GFELLER SUBSCRIBER LINE CONCENTRATOR

POWER SUPPLY

1. GENERAL

1.01 This is one of a group of sections pertaining to the Gfeller subscriber line concentrator and having the base numbers A804.901 and C85.010. This section covers information on the Power Equipment Company's PEC-8001-A power supply for the line concentrator.

1.02 A fully equipped unit which will supply the ultimate power requirements for five concentrators is designated PEC-8001-A. It will supply 70 or 80 volts ac and 72 volts dc. It contains a dc-operated vibrator assembly which provides an emergency source of 115-volt ac to supply the unit in case of power failure. However, all installations will not require the 72-volt dc feature or the emergency ac feature. To provide for obtaining only the necessary major components, singly or in combination, they have been designated as follows:

PEC-8001-C—Transformer Assembly

PEC-8001-D—Vibrator Assembly

PEC-8001-B—Consists of PEC-8001-C Transformer Assembly and PEC-8001-D Vibrator Assembly

PEC-8001-E—Rectifier Assembly

PEC-8001-F—Filter Assembly

A schematic of the power supply is shown at the end of this section.

1.03 As shown in Fig. 1, the assemblies, with the exception of the filter assembly, are contained in drawer-like units. By turning the knurled knobs counterclockwise to unlock them, the units can be withdrawn part way with the wiring connected or completely with the wiring disconnected.

> ***Caution: Before withdrawing the PEC-8001-C unit, move the wiring aside far enough to clear the alarm relays.***

The filter assembly is contained separately on its own mounting plate. Fig. 2 shows a rear view of the complete unit with the cover removed.

1.04 *PEC-8001-C* is the source of ac power for up to five concentrators. It contains a step-down transformer whose primary requires an input of 105 to 125 volts, 60-cycle, single-phase ac. The primary is tapped to obtain some adjustment of the output. The secondary is tapped to obtain outputs of 70 and 80 volts ac for the concentrators. The secondary taps are strapped as required to terminals which will supply five concentrators through five individual 0.5 ampere fuses. Connected to the concentrator side of each fuse is a relay which, under normal conditions, will remain operated. Should the fuse operate or the ac power fail, the relay will release and its contacts will provide a closure to the ac fuse alarm circuit.

> ***Note:*** The procedure in this section calls for connecting all unused ac supply leads to the secondary of the transformer. This will keep the respective alarm relays operated to prevent a false ac fuse alarm.

1.05 *PEC-8001-D* vibrator assembly contains a dc operated vibrator, a transformer and a relay. It is an emergency source of ac power for PEC-8001-C and E. It will be put into operation automatically if the regular ac source fails. The winding of the relay is connected across the regular 115-volt ac source. The relay will be held

