

Fig. 12-1 Rectangular-Shape Graphic Symbols for Gates

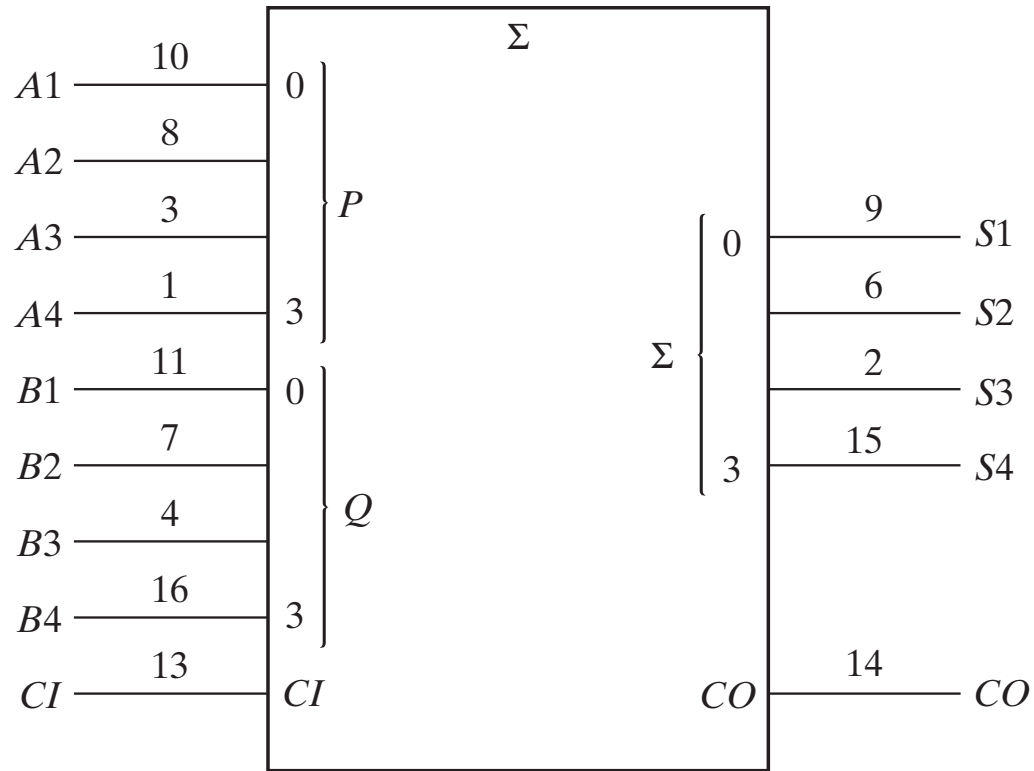


Fig. 12-2 Standard Graphic Symbol for a 4-Bit Parallel Adder, IC Type 7483

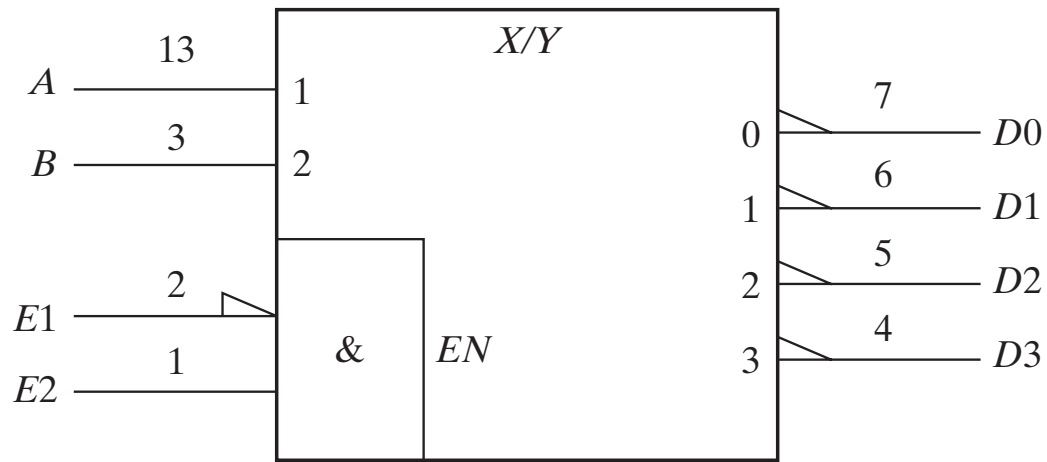
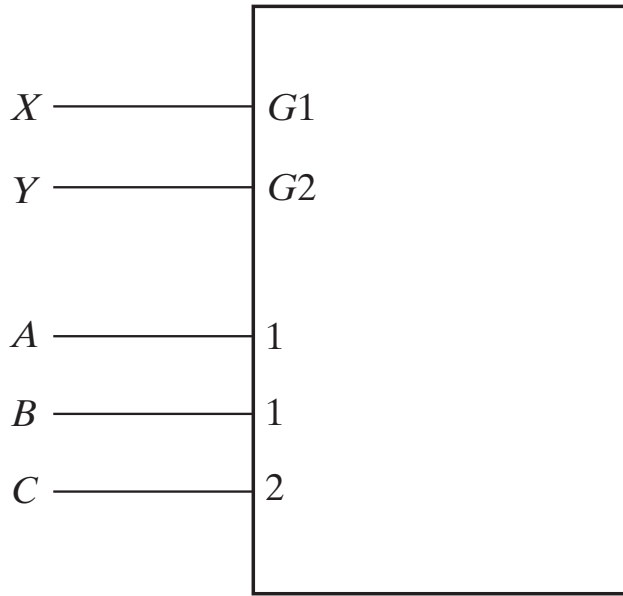


