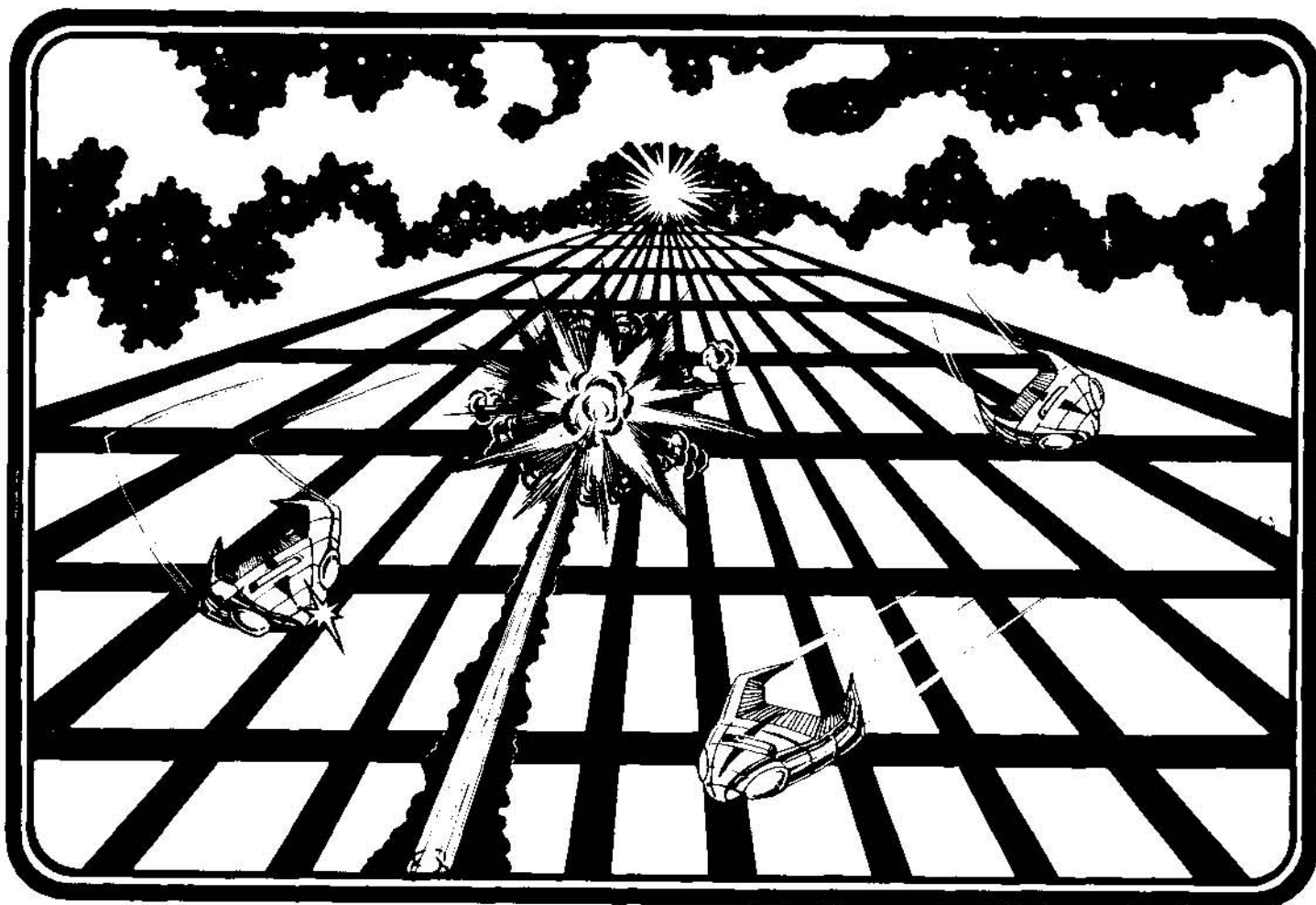


**COSMIC SERIES**

# **DEVILZONE**

Operation, Maintenance  
and  
Service Manual



**UNIVERSAL**

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### — WHEN ORDERING PARTS —

Since each component part is indicated by block, definitely specify both the corresponding Fig. No. and part No. within the Fig. when placing an order for it.

## **I. FEATURES OF THIS MACHINE**

1. The game packs in excellent features capturing the hearts of players.
2. The lever control system is simple to handle.
3. At the flick of a dip switch, you can select among extended play, the number of LASER SHIPS and time of appearance of an additional LASER SHIP, etc.
4. High score for the day is always displayed on the screen.
5. Finely disigned cabinet and fascinating acoustic effects.
6. The 6 highest scorers can register their name on the screen.

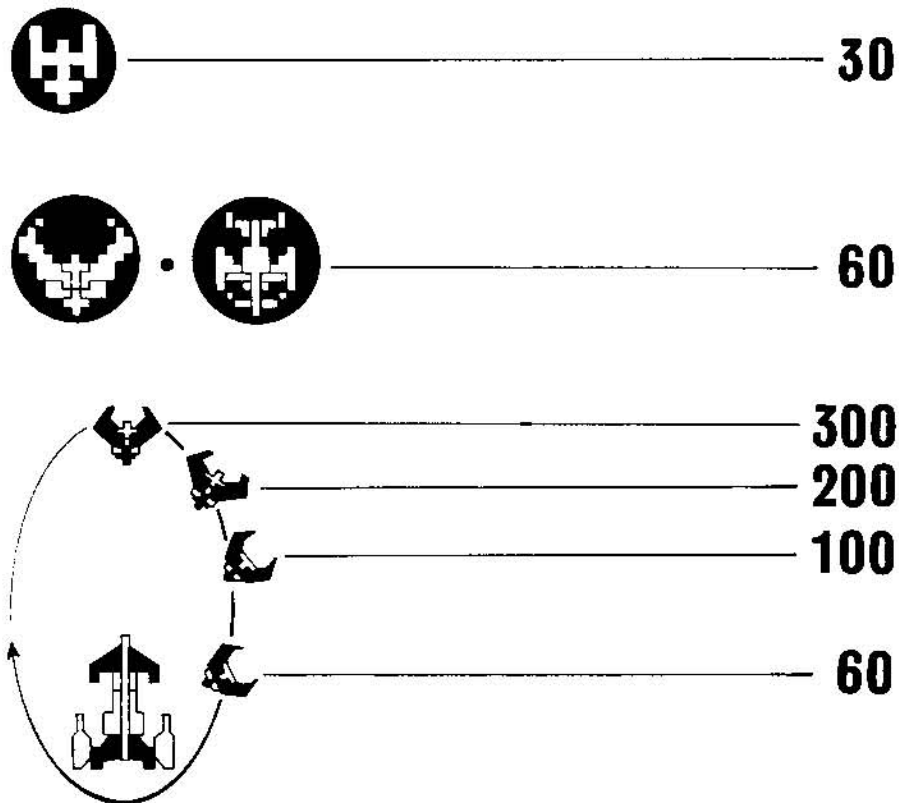
## **II. HOW TO HANDLE AND MAINTAIN THIS MACHINE**

1. Since the UNIVERSAL's DEVIL ZONE employs a color TV receiving set, be careful not to shake it during transit and when carrying it about.
2. Install it at a location which is not exposed to direct sunlight. In order to prevent the inside temperature rising, avoid as much as possible a location near a heater, etc.
3. Since the grounding terminal is visible, be sure to connect it to a grounding conductor.
4. Insert the power cord into the outlet and turn on the switch.
5. Even if the solid-state module seems to be out of order, do not check the circuit by means of a circuit tester, etc., since the internal voltage of the tester, etc. may sometimes break down the IC.
6. Make sure the machine is well ventiated. If the temperature of the IC and transistor is lower than 60°C, the function normally and may be considered reliable. If it exceeds 60°C, their performance cannot be guaranteed.
7. Make sure that the connector, etc. is not disconnected.
8. Whenever connecting the power cord of the solid-state module to, or disconnecting it from, the outlet, be sure to turn the power off.
9. Although the products of UNIVERSAL are manufactured with the utmost care, they may develop malfunctions when used for long periods. So, be sure to chek this machine daily.

### III. HOW TO PLAY

1. A fleet of space devils floating in the far away space. They will come flying in a four-plane formation to assault you. Destroy them by using your fire beam gun while dodging their missiles or dash.
2. When the last plane of the four-plane formation began assaulting while turning, destroy it at as remote a position as possible, and you can score high points.
3. Scoring 3,000 pts awards another spaceship.
4. The 6 highest scorers can register their name on the screen after the end of the game. By working the lever move the cursor until it reaches under either of the alphabets, numerals and symbols aimed at, and drive it in place by using the fire button.

### SCORE



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

## A. POSITIONS OF DIP SWITCHES

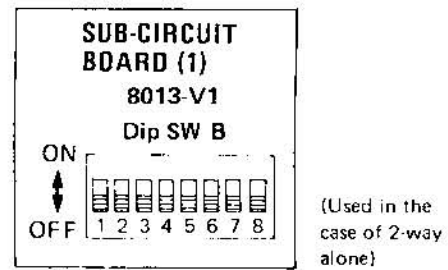
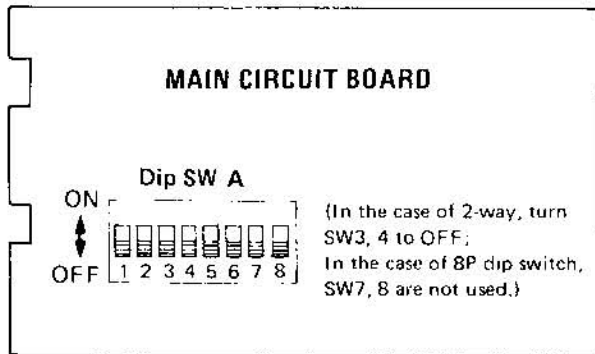


Fig. 1 Positions of Dip Switches

## 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

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

[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
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

# UPRIGHT TYPE

This documentation provides standard information.  
Universal reserves the right to change without notice.



# VI. UPRIGHT TYPE PARTS CATALOG

## A. COMPONENT PARTS RELATED TO CABINET (OUTSIDE)

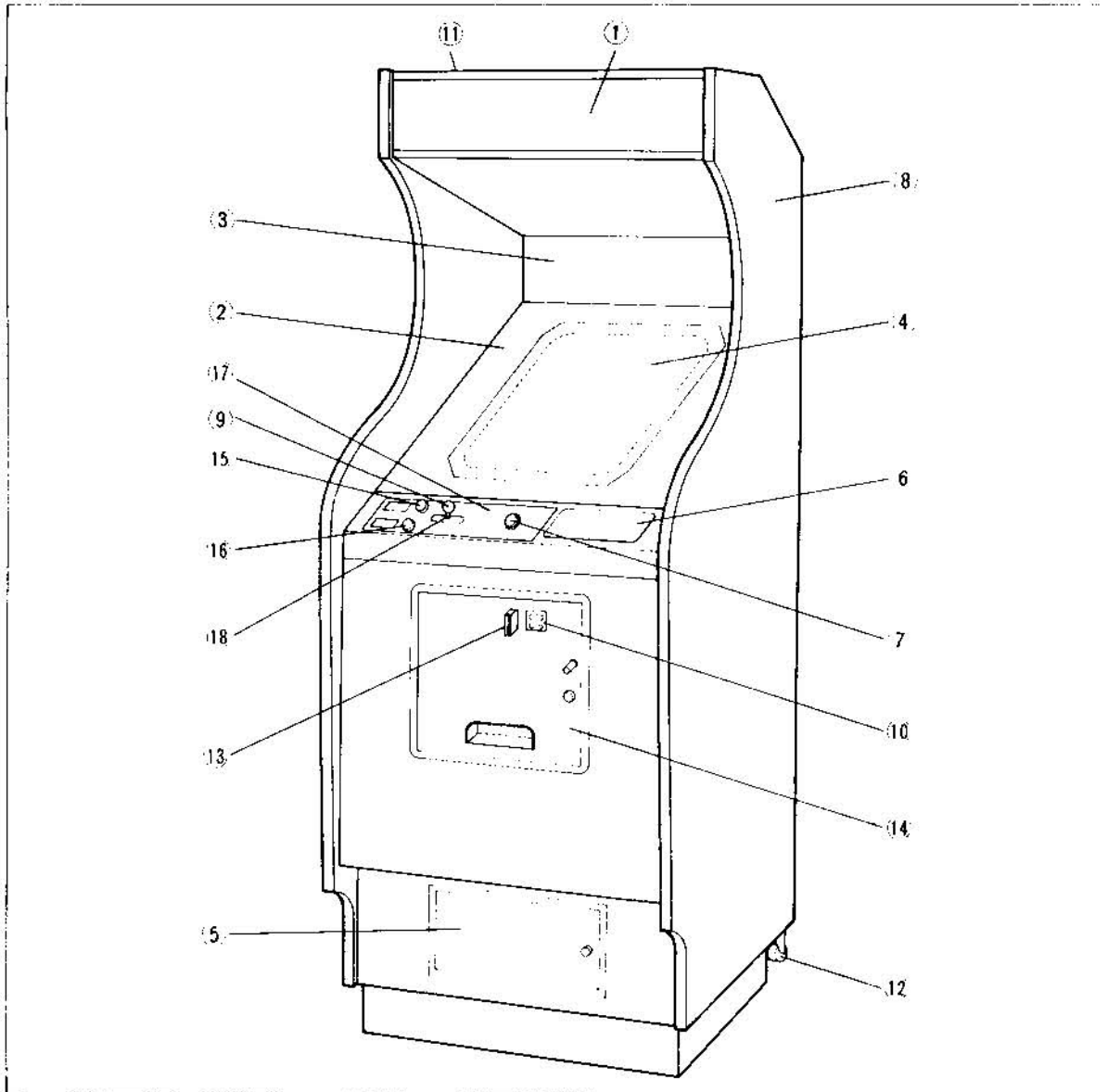
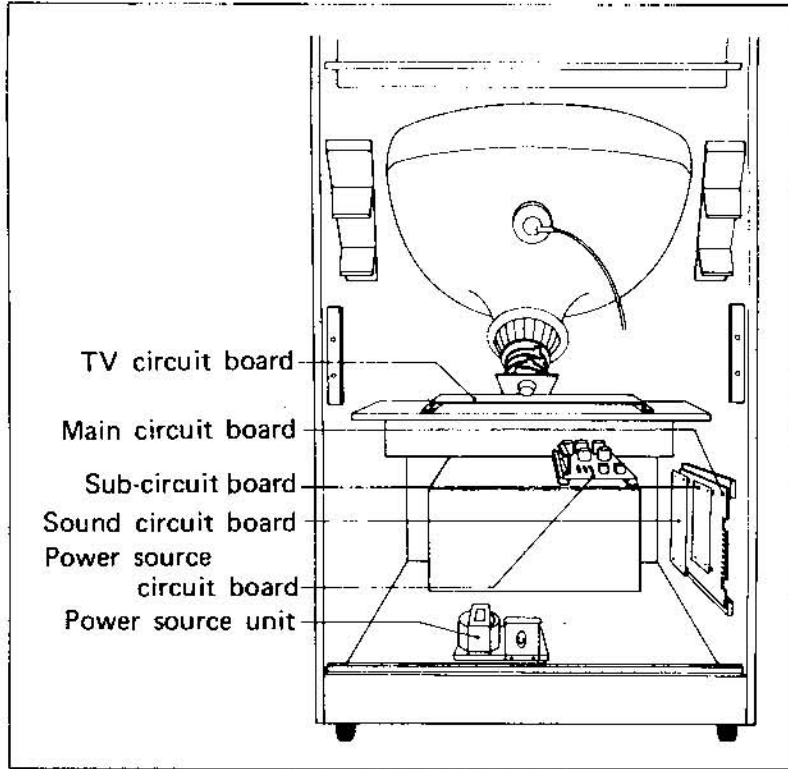


