

elm order	given basis B				$\alpha^i$
	$\beta_0$	$\beta_1$	$\beta_2$	$\beta_3$	
-	0	0	0	0	0
1	1	0	0	0	1
3	1	1	0	1	$\alpha^5$
3	0	1	0	1	$\alpha^{10}$
15	0	1	1	0	$\alpha^{13}$
15	1	0	1	1	$\alpha^{11}$
5	1	0	1	0	$\alpha^9$
15	1	1	1	0	$\alpha^7$
5	0	0	0	1	$\alpha^3$
15	0	1	0	0	$\alpha$
15	0	0	1	1	$\alpha^{14}$
5	1	1	0	0	$\alpha^{12}$
15	0	1	1	1	$\alpha^8$
5	1	1	1	1	$\alpha^6$
15	1	0	0	1	$\alpha^4$
15	0	0	1	0	$\alpha^2$

Table 1: Element table for  $\text{GF}(2^4)$  with generator  $\alpha$ , which is a root of  $x^4 + x^3 + Z(2)^0$ .

$$\text{Basis B} = [\beta_i] = [Z(2)^0, Z(2^4)^7, Z(2^4)^{14}, Z(2^4)^6] = [1, \alpha, \alpha^2, \alpha^3]$$