

**TYPE N2 CARRIER TELEPHONE SYSTEM
LINE TERMINATING UNIT
ADJUSTMENT OF REPEATER POWER SUPPLY 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 three transistorized repeaters in series may be powered. The transmitting pair carries +130 volts (or ground when only a -48 volt battery is required) and the receiving pair carries -48 volts, -130 volts, or ground as required. When unsoldered 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 fed sealing current may be beyond the repeaters receiving power from the N2 terminal.

Options are available by means of screw-type connectors in the line terminating unit for the different power conditions.

The purpose of this test is to adjust the resistance in series with the power supplies to the values specified in order that the correct current will be supplied to the repeaters.

APPARATUS:

- 1 — KS-14510, List 1 or List 5 Volt-ohm-milliammeter, or equivalent (20,000 ohms per volt)
- 2 — W1Y Cords (shorting straps), or equivalent

STEP	PROCEDURE
	(A) No Power Being Transmitted Over the Cable
1	Remove the line terminating unit from the terminal mounting. Turn screw E clockwise to make contact and check to see that no other screws are making contact.
2	Temporarily short capacitors C5 and C6 to ensure that they are discharged. (See Fig. 1, 2, and 3.)
3	Strap terminal 10 of P1 to terminal 10 of P2 with a W1Y cord. Strap terminal 20 of P1 and P2 together. (See Fig. 1, 2, and 3.)
4	Measure the resistance with the volt-ohmmeter connected to the terminals of C5 and C6 as shown in Fig. 3. <i>Requirement:</i> 1 ohm maximum
5	Remove the straps from P1 and P2, and return the line terminating unit to the terminal mounting.

STEP	PROCEDURE
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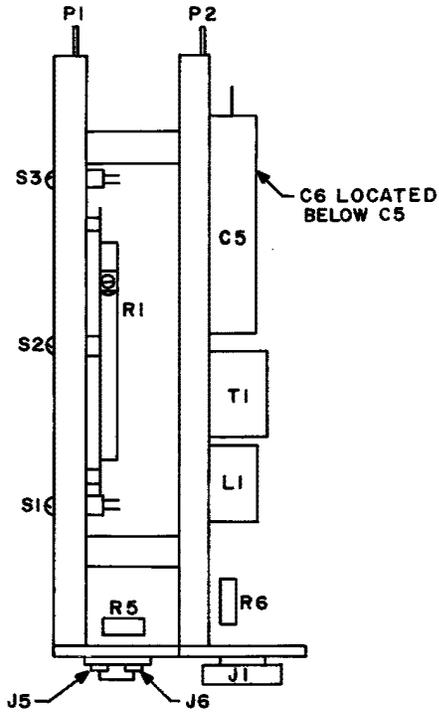