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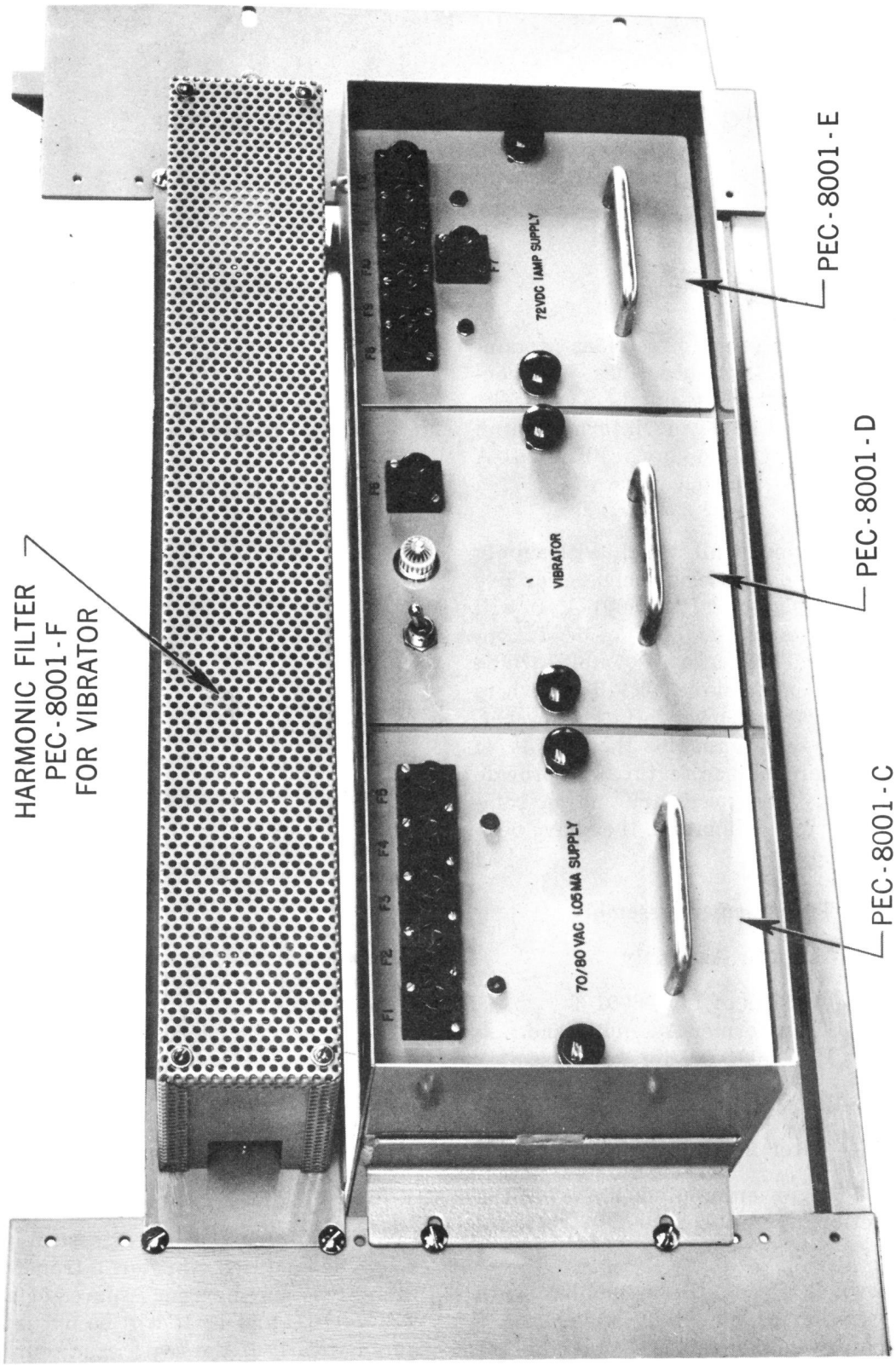


