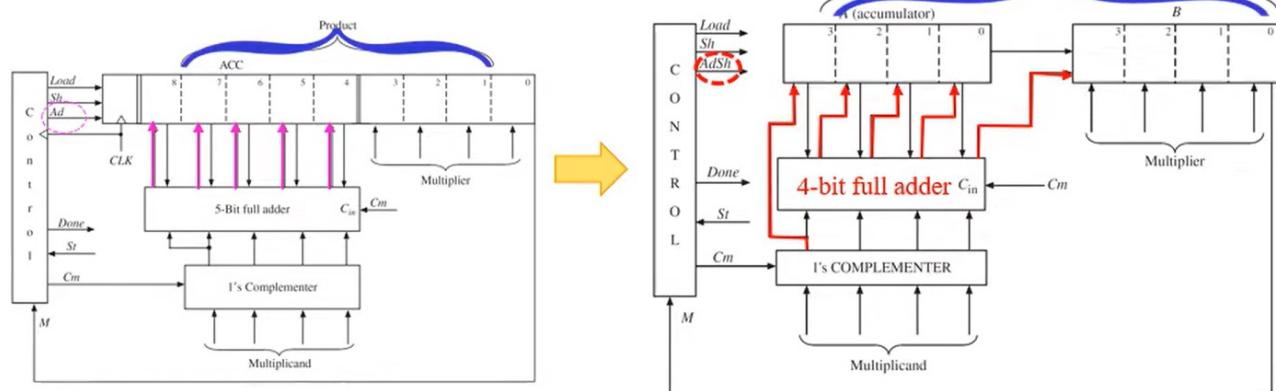


4.1.1 Faster Multiplier

B. Faster Multiplier

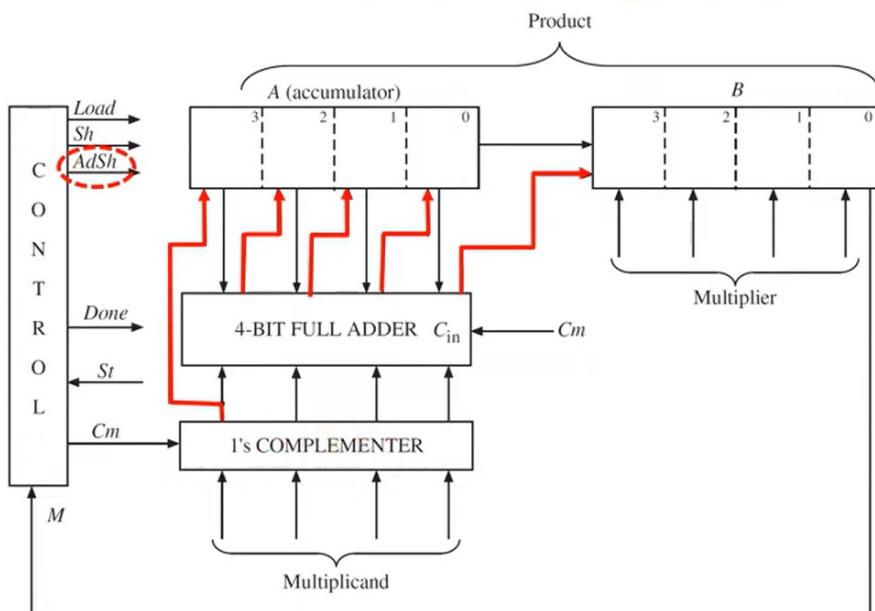
* In Figure 4.32, the **add** and **shift** operations are done at two separate clock times.

- Speed up the operation of the multiplier:
 - Move **wires** from the **adder output one position to the right**, so adder output is shifted over one position when it is loaded into the accumulator.
 - ⇒ The **add** and **shift** operations can occur at the same clock time.



Block Diagram

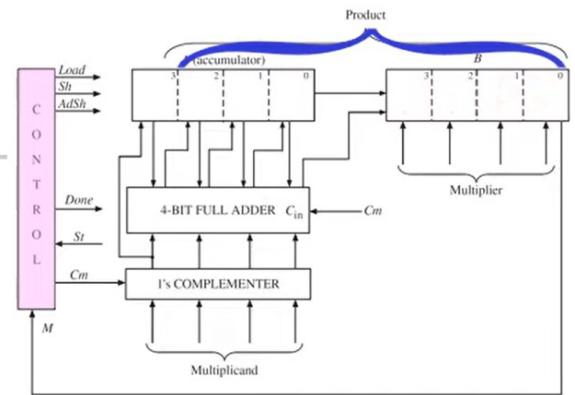
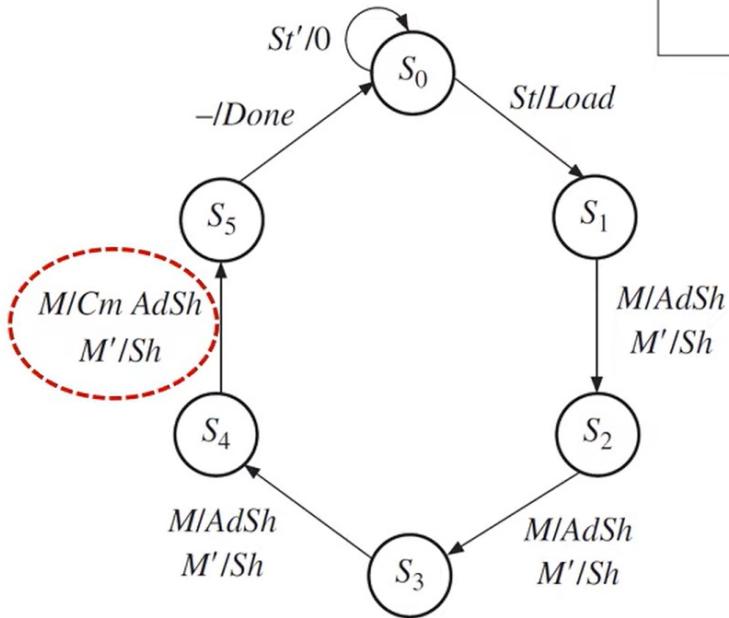
- Hardware required to multiply two 4-bit fractions (includes sign bit):



St: start signal
M: current multiplier bit
Load: load multiplier into B and clear A
Sh: shift signal, causes A & B to shift right one place w/ sign extension
AdSh: add and shift signal
Cm: complement signal

State Graph

- State diagram for the control circuit:



* The add and shift operations are done at the same clock time.