

THE UNIVERSITY OF CHICAGO

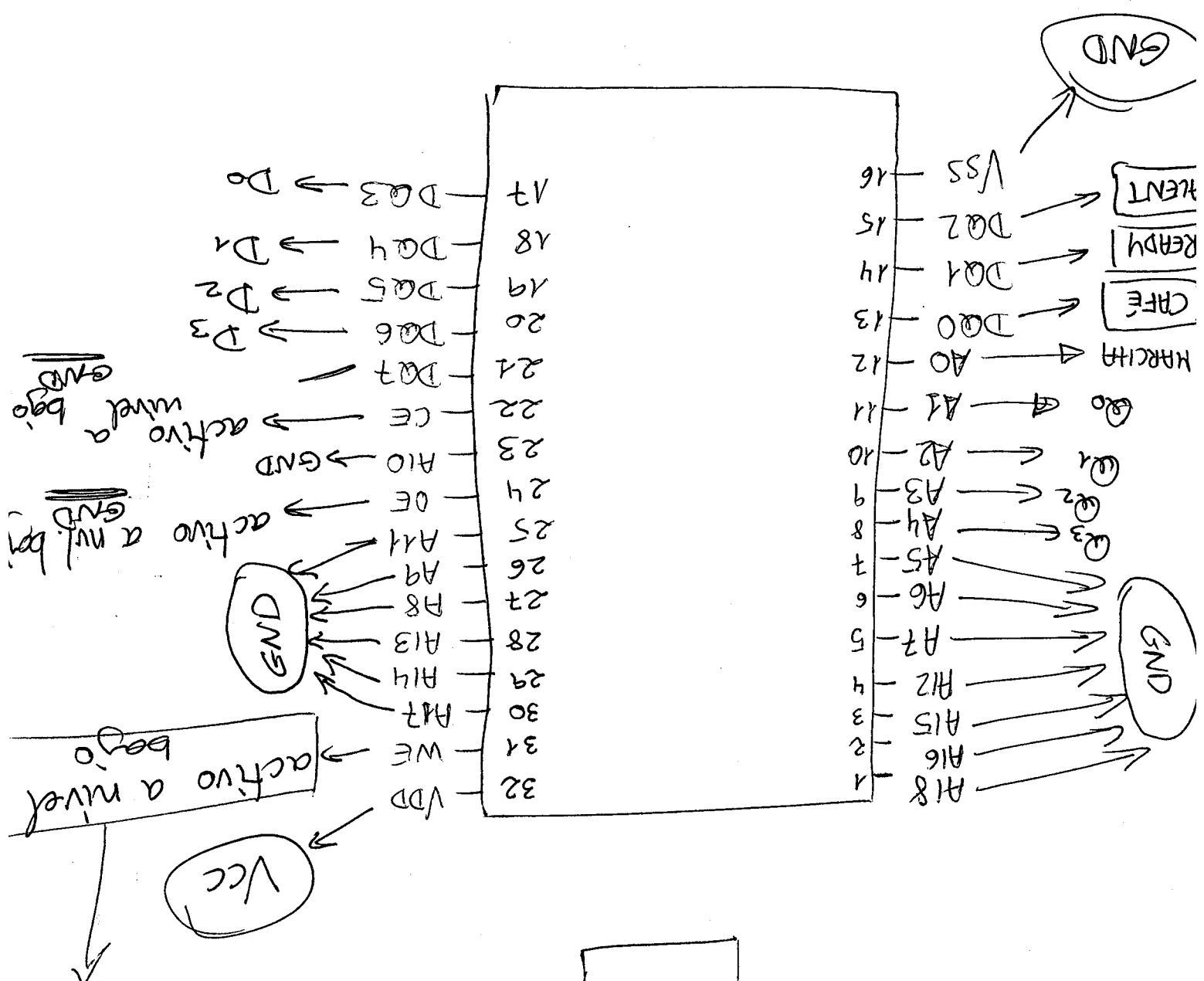
PHILIP H. KATZ

