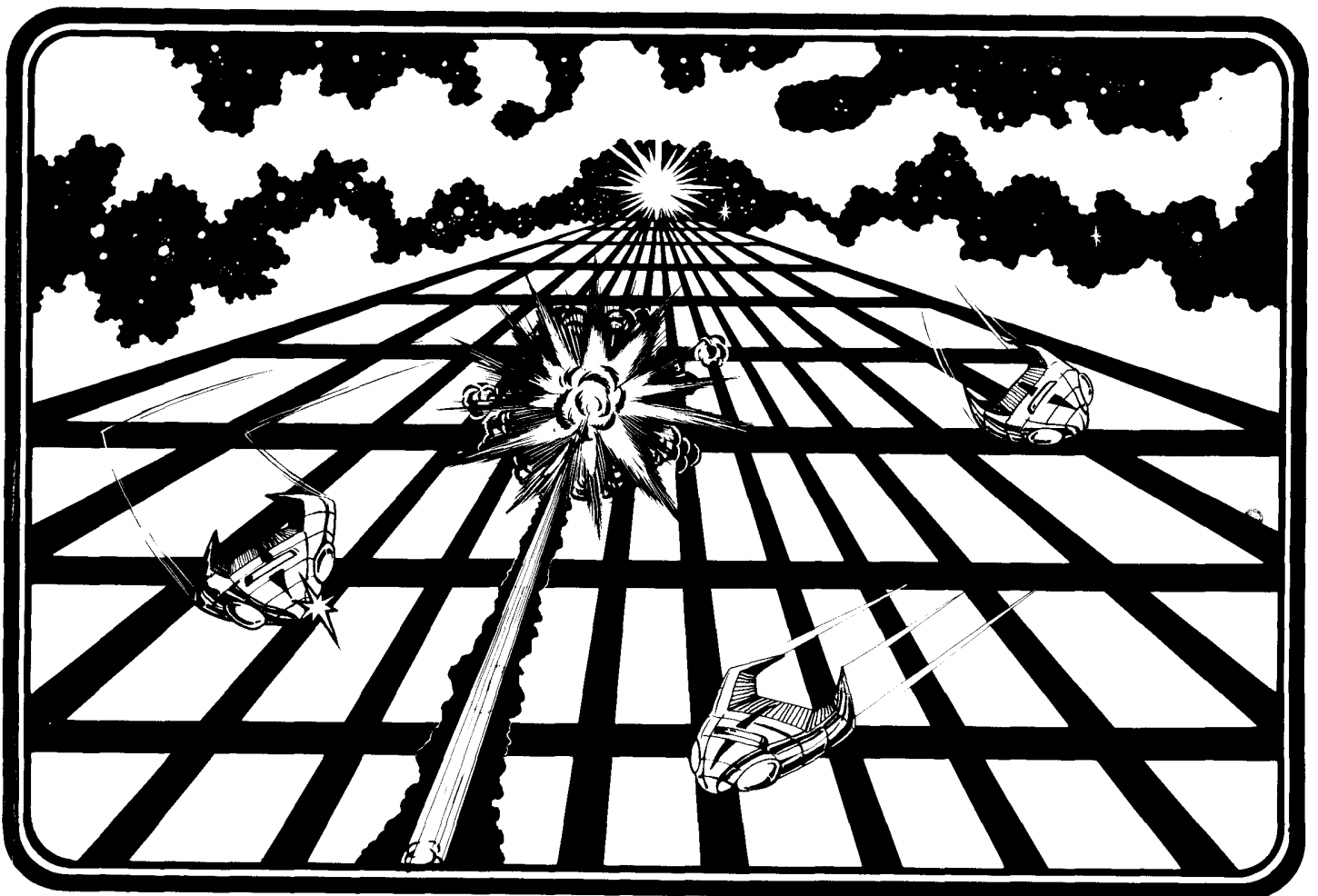


COSMIC SERIES

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.

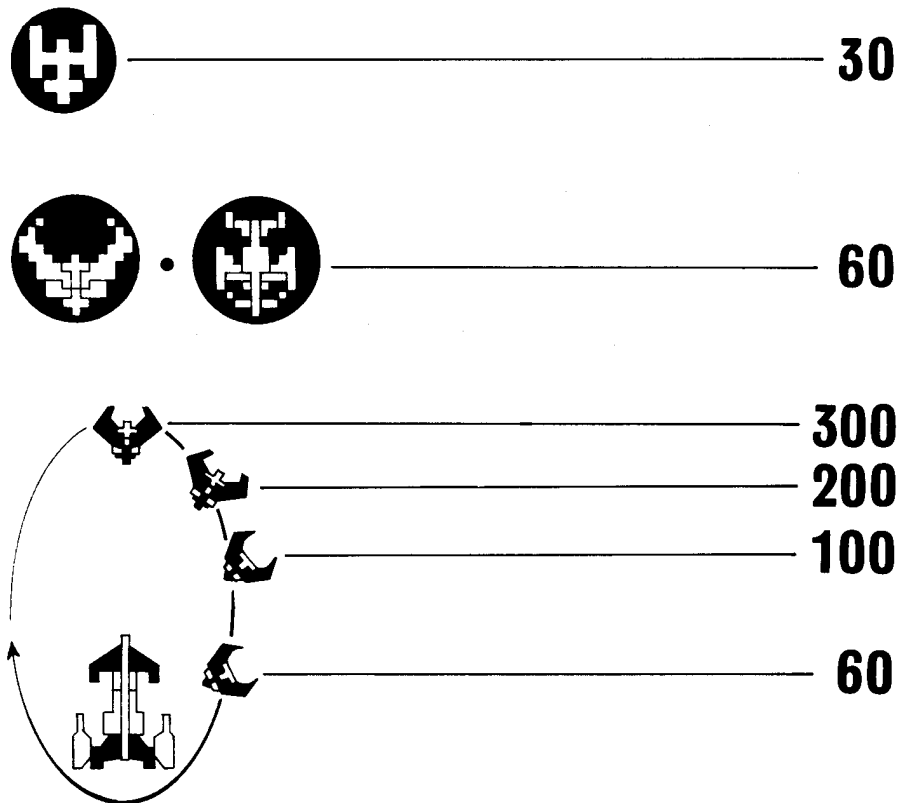
II. HOW TO HANDLE AND MAINTAIN THIS MACHINE

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

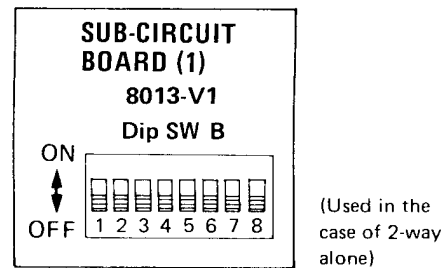
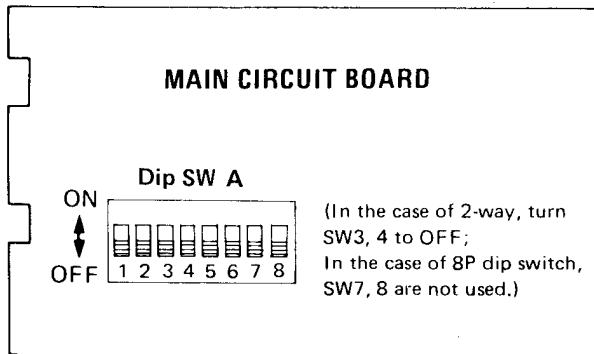


Fig. 1 Positions of Dip Switches

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)

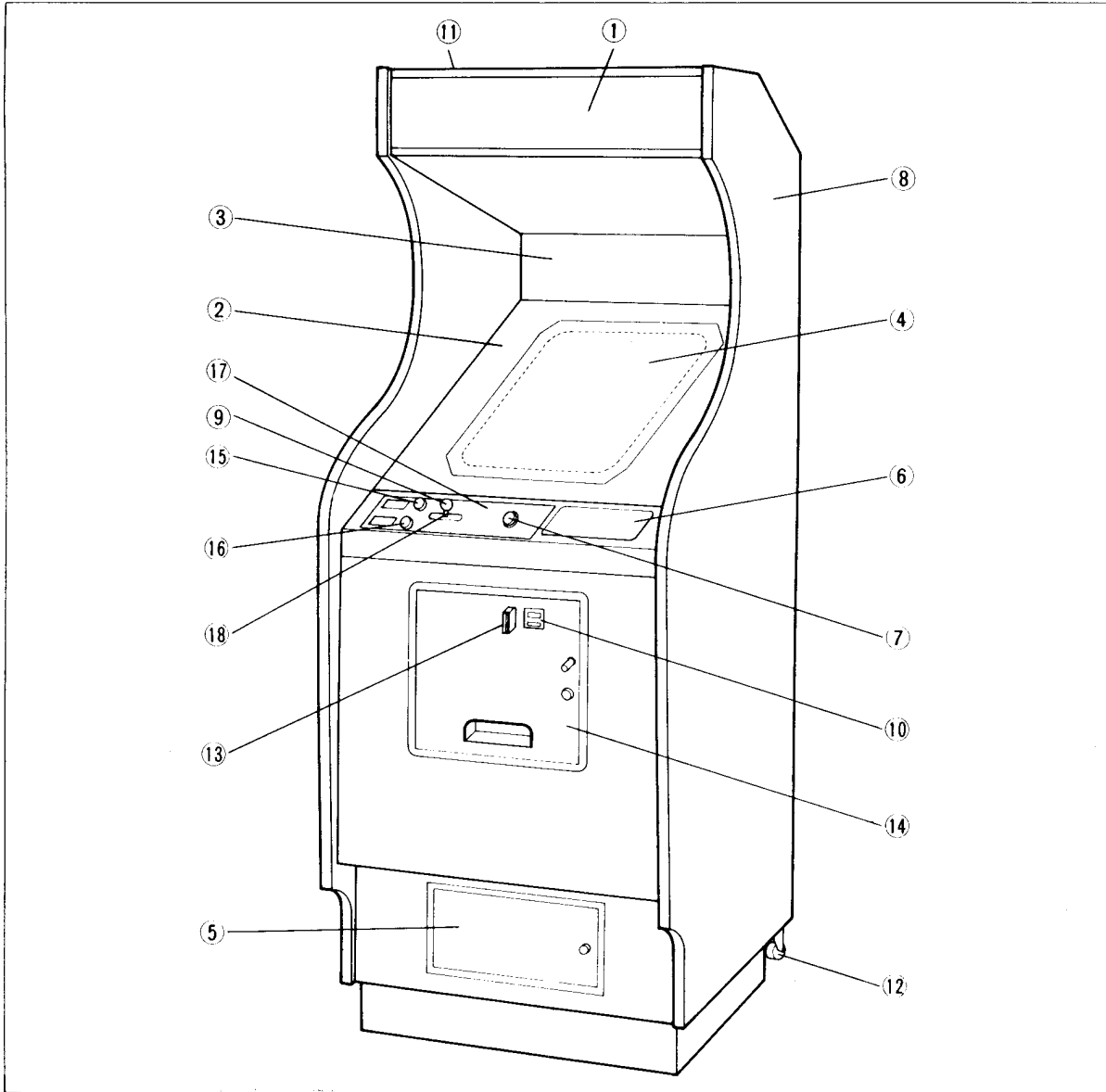


Fig. 3 Component Parts Related to Cabinet (Outside)

