

GFELLER LINE CONCENTRATORS
49-9-2, 49-11 + 1-2, 49-12-2
INITIAL PREPARATION, LINE-UP, AND CUTOVER
DC OPERATION

1. GENERAL

1.01 This appendix is issued to include the necessary information on units converted to DC battery operation.

1.02 The following additional information and alteration of the main section is necessary for DC operation. The main section text is valid, as is, for AC operation.

1.03 The following paragraphs and figures of the main section are replaced:

1.03B	2.06	2.11	4.Steps 11 to 45	Fig. 3
1.08	2.07	3.Step 7b	5.Step 8	Fig. 4
2.05	2.09	3.Step 8C	Fig. 2	

1.03B Test of Resistors RI, RII, RIII, and Relays RA through RF: This test provides for adjusting resistors RI, RII, and RIII to suit particular cable conductor resistance, balances out dc ground current, and verifies that relays RA through RF meet electrical requirements. Under plus-and-minus battery operation, test B of the main section is no longer valid. Two new procedures, test B1 and test B2, are substituted for it. Test B1 is to be performed at the same point in the testing sequence as the original Test B (immediately following test A and preceding test C). Test B2 is to be performed immediately following test C and preceding test D.

3. PREPARATION

STEP

ACTION

VERIFICATION

7b If preliminary tests are to be made with the units located side by side prior to their being installed - Simulate the effective cable resistance of the control leads and trunk conductors by interconnecting both units using the wire-wound resistors as follows:

- (a) Control leads - use 7 of the variable 10 watt resistors (one for each lead) adjusted to one half the resistance value obtained in Step 5.

1.08 Under plus-and-minus battery operations the arrangement of terminal strip III on the central office unit has been modified. The new arrangements are shown in Fig. 2A, Fig. 3A and Fig. 4A of this appendix. Fig. 2A is for the line concentrators covered by schematic S10460-3. Fig. 3A is for the line concentrators covered by schematic S10460-4. Fig. 4A is for line concentrators covered by schematic S11888.

2. APPARATUS

2.05 (Replaces paragraphs 2.05, 2.06, and 2.07 of the main section). A number of variable wire-wound resistors (10 watt) are required for simulating control and trunk cable resistance. For the 49-9-2 model, 25 resistors are required. For the 49-11+1-2 model, 29 resistors are required. For the 49-12-2 model, 31 resistors are required.

2.09 Paragraph 2.09 is disregarded because no 25 ohm resistor is required for testing Gfeller units that have been modified for plus-and-minus operation.

2.11 Testing cord, W2W cord, 6 feet long, equipped with one No. 310 plug, No. 360B tool and No. 360C tool (No. 2W17A cord), two No. 141 cord tips.

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
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|----|--|--|
| 7b | (b) Trunk conductors - use the remainder of the variable 10 watt resistors adjusted to one half the resistance value obtained in Step 5. | |
|----|--|--|

Step 8c should be replaced by the following: If tests B through J are to be made after the units are installed - Connect the control leads I through VII as follows:

Use first control pair for leads I and II and connect them to the tip and ring, respectively.

Use second control pair for leads III and V and connect them to the tip and ring, respectively.

Use third control pair for leads VI and VII and connect them to the tip and ring, respectively.

Use the tip of the fourth control pair for lead IV.

4. METHOD

In the following procedures the assumption is made that a number of concentrators are being lined up simultaneously. If an additional concentrator or concentrators are to be supplied from the same power supply which already supplies one or more in service Gfeller units, then all of the units must be readjusted together. If only one unit is being lined up, the procedure is simply a special case of the following.

Tests B1 and B2 replace test B of the original section. B1. Test of Resistors RI, RII, RIII, and Relays RA through RF.

Note: The terms MK jacks and MC jacks as used in the practices refer to the same set of jacks.