Fig. 3 Component Parts Related to Cabinet (Outside)

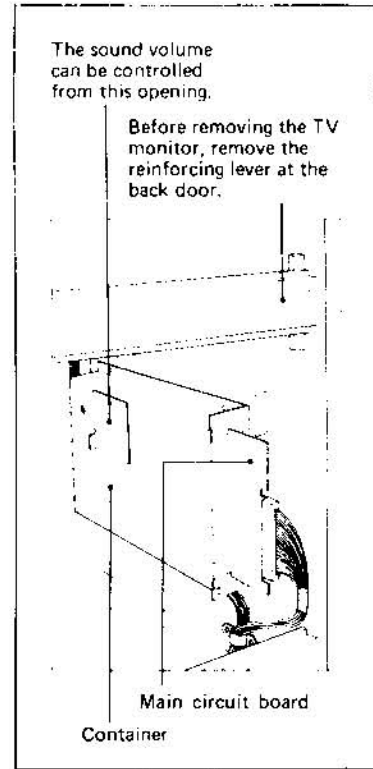
### OUTSIDE CABINET PARTS LIST

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**



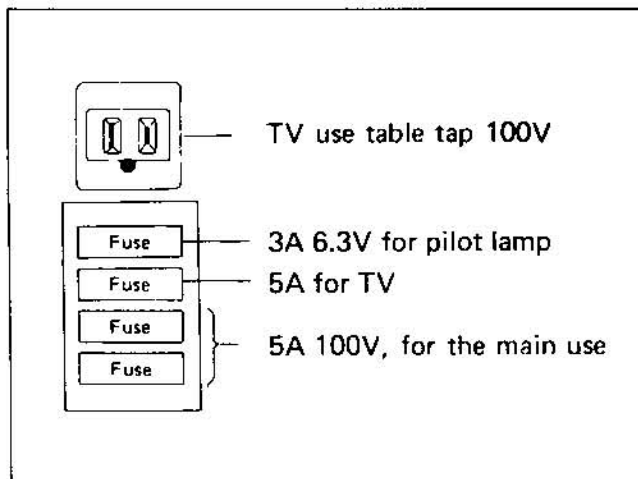
**Fig. 4 Circuit Board Mounting Positions**



**Fig. 5 Side View of Circuit Board Mounting Positions**

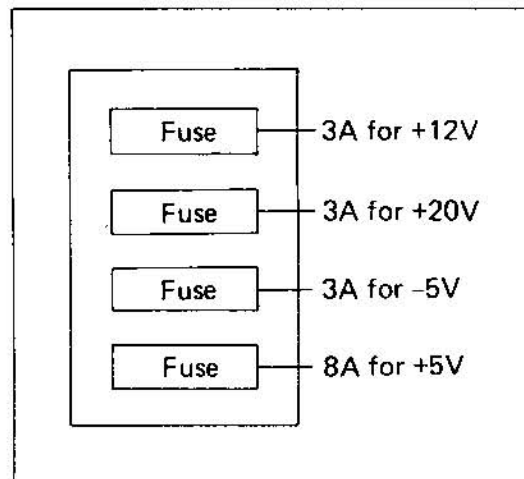
**C. FUSES**

Fuses in the power source unit



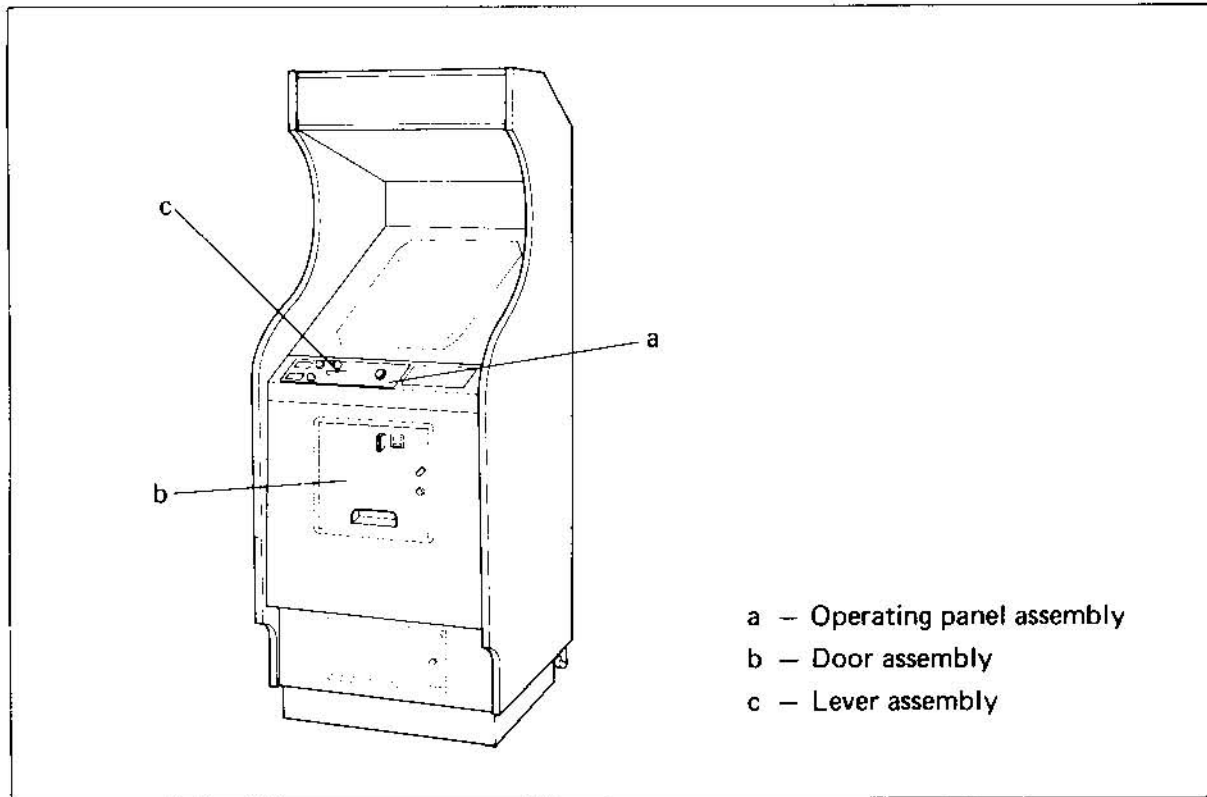
**Fig. 6 Fuses in the Power Source Unit**

Fuses in the power circuit board



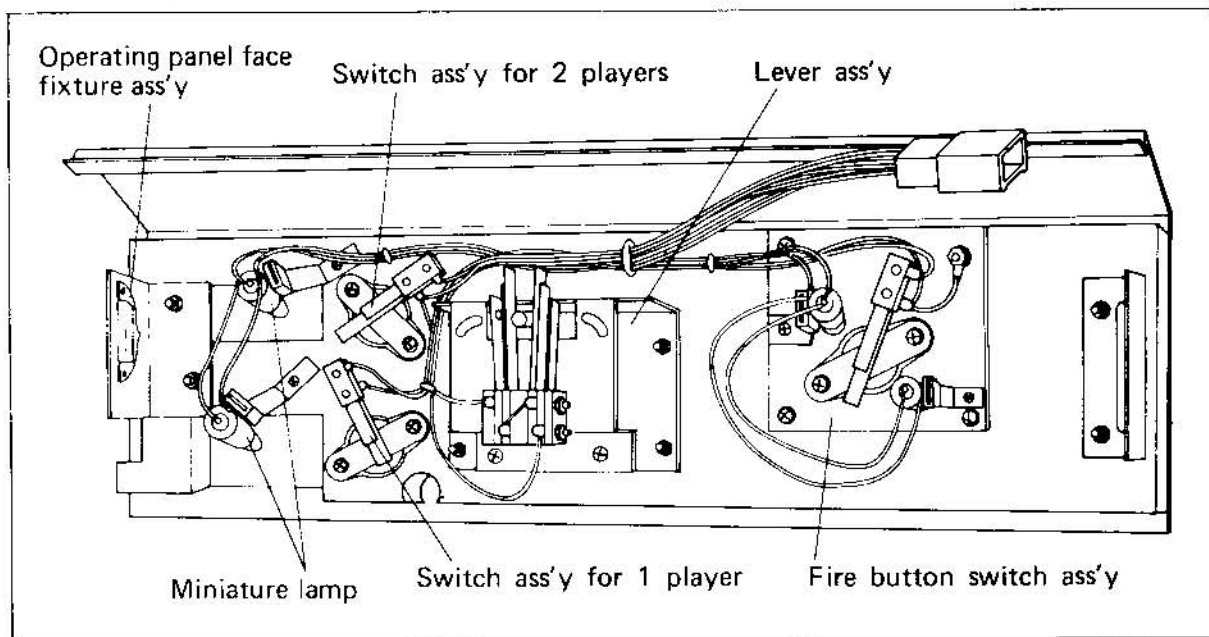
**Fig. 7 Fuses in the Power Circuit Board**

**D. COMPONENT PARTS RELATED TO CABINET (INSIDE)**



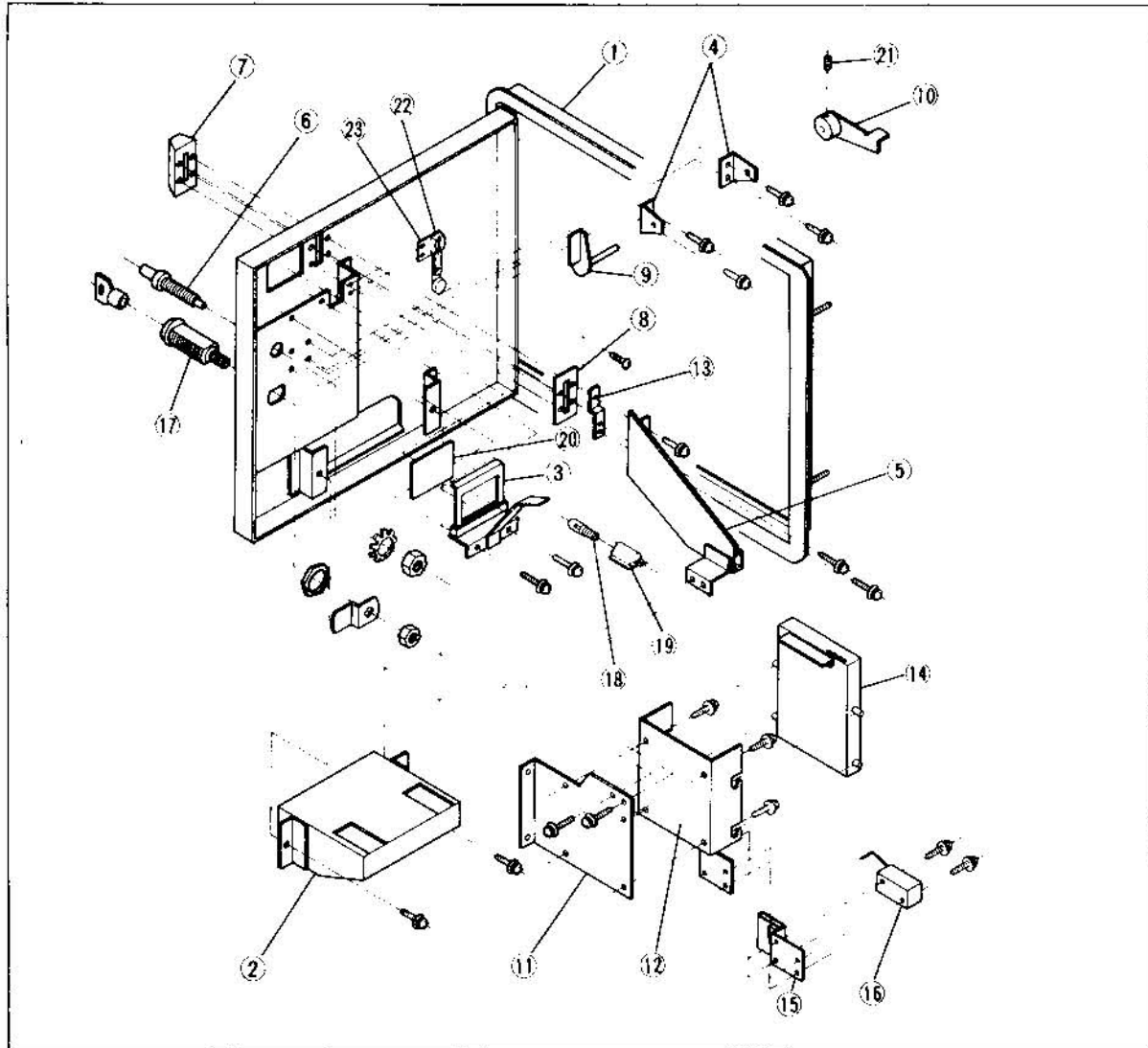
**Fig. 8 Component Parts Related to Cabinet (Inside)**

