Computer Logic and Digital Circuit Design (PHYS306/COSC330): Unit 3

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Summary

Unit 3 Summary

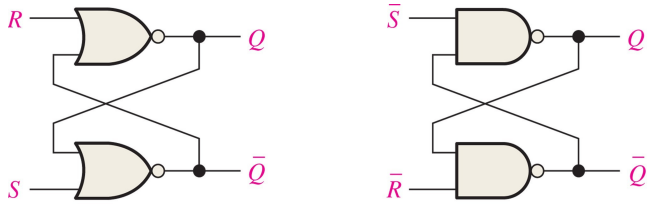
Reading: chapter 7

We now know how to generate and process digital data. We can do algebra, compare numbers, encode, decode, and multiplex. *How does memory work? How is information held in digital systems?*

1. S-R latches
    - Basic latch, de-bounce
    - Gated latch
    - D-latch
2. Flip-flops

S-R Latches

S-R Latches



(a) Active-HIGH input S-R latch

(b) Active-LOW input $\overline{S}$-$\overline{R}$ latch

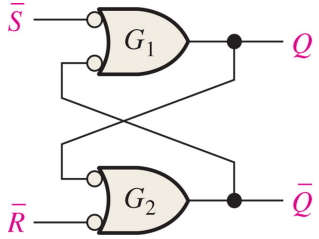


TABLE 7–1

Truth table for an active-LOW input $\overline{S}$-$\overline{R}$ latch.

Inputs		Outputs		
$\bar{S}$	$\bar{R}$	Q	$\bar{Q}$	Comments
1	1	NC	NC	No change. Latch remains in present state.
0	1	1	0	Latch SET.
1	0	0	1	Latch RESET.
0	0	1	1	Invalid condition

Figure 1: An S-R latch is a *multivibrator* that holds its state when SET, or RESET.

