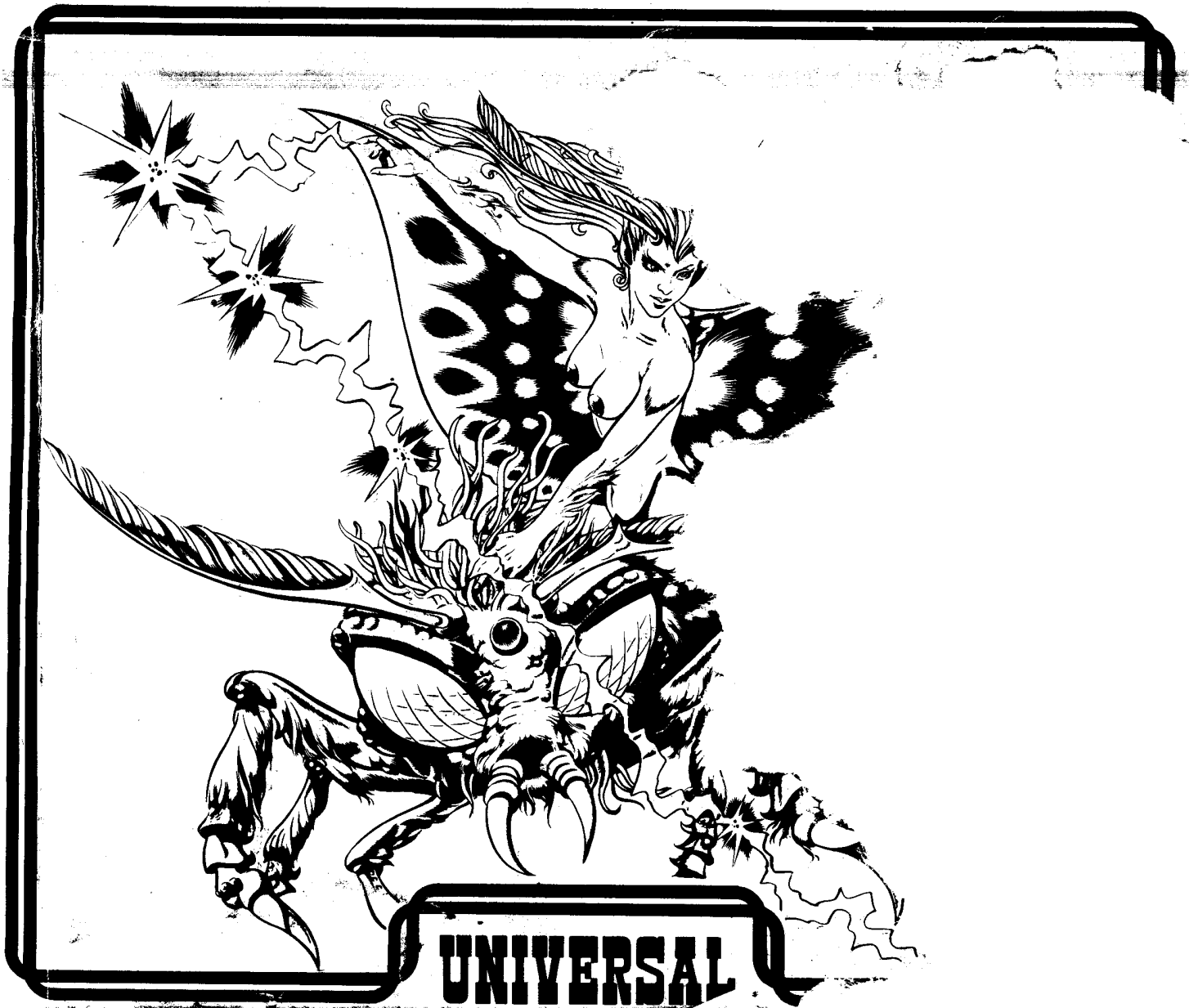


Magical SPOT

Operation, Maintenance
and Service Manual



III. HOW TO PLAY

1. By working the lever move the laser ship and shoot down the larvae dropping from the UFO.
When hit the first time, the larvae change color and slow down. They are destroyed when hit the second time.
You can also shoot down the grubs dropping from the UFO.
2. When the larvae reach the lowest stage, they creep under the ground one after another and change into cocoons. At this time, the cocoons do not fire a gun however, if the cocoons run into the laser ship the ship will explode.
3. As it becomes increasingly difficult to dodge the enemy's attack, the cocoons accumulate under the base. When 7 cocoons accumulate, they fly up and split on the screen changing into 7 Ultramoths which strongly assault your laser ship.
The Ultramoths make a frontal attack at your laser ship in a line of 7, and dash against it in the second round.
4. If you dodge the enemy's attack so that the number of cocoons grown is kept under 6, or if you destroy all of the 7 Ultramoths and clear the screen, your rank rises.
Each time when 2 ranks (Ranks 1 and 2, Ranks 3 and 4, Ranks 5 and 6, and so on) are raised, the screen color changes and the entire enemy nest' level drops one by one. At Ranks 11 and 12 the enemy reaches very close to your laser ship.
From Rank 13 on, their nest level returns to the Rank 1 position.
5. Scoring 5,000 points awards another laser ship (the number of points can be changed by using dip switches). When all the laser ships are destroyed, the game is over.

Score

Grubs dropping from the UFO	60
Hit the 1st time (color changes)	13
Hit the 2nd time (explodes)	32
Ultramothe (imago)	50 - 90

IV. VARIOUS OPTIONAL SETTINGS (1-way, 2-way common version)

A. POSITIONS OF DIP SWITCHES

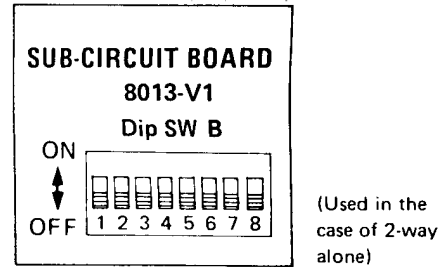
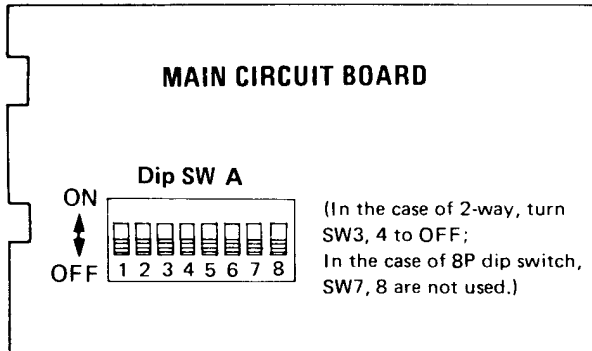


Fig. 1 Positions of Dip Switches

B. SETTING THE OPTION (DIP SWITCHES)

[Dip Switches A]

1. Change-over setting of the mode of game (SW1)

Style	SW1
Table	OFF
Upright	ON

2. Setting the number of LASER SHIPS for game (SW2)

Number of LASER SHIPS	SW2
2 Ships	ON
3 Ships	OFF

(Set at 3 ships when shipped)

3. Setting the game charge (Coin & Credit) (SW3, 4)

Coin, Credit	SW3	SW4
1 Coin 1 Credit	ON	ON
1 Coin 2 Credits	OFF	ON
2 Coins 1 Credit	ON	OFF
Set by using Dip SW B for 2-way chute	OFF	OFF

4. Setting the required score for an additional LASER SHIP (SW5, 6)

Score for Extra	SW5	SW6
2000 points	ON	OFF
3000 points	OFF	ON
5000 points	OFF	OFF
No extra	ON	ON

(Set at 5000 points when shipped)

[Dip Switches B]

* Used in the case of 2-way chute alone. At that time, be sure to turn SW3, 4 of Dip Switches A to OFF.

a. Right chute (SW1, 2, 3, 4)

Coin	Credit	SW1	SW2	SW3	SW4
1	1	OFF	OFF	OFF	OFF
1	2	OFF	OFF	OFF	ON
1	3	OFF	OFF	ON	OFF
1	4	OFF	OFF	ON	ON
1	5	OFF	ON	OFF	OFF
2	1	OFF	ON	OFF	ON
2	2	OFF	ON	ON	OFF
2	3	OFF	ON	ON	ON
3	1	ON	OFF	OFF	OFF
3	2	ON	OFF	OFF	ON
3	3	ON	OFF	ON	OFF
3	4	ON	OFF	ON	ON
4	1	ON	ON	OFF	OFF
4	2	ON	ON	OFF	ON
4	3	ON	ON	ON	OFF
4	4	ON	ON	ON	ON

b. Left chute (SW5, 6, 7, 8)

Coin	Credit	SW5	SW6	SW7	SW8
1	1	OFF	OFF	OFF	OFF (Outside)
1	2	OFF	OFF	OFF	
1	3	OFF	OFF	ON	
1	4	OFF	OFF	ON	
1	5	OFF	ON	OFF	
2	1	OFF	ON	OFF	
2	2	OFF	ON	ON	
2	3	OFF	ON	ON	
3	1	ON	OFF		
3	2	ON	OFF		
3	3	ON	OFF		
3	4	ON	OFF		
4	1	ON	ON	OFF	ON
4	2	ON	ON	OFF	ON
4	3	ON	ON	ON	OFF
4	4	ON	ON	ON	ON

