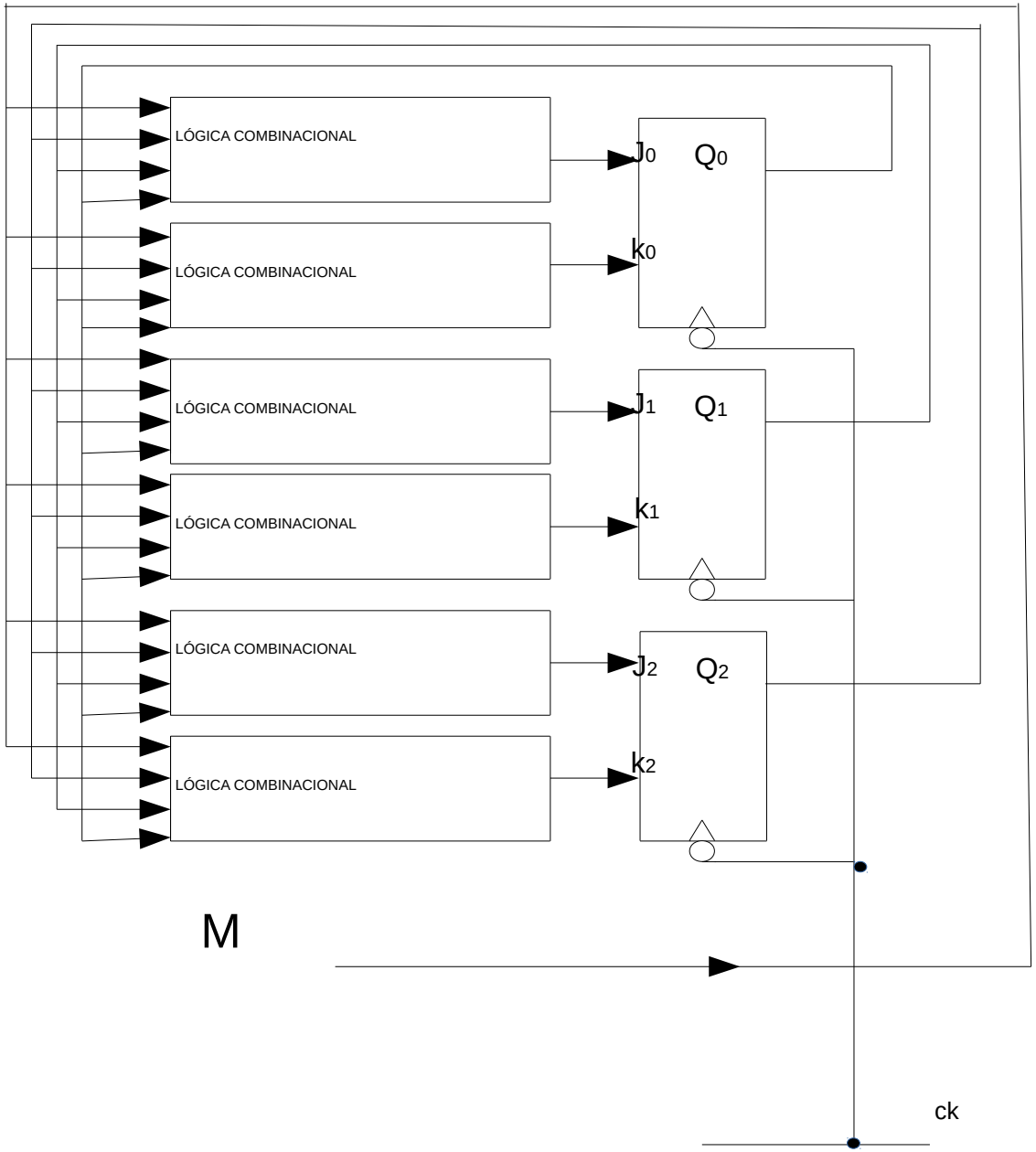
Contador Síncrono de 3 bits up/down utilizando flip-flop JK

