$b3 = a3'a2\,a1\,a0 + a3\,a2'a1\,a0$

$b2' = a3'a2'a1'a0 + a3'a2'a1\,a0'$

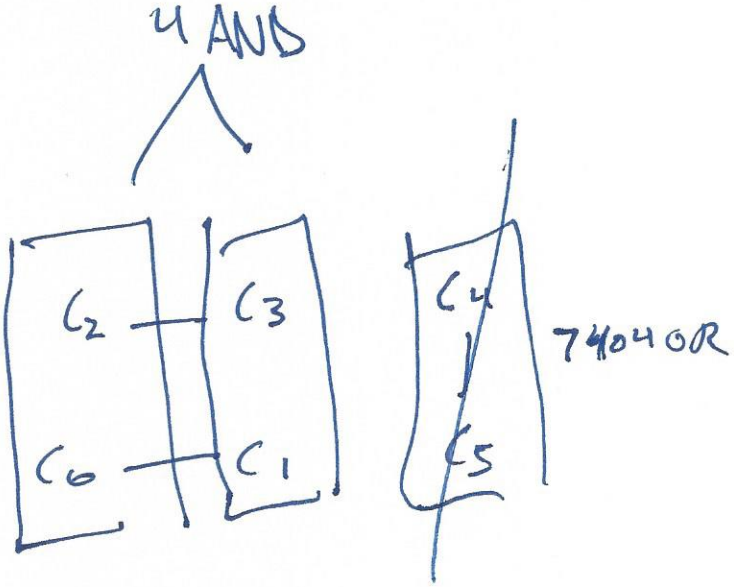
$b0 = c_1 + c_2$

$b1' = a1$

$b1 = a1'$

$c_4 = c_2$

$c_5 = c_1$

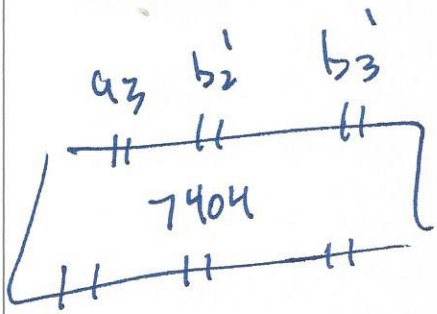


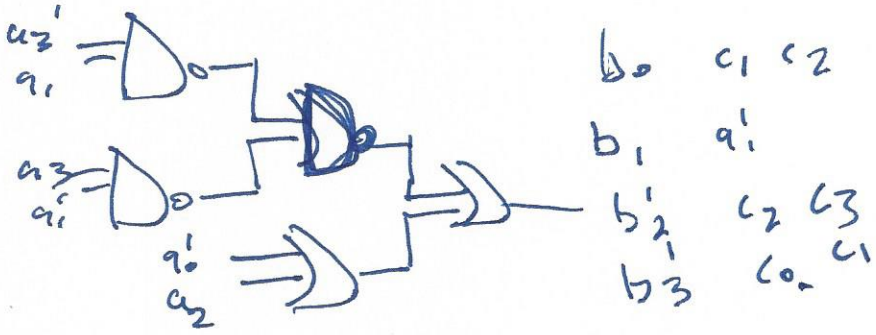
$b0 = a3'a2'a1'a0 + a3\,a2'a1\,a0$

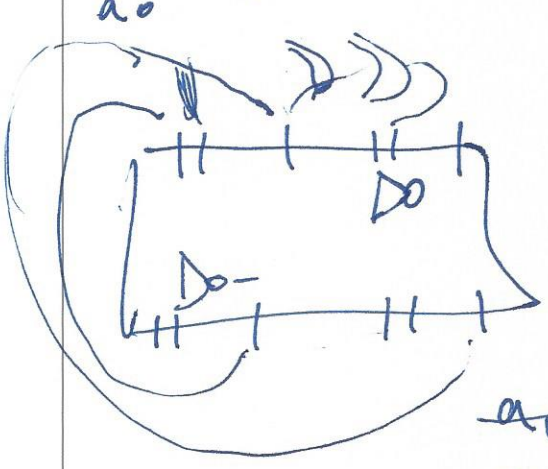
$b0' = a0' + a3'a1 + a2 + a3\,a1'$

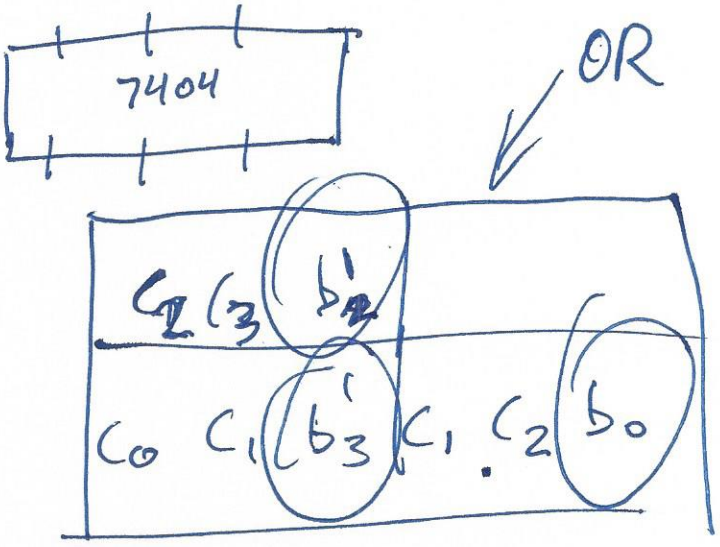
$b0 = a0$

$b0 = b3$?









a_1 a_3

a_0 a_2

b_2 b_1

b_2 b_0

a3	a2	a1	a0	b3	b2	b1	b0	
I1	I0	O1N	O0N	RN	WN	3DIR	3SN	
0	0	0	0	1	1	-	0	MDR TO BUS
0	0	0	1	1	0	1	1	R1 TO MEM
0	0	1	0	1	0	-	0	R0 TO MEM
0	0	1	1	1	1	-	0	DEFAULT (off)
0	1	0	0	1	1	-	0	
0	1	0	1	1	1	-	0	
0	1	1	0	1	1	-	0	
0	1	1	1	0	1	-	0	MEM TO R0
1	0	0	0	1	1	-	0	
1	0	0	1	1	1	-	0	
1	0	1	0	1	1	-	0	
1	0	1	1	0	1	0	1	MEM TO R1
1	1	0	0	1	1	-	0	
1	1	0	1	1	1	-	0	
1	1	1	0	1	1	-	0	
1	1	1	1	1	1	-	0	BUS TO MDR

0000 1110 11-0 10
0001 1011 1011 00
0010 1000 10-0 10
0011 1100 11-0 00
0100 1110 11-0 00
0101 1110 11-0 01
0110 1100 11-0 00
0111 0100 01-0 01
1000 1110 11-0 00
1001 1110 11-0 00
1010 1100 11-0 00
1011 0101 0101 00
1100 1110 11-0 10
1101 1110 11-0 00
1110 1100 11-0 00
1111 1100 11-0 01

