

A Grateful Reader

First of all, I want to commend you on an excellent magazine, both in content and presentation.

The article "Build a TV transmitter" (*Electronics Now*, May 1996) was not only outstanding, but entertaining as well. As a regular reader and one who is interested in this field of study, the article was invaluable and appeared at just the right time to help me.

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Simpler Frequency Doubler

I'm surprised that your circuit gurus didn't catch the fact that a much simpler circuit for frequency doubling exists than the one from Bobby Smith ("Letters", *Electronics Now*, September 1996). Here are two versions.

Figure 1 uses only a single exclusive-OR gate and a couple of passive components. The width of the output pulses are determined by the time constant of the RC network, and the maximum input frequency cannot exceed $\frac{1}{2}RC$. If very high frequency operation is needed, or if very narrow output pulses can be tolerated, the circuit shown in Fig. 2 can be used. In that case, the output pulse width is determined by the propagation time delay of the exclusive-OR gate, and the input frequency cannot exceed $\frac{1}{2}[\text{delay}]$. Neither circuit has a low-frequency limit.

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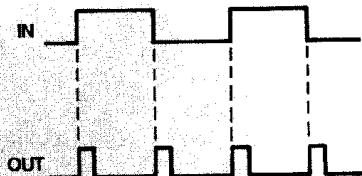
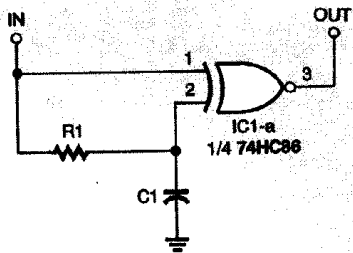


FIG. 1

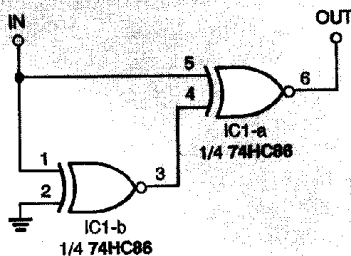


FIG. 2

modest requirements for guitar amplification. Of course, Mr. Hendry did mention his preference for a small amount of distortion, and that might be why he decided to use that particular op-amp.