

IDEAS FOR EXPERIMENTERS

Random tone generator

When David Hughes of Howrah Tasmania was working on a project to design a reasonably small robot he found that he needed a randomly sequenced 10-note generator to provide his 'pet' with a voice.

The MM5837 is a bit unnecessary (a fast clock would do) but I found that the random sequences would be better if this chip was used. The MM5837 supplies noise to the 4066 digital switch and the clock formed by the two 4011 NAND gates periodically lets a few noise spikes through via the switch control pin 13. The clock operates at about 1-2 Hz with the $4\mu\text{F}$ capacitor.

The noise spikes are fed to the clock input of a 4017 decade counter/decoder. When a logic '1' appears at pin 13 of the 4066 the 4017 is clocked a random number of times.

When the 4011 clock output is high the 'organ' formed by the transistors and resistor network

is off so that notes cannot be produced while the 4017 is being clocked. This stops a terrible racket from being produced each time clocking occurs. When the 4011 clock goes low

again, the tone generator is switched on and the tone selected by the 4017 is played.

As each pulse received by the counter moves the logic '1' output to a different pin i.e. pins 1,

2, 3, 4, 5, 6, 7, 9, 10 or 11 when clocking has finished, the logic '1' could be on any of these ten outputs because of the random noise spikes that produced the clocking.