Fig. 1 — Power Supply, Front View

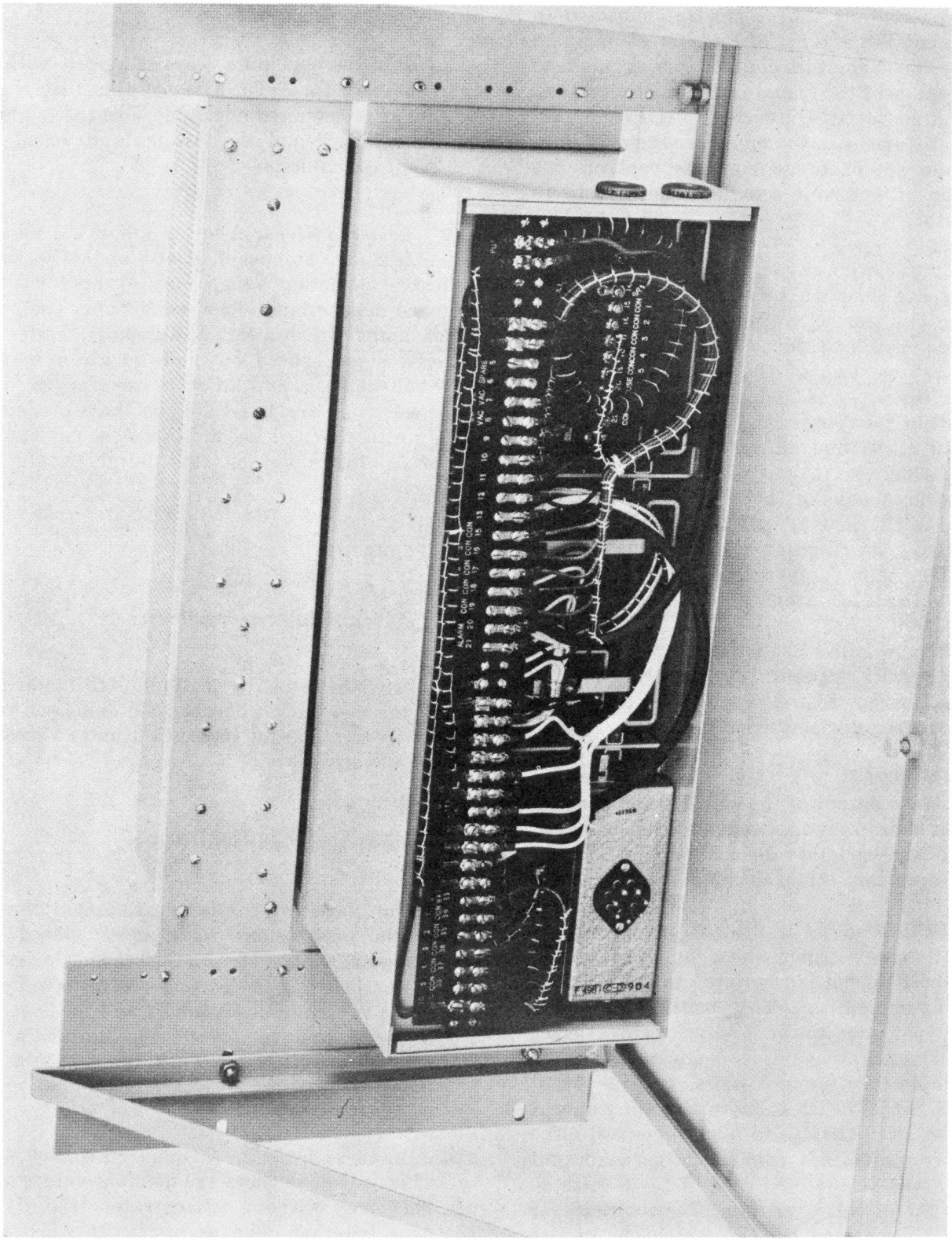


Fig. 2 — Power Supply, Rear View, with Cover Removed

operated as long as this source is good. The high side of the regular source is also connected to the make contact of a set of transfer contacts on this relay. The armature contact carries this lead to the primary of the transformer in PEC-8001-C. The break contact is connected to the secondary of the transformer in the vibrator assembly unit. A separate set of break contacts controls the connection of —48-volt central office battery to the vibrator.

1.06 If the regular ac source fails, the relay will release. The contacts supplying —48 volts dc to the vibrator will close. The vibrator will start under self interruptions and will energize the primary portion of the transformer, alternating 60 times per second between the windings either side of the center tap. This produces in the secondary a 60-cycle ac current adjustable by means of taps to 115 volts. This output is now connected, by means of the transfer set of relay contacts, to the primary of the transformer in PEC-8001-C; the regular ac source is disconnected. The neon lamp on the assembly panel glows to indicate ac output from the transformer.

1.07 When regular ac power is restored, the relay will reoperate, stopping the vibrator and transferring PEC-8001-C from the emergency to the regular ac source.

1.08 ***PEC-8001-F*** is a filter section connected into the output of the vibrator assembly. It filters out vibrator noise and hum which might otherwise feed back into the central office battery or be induced into other circuits.

1.09 ***PEC-8001-E*** is a typical semiconductor full-wave rectifier whose input is 115 volts ac and whose output is regulated within 22 to 26 volts dc at one ampere. The positive side of the output is connected to the —48-volt central office battery. The negative side is connected, through five separate 0.75 ampere fuses, to five output terminals. Since the 22- to 26-volt rectifier output is in series with the 45- to 52-volt central office battery, concentrators connected to the output terminals will be supplied with 67 to 78 volts dc for nominal 72-volt operation. The input to the rectifier is connected to PEC-8001-C in such a manner that, if the vibrator assembly is provided, the rectifier will be supplied from the emergency source in the event of failure of the regular ac supply.

> ***Note:*** Earlier units were equipped with a 3-ampere fuse (F7). Use of this fuse is no longer considered advisable. The fuse should be removed and the terminals strapped on the fuse holder.

1.10 ***Lettered Steps:*** A letter a, b, c, etc, added to a step number in Part 3 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

2.01 4-inch regular screwdriver.

2.02 KS-14510, List 1 volt-ohm-milliammeter (or meters of at least 1000 ohms-per-volt sensitivity suitable for measuring up to 78 volts dc and 80 volts ac).

3. TESTS AT TIME OF INSTALLATION

3.01 For these tests it is assumed that straps and connections have been placed in accordance with the notes on the schematic drawing. If the leads to the ac fuse alarm have been connected to terminals 20 and 21 and the concentrators connected to any of the terminals 15 through 19 and 34 through 39, these should be disconnected until the tests are completed.

