

# SIGNAL - POWERED SIGNAL SQUARER

THIS INEXPENSIVE ADDITION TO A SINE-WAVE GENERATOR  
PRODUCES FAST RISE-TIME  
SQUARE WAVES OF THE SAME FREQUENCY

By **LESLIE SOLOMON**, Technical Editor

**M**OST EXPERIMENTERS either have, or have access to, conventional audio frequency sine-wave generators. However, there may come a time when you are finishing some project and the instructions call for the use of a square-wave signal—but you don't have a square-wave generator! After being hit this way a couple of times, the author decided to either buy a composite sine/square wave generator, or cook up some circuit that could be used with an existing sine-wave source. The result is shown in the diagram below.

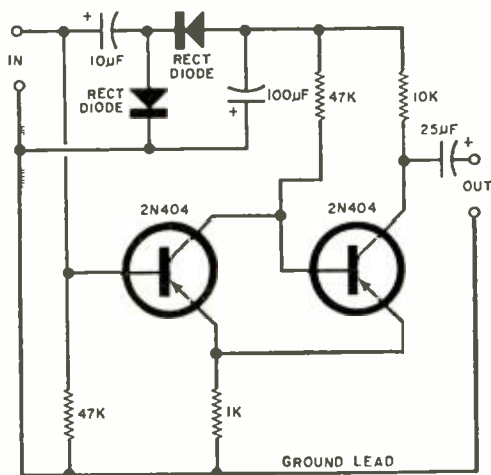
The circuit is a conventional two-transistor Schmitt trigger having a built-in

power supply with both signal and a.c. power derived from the output signal of the audio generator. Operation of the Schmitt trigger is such that the frequency of the output square wave is the same as the frequency of the incoming sine wave. Unlike a bistable multivibrator, commonly used in squaring circuits, the Schmitt circuit does not divide the frequency by two. Also, rise time is excellent.

Input signal requirements are rather broad. The circuit will accept almost any source of a.c. between 50 and 15,000 Hz. with a voltage level between 0.5 and 10 volts r.m.s. Output signal level is a function of input signal level.

Component values are not critical and may vary broadly from those shown in the schematic. If *n*p*n* transistors are used, reverse the polarity of the rectifier diodes and the electrolytic capacitors. In fact, a little experimentation with various values of resistors and capacitors will teach you a lot about Schmitt trigger operation. The rectifier diodes can be any type, of almost any voltage or current ratings, that you happen to have on hand.

Mounting is up to the builder. Several units have been made, ranging from small PC boards that can be directly plugged into the output jacks of the sine-wave generator to perforated board projects that are mounted within the generator and provided with separate output terminals.



The incoming sine waves play a dual role: they trigger the Schmitt circuit and supply d.c. power.

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