Signed-Operand Multiplication

Booth Algorithm

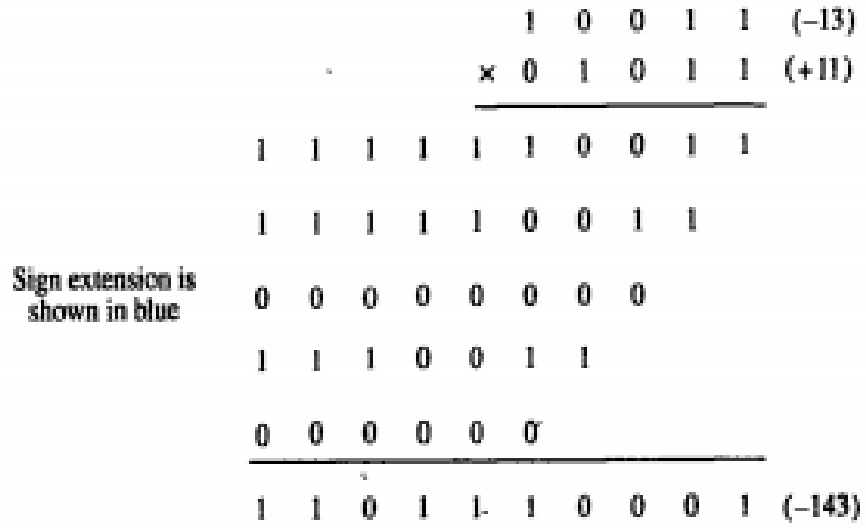

Figure 6.8 Sign extension of negative multiplicand.

45*30

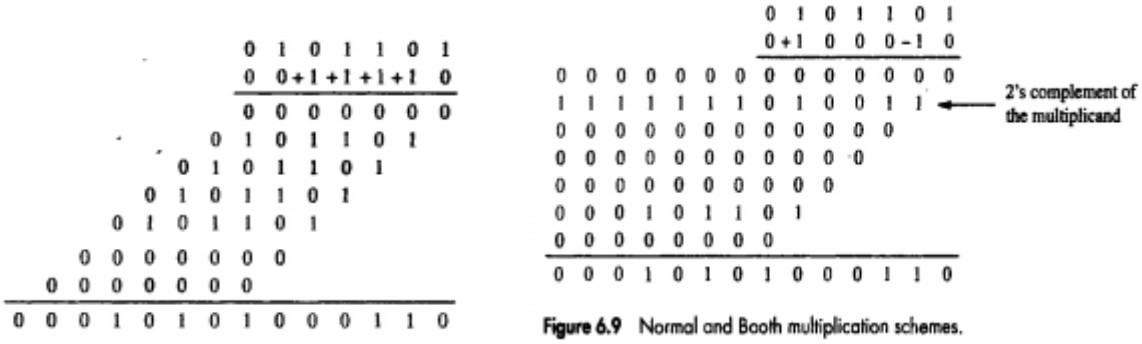

Figure 6.9 Normal and Booth multiplication schemes.

difference between two numbers:

$$\begin{array}{r} 0100000 \quad (32) \\ -0000010 \quad (2) \\ \hline 0011110 \quad (30) \end{array}$$

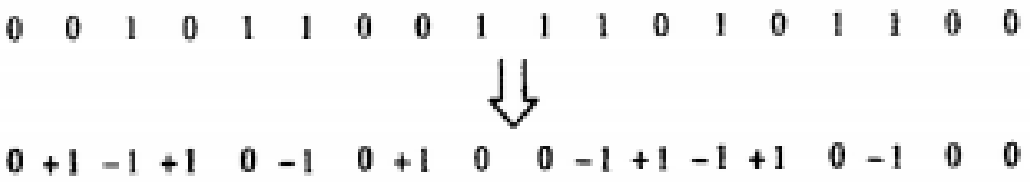

Figure 6.10 Booth recoding of a multiplier.

Multiplier		Version of multiplicand selected by bit i
Bit i	Bit $i-1$	
0	0	$0 \times M$
0	1	$+1 \times M$
1	0	$-1 \times M$
1	1	$0 \times M$

Figure 6.12 Booth multiplier recoding table.

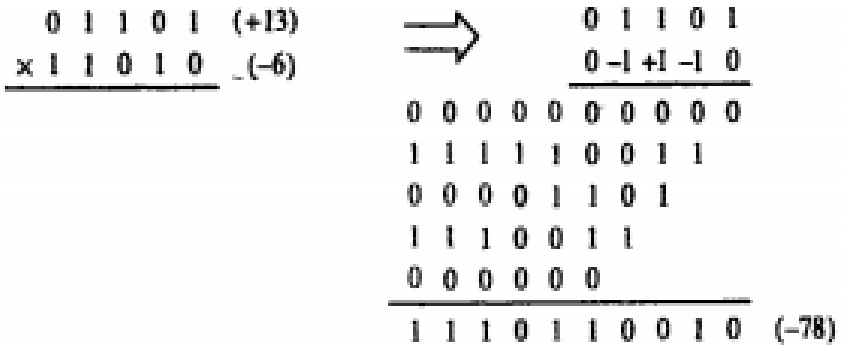

Figure 6.11 Booth multiplication with a negative multiplier.

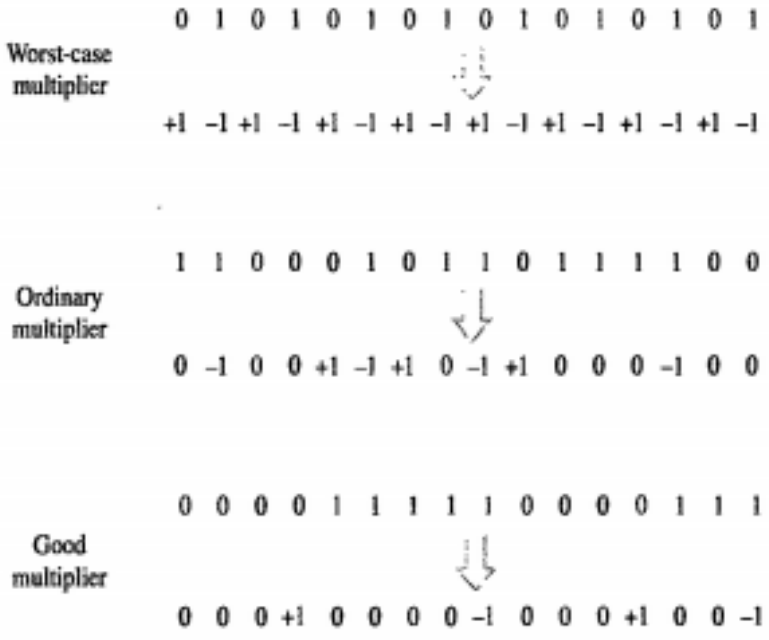

Figure 6.13 Booth recoded multipliers.