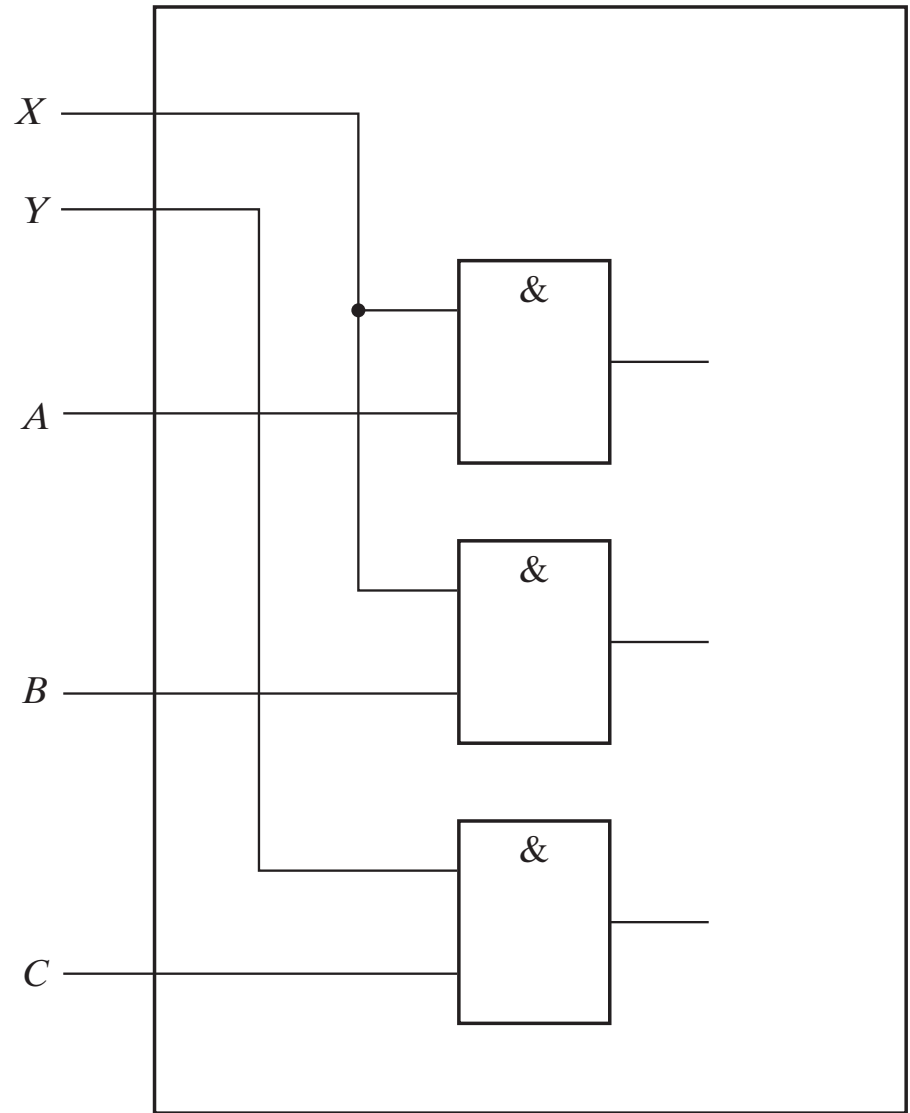
Fig. 12-3 Standard Graphic Symbol for a 2-to-4-Line Decoder (one-half of IC type 74155)

Symbol	Description
	Active-low input or output
	Logic negation input or output
	Dynamic indicator input
	Three-state output (see Fig. 10-16)
	Open-collector output (see Fig. 10-12)
	Output with special amplification
	Enable input
	Data input to a storage element
	Flip-flop inputs
	Shift right
	Shift left
	Countup
	Countdown
	Contents of register equals binary 15