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
11	Remove all the fuses at the PEC power supply.	
12	At each central office unit remove the shorting plugs from the MK1, MK2, and MK3 jacks.	
13	Connect an ohmmeter from the line side of the MK1 jack to ground on one concentrator and adjust the RI resistor to obtain a resistance of 675 ohms \pm 15 ohms.	Ohmmeter reads 675 ohms.
14	Remove ohmmeter	
15	Repeat steps 13 and 14 for MK2 and RII and also for MK3 and RIII. These resistors should arrive at approximately the same setting, if not check the resistor, relay winding, and cable pair associated with each control pair. The resistances of the control leads I through VII should all be within a few ohms of each other.	Ohmmeter reads 675 ohms in each case.
16	Repeat steps 13, 14, and 15 for the other concentrators being lined up.	Ohmmeter reads 675 ohms in all cases.
17	Replace the shorting plugs and the power supply fuses.	All relays RA, RB, RC, RD, RE, and RF operate.

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
	Before performing test B2, make certain that both test B1 and test C have been completed. <u>B2. Further Test of resistors RI, RII, RIII, and Relays RA through RF.</u>	
18	Remove the shorting plug from test jacks MK1 on one concentrator central office unit.	
19	Connect dc milliammeter to test jacks MK1.	
20	Adjust resistor RI to obtain a reading in accordance with Table C (± 2 ma).	
21	Remove milliammeter and replace plug.	
22	Repeat steps 18 to 21 for MK2 and RII.	
23	Repeat steps 18 to 22 for the other concentrators being lined up. After this has been done for each concentrator unit, check all measurements again until no further adjustments are required. This will be necessary as the positive supply changes with any change in the load.	
24	Measure the ac supply voltage at the pin jacks on the front of the PEC power supply with an ac voltmeter.	Voltmeter reads between 68 and 71 volts ac.
25	If voltmeter reading is not between 68 and 71 volts ac, refer to steps 5 through 11 in the section entitled "Tests at Time of Installation" in BSP 067-201-501 or BSP 067-201-502 for ac output adjustment.	
26	If any change is made in the ac supply voltage, repeat steps 18 to 23 again.	
27	Record the ac supply voltage.	
28	Remove the shorting plug from test jacks MK 5 one one central office unit.	
29	Connect dc milliammeter to test jacks MK 5.	Observe current reading corresponding to Table A.
30	Remove milliammeter and replace MK 5 plug.	
31	Add 7 ma to the value of current observed in step 29, then subtract this total from the sum of the currents flowing through MK 1 and MK 2, which have been previously determined. For example: if current in MK 1 and MK 2 is 70 ma in each case and the current of step 29 is 57 ma. $57 + 7 = 64$ ma $70 + 70 = 140$ ma $140 - 64 = 76$ ma	
32	Remove the shorting plug from test jacks MK 3 on the central office unit being lined up.	

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
33	Connect dc milliammeter to test jacks MK 3.	
34	Adjust RIII to obtain a current reading equal to that calculated in step 31. This will provide a cancelling balance of positive and negative ground return currents during the no switching conditions.	
35	At the remote end with the concentrators in an idle condition (no switching occurring), place a milliammeter in series with the ground lead. This can be most easily achieved at the jacks marked + and g7 on all 49-9-2 and 49-12-2 models. On model 49-11+1-2 concentrators the milliammeter should also be placed in series with the ground lead for this test. Some thought must be used, however, as no convenient test jacks exist on these units.	The ammeter should not read more than 5 ma for any of the units tested.
36	If the ammeter gives a reading greater than 5 ma, recheck the calculation of step 31 and the adjustment of step 34 and correct any errors.	Ammeter now reads 5 ma or less.
37	Repeat steps 28 through 36 for all units being lined up.	
38	Remove plug from test jacks MK 1.	Relays RA and RD release.
39	Replace plug.	Relays RA and RD operate.
40	Remove plug from test jacks MK 2.	Relays RB and RE release.
41	Replace plug.	Relays RB and RE operate.
42	Repeat steps 40 and 41 for test jacks MK 3.	Same as steps 40 and 41 except that relays RC and RF release and operate.
43	Repeat steps 38 through 42 for all units being lined up.	
44	Check the operate and release requirements of relays RA through RF as specified in the circuit requirement table of Section 067-201-701, with reference to the corresponding appendix to that section.	
45	At subscriber units - Repeat step 44. Use the procedures outlined in the appendix to Section 067-201-701, for making these relay tests.	