1955

1956

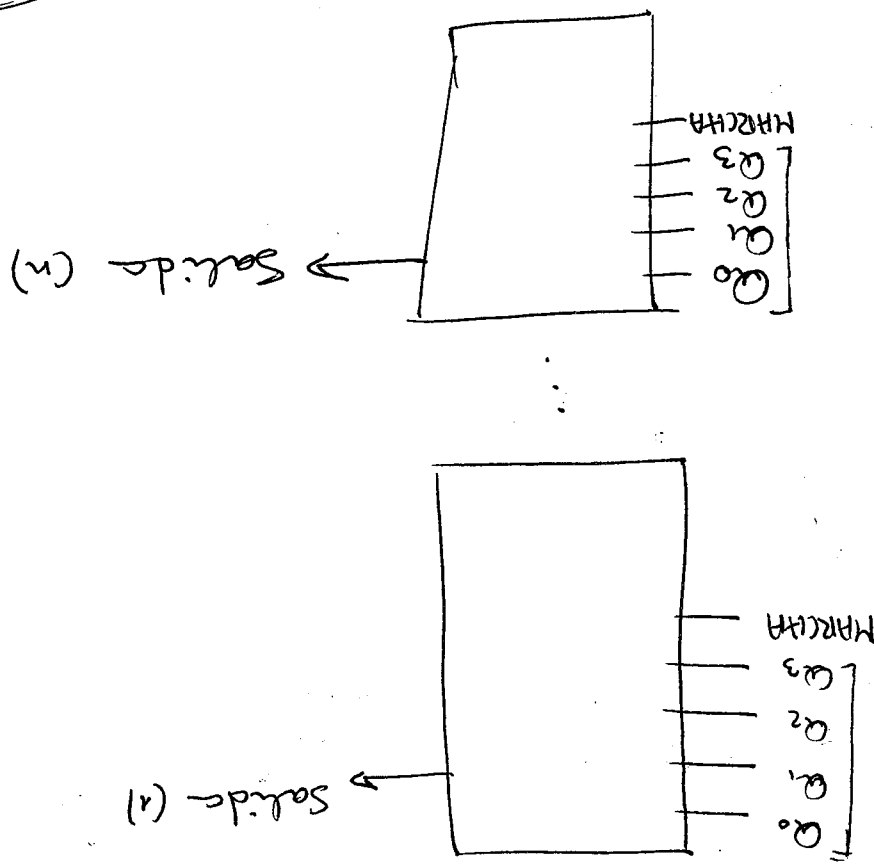
1957