3.02 In these tests the 70- and 80-volt ac and 72-volt dc outputs are nominal values and are measured without concentrator load. It is not expected that changes in output when the load is connected will effect the performance of the concentrators. However, it may be well to

recheck these voltages after the load is connected but before the concentrators are put in service. This will assure that optimum tap connections have been chosen.

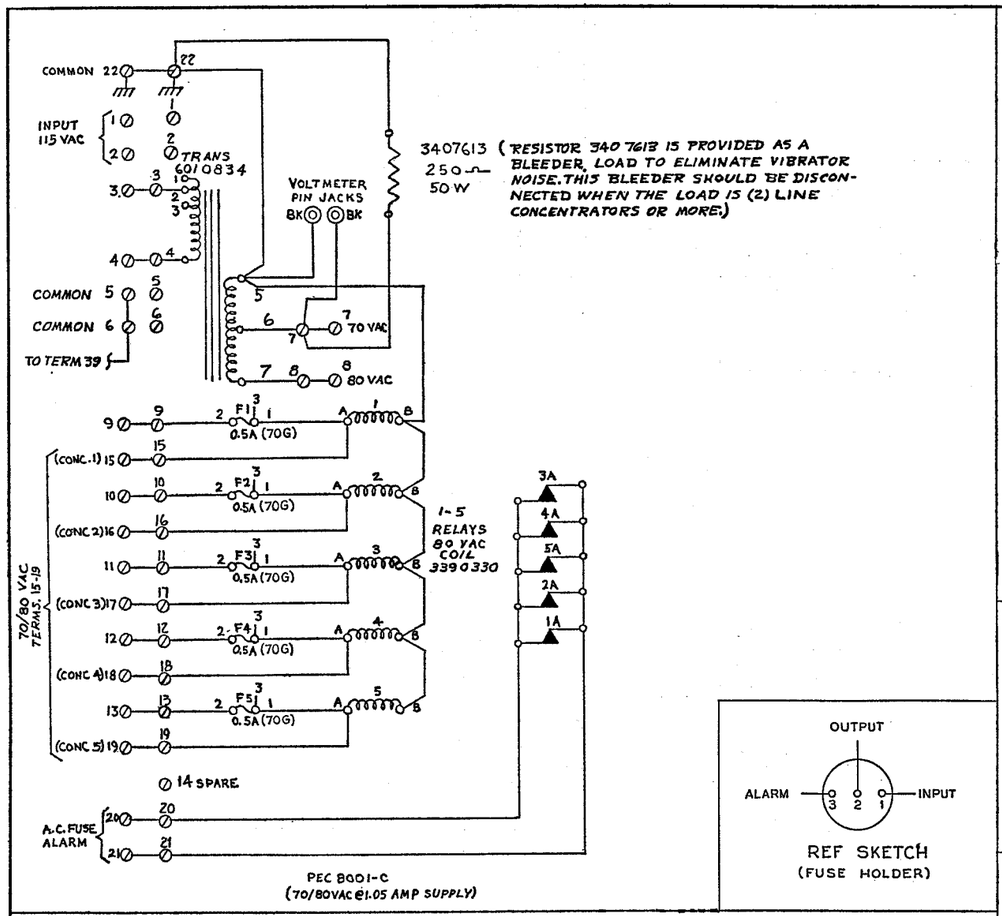
STEP	ACTION	VERIFICATION
PEC-8001-C		
	Caution: Remove fuses from regular 115-volt ac supply and from 48-volt supply, if provided.	
1a	If PEC-8001-D (vibrator assembly) is provided — Operate toggle switch to up position.	
2	Check that fuses F1 through F5 are installed.	Correct capacity (0.5 amp) indicated by red bead.
3b	If any of the terminals 9 through 13 are not connected — Strap any unused terminals 9 through 13 to terminal 7.	
4	Install fuse in regular 115-volt ac supply.	If PEC-8001-D is provided — Neon lamp not lighted.
5	Connect ac voltmeter to pin jacks of PEC-8001-C.	Voltmeter reads 70V ac.
6c	If voltmeter reading is not 70V ac — Remove fuse from 115-volt ac supply.	
7c	Withdraw assembly (see 1.03) far enough to gain access to primary taps (1, 2 and 3).	
8c	Move existing connection as required. ***Note:*** The higher the tap number, the higher the output voltage.	
9c	Replace fuse in 115-volt supply.	Voltmeter reads 70V ac.
10c	Push in and lock unit in place.	
11	Remove ac voltmeter connections from pin jacks.	
12	Connect leads from ac alarm circuit to terminals 20 and 21.	Alarms not actuated.

