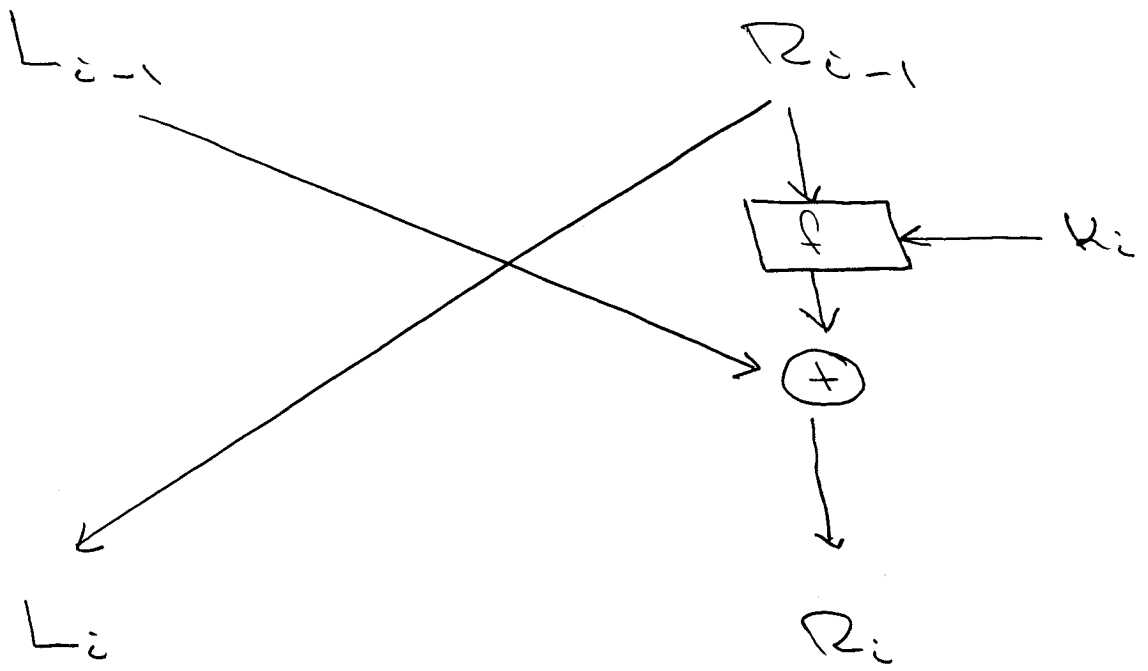
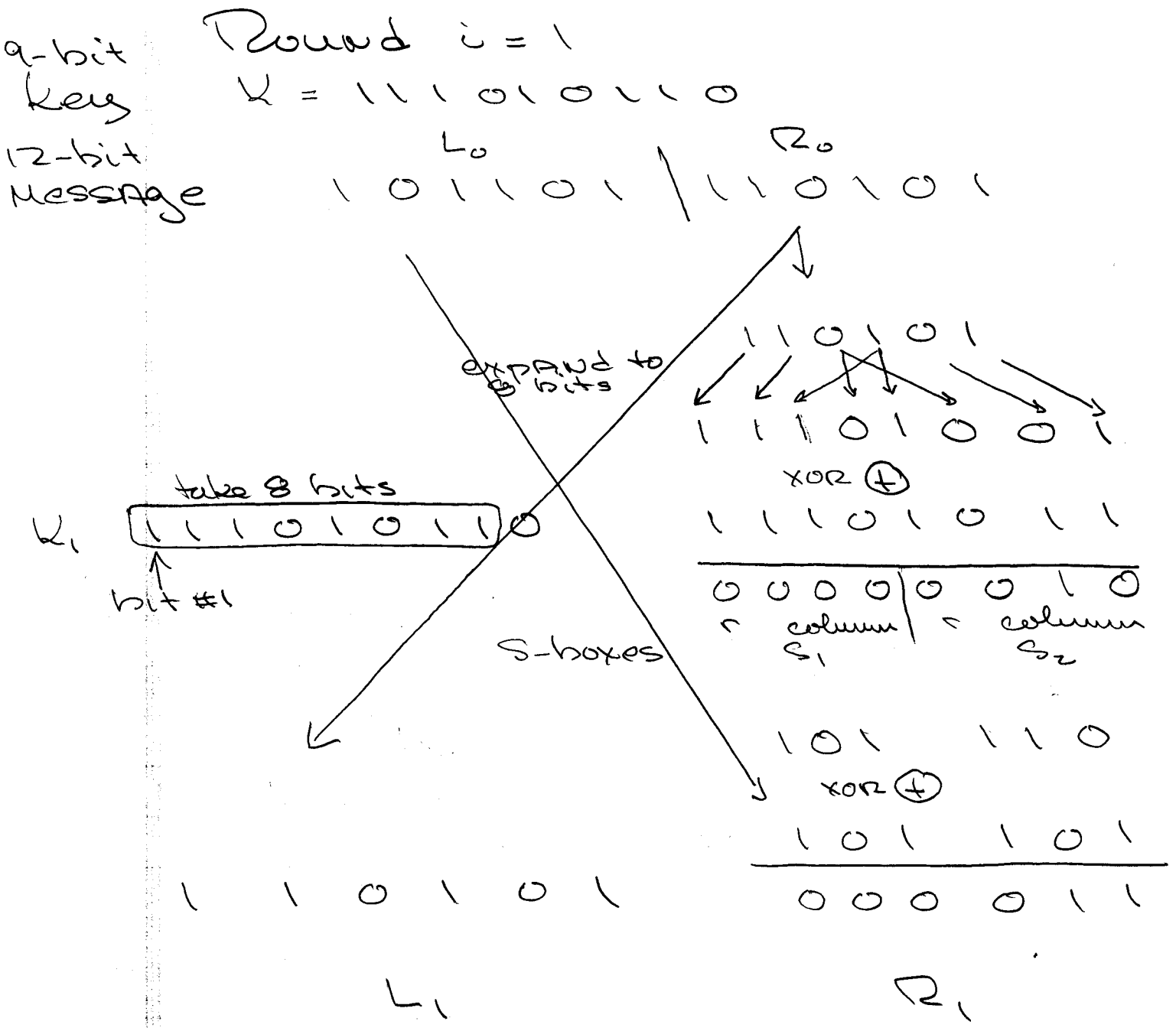
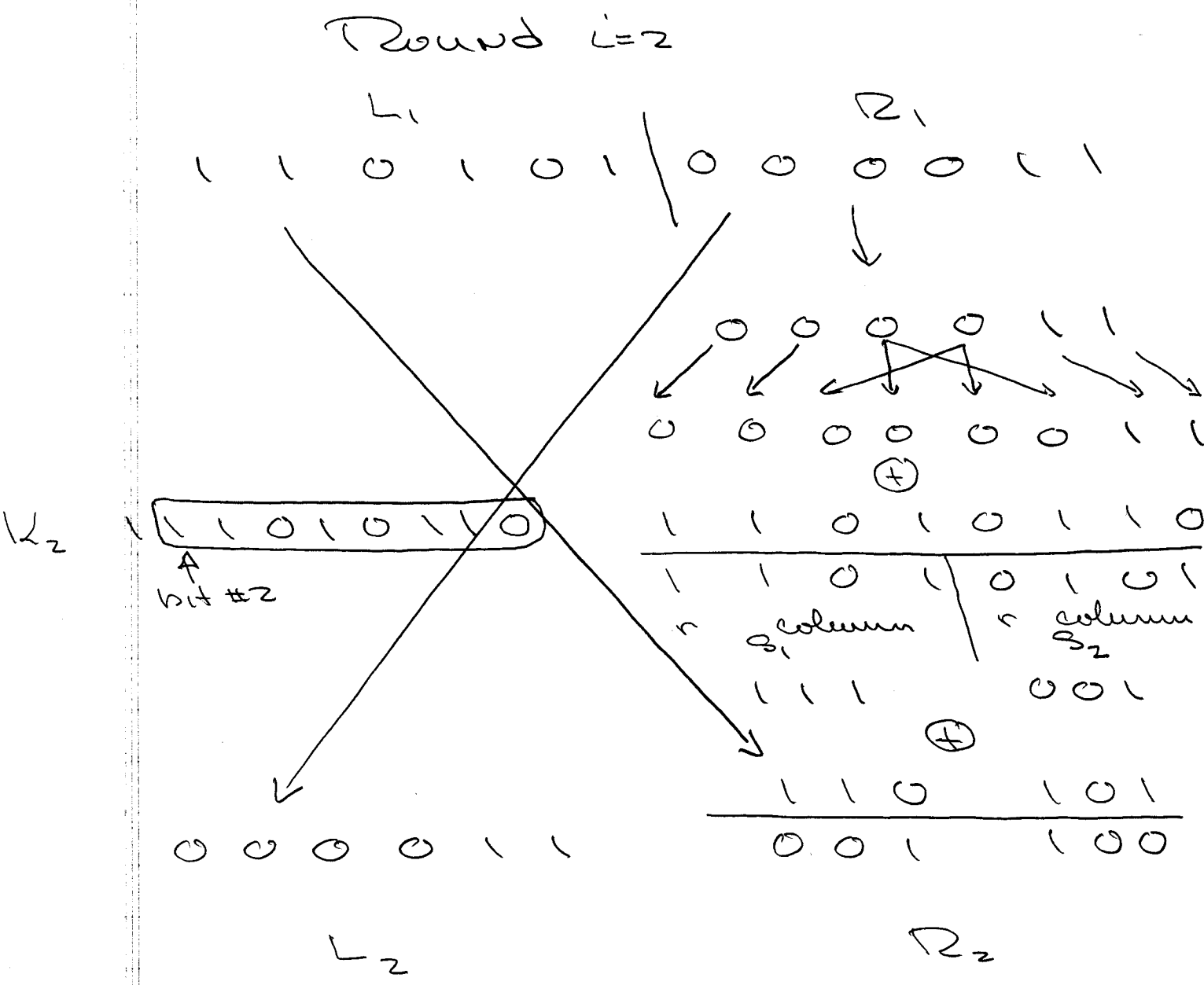
One round of a Feistel System

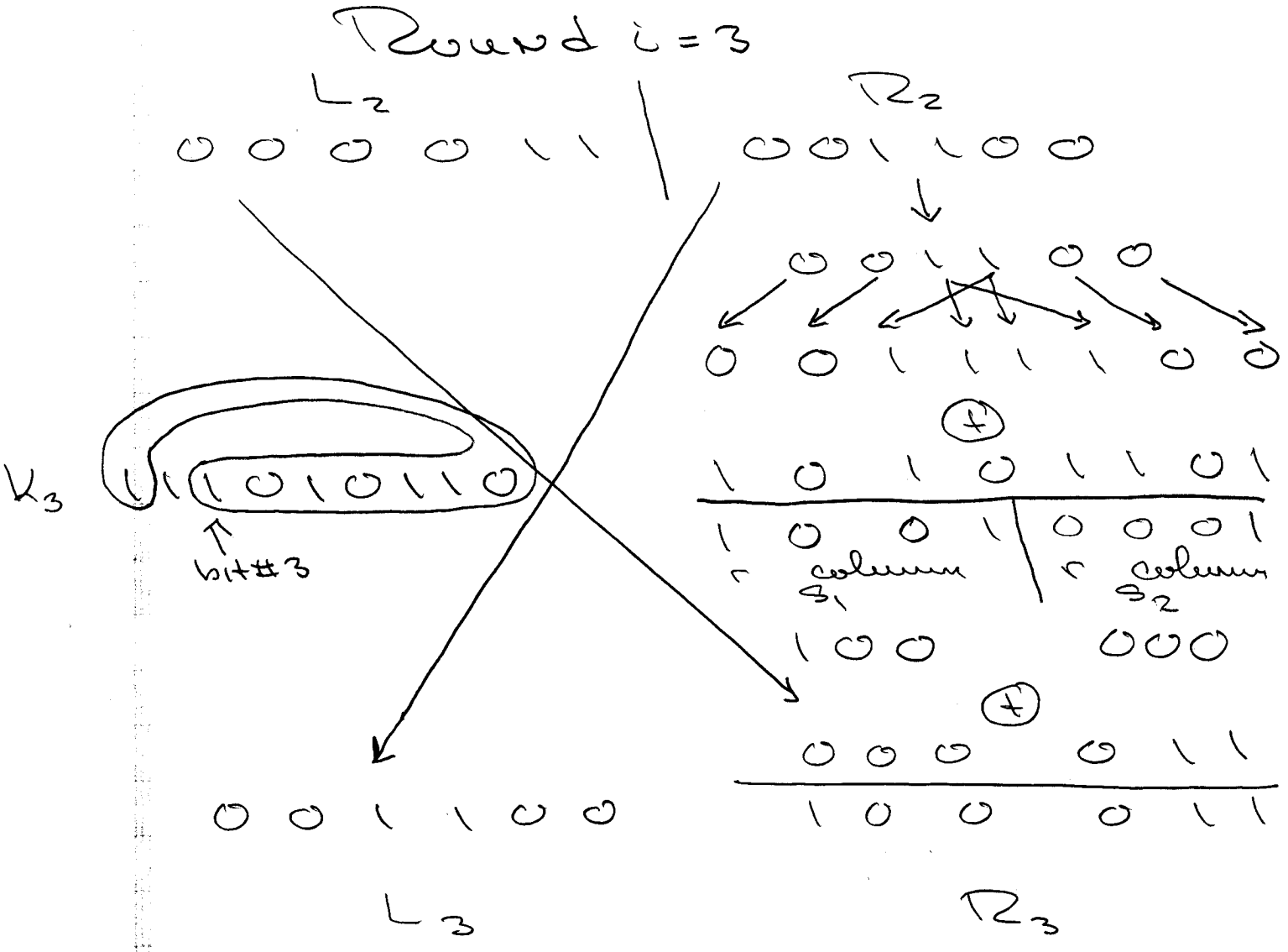