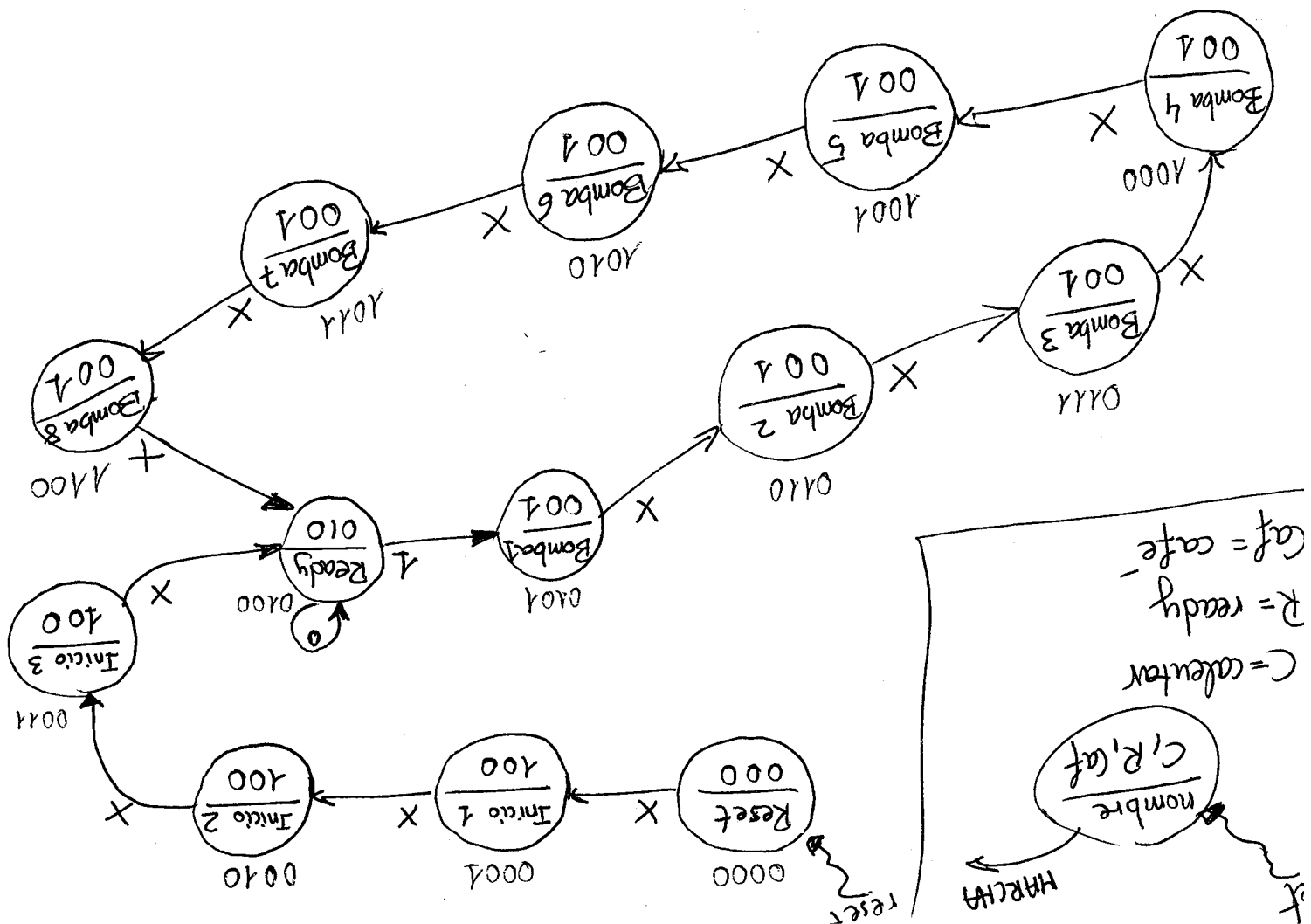
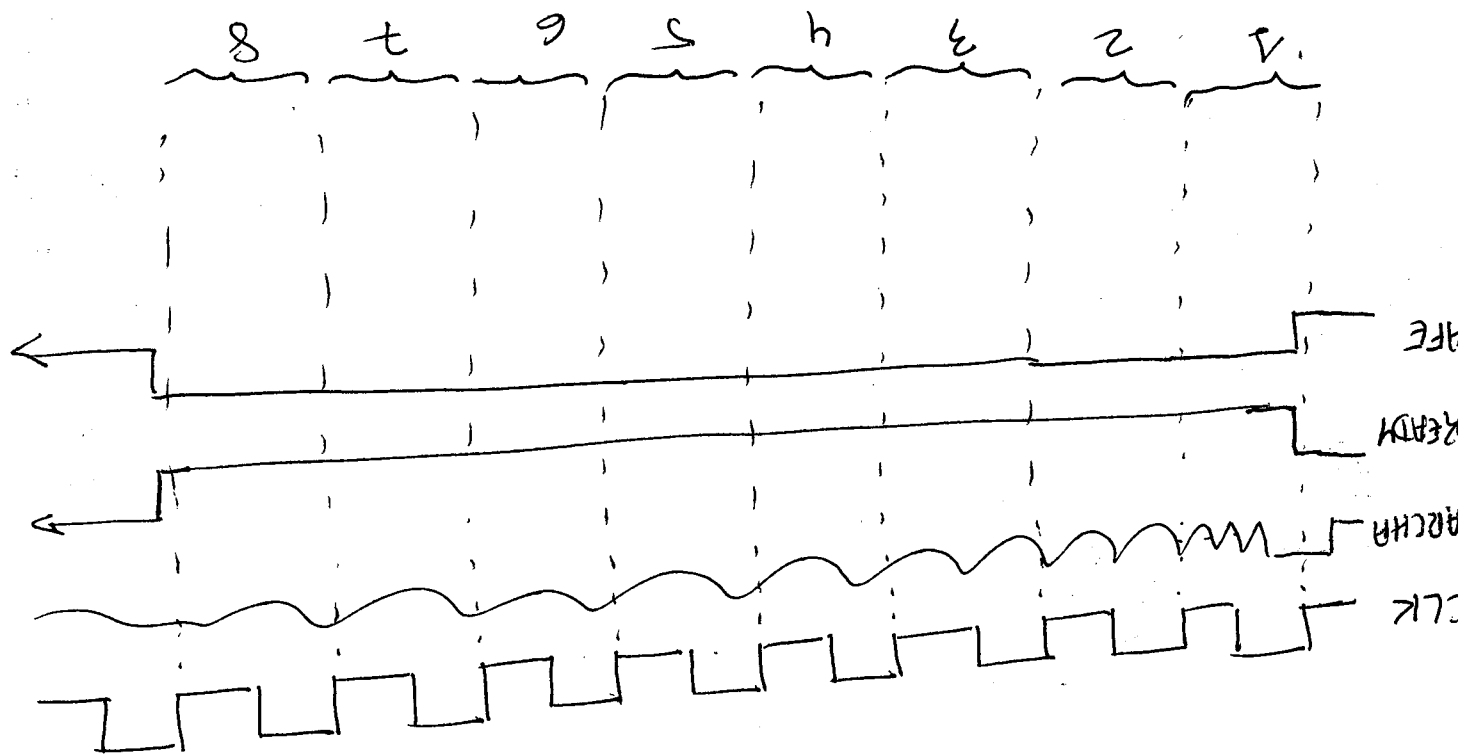
1958



