How to use a surplus ELGAR GIPS 800 power supply

The ELGAR GIPS 800 power supply contains two 24VDC batteries, each comprised of a set of lead-acid gel-cels. This application note assumes that the internal batteries are dead. Due to the high cost of new gel-cels, regular deep-cycle lead acid batteries can be used externally to economize and provide longer run times.

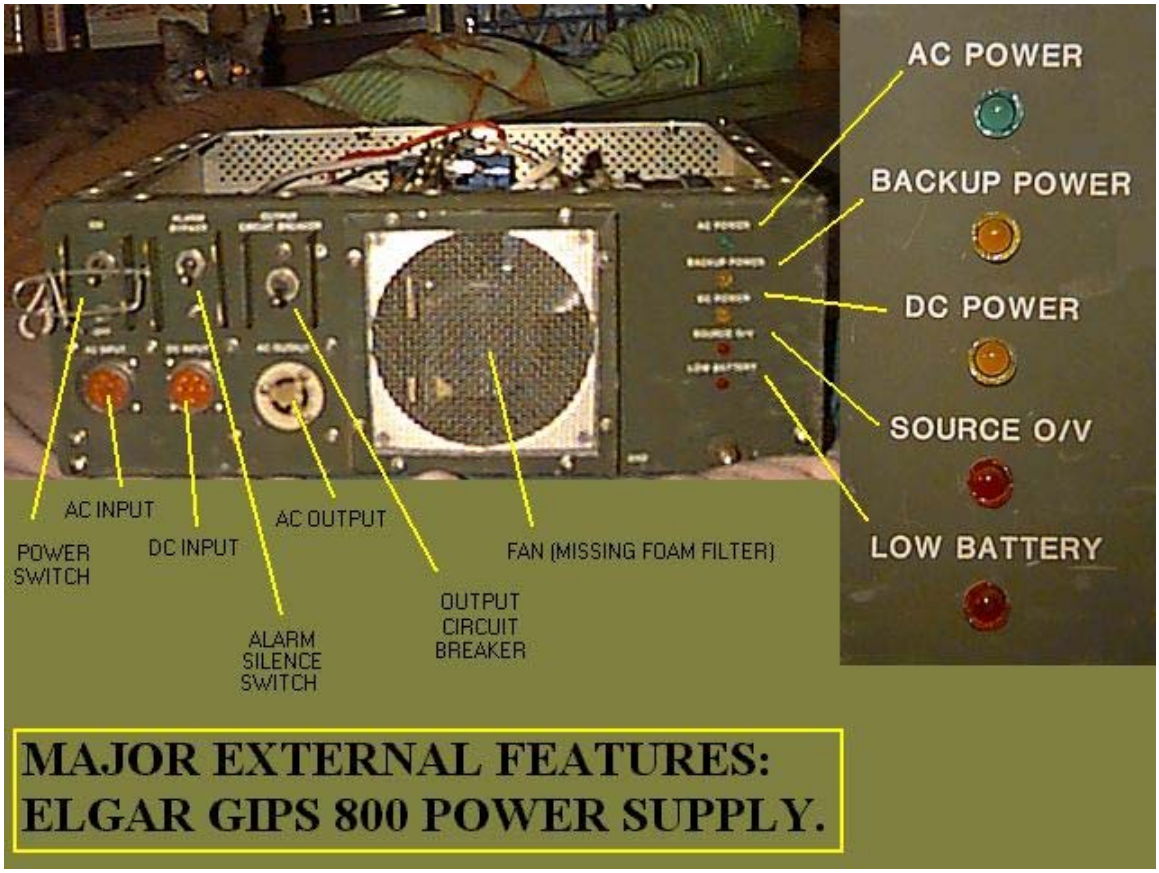

Figure 1. Power supply front panel.

Removal of the old batteries:
First, the old batteries will be removed. To do this, the delicate inverter and control boards assembly must be moved out of the way.

Open the top of the unit by removing numerous screws from the top panel.

