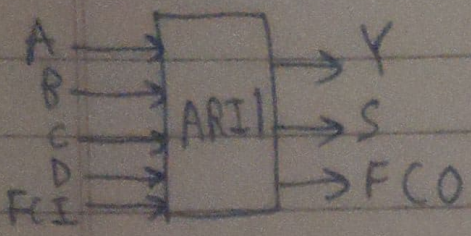


Output string (20 bit) = [19:0] INIT

Y = [15:0] INIT based on ABCD value (binary)

S = FCI ⊕ Y

FCO = P'υ + P(FCI)

INIT[17]	INIT[16]	υ
0	0	0
0	1	F0
1	0	1
1	1	F1

F0 → value of Y when A = 0

F1 → value of Y when A = 1

INIT[19]	INIT[18]	P
0	0	0
0	1	Y
1	X	1

P	υ	FCI	FCO
0	υ	X	υ
1	X	FCI	FCI

$$FCO = \overline{P}\,h + P(FCI)$$

$$P = INIT[19] + (\overline{INIT[9]})\,INIT[18]$$

$$h = (F0)(INIT[16])(\overline{INIT[17]}) + (INIT[17])(\overline{INIT[16]}) + (F1)(INIT[16])(INIT[17])$$

$$F0 = INIT[(0BCD)_{10}]$$

$$F1 = INIT[(1BCD)_{10}]$$

$$Y = INIT[(ABCD)_{10}]$$

$$S = Y \oplus FCI$$

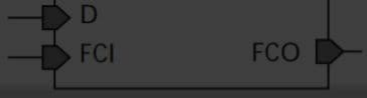


Figure 22 • ARI1

Input	Output
A, B, C, D, FCI	Y, S, FCO

The ARI1 cell has a 20bit INIT string parameter that is used to configure its functionality. The interpretation of the 16 LSB of the INIT string is shown in the table below. F0 is the value of Y when A = 0 and F1 is the value of Y when A = 1.

Table 4 • **Interpretation of 16 LSB of the INIT String for ARI1**

ADCB	Y	
0000	INIT[0]	F0
0001	INIT[1]	
0010	INIT[2]	
0011	INIT[3]	
0100	INIT[4]	
0101	INIT[5]	
0110	INIT[6]	
0111	INIT[7]	
1000	INIT[8]	F1
1001	INIT[9]	
1010	INIT[10]	
1011	INIT[11]	
1100	INIT[12]	
1101	INIT[13]	
1110	INIT[14]	
1111	INIT[15]	

Table 5 • **Truth Table for S**

Y	FCI	S
0	0	0
0	1	1
1	0	1
1	1	0

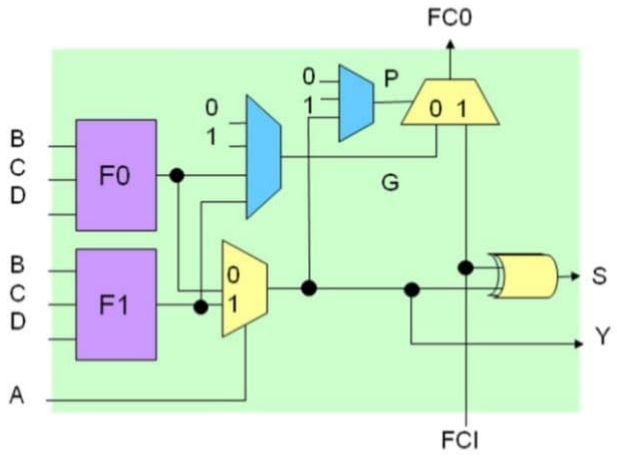
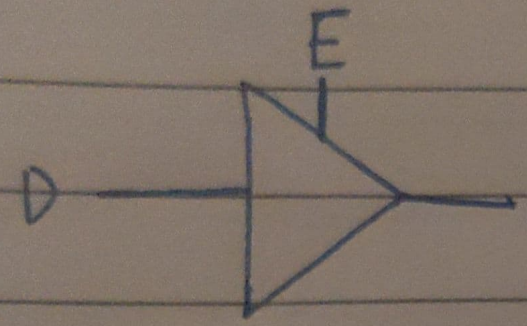


Figure 23 • **ARI1 Logic**

The 4 MSB of the INIT string controls the output of the carry bits. The carry is generated using carry propagation and



D, E
input

output

D	E	PAD
X	0	Z
D	1	D

$$PAD = E(D) + Z(\bar{E})$$

invalid state