

Feedback is taken through R10 directly from the output with the overall gain set at 5 by the ratio of R10 to R7. An additional LM395 is driven from the negative power supply lead of the LM308 to provide some output current sink capability (2A) so the supply can be quickly programmed even with large capacitive loads. Frequency compensation is achieved with C3 for the LM308 and C4 for the overall loop. Resistor R11, capacitors C5 and C6 and network R15-C9 suppress parasitic high frequency oscillations.

When the circuit is used in the constant current mode, the LM101A overcomes the constant voltage loop to control the output. Output current is sensed in R9 and compared with the voltage between V^+ and the arm of R2. R2 is connected across an LM113 low voltage reference diode to provide a 0V to 1.2V reference for 0A to 12A output. When the output current is below the set level, the LM101A output is

positive, reverse biasing D3 and the LM308 control the output. When the current increases to the control point the output of the LM101A swings negative and decreases the drive to the output pass devices through D3, limiting the current. (Note that no separate positive supply is needed since the common mode operative range of the LM101A is equal to the positive supply.) Diode, D2, clamps the output of the LM101A when it is not regulating, decreasing the switchover time from voltage to current mode operation.

A few special precautions are needed in construction for proper operation. All LM395's should be mounted on the same heat sink to insure good current sharing. Also, a large heat sink is necessary since 300W will be dissipated under worst case conditions. Since the LM395's are high devices, the supply bypasses should be near the power transistors.