Fig. 1 - Line Terminating Unit - Top View

TEST POINTS WHEN NO POWER IS BEING TRANSMITTED. STRAP TOGETHER WHEN POWER IS BEING TRANSMITTED

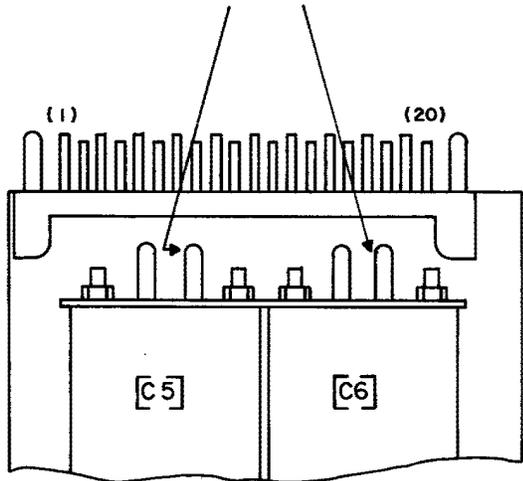
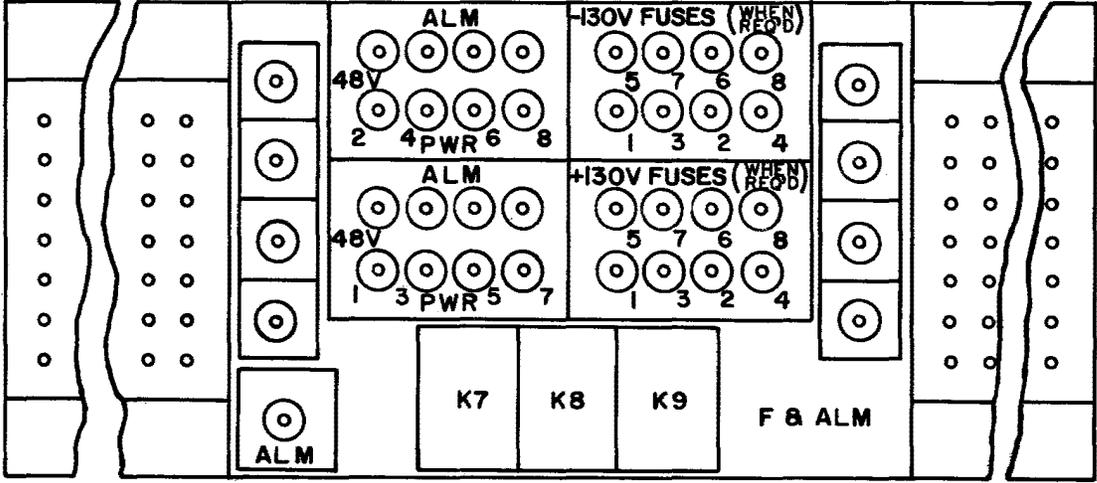
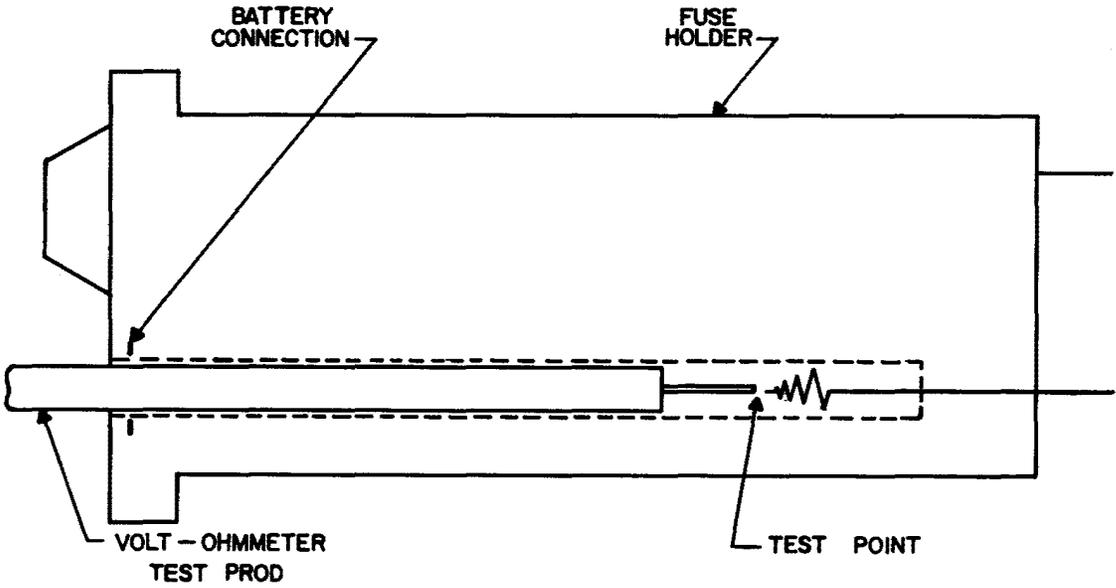


Fig. 3 - View of C5 and C6 Terminals

STEP	PROCEDURE
	
	<p align="center">Fig. 4 – Bay Cable Terminating Unit Fuse and Alarm Section — Front View (Mounted at the Top of the Terminal Bay)</p>
	<p align="center">(B) Power Being Transmitted Over the Cable</p>
6	<p>Remove the appropriate fuses from the bay cable terminating unit. The fuses involved may be +130V or -48V alone, or +130V and -48V, or +130V and -130V. The -48V fuse is the terminal -48 PWR fuse. (See Fig. 4.)</p>
7	<p>Remove the line terminating unit from the terminal mounting and strap C5 to C6. (See Fig. 2 and 3.)</p>
8	<p>Adjust the appropriate screws for the desired feature (Table A). Check to ensure that only the desired screws are making contact.</p>
9	<p>For the sealing current only option, proceed to Step 12. No adjustment of the terminal resistance is necessary since any setting of R1 will permit a sufficient amount of current flow when sealing current only is being supplied.</p>
10	<p>Refer to the circuit order card for the total terminal resistance required. Subtract the resistance shown in Table A to determine the resistance required in R1. (See Note following Step 17.)</p>
11	<p>Measure, with the volt-ohmmeter across R1, for the resistance computed in Step 10. If necessary, adjust R1 by loosening the slider clamping screw and moving the slider for the correct resistance. When the correct setting has been made, tighten the clamping screw and recheck the resistance reading.</p>
12	<p>Return the line terminating unit to the terminal mounting.</p>
13	<p>To measure the total terminal resistance as called for on the circuit order, connect the volt-ohmmeter between the equipment sides of the fuse holders (or from the fuse holder to ground if only one supply is required) located in the bay cable terminating unit which is mounted at the top of the N2 terminal bay. (See Fig. 2, 4, 5, and Note following Step 17.)</p>

