



Fig. 1. Digital/analog converter uses COSMOS inverter.

Readers' Circuits. Reviewing Robert Schuman's digital-to-analog (D/A) converter circuit in the June column, reader Keith Lawler (21 W. 264 Coronet, Lombard, IL 60148) suggests that his approach, illustrated in Fig. 1, may offer advantages over the earlier design in many experimenter applications. As in Robert's D/A converter, Keith has used a hex inverter (*IC1*) as a buffer and a weighted resistor network to combine the buffer's outputs and develop an analog signal. Keith's improvements consist of using a COS/MOS rather than a TTL inverter and an R-2R ladder network rather than a series of resistors with doubled and redoubled values. According to Keith, the COS/MOS device delivers more consist-

ent "1" and "0" outputs than does the TTL unit, while the R-2R ladder network is easier to assemble, requiring only two resistance values and a lower total parts count.

Referring to the schematic diagram, *IC1* is an RCA type CD4069B, while the resistors are standard ¼- or ½-watt types; for optimum results, precision (low-tolerance) resistors should be used in the ladder network. While neither parts placement nor the wiring arrangement are critical, customary care should be exercised when installing *IC1* to avoid damage, remembering that this is a MOS device. The dc source is not critical and may range from 3 to 15 volts, furnished either by batteries or a well regulated and filtered line-operated power supply.