Fig. 12-4 Qualifying Symbols Associated with Inputs and Outputs



(a) Block with $G1$ and $G2$



(b) Equivalent interpretation

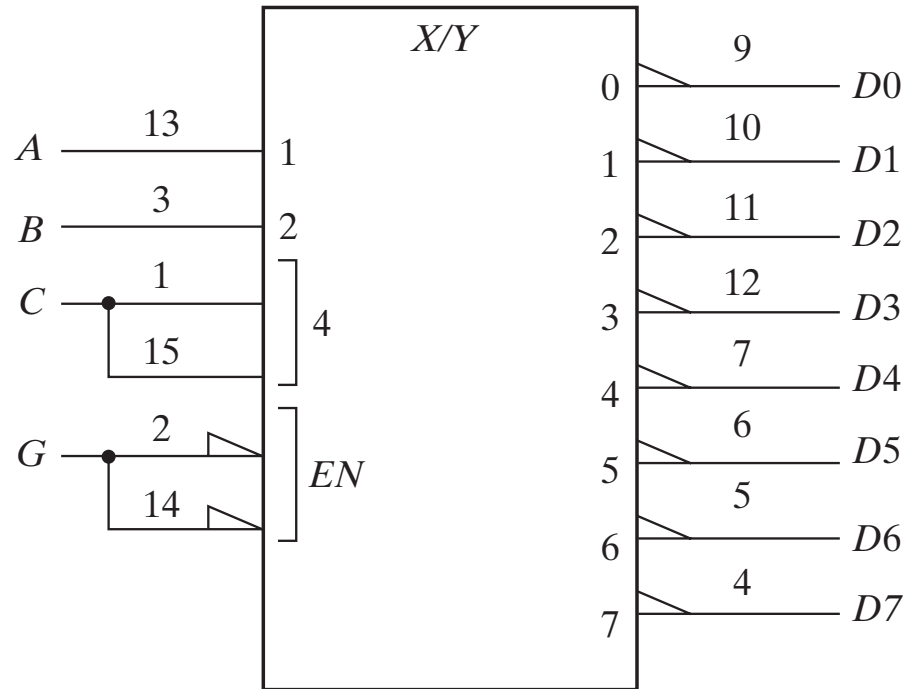
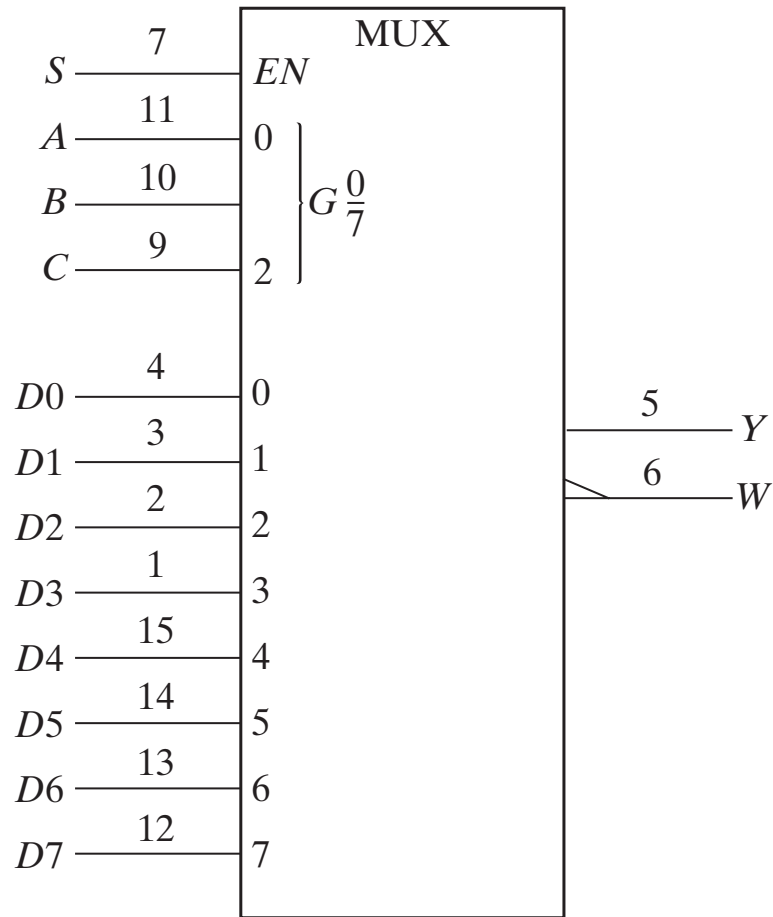
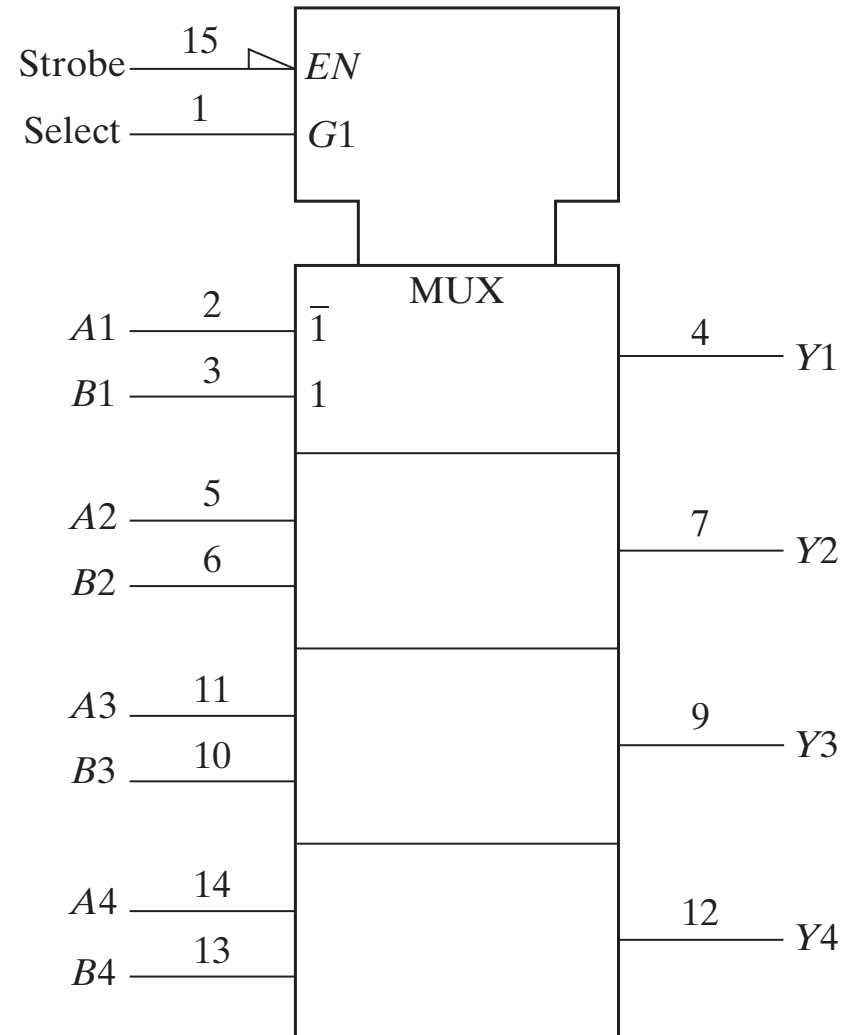