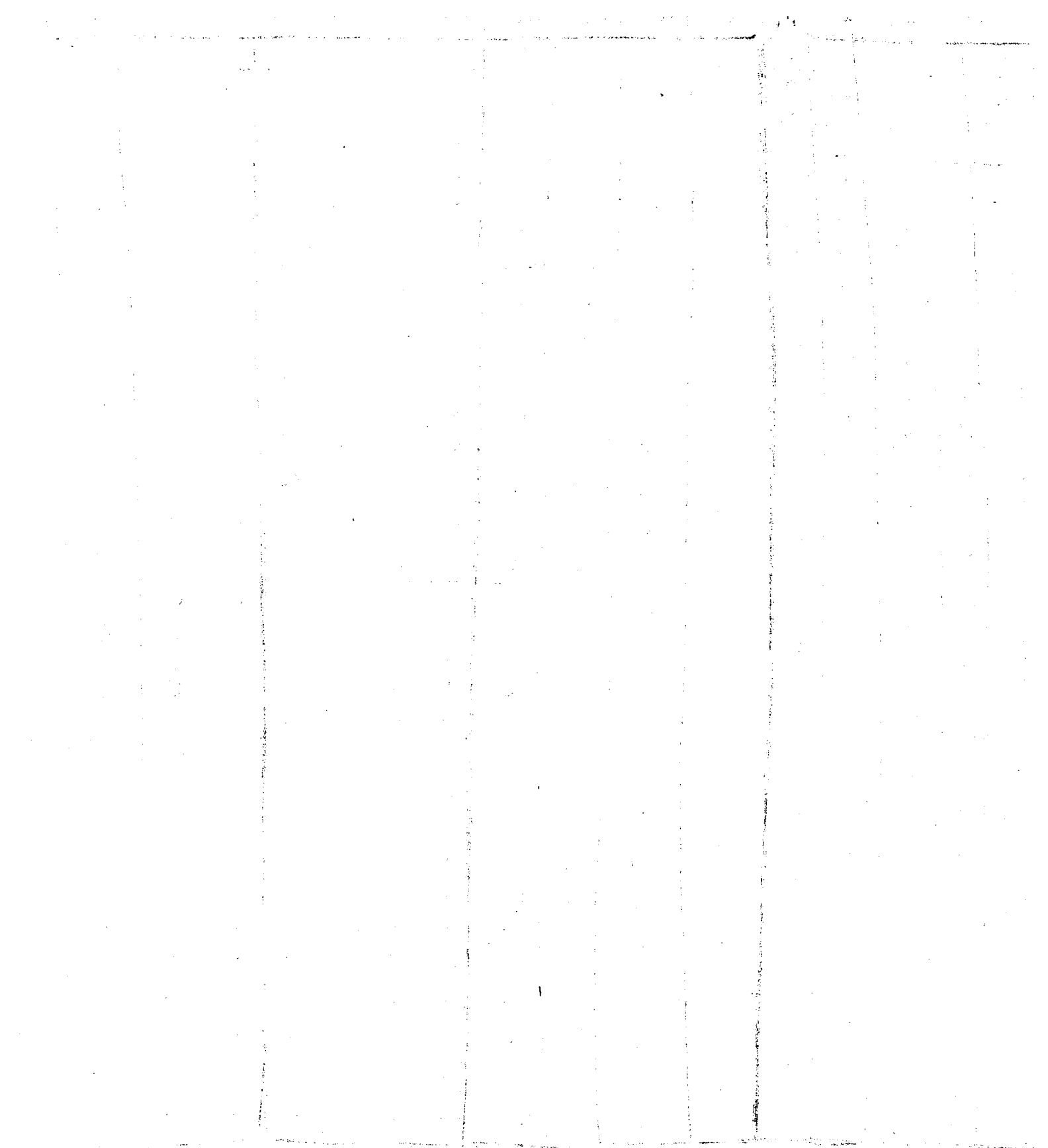
POWER A UNO