TABLE C

Outside Temperature (Degrees-Fahrenheit)	Current Flow (MK1 and MK2)
95°- 120°	69 ma
45°- 94°	70 ma
15°- 44°	71 ma

5. CUTOVER PROCEDURES

In Step 8 the connection of control leads V, VI, and VII should be included. These leads are to be connected in the same way as is specified in the addendum for Step 8c of part 3 (Preparation).

In place of Steps 11 through 25 of this part, Test B1 of this addendum should be performed. Then continue in the regular order to perform Steps 26, 27, and 28. After Step 28 has been completed, perform Test B2 of this addendum. On the completion of Test B2, perform the rest of the tests of the section from 29 on as indicated in the practice.

6. REVISIONS TO DIAGRAMS

As previously stated, under plus-and-minus battery operation certain revisions to terminal strip III of all the modified units were necessary. Fig. 2A is to be used with Fig. 2, page 22, of the original section. Fig. 3A is to be used with Fig. 3, page 23, and Fig. 4A is for use with reference to model 49-11+1-2 in Fig. 4,

page 24. These drawings (2A, 3A, 4A) do not completely replace the corresponding terminal strips shown in the section, but are intended to make clear the terminal strip arrangement being used.

7. SPECIAL NOTES

In order to employ proper protection practices, it is necessary on Gfeller models 49-9-2 to use the protectors at the remote end in a special way. As no protectors exist for control leads V, VI, and VII, it is required that the protectors intended for subscriber lines 48 and 49 be used for these control leads. If more than 47 subscribers are ever connected to the unit, a special protector block can be installed to connect them through.

When performing Test I of the section on a Gfeller model 49-9-2 which has terminal strips corresponding to Fig. 2, page 22, (Fig. 2A of appendix, it will be noticed that punchings AB1₃ and V1₁ do not exist on terminal strip III. Hence, with these units it is necessary to attach test leads at the actual relay contacts.

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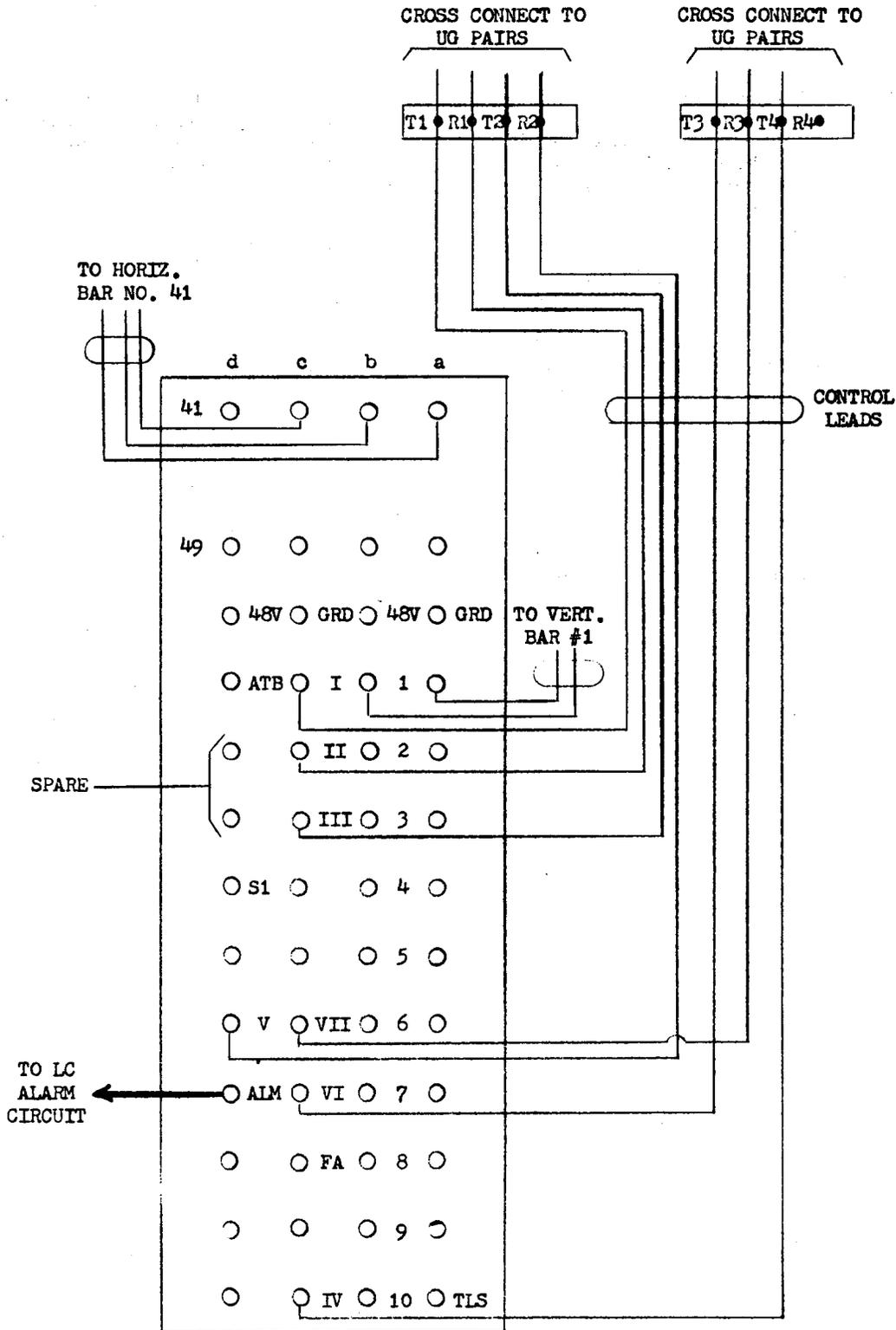


