

COMMON-CATHODE DRIVERS

I'm building a circuit that uses a 4511 to drive a seven-segment LED display. Everything is fine but the chip is designed to drive only common-cathode displays and I have a box of common-anode displays. Is there any way I can use these instead of having to go out and buy a bunch of common-cathode displays? I asked the person in the store about this and he said there was no way it could be done. You're my last hope.—N. Rofe, New Brunswick, NJ

Although you're not *supposed* to do it, there's *always* a way to do that kind of thing. The person in the store who told you that it was impossible has, in kind words, a very limited imagination.

The 4511 is designed to directly drive a common-cathode display, but using it to drive a common-anode display means that you'll have to add a transistor as shown in Fig. 1. The transistor is working as a simple inverter, and just about any small signal PNP transistor should be able to handle the amount of current you'll need. Re-

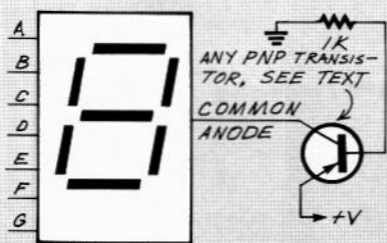


FIG. 1—THE 4511 IS DESIGNED to directly drive a common-cathode display but, by adding a transistor as shown here, you can use it to drive a common-anode display.

member the rule: Better to underrate parts than to overrate them.

You may find the schematic shown in Fig. 2 to be useful as well. Even though the 4511 can directly drive a common-cathode display, it has (as do all display drivers) a maximum current that it can deliver at the outputs.

That causes a problem when you try to drive really big displays or even incandescent bulbs.

Putting a transistor at the output switches the burden of powering the display from the chip to the transistor. If you need more current just add a

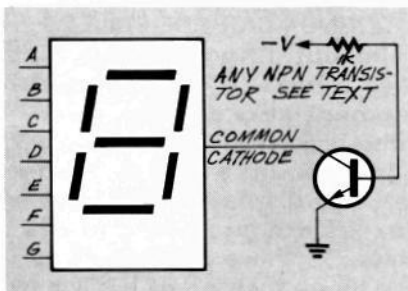


FIG. 2—EVEN THOUGH THE 4511 can directly drive a common-cathode display, you may have to add a transistor to the output. That allows you to drive really big displays or even incandescent bulbs.

chunkier transistor. The solution is really that simple.

Of course you have to keep in mind that the 4511 is a CMOS part and it can't be expected to deliver enough current to trigger heavy-duty transistors. If you ever want to do something like that, you'll have to build an

intermediate transistor stage to bring the output of the 4511 up to the level of the output transistor. But, for driving standard common-anode displays that typically want a maximum of about 20 mA per segment, that circuit should solve the problem without any difficulty.

DIGITAL AMPLIFICATION

I've built a circuit to accept data from a temperature sensor but the input signal is a bit too low to go through my A-to-D converter. I don't want to have to add analog circuitry to the design so is there any easy way to amplify the incoming signal with digital IC's?—A. Dolan, Belmar, NJ

Once upon a time there was no way to do that, but your problem can be solved with the addition of a couple of CMOS inverters. You may have to add an IC to the board but, if you've got three spare inverters around, you can use them.

The 4049 is a good choice for this application since it can handle higher power levels and is perfect to use if you've got to do any sort of voltage

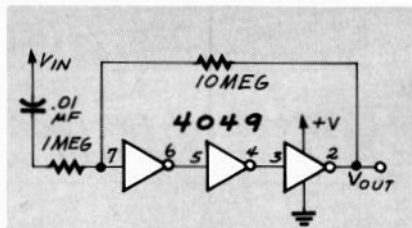


FIG. 3—The 4049 CAN HANDLE high power levels and is perfect for any sort of voltage translation. The amplifier will give you a gain of 10 with an input impedance of over a megohm.

translation. As shown in Fig. 3, the amplifier will give you a gain of 10 with an input impedance of over a megohm. It doesn't require any kind of special layouts and should work without a problem. If you add a 4049 remember to do something with the unused inverter inputs.

Although you can easily build the circuit, and it will do the job, I don't understand why you don't build a small single-transistor amp to do the same job. I don't know what the characteristics of your input signal are but I'm sure you could easily design a simple transistor amp to provide the gain you need. **R-E**