**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

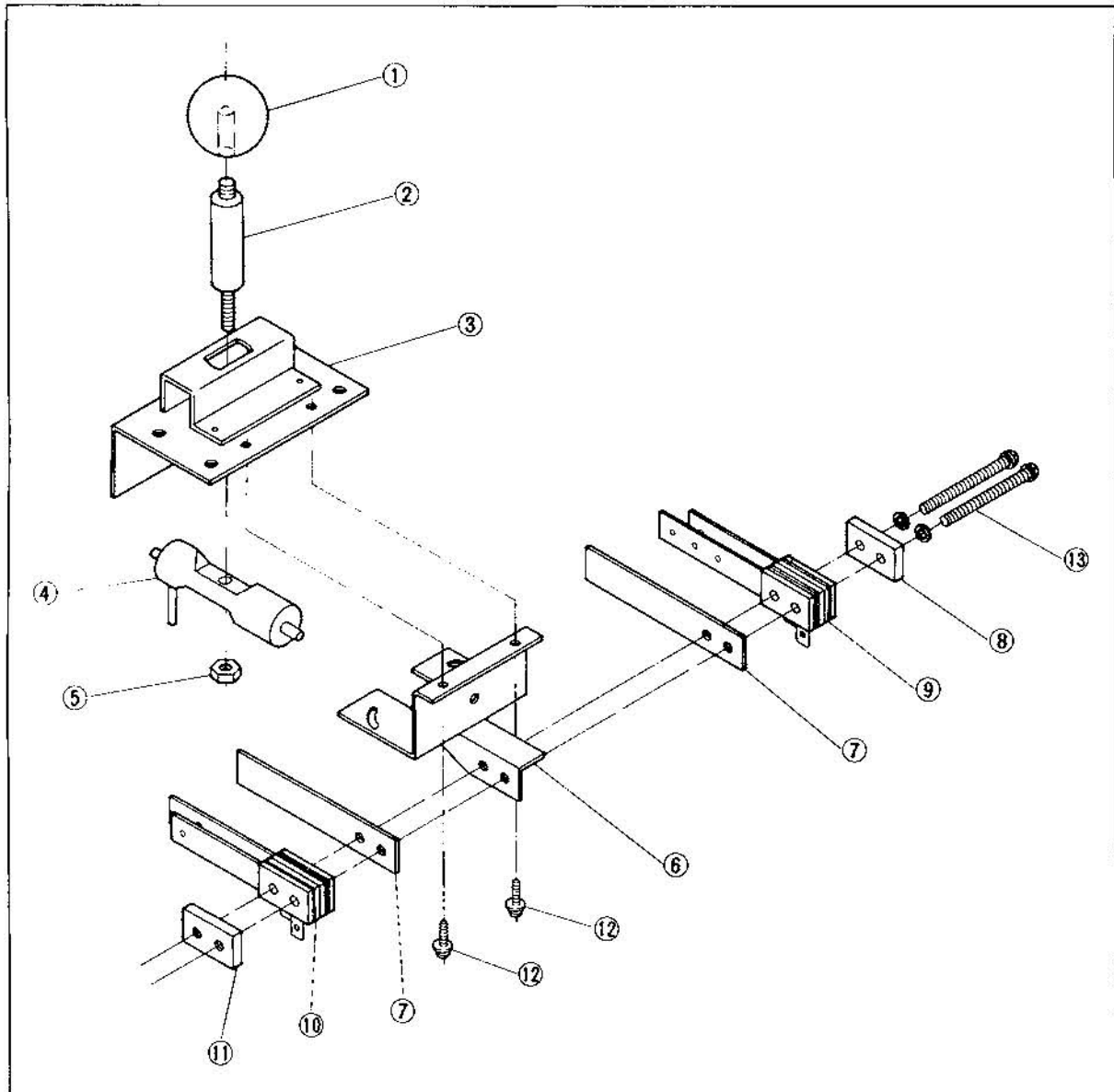
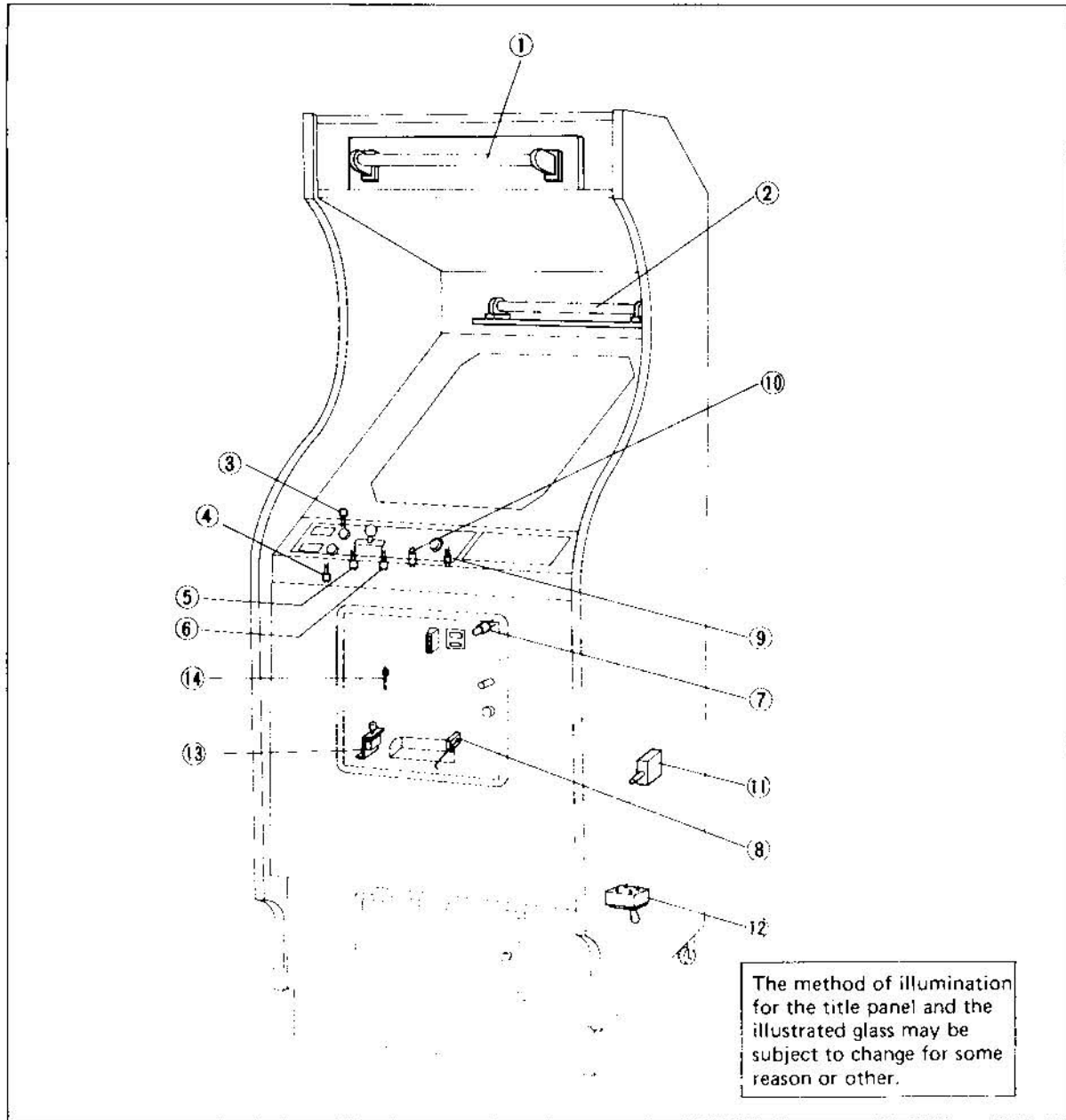


Fig. 11 Lever Assembly

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	Blades switch
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

# TABLE TYPE

This documentation provides standard information.  
Universal reserves the right to change without notice.

# VII. TABLE TYPE PARTS CATALOG

## A. COMPONENT PARTS RELATED TO CABINET (OUTSIDE)

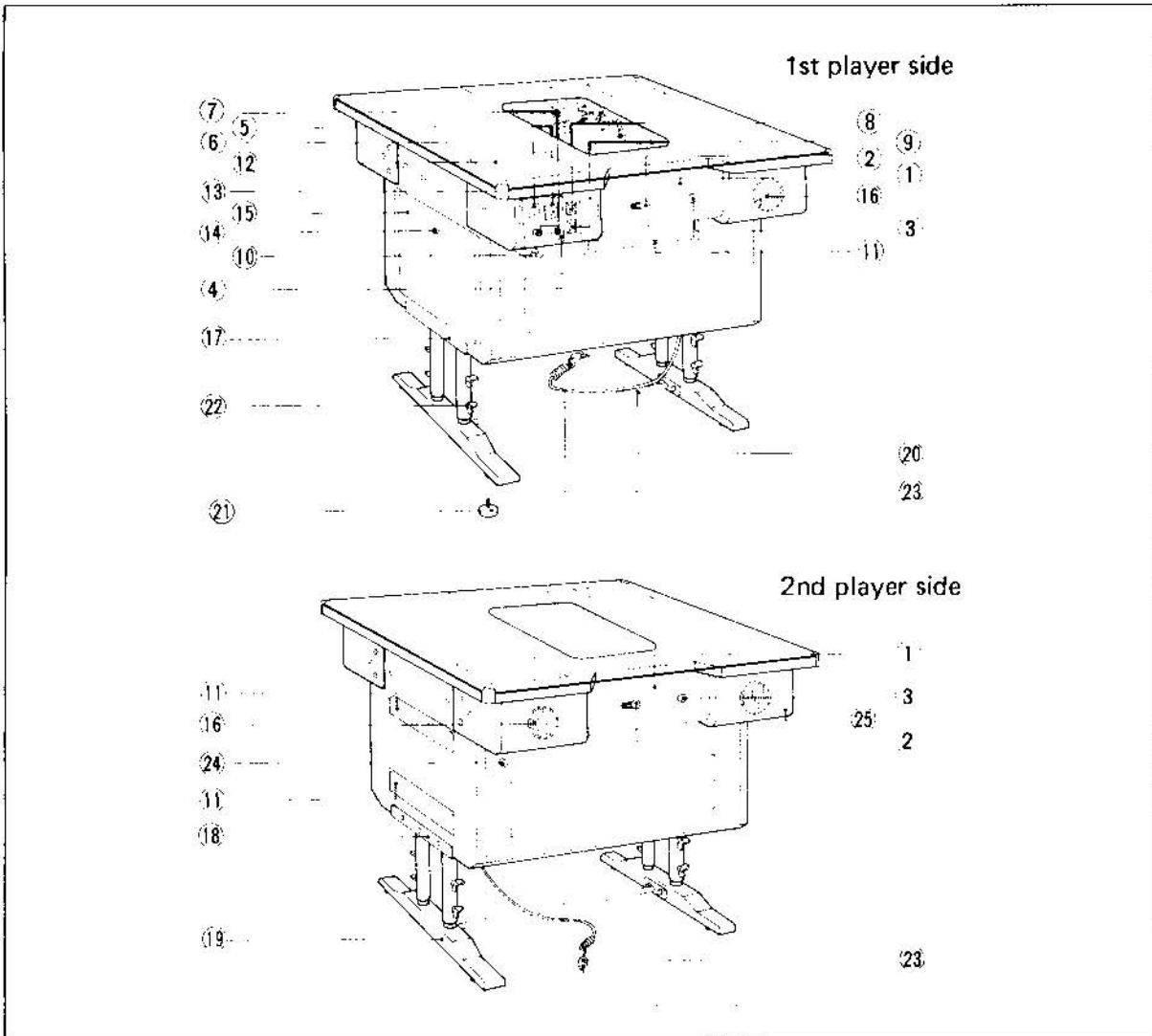


Fig. 13 Component Parts Related to Cabinet (Outside)