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

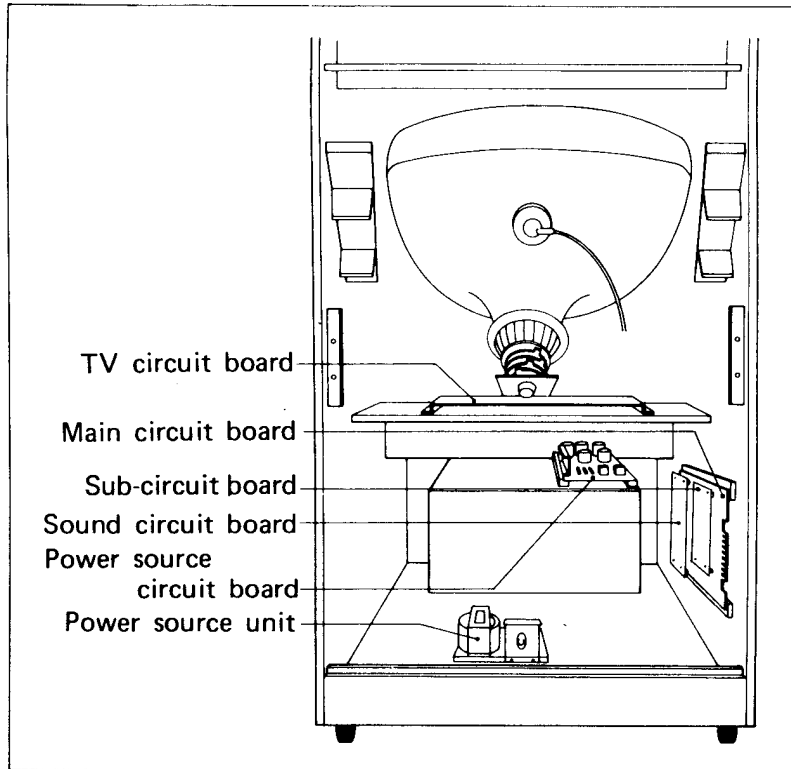


Fig. 4 Circuit Board Mounting Positions

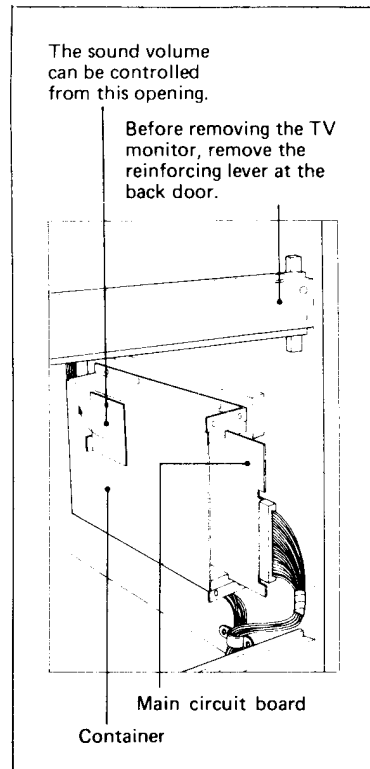


Fig. 5 Side View of Circuit Board Mounting Positions

C. FUSES

Fuses in the power source unit

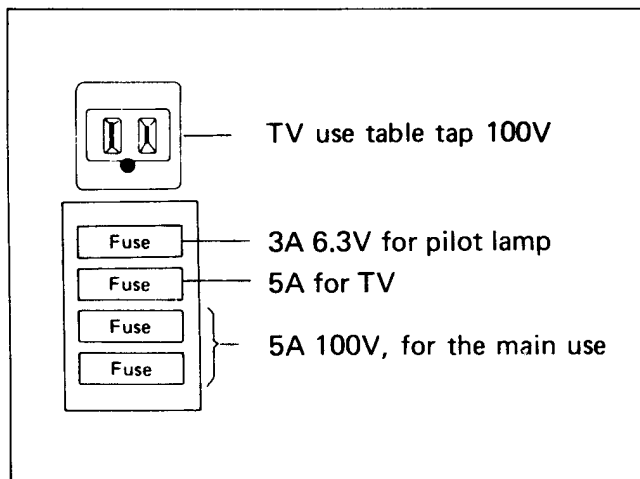


Fig. 6 Fuses in the Power Source Unit

Fuses in the power circuit board

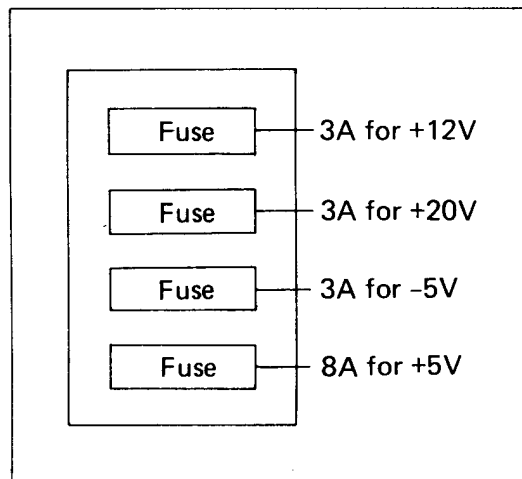


Fig. 7 Fuses in the Power Circuit Board

D. COMPONENT PARTS RELATED TO CABINET (INSIDE)

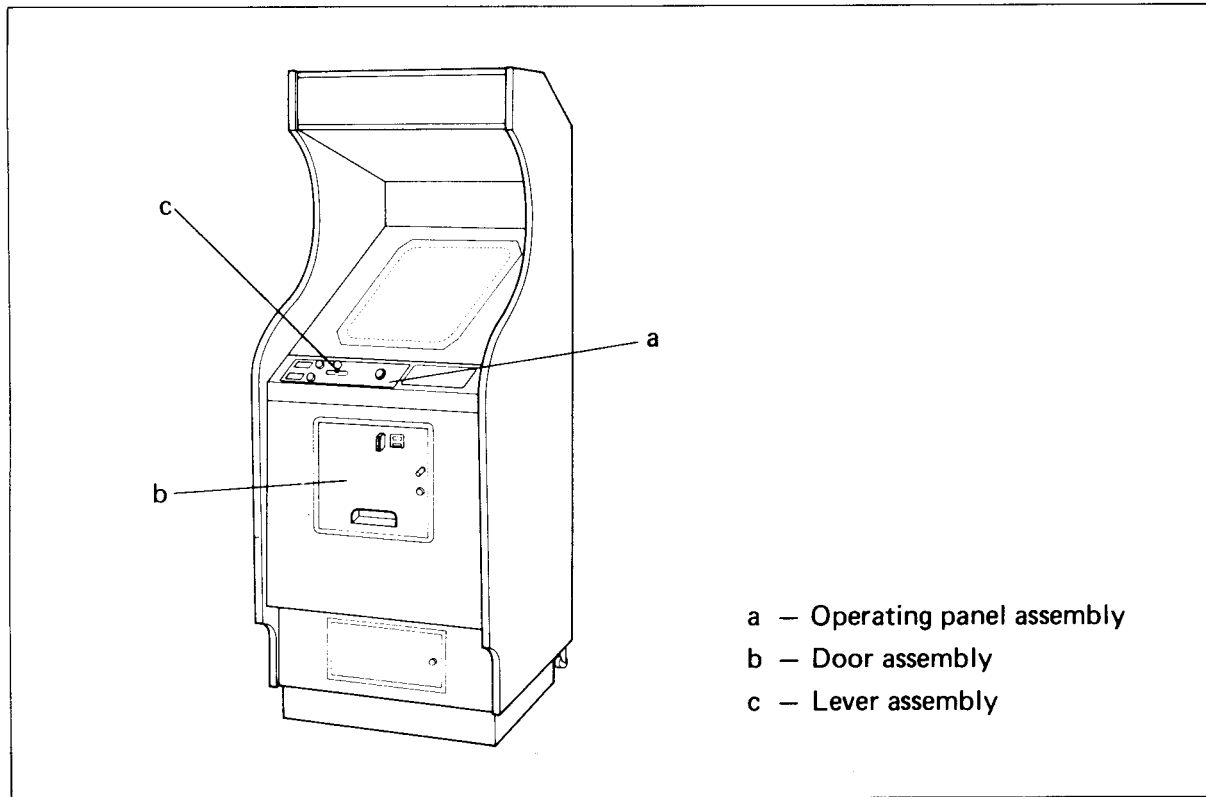


Fig. 8 Component Parts Related to Cabinet (Inside)