C. VOLUME CONTROLLER KNOB

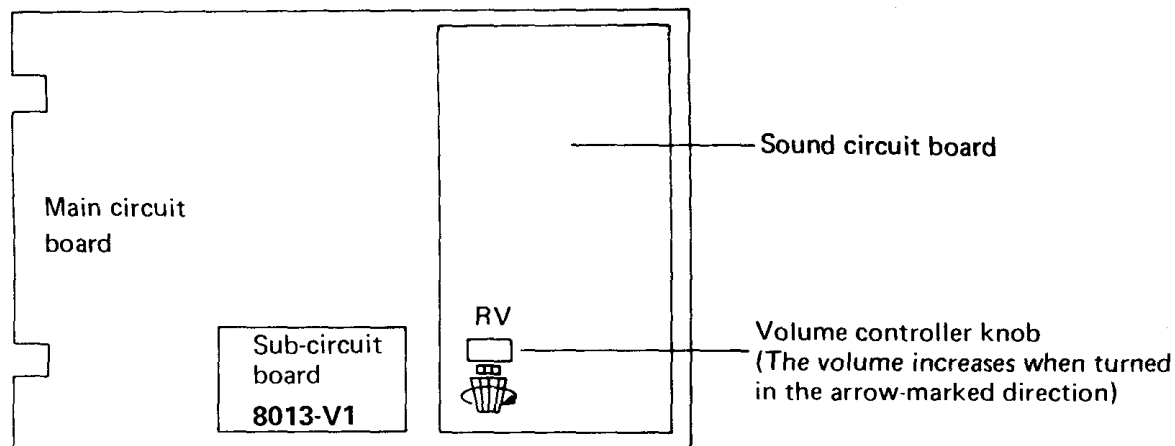


Fig. 2 Position of Volume Controller Knob

V. TV MONITOR

A. ADJUSTMENT OF TV PICTURE SCREEN

Since the TV picture screen has been factory-adjusted to optimum conditions at the time of shipment, it needs no adjustment as a rule. If it should by chance need adjustment, adjustment is possible to some extent by manipulating the knobs which appear in the wiring drawing (20''),

VI. UPRIGHT TYPE PARTS CATALOG

A. COMPONENT PARTS RELATED TO CABINET (OUTSIDE)

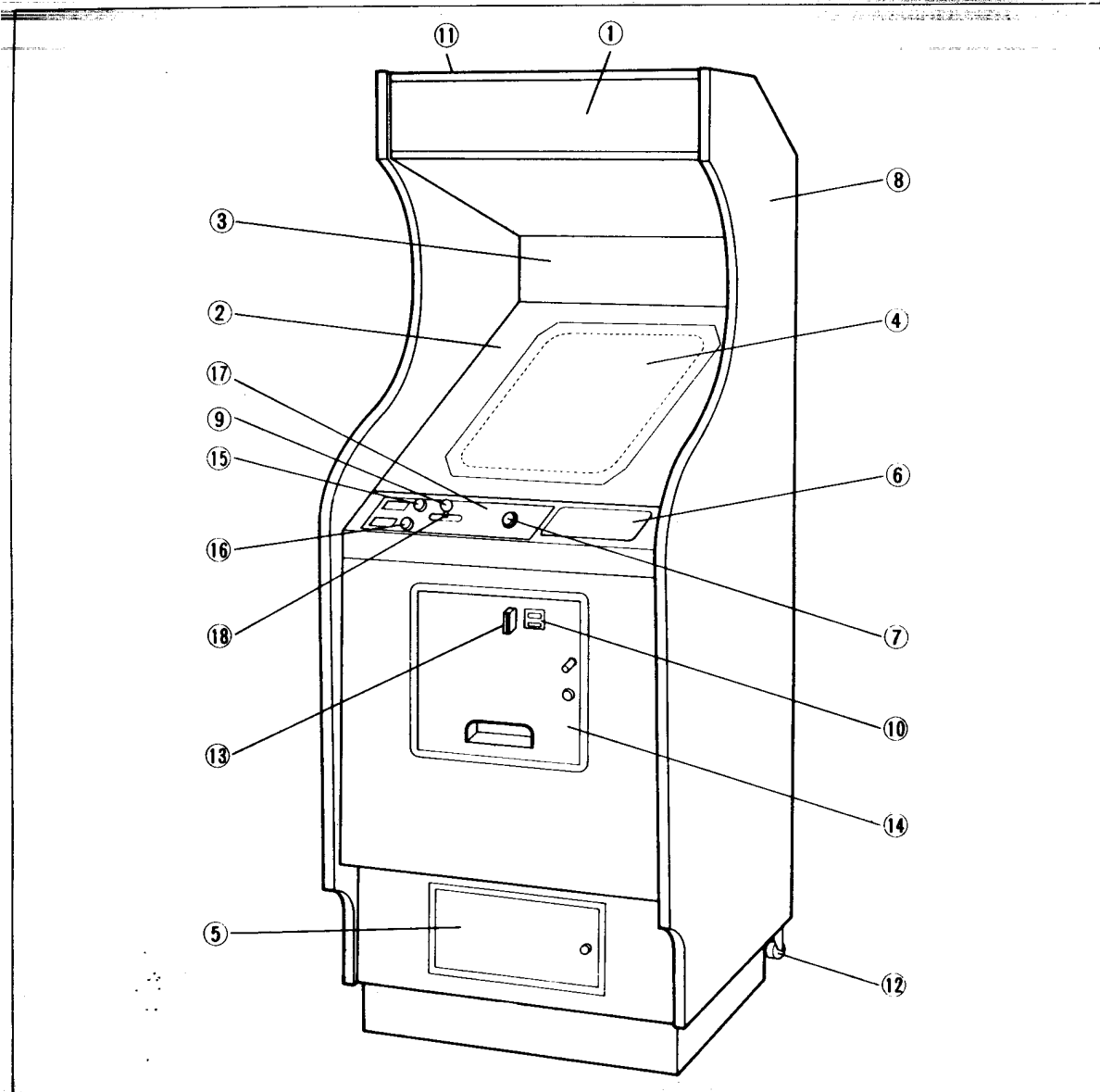


Fig. 3 Component Parts Related to Cabinet (Outside)

OUTSIDE CABINET PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Title panel	11	Title panel fixture
2	Illustrated glass A	12	Caster
3	Illustrated glass B	13	Coin slot
4	CRT	14	Main door
5	Cash box door	15	Push button (1 player)
6	Sticker for game rules	16	Push button (2 players)
7	Push button (Fire)	17	Operating indication panel
8	Cabinet proper	18	Control lever (general name)
9	Knob 32-Dim.		
10	Coin indication panel		