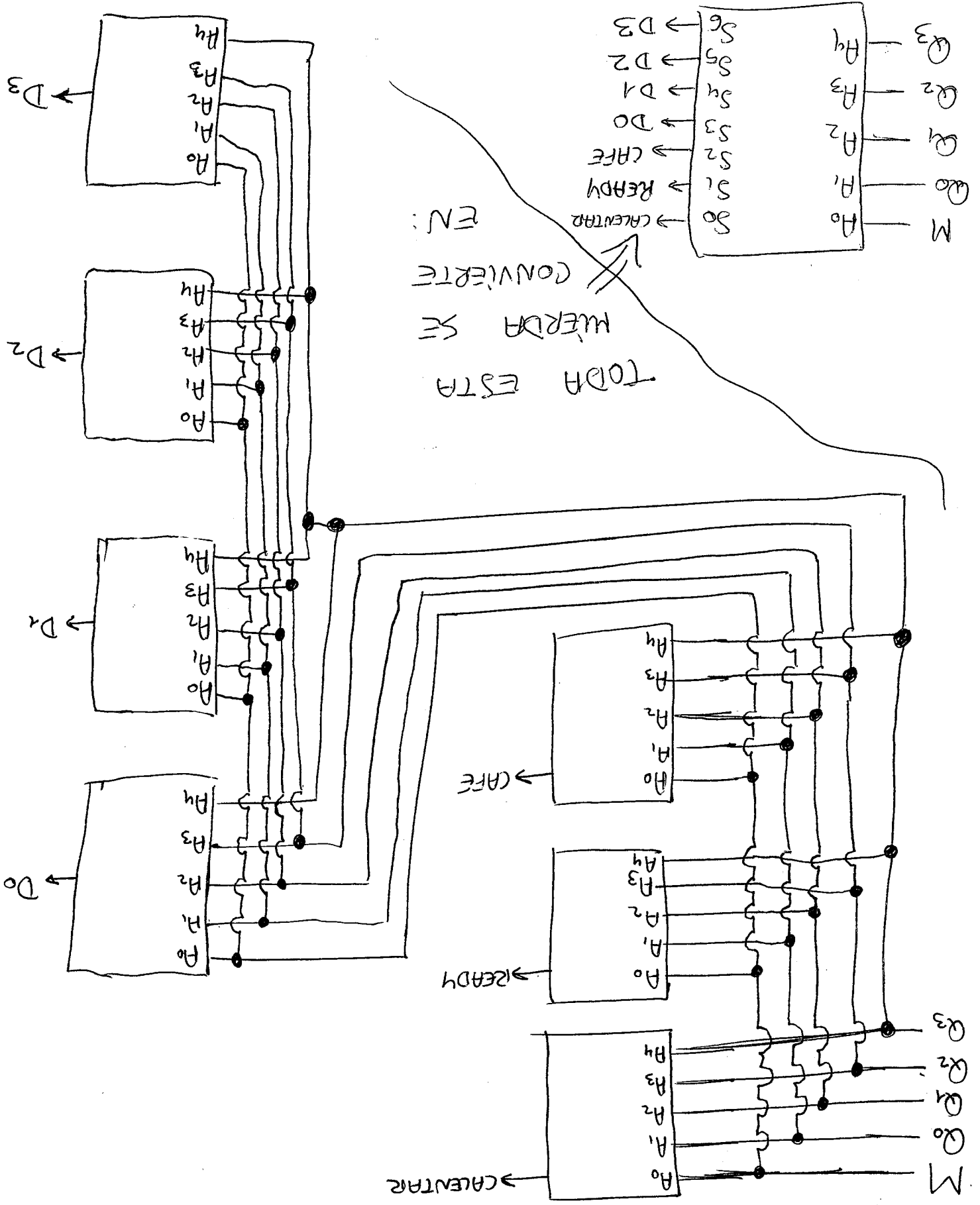
1ª CONEXIÓN MONTAJE

