CUSTOM REGULATED (VOLTAGE & CURRENT) POWER SUPPLY

This is another "Quality" piece of test equipment for bench use. I.C. Chip (LM317), limits are 37VDC and 1.5Amps. Design limits of power supply give plenty of "Coasting" room; for maximum use; and minimum repair. (My own initial unit has been running for 5½ yrs, with no repair necessary!)

I utilized a Radio Shack Metal Cabinet #270-253 to build entire unit. The base of case served as heat sink for both IC's and bridge rectifier. A panel mount fuse holder was also used-on the front. (Since then I have built a larger unit, utilizing the same basic design. - ± 35V, 3A with voltage/current meters.)

Skematic is in 2 sections: Regulated Adjustable Power Supply, and Adjustable Current Regulator.

Theory of Operation

Reg. P/S: R1 is voltage output adjustment, (adjust for minimum voltage). At minimum voltage should read 1.2VDC or less! If not, change value of R2 until it does..(put 500 ohm adjustable resistor in place-vary until you get 1.2VDC or less-remove and measure the resistance. Insert that value resistor into R2 position, DO NOT leave the variable resistor in place!). The reason for have 1.2VDC or less minimum-Nickle Cadmimum batteries are 1.2V and can deep-cycle just one if needed. (D3, R3 is bleeder network...)

Switch S2: for non-current regulation of voltage output. (D4 is to prevent 'feedback' to power supply from item being powered.)

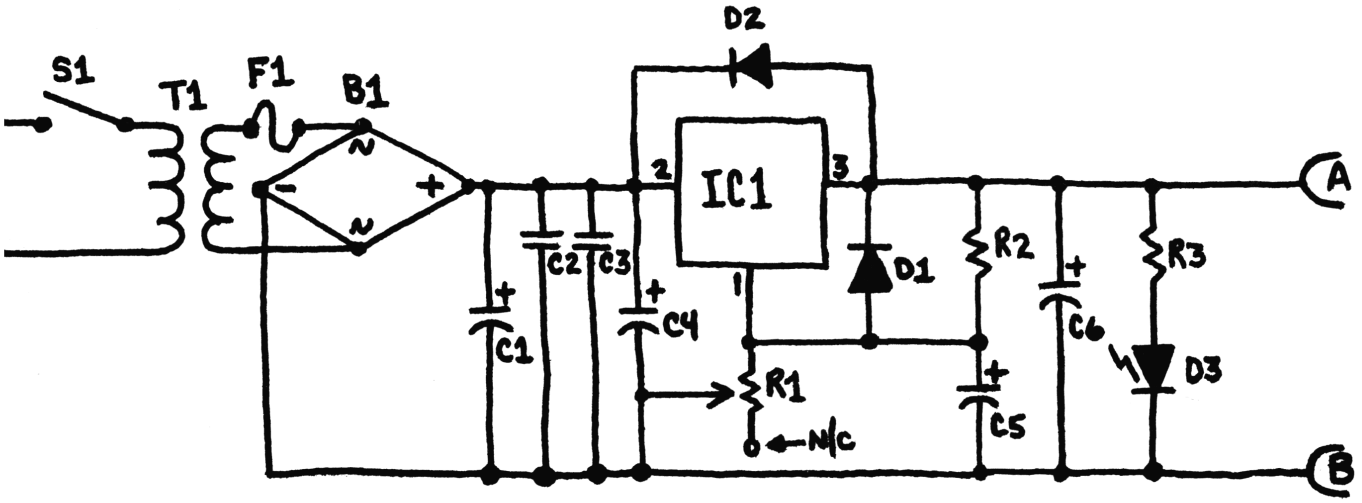
Current Regulator: This is drawn separately as may want to incorporate into any existing equipment on hand. Voltage in/out is the same, only the current is regulated/adjustable by R4, at 1.5A MAX. Current is read with either external or built-in meter - your choice.