B. DRAWING OF CIRCUIT BOARD MOUNTING POSITIONS

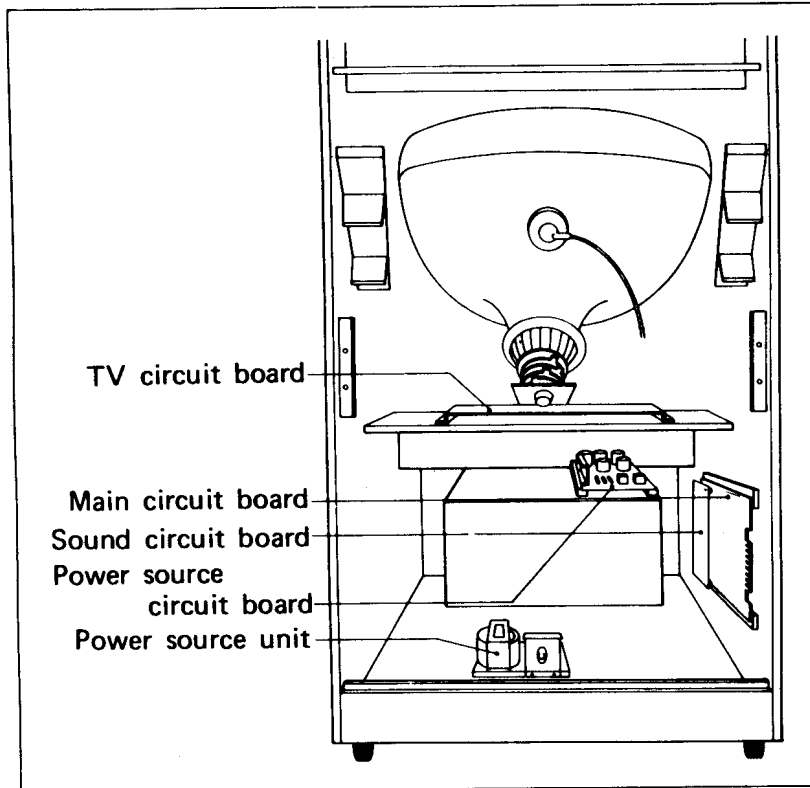


Fig. 4 Circuit Board Mounting Positions

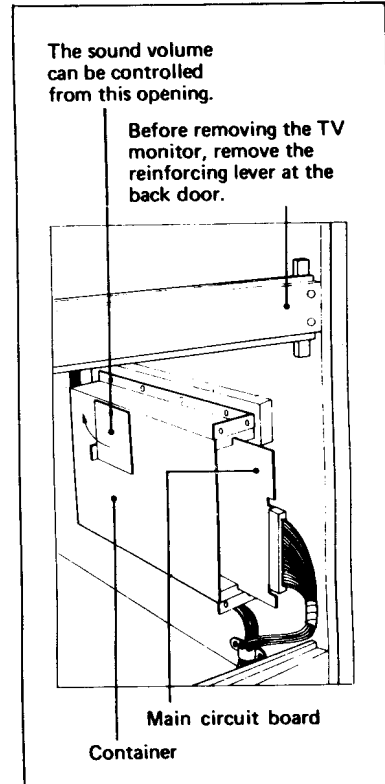


Fig. 5 Side View of Circuit Board Mounting Positions

C. FUSES

Fuses in the power source unit

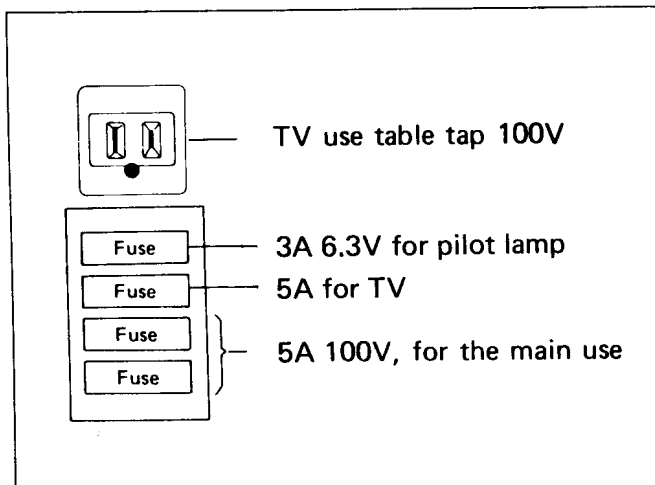


Fig. 6 Fuses in the Power Source Unit

Fuses in the power circuit board

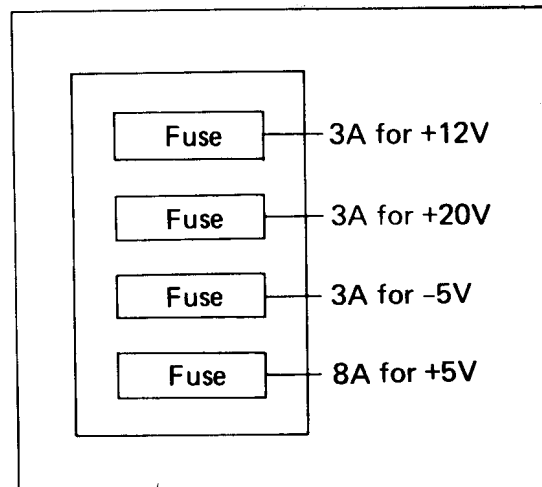


Fig. 7 Fuses in the Power Circuit Board

D. COMPONENT PARTS RELATED TO CABINET (INSIDE)

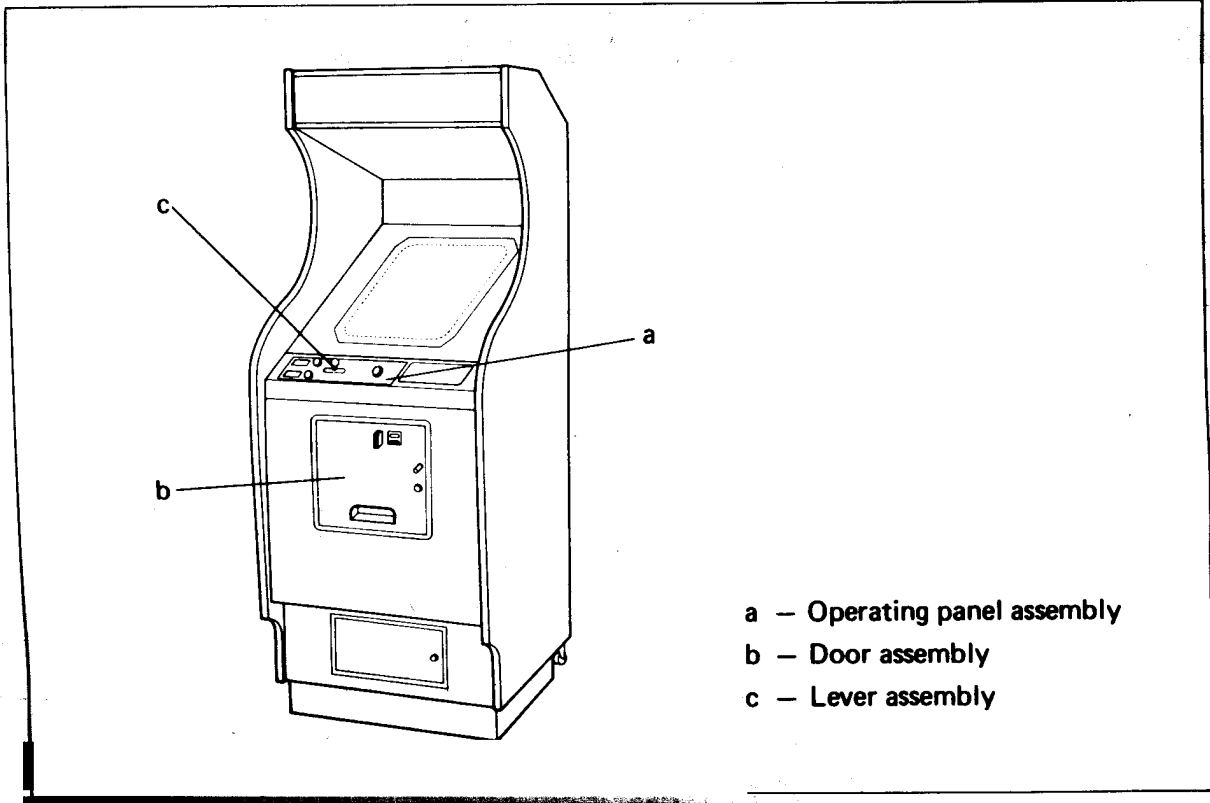


Fig. 8 Component Parts Related to Cabinet (Inside)

a) Operating panel assembly

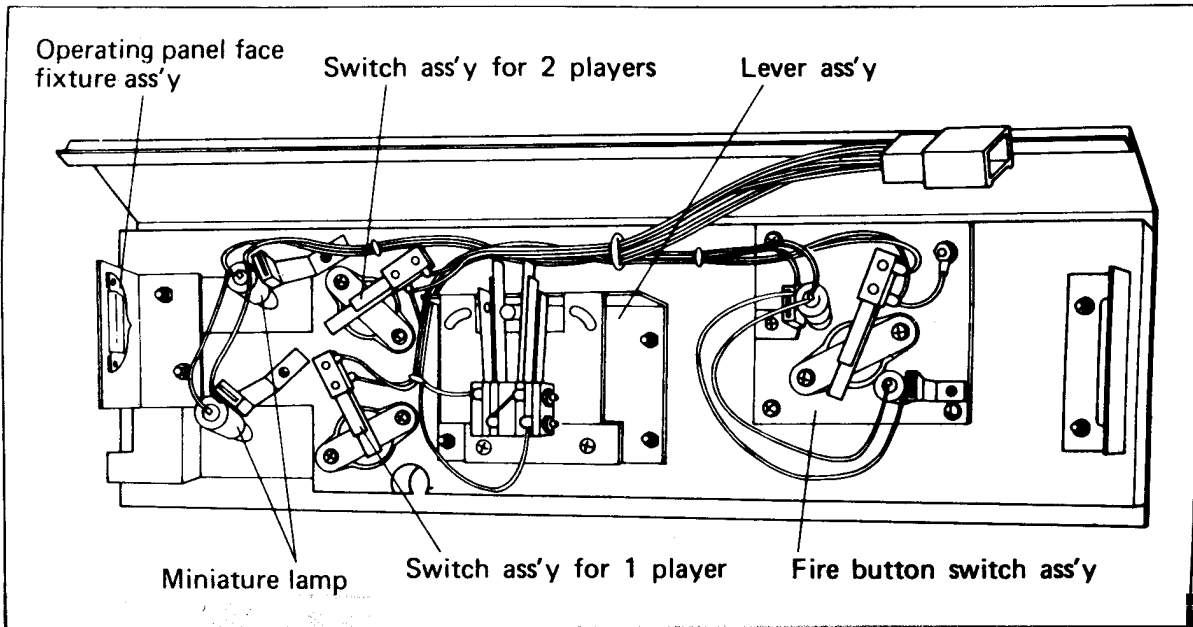


Fig. 9 Operating Panel Assembly

b) Door assembly and parts list

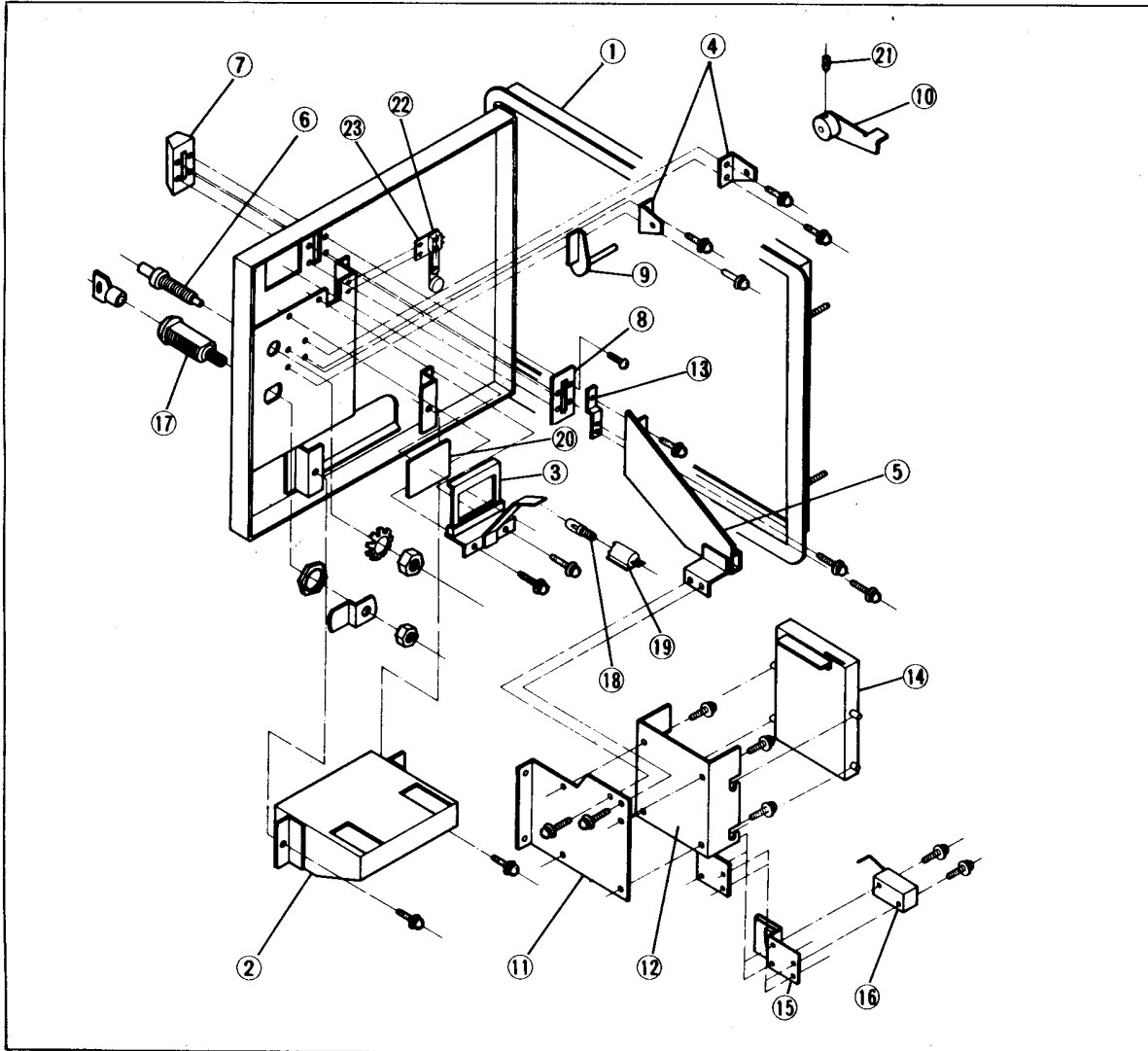


Fig. 10 Inside View of Door Assembly

DOOR ASSEMBLY PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Main door	13	Coin slot shute holder
2	Returning soucer	14	Rejector
3	Lamp & plastic plate bracket	15	Sensor slot
4	Rearing	16	Micro switch
5	Coin slot shute	17	Key sets
6	Returning button	18	Miniature lamp
7	Coin slot	19	Miniature lamp socket
8	Slot plate	20	Coin indication panel
9	Transmission shaft	21	Hexagon socket head screw
10	Rotary bracket	22	Slam switch
11	Rejector bracket	23	Slam switch holder
12	Rejector case		