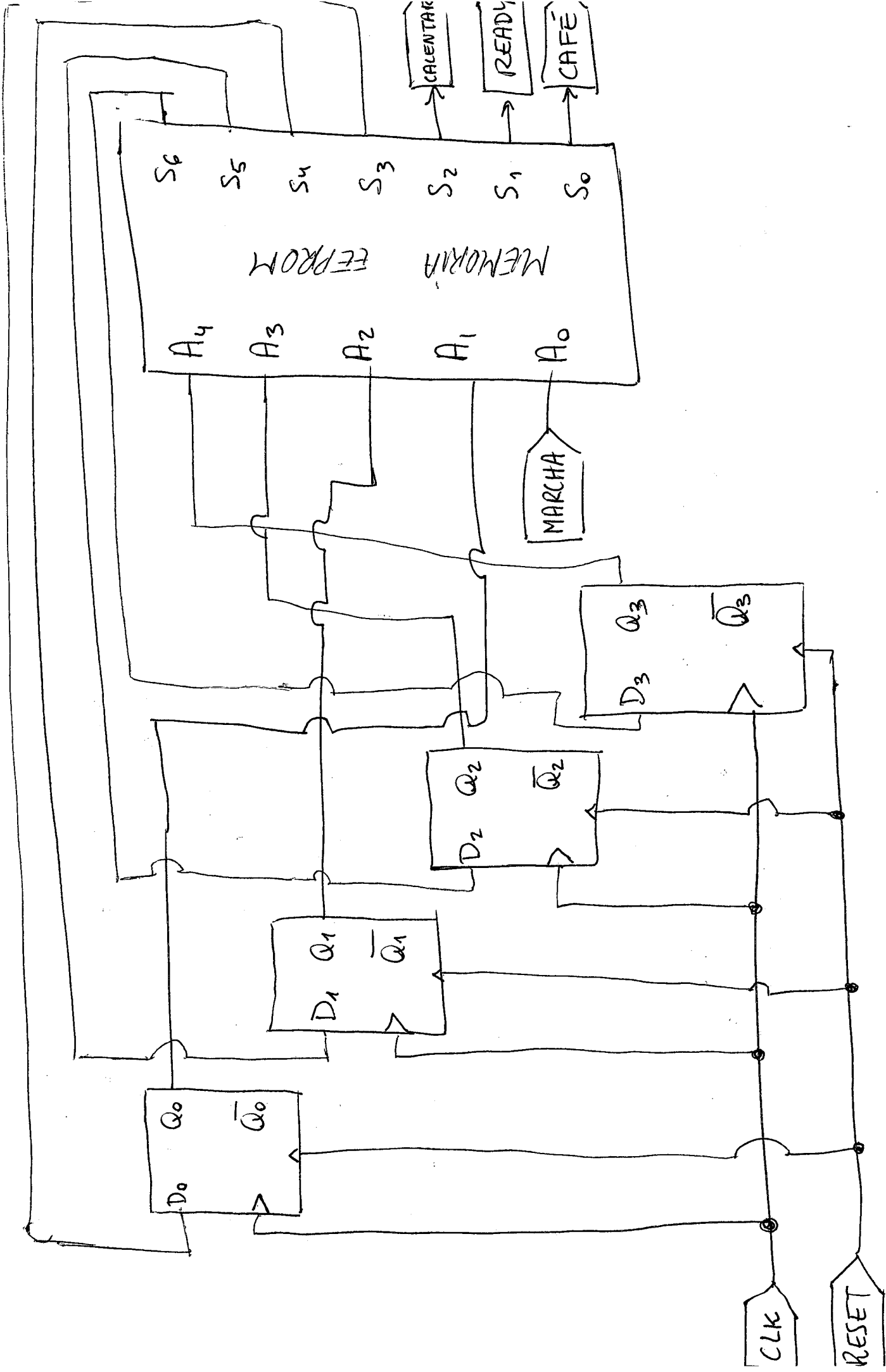




[illegible]