a) Operating panel assembly

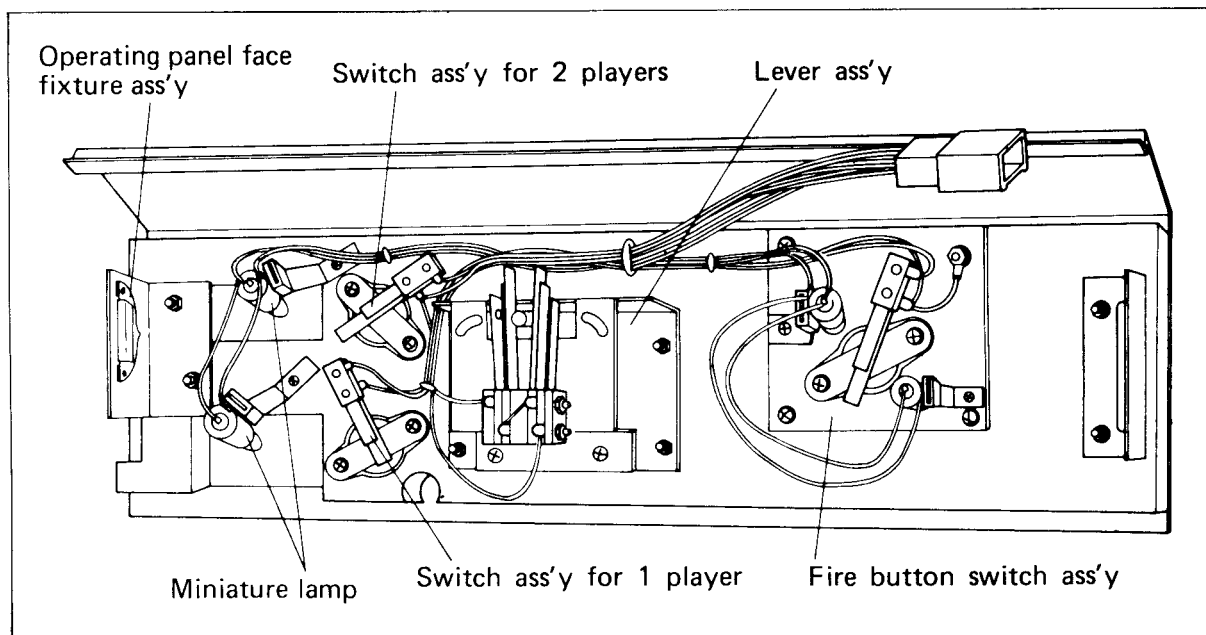


Fig. 9 Operating Panel Assembly

b) Door assembly and parts list

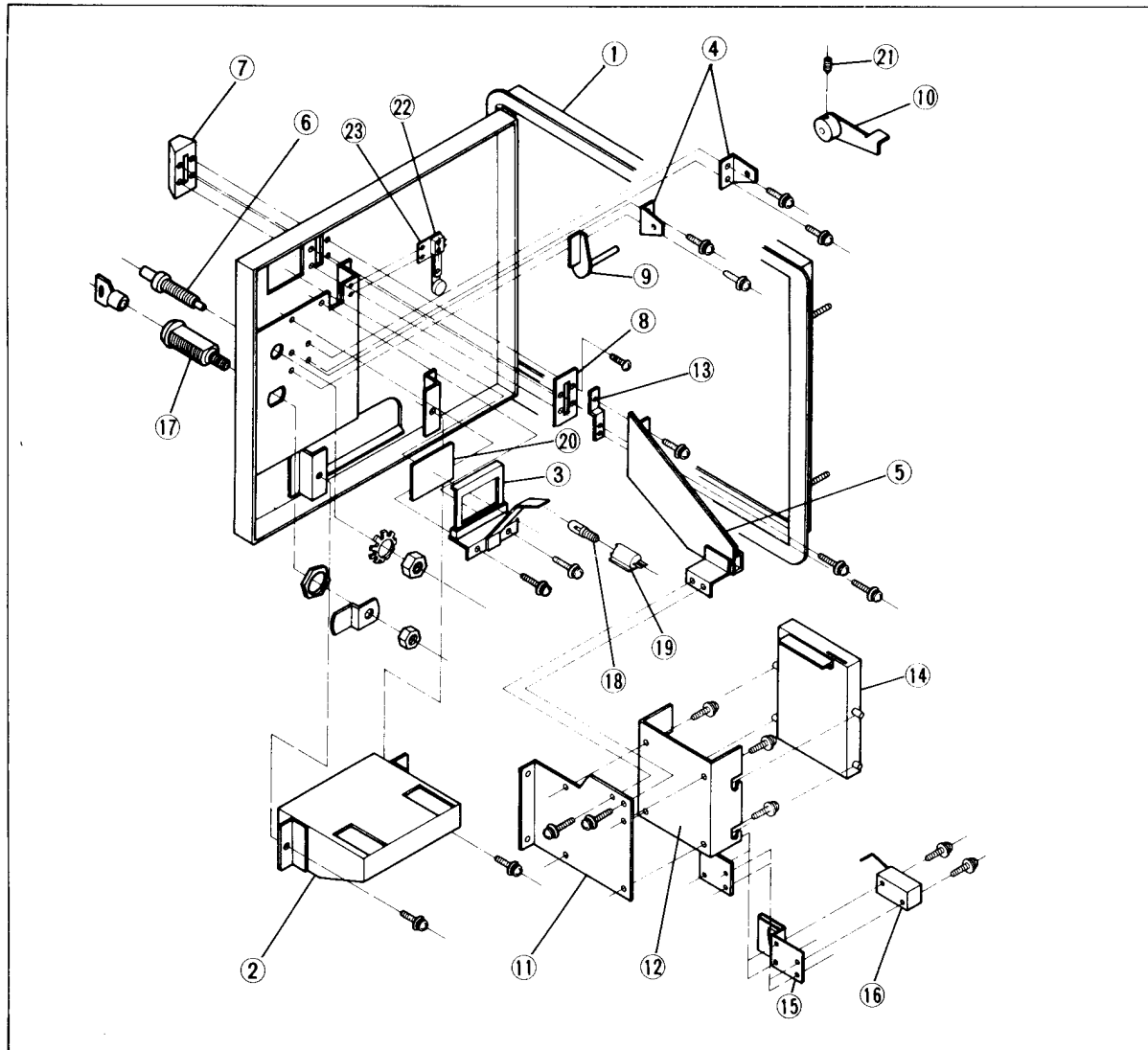


Fig. 10 Inside View of Door Assembly

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

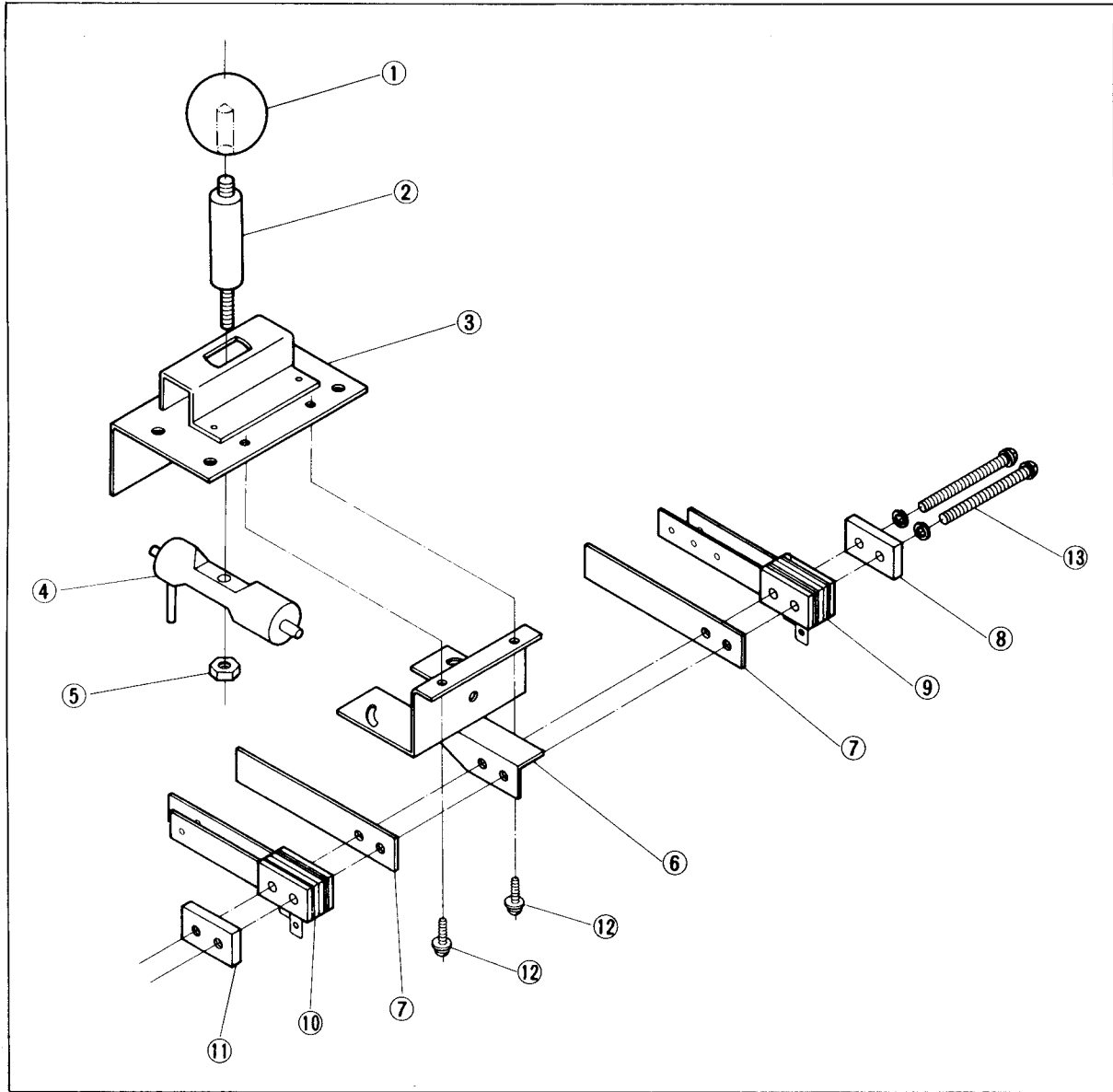


Fig. 11 Lever Assembly

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

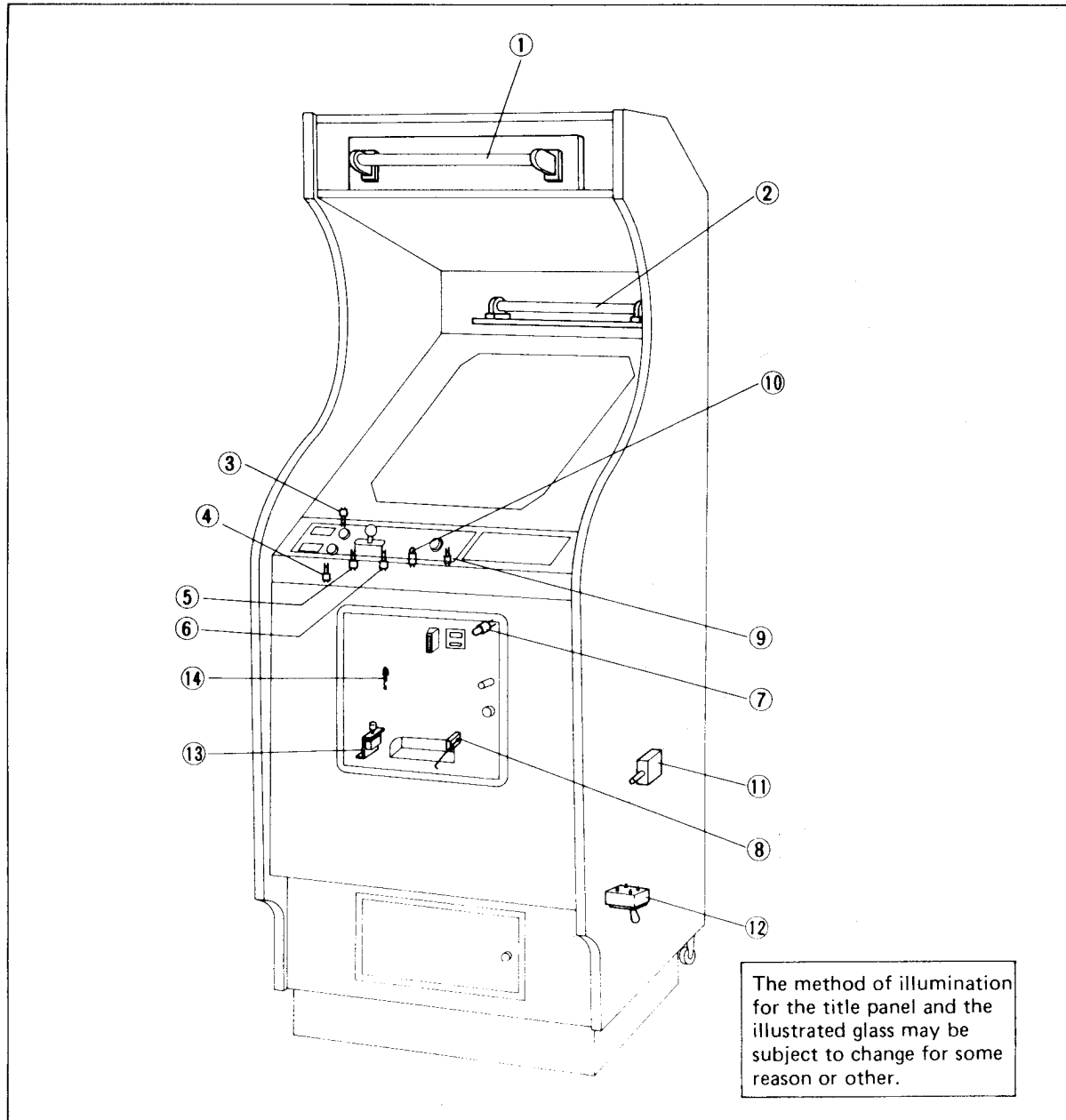


Fig. 12 Component Parts Related to Switches in the Cabinet

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)

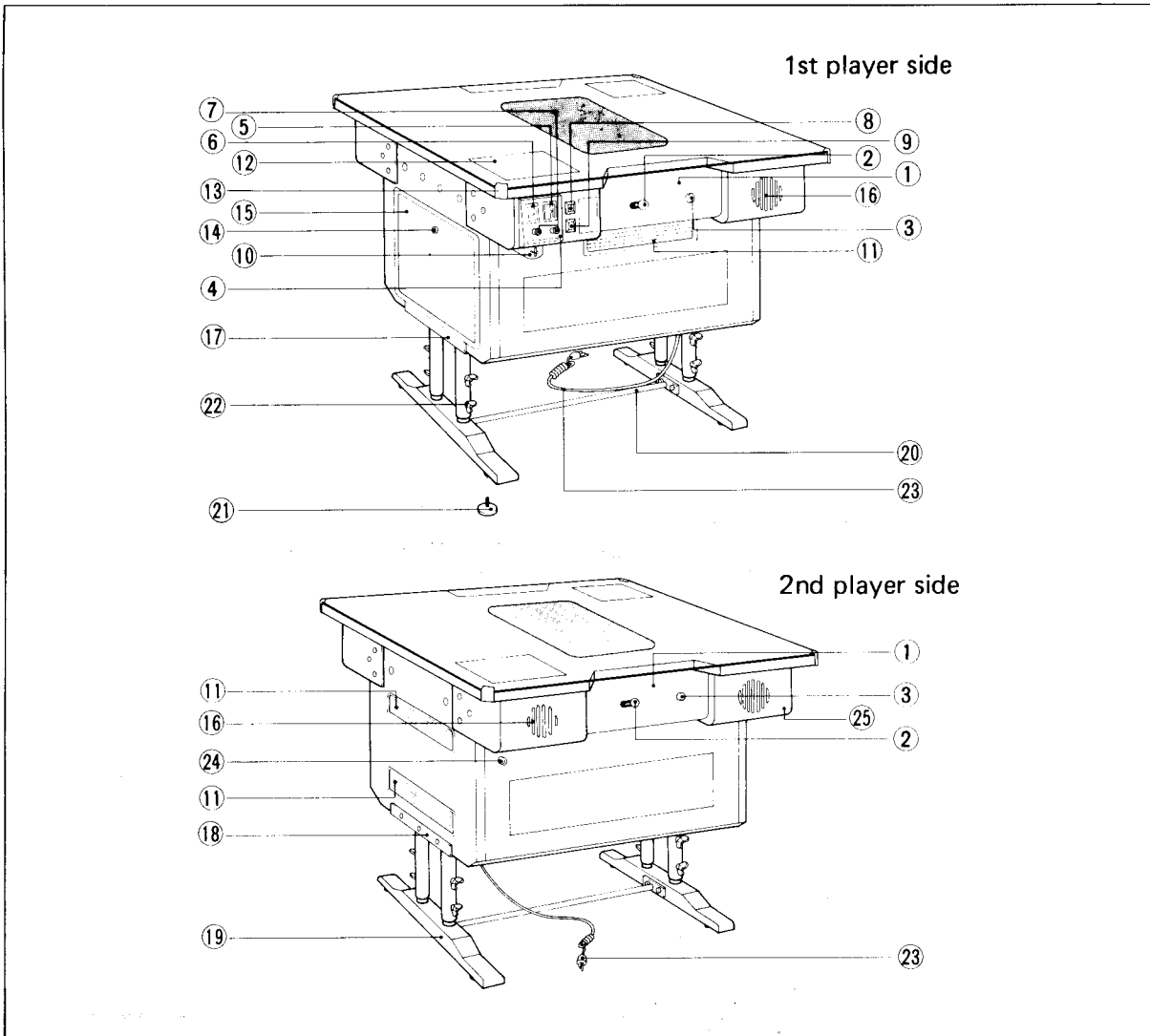


Fig. 13 Component Parts Related to Cabinet (Outside)

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

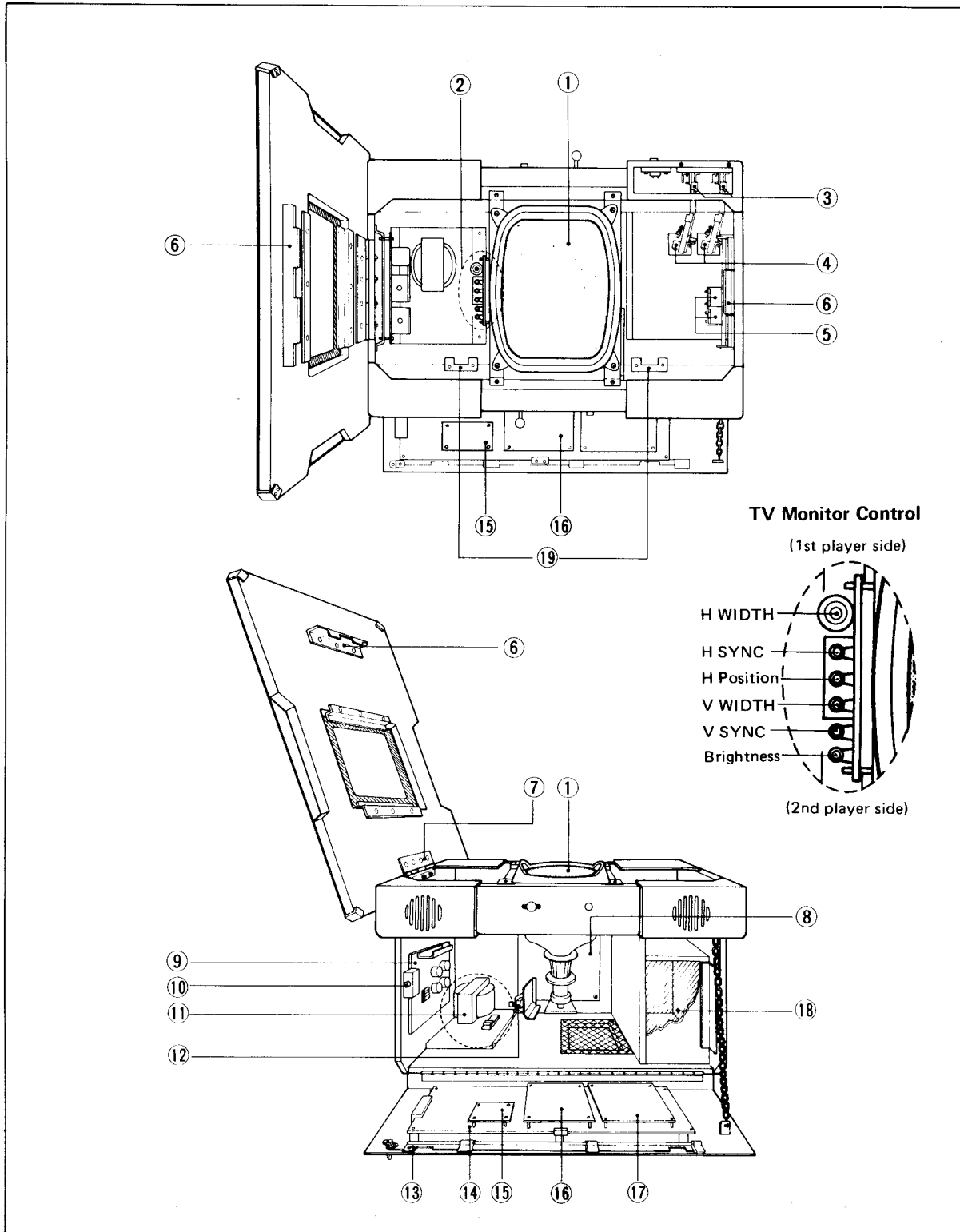


Fig. 14 Component Parts Related to Cabinet (Inside)

