CSC258 Prelab Six

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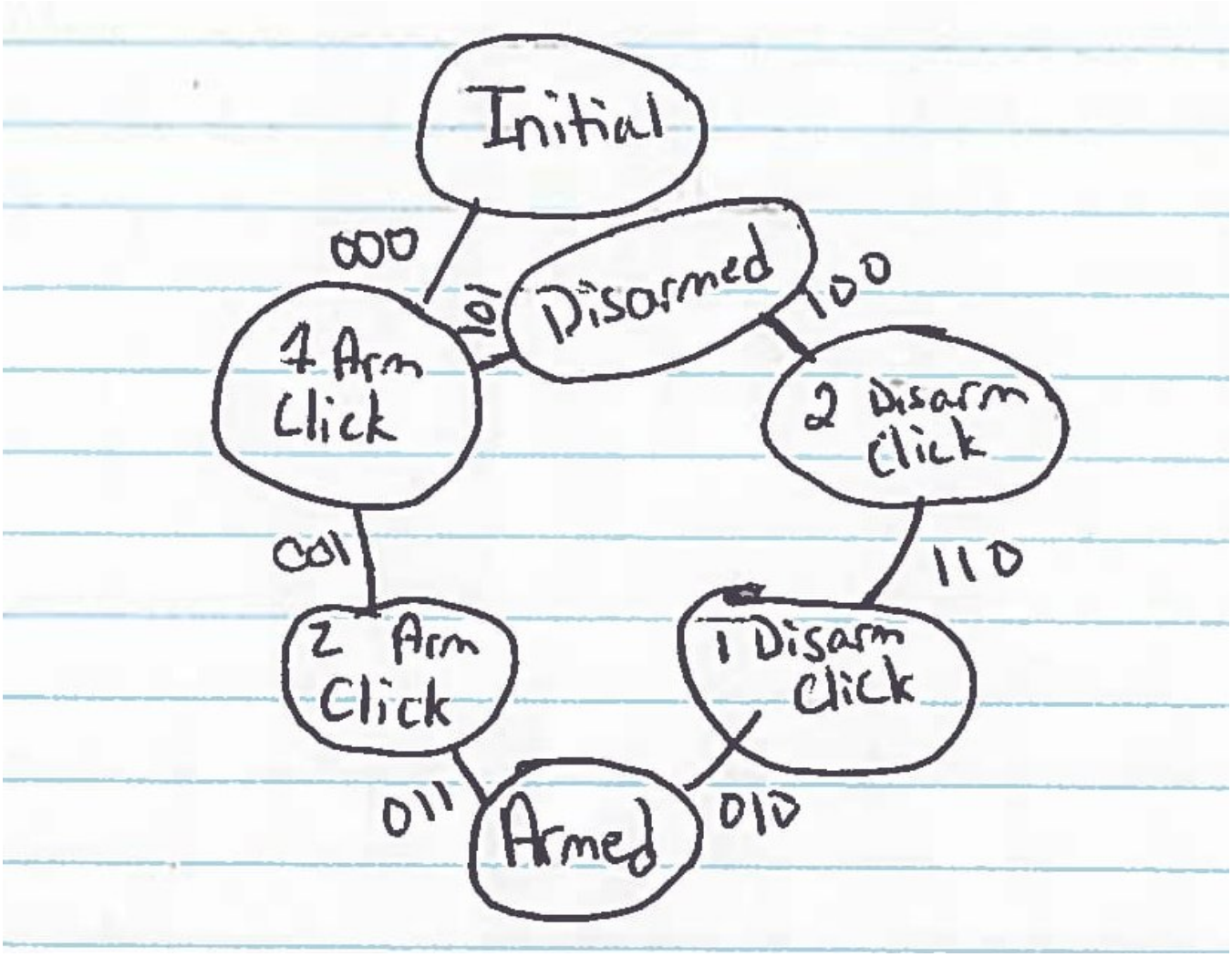
1 States of the circuit

The circuit has the following states:

- 000 (Initial)
- 001 (1 Click - To arm)
- 011 (2 Clicks - To arm)
- 010 (3 Clicks - Armed)
- 110 (1 Click - To disarm)
- 100 (2 Clicks - To disarm)
- 101 (3 Clicks - Disarmed)