Fig. 12-6 IC Type 74155 Connected as a 3×8 Decoder

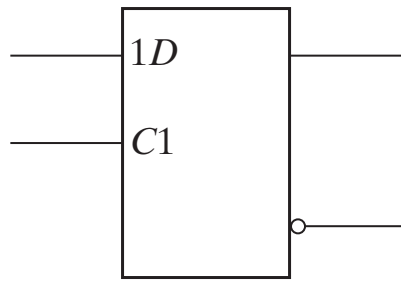


(a) IC type 74151 8×1 MUX

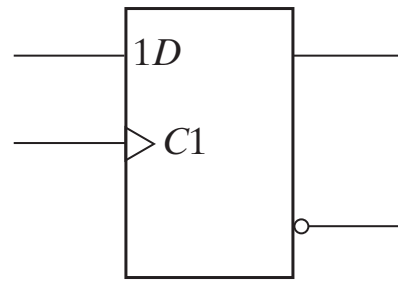


(b) IC type 74157 quadruple 2×1 MUX

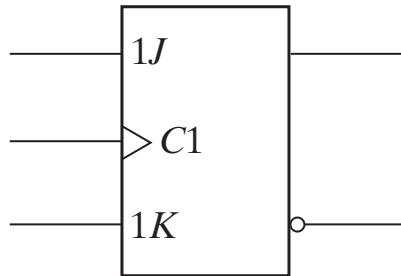
Fig. 12-7 Graphic Symbols for Multiplexers