Fig. 2A
 Terminal Strip III

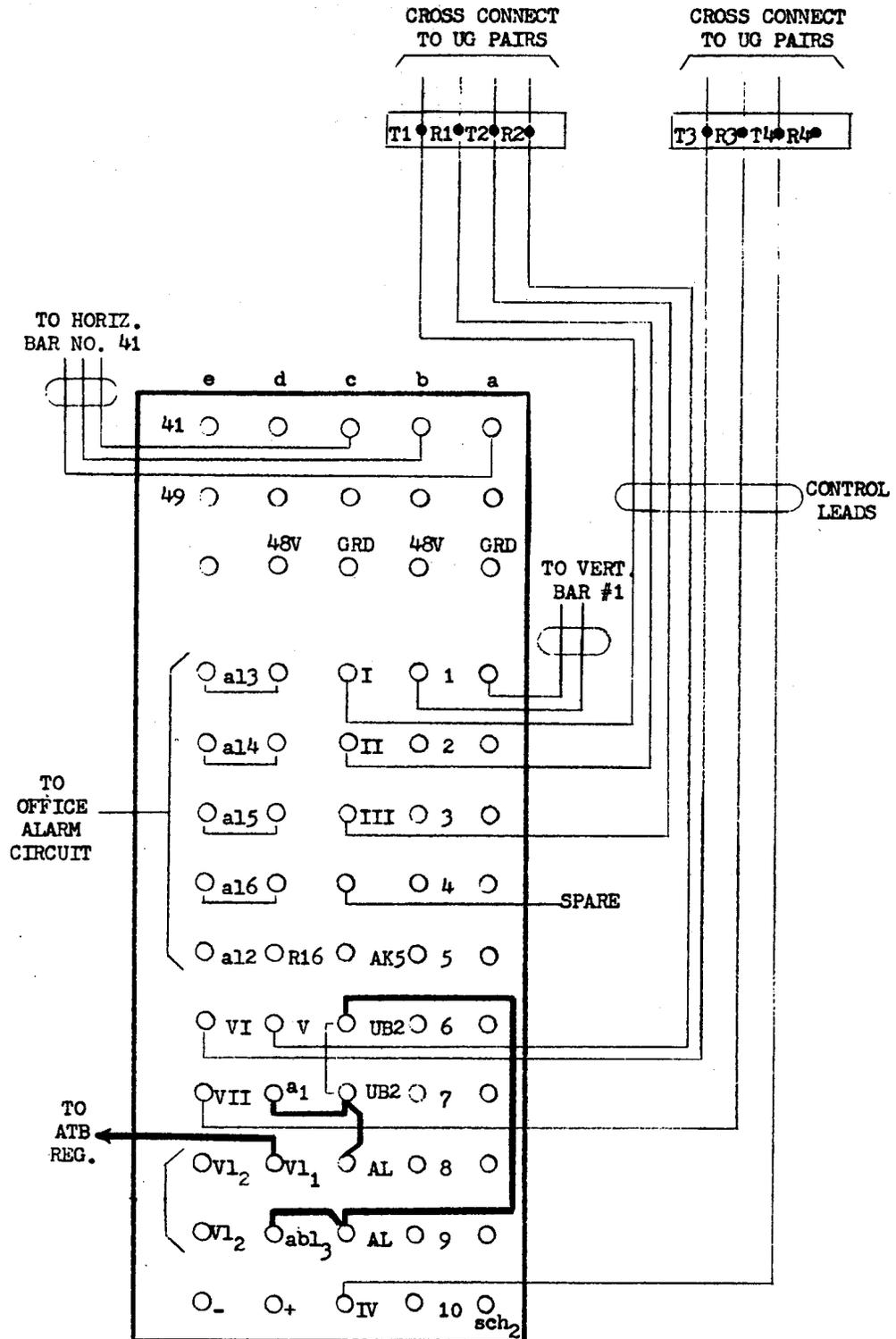


Fig. 3A
Terminal Strip III