Using care not to damage the circuit board assembly, turn the unit upside down and remove the four screws underneath the chassis which hold the black heatsink in contact with the bottom of the inside of the chassis.

Remove the screws that hold the bottoms of the batteries assemblies in place, from the bottom of the chassis. The batteries will not fall out. They are still held by screws in the sides.

Turn the unit right side up. Unplug the connectors going to the batteries and to the pc board assembly. At the front and rear of the PC boards assembly will be a bracket, one at the front, and

one at the rear. Remove the two small countersunk machine screws holding the brackets in place to the front and the back of the chassis top lip. Remove the front and rear brackets from the PC boards assembly by using a long screwdriver to unscrew the screws holding the brackets in place.

The boards assembly should now be able to be tilted up and with some difficulty, wiggled out of place so that there will be some room to get the batteries out. A helper is a good idea, so that damage to the delicate boards assembly is prevented.

Note the lesser of the two boards has a large CPU chip and an EPROM. If the EPROM has no label over its clear window, be sure to place a small piece of opaque tape such as electrical tape over the window to prevent UV light from the sun or fluorescent lamps from erasing the EPROM. If the EPROM is erased, the power supply will not work. Avoid touching the circuits themselves. Avoid static electricity.

Remove the screws from the sides of the batteries assemblies, and slide them carefully out, with some difficulty. Recycle the batteries.

The cables of the batteries assemblies can be re-used to connect your own batteries. Each battery assembly is a 24 volt pack. They are in parallel for redundancy, so only one is really needed at a time.

Replace the circuit boards assemblies into the chassis and replace the brackets and screws that were removed before.