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

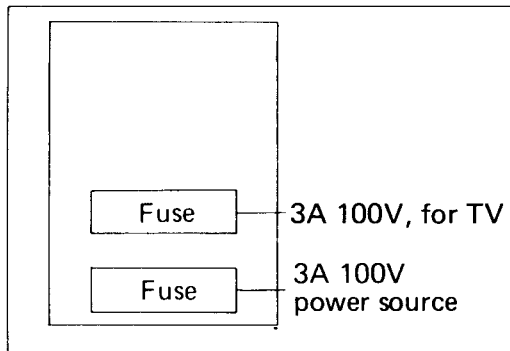


Fig. 15 Fuses in the Power Source Unit

Fuses in the power circuit board

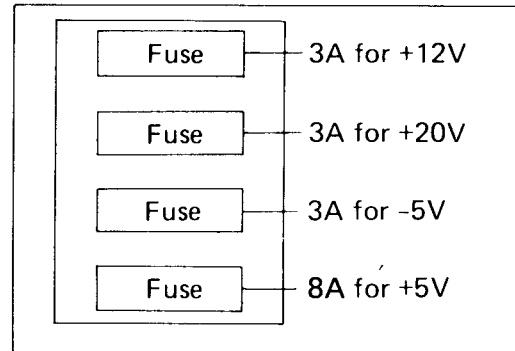


Fig. 16 Fuses in the Power Circuit Board

c) Operating panel assembly

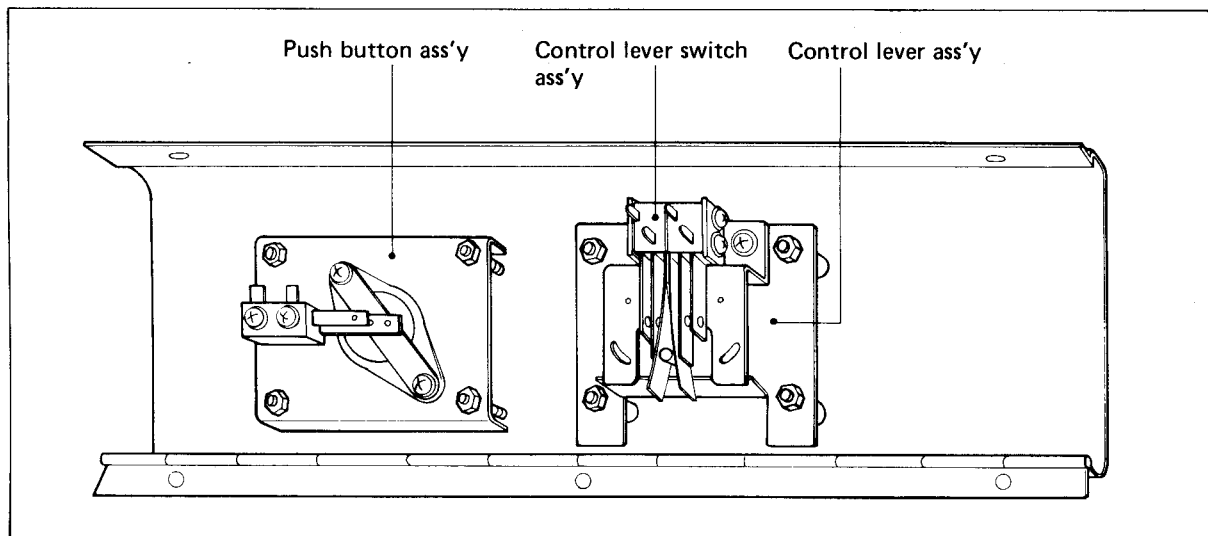


Fig. 17 Operating Panel Assembly

VIII. CIRCUIT BOARD

A. CIRCUIT BOARD IC LOCATION AND PARTS LIST

a) Main circuit board IC location and parts list

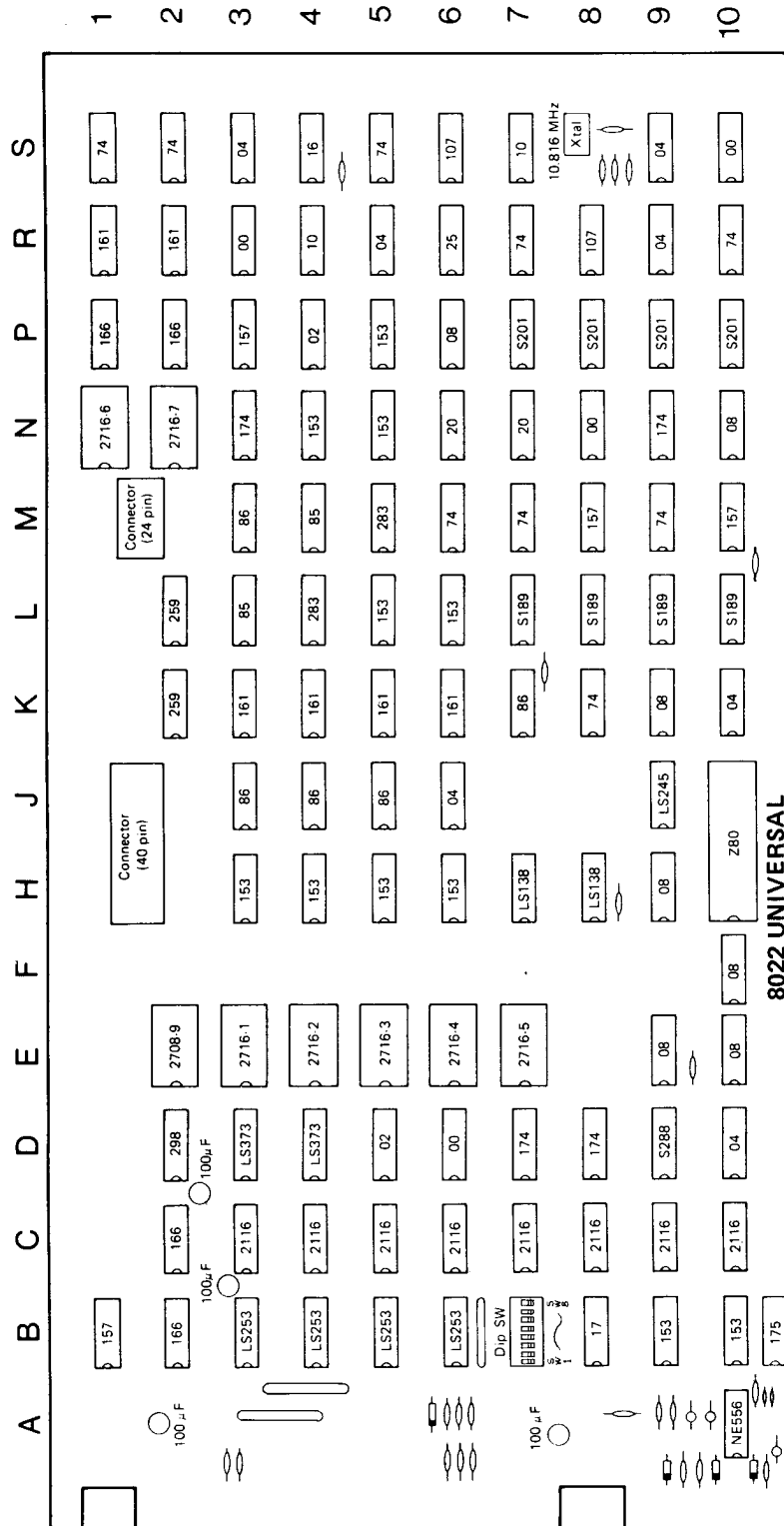


Fig. 18 Main Circuit Board

[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
NE556	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)

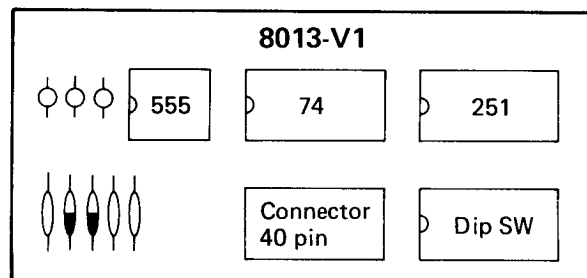


Fig. 19 Sub-circuit Board (1) 8013-V1

[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

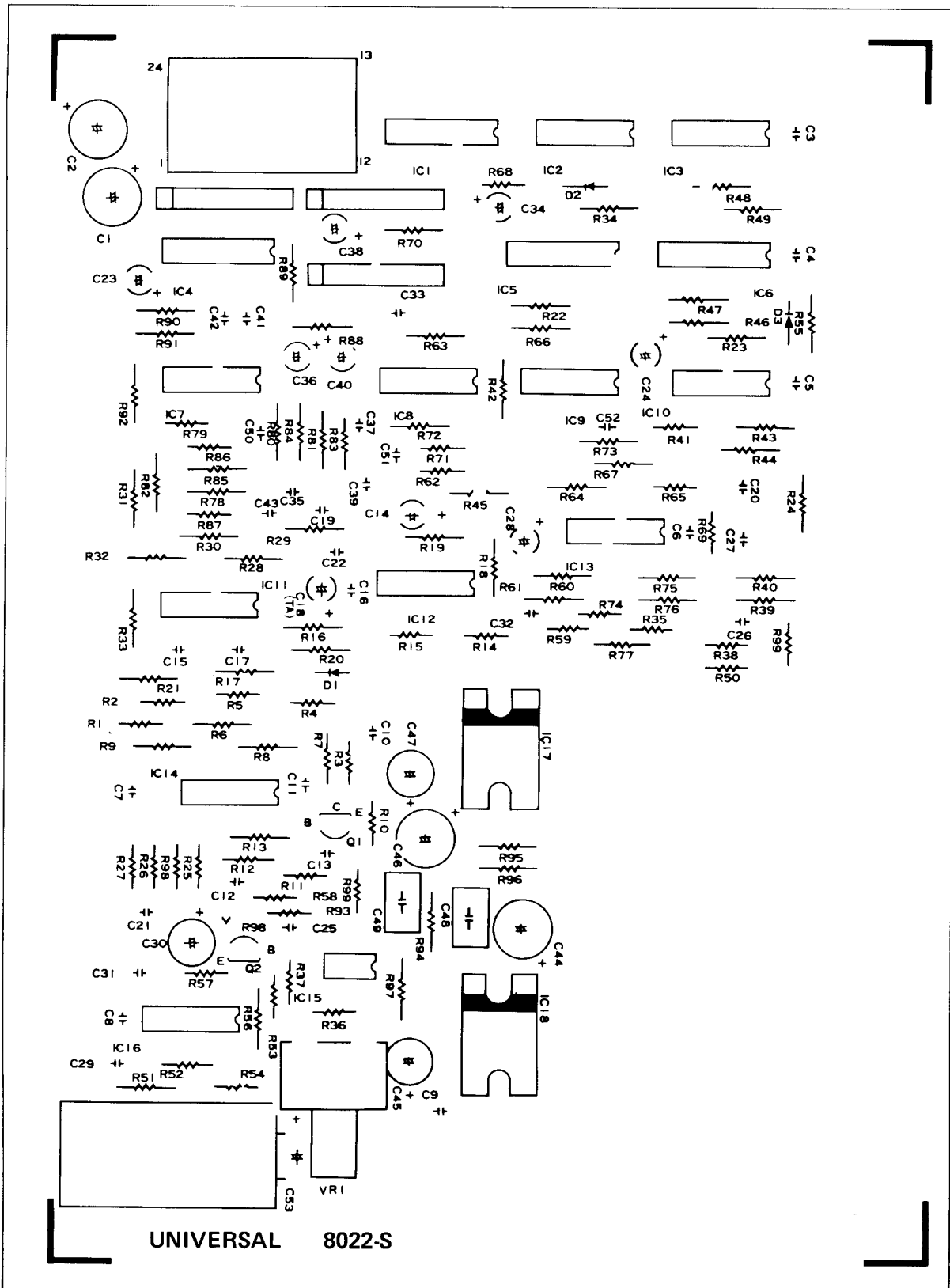


Fig. 20 Sound Circuit Board

Location	Rating	Description
R1	1K	Carbon solid resistor
2	1K	"
3	1M	"
4	1K	"
5	100K	"
6	1K	"
7	100K	"
8	1K	"
9	1M	"
10	51K	"
11	51K	"
12	100K	"
13	1M	"
14	1K	"
15	470K	"
16	100K	"
17	100K	"
18	120K	"
19	1K	"
20	100K	"
21	100K	"
22	100K	"
23	100K	"
24	1K	"
25	100K	"
26	10K	"
27	10K	"
28	10K	"
29	100K	"
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	"
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	"
71	1K	"