0110 0101 0000 0010

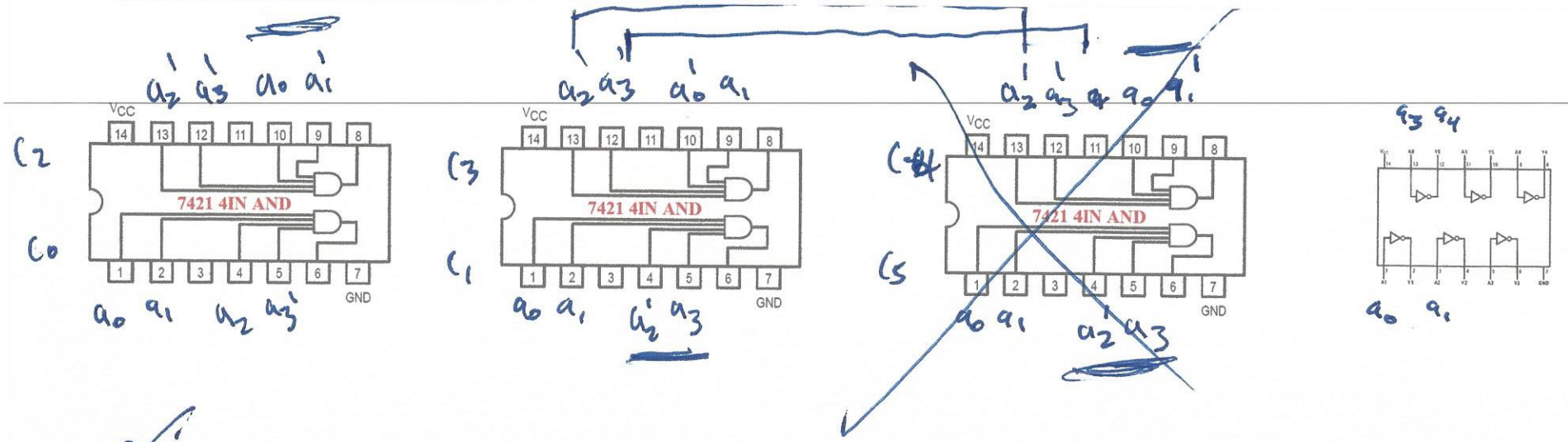
0110 0011 0000 0100 0110

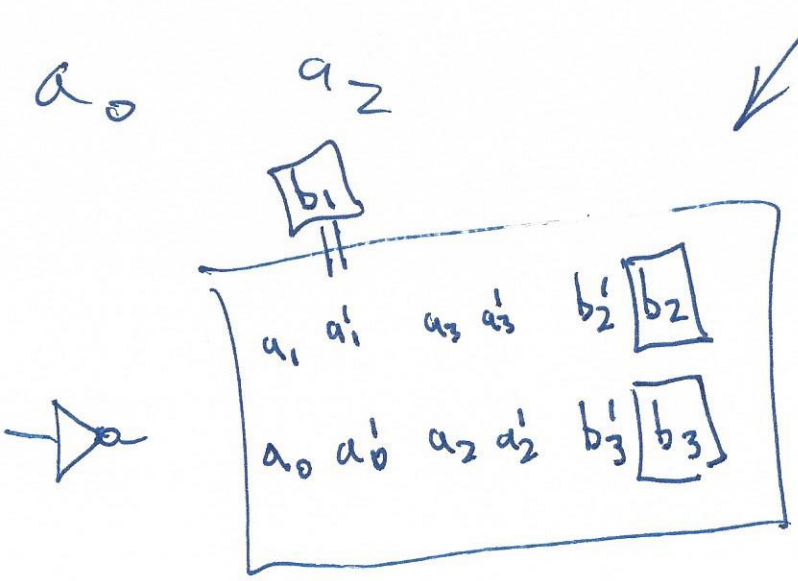
Z 1
3 0

00 11

00 0 1
01 0 1.
10 1 0
11

(10)


Vcc
14 13 12 11 10 9 8
7421 4IN AND
1 2 3 4 5 6 7
GND
Vcc
14 13 12 11 10 9 8
7421 4IN AND
1 2 3 4 5 6 7
GND
Vcc
14 13 12 11 10 9 8
7421 4IN AND
1 2 3 4 5 6 7
GND


