12 Volts, 5 Amps, 3 Terminals

—what could be simpler?

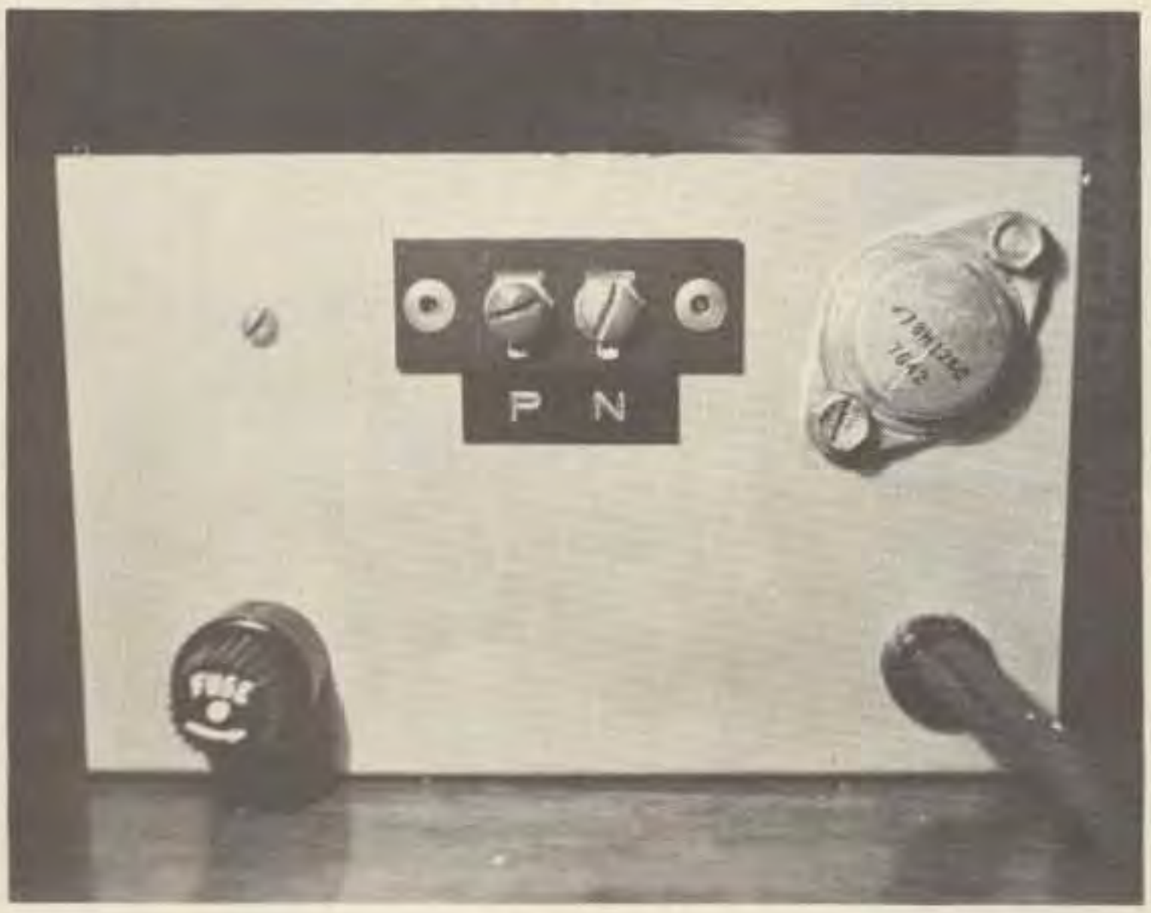
Protect yourself from shorts and headaches.