c) Lever assembly and parts list

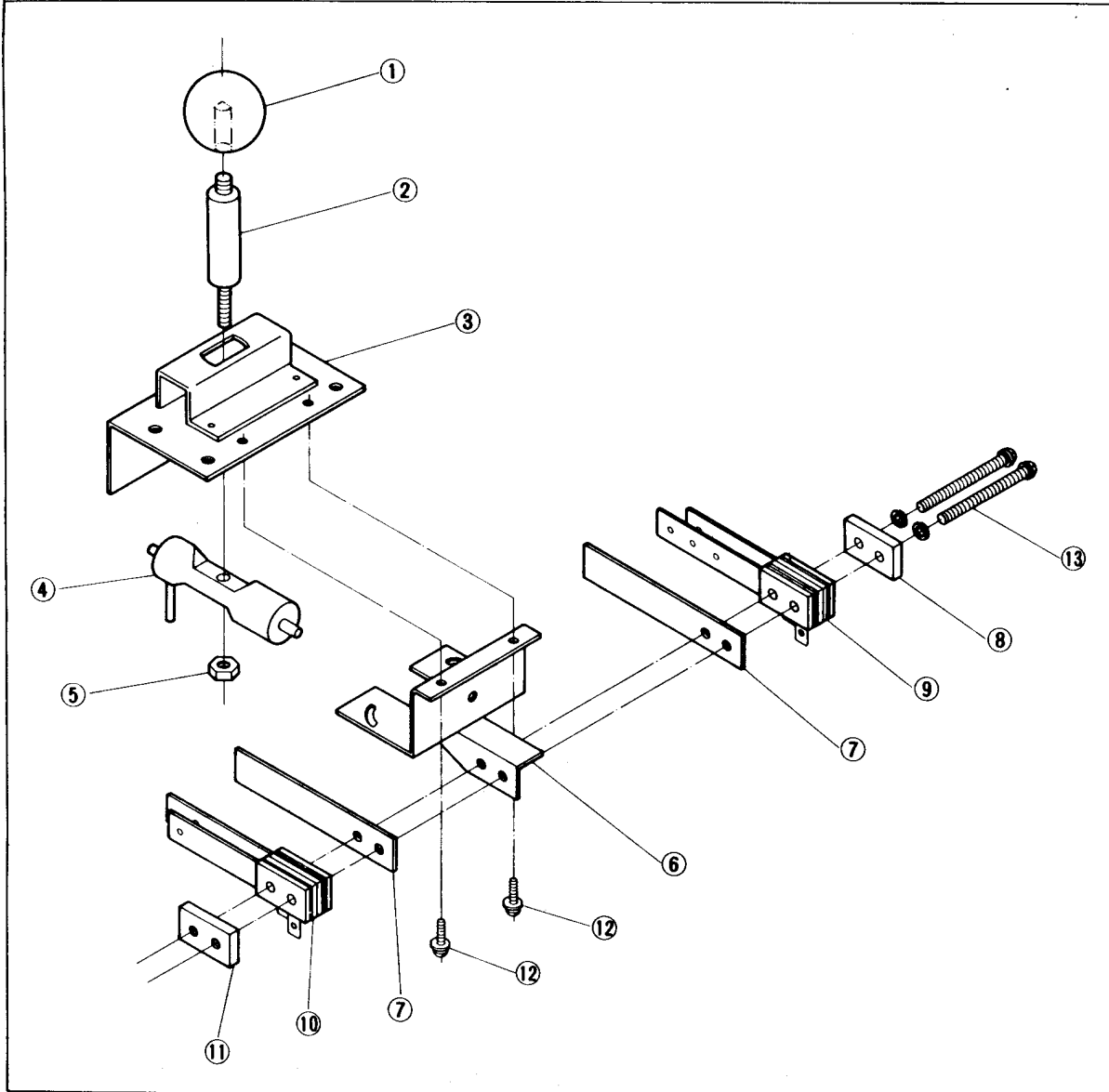


Fig. 11 Lever Assembly

LEVER ASSEMBLY PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Knob 32-Dim.	8	Spring holder
2	Lever shaft	9	Blades switch
3	Lever guide & stopper	10	Blades switch
4	Transmission bar	11	Spring holder with nut
5	Nut with stopper	12	Bolt
6	Switch bracket	13	Bolt
7	Spring		

E. COMPONENT PARTS RELATED TO SWITCHES IN THE CABINET

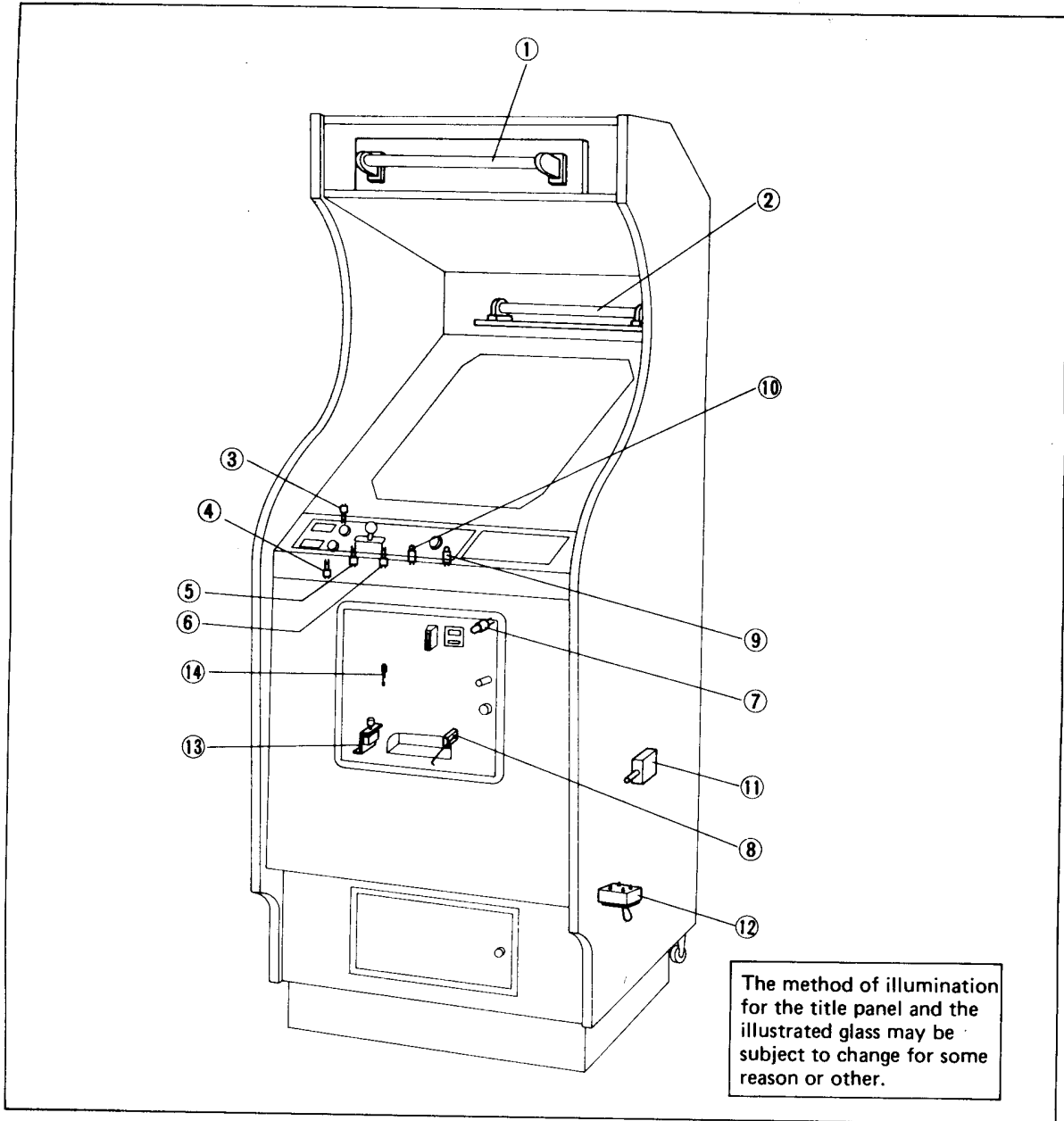


Fig. 12 Component Parts Related to Switches in the Cabinet

INSIDE CABINET PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Fluorscent lamp assembly	8	Micro switch
2	Fluorscent lamp assembly	9	Miniature lamp assembly
3	Blades switch	10	Miniature lamp assembly
4	Blades switch	11	Door switch
5	Blades switch	12	Toggle switch
6	Blades switch	13	Micro switch
7	Miniature lamp assembly	14	Slam switch