Inverter
b1
b2
b3
bo

$b3 = (c2)'(c4)'(c7)'$

3 nand, 1 four and

$b2 = (c0)'(c3)'(c5)'$

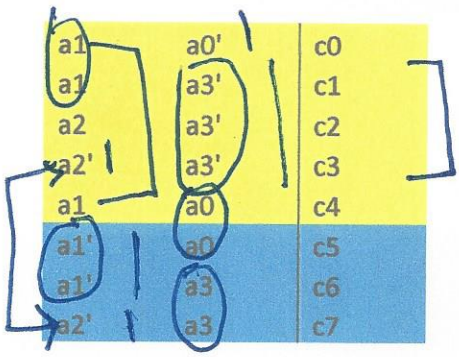
3 nand, 1 four and

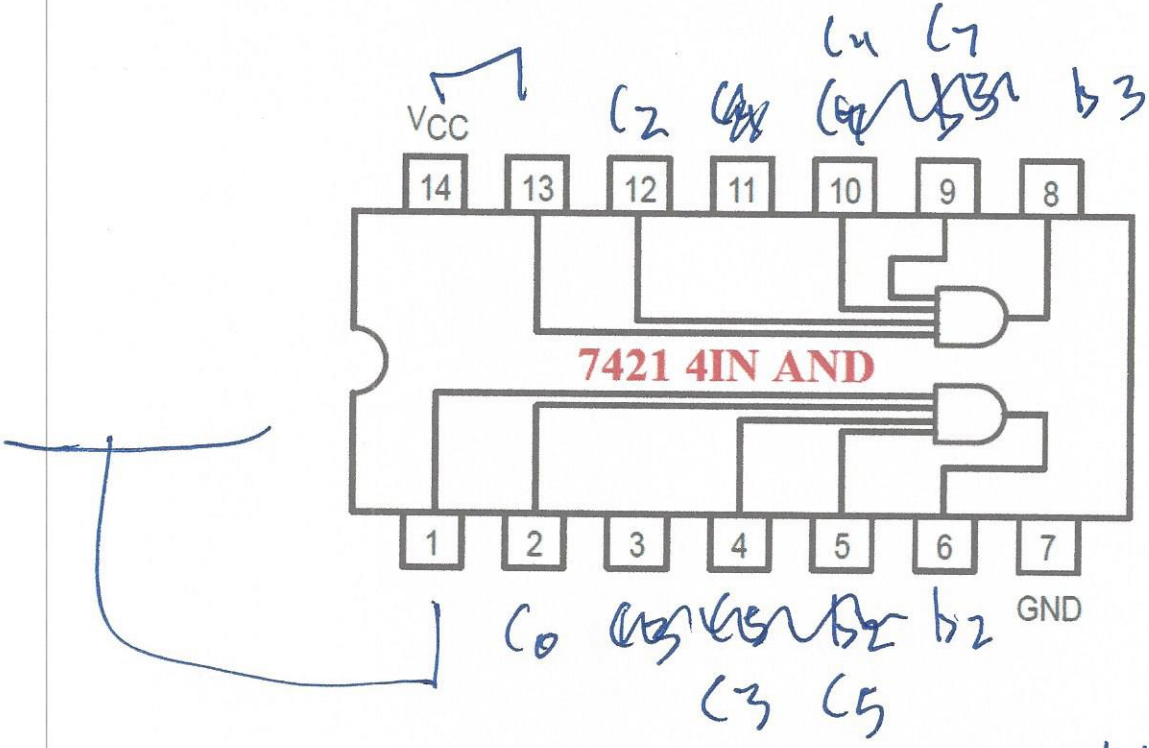
$b1 = (a1')$

$b0 = (a0)\ (a2')\ (c1)'\ (c6)'$

2 nand, 1 four and

inverter

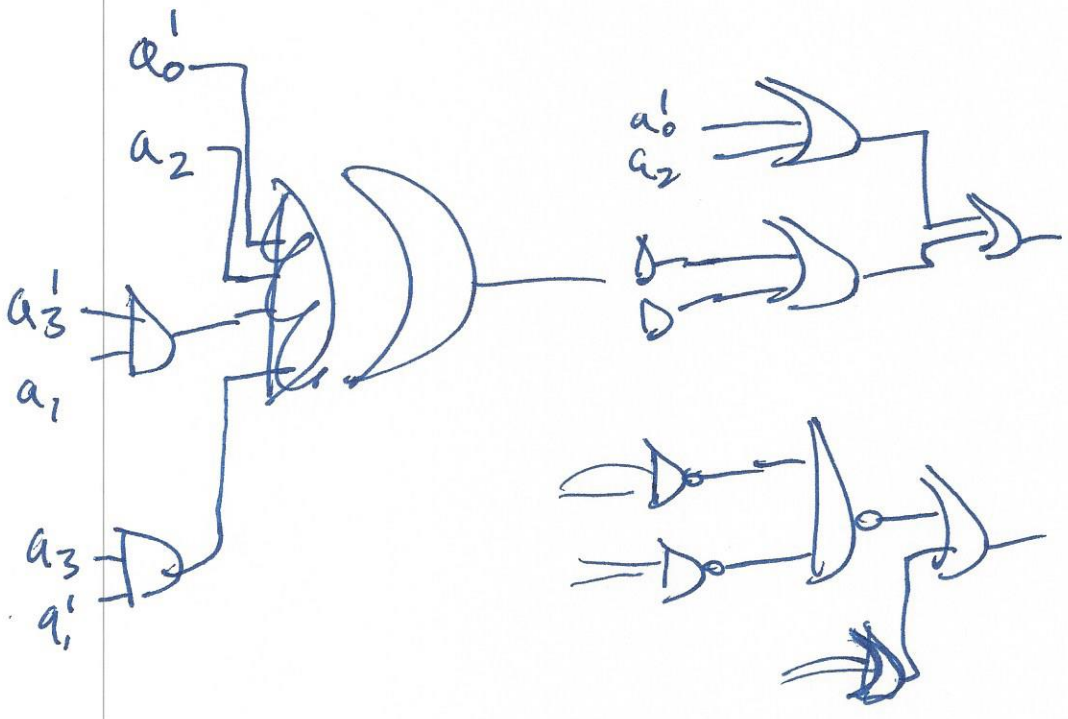


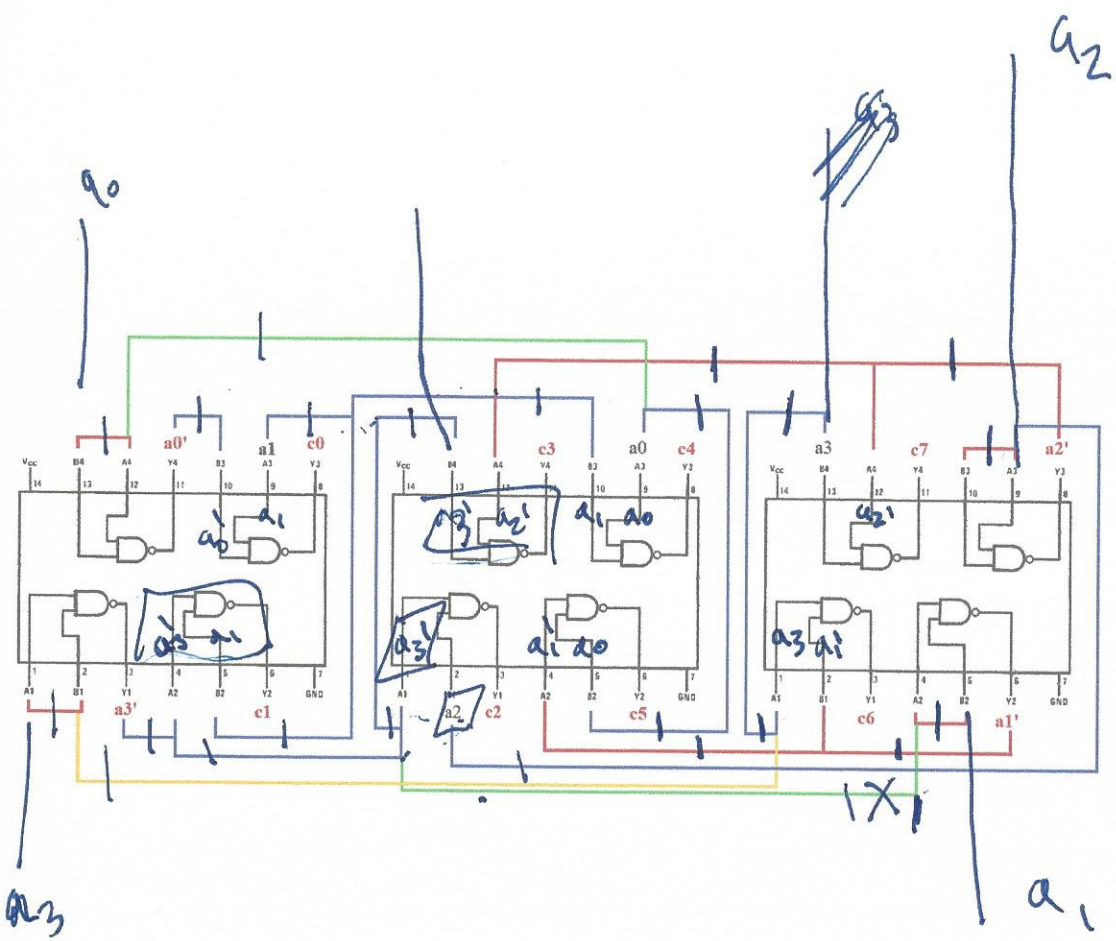