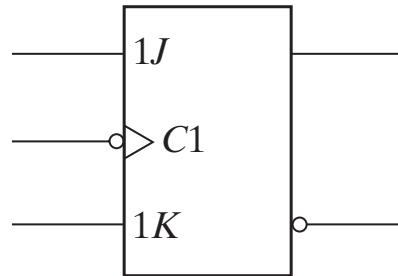
D latch



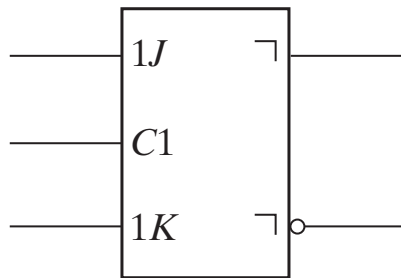
Positive-edge-triggered
D flip-flop



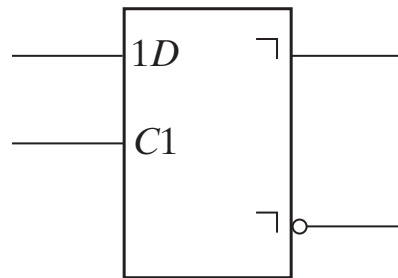
Positive-edge-triggered
JK flip-flop



Negative-edge-triggered
JK flip-flop

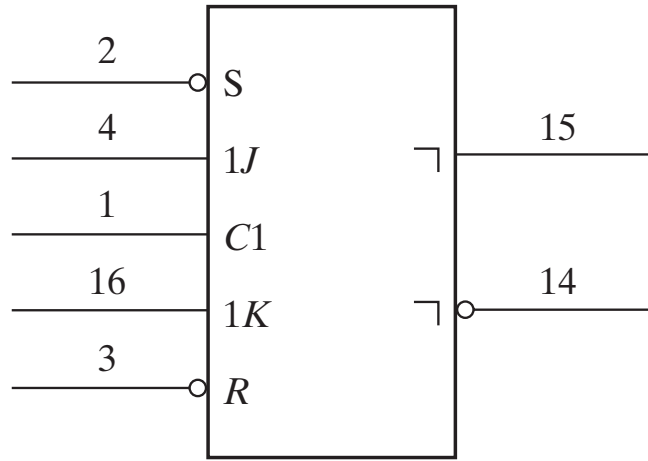


Master-slave *JK* flip-flop