STEP	PROCEDURE
	
	<p align="center">Fig. 5 – Fuse Holder Test Point Located in Bay Cable Terminating Unit</p>
	<p>Caution: To prevent damage to the meter when inserting the test prod into the fuse holder, set the volt-ohmmeter scale to 300V dc. When the test prods are in place, change the meter scale to OHMS.</p>
14	<p>For sealing current only, the total resistance may be as follows without adjustment:</p> <p>Requirement: 1900 ohms to 2700 ohms</p>
15	<p>If the circuit order requirement is not met, remove the line terminating unit and repeat Steps 8, 11, and 12. If a +130 volt supply is being used, screw G or H may be used in conjunction with the R1 adjustment to obtain the correct resistance. However, screw G shall be used in preference to screw H whenever applicable.</p>
16	<p>Pull out the line terminating unit from the terminal mounting and remove the strap between C5 and C6. Indicate on the faceplate of the unit, in the space provided, the power feed options as left. Reinsert the line terminating unit in the terminal mounting.</p>

STEP	PROCEDURE
17	<p>Restore the appropriate fuses in the bay cable terminating unit.</p> <p><i>Note:</i> In certain cases, for coordination with N1 systems, line build out for N2 systems may be located in a high-frequency cross-connecting and line build-out cabinet. The line build out may be slope networks (J98706L, M, N, or T) and/or span pads (J98703B, List 1 to List 15). When slope networks are used in the cross-connecting cabinet, the repeater power is bypassed around the networks by means of two modified noise control units on an as yet nonstandard job basis. The circuit order card should allow approximately 2.2 ohms for each slope network arrangement and for span pad resistance. Maximum loop resistances listed in Table A should be reduced by the amount of loop resistance of the line build out located in a cross-connect cabinet.</p>

Power to Electron Tube-type Repeater	+130 & -130	B + (G or H)	130 + (384 or 130)	†	9 & (17 or 18)
Sealing Current Only	-48	C + J	2010	†	4 & 13
No Power Transmitted		E			C5 & C6 (P1 terminals not used)

* Including line build out mounted externally from the N2 terminal. (See Note following Step 17.)

† There are no dc resistance limits which apply in these cases; the voltage provided is sufficient to permit use of these options with the maximum length cables allowable for signal transmission.

