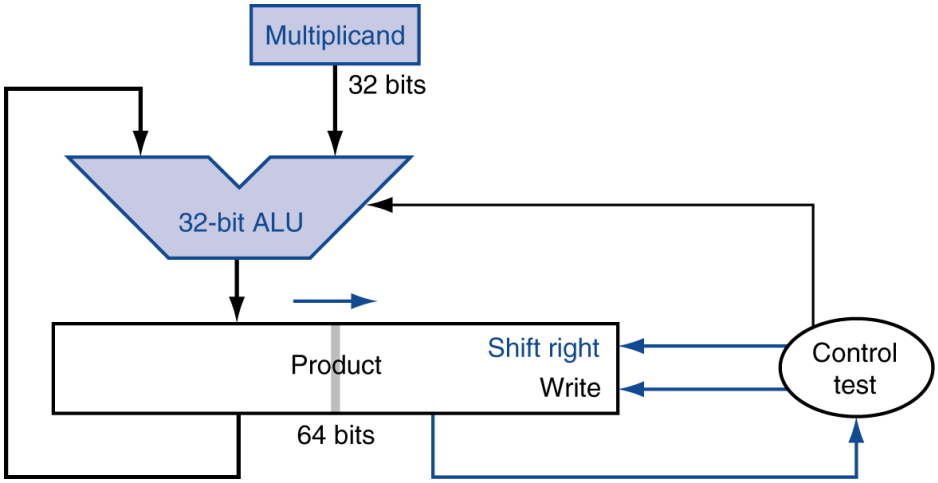
# *Optimized Multiplier Example*

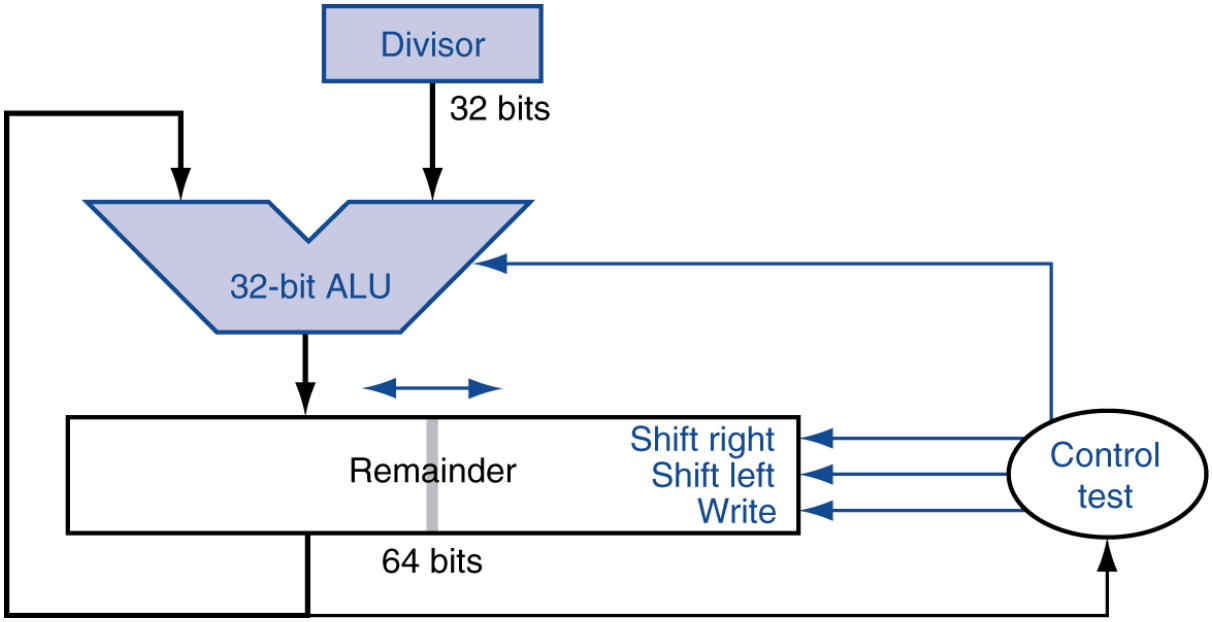



Show the register content for multiplying 6 by 4

Multiplicand remains fixed at 4 = 0100

| | Product | Notes |
|---|---|---|
| init | 0000\|011**0** | LSB=0 → shift right |
| 1 | 0100\|001**1** | LSB=1 → addition then shift right |
| 2 | 0110\|000**1** | LSB=1 → addition then shift right |
| 3 | 0011\|0000 | LSB=0 → shift right |
| 4 | 0001\|1000 | Result = 24 |

# *Optimized Divider Example*




Show the register content for dividing 13 by 3

Divisor = 3 = 0011

| | Remainder before | Remainder after | Notes |
|---|---|---|---|
| init | | 0000\|1101 | |
| 1 | 0001\|101X<br>1110\|101X | 0001\|1010 | Shift left → Subtraction res is -ve → restore and quotient bit = 0 |
| 2 | 0011\|010X<br>0000\|010X | 0000\|0101 | Shift left → Subtraction res is +ve → quotient bit = 1 |
| 3 | 0000\|101X<br>1101\|101X | 0000\|1010 | Shift left → Subtraction res is -ve → restore and quotient bit = 0 |
| 4 | 0001\|010X<br>1110\|010X | 0001\|0100 | Shift left → Subtraction res is -ve → restore and quotient bit = 0 |
| | Remainder= 0001=1 quotient=0100 = 4 | | |