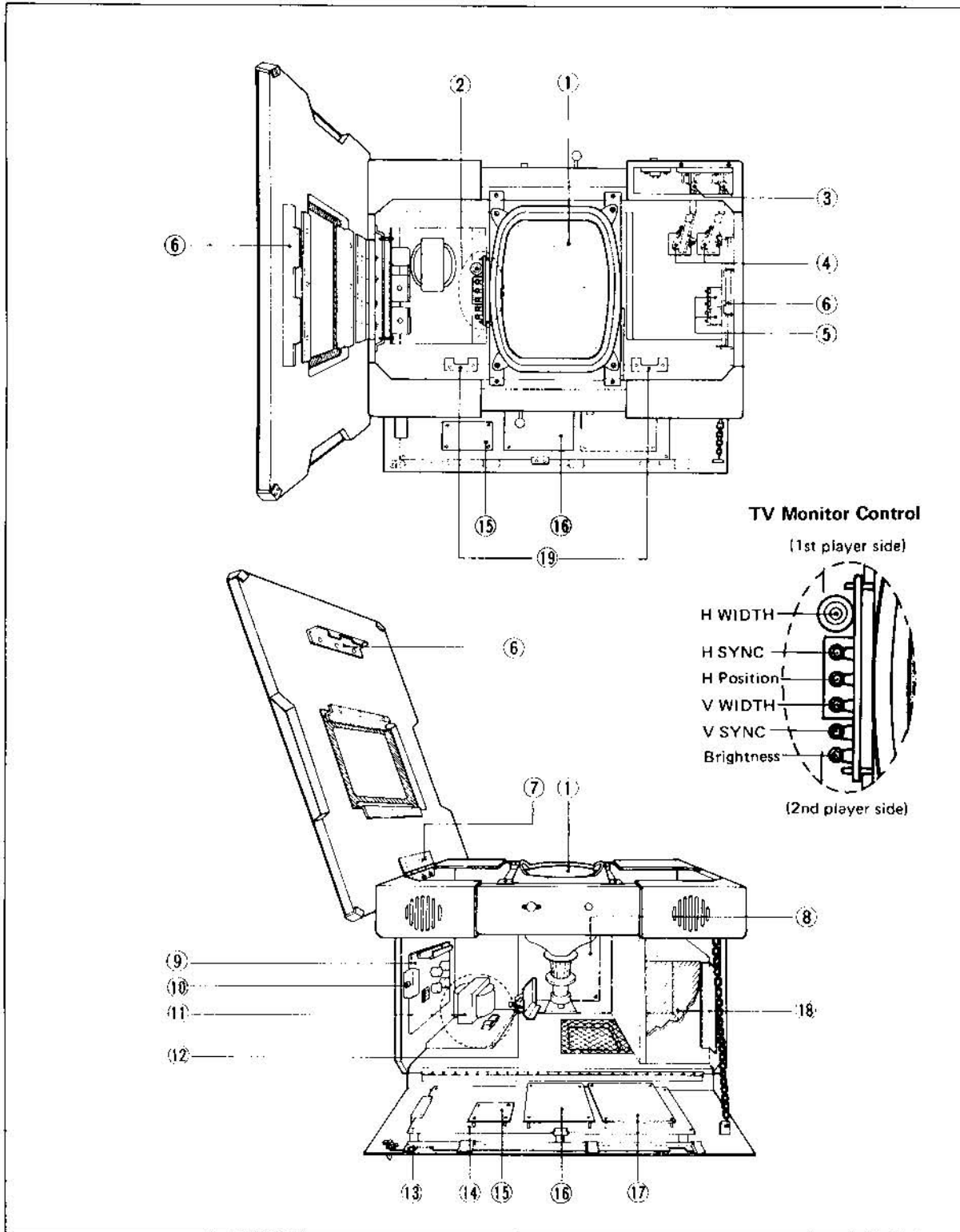
### OUTSIDE CABINET PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Operating indication illustrated panel	13	Glass fittings
2	Control lever	14	Cash box door key
3	FIRE button	15	Cash box door
4	Coin slot frame	16	Speaker (x2)
5	Selector plate (1)	17	Leg (left)
6	Selector plate (2) [not used in case of 1-way]	18	Leg (right)
7	Cancel button	19	Foot
8	Push button ass'y (for 1 player)	20	Foot support
9	Push button ass'y (for 2 players)	21	Leg adjuster
10	Cancel coin receptacle	22	Thumbscrew (x8)
11	Ventilating panel (x3)	23	Power cord (AC)
12	Sticker for game rules (x2)	24	Door key
		25	Cabinet corner box



**B. COMPONENT PARTS RELATED TO CABINET (INSIDE)**

**a) Inside cabinet**



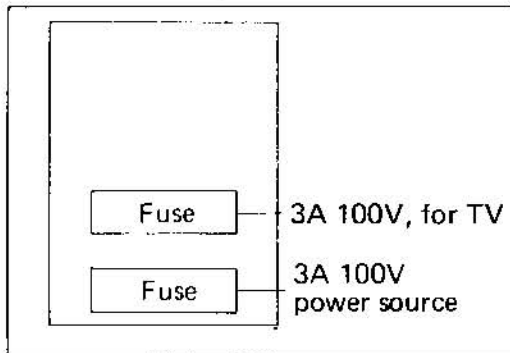
**Fig. 14 Component Parts Related to Cabinet (Inside)**

**INSIDE CABINET PARTS LIST**

Ref. No.	Name	Ref. No.	Name
1	CRT (14" color)	11	Power source unit
2	TV monitor control	12	Demagnetization switch
3	Rejector ass'y	13	Door lock ass'y
4	Coin micro switch	14	Main circuit board
5	Coin counter	15	Sub-circuit board (1) 8013-V1
6	Table lock mechanism ass'y	16	Sub-circuit board (2)
7	Butterfly plate ass'y	17	Sound circuit board
8	TV monitor circuit board	18	Cash box
9	Power source circuit board	19	Metal door fixture
10	Door switch		

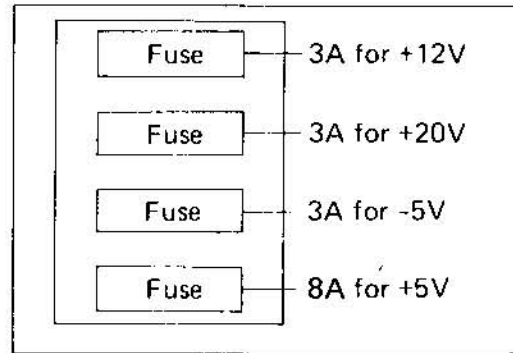
**b) Fuses**

Fuses in the power source unit



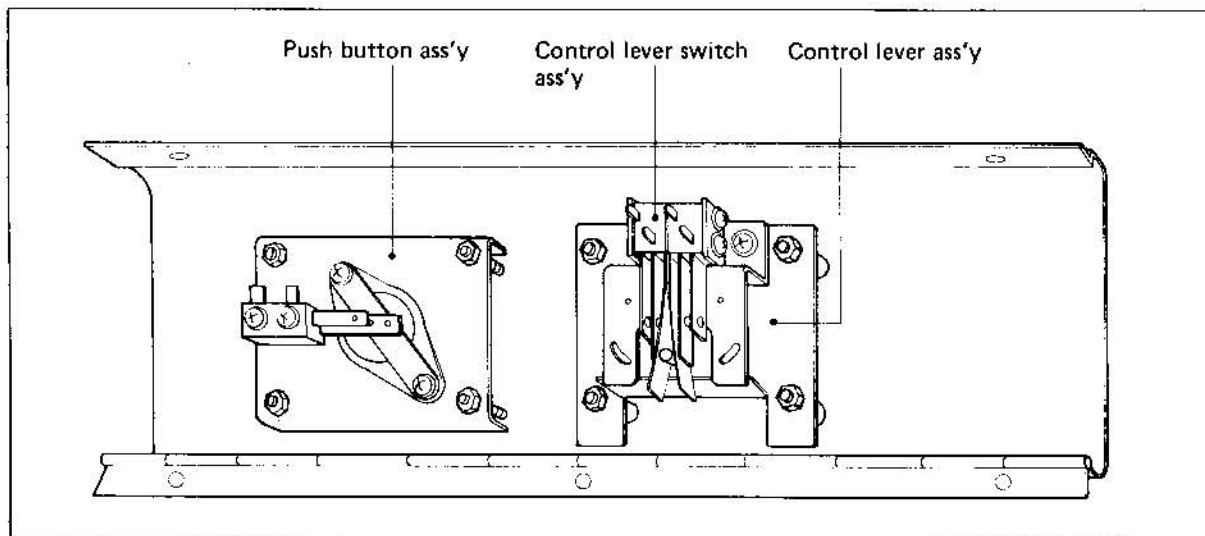
**Fig. 15 Fuses in the Power Source Unit**

Fuses in the power circuit board



**Fig. 16 Fuses in the Power Circuit Board**

**c) Operating panel assembly**



**Fig. 17 Operating Panel Assembly**

# VIII. CIRCUIT BOARD

## A. CIRCUIT BOARD IC LOCATION AND PARTS LIST

### a) Main circuit board IC location and parts list

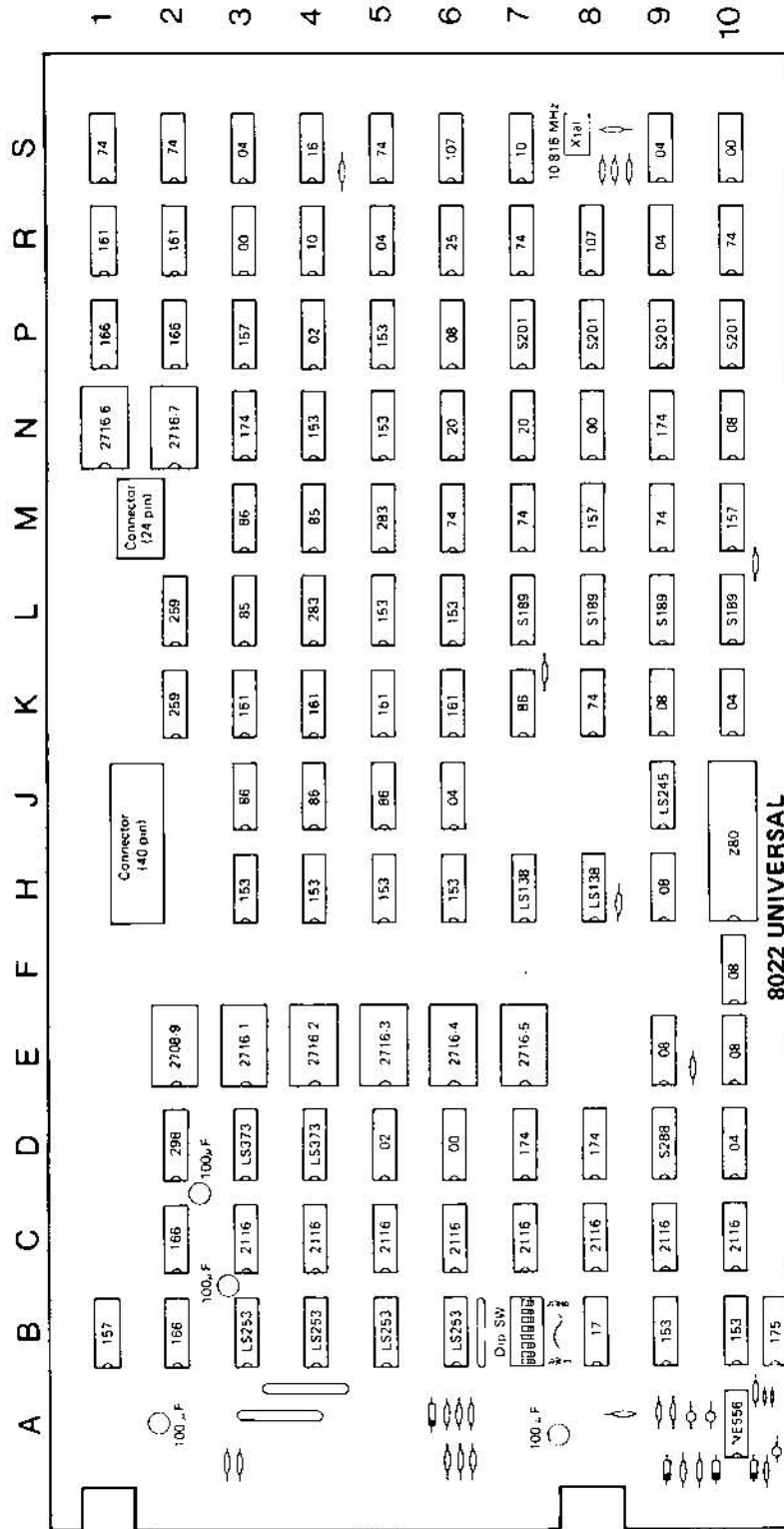


Fig. 18 Main Circuit Board

[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 (1) 8013-V1 IC location and parts list

(Used in the case of 2-way alone)