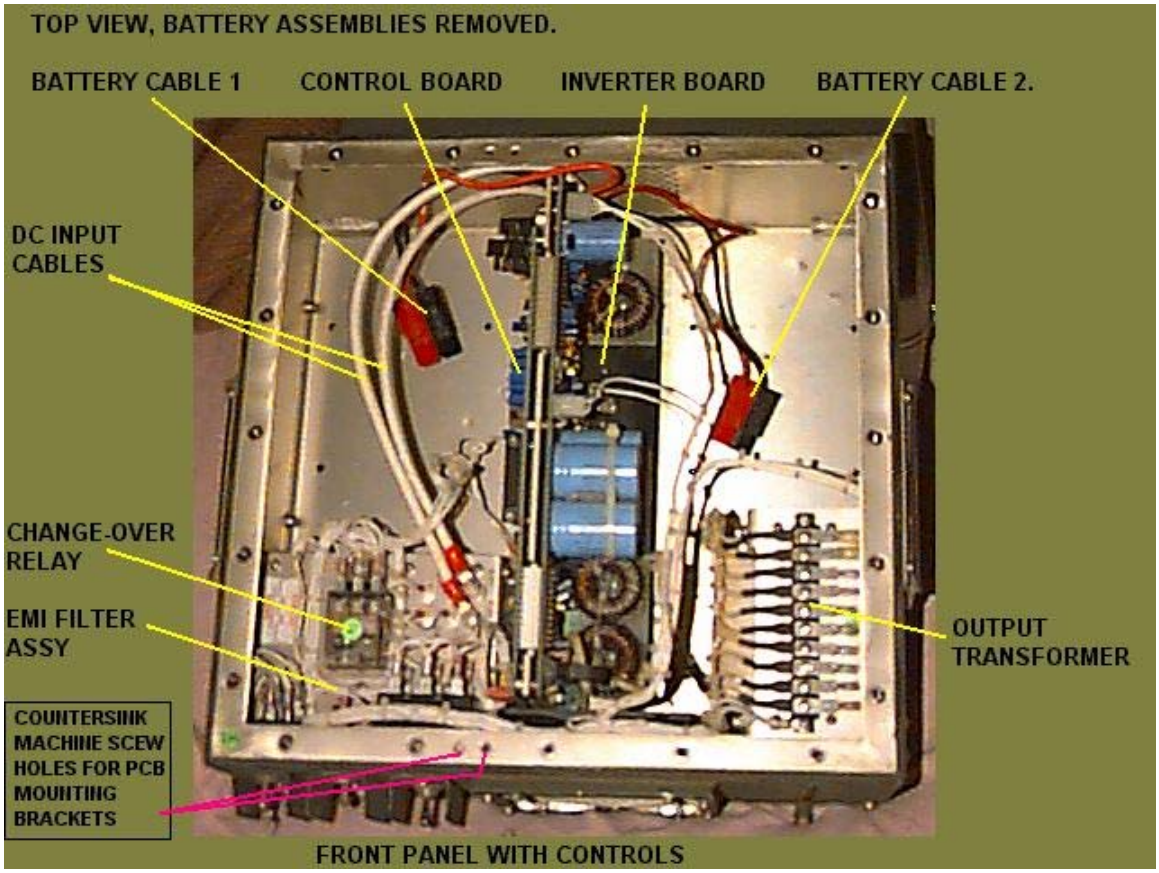

Figure 2. Power Supply with gel-cells removed.

Notes:
The power supply is intended to charge its batteries from an external source of 120VAC. Charging from the 24VDC input has not been verified. When the inverter is not in use, the 125VAC is passed through the unit to the AC output receptacle. The inverter system operates by using a switching circuit to produce 48VAC from the 24VDC battery supply, and stepping this up with a transformer to 125VAC. Upon failure of the external power (in case both are used, failure of both external power sources), the power supply will switch over automatically to battery power. This action depends upon the presence of a decently charged 24VDC backup battery, which is the function of the original gel-cels. If AC power is used, or if it is supplied while the inverter is running, the inverter will phase-lock itself to the incoming AC power, and the UPS will switch over at that time.

