

the line. By the way, for all intents and purposes, a 47-ohm resistor is close enough.

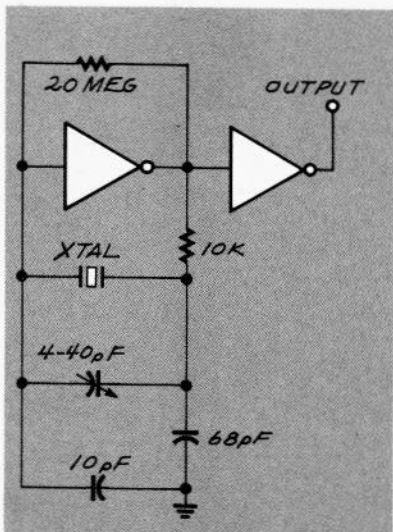


FIG. 1—CRYSTAL OSCILLATOR. If you use an inverting hex buffer like the 4049, powered from a 5-volt supply, the circuit will work with crystals as high as 14 MHz.

CRYSTAL OSCILLATOR

I'm building a circuit that requires a crystal oscillator, but I'm not sure which design to use. I don't have to worry about any extreme temperatures, and I have a bunch of spare gates left over on the board. Most of the crystal oscillator designs I've seen require the addition of special chips, and I don't have a lot of room left on the board. Have you got a simple circuit that will

do the job?—J. Gillan, Hendon, NH

If your requirements are as simple and straightforward as you say, the circuit in Fig. 1 is exactly what you need. It can be made from the extra gates you have, is self-starting, and is also extremely reliable.

The circuit will work well with as little as a 5-volt supply, and the crystal frequency limit really depends on the amount of gain there is in the gate you use. Something like a 4049 will work with crystals as high as 14 MHz. If you use more than 5 volts for the supply, you should be able to go even higher.

One interesting variation on this circuit is to use a two-legged gate instead of a simple inverter. That will let you turn the design into a gated oscillator so you can turn it on and off under circuit control. I don't know if that's important in your application, but it's a good thing to keep in the back of your mind.