VII. CIRCUIT BOARD

A. CIRCUIT BOARD IC LOCATION AND PARTS LIST

a) Main circuit board IC location and parts list

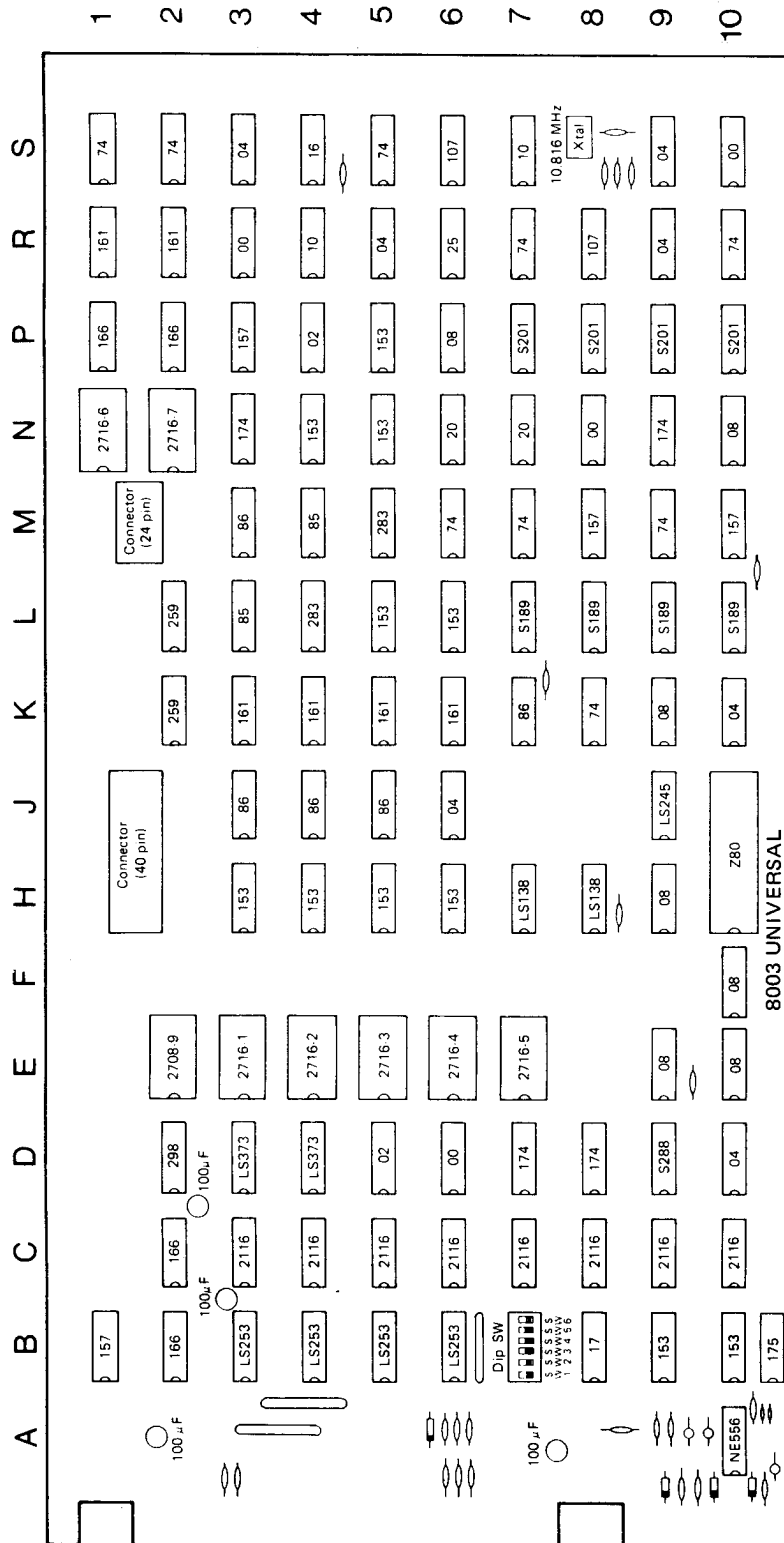


Fig. 18 Main Circuit Board

[1] Integrated Circuit

Item No.	Q'ty	Description
7400N	4	Transistor Logic
7402N	2	"
7404N	7	"
7408N	7	"
7410N	2	"
7416N	1	"
7417N	1	"
7420N	2	"
7425N	1	"
7474N	9	"
7485N	2	"
7486N	5	"
74107N	2	"
74S138N	2	"
74153N	11	"
74157N	4	"
74161N	6	"
74166N	4	"
74174N	4	"
74175N	1	"
74S189N	4	64 bits Bipolar RAM
74S201N	4	256 bits Bipolar RAM
74LS245N	1	Transistor Logic
74LS253N	4	"
74259N	2	"
74283N	1	"
74S288N	1	256 bits Bipolar ROM
74298N	1	Transistor Logic
74LS373N	2	"
2116	8	Nch MOS 16K bits Dynamic RAM
2708	1	Nch MOS 8K bits EPROM

Item No.	Q'ty	Description
2716	8	Nch MOS 16K bits EPROM
Z80	1	Nch MOS CPU
NE555	1	Transistor Logic

[2] Other Semiconductor Devices

Item No.	Q'ty	Description
10D1	4	Diode

[3] Capacitors

Rating	Q'ty	Description
100PF/12V	1	Ceramic Capacitor
150PF/12V	1	"
0.1μF/12V	55	"
1μF/50V	1	Chemical Capacitor
10μF/16V	2	"
100μF/25V	4	"

[4] Resistors

Rating	Q'ty	Description
MS1028AM	3	1KΩ Resistor Array
10Ω 1/4W	3	Carbon Solid Resistor
47Ω "	3	"
270Ω "	3	"
330Ω "	1	"
510Ω "	3	"
1KΩ "	8	"
4.7KΩ "	1	"
47KΩ "	2	"

[5] Misc

Name	Q'ty	Description
Dip SW	1	8 Elements Switch Array
X'tal	1	10.816MHz

b) Sub-circuit board IC location and parts list

(Used in the case of 2-way alone)

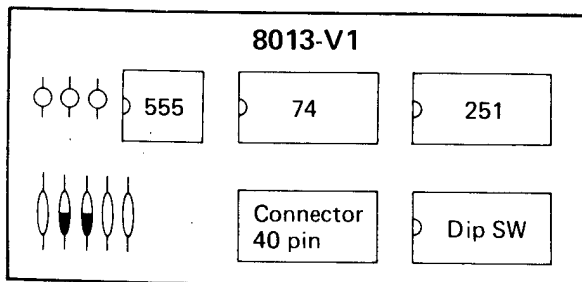


Fig. 19 Sub-circuit Board

[1] Integrated Circuit

Item No.	Q'ty	Description
7474N	1	Transistor Logic
74251N	1	"
NE555	1	Timer

[2] Other Semi Conductor Devices

Item No.	Q'ty	Description
10D1	2	Diode

[3] Capacitors

Rating	Q'ty	Description
0.1μF/12V	4	Ceramic Capacitor
1μF/50V	1	Chemical Capacitor

[4] Resistors

Rating	Q'ty	Description
MS1028AM	1	1kΩ Resistor Array
47Ω	1	Carbon Solid Resistor
1kΩ	1	"
47kΩ	1	"

[5] Misc

Name	Q'ty	Description
Dip SW	1	8 elements Switch Array

c) Sound circuit board IC location and parts list

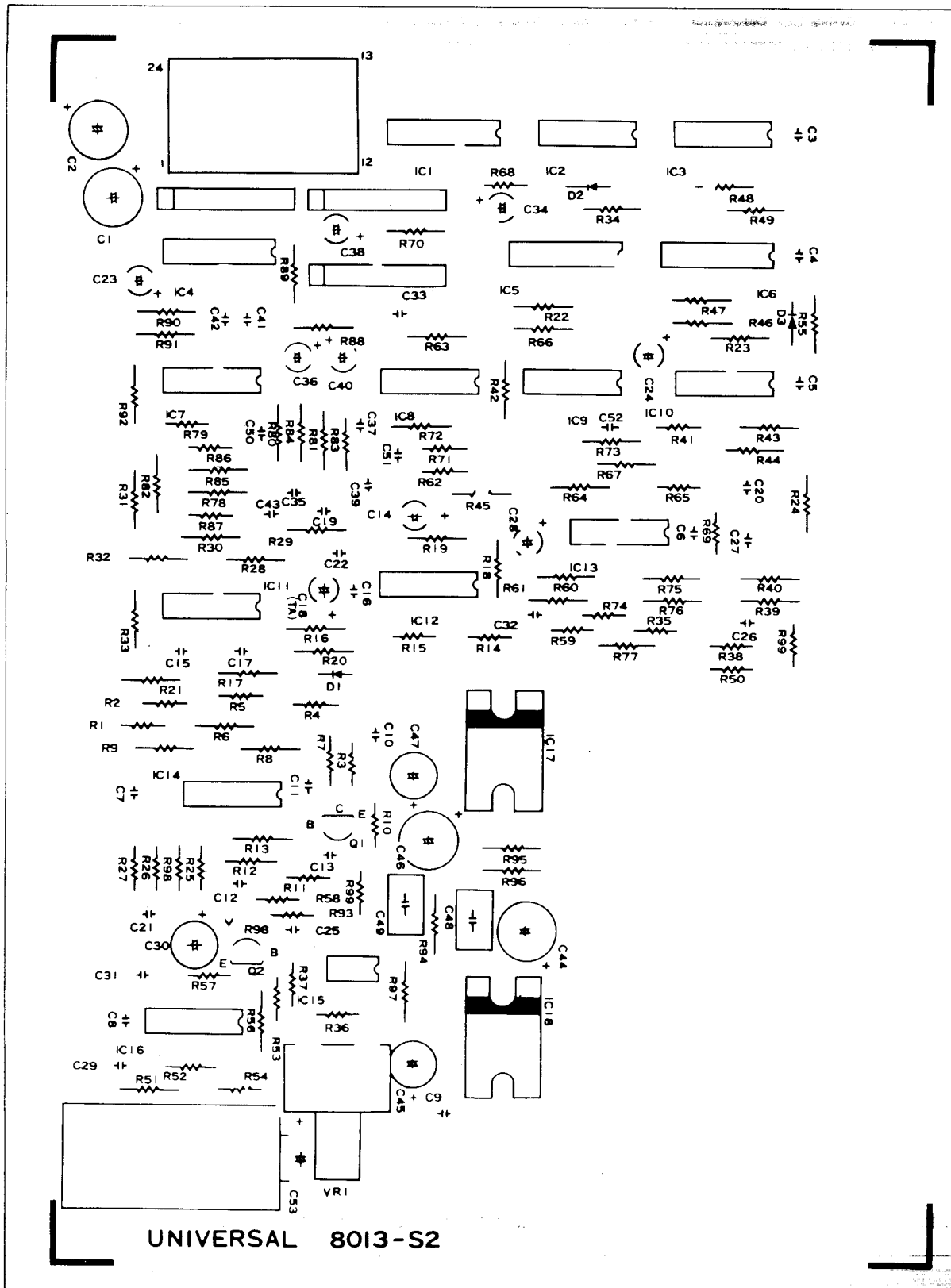
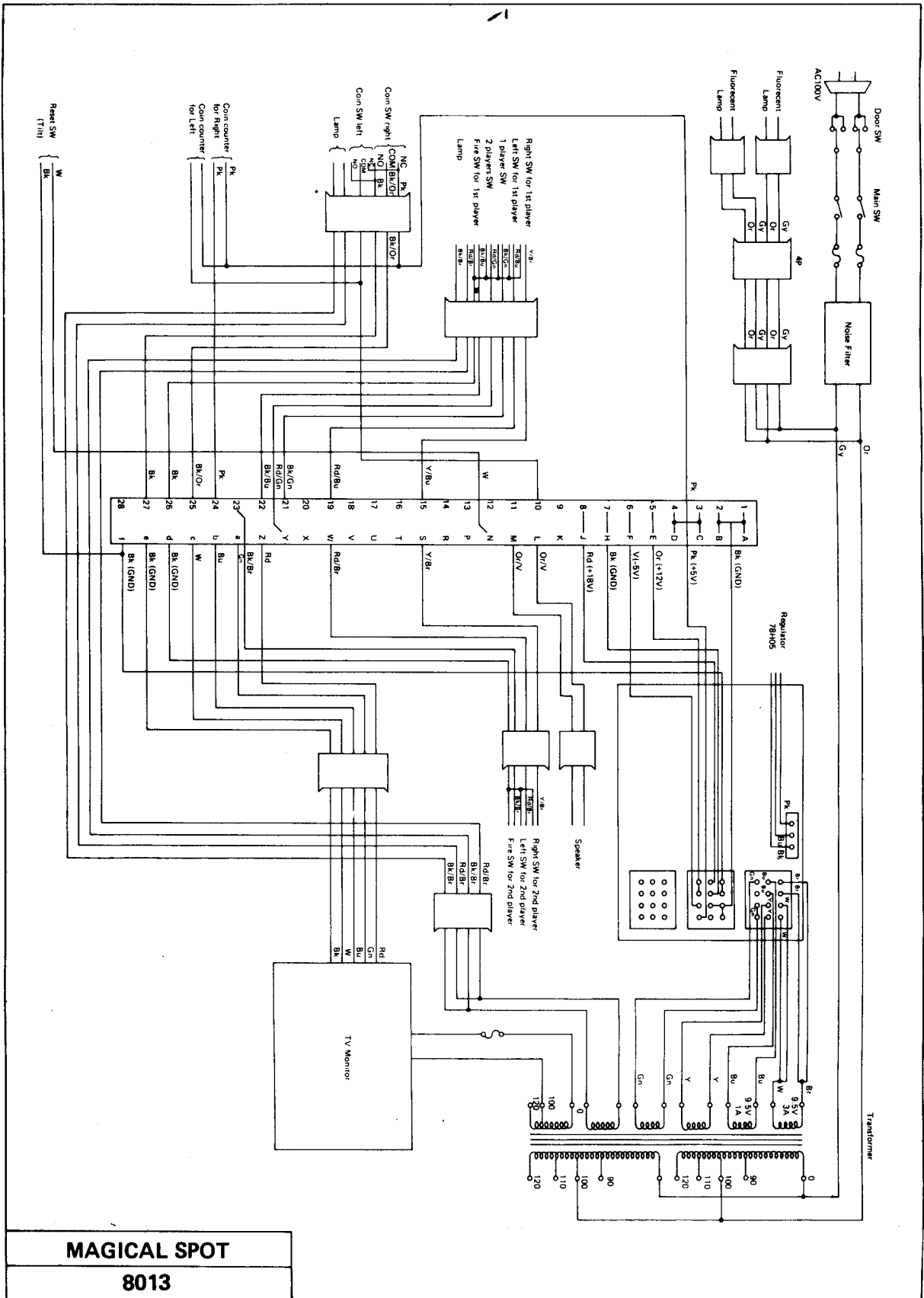