Location	Rating	Description
72	51K	Carbon solid resistor
73	100K	"
74	100K	"
75	100K	"
76	100K	"
77	220K	"
78	100K	"
79	100K	"
80	100K	"
81	100K	"
82	120K	"
83	100K	"
84	100K	"
85	100K	"
86	100K	"
87	220K	"
88	100K	"
89	51K	"
90	100K	"
91	100K	"
92	220K	"
93	10K	"
94	2.2K	"
95	4.7Ω	"
96	1.5Ω	"
97	1.5Ω	"
98	10K	"
99	22K	"
C1	100μF 16V	Chemical
2	100μF 25V	"
3	0.1μF	Ceramic
4	0.1μF	"
5	0.1μF	"
6	0.1μF	"
7	0.1μF	"
8	0.1μF	"
9	0.1μF	"
10	0.1μF	"
11	0.1μF	"
12	0.022μF	Mila
13	0.1μF	Ceramic
14	1μF 16V	Chemical
15	0.1μF	Ceramic
16	0.01μF	Mila
17	6800pF	"
18	0.22μF	Tantalum
19	0.022μF	Mila
20	Not Used	"
21	0.1μF	Ceramic
22	0.1μF	"
23	1μF 16V	Chemical
24	10μF 16V	"
25	4700pF	Mila
26	0.1μF	Ceramic
27	0.022μF	Mila
28	10μF 16V	Chemical
29	0.01μF	Mila
30	22μF 16V	Chemical
31	0.01μF	Mila
32	470pF	Ceramic
33	3300pF	Mila
34	1μF 16V	Chemical

Location	Rating	Description
35	0.1μF	Ceramic
36	4.7μF 16V	Chemical
37	0.047μF	Mila
38	2.2μF	Chemical
39	0.1μF	Ceramic
40	1μF 16V	Chemical
41	0.1μF	Ceramic
42	0.022μF	Mila
43	0.01μF	"
44	100μF 16V	Chemical
45	47μF 16V	"
46	100μF 16V	"
47	47μF 16V	"
48	0.068μF	Mila
49	0.068μF	"
50	0.01μF	"
51	2200pF	"
52	0.015μF	"
53	1000μF 16V	Chemical
54	0.047μF	Ceramic

Location	Item No.	Description
Q1	2SC945	N-P-N Transistor
2	"	"
D1	1S1588	Switching Diode
3	"	"
RB1	MS1038AM	10KΩ Resistor Array
2	"	"
3	"	"
VR1	RV16YP	1KΩ(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	μPC1181H	Power Amplifier
18	μPC1181H	"

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 μ F/12V	7	Ceramic Capacitor

[3] Resistors

Rating	Q'ty	Description
MS1028M	1	1K Ω Rogstor Array

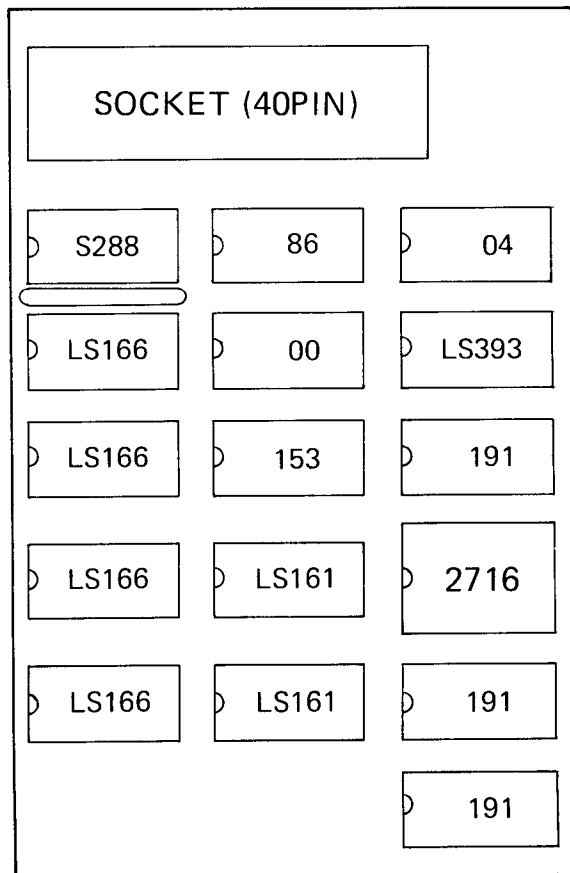
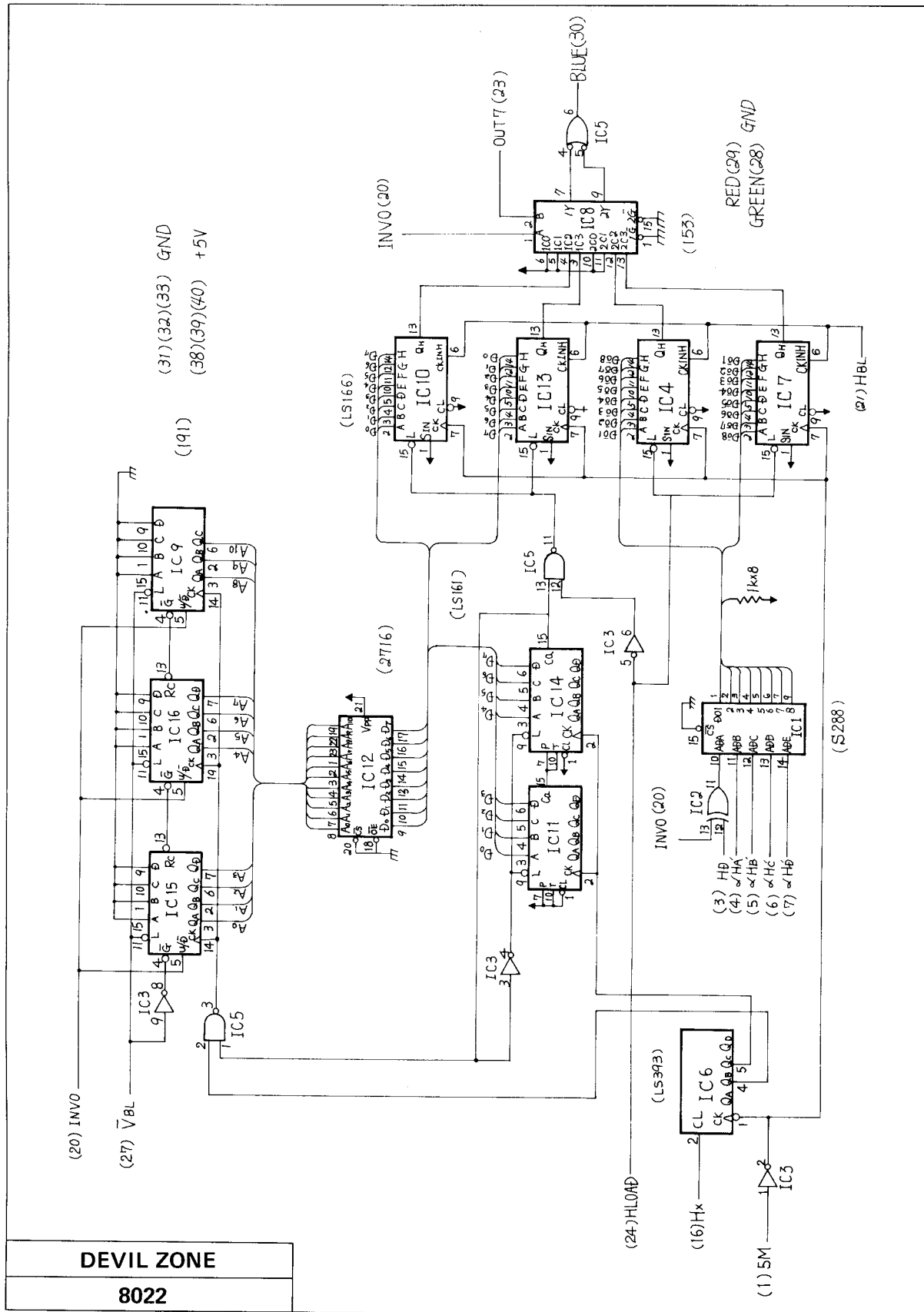


Fig. 21 Sub-circuit Board (2)

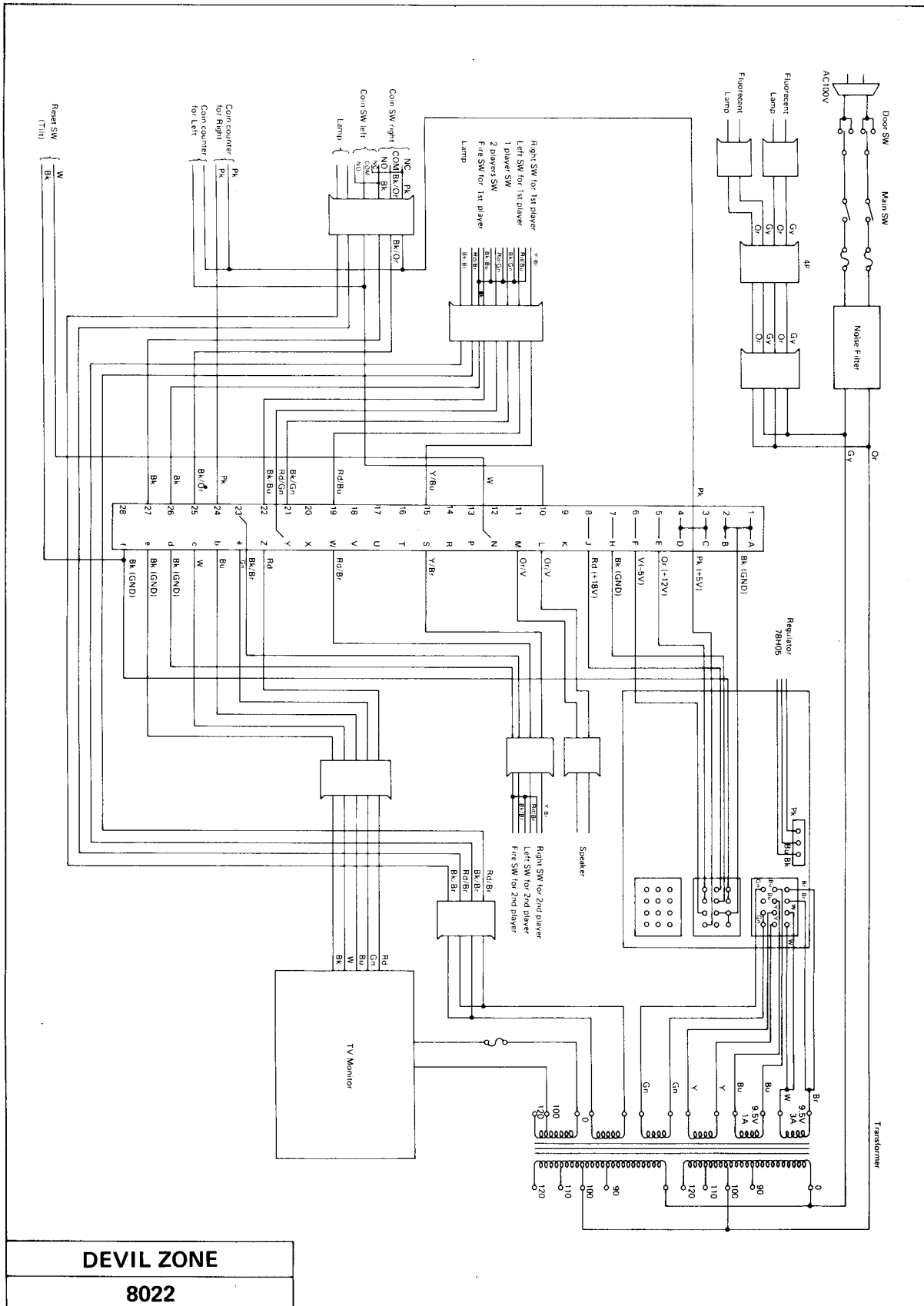
SUB-CIRCUIT BOARD (2) BLOCK DIAGRAM



DEVIL ZONE

8022

WIRING DIAGRAM (CONNECTOR)



