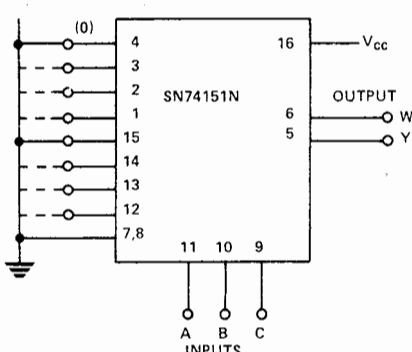
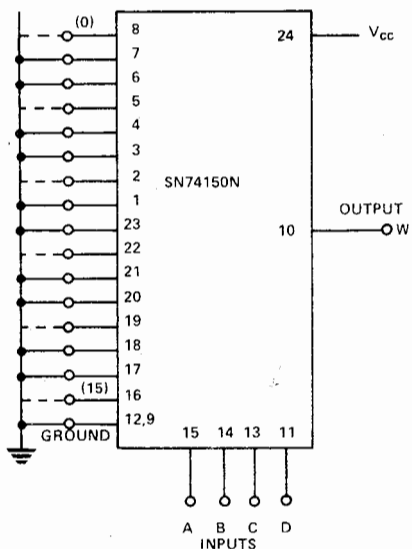


SELECTOR MULTIPLEXER HINTS



This is a method of implementing arbitrary logic functions with an absolute minimum of wiring up and maximum reliability.

The circuits are based on logic data selector/multiplexers, either TTL or CMOS (TTL shown). The first diagram shows the arrangement for producing a function of four variables. The four input variables are decoded by a 74150 16-line to 1-line data selector and used to govern which of sixteen data inputs is used to control the output state of the selector. The output is the complement of the selected input. This in effect forms a low cost, hardwired PROM (Programmable Read-Only-Memory) which is programmed by wired links or switches as shown, (or by inputs from other logic gates).

To programme the inputs, for a given set of variables, the input, number corresponding to the binary number formed by variables ABCD, (1-2-4-8) is connected high for a low output or low for a high output. In practice only connections to low need be made if it is more convenient, although it is good practice to tie the high inputs to Vcc (or VDD) via a 1k

resistor. (The links as shown in the example implement a function to produce an output only if the binary number ABCD is exactly divisible by three.) If it is preferred, each input may be tied to a high level via its own resistor which may then be left in circuit even if required to short the input down to earth.

An ideal form of switch for programming infrequently changed functions which must nevertheless be easily changed is the modern PCB mounting dual-in-line switch which takes up little room. A typical application of this might be for adjusting clock rate timers. A similar arrange-

ment is shown for a function of three variables using the SN74151 IC. In this case the output is available in both true (Y) and complement (W) forms. (In the example shown the majority function is produced. Output is high if two or more inputs are high, otherwise low.)