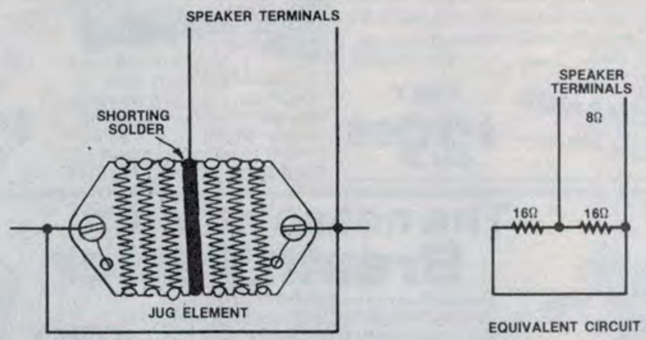
Circuit & Design Ideas

Interesting circuit ideas from readers and technical literature. While this material has been checked as far as possible for feasibility, the circuits have not been built and tested by us. As a consequence, we cannot accept responsibility, enter into correspondence or provide constructional details.

High-power dummy loads



When testing audio power amplifiers, it is often necessary to have non-inductive, high power 4 or 8Ω dummy loads into which the amplifier can be operated. Unfortunately, commercial resistors which meet this criteria are quite expensive. A low-cost solution is to build a 1000W dummy load using 240VAC electric jug elements.

The recommended jug elements are 1650W units distributed by Chelsea Products (Box 502 GPO, Sydney). These are specified since, unlike many other units, they are wound with resistance wire which can be soldered.

The resistance of the jug element is around 35Ω and this is reduced to 32Ω by soldering together some of the turns of wire in the centre of the element. The solder should be positioned so that the resistance between the soldered section and each end of the jug element is exactly 16Ω. A small piece of wire is then soldered between each end of the jug element, shorting the ends together and placing the two 16Ω sections in parallel to give an 8Ω load (see diagram). To produce a 4Ω load, simply parallel two of the above 8Ω loads.

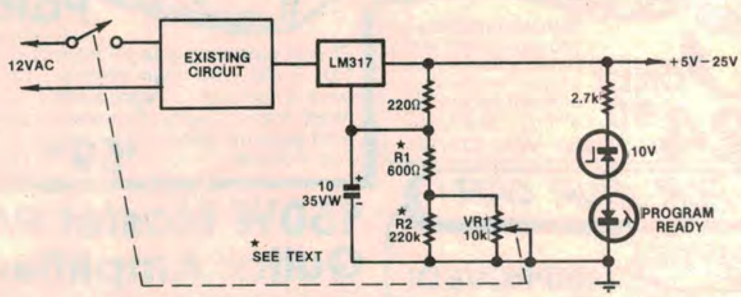
The lead running to the amplifier "+" terminal is connected to the shorting solder in the centre of the jug element while the lead running to the amplifier "−" terminal is connected to one of the shorted ends of the jug element.

During use, the dummy loads (jug elements) should be immersed in water to help remove the heat generated. For small amplifiers a jar of water will suffice but for larger amplifiers anything up to a bucket of water may be required (a 16-litre bucket of water was used to test the Perreaux amplifier in the January issue).

Resistance changes due to heating of the jug element are fairly small, the temperature coefficient of resistance being around .00017 per degree Celsius. Using this figure gives a resistance change of under 1.5% from 20°C to 100°C.

J. Skeen,
Electronics Australia.

Modifying the EA EPROM Programmer



Some readers who built the EA EPROM Programmer (January, 1982) encountered a vexing problem – the unit destroyed the EPROM as soon as switch S3 was switched to "program ready".

After some experimenting, it was discovered that a voltage transient on the OE pin of the 2716 was responsible for the destruction. This voltage transient occurred whenever the Vpp pin was switched from +5V to +25V by S3a, as the tracks feeding the OE and Vpp pins run parallel for a considerable distance.

This circuit overcomes the problem by allowing the voltage on the Vpp pin to be increased slowly from +5V to +25V. Essentially, it consists of a modification to the LM317 regulator circuit.

As long as the unit is switched on and off with switchpot VR1 rather than at the power point, Vpp will always initially be at +5V. Changing Vpp to +25V is then achieved simply by rotating the potentiometer fully clockwise.

Resistors R1 and R2 have nominal values of 600Ω and 220kΩ respectively. Adjust R1 for +5V output with VR1 fully anticlockwise and R2 for +25V output with VR1 fully clockwise.

The 50ms program circuit was also modified. In original form, the circuit occasionally produced a second pulse when the program switch was released, thereby programming two successive memory locations with the same data on "auto increment" or double programming on "step" amd "auto read". This problem can be overcome by increasing the 1kΩ resistor between the switch and +5V to 1MΩ, thereby providing more effective switch debouncing.

Finally, notes and errata for March 1982 neglected to add that pin 14 of IC13 should go to pin 19 of the EPROM, not to pin 15 of IC3. The circuit board is correct.

H. Franchimon,
Macquarie University, NSW. **$15**

Editor's note: readers are also referred to an alternative solution published on page 150 of the December 1983 issue.