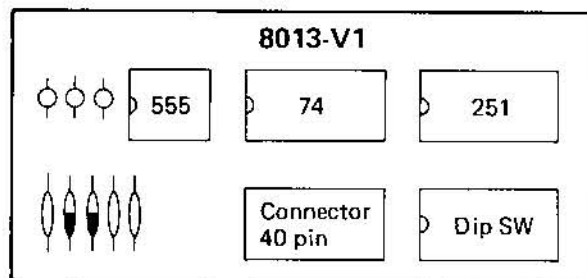


Fig. 19 Sub-circuit Board (1) 8013-V1

[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

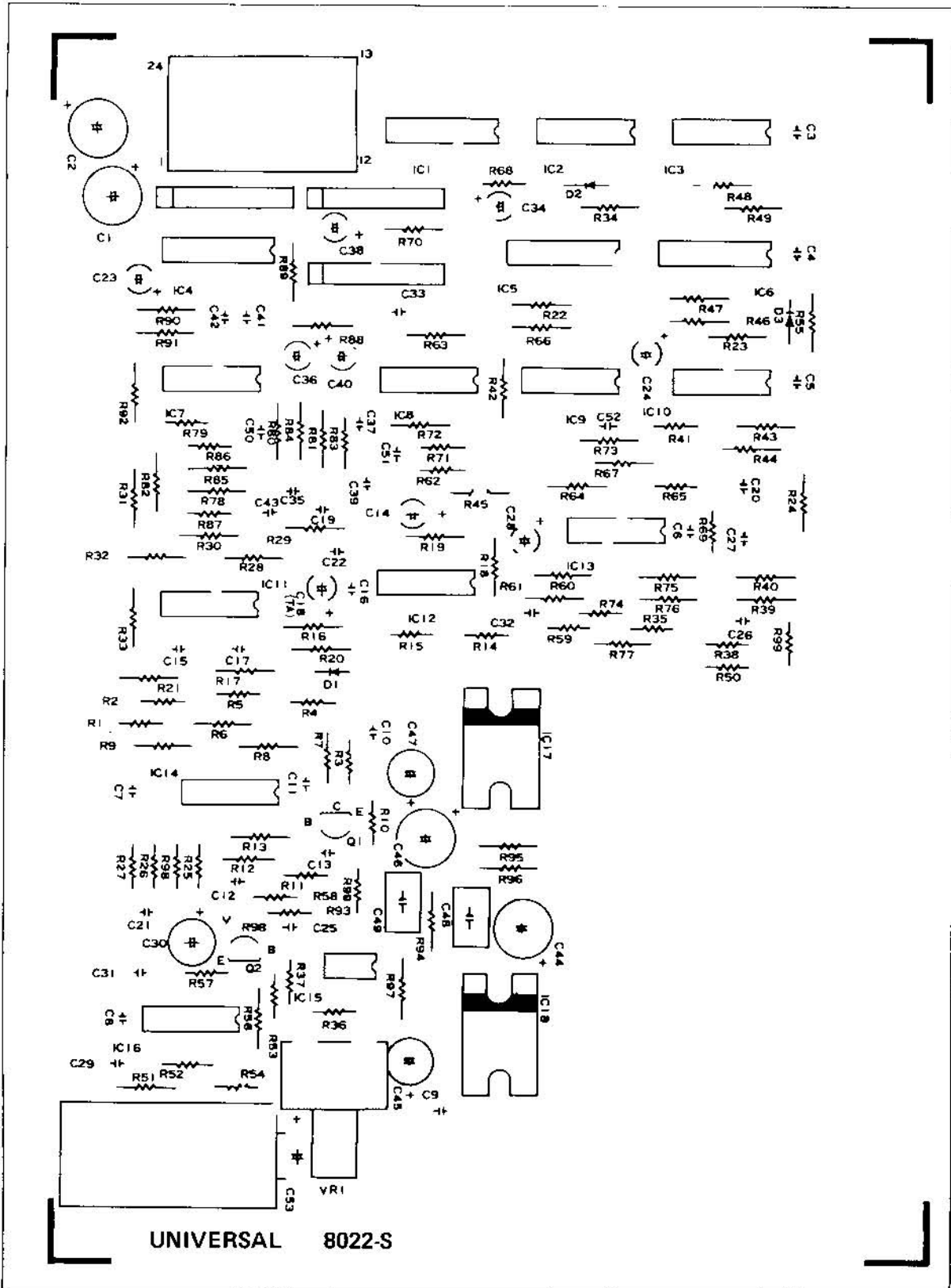


Fig. 20 Sound Circuit Board

Location	Rating	Description	Location	Rating	Description	Location	Rating	Description
R1	1K	Carbon solid resistor	72	51K	Carbon solid resistor	35	0.1μF	Ceramic
2	1K	"	73	100K	"	36	4.7μF	Chemical
3	1M	"	74	100K	"	16V		
4	1K	"	75	100K	"	37	0.047μF	Mila
5	100K	"	76	100K	"	38	2.2μF	Chemical
6	1K	"	77	220K	"	39	0.1μF	Ceramic
7	100K	"	78	100K	"	40	1μF	Chemical
8	1K	"	79	100K	"	16V		
9	1M	"	80	100K	"	41	0.1μF	Ceramic
10	51K	"	81	100K	"	42	0.022μF	Mila
11	51K	"	82	120K	"	43	0.01μF	"
12	100K	"	83	100K	"	44	100μF	Chemical
13	1M	"	84	100K	"	16V		
14	1K	"	85	100K	"	45	47μF	"
15	470K	"	86	100K	"	16V		
16	100K	"	87	220K	"	46	100μF	"
17	100K	"	88	100K	"	16V		
18	120K	"	89	51K	"	47	47μF	"
19	1K	"	90	100K	"	16V		
20	100K	"	91	100K	"	48	0.068μF	Mila
21	100K	"	92	220K	"	49	0.068μF	"
22	100K	"	93	10K	"	50	0.01μF	"
23	100K	"	94	2.2K	"	51	2200pF	"
24	1K	"	95	4.7Ω	"	52	0.015μF	"
25	100K	"	96	1.5Ω	"	53	1000μF	Chemical
26	10K	"	97	1.5Ω	"	16V		
27	10K	"	98	10K	"	54	0.047μF	Ceramic
28	10K	"	99	22K	"			
29	100K	"						
30	100K	"	C1	100μF	Chemical			
31	100K	"		16V				
32	100K	"	2	100μF	"	Location	Item No.	Description
33	100K	"		25V		Q1	2SC945	N-P-N Transistor
34	100K	"	3	0.1μF	Ceramic	2	"	"
35	10K	"	4	0.1μF	"	D1	1S1588	Switching Diode
36	1K	"	5	0.1μF	"	3	"	"
37	75K	"	6	0.1μF	"			
38	100K	"	7	0.1μF	"	RB1	MS1038AM	10KΩ Resistor Array
39	51K	"	8	0.1μF	"	2	"	"
40	100K	"	9	0.1μF	"	3	"	"
41	100K	"	10	0.1μF	"			
42	220K	"	11	0.1μF	"	VR1	RV16YP	1KΩ(B) Variable Resistor
43	220K	"	12	0.022μF	Mila			
45	220K	"	13	0.1μF	Ceramic	IC1	ULN2003AN	Darlington Transistor Array
46	100K	"	14	1μF	Chemical	2	CD4011CN	Quad 2-Input NAND Gate
47	51K	"	15	0.1μF	Ceramic	3	CD4013CN	Dual D Flip Flop
48	24K	"	16	0.01μF	Mila	4	ULN2003AN	Darlington Transistor Array
49	12K	"	17	6800pF	"	5	CD4049CN	Hex Inverting Buffer
50	1K	"	18	0.22μF	Tantalum	6	CD4040CN	14-Stage Binary Counters
51	1K	"	19	0.022μF	Mila	7	LM324N	Quadruple Operational Amplifiers
52	51K	"	20	Not Used		8	NE556N	Dual Timer
53	10K	"	21	0.1μF	Ceramic	9	CD4016CN	Quad Bilateral Switch
54	330K	"	22	0.1μF	"	10	LM324N	Quadruple Operational Amplifiers
55	10K	"	23	1μF	Chemical	11	LM324N	"
56	1K	"	24	16V		12	NE556N	Dual Timer
57	100K	"		16V		13	LM324N	Quadruple Operational Amplifiers
58	100K	"	25	4700pF	Mila	14	LM324N	"
59	100K	"	26	0.1μF	Ceramic	15	NE555N	Timer
60	100K	"	27	0.022μF	Mila	16	LM324N	Quadruple Operational Amplifiers
61	100K	"	28	10μF	Chemical			
62	1K	"		16V				
63	51K	"	29	0.01μF	Mila			
64	100K	"	30	22μF	Chemical			
65	100K	"		16V				
66	330K	"	31	0.01μF	Mila			
67	75K	"	32	470pF	Ceramic			
68	100K	"	33	3300pF	Mila			
69	100K	"	34	1μF	Chemical	17	μPC1181H	Power Amplifier
70	100K	"		16V		18	μPC1181H	"
71	1K	"						

**d) Sub-circuit board (2) IC location and parts list**

**[1] Integrated Circuit**

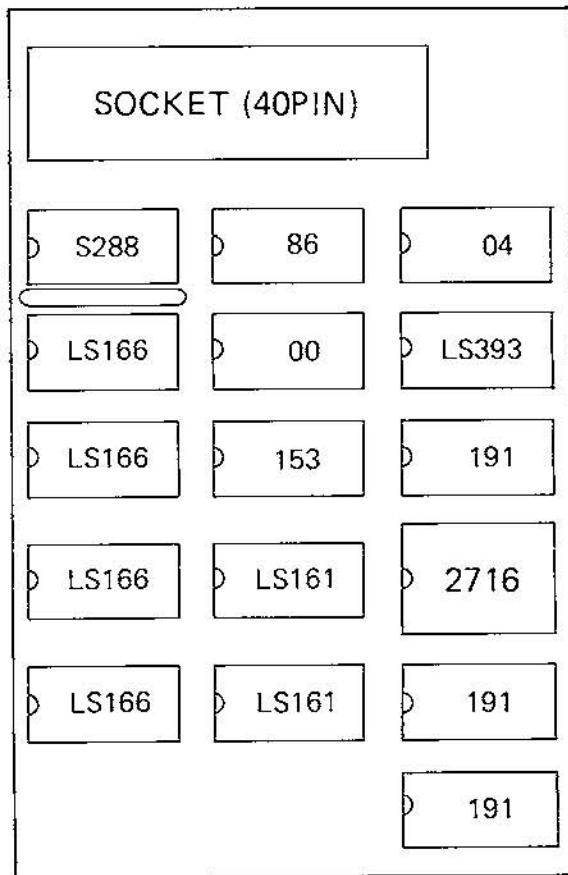
Item No.	Q'ty	Description
7400N	1	Transistor Logic
7404N	1	"
7486N	1	"
74153N	1	"
74161AN	2	"
74166N	4	"
191N	3	"
S288N	1	256 bit Bipolar ROM
LS393N	1	Transistor Logic
2716	1	Nch Mos 16K bit EP ROM