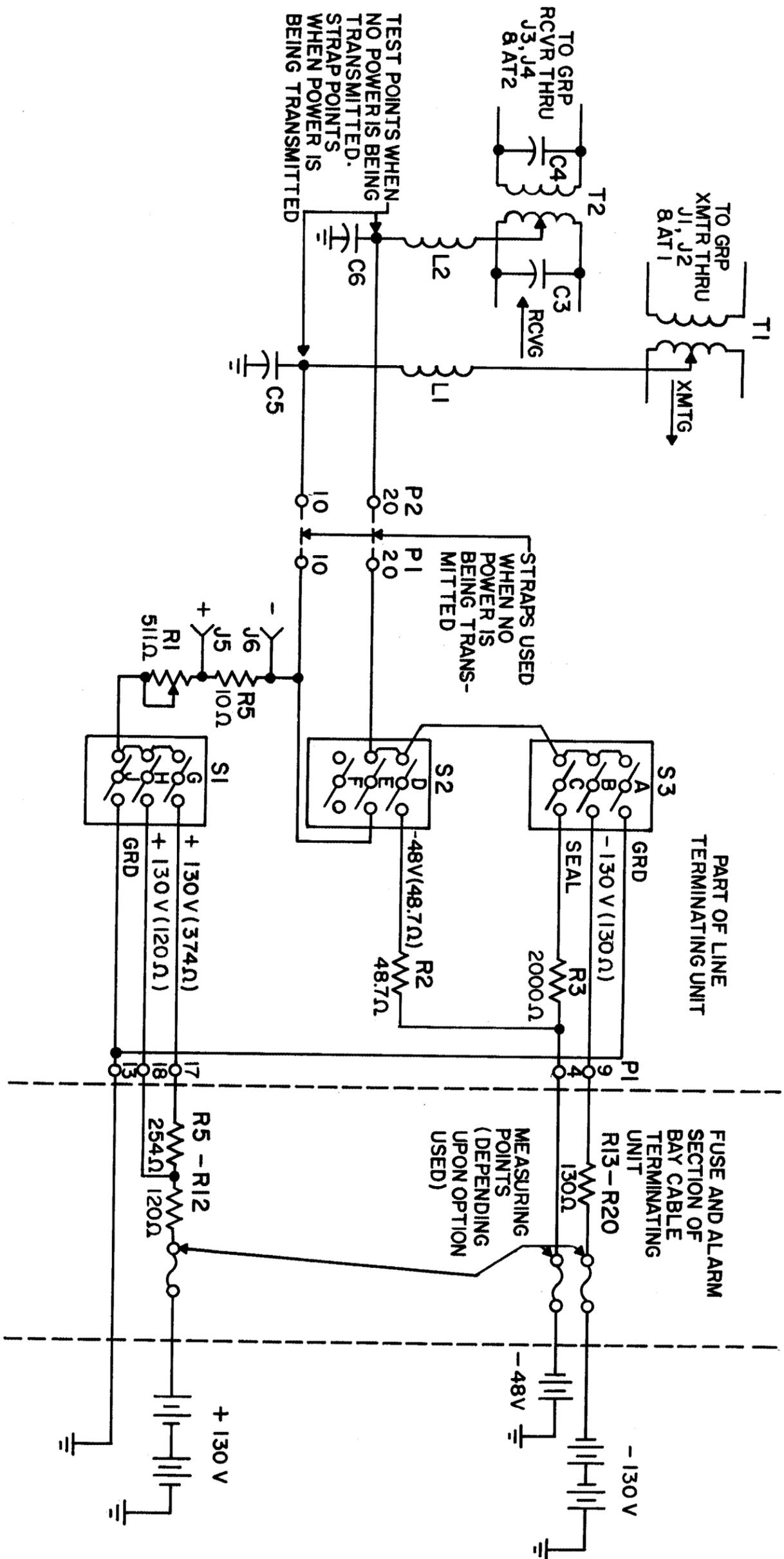


Fig. 2 - Power Feed Circuit

TABLE A

Power Feed Options

POWER FEATURE OR OPTION	BATTERY SUPPLY	POWER CONNECTION SCREWS USED	SUBTRACT FROM TOTAL TERMINAL RESISTANCE FOR REQUIRED R1 RESISTANCE	*APPROX MAX TOTAL CABLE LOOP RESISTANCE	P1 TERMINALS CONNECTED IN POWER FEED CIRCUIT	
			ohms	ohms		
Power to Transistorized Repeaters	1 HL REP	-48	D + J	58.7	150	4 & 13
		+130	A + (G or H)	384 or 130	†	13 & (17 or 18)
	1 LH REP	+130	A + (G or H)	384 or 130	†	13 & (17 or 18)
	2 REP (HL & LH)	+130	A + H	130	400	13 & 18
		+130 & -48	D + (G or H)	48.7 + (384 or 130)	†	4 & (17 or 18)
	3 REP (2HL + 1LH)	+130 & -48	D + H	178.7	570	4 & 18
+130 & -130		B + (G or H)	130 + (384 or 130)	†	9 & (17 or 18)	
3 REP (2LH + 1HL)	+130 & -130	B + (G or H)	130 + (384 or 130)	†	9 & (17 or 18)	
Power to Electron Tube-type Repeater	+130 & -130	B + (G or H)	130 + (384 or 130)	†	9 & (17 or 18)	
Sealing Current Only	-48	C + J	2010	†	4 & 13	
No Power Transmitted		E			C5 & C6 (P1 terminals not used)	

* Including line build out mounted externally from the N2 terminal. (See Note following Step 17.)

† There are no dc resistance limits which apply in these cases; the voltage provided is sufficient to permit use of these options with the maximum length cables allowable for signal transmission.