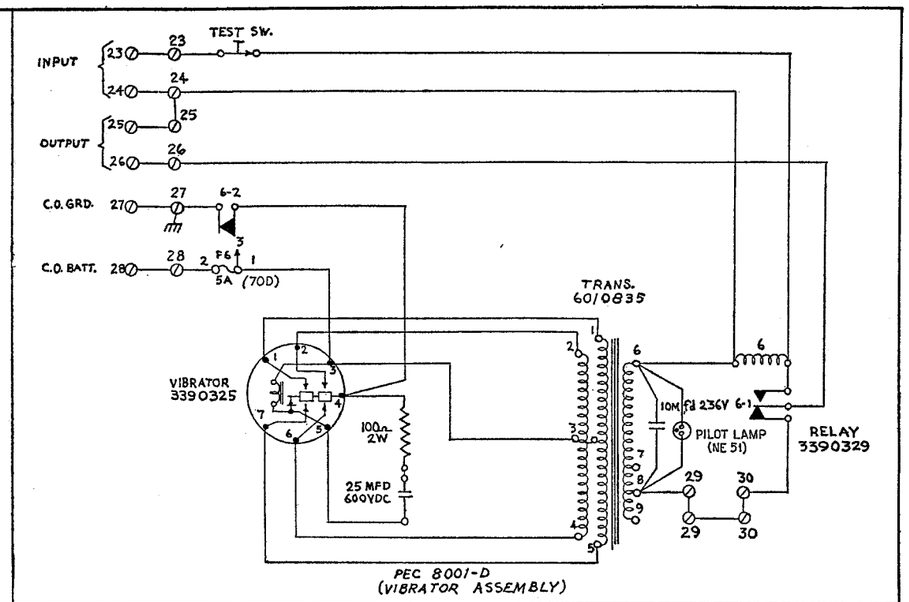
STEP	ACTION	VERIFICATION
13	Remove fuse F1. *Note:* Turn the fuse holder cap a quarter turn counterclockwise and remove the cap; the fuse can then be withdrawn.	Prescribed visual and audible alarms actuated.
14	Replace F1 fuse and cap.	Alarms retired.
15	Repeat Steps 13 and 14 on fuses F2 through F5.	Same as Steps 13 and 14.
16	At rear of unit — Apply one lead of ac voltmeter to metal chassis of unit.	
17	Apply other lead in turn to terminals 15 through 19.	Voltmeter reading at each terminal same as that obtained in Step 5 or 9c.

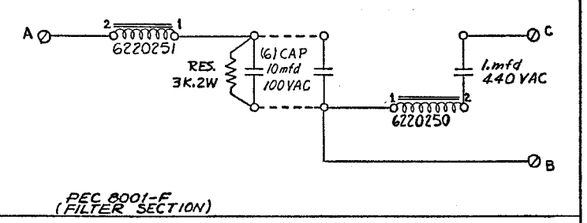
PEC-8001-D

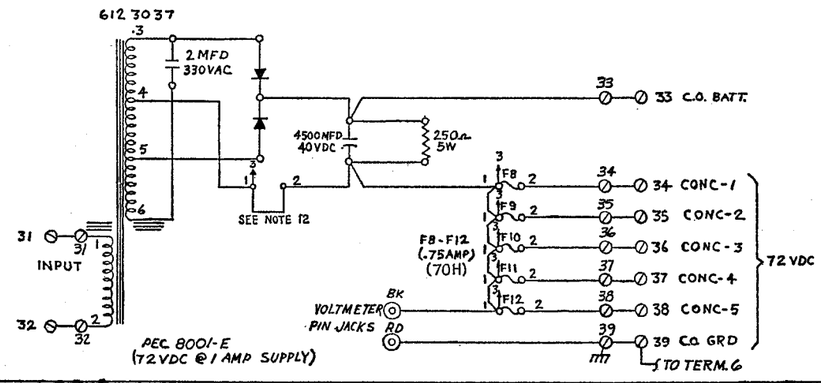
18	Install fuse in 48-volt central office battery supply.	
19	Check that fuse F6 is installed.	Green bead indicates correct capacity (5 amp).
20	Connect ac voltmeter to pin jacks on PEC-8001-C.	Record ac voltage reading.
21	Operate toggle switch on vibrator assembly to down position.	Panel lamp lights.
22	Compare ac voltmeter reading with that obtained in Step 5 or 9c.	Reading approximately the same.
23	Restore toggle switch to up position.	Panel lamp extinguished.
24d	If voltmeter readings were not approximately the same — Withdraw vibrator assembly far enough to get access to the transformer secondary taps (7, 8 and 9).	
25d	Change wiring on taps as required. *Note:* The higher the tap number, the higher the ac voltage output.	