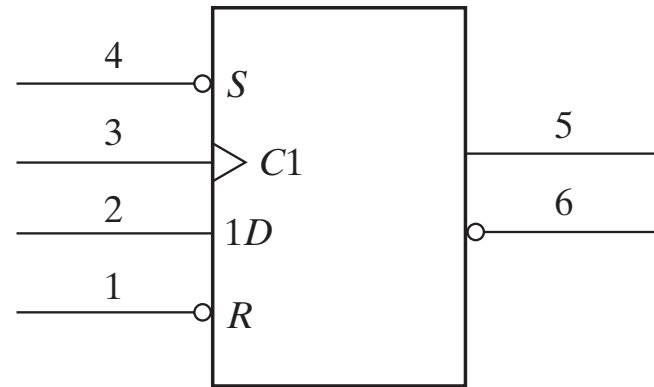


Master-slave *D* flip-flop

Fig. 12-8 Standard Graphic Symbols for Flip-Flops



(a) One-half 7476 *JK* flip-flop



(b) One-half 7474 *D* flip-flop

Fig. 12-9 IC Flip-Flops with Direct Set and Reset

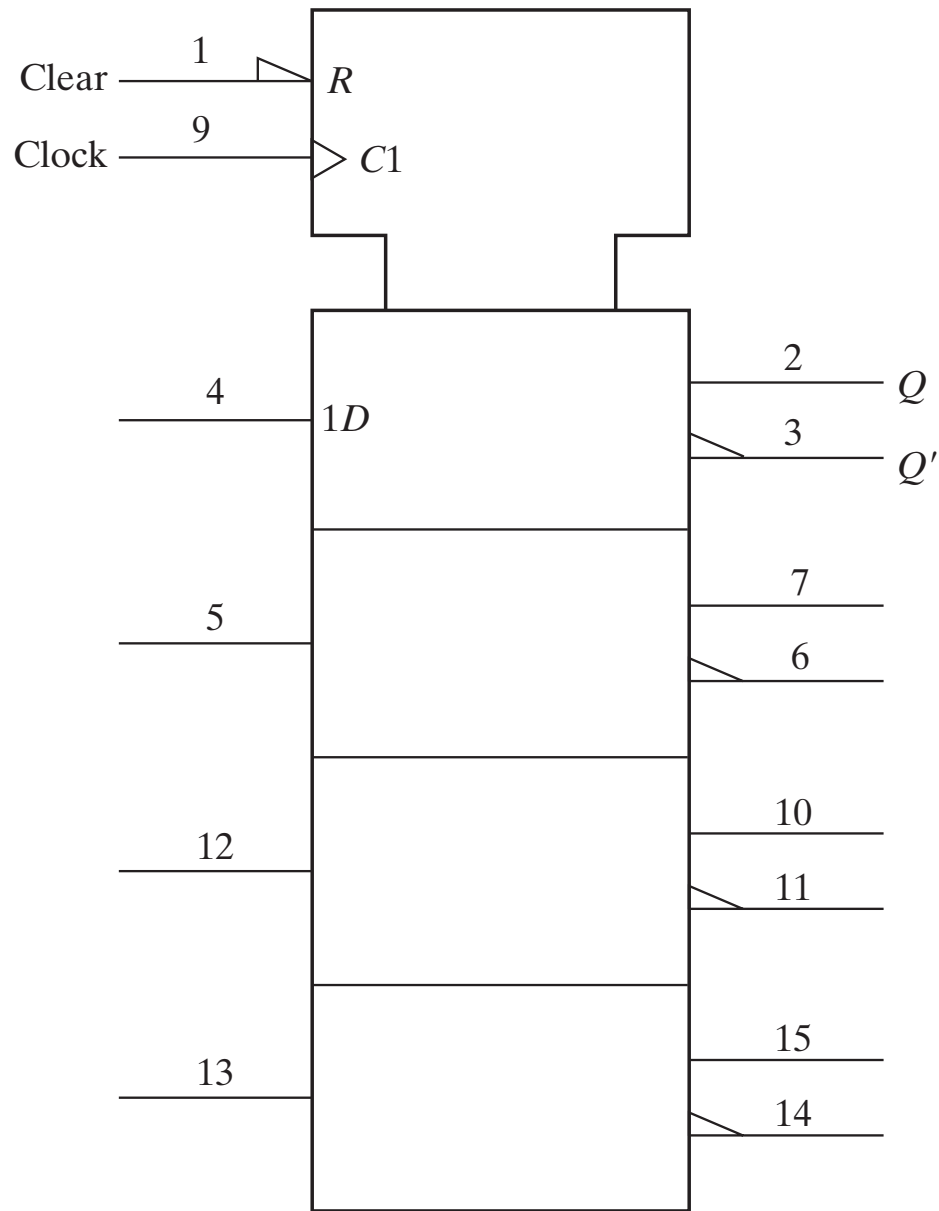