Estado atual Próximo estado

M	Q_2^n	Q_1^n	Q_0^n		Q_2^{n+1}	Q_1^{n+1}	Q_0^{n+1}			J_2	k_2		J_1	k_1		J_0	k_0
0	0	0	0		0	0	1			0	x		0	x		1	x
0	0	0	1		0	1	0			0	x		1	x		x	1
0	0	1	0		0	1	1			0	x		x	0		1	x
0	0	1	1		1	0	0			1	x		x	1		x	1
0	1	0	0		1	0	1			x	0		0	x		1	x
0	1	0	1		1	1	0			x	0		1	x		x	1
0	1	1	0		1	1	1			x	0		x	0		1	x
0	1	1	1		0	0	0			x	1		x	1		x	1
1	0	0	0		1	1	1			1	x		1	x		1	x
1	0	0	1		0	0	0			0	x		0	x		x	1
1	0	1	0		0	0	1			0	x		x	1		1	x
1	0	1	1		0	1	0			0	x		x	0		x	1
1	1	0	0		0	1	1			x	1		1	x		1	x
1	1	0	1		1	0	0			x	0		0	X		x	1
1	1	1	0		1	0	1			x	0		x	1		1	x
1	1	1	1		1	1	0			x	0		x	0		x	1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J0
Q0
k0
J1
Q1
k1
J2
Q2
k2
M
ck

M	Q_2^n	Q_1^n	Q_0^n	Q_0^{n+1}		J_0	k_0
0	0	0	0	1		1	x
0	0	0	1	0		x	1
0	0	1	0	1		1	x
0	0	1	1	0		x	1
0	1	0	0	1		1	x
0	1	0	1	0		x	1
0	1	1	0	1		1	x
0	1	1	1	0		x	1
1	0	0	0	1		1	x
1	0	0	1	0		x	1
1	0	1	0	1		1	x
1	0	1	1	0		x	1
1	1	0	0	1		1	x
1	1	0	1	0		x	1
1	1	1	0	1		1	x
1	1	1	1	0		x	1

J	K	Q^{n+1}		Q n Q n+1	J	K
0	0	Q^n		0 → 0	0	X
0	1	0		0 → 1	1	X
1	0	1		1 → 0	X	1
1	1	$/Q^n$		1 → 1	X	0

Q_1 Q_0 / M Q_3	00	01	11	10		Q_1 Q_0 / M Q_3	00	01	11	10
00						00				
01						01				
11						11				
10						10				

J_0 =

k_0 =

M	Q_2^n	Q_1^n	Q_0^n	Q_1^{n+1}		J_1	k_1
0	0	0	0	0		0	x
0	0	0	1	1		1	x
0	0	1	0	1		x	0
0	0	1	1	0		x	1
0	1	0	0	0		0	x
0	1	0	1	1		1	x
0	1	1	0	1		x	0
0	1	1	1	0		x	1
1	0	0	0	1		1	x
1	0	0	1	0		0	x
1	0	1	0	0		x	1
1	0	1	1	1		x	0
1	1	0	0	1		1	x
1	1	0	1	0		0	X
1	1	1	0	0		x	1
1	1	1	1	1		x	0

J	K	Q^{n+1}		Qn Qn+1	J	K
0	0	Q^n		0 → 0	0	X
0	1	0		0 → 1	1	X
1	0	1		1 → 0	X	1
1	1	$/Q^n$		1 → 1	X	0

Q_1 Q_0 / M Q_3	00	01	11	10		Q_1 Q_0 / M Q_3	00	01	11	10
00						00				
01						01				
11						11				
10						10				

J_1 =

k_1 =

M	Q_2^n	Q_1	Q_0		Q_2		J_2	k_2
0	0	0	0		0		0	x
0	0	0	1		0		0	x
0	0	1	0		0		0	x
0	0	1	1		1		1	x
0	1	0	0		1		x	0
0	1	0	1		1		x	0
0	1	1	0		1		x	0
0	1	1	1		0		x	1
1	0	0	0		1		1	x
1	0	0	1		0		0	x
1	0	1	0		0		0	x
1	0	1	1		0		0	x
1	1	0	0		0		x	1
1	1	0	1		1		x	0
1	1	1	0		1		x	0
1	1	1	1		1		x	0

J	K	Q^{n+1}		Q^n Q^{n+1}	J	K
0	0	Q^n		0 → 0	0	X
0	1	0		0 → 1	1	X
1	0	1		1 → 0	X	1
1	1	$/Q^n$		1 → 1	X	0

n+1

Q_1 Q_0 / M Q_3	00	01	11	10		Q_1 Q_0 / M Q_3	00	01	11	10
00						00				
01						01				
11						11				
10						10				

J_2 =

K_2 =