STEP	ACTION	VERIFICATION
26d	Operate toggle switch to down position.	Panel lamp lights. Ac voltmeter reading approximately same as that obtained in Step 5 or 9c.
27d	Restore toggle switch to up position.	Panel lamp extinguished.
28	Withdraw assembly far enough to get access to the vibrator.	
29	Remove the vibrator and substitute the spare. ***Note:*** The vibrator is mounted in a socket similar to those used for electron tubes.	
30	Operate toggle switch to down position.	Panel lamp lights. Voltmeter reading approximately same as that obtained in Step 5 or 9c.
31	Restore toggle switch to up position. ***Note:*** If original vibrator is to be used in service, remove the spare and remount the original at this time.	Panel lamp extinguished.
32	Push in vibrator assembly and lock it in place.	
33	Remove ac voltmeter connections from pin jacks.	
34	At rear of unit — Apply negative lead of dc voltmeter to terminal 28 and positive lead to framework of assembly.	Voltmeter reads between 45 and 52 volts, indicating framework grounded.
PEC-8001-E		
35	Check that fuses F8 through F12 are installed.	Correct capacity (0.75 amp) indicated by brown bead.
36	Connect dc voltmeter to pin jacks (+ to red, — to black).	Voltmeter reads between 67 and 78 volts dc.
37	Remove voltmeter connections from pin jacks.	
38	At rear of unit — Apply positive lead of dc voltmeter to framework of assembly.	
39	Apply negative lead in turn to each of terminals 34 through 38.	Voltmeter reading same as that obtained in Step 36.









Circuit Notes

Connections and Strapping

1 – Connect 115-volt ac to terms. 1 and 2.

2 – Connect central office ground to terminal 6.

3 – For 70-volt ac output strap:
term 7 to 9, 10, 11, 12 or 13, as required, for concentrators requiring 70 volts ac.

4 – For 80-volt ac output strap:
term 8 to 9, 10, 11, 12 or 13, as required, for concentrators requiring 80 volts ac.

5 – When PEC 8001-C only is equipped,
Strap term. 1 to 3
2 to 4
6 to 22

6 – When PEC 8001-B (which consists of PEC-8001-C and PEC-8001-D) is furnished, strap:
term. 1 to 23
2 to 24
3 to 25
4 to 26
6 to 22
22 to 27
29 to 30
— already strapped when interconnect cable is provided
connect terminal 28 to-48V central office battery through a 10 amp fusetron.

7 – When PEC 8001-E is furnished, connect term. 33 to-48V central office battery through a 5 amp fuse or strap terminal 33 to 28 if PEC-8001-D is furnished.
Strap term. 1 to 3 — omit if PEC-8001-D is furnished.
2 to 4
3 to 31 — already connected if interconnect
4 to 32 cable is furnished.
6 to 39
Connect terms 34 through 38, as required, to concentrators requiring 72-volt dc operation.

8 – When PEC-8001-F is to be connected, remove the strap between terminals 29 and 30 and connect terminal 29 to A, 30 to B, 25 to C. On earlier units terminals 29 and 30 were not wired. In these cases, wire to PEC-8001-D internally to conform to the above pattern.

Miscellaneous

9 – Disconnect bleeder resistor 3407613 (250-ohm, 50-watt) in PEC-8001-C when load is two line concentrators or more.

10 – Taps designated 1, 2 and 3 on primary of transformer 6010834 (PEC-8001-C) provide a means of adjusting the ac output voltage.

11 – Taps designated 7, 8 and 9 on secondary of transformer 6010835 (PEC-8001-D) provide a means of adjusting the ac output of the vibrator unit.

12 – If PEC-8001-E is equipped with fuse F7, remove the fuse and strap terminals 1 and 2 of the fuse holder.

POWER SUPPLY PEC-8001-A
FOR
GFELLER SUBSCRIBER LINE
CONCENTRATORS