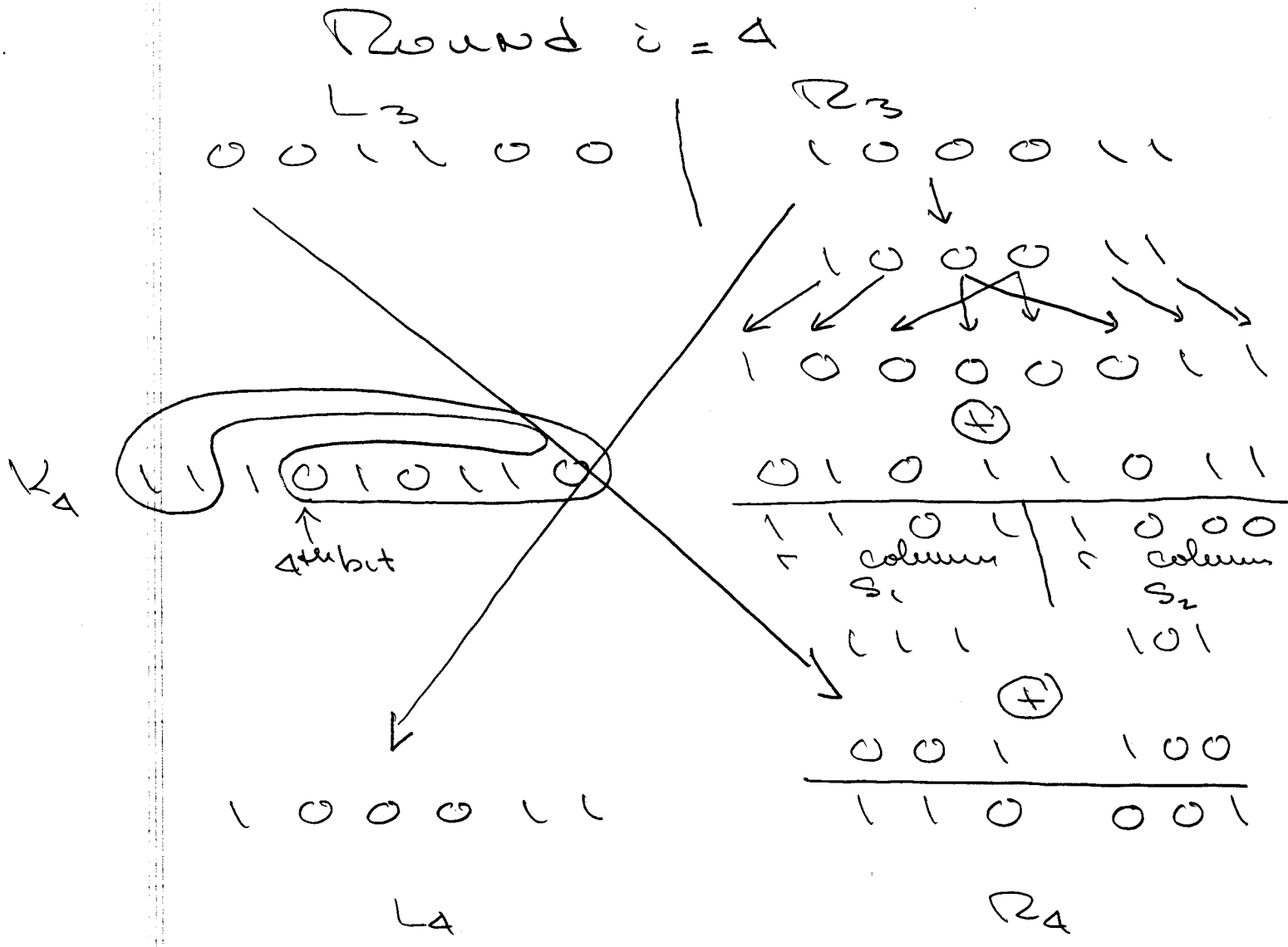
trapp & washington

Now, ... 4 rounds of the trapp-washington Simplified DES-type Algorithm


Round i = 1
9-bit key
K = 1 1 1 0 1 0 1 1 0
12-bit message
L0
R0
1 0 1 1 0 1
1 1 0 1 0 1
EXPAND to 8 bits
1 1 0 1 0 1
1 1 1 0 1 0 0 1
XOR ⊕
take 8 bits
K1
1 1 1 0 1 0 1 1
bit #1
1 1 1 0 1 0 1 1
0 0 0 0 0 0 1 0
← column S1
← column S2
S-boxes
1 0 1
1 1 0
XOR ⊕
1 0 1
1 0 1
1 1 0 1 0 1
0 0 0 0 1 1
L1
R1


Round i=2
L_1
R_1
1 1 0 1 0 1 | 0 0 0 0 1 1
0 0 0 0 1 1
0 0 0 0 0 1 1
K_2
1 1 0 1 0 1 1 0
bit #2
1 1 0 1 | 0 1 0 1
r S_1 column
r S_2 column
1 1 1
0 0 1
1 1 0 1 0 1
0 0 0 0 1 1
0 0 1 1 0 0
L_2
R_2


Round i = 3
L_2
R_2
K_3
bit #3
S_1
S_2
L_3
R_3



12-bit ciphertext 100011110001