Fig. 12-10 Graphic Symbol for a 4-Bit Register, IC Type 74175

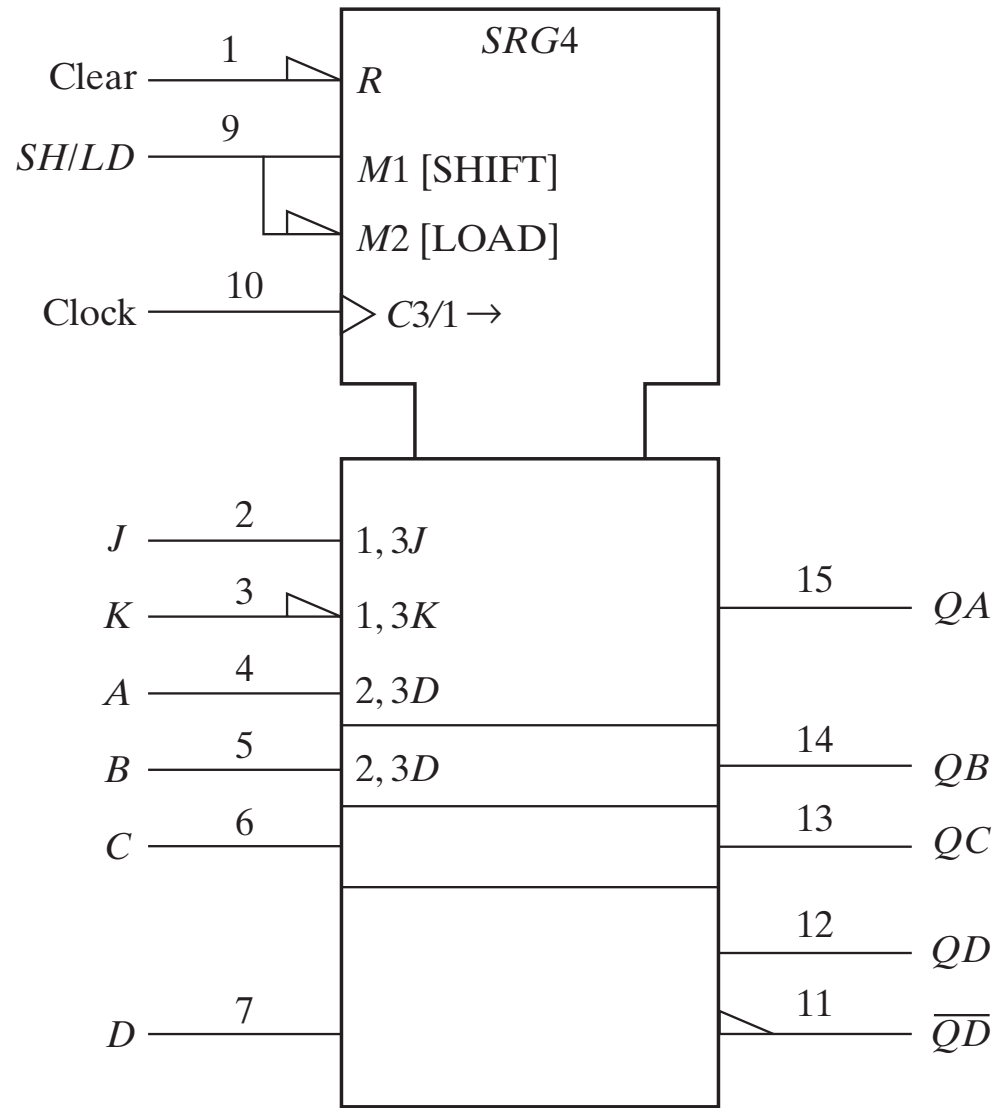


Fig. 12-11 Graphic Symbol for a Shift Register with Parallel Load, IC Type 74195

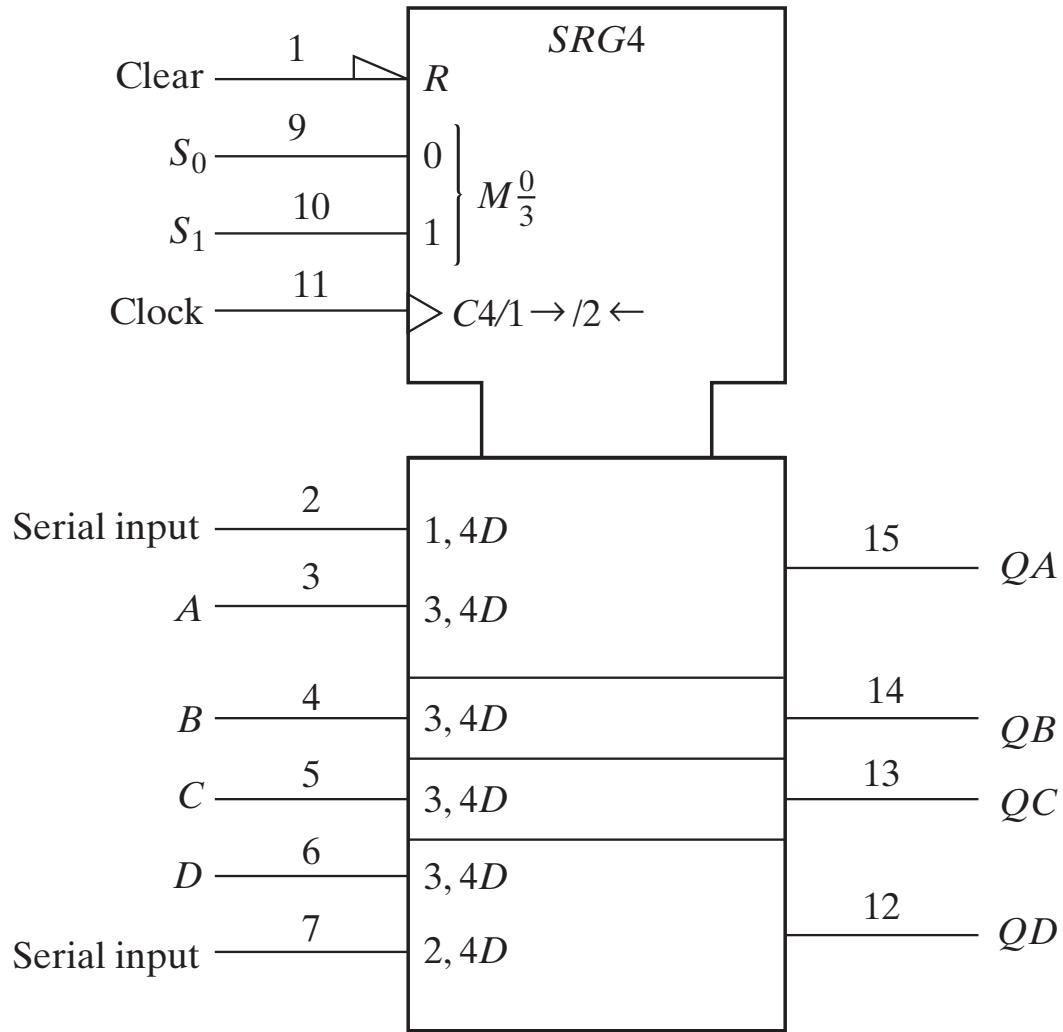


Fig. 12-12 Graphic Symbol for a Bidirectional Shift Register with Parallel Load, IC Type 74194