Fig. 20 Sound Circuit Board

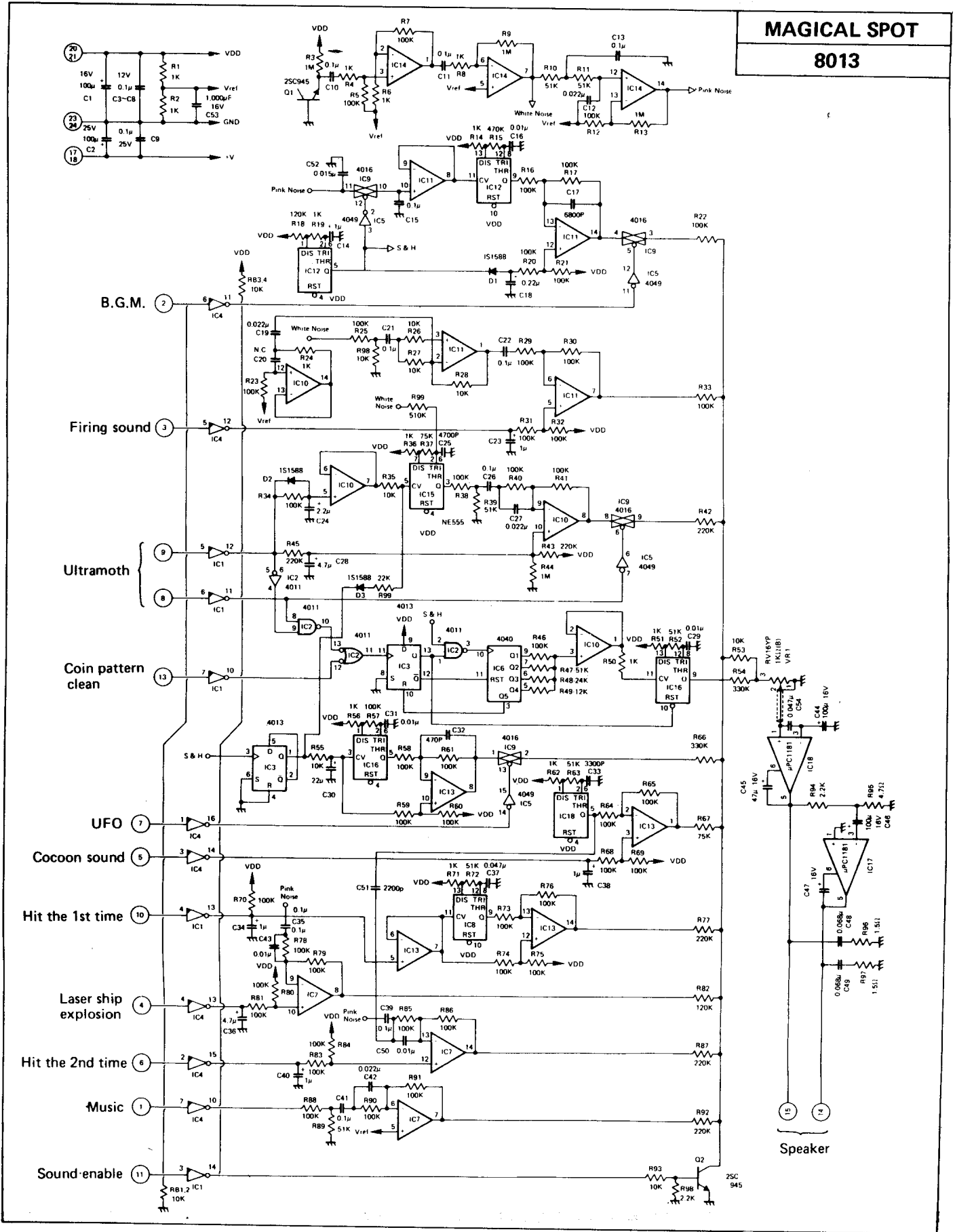
Location	Rating	Description	Location	Rating	Description	Location	Rating	Description
R1	1K	Carbon solid resistor	71	1K	Carbon solid resistor	30	22 μ F	Chemical
2	1K	"	72	51K	"	31	0.01 μ F	Mila
3	1M	"	73	100K	"	32	470pF	Ceramic
4	1K	"	74	100K	"	33	3300pF	Mila
5	100K	"	75	100K	"	34	1 μ F	Chemical
6	1K	"	76	100K	"	35	0.1 μ F	Ceramic
7	100K	"	77	220K	"	36	4.7 μ F	Chemical
8	1K	"	78	100K	"	37	0.047 μ F	Mila
9	1M	"	79	100K	"	38	1 μ F	Chemical
10	51K	"	80	100K	"	39	0.1 μ F	Ceramic
11	51K	"	81	100K	"	40	1 μ F	Chemical
12	100K	"	82	120K	"	41	0.1 μ F	Ceramic
13	1M	"	83	100K	"	42	0.022 μ F	Mila
14	1K	"	84	100K	"	43	0.01 μ F	"
15	470K	"	85	100K	"	44	100 μ F	Chemical
16	100K	"	86	100K	"	45	47 μ F	"
17	100K	"	87	220K	"	46	100 μ F	"
18	120K	"	88	100K	"	47	47 μ F	"
19	1K	"	89	51K	"	48	0.068 μ F	Mila
20	100K	"	90	100K	"	49	0.068 μ F	"
21	100K	"	91	100K	"	50	0.01 μ F	"
22	100K	"	92	220K	"	51	2200pF	"
23	100K	"	93	10K	"	52	0.015 μ F	"
24	1K	"	94	2.2K	"	53	1000 μ F	Chemical
25	100K	"	95	4.7 Ω	"	54	0.047 μ F	Ceramic
26	10K	"	96	1.5 Ω	"			
27	10K	"	97	1.5 Ω	"			
28	10K	"	98	10K	"			
29	100K	"	99	22K	"			
30	100K	"						
31	100K	"						
32	100K	"						
33	100K	"						
34	100K	"						
35	10K	"						
36	1K	"						
37	75K	"						
38	100K	"						
39	51K	"						
40	100K	"						
41	100K	"						
42	220K	"						
43	220K	"						
44	1M	"						
45	220K	"						
46	100K	"						
47	51K	"						
48	24K	"						
49	12K	"						
50	1K	"						
51	1K	"						
52	51K	"						
53	10K	"						
54	330K	"						
55	10K	"						
56	1K	"						
57	100K	"						
58	100K	"						
59	100K	"						
60	100K	"						
61	100K	"						
62	1K	"						
63	51K	"						
64	100K	"						
65	100K	"						
66	330K	"						
67	75K	"						
68	100K	"						
69	100K	"						
70	100K	"						
			C1	100 μ F 16V	Chemical			
			2	100 μ F 25V	"			
			3	0.1 μ F 12V	Ceramic			
			4	0.1 μ F 12V	"			
			5	0.1 μ F 12V	"			
			6	0.1 μ F 12V	"			
			7	0.1 μ F 12V	"			
			8	0.1 μ F 12V	"			
			9	0.1 μ F 25V	"			
			10	0.1 μ F 12V	"			
			11	0.1 μ F 12V	"			
			12	0.022 μ F	Mila			
			13	0.1 μ F	Ceramic			
			14	1 μ F	Chemical			
			15	0.1 μ F	Ceramic			
			16	0.01 μ F	Mila			
			17	6800pF	"			
			18	0.22 μ F	Tantalum			
			19	0.022 μ F	Mila			
			20	Not Used				
			21	0.1 μ F	Ceramic			
			22	0.1 μ F	"			
			23	1 μ F	Chemical			
			24	2.2 μ F	"			
			25	4700pF	Mila			
			26	0.1 μ F	Ceramic			
			27	0.022 μ F	Mila			
			28	4.7 μ F	Chemical			
			29	0.01 μ F	Mila			
						Location	Item No.	Description
						Q1	2SC945	N-P-N Transistor
						2	"	"
						D1	1S1588	Switching Diode
						2	"	"
						3	"	"
						RB1	MS1038AM	10K Ω Resistor Array
						2	"	"
						3	"	"
						VR1	RV16YP	1K Ω (B) Variable Resistor
						IC1	ULN2003AN	Darlington Transistor Array
						2	CD4011CN	Quad 2-Input NAND Gate
						3	CD4013CN	Dual D Flip Flop
						4	ULN2003AN	Darlington Transistor Array
						5	CD4049CN	Hex Inverting Buffer
						6	CD4040CN	14-Stage Binary Counters
						7	LM324N	Quadruple Operational Amplifiers
						8	NE556N	Dual Timer
						9	CD4016CN	Quad Bilateral Switch
						10	LM324N	Quadruple Operational Amplifiers
						11	LM324N	"
						12	NE556N	Dual Timer
						13	LM324N	Quadruple Operational Amplifiers
						14	LM324N	"
						15	NE555N	Timer
						16	LM324N	Quadruple Operational Amplifiers
						17	μ PC1181H	Power Amplifier
						18	μ PC1181H	"