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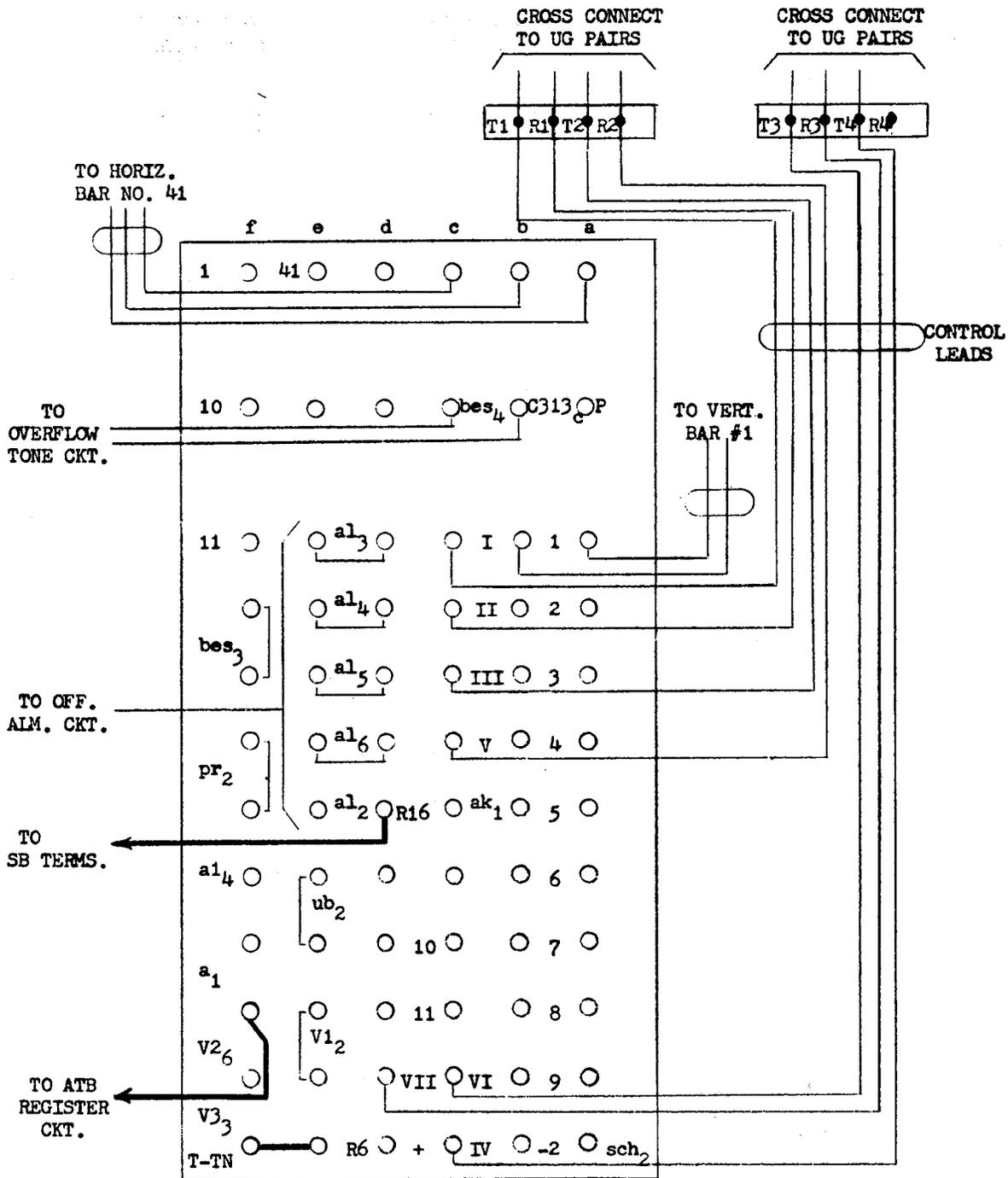