**[2] Capacitors**

Rating	Q'ty	Description
0.1 $\mu$ F/12V	7	Ceramic Capacitor

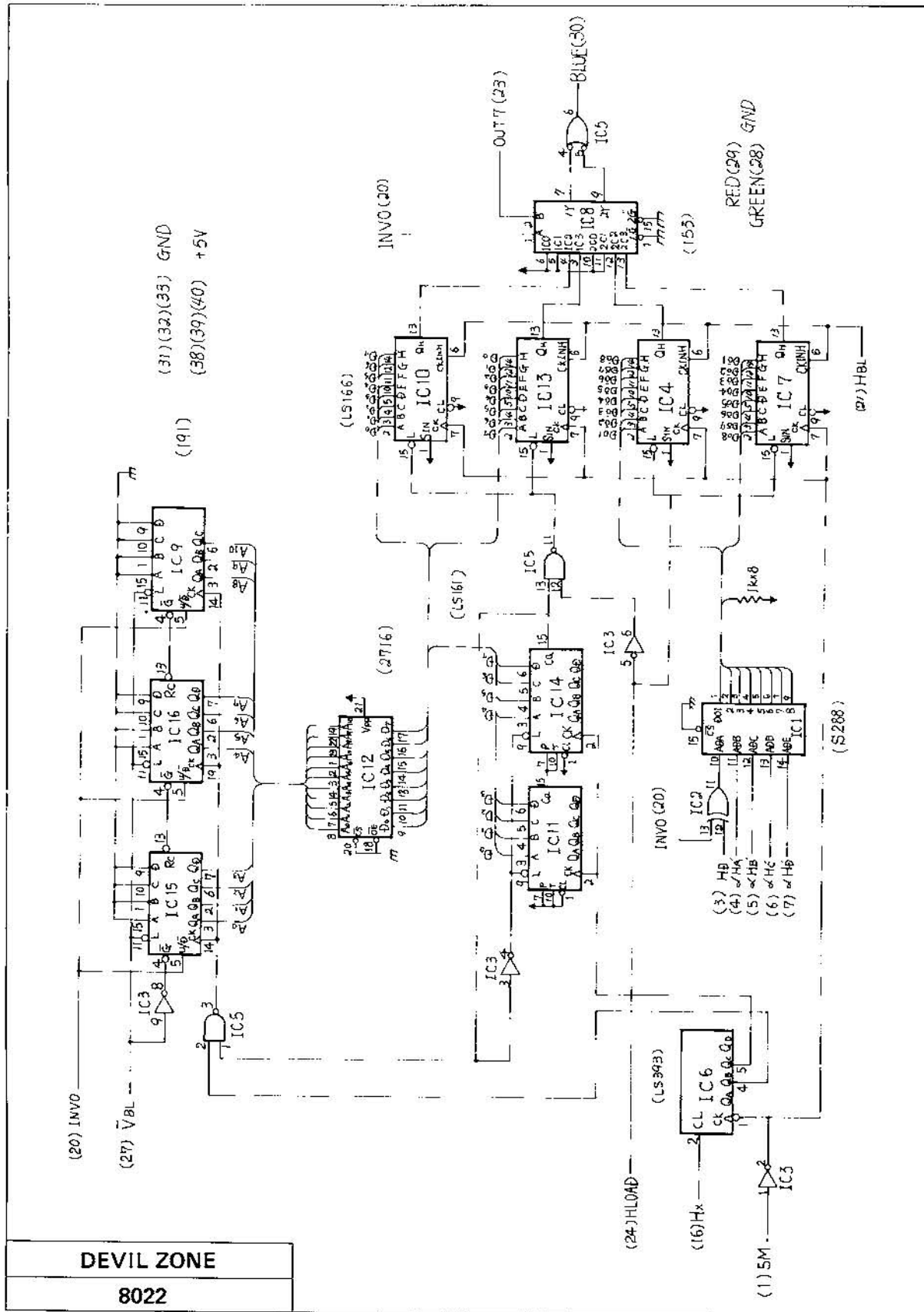
**[3] Resistors**

Rating	Q'ty	Description
MS1028M	1	1K $\Omega$ Rogstor Array



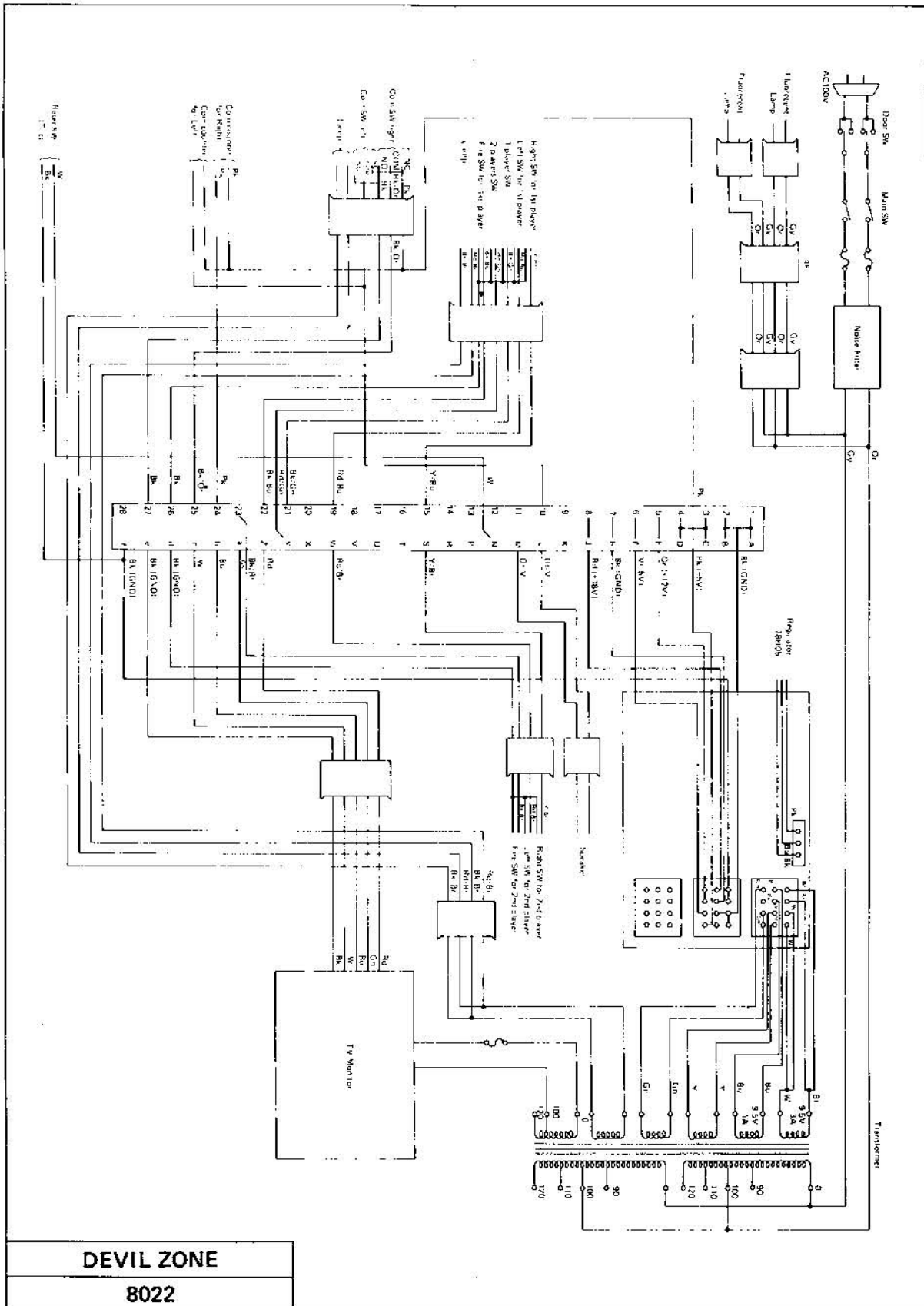
**Fig. 21 Sub-circuit Board (2)**

# SUB-CIRCUIT BOARD (2) BLOCK DIAGRAM





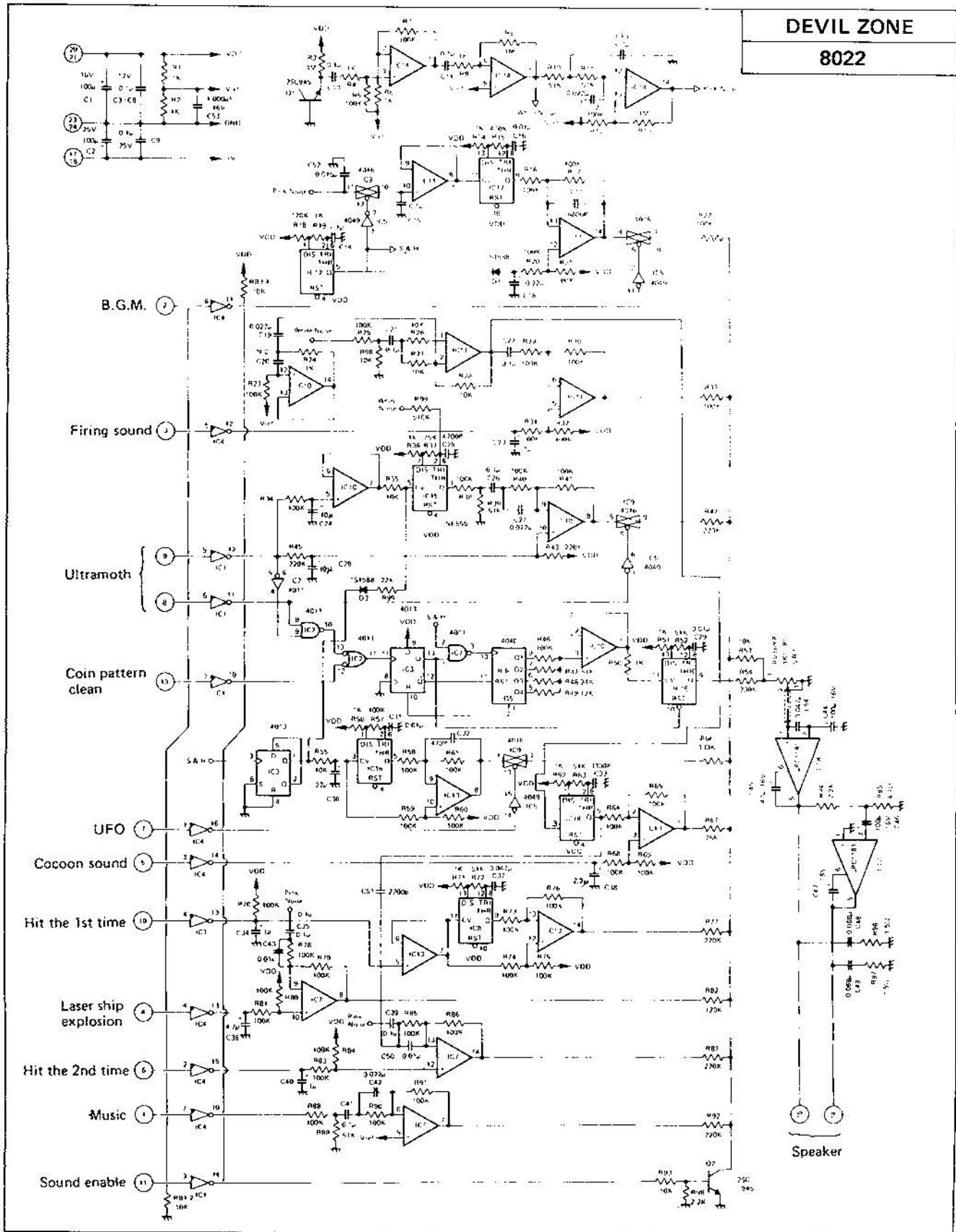
WIRING DIAGRAM (CONNECTOR)



