META HF Millennium 810H UPS

By G8MNY (Updated Nov 12)
(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

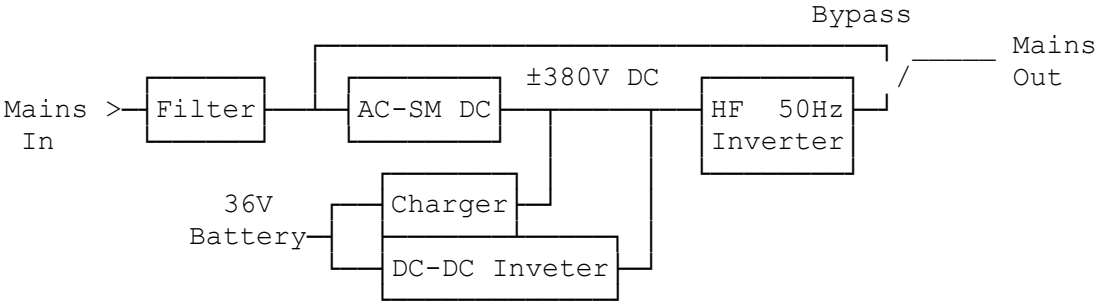
This is some info I have found out on this Italian 100% Power Conversion UPS. (Uninterruptable Power Supply)

The 1kW HF Millennium (810H), has 2x small paralleled 36V 7AH battery sets, so I modified it for external batteries & front panel battery digital meter.

SYSTEM

It is not like the APC UPSs, as there is no big 50Hz mains transformer. The META rectifies the mains to make ±380V DC regulated @ 2A each, & inverts this with HF class D amp into 50Hz 230V @ 5A sine wave. On battery mode it has a DC-DC inverter from 36V @ 45A to the 380V DC. The THROUGH non inverting mode, only comes on for overloads.

Although inverting at HF all the time I could not hear any QRM on 80m with my external aerial.



SPEC

Input 186-264v full load, 110-265V 50% load.
Output 230V ±2% 50Hz Sine wave.
Power 1kW max 4.35A resistive load. e.g. 700W max with PF 0.7 load.
Freq Sync. will lock to mains if within tolerance e.g. ±2Hz
Bypass mode, only used on overloads.
Efficiency 80% with 50-100% loads. (about 70W lost all the time!)

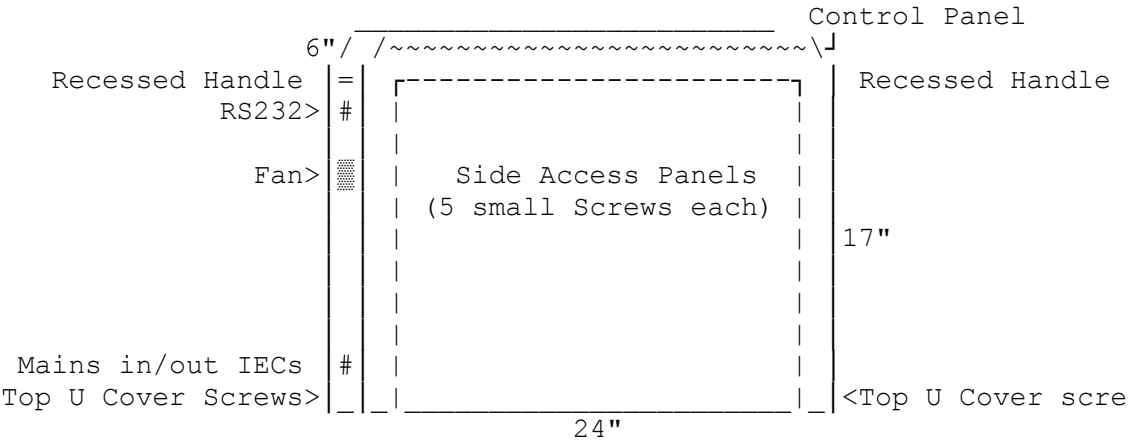
INTERNAL BATT TESTING

I did a 60W car headlamp test on each of the small 12v batteries, only 1 was below 11V (10.9V) so I paralleled up all the batteries & put them on 13.8V charge for a few hours to even up the charge. The 6 batteries are the standard 7AH 12v tagged type. I marked up the weak one for future reference in case it stays weak. Currently the charge status reads 80%. (4 of the 5 LEDs on after batt test.)

FAN FAULT

The 12V DC FAN was duff & alarms the UPS if plugged in. (brushless type draws 2A @ 12V & does not spin!). It has been running on a 27V supply, (duff reg?) so I replace the fan with a quiet efficient 50V DC one I had rather than fault the motherboard's fan regulator.

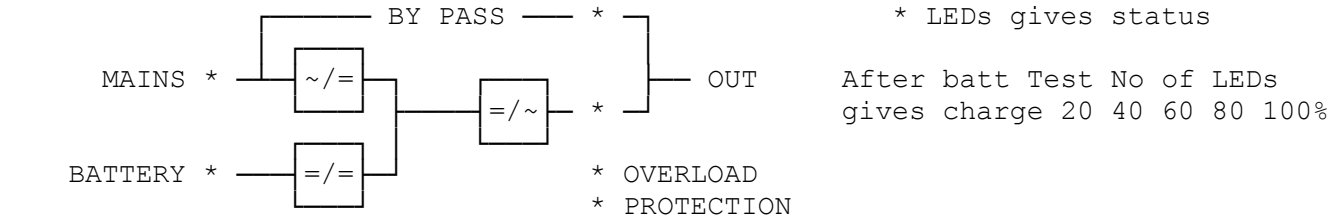
THE CASE
The case comes apart very strangely!