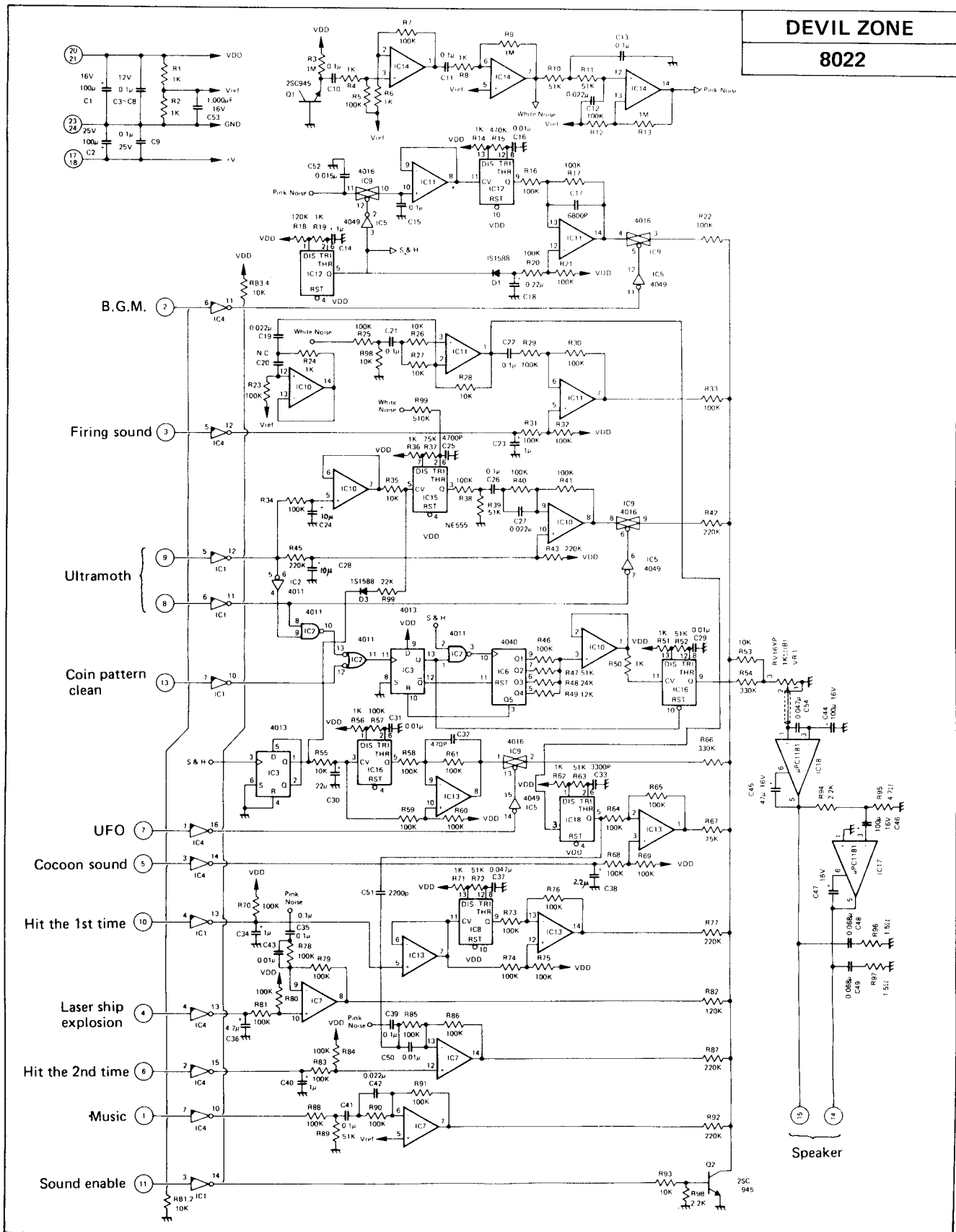
DEVIL ZONE

8022

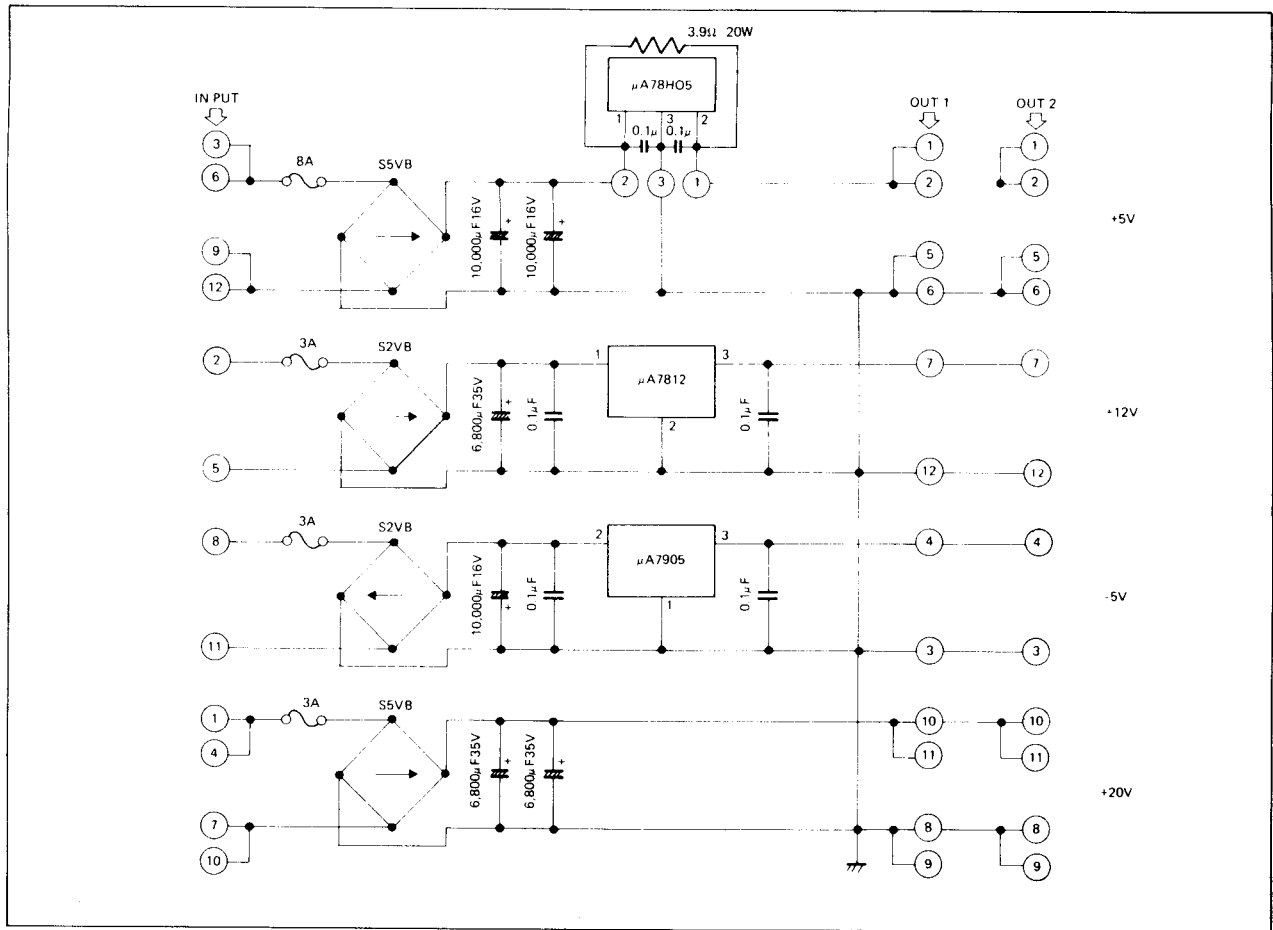
SOUND BLOCK DIAGRAM

DEVIL ZONE

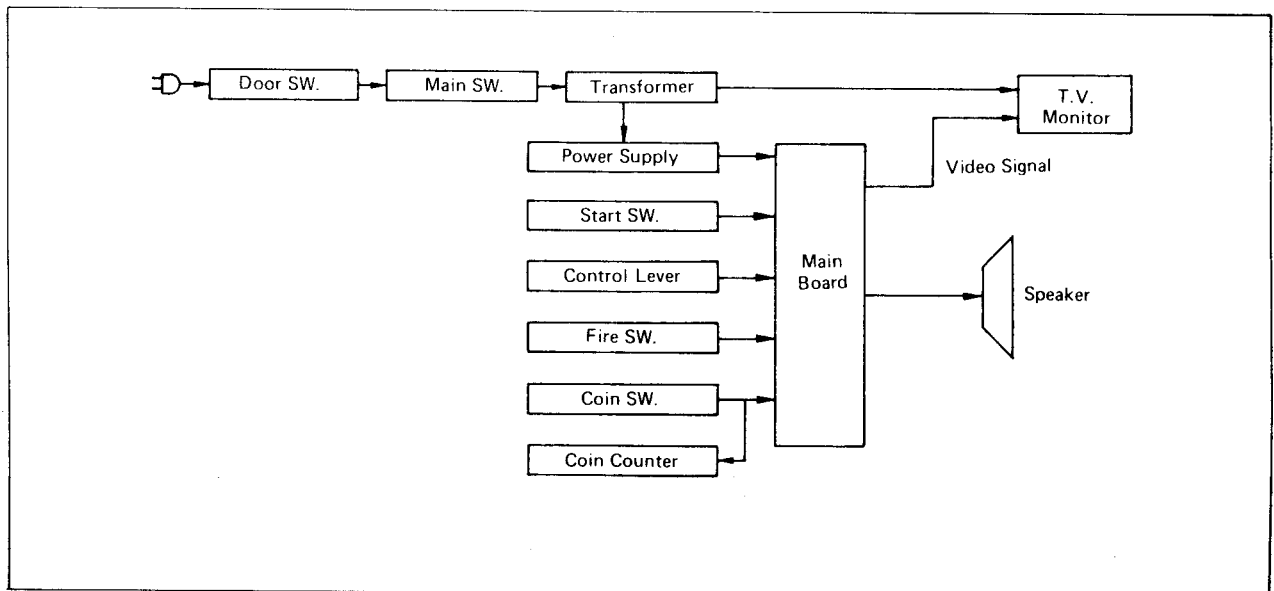
8022



POWER SOURCE BLOCK DIAGRAM



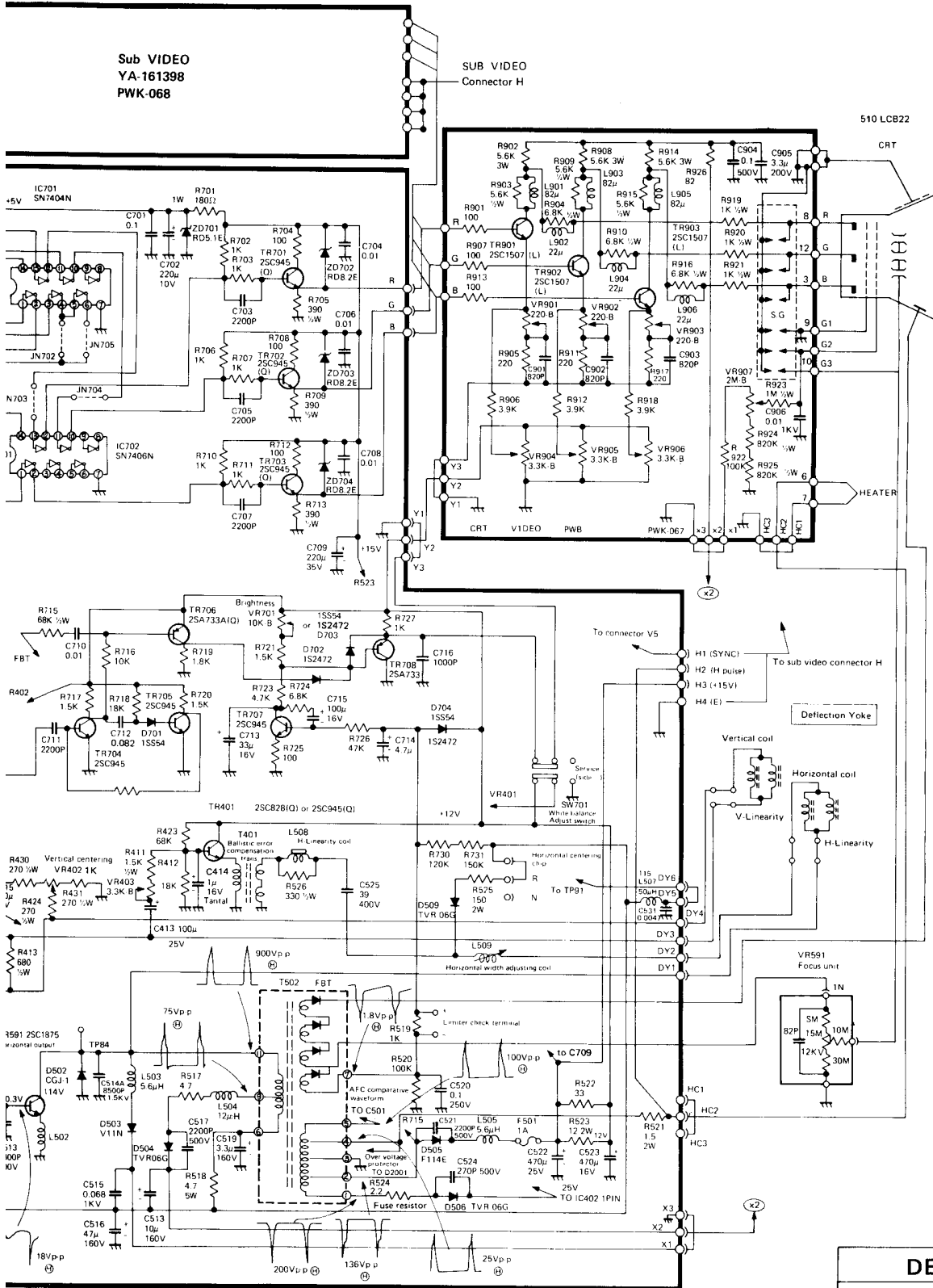
BLOCK DIAGRAM



Sub VIDEO
YA-161398
PWK-068

SUB VIDEO
Connector H

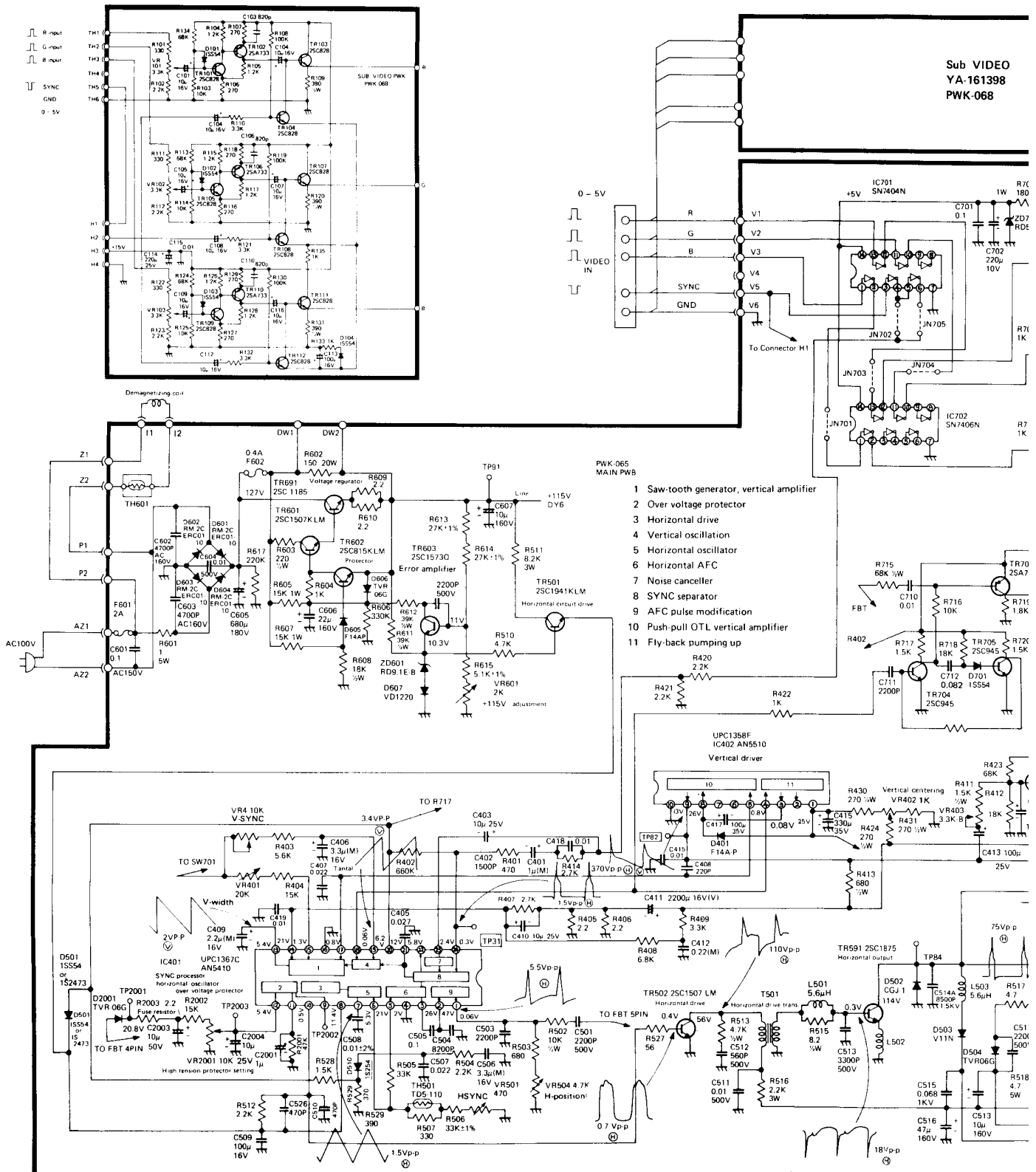
510 LCB22

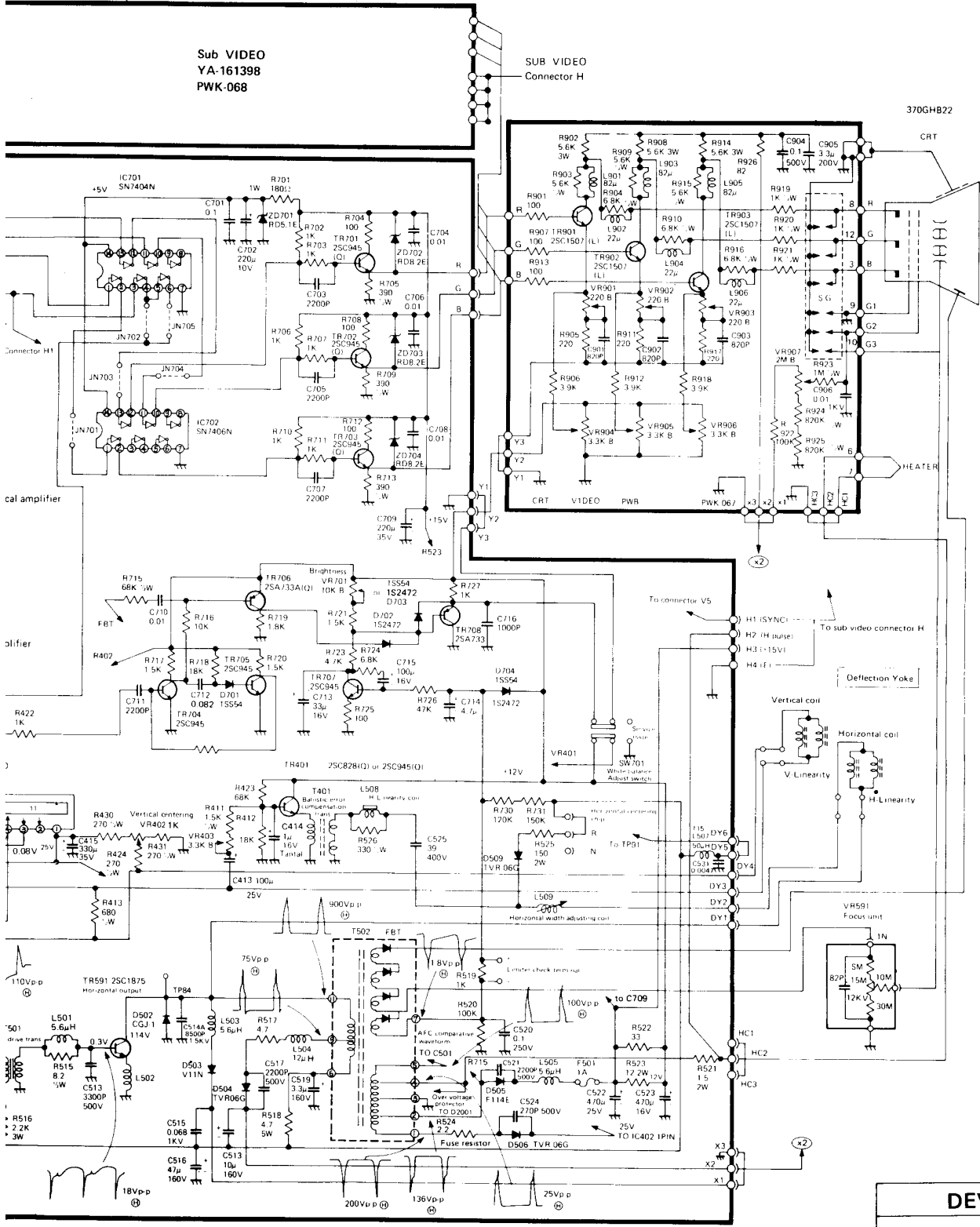