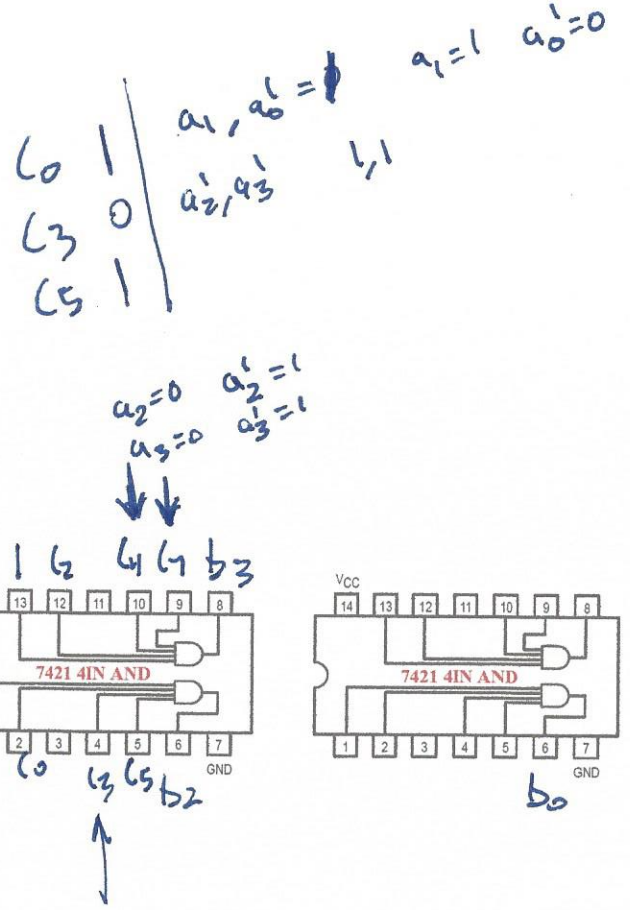
b_3 = $\frac{1}{4}$ inv, 1 and

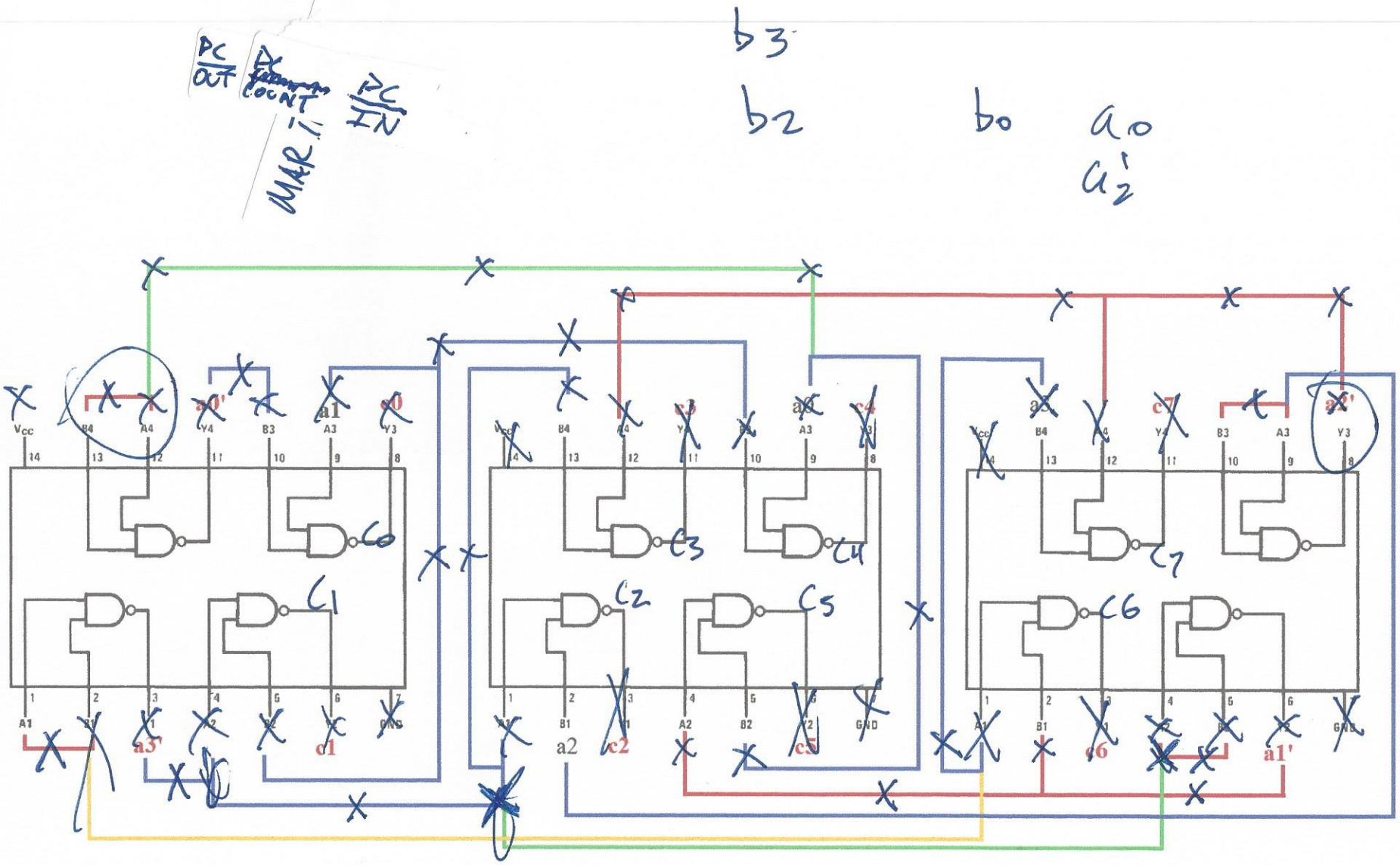
b_2 = " "

b_1 = 1/8 inv




a0'
a1
c0
c3
a0
c4
a3
c7
a2'
a3'
c1
c2
c5
c6
a1'
GND


7421 4IN AND
7421 4IN AND
GND
GND


PC OUT
PC COUNT
PC IN
MAR i:
b3
b2
b0
a0
a2'
Vcc
GND
a0'
a1
c0
a3'
c1
a2
c2
c3
c4
c5
c6
c7
a1'