$D_2$

$Q_2 Q_1$	$Q_0 X$	00	01	11	10
00				1	1
01				1	1
11		1	1	1	
10		1	1	1	

$$D_2 = Q_2 + Q_1 Q_0$$

$D_1$

$Q_2 Q_1$	$Q_0 X$	00	01	11	10
00		1	X		
01		1	X		
11		1		X	
10		1		X	

$$D_1 = \bar{Q}_2 \bar{Q}_1 Q_0 + Q_1 \bar{Q}_0$$

$D_0$

$Q_2 Q_1$	$Q_0 X$	00	01	11	10
00		1	1	X	
01		1	1	X	1
11				X	1
10				X	

$$D_0 = \bar{Q}_2 \bar{Q}_0 + Q_2 X$$

$$a \oplus b = \bar{a}b + a\bar{b}$$

~~$6 \times 4 = 24$~~   
 ~~$3 + 2 = 5$~~   
 ~~$10 \times 5 = 100$~~

Calendar

$Q_2 Q_1$ $Q_0 X$	00	01	11	10
00		1	X	
01		1	X	
11	1	1	X	
10	1	1	X	

$$\text{Calendar} = \cancel{Q_0} Q_1 + Q_0 \overline{Q_2}$$

Ready

$Q_2 Q_1$ $Q_0 X$	00	01	11	10
00			X	1
01			X	1
11			X	
10			X	

$$\text{Ready} = Q_2 \overline{Q_0}$$

Cafe'

$Q_2 Q_1$ $Q_0 X$	00	01	11	10
00			X	
01			X	
11			X	1
10			X	1

$$\text{Cafe}' = Q_2 Q_0$$



1	0	0	0	1
↓ 2	0	0	1	0
↓ 3	0	0	1	1
↓ 4	0	1	0	0
↓ 5	0	1	0	1
↓ 6	0	1	1	0
↓ 7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

---

1 memoria

1 contador

4 FF's tipo D

8 OR2

$$Q_2 Q_1$$

$$Q_0 M$$

	00	01	11	10
00				
01				
11				
10				

$Q_3 = 0$

$$Q_2 Q_1$$

$$Q_0 M$$

	00	01	11	10
00				
01				
11				
10				

$Q_3 = 1$

Calent

$$Q_2 Q_1$$

$$Q_0 M$$

	00	01	11	10
00				
01				
11				
10				

$Q_3 = 0$

$$Q_2 Q_1$$

$$Q_0 M$$

	00	01	11	10
00				
01				
11				
10				

$Q_3 = 1$

Ready

$$Q_2 Q_1$$

$$Q_0 M$$

	00	01	11	10
00				
01				
11				
10				

$Q_3 = 0$

$$Q_2 Q_1$$

$$Q_0 M$$

	00	01	11	10
00				
01				
11				
10				

$Q_3 = 1$

Cafe

$Q_0 M$

	00	01	11	10
00				
01				
11			1	
10			1	

$Q_3 = 0$

$D_3$

$Q_0 M$

	00	01	11	10
00	1	1	X	
01	1	1	X	
11	1	1	X	X
10	1	1	X	X

$Q_3 = 1$

$$D_3 = Q_3 \bar{Q}_2 + Q_2 Q_1 Q_0 \quad \checkmark$$

$Q_2 Q_1$

$Q_0 M$

	00	01	11	10
00			1	1
01			1	1
11	1			1
10	1			1

$Q_3 = 0$

$D_2$

$Q_2 Q_1$

$Q_0 M$

	00	01	11	10
00			X	1
01			X	1
11	1	X	X	X
10	1	X	X	X

$Q_3 = 1$

$$D_2 = Q_2 \bar{Q}_0 + \bar{Q}_2 Q_1 Q_0 + Q_2 \bar{Q}_1 \quad \checkmark$$

$Q_2 Q_1$

$Q_0 M$

	00	01	11	10
00			1	1
01			1	1
11	1			1
10	1			1

$Q_3 = 0$

$D_1$

$Q_2 Q_1$

$Q_0 M$

	00	01	11	10
00		1	X	
01		1	X	
11	1		X	X
10	1		X	X

$Q_3 = 1$

$$D_1 = Q_1 \bar{Q}_0 + \bar{Q}_1 Q_0 = Q_1 \oplus Q_0 \quad \checkmark$$

$Q_2 Q_1$

$Q_0 M$

	00	01	11	10
00	1	1	1	
01	1	1	1	1
11				
10				

$Q_3 = 0$

$D_0$

$Q_2 Q_1$

$Q_0 M$

	00	01	11	10
00	1	1	X	
01	1	1	X	
11			X	X
10			X	X

$Q_3 = 1$

$$D_0 = \bar{Q}_2 \bar{Q}_0 + Q_1 \bar{Q}_0 + \bar{Q}_3 \bar{Q}_0 M \quad \checkmark$$

