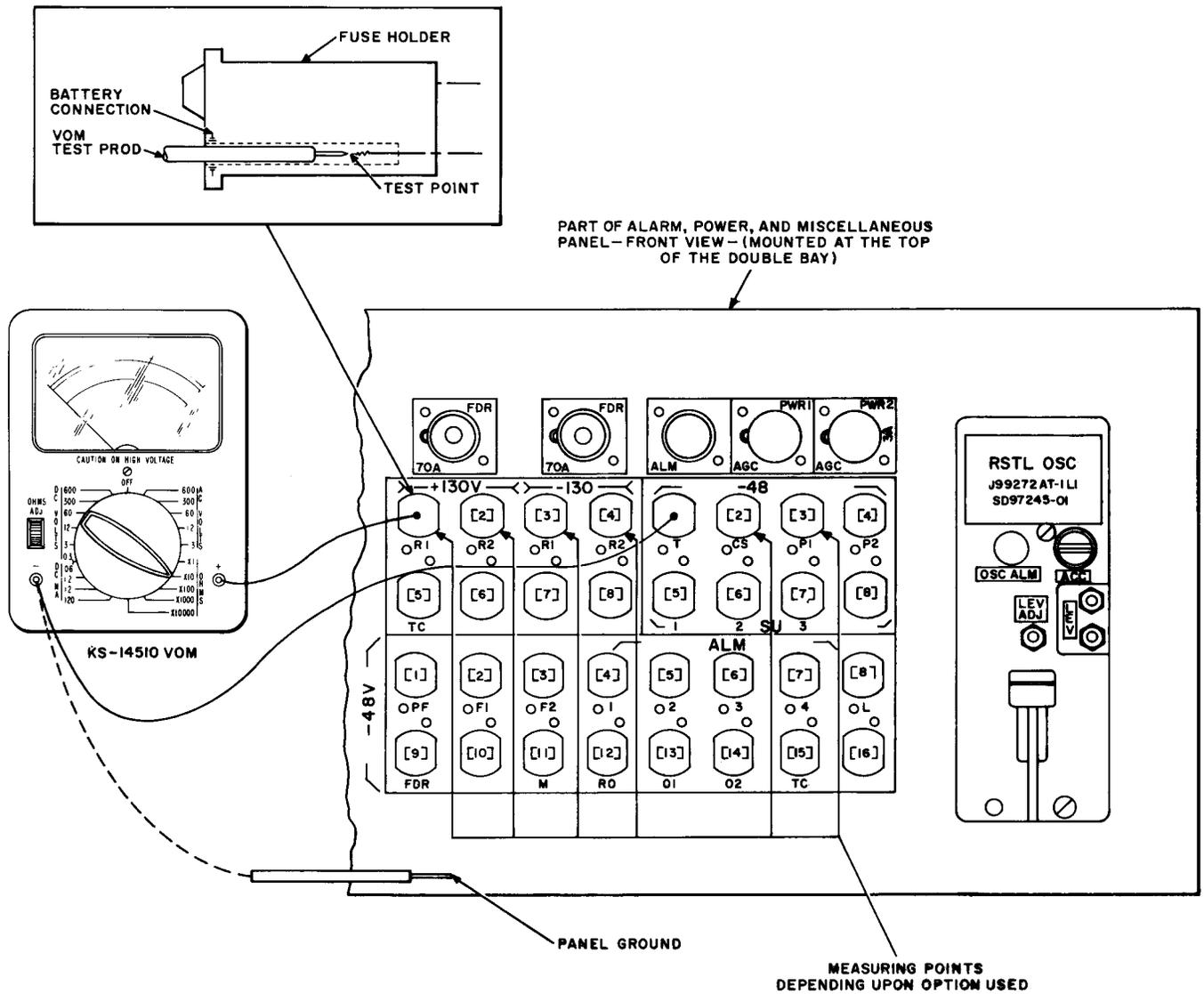


Fig. 5—Part of Alarm Power and Miscellaneous Panel—Front View—Measurement of Terminal Resistance