Fig. 4A
Terminal Strip III
49 - 11 + 1 - 2

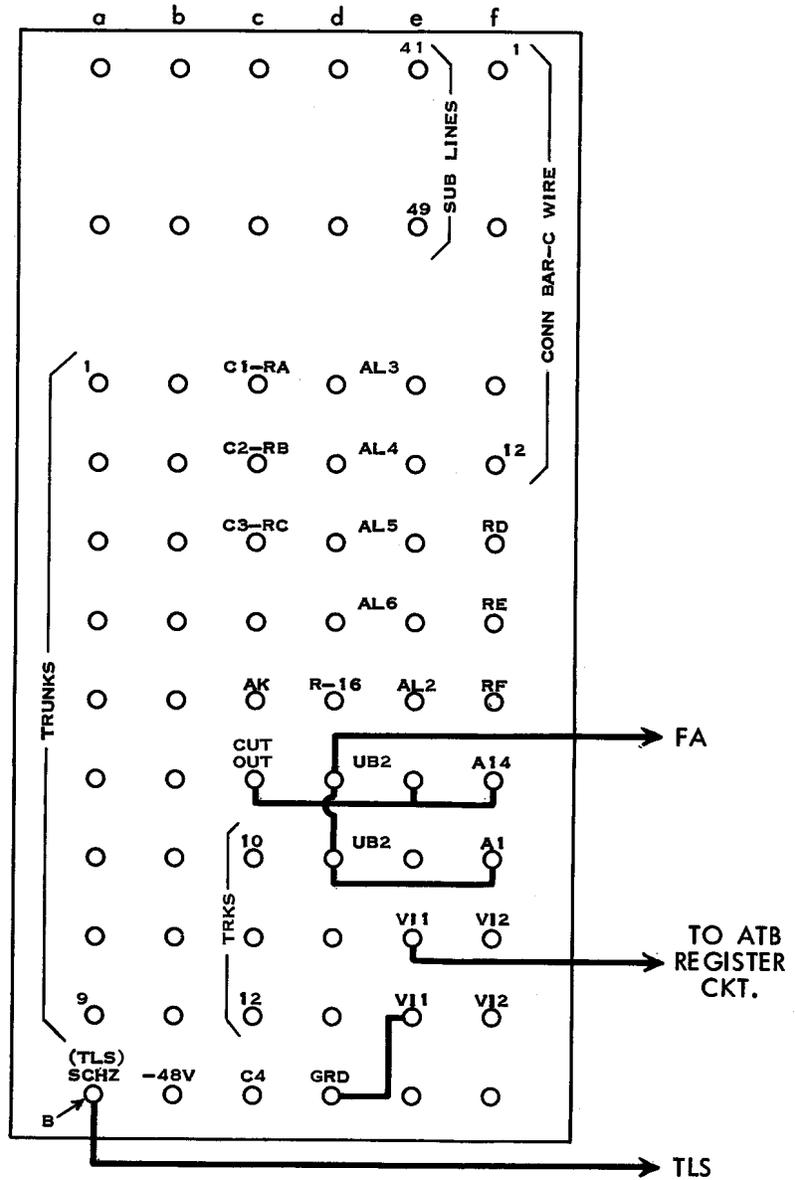


Fig. 5A
Terminal Strip III
49 - 12 - 2