$D_2$

$Q_2 Q_1$ $Q_0 X$	00	01	11	10
00	0	0	X	1
01	0	0	X	1
11	0	1	X	1
10	0	1	X	1

$$D_2 = Q_2 + Q_1 Q_0$$

$D_1$

$Q_2 Q_1$ $Q_0 M$	00	01	11	10
00	0	1	X	0
01	0	1	X	0
11	1	0	X	0
10	1	0	X	0

$$D_1 = \bar{Q}_2 \bar{Q}_1 Q_0 + Q_1 \bar{Q}_0$$

$D_0$

$Q_2 Q_1$ $Q_0 X$	00	01	11	10
00	1	1	X	
01	1	1	X	1
11			X	1
10			X	

$$D_0 = \bar{Q}_2 \bar{Q}_0 + Q_2 X$$

$\text{Calentar}$

$Q_2 Q_1$ $Q_0 X$	00	01	11	10
00	0	1	X	0
01	0	1	X	0
11	1	1	X	0
10	1	1	X	0

$$\text{Calentar} = Q_1 + Q_0 \bar{Q}_2$$

$\text{Ready}$

$Q_2 Q_1$ $Q_0 X$	00	01	11	10
00			X	1
01			X	1
11			X	
10			X	

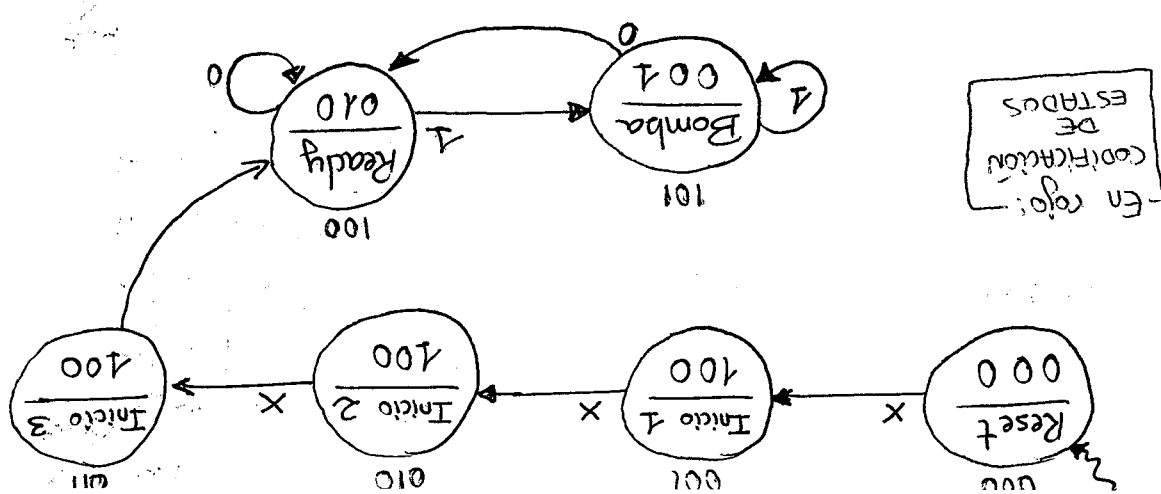
$$\text{Ready} = Q_2 \bar{Q}_0$$

$\text{Café}$

$Q_2 Q_1$ $Q_0 X$	00	01	11	10
00			X	
01			X	
11			X	1
10			X	1

$$\text{Café} = Q_2 Q_0$$

ESTADO ACTUAL			ENTRADA SISTEMA			ESTADO SIGUIENTE			EVALUACIONES DE ESTADO DE LOS FF's			SALIDAS SISTEMA		
Q <sub>2</sub>	Q <sub>1</sub>	Q <sub>0</sub>	M	Q <sub>2</sub> <sup>+</sup>	Q <sub>1</sub> <sup>+</sup>	Q <sub>0</sub> <sup>+</sup>	D <sub>2</sub>	D <sub>1</sub>	D <sub>0</sub>	C	R	Caf		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
0	0	0	0	0	0	0	0	0	0	0	0	0	0	14



En rojo: CODIFICACION DE ESTADOS  
 nombre estado / C, R, Caf  
 MARCHA  
 reset  
 (=calentar)  
 R = ready  
 Caf = cafe