WIRING DIAGRAM (CONNECTOR)

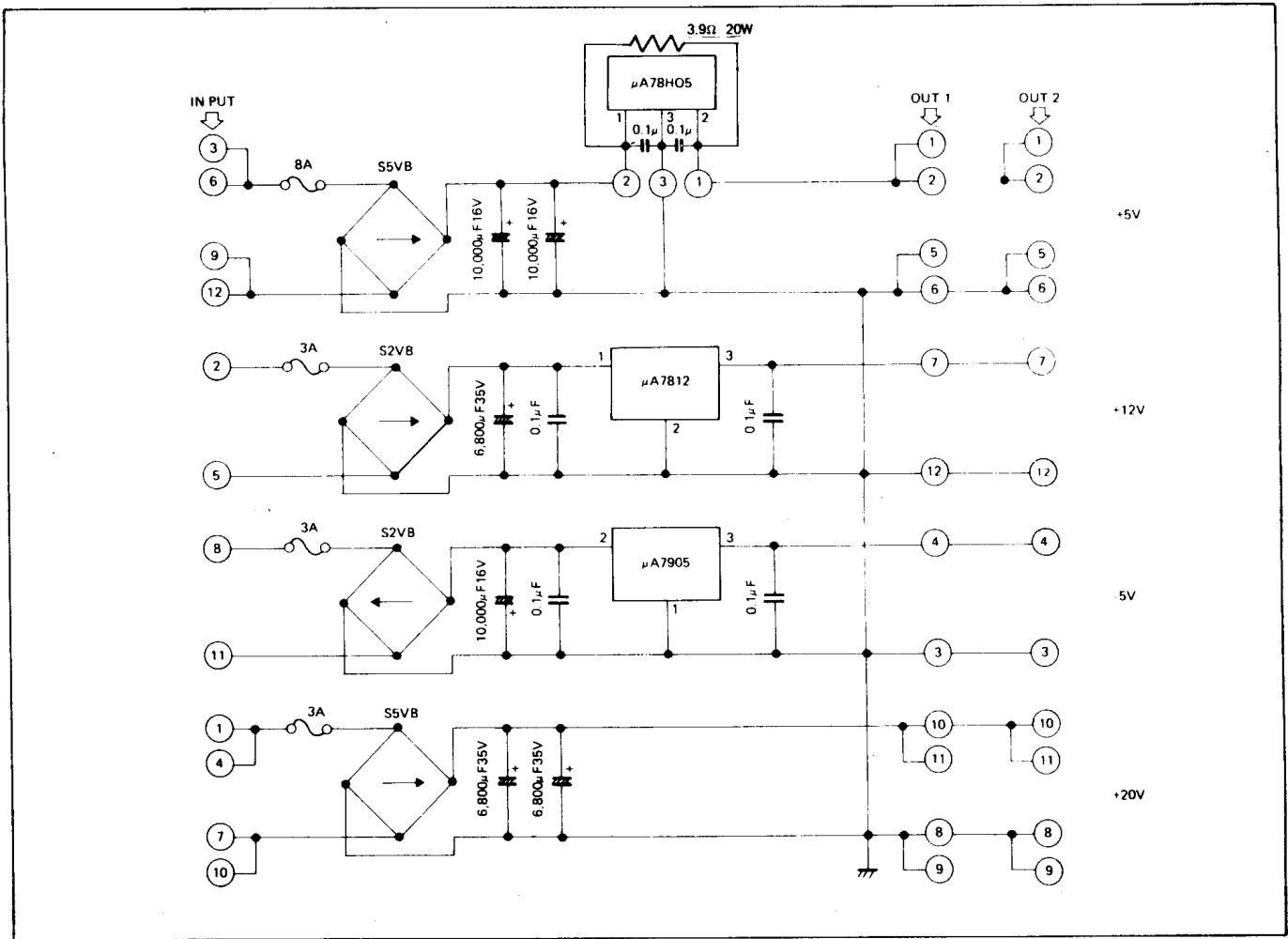


SOUND BLOCK DIAGRAM

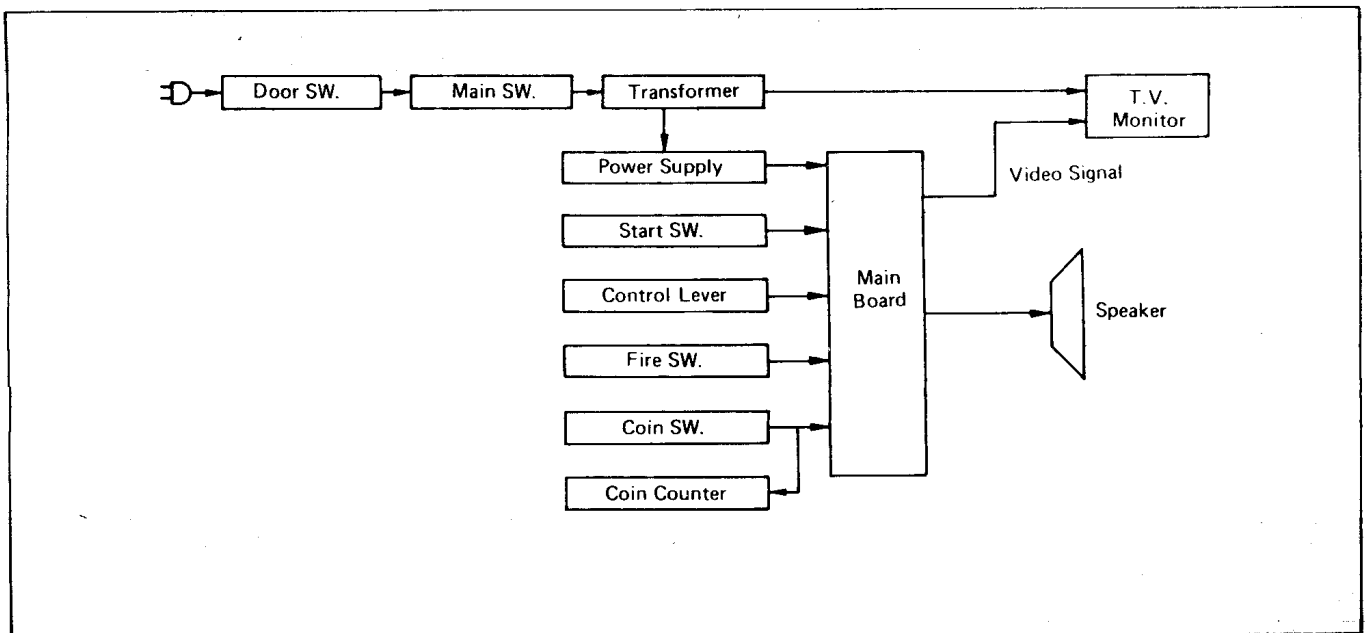
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POWER SOURCE BLOCK DIAGRAM



