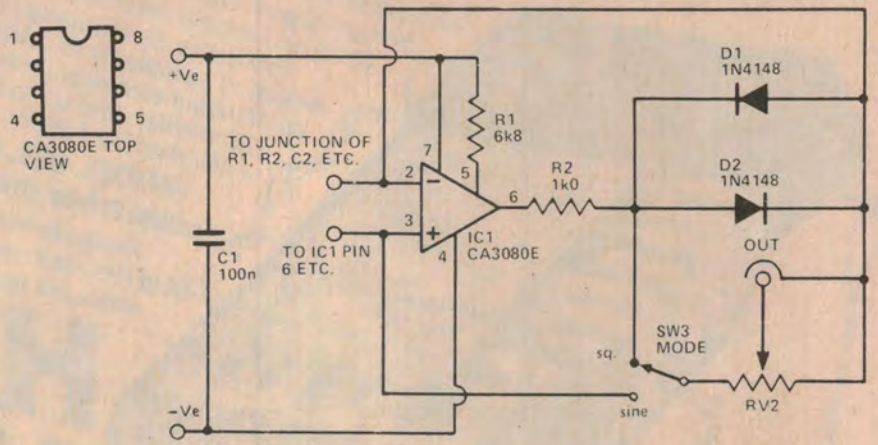
Sine to square converter



THIS CIRCUIT provides an optional squarewave of about 1.2 volts peak to peak when used with the signal generator circuit described on page 57. The above circuit requires no modification, other than the omission of output attenuator potentiometer RV2 which is included in this section of the unit instead.

The squaring circuit is based on operational transconductance amplifier IC1. This device is in some ways similar to an ordinary operational amplifier, but it is the output current rather than the output voltage that is a function of the input voltages. The inverting input of the device is biased to the central tapping on the supply lines, and the non-inverting input is fed with the sinewave output from the main signal generator circuit. When fed with positive going half cycles, the non-inverting input is taken to a higher voltage than the inverting one, resulting in a forward bias being applied to D2 by way of current limiting resistor R2. This produces a positive potential of about 0.6 volts across D2. When the circuit is fed with negative going half cycles the non-inverting input is taken to a lower potential than the inverting one, causing a forward bias to be applied to D1, and producing a negative output potential of about 0.6 volts.

Thus the output is switched from one polarity to the other as the input signal changes polarity, producing the desired squarewave signal. The CA3080E device has a high slew rate (50 V/uS) and is therefore capable of producing a high quality squarewave signal even at the higher frequencies covered by the unit. The gain of the CA3080E can be varied by altering the bias fed to its pin 5, but this feature is of no use in this application and R1 provides a strong bias to the device so that it operates at high gain. SW3 is the mode switch, and merely connects RV2 and the output socket to the output of the sinewave generator or squaring circuit, as required.

The squaring circuitry only adds about 3 mA or so to the current consumption of the unit. ●

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