2 State transition diagram



3 Number of flip-flops

3 flip-flops are required

4 Values of the flip-flops to avoid intermediate states

- 000
- 001
- 011
- 010
- 110
- 100
- 101

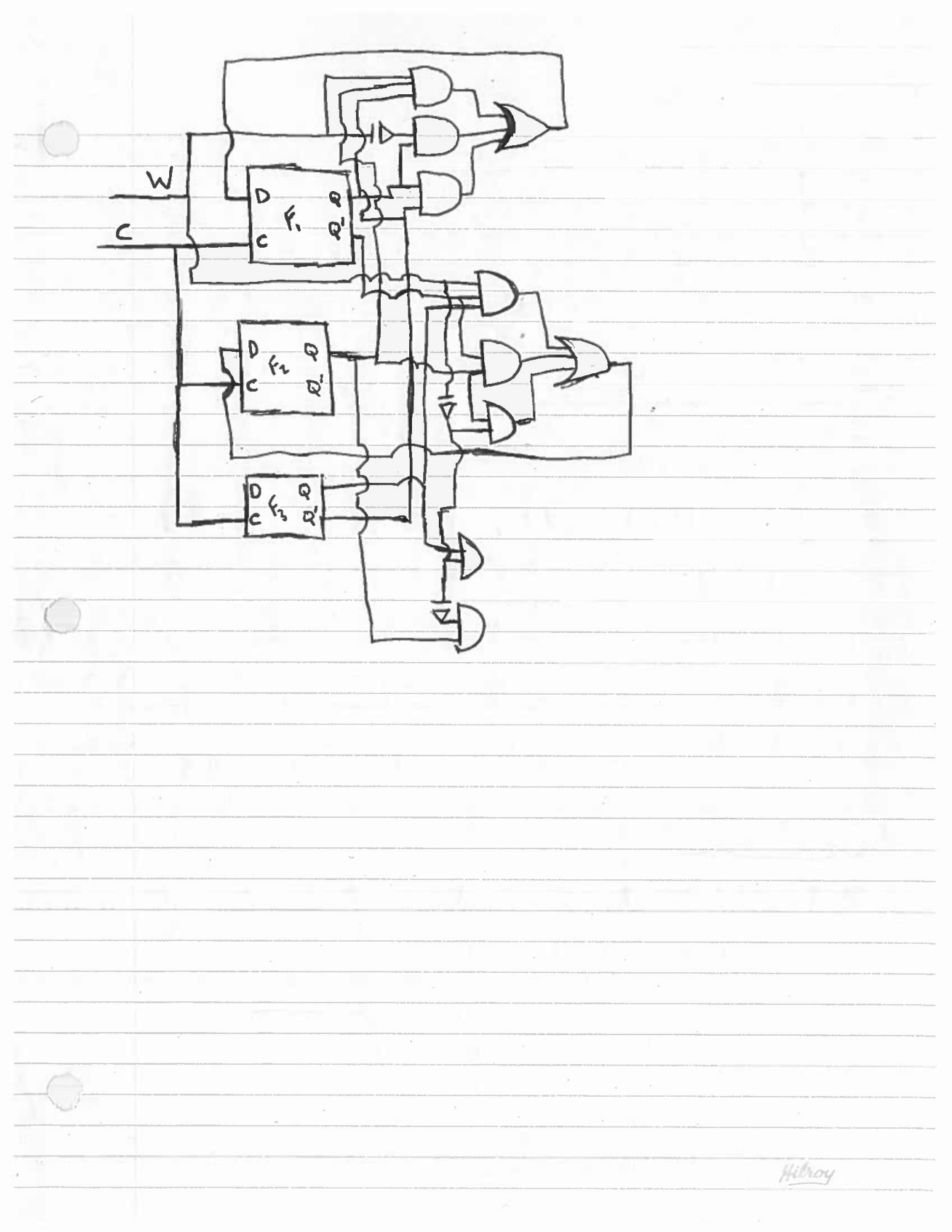
5 State table

F_1	F_2	F_3	W	F_1	F_2	F_3
0	0	0	0	0	0	0
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	1	1
0	1	1	0	0	1	1
0	1	1	1	0	1	0
0	1	0	0	0	1	0
0	1	0	1	1	1	0
1	1	0	0	1	1	0
1	1	0	1	1	0	0
1	0	0	0	1	0	0
1	0	0	1	1	0	1
1	0	1	0	1	0	1
1	0	1	1	0	0	1

6 Combinational Logic

F_1: $F_1 \cdot \overline{F_3} + F_1 \cdot \overline{W} + W \cdot F_0 \cdot \overline{F_3}$
F_2: $\overline{F_1} \cdot F_3 \cdot W + \overline{F_1} \cdot F_2 + F_2 \cdot \$\overline{W}\$$
F_3: $F_3 \cdot \overline{W} + \overline{F_2} \cdot W$

7 Flip-flop circuit diagram



8 State Values

- State 010 is the armed state
- State 101 is the disarmed state

9 Output logic statements

Armed: $\overline{F_1}\cdot \mathrm{F}_2 \cdot \overline{F_3}$
$Disarmed : F_1 \cdot \overline{F_2} \cdot \mathrm{F}_3$

10 Modified circuit diagram