Gary Toncre WA4FYZ
13764 S.W. 54th Lane
Miami FL 33175

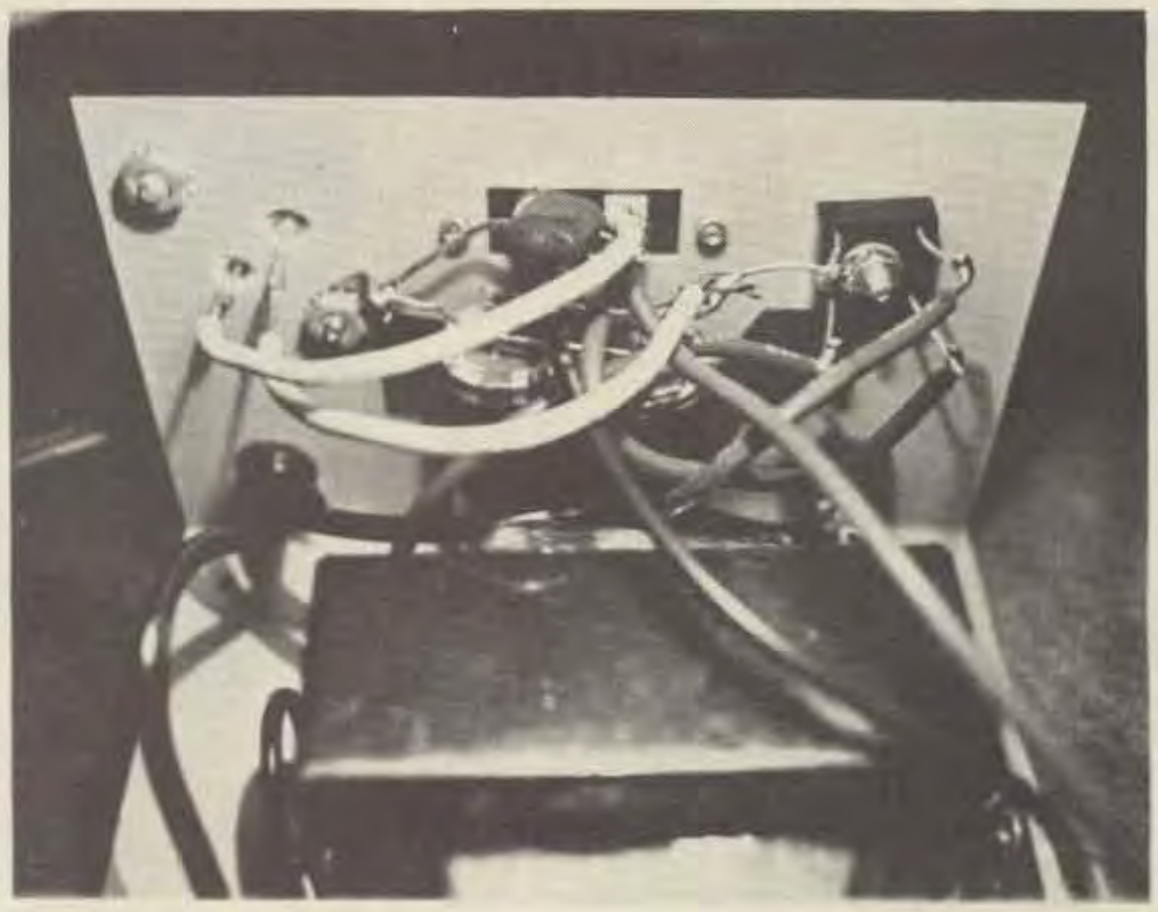
It seems that in the last several months, *73* has carried more than its share of regulated power supply articles. I started to build one of them for use with my TR-22 and my Heathkit® amplifier. Sure, for three bucks or so, anyone can build a regulator for his power supply using a 2N3055 pass transistor, a zener diode, and a few resistors. The only problem is that such a circuit has no protection against short circuits and excessive current draw. To add the extra circuitry for protection can increase the cost considerably.

The solution to my problem was found in a new regulator subsystem by Fairchild. The device, a Fairchild 78H12, is a complete regulator with internal current limiting and thermal-shutdown circuitry in a TO-3-type case. It will handle 5 Amps at 12 V dc before current limiting begins. In other words, the device is indestructible. The price is about $9.00, which is expensive in this day and age, but not for complete protection in a TO-3 case. Other than the power supply capacitors and an output bypass capacitor, no other external parts are needed.

Fig. 1 shows a schematic of my supply. I added the regulator to an already-assembled power supply. Because the device is complete in itself, modification of the power supply was minimal. Also, the company that built the power supply was thoughtful enough to have drilled the holes for a TO-3 pass transistor. So, I simply mounted the regulator in the holes provided, and used a little heat-sink compound. If you plan to draw more than a few Amps, I would recommend using a heat sink—the bigger, the better. Two more steps completed the addition of the regulator. First, I had to break the positive lead between the filter capacitor and the output terminal strip. I then ran a wire from the capacitor to the input (pin 1) of the regulator, and a wire from the output (pin 2) of the regulator to the



The rear of the power supply shown with the 78H12 regulator installed in the holes that were provided by the manufacturer for a pass transistor. The white area around the regulator is not an insulator (the regulator case should be grounded to the chassis), it is common heat-sink compound which helps transfer the heat to the chassis from the regulator.



Inside view of the power supply. The two white wires connect the positive side of capacitors C1 to the input (pin 1) of the regulator, and the other is the output to the terminal strip on the rear. The capacitor on the terminal strip is C2, which bypasses any noise at the output of the regulator to ground.

terminal strip. It was also necessary to ground the negative lead to the chassis, since the case of the regulator must be at ground potential. Don't insulate the regulator from the chassis.

If you are building a supply from scratch, I would recommend the use of a 15- or 18-volt transformer. My power supply uses a 12-volt transformer which develops about 18 volts of unregulated dc output. But, after the current passes through the regulator, the output is only a regulated 11.5 volts dc. Although I haven't tried, I don't think that the full 5-Amp capacity could be reached. Keep in mind, though, that the peak input voltage to the regulator cannot exceed 25 volts.

I've used the regulator with my 2 meter amp and my TR-22. Under key-down conditions, the regulator will become warm to the touch after about one minute. Again, a larger size heat sink would allow more current to be drawn while keeping the regulator cool.

Two other versions are available: the 78H05 for 5 V dc, and the 78H15 for 15 V dc. Both will handle 5 Amps, and are priced the same as the 78H12. ■

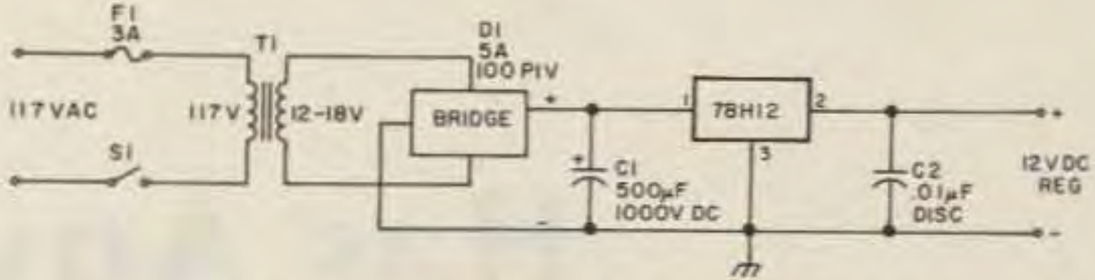


Fig. 1. Power supply schematic.