

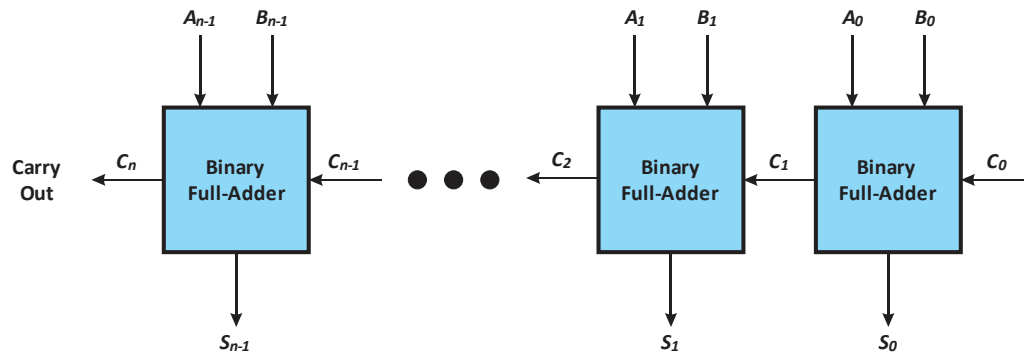


FIGURE 3.22 Logic Diagram for an n-bit Ripple-Carry Adder

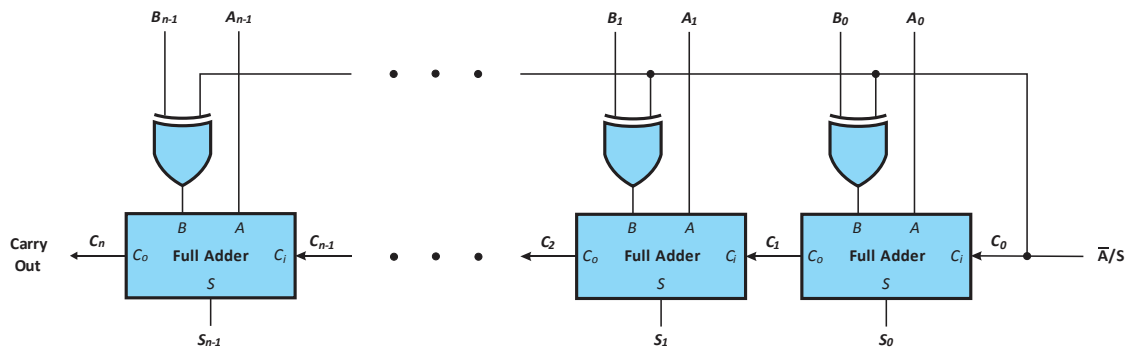


FIGURE 3.22.1 Logic Diagram for an n-bit Ripple-Carry Adder-Subtractor

- $\overline{A}/S = 0 \Rightarrow \text{Add}$
- $\overline{A}/S = 1 \Rightarrow \text{Subtract } A - \overline{B} + 1 = A - B$
- Let  $\overline{A}/S = T$
- Find  $B_i \oplus T$  when  $T = 0$ 
  - o  $B_i \oplus T = B_i' T + B_i T' = B_i' \cdot 0 + B_i \cdot 1 = B_i$
- Find  $B_i \oplus T$  when  $T = 1$ 
  - o  $B_i \oplus T = B_i' T + B_i T' = B_i' \cdot 1 + B_i \cdot 0 = B_i'$