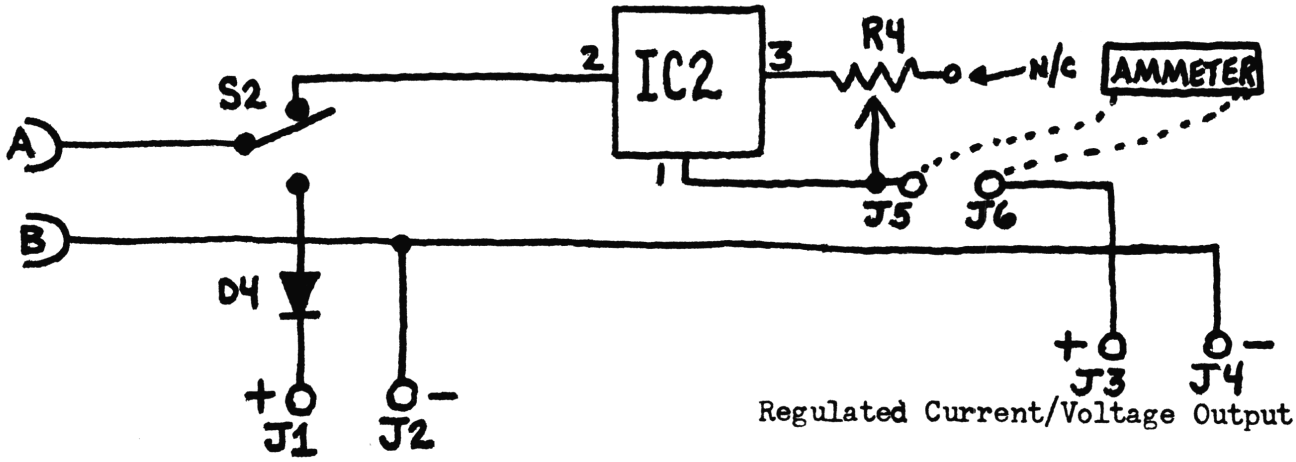
This unit is not hard to build, most parts can be found in the 'Junk box', but have added Radio Shack P/N's to most items. DO NOT DE-RATE the parts' voltage/current ratings!.....

Parts List: IC 1, 2 - LM317 (TO-220), R/S 276-1778
F1 - 2A Fast Blow, R/S 270-1275
T1 - 117VAC Pri/25.2VAC Sec-3A, R/S 273-1151
B1 - 6A/50PIV Full Wave Bridge, R/S 276-1180
C1 - 4,000MFD/50VDC Electrolytic-MINIMUM (may have to parallel 2-2000Mfd/50V) R/S 272-1048
C2 - .1Mfd/150V disc, R/S 272-1053
C3 - .01Mfd/150V disc, R/S 272-1051
C4 - .47/50VDC Electrolytic, R/S 272-1433 (O.K. on 35V)
C5 - 22Mfd/50VDC " R/S 272-1014 "
C6 - 47Mfd/50VDC " R/S 272-1015 "

Reg. (E & I) P/S: (Cont.)

Parts List: R1 - 5K Pot, Linear Taper, R/S 271-1714*
R2 - 220 ohm ½W 10%, R/S 271-015
R3 - 2.2M ohm ½W 10%, R/S 271-061
R4 - 10K Pot, Linear Taper, R/S 271-1715
D1, D2 - 1N4003 (minimum), R/S 276-1102
D3 - Red (any color will do) L.E.D., R/S 276-041
D4 - 1N5400 (minimum), R/S 276-1141
S1 - SPST, 3A/117VAC, R/S 271-1740*
S2 - SPDT, 6A/117VAC, R/S 275/654
J1-J4 - Insulated Binding Posts (R/S 274-661 has 2 sets)
J5, J6 - Optional, or add an Ammeter, 2A...
*On-Off sw, clips to back of pot...
Misc: Case, fuse holder, IC mounting hardware, Perf. board, standoffs, wire, etc.....





Regulated Voltage Output

Regulated Current/Voltage Output