Circuit & Design Ideas

TTL-RGB to composite video converter

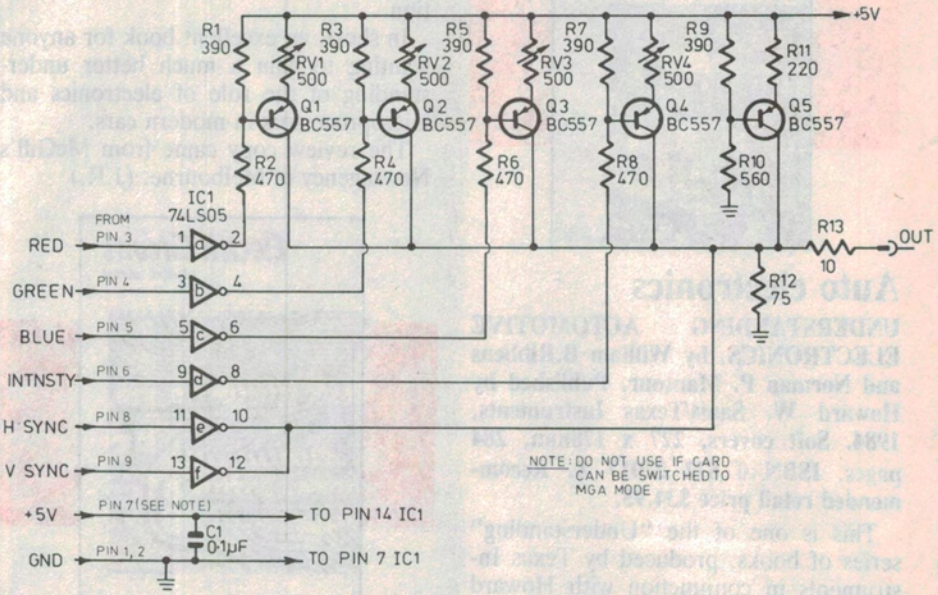
The average composite video display on an IBM PC or clone is amazingly poor. This can have a number of causes. Some monitors are incompatible with the NTSC colour burst put out by some adapter cards. Many monitors require a video signal of 2V peak to peak, while others work properly on the more standard 1V peak to peak signal. Of course the video output of CGA cards varies with manufactures from one to two volts peak to peak.

The intensity levels of various colours is also hit and miss (what can you expect from crash mixing into the base of the output transistor) and does not always work well with every colour combination.

It is possible to get a much improved display for just a few dollars.

This circuit uses the TTL output of the CGA card and converts the signals into a high quality composite video signal suitable for monochrome monitors. Q1-5 work as constant current sources and when on, develop a voltage across R12. Q5 is permanently on; the current supplied provides the 0.5V black level.

Q1-4 are on when the appropriate open collector outputs are low. Presets RV1-4 control the level of brightness produced. With careful adjustment it is possible to produce sixteen different shades on a monitor. Inverters E and F provide the sync pulses by pulling the output down to O.2V.



VIDEO CONVERTER

The five volt supply for the circuit was supplied in my case by modifying the CGA card. I linked pin 7 on the 9 pin D socket to the nearest 5V rail on the CGA card, and ran this 5V supply to my converter.

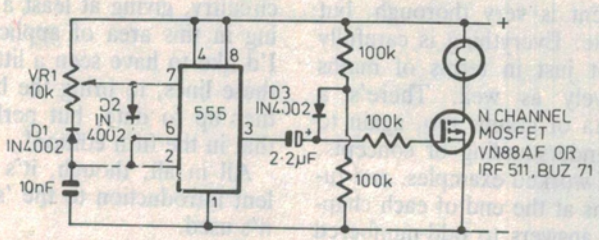
This will not work if you have an adapter card that allows you to switch between CGTA mode and MGA mode. If so you will have to provide a separate 5V supply and leave pin seven alone (it is the video data output in MGA mode).

David Eather,
Brisbane, Qld **$40**

Dimmer for torches

This circuit was designed to conserve the expensive 6 volt lantern batteries used in "Dolphin" torches. It was fitted into the narrow space between the battery and the lamp reflector inside the torch, with only the control knob visible from the outside of the case.

The design is essentially a modified 555 timer oscillator with variable duty cycle, driving a MOSFET via a charge pump. The charge pump was necessary as most MOSFETs require more than 6 volts to turn them on fully, but can tolerate up to about 3 volts before turning on at all.



TORCH DIMMER

The 555 oscillator is modified so it charges the capacitor through one side of VR1 and discharges it through the other. This allows the duty cycle to be variable from 0% to 100% and keeps the scale linear.

The charge pump works by the 2.2uF capacitor charging to 2.4 volts while the 555's output is low, and applying 8.4V (6V + 2.4V) to turn the MOSFET on via the 100k resistor when its output is high. This then turns on the MOSFET and lamp during the time when the output of the 555 is high.

Jeffrey Harrison,
Mt.Waverley, Vic. **$40**