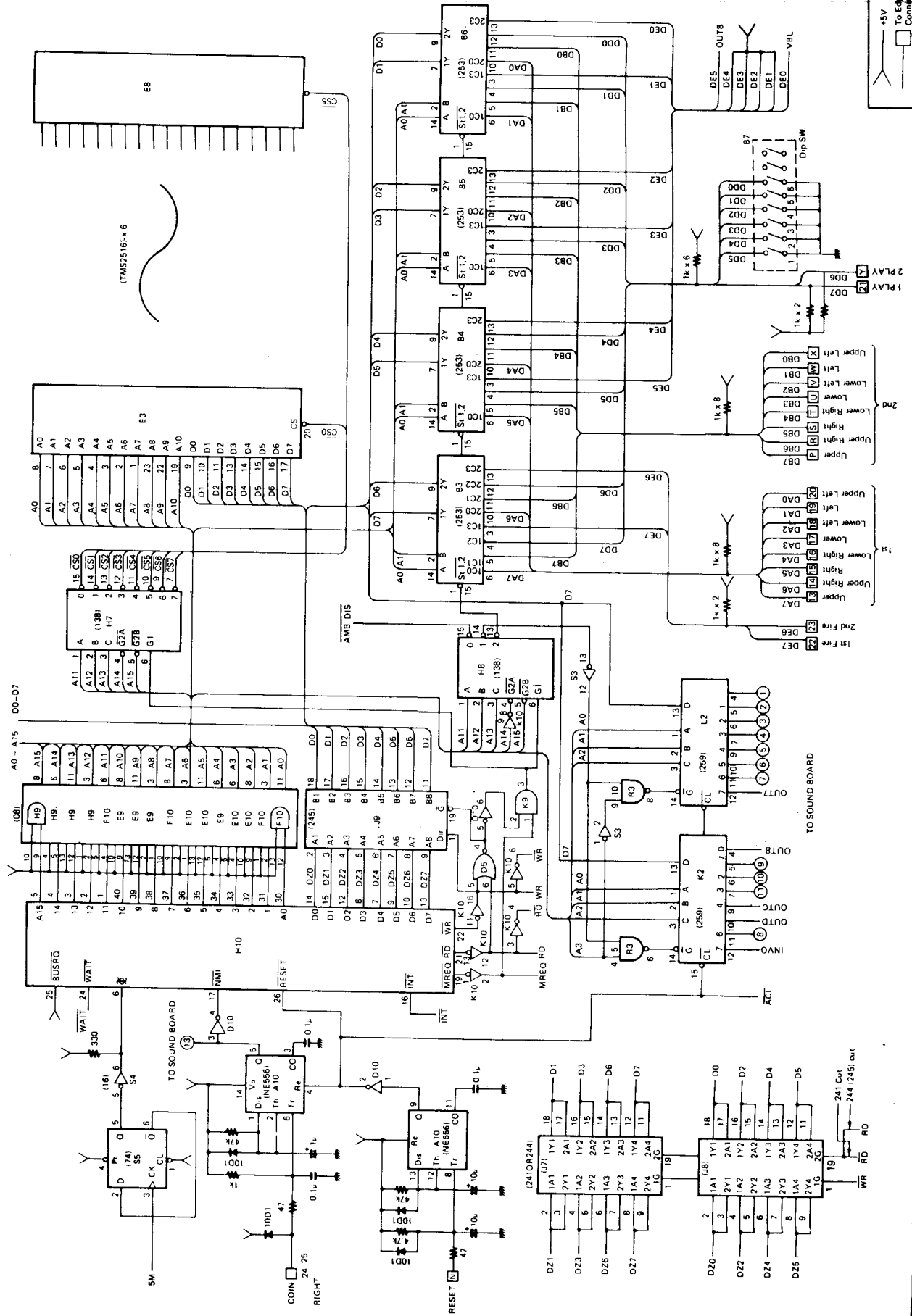
BLOCK DIAGRAM

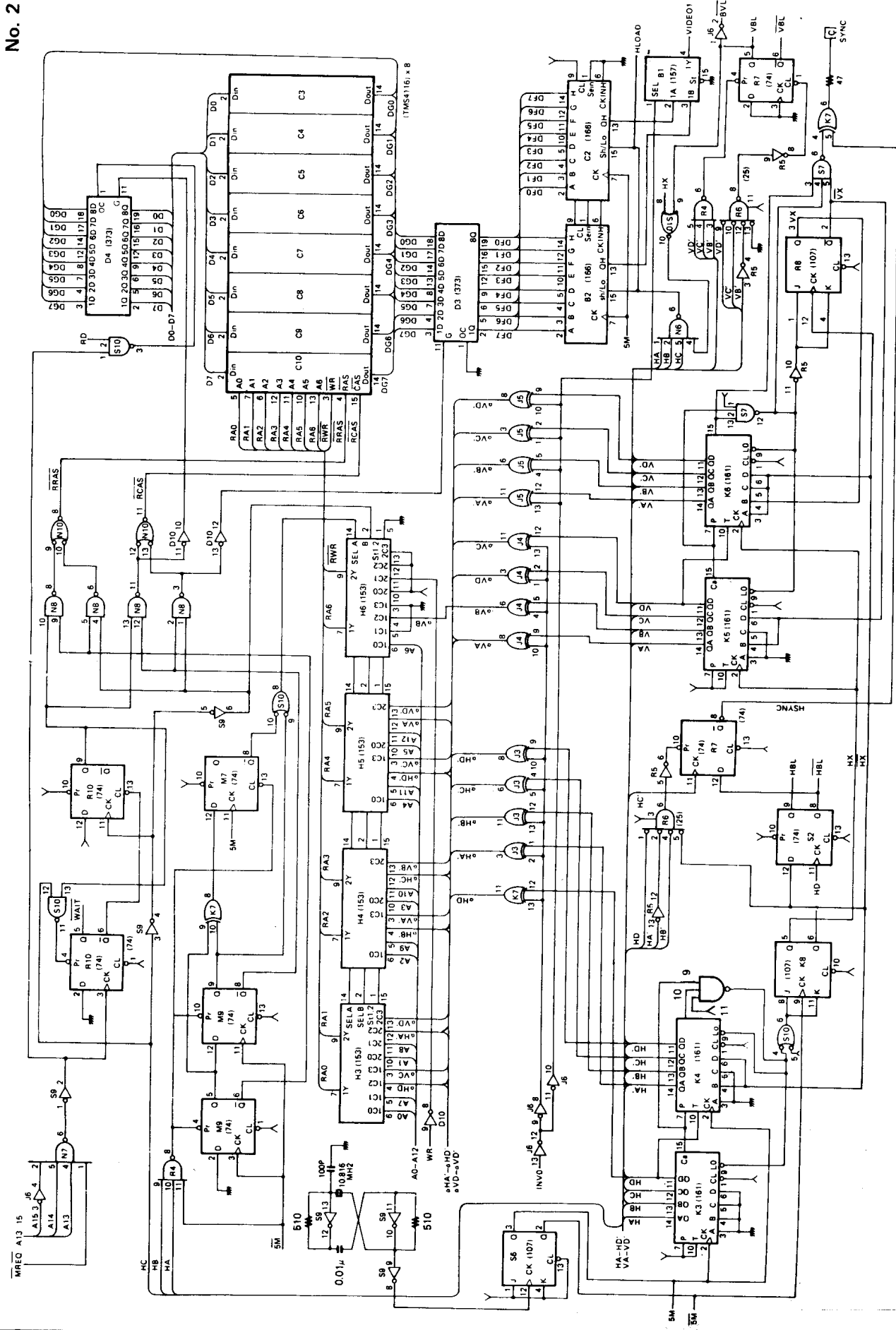


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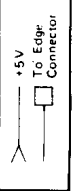
MAIN BLOCK DIAGRAM

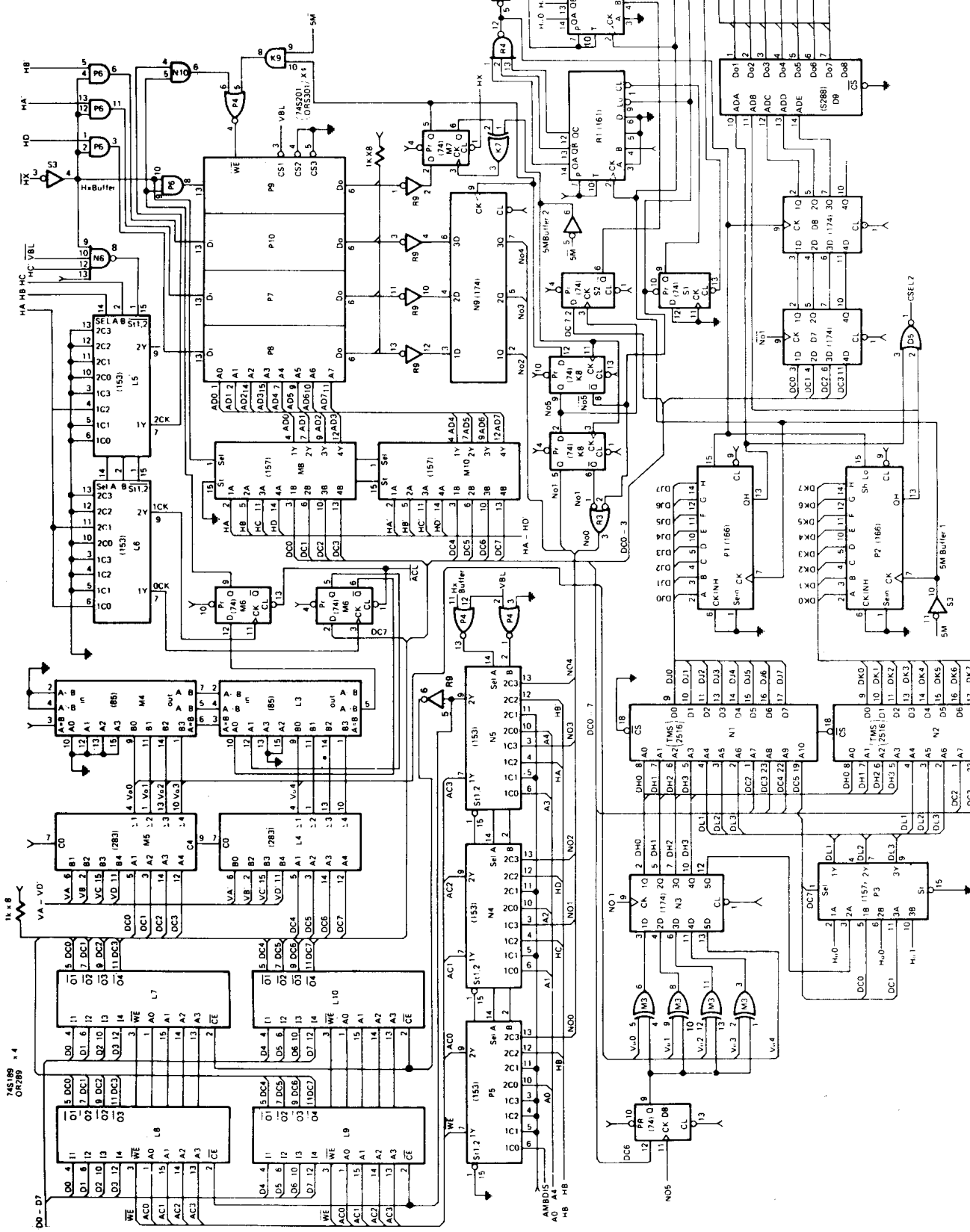
No. 1





MAGICAL SPOT
8013





MAGICAL SPOT
8013

