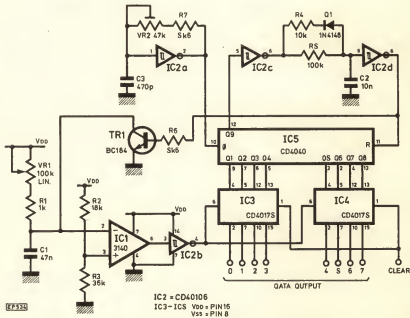


DIGITAL POTENTIOMETER

It is useful on many occasions to be able to feed a value set on a variable resistor into a microcomputer. Examples of this include cursor and graphics control, games, servo position, and even speed control. The easiest way to do this is to feed a voltage output from the resistor to an A to D converter; but this does tend to be expensive if 8 bit resolution is required. The circuit presented here achieves 8 bit accuracy from 100k potentiometer at not very much cost.

Capacitor C1 charges up via VR1 until the threshold of the 3140 is reached. Obviously the setting of VR1 will influence the charge up time. The output of the 3140 changes and in so doing loads the two four bit latches, IC3 and 4, with the current count value on the outputs of IC5 (a 14 bit counter). This latched value will vary between 1 and 255 using the values shown, over the sweep of the potentiometer. The counter continues until Q9 goes high, corresponding to a count of 256. The output from pin 8 of the Schmitt trigger goes high very quickly after, resetting the counter and discharging C1 by means of the transistor. As the counter resets Q9 goes low, and capacitor C2 starts to charge



slowly, until the threshold of the Schmitt is reached releasing the counter and stopping the discharge. This delay is necessary to ensure C1 has plenty of time to discharge. The main oscillator should be adjusted to give a count of 255 with the potentiometer fully open, this corresponds to 107kHz.

The data is continuously available at the latch outputs. If some form of Read/Clear is required the clear line should be connected to the processor port, otherwise it should be pulled up.

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