DEVIL ZONE

8022

SCHEMATIC DIAGRAM (20" color)





Sub VIDEO
YA-161398
PWK-068

SUB VIDEO
Connector H

370GH822

CRT

HEATER

cal amplifier

olifier

)

110Vp-p

75Vp-p

18Vp-p

200Vp-p

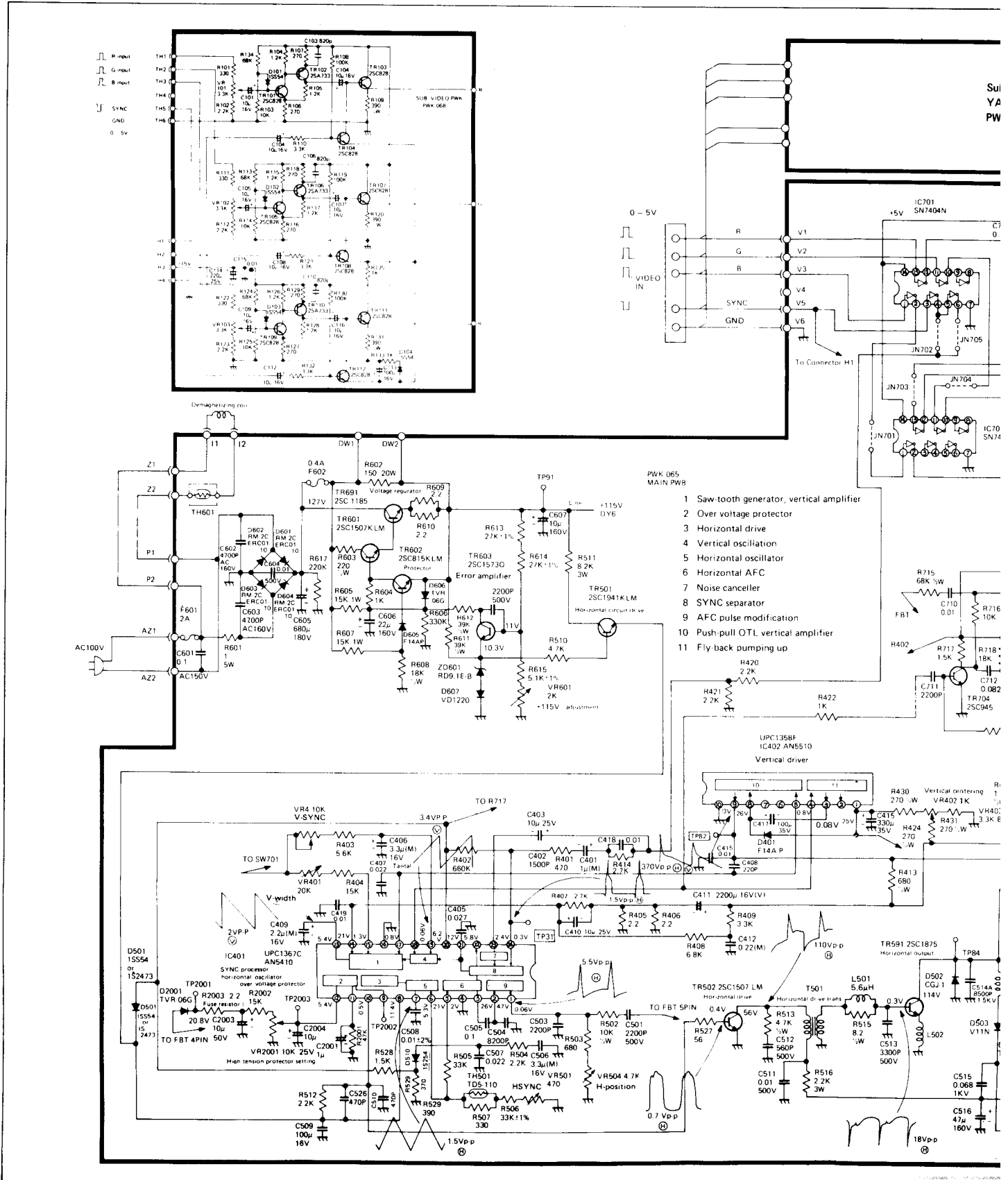
136Vp-p

75Vp-p

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 canceler
- 8 SYNC separator
- 9 AFC pulse modification
- 10 Push-pull OTL vertical amplifier
- 11 Fly-back pumping up