S-R Latches

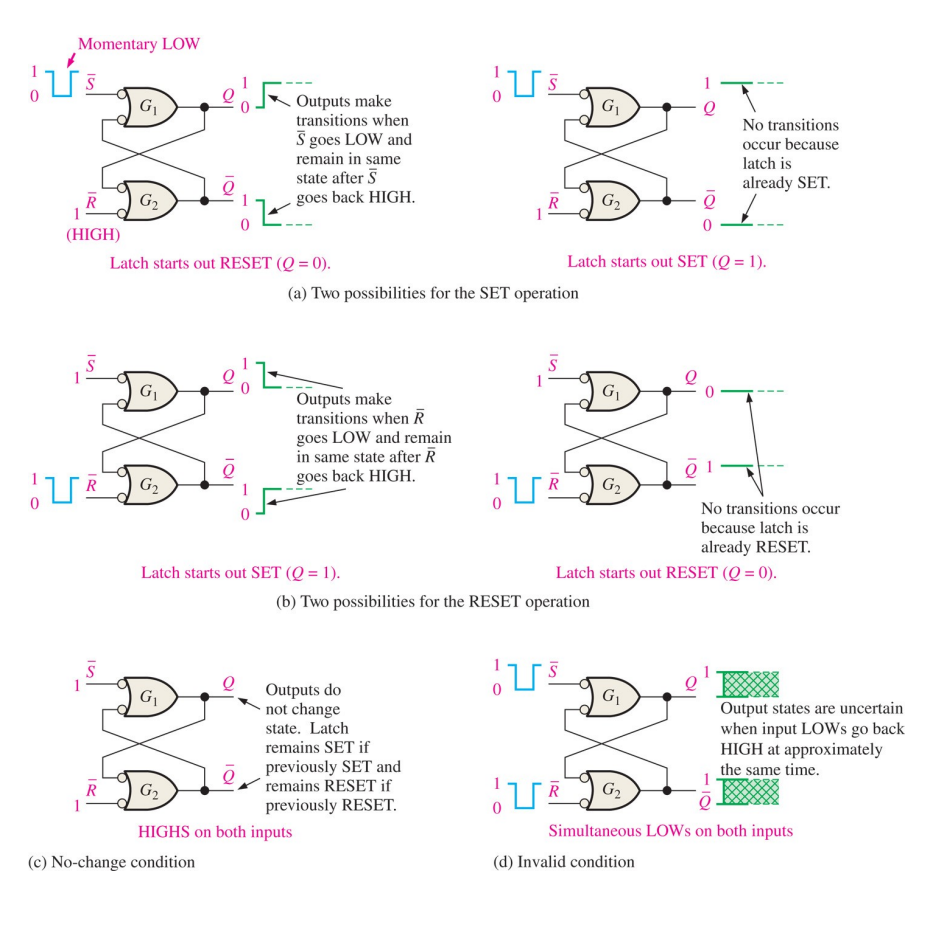


Figure 2: Summary of potential states of a basic S-R latch.

S-R Latches

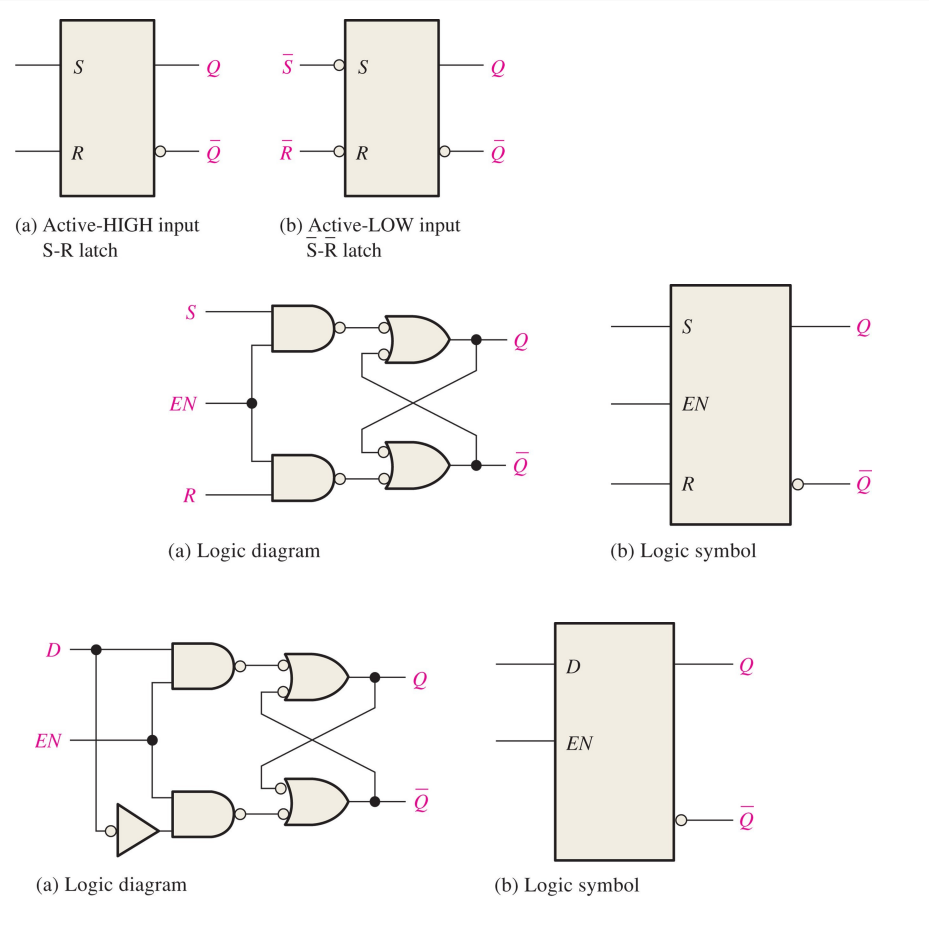


Figure 3: The basic, gate-enabled, and D-latch systems. For the latter two, both the gate and symbol are shown.

