New attempt at drawings for multipliers PhL 6.16.13

Eventually I found a nice way to do these drawings.

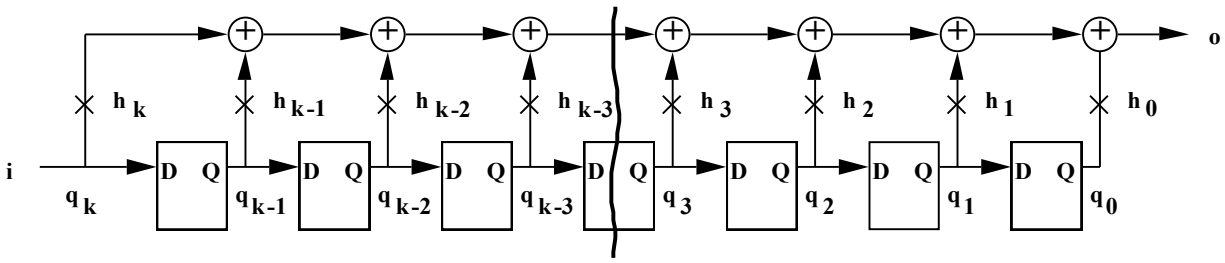


Figure 7: A polynomial multiplier circuit.

$$h_k z^k + h_{k-1} z^{k-1} + \ldots\ldots + h_2 z^2 + h_1 z + h_0$$

$$i_r z^{-r} + i_{r-1} z^{-r+1} + \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots + i_2 z^{-2} + i_1 z^{-1} + i_0$$

$$i_0 h_k z^k + i_0 h_{k-1} z^{k-1} + i_0 h_{k-2} z^{k-2} \ldots\ldots\ldots\ldots\ldots\ldots + i_0 h_2 z^2 + i_0 h_1 z^1 + i_0 h_0 z^0$$

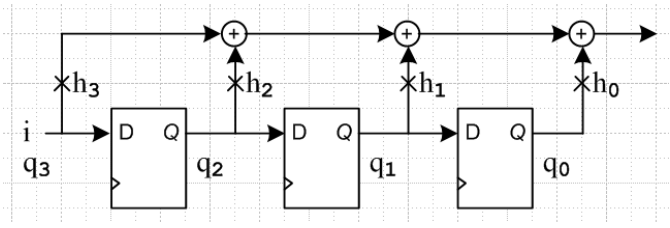
$$i_1 h_k z^{k-1} + i_1 h_{k-1} z^{k-2} + \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots + i_1 h_2 z^1 + i_1 h_1 z^0 + i_1 h_0 z^{-1}$$

$$i_2 h_k z^{k-2} + i_2 h_{k-1} z^{k-3} + \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots + i_2 h_2 z^0 + i_2 h_1 z^{-1} + i_2 h_0 z^{-2}$$

$$x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z}$$

$$x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z} + x^{k-k}_{x-x y-y z}$$

Figure 7 with k = 3:



$$
\begin{array}{l}
\qquad h_3z^3 + h_2z^2 + h_1z + h_0 \\
\ldots + i_3z^{-3} + i_2z^{-2} + i_1z^{-1} + i_0z^0 \\
\hline
\qquad i_0h_3z^3 + i_0h_2z^2 + i_0h_1z^1 + i_0h_0z^0 \\
\qquad\quad i_1h_3z^2 + i_1h_2z^1 + i_1h_1z^0 + i_1h_0z^{-1} \\
\qquad\qquad i_2h_3z^1 + i_2h_2z^0 + i_2h_1z^{-1} + i_2h_0z^{-2} \\
\qquad\qquad\quad i_3h_3z^0 + i_3h_2z^{-1} + i_3h_1z^{-2} + i_3h_0z^{-3} \\
\qquad\qquad\qquad i_4h_3z^{-1} + i_4h_2z^{-2} + i_4h_1z^{-3} + i_4h_0z^{-4} \\
\qquad\qquad\qquad\quad i_5h_3z^{-2} + i_5h_2z^{-3} + i_5h_1z^{-4} + i_5h_0z^{-5} \\
\qquad\qquad\qquad\qquad **** + ***** + ****\ldots \\
\qquad\qquad\qquad\qquad\quad ***** + ****\ldots \\
\qquad\qquad\qquad\qquad\qquad *****\ldots \\
\hline
\qquad o_0z^3 + o_1z^2 + o_2z^1 + o_3z^0 + o_4z^{-1} + o_5z^{-2} + o_6z^{-3} + o_7z^{-4} + o_8z^{-5} \\
\\
= z^3 [\, o_0z^0 + o_1z^{-1} + o_2z^{-2} + o_3z^{-3} + o_4z^{-4} + o_5z^{-5} + o_6z^{-6} + o_7z^{-7} + o_8z^{-8}
\end{array}
$$