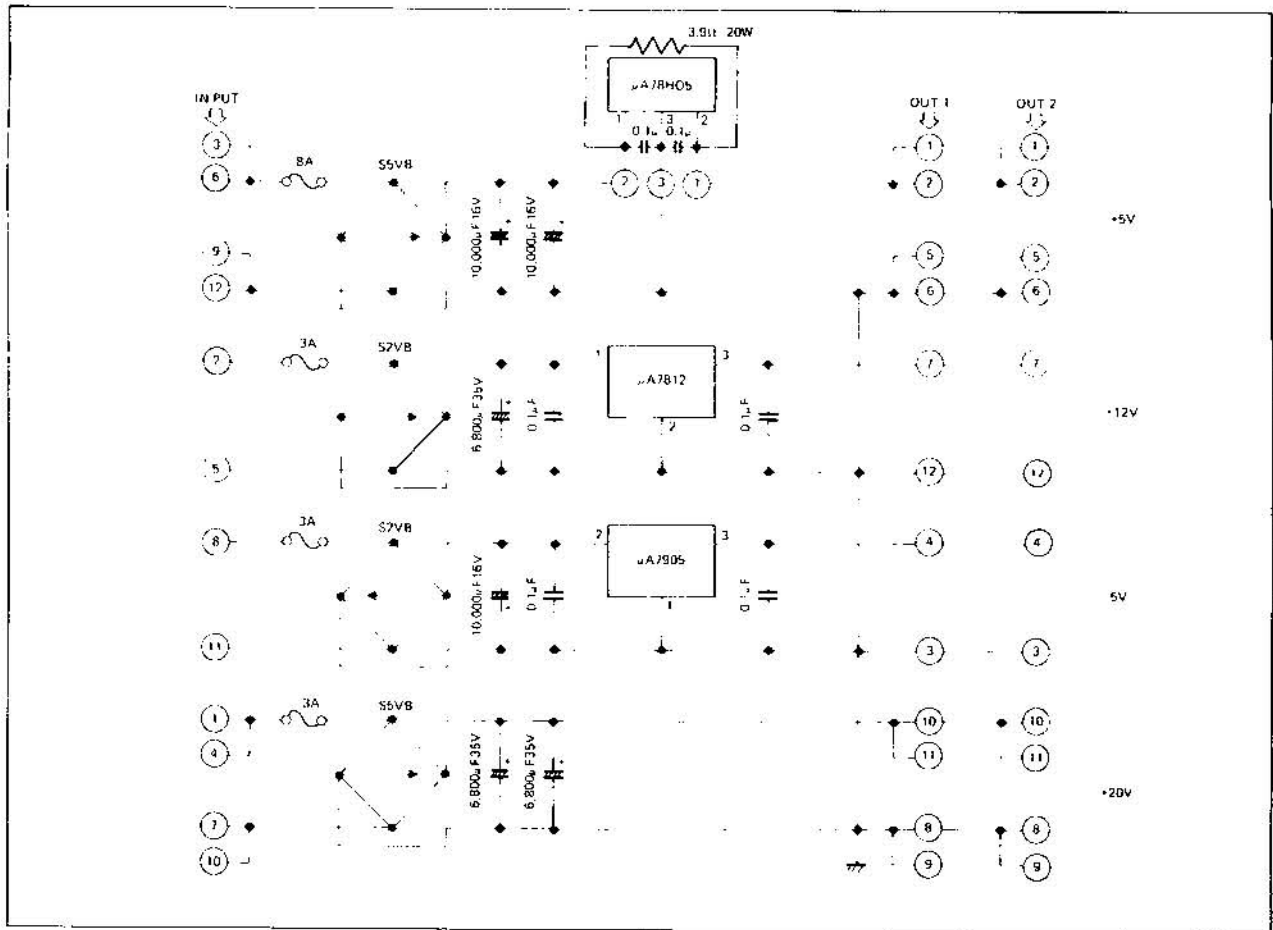
# SOUND BLOCK DIAGRAM

DEVIL ZONE

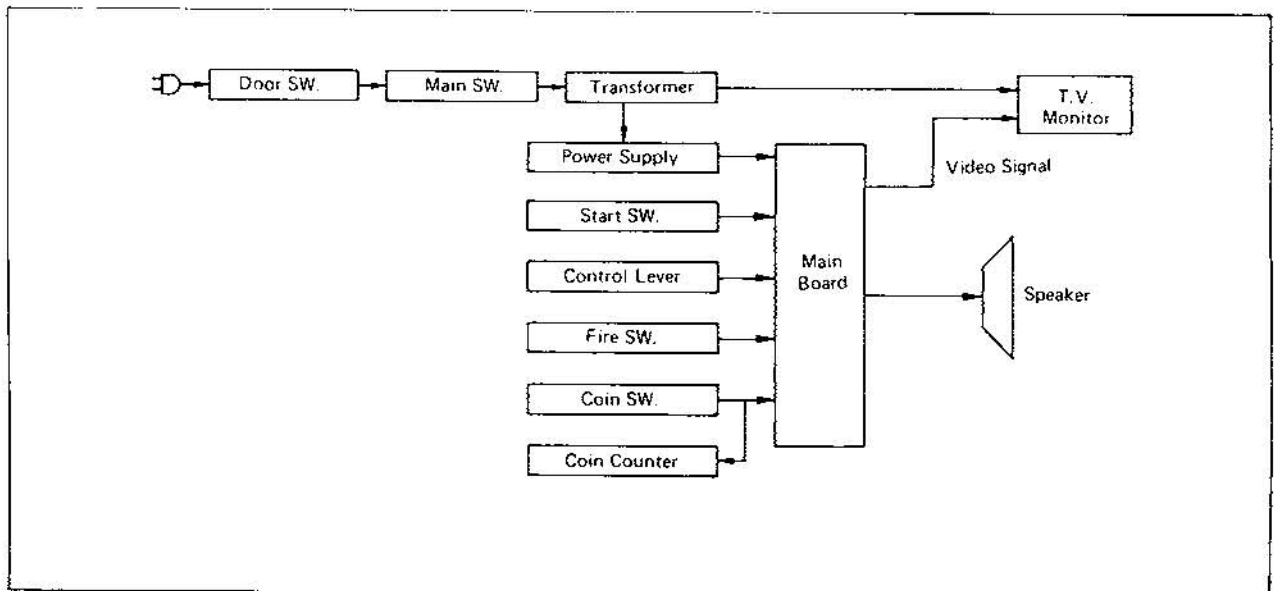
8022



# POWER SOURCE BLOCK DIAGRAM



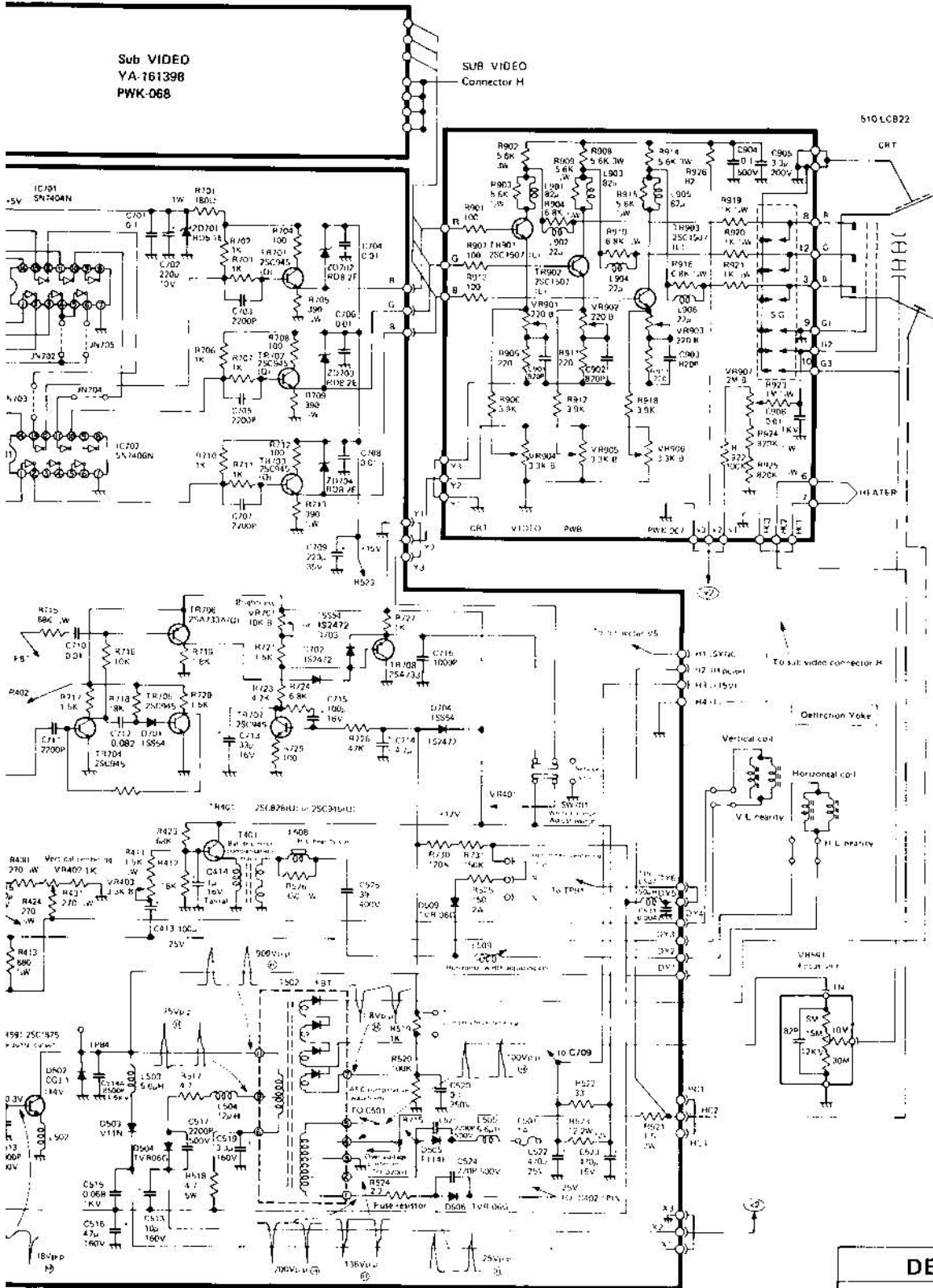
# BLOCK DIAGRAM



Sub VIDEO  
YA-161398  
PWK-068

SUB VIDEO  
Connector H

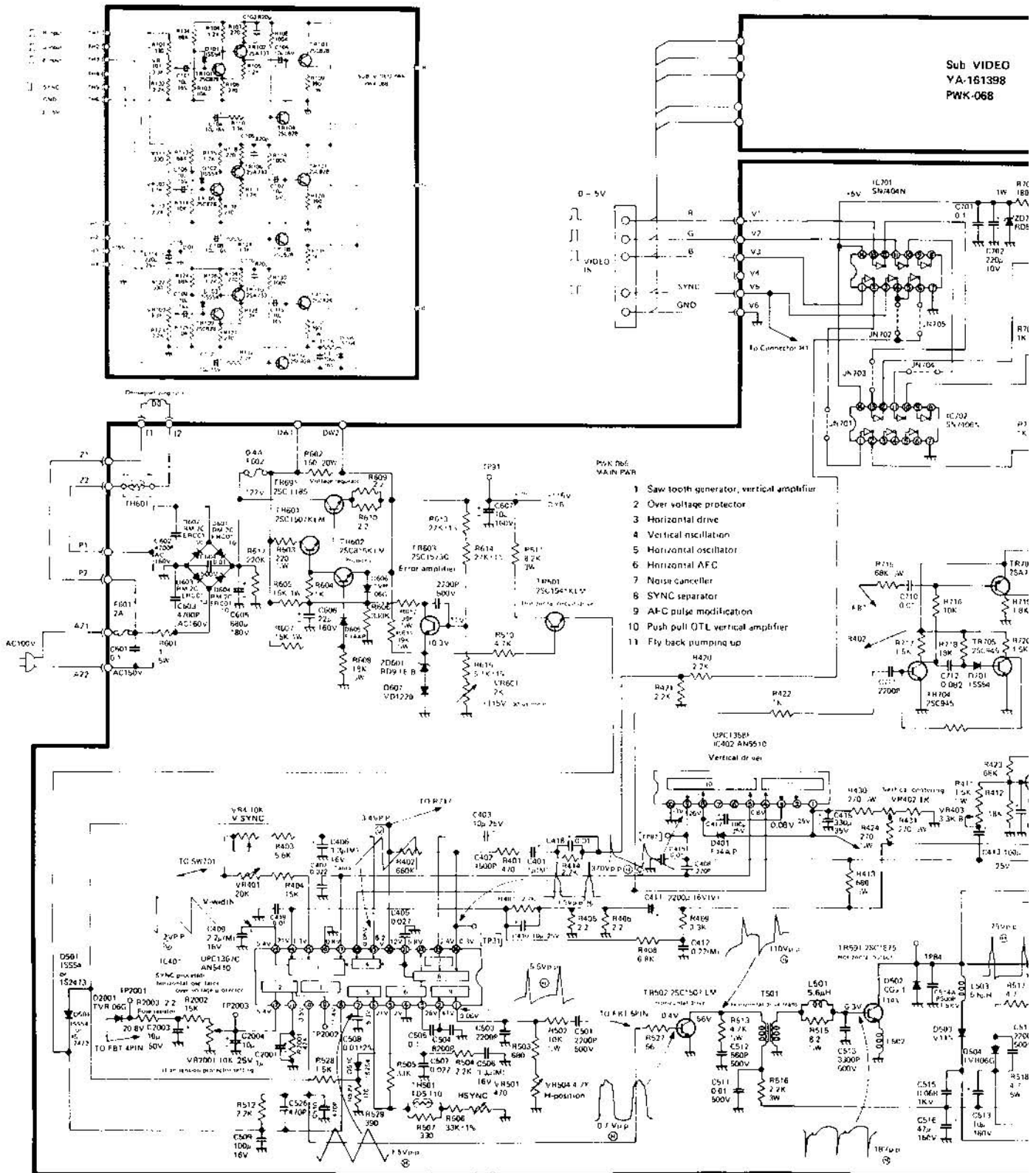
510 LCB22

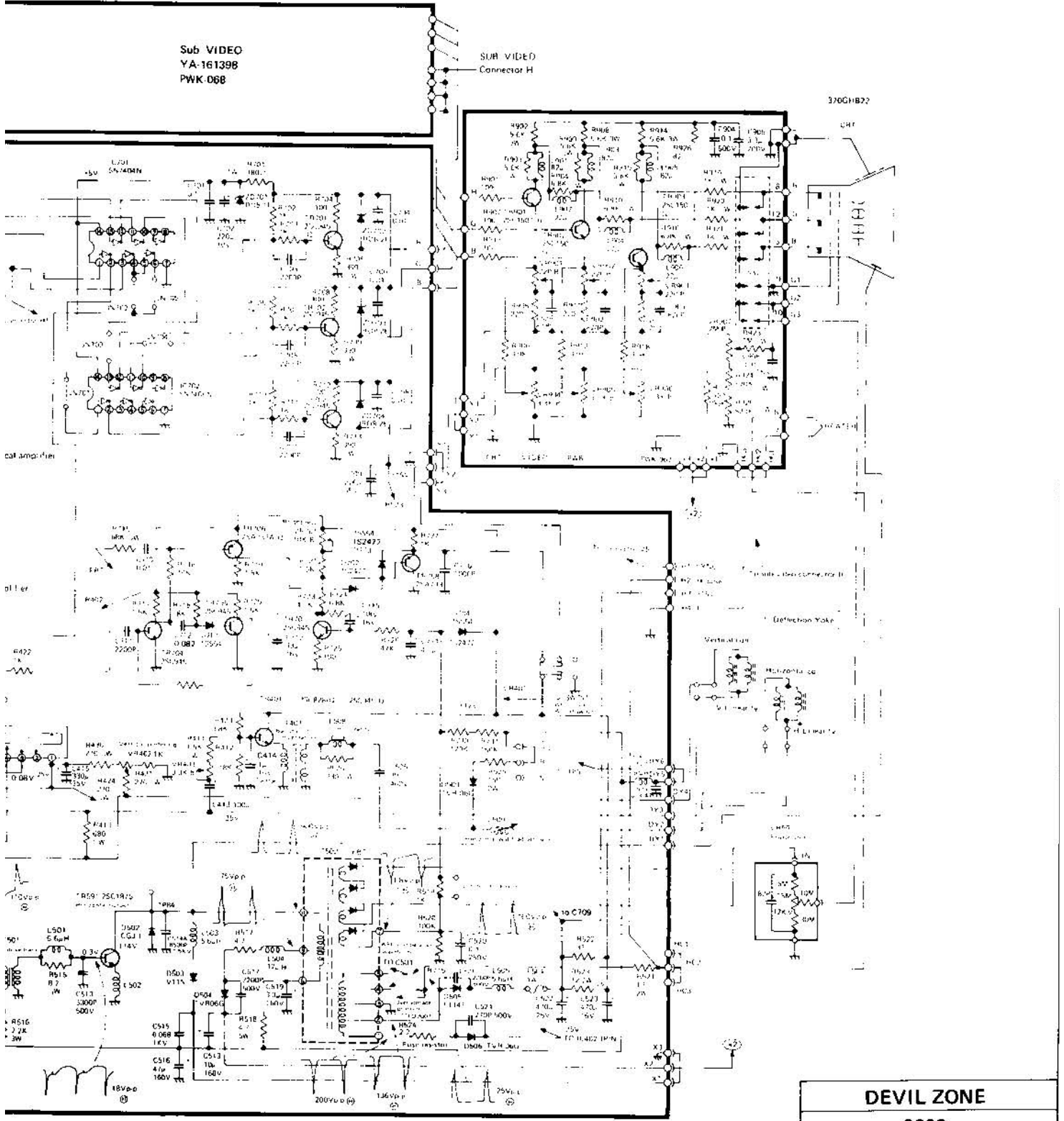


DEVIL ZONE

8022

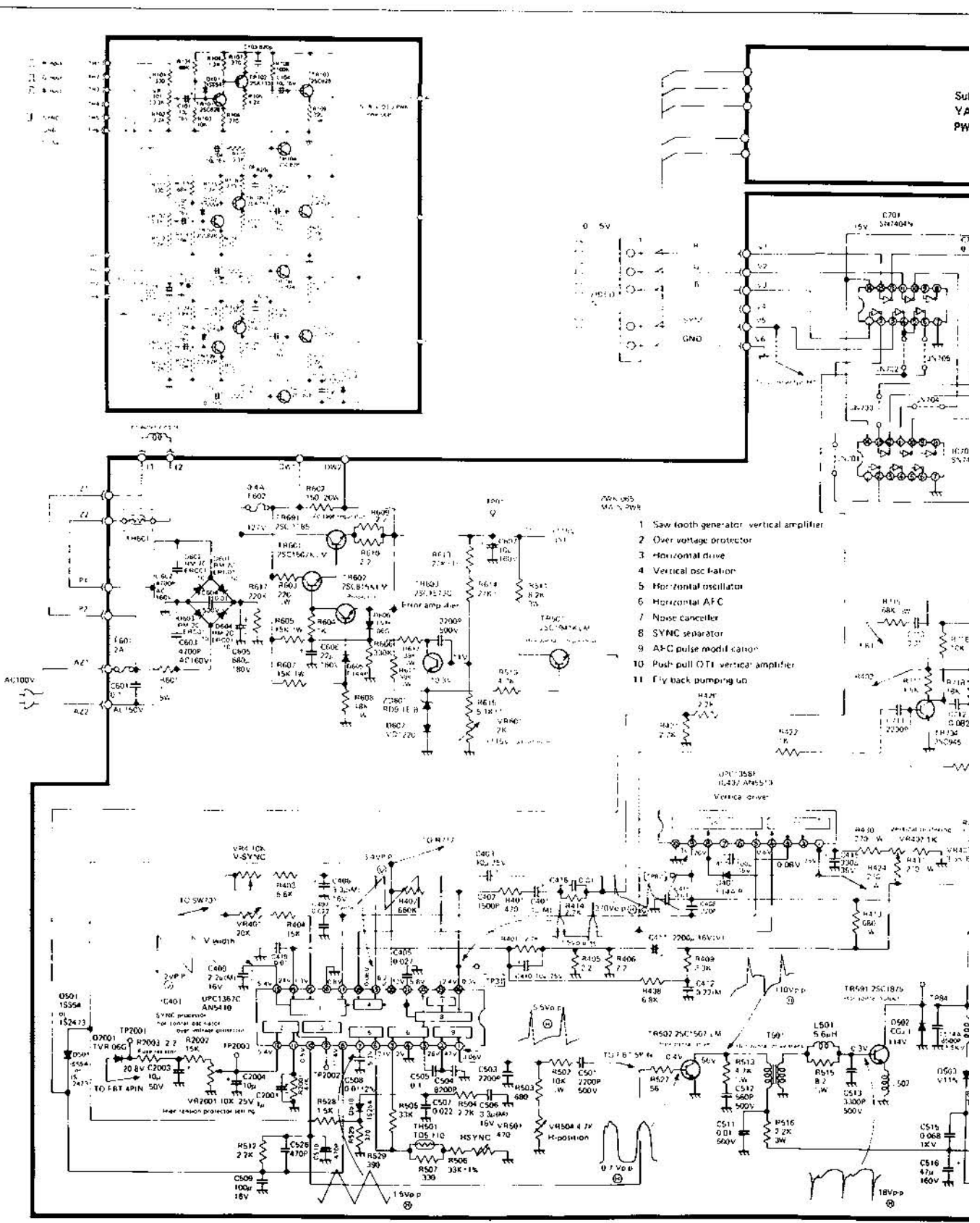
**SCHEMATIC DIAGRAM (20" color)**





DEVIL ZONE  
8022

# SCHEMATIC DIAGRAM (14" color)



- 1 Saw tooth generator, vertical amplifier
- 2 Over voltage protector
- 3 Horizontal drive
- 4 Vertical oscillator
- 5 Horizontal oscillator
- 6 Horizontal AFC
- 7 Noise canceller
- 8 SYNC separator
- 9 AFC pulse modulator
- 10 Push-pull OTI vertical amplifier
- 11 Fly back pumping up

