

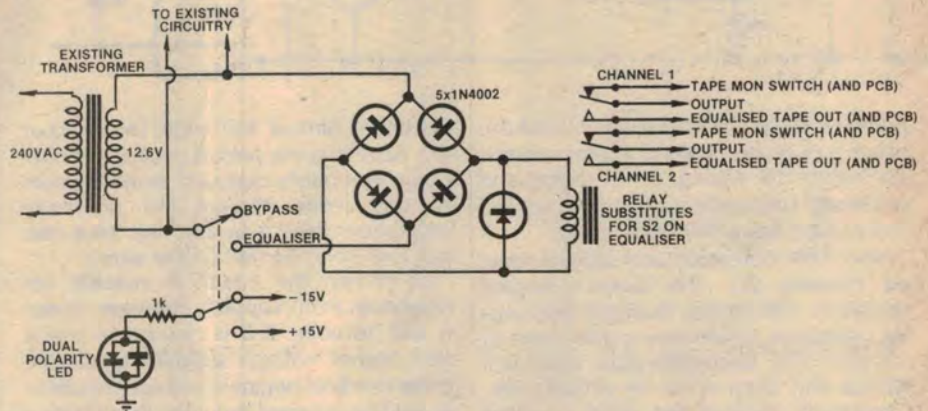
# Circuit & Design Ideas

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.

## Suppressing Audio Switching Transients

Many ancillary items of hifi audio equipment produce unwanted audible transients at switch on and/or off. As most of these devices are intended for insertion into the "tape monitor" circuitry of their associated audio amplifier systems, a switched OPERATE/BYPASS function is usually featured in these units for in/out comparison of sound quality. Substitution of a DPDT relay (and interfacing components) for the hard-wired switching circuitry enables suppression of the aforementioned audible transients.

For example, the Playmaster Graphic Equaliser (EA May, 1979) produces a slight "chirp" at its output when it is switched off. This chirp can be muted by installing a supplementary bridge rectifier and 12 volt DC relay to perform the audio switching (as shown in the accompanying diagram). One pole of the BYPASS/EQUALISE switch is utilised to in-



terrupt the supply to the rectifier and thus control the relay operation. If desired, the spare pole of this 2-pole switch could be utilised to change polarity to a bi-colour dual polarity LED, and so give visual indication of the equaliser's operational mode.

The changeover contacts are so wired

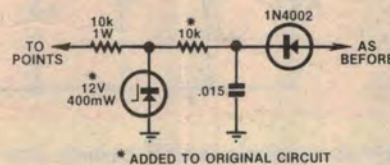
that the equaliser is only in circuit when the relay is energised. Thus, at "switch off", power is removed from the relay and the contacts change the circuit to the BYPASS mode so that the chirp is not heard.

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Como, WA.

## Cure for Fluctuating Dwell and Tacho Readings

When used on some motor vehicles, the EA Digital Engine Analyser (October, 1980) may produce slightly varying readouts (of the order of 1 to 3%). This can be due to an above average voltage "spike" being generated across the points of that vehicle's ignition system. This problem can be simply cured by adding a "voltage clipping section" ahead of the low pass filter at the input of the instrument.

Only two additional components are required: a 10k $\Omega$  resistor, and a 12 volt



zener diode. Lift the end of the original 10k $\Omega$  1 watt series input resistor from its connection with the 0.015 $\mu$ F capacitor and 1N4002 diode. Insert the new 10k $\Omega$  resistor between the unattached end of the original resistor and the

capacitor/diode junction. The neatest modification is to stand both resistors vertically to the printed circuit board, and "arch" their junction.

Now connect the cathode of the zener diode to the junction of the two resistors. Drill a small hole in the PCB near the "earthy" end of the 0.015 $\mu$ F capacitor, pass the anode lead of the zener through this hole and solder to the "earth" track.

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## Switch-Mode Control of Low Voltage DC Motors

Whilst this power control circuit was developed for use with radio-controlled model boats, it may also be used in other low-voltage DC load applications. As shown, the design is suitable for 7 amp continuous loads; and up to 10 amps intermittent. If 5 amps (or less) maximum output is required, an economical MJ2955 may be substituted for the MJ15004(Q2). In contrast with the characteristics of the usual power rheostats (used in model boats), speed control of a motor is very smooth with

reliable running at very low rpm. Such performance is due to the unit's low source impedance at the "simulated" low voltage outputs.

Basis of the design is to vary the duty cycle of a 555 timer which is connected in the astable mode. The pulsed output of the 555 drives a Darlington pair of PNP transistors, which feed the load. For model boat applications, a relay with heavy duty changeover contacts is interposed between the output and the motor to permit simple remote reversing

control. The reverse connected 1N5401 diode protects the output transistors from possible voltage "spikes" produced by an inductive load.

A novel method has been chosen for varying the duty cycle of the free running 555 timer circuit, with the complementary-symmetry output of the 555 being used as the source for both charging and discharging the timing capacitor. The charging circuit is via D1 and half the resistance of the potentiometer (assuming the potentiometer is set to its mid-