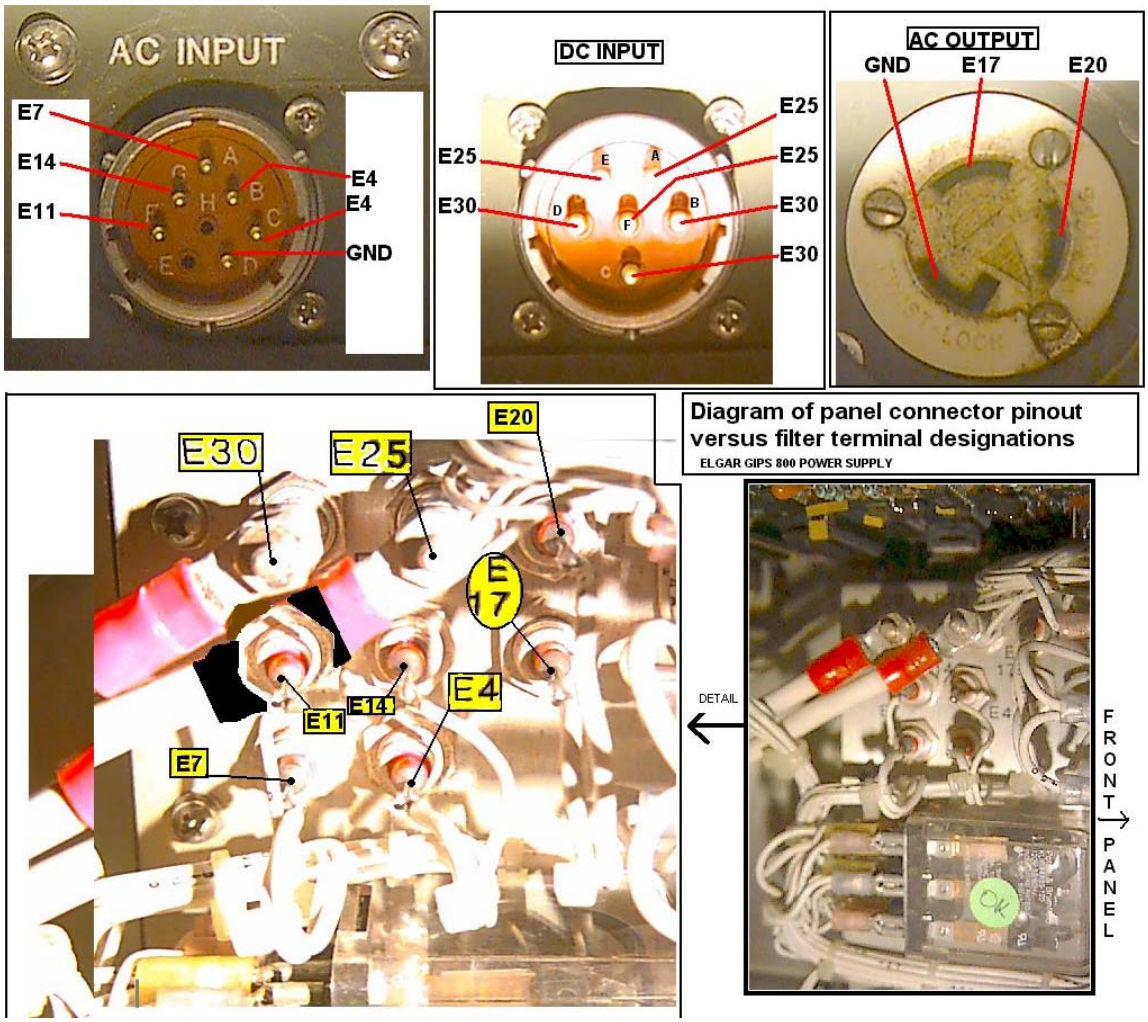

Figure 3. Location of major connections.

To use the power supply normally as an automatic failover UPS, you must use a 24VDC storage battery connected internally to the UPS as designed. The UPS will charge the battery when external AC power is present. Charging from external 24VDC is not verified.

To use the UPS as an inverter to make 120VAC from 24VDC vehicular power, connect the RED internal battery wire to terminal E25, and supply 24VDC power as per the chart below. This will 'fake out' the unit to think it has a set of batteries connected.

In any case, either the front panel connectors can be used, or the internal connections can be made. Use of the front panel connectors provides a great deal of EMI reduction because the large box behind the connectors contains filtering circuitry. The mating connectors for the front panel are difficult to obtain at a reasonable cost. Wires or modified female lug connectors may be fitted to, or soldered to, the gold-plated pins without too much trouble. The apparent VA rating of the UPS is 800, but this has not been tested.

When the power switch is "ON", the terminal F on the AC INPUT seems to be connected to terminals B and C.

The fan only runs when the heatsink reaches a certain temperature, which is still fairly cool.

When both AC and DC primary power are supplied, the user can switch from AC to DC input power by means of opening a switch connected to pins F and G of the AC INPUT connector. This switch will carry 120VAC primary power at low current to operate a relay. This action starts the inverter. If 24VDC external power is not present, the 'internal' batteries will be used.

When the unit is powered up, all of the indicator lights will flash together for a few seconds. After this 'boot up', the unit will function, and the lights will show the status. It has been noted that some of the units display "SOURCE O/V" when in operation at normal voltages. This does not seem to affect operation. Do not adjust any controls inside the unit.

Front panel Connection	Internal Terminal	Function
AC INPUT –A	E7	AC input probably neutral
AC INPUT –B	E4	AC input probably hot
AC INPUT –C	E4	AC input probably hot
AC INPUT –D	CHASSIS GND	Ground
AC INPUT –F	E11	Function switch
AC INPUT –G	E14	Function switch
DC INPUT –A	E25	24VDC + input
DC INPUT –B	E30	24VDC – input
DC INPUT –C	E30	24VDC –input
DC INPUT –D	E30	24VDC –input
DC INPUT –E	E25	24VDC +input
DC INPUT –F	E25	24VDC +input
AC OUTPUT –GND	CHASSIS GND	Ground
AC OUTPUT –E17	E17	AC out (NEC polarity)
AC OUTPUT –E20	E20	AC out (NEC polarity)
None	RED gel-cel terminal	Backup battery 24VDC +
None	BLACK gel-cel terminal	Backup Battery 24VDC -

Table 1. Relationship between front panel connections and internal connections.