Sul  
VA  
PW

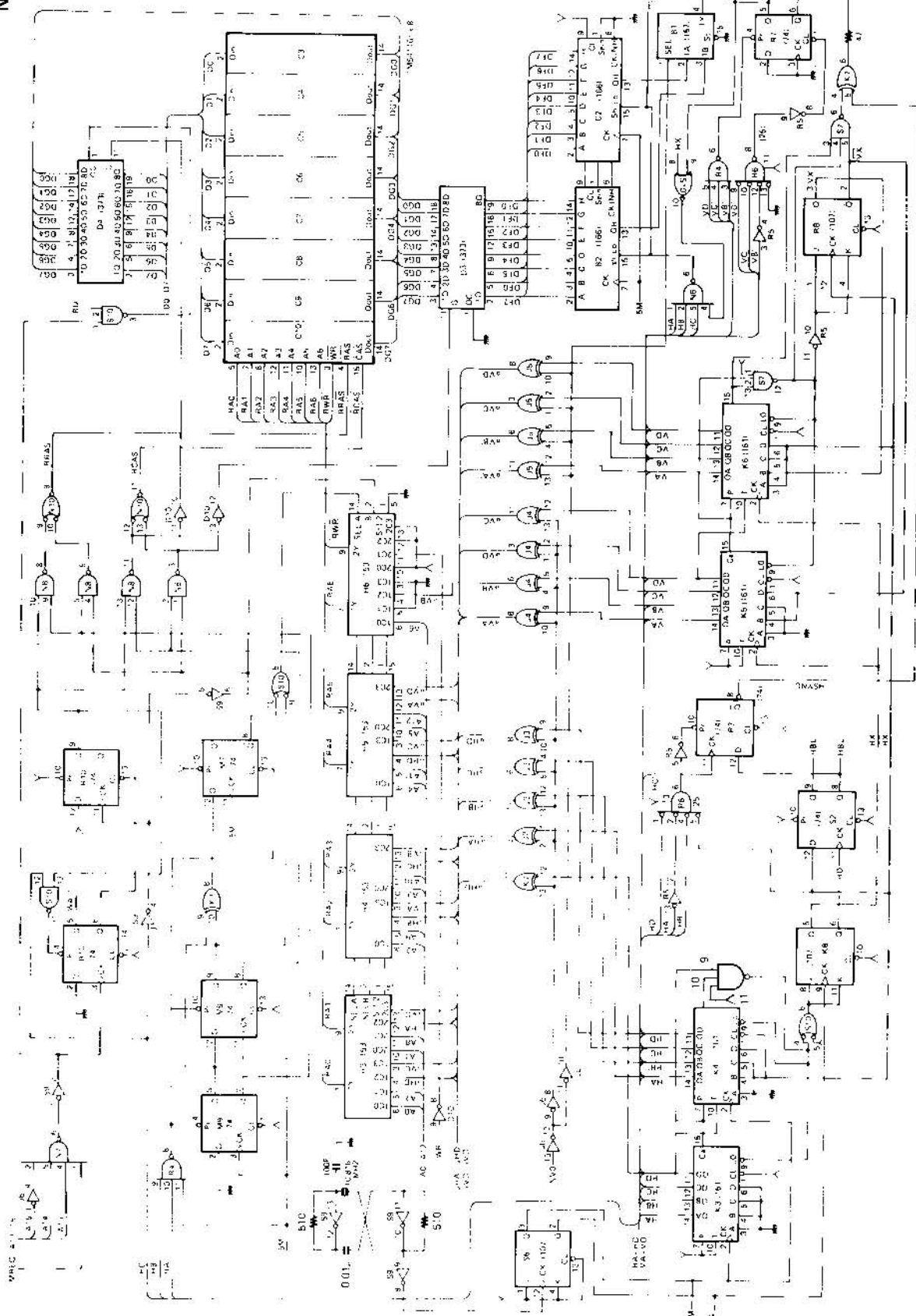
0 5V

200K 0.05  
MAG. 2.00X

07C135B  
11437 AP5573  
Vertical driver

\*R507 25C1507 LM

18Vpp

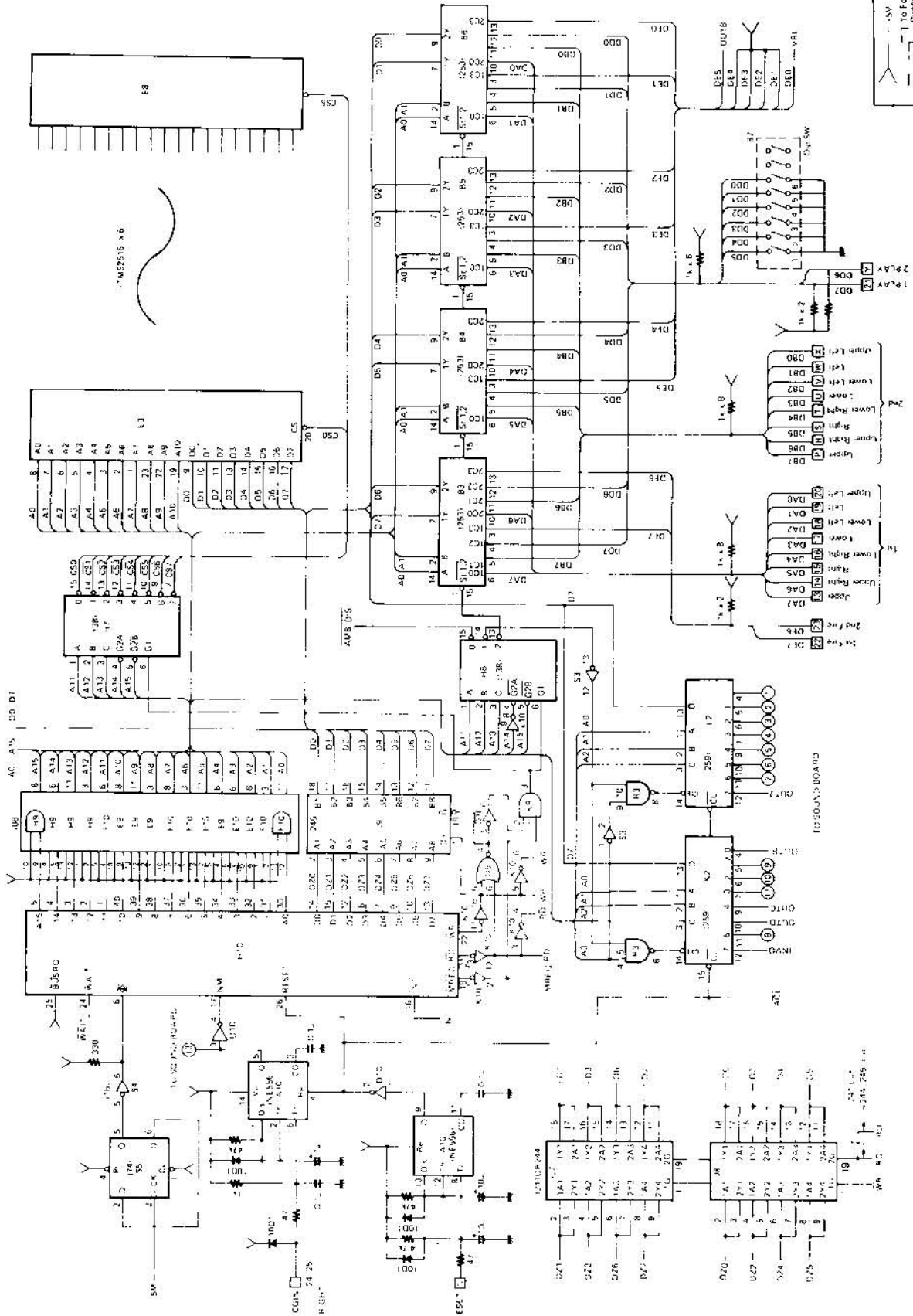


DEVIL ZONE  
8022

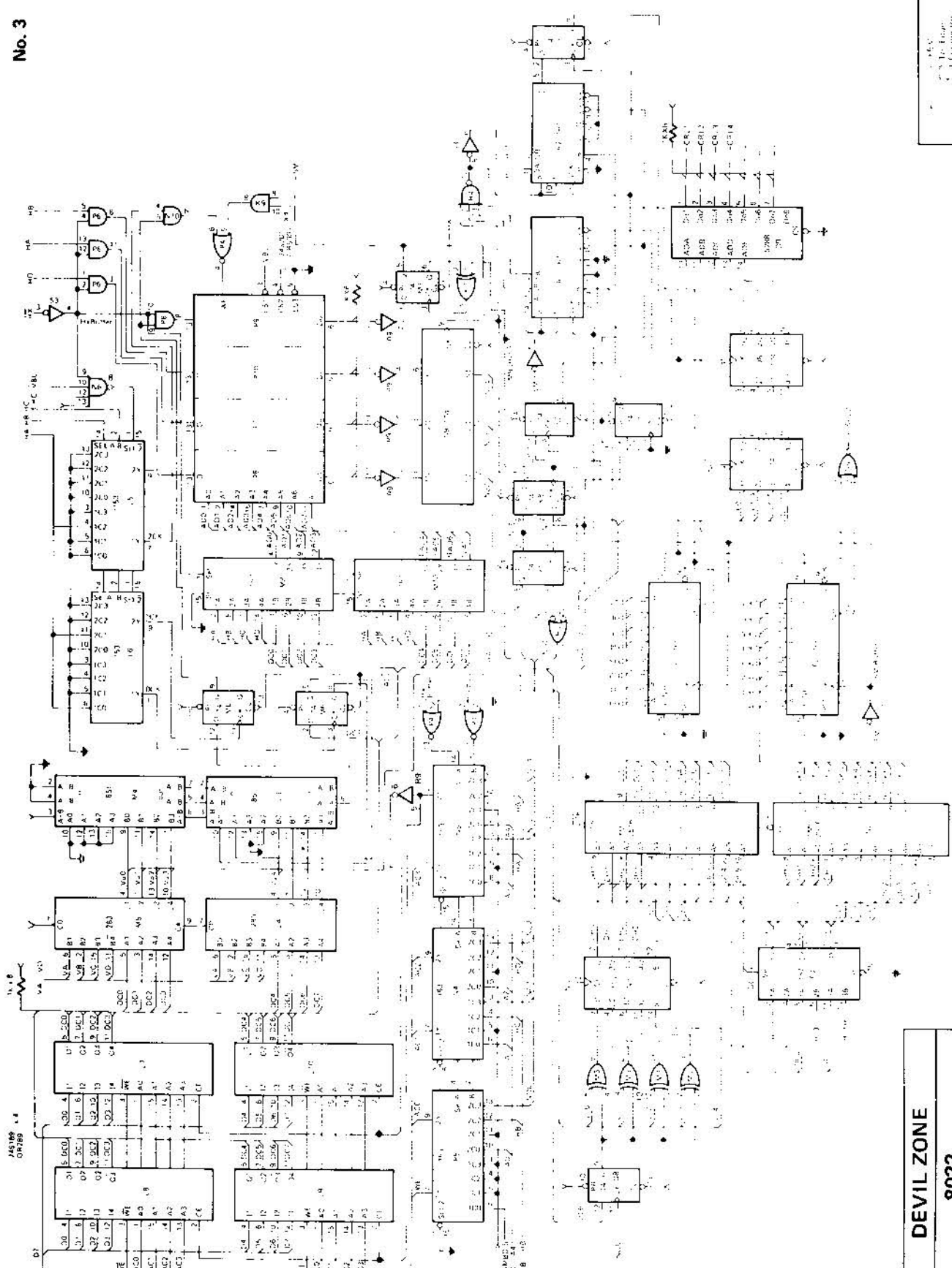
45V  
To Edge  
Connector



MAIN BLOCK DIAGRAM



74S189 x 4  
04789



DEVIL ZONE  
8022

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DS90C02