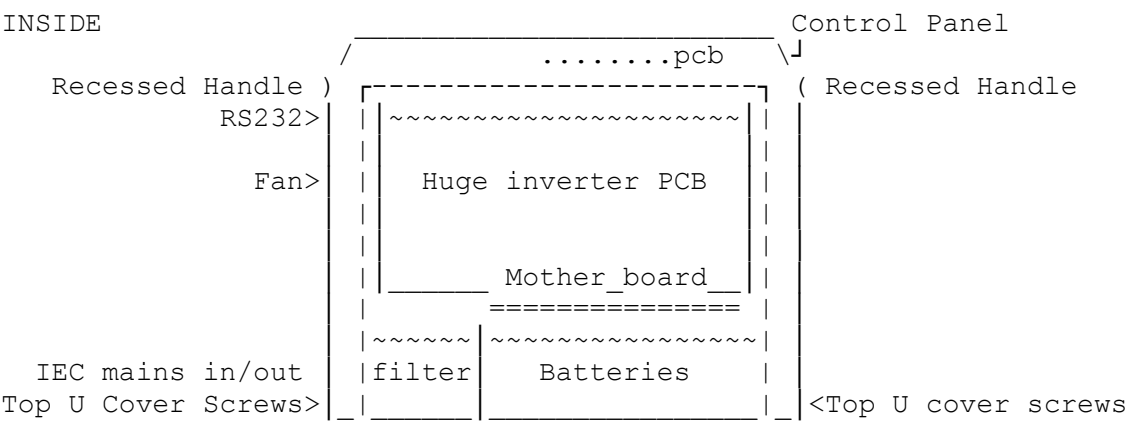
After removing the steel side panels, the top steel U cover comes off with 3 plug leads.

Removing the centre PCB section steel frame with 4 small screws, leaves the heavy bottom battery tray & mains filter compartment.

CONTROL PANEL



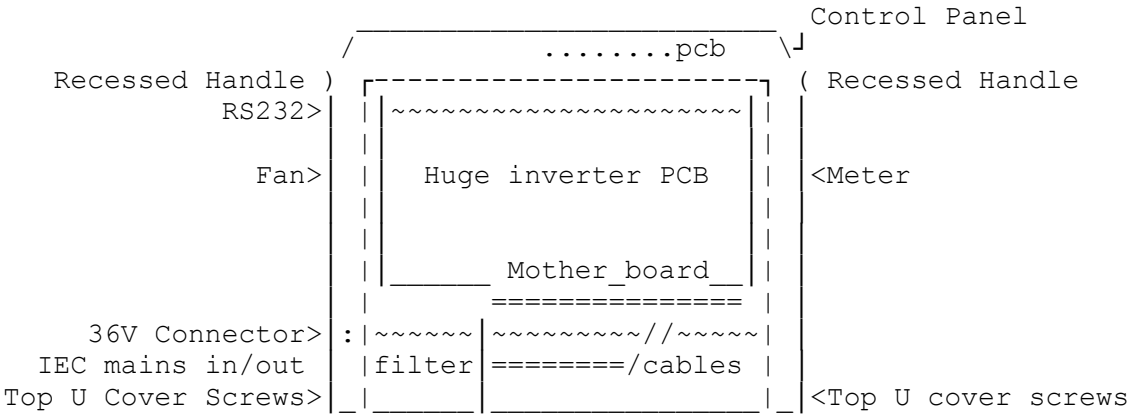
INSIDE



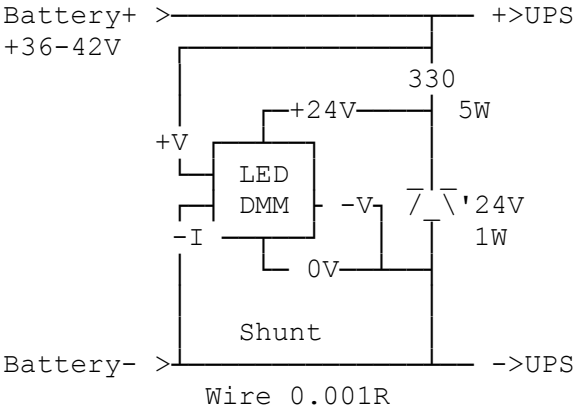
SOFTWARE
There are no hardware options on the UPS, all are set using software.

EXTERNAL BATTERIES
As the use is for Broadcast Studio power, which needed long mains fails times, I wired a 60A connector block on the back directy to the PCB where the small batteries were connected. (bypassing the 2x 30A fuses). The External batteries are 3x 110AH & has a 60A fuse in one of the battery jumper links, so all the heavy wiring is protected. Theoretically this gives about 3 hrs backup at full power!

However the Battery "floats" near neutral & should not be earthed, as the mains RCD can be tripped!



METERING
I also added a cheap large digital LED Meter UP5135 50V 100A to the front panel so Volts & Current can be measured. The meter needed 24V @ 50mA & also a current shunt. I used a 5W 330R & 24V zener to safely drop the Battery to 24V voltage, over 24V the LEDs went off & the volts went even higher!



The current shunt only needed a few mV, so the voltge drop across 1ft of thick wire to the rear connector was more than enought I calibrated it (preset pot) with a 10A load & DMM.

In use the meter reads 41.5V on charge @0.8A & down to 35V on discharge, after 3 hrs allowing a good estimates of the lifetime left to be made. At 500W mains load, 17A is drawn 82% effiecent giving the backup liftime >4Hrs.

See my buls on "APC Smart 900 UPS", "Lead Acid Batteries", "Constant Voltage Transformers", & "Mains Power Protector".

Why don't U send an interesting bul?

73 De John, G8MNY @ GB7CIP