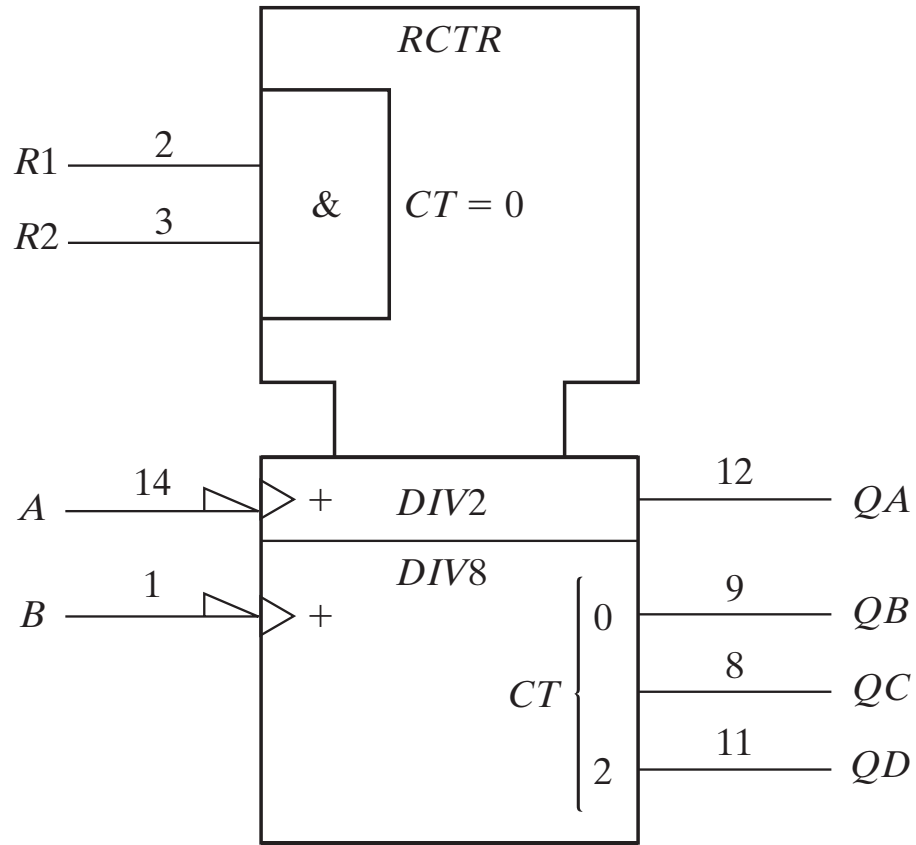


Fig. 12-13 Graphic Symbol for Ripple Counter, IC Type 7493

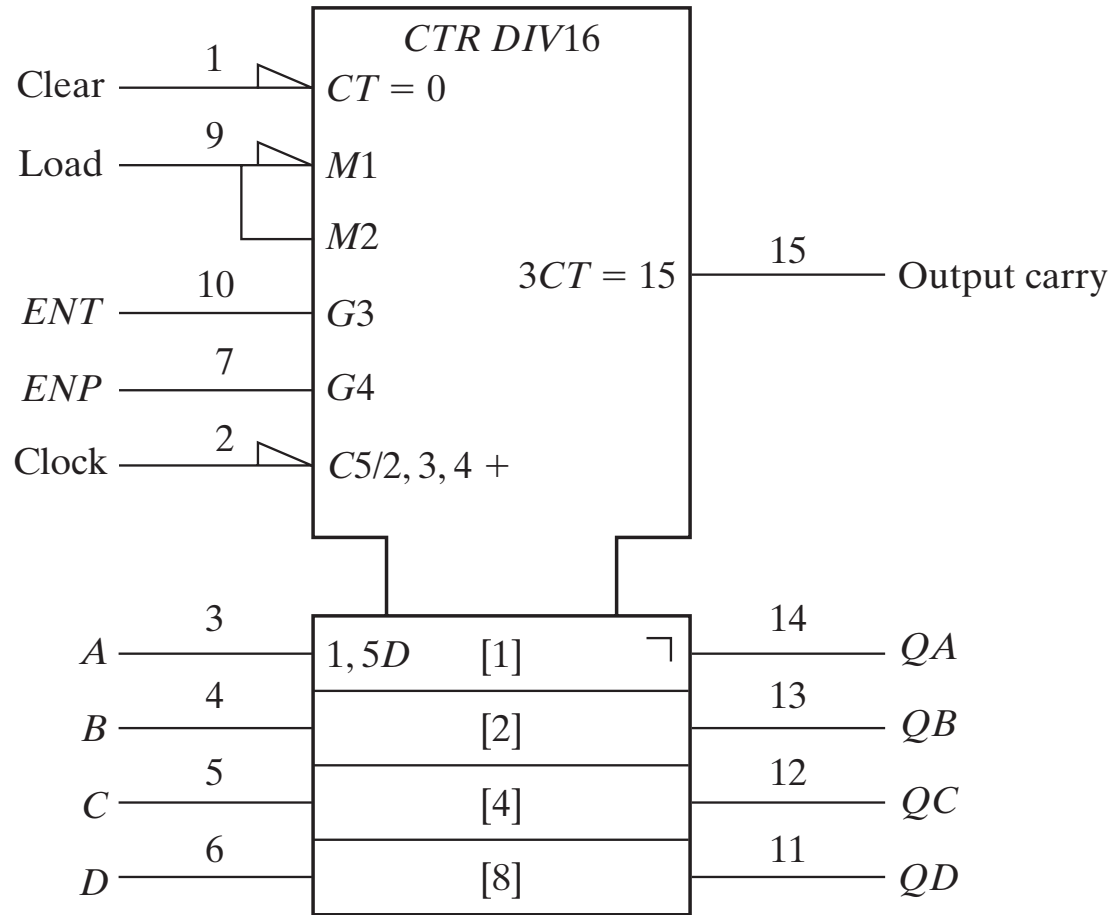


Fig. 12-14 Graphic Symbol for 4-Bit Binary Counter with Parallel Load, IC Type 74161

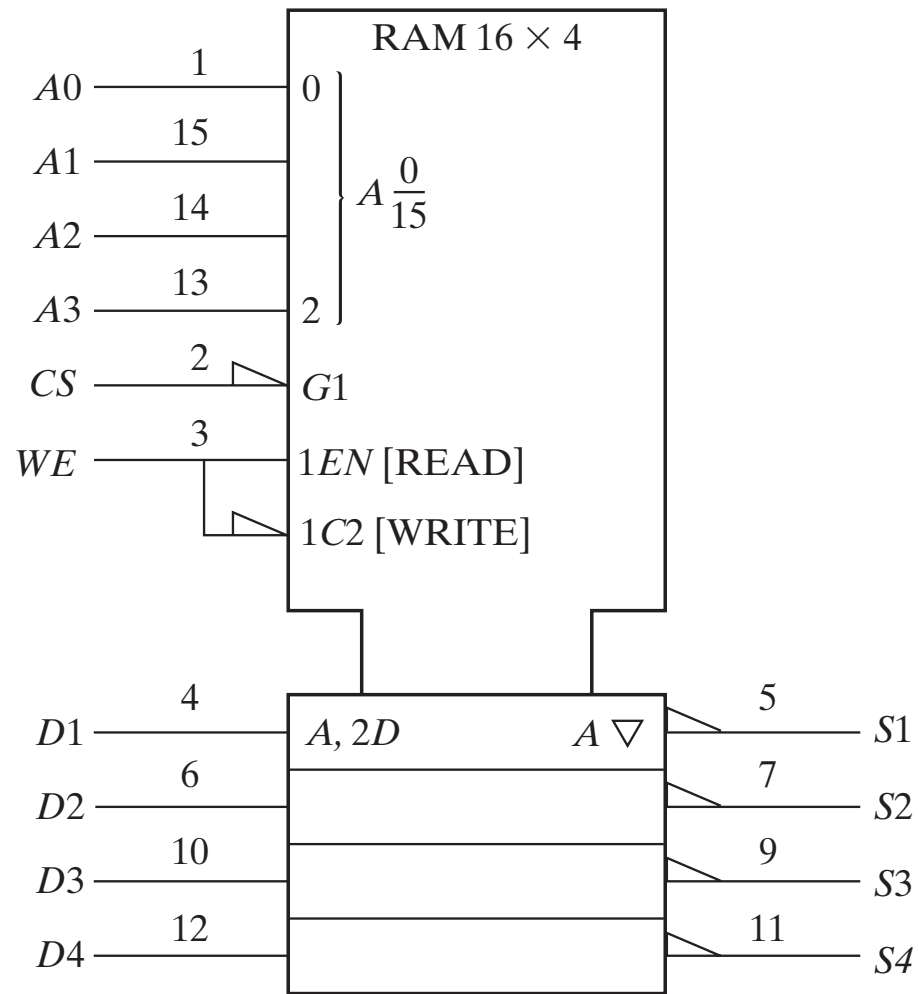


Fig. 12-15 Graphic Symbol for 16×4 RAM, IC Type 74189