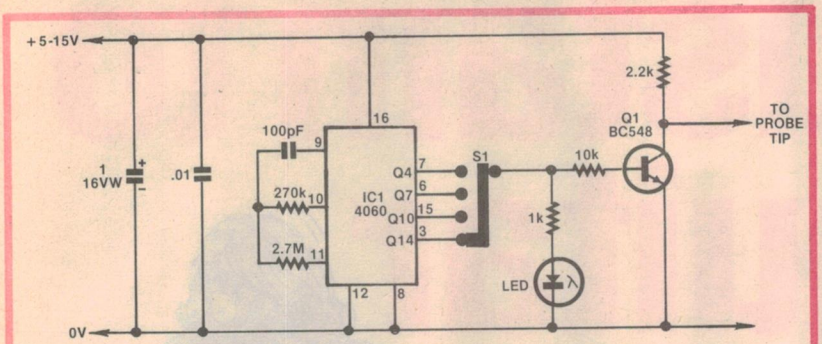
Circuit & Design Ideas



Logic pulser probe

This simple pulser probe makes it easy to troubleshoot digital logic circuitry. The heart of the circuit is a 4060 14-stage ripple carry binary counter IC1, which incorporates an on-chip oscillator and a multistage divider circuit.

The 100pF capacitor and the 2.7MΩ and 270kΩ resistors set the oscillator frequency to a nominal 16.8kHz. Switch S1 selects the Q4, Q7, Q10 and Q14 outputs of the 4060 to derive frequencies of 1.05kHz, 131Hz, 16.4Hz and 1.03Hz respectively. The selected output is then buffered by transistor Q1 which has its collector connected directly to the probe tip.

The selected Q output is also used to drive a red indicator LED. This LED will pulse at the two lower frequencies, and will appear continuously lit at the two higher frequencies.

The prototype was built on a small PC board and mounted inside a Jabel plastic probe case. The layout is not critical however, and other construction techniques (eg, stripboard) could also be used.

C. Syms,
Flynn, ACT. **$12**

Improved graphics for VZ200 Computer

Want a 50% improvement to the graphics resolution of your VZ200 computer? Here's how you do it.

Inside the VZ200 is Motorola's MC6847 video display generator (VDG) chip. This is an easily programmed yet highly versatile device offering several text, mixed text/graphic and graphic modes.

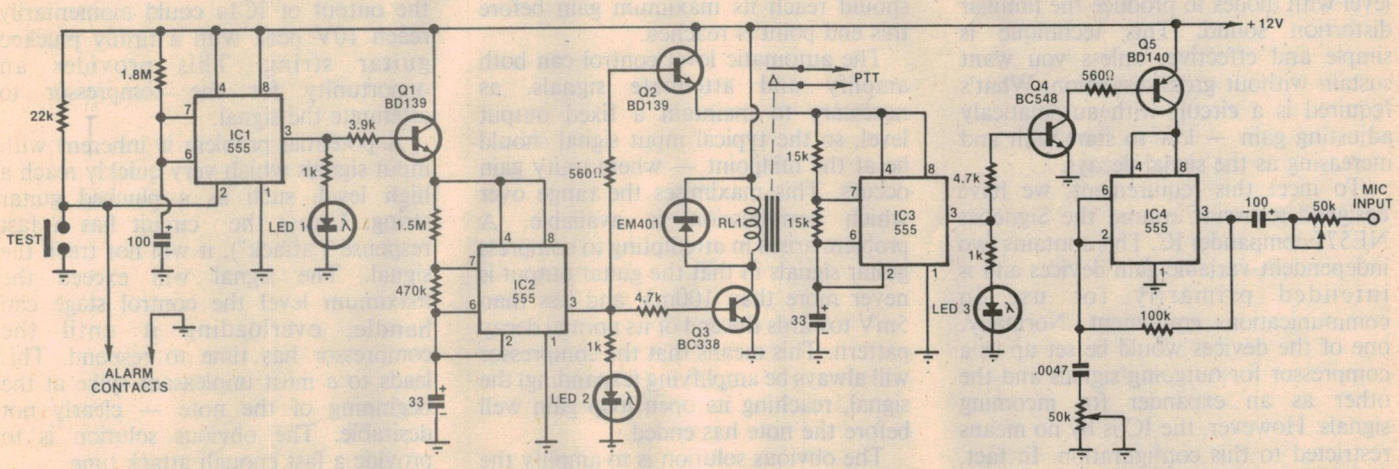
As standard, the VZ200 comes with a 128 × 64 dot 4-colour graphic mode. In this mode, each display byte is split into four dots, each occupying two bits. The two bits specify which of four colours the dot is in one of two 4-colour sets — making eight colours available in all.

This requires all 2K of video RAM.

By cutting the track linking pin 30 of U15 (the VDG) to ground and then connecting this pin to +5V (pin 17), a new graphics mode is derived. This mode offers 128 × 96 dot monochrome (ie, two-colour) graphics, where each bit specifies one dot and requires 1.5K of RAM. The advantage of this mode is that the dots are square which improves plot appearance.

A single-pole 2-position switch can be used to switch between one mode and the other. This switch can be mounted on the side of the case.

P. Dimond,
Lidcombe, NSW. **$10**



Two-way radio alarm tone generator

There is sometimes a need for an alarm tripped tone to be transmitted via radio to a receiver or paging unit. This circuit uses just four ICs, five transistors and a handful of other components.

IC1 is wired as a one shot monostable, being triggered by PB1, a test button, or the alarm contacts in parallel with it. This switches high at its output, pin 3, for approximately three minutes with the values shown. This turns on Q1 via its 3.9kΩ base resistor and also LED 1.

When Q1 turns on it connects the 12V rail to IC2, which is wired as a square wave generator with an "on" time of approximately 45s and an "off" time of 10s. When IC2's output (pin 3) goes high, it turns on Q2, Q3 and LED 2.

When Q2 turns on it connects the 12V rail to IC3, while Q3 activates the PTT relay RL1. IC3 operates at approximately 1Hz and, when its pin 3 output goes high, turns on Q4, Q5 and LED 3.

When Q5 turns on it connects the 12V rail to IC4, which is wired as an audio oscillator. Its output from pin 3, is fed to the radio transmitter microphone circuit via a 50kΩ trimpot which controls the level. A second 50kΩ variable resistor, in conjunction with the .0047μF capacitor, controls the oscillator frequency.

In summary, activating the alarm turns the circuit on for three minutes, during which time IC2 turns the transmitter on for 45s periods with 10s intervals in between. At the same time, IC3 and IC4 apply a 1Hz modulated audio tone to the microphone input to produce a siren-like effect.

P. Howarth,
Gunnedah, NSW. **$20**