S-R Latches

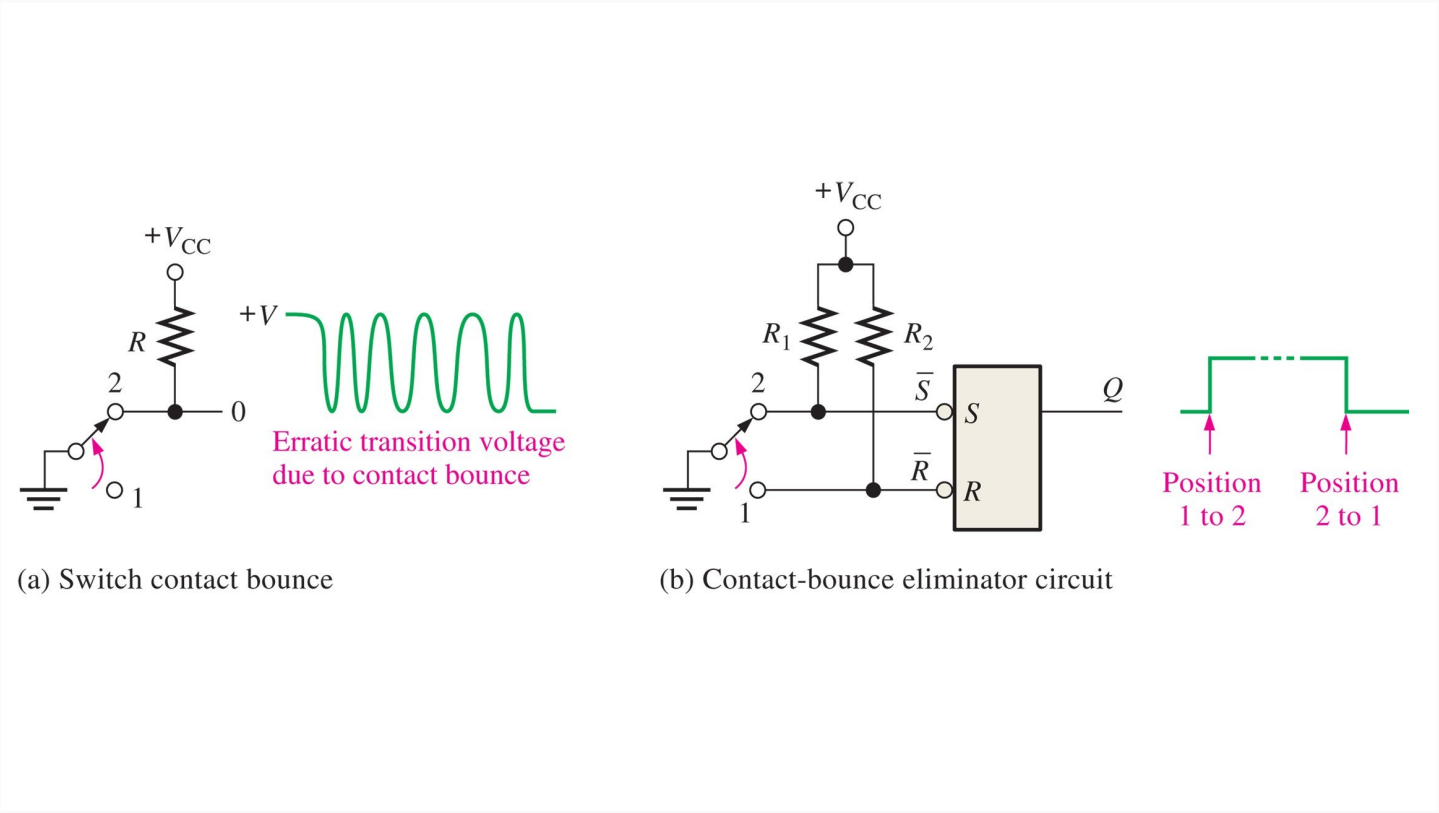


Figure 4: De-bouncing is important any time a mechanical switch is meant to interact with digital logic.

Conclusion

Unit 3 Summary

1. things.