Sul
YA
PW

0-5V

VIDEO IN

To Connector H1

PWK 065
MAIN PWB

+115V
DY6

10.3V

-115V adjustment

Vertical driver

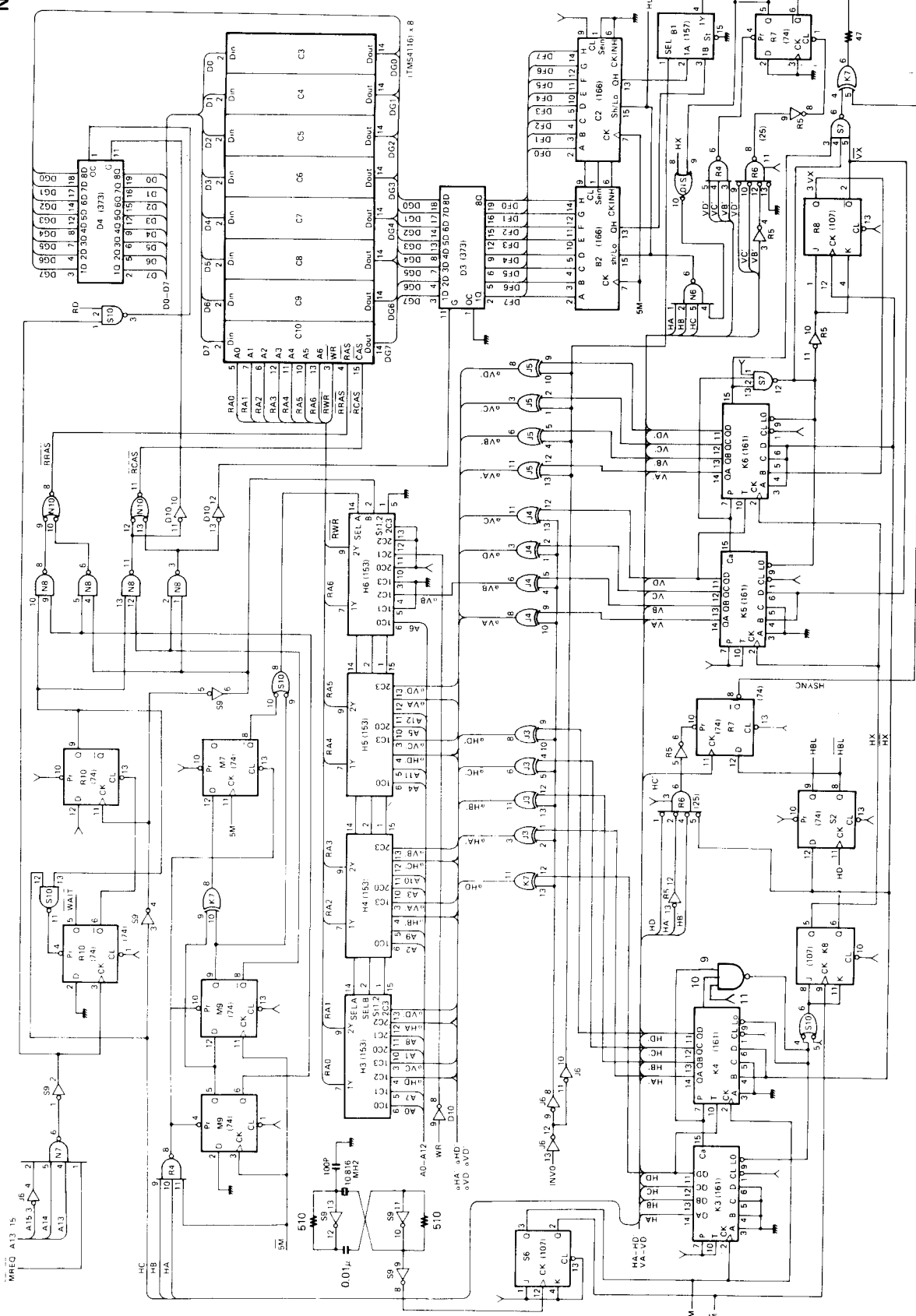
Vertical centering

Horizontal drive trans

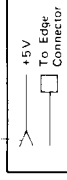
Horizontal output

0.7 Vp-p

18Vp-p



DEVIL ZONE
8022

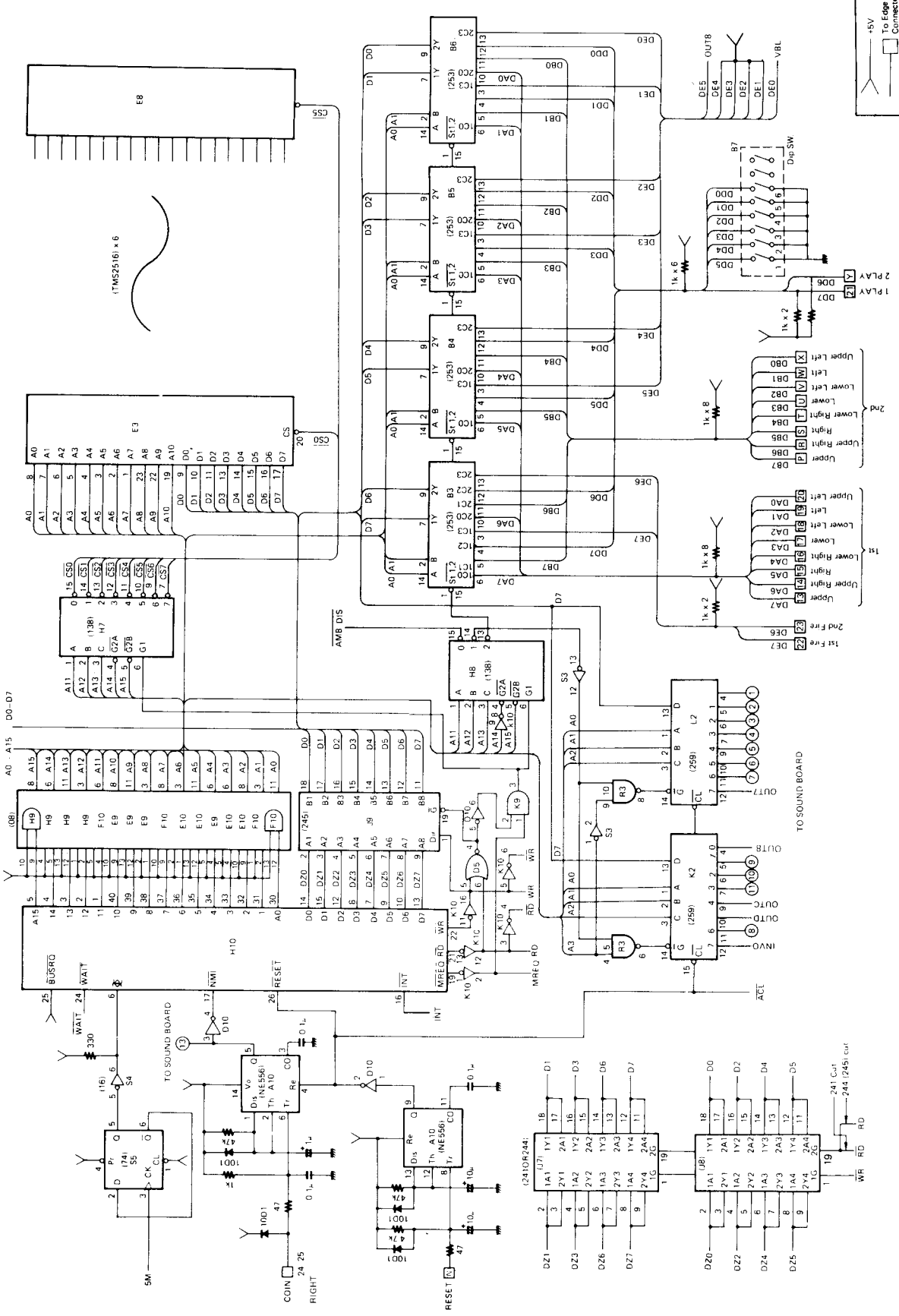


DEVIL ZONE

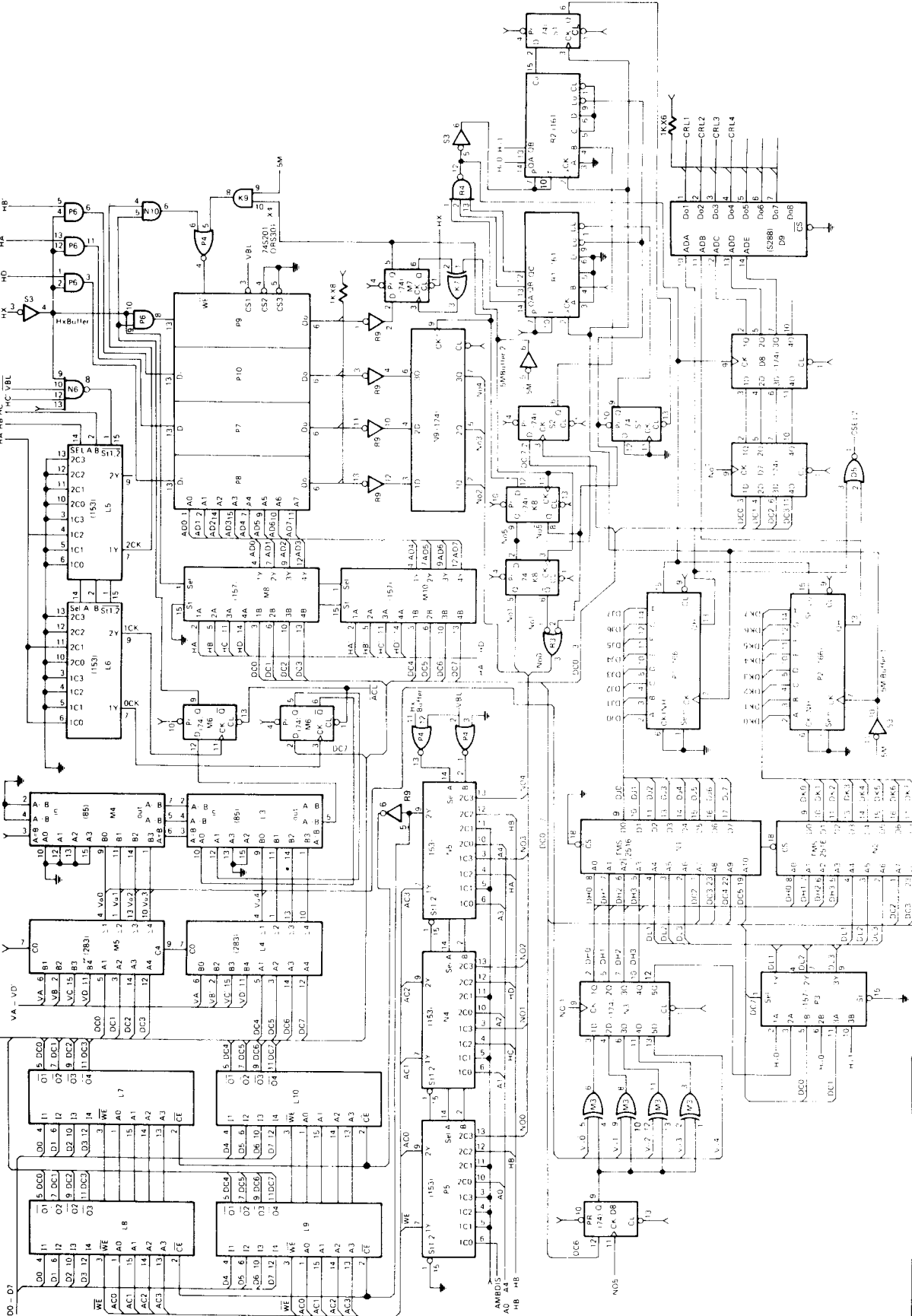
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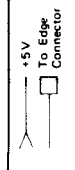
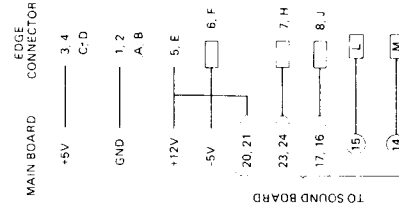
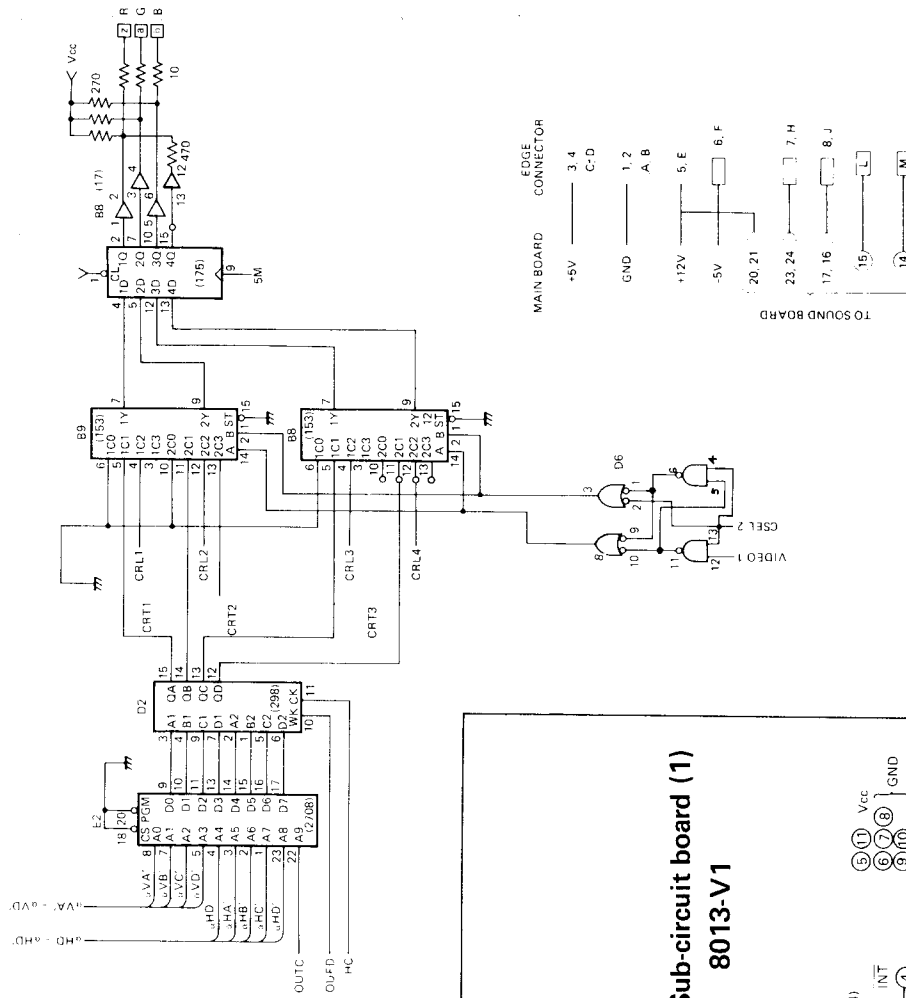
MAIN BLOCK DIAGRAM

No. 1



+5V
To Edge
Connector





Used in the case of 2-way alone

Encircled figures represent the 16 pin IC socket's pin number. (apply to this drawing alone)

Sub-circuit board (1) 8013-V1