

Mr. Do!

TM

Operation, Maintenance and Service Manual



UNIVERSAL

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**Thank you very much for your purchase of the MR. DO!.
Carrying a CPU, the MR. DO! is a game machine of the
newest type with many features and functions.**

**This manual describes how to make the most of such features
and functions, so please read it carefully in order to make the
best use of the machine.**

www.BasementArcade.com

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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.

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I. FEATURES OF THIS MACHINE

1. This video game packs in a variety of excellent features captivating players.
2. The lever control system is simple to operate.
3. By setting or combining dip switches one can select anyone of a variety of game features.
4. Additionally, by means of dip switches, one determines which of the four (4) levels of difficulty desired.
5. The highest scorer for the day is always displayed on the screen, and the 10 highest scorers can enter their names on the screen as well (dip switch combinations are also used to select letters when registering the player's name).
6. Ultra-contemporary cabinet and fascinating acoustics.

II. HOW TO HANDLE AND MAINTAIN THIS MACHINE

1. Since the UNIVERSAL's MR. DO! 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 ventilated. 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. are 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 on.
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 check this machine daily.

III. HOW TO PLAY

1. Use Mr. Do! to wipe out monsters with either a power ball or a falling apple. (Mr. Do! diys ahead by pushing an apple.)
2. The screen will be cleared when all monsters have been wiped out or all cherries have been eaten up.
3. You are awarded a high score if you instantly destroy many monsters by "apple dropping", or have Mr. Do! eat one block of 8 cherries at once.
4. When eating the center target, an EXTRA monster and two henchmen will appear. The henchmen will eat the apple, so they cannot be killed by "apple dropping". Destroy them by using the power ball. If you destroy the EXTRA monster first, all henchmen will change into apples.
5. If the EXTRA monster is destroyed, you are awarded another Mr. Do!.
6. If Mr. Do! crashes into an apple that has fallen and broken open revealing the lucky diamond inside, a replay is awarded.
7. Mr. Do! will die when he touches any of the monsters.
8. The ten highest scorers can enter their names on the screen.

ASSAULTING



1. Throw the power ball to destroy the monsters.



2. Drop the apple to crush the monsters.
(Many monsters can be crushed at one time.)



SCORE

Monster



EXTRA Monster



- When wiped out by using a power ball 500 pts
- When crushed by an apple . . . 1,000 pts
- When more than 2 monsters have been crushed 2,000 pts - ?



Cherry. . . 50 pts (500 pts when 8 cherries have been eaten in a row)

Center target					~ ?
Score	1000	1500	2000	2500	~ ?



Diamond
. 8,000 pts

IV. VARIOUS OPTIONAL SETTINGS

A. SERVICE SWITCHES AND DIP SWITCHES

- Dip Switch A

1. Number of Mr. Do's (SW1, 2)

No. of Mr. Do's	SW1	SW2
3	OFF	OFF
4	OFF	ON
5	ON	OFF
2	ON	ON

2. Game Style (SW3)

Style	SW3
Table	OFF
Upright	ON

3. Ease or Hardness of "EXTRA" (SW4)

Ease or Hardness	SW4
Easy to win	OFF
Hard to win	ON

4. Ease or Hardness of "SPECIAL" (SW5)

Ease or Hardness	SW5
Easy to win	OFF
Hard to win	ON

5. Automatic Screen Renewal (SW6)

Automatic screen renewal	SW6
Can	OFF
Cannot	ON

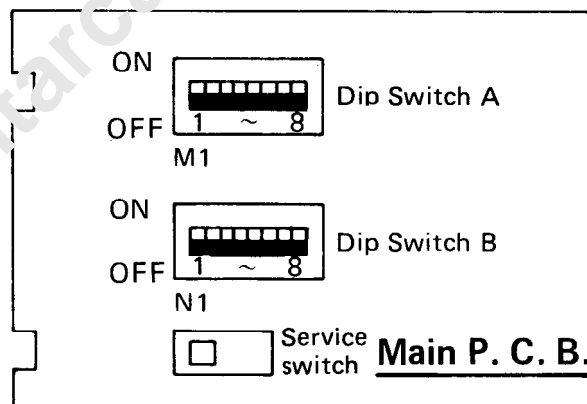
- Dip Switch B (Coin & Credit)

Coin	Credit	Left-side chute				Right-side chute			
		SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
1	1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	2	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
1	3	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
1	4	OFF	OFF	ON	ON	OFF	OFF	ON	ON
1	5	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
2	1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
2	3	OFF	ON	ON	OFF	OFF	ON	ON	OFF
3	1	OFF	ON	ON	ON	OFF	ON	ON	ON
3	2	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
4	1	ON	OFF	OFF	ON	ON	OFF	OFF	ON
1	1	ON	OFF	ON	OFF	ON	OFF	ON	OFF
1	1	ON	OFF	ON	ON	ON	OFF	ON	ON
1	1	ON	ON	OFF	OFF	ON	ON	OFF	OFF
1	1	ON	ON	OFF	ON	ON	ON	OFF	ON
1	1	ON	ON	ON	OFF	ON	ON	ON	OFF
Free play		ON	ON	ON	ON	ON	ON	ON	ON

6. Ease or Hardness of Game (SW7, 8)

Ease or Hardness	SW7	SW8
1 (Average)	OFF	OFF
2	OFF	ON
3	ON	OFF
4 (Hard)	ON	ON

- Position of Dip Switch/Service Switch



- Service Switch

When pressing the service switch, credit is increased by setting the left-side chute.

Standard and Custom Price Settings

The game price set by a combination of dip SWs is displayed on the monitor when coin credit is 0.

- When the settings for right and left chutes are the same, "1 coin - 1 credit", "2 coins - 3 credits", etc. are displayed.
- When the settings for right and left chutes are provided differently, their respective contents can be displayed.

V. HOW TO CONDUCT SELF-TESTING

★ This machine has a self-testor which locates any abnormalities with the machine should they occur.

[Self-Testing Procedure]

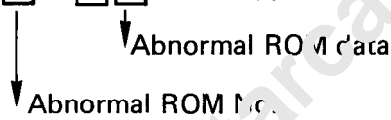
Turn power ON while pressing the push-button or either the 1st or the 2nd player side, and self-testing will follow automatically.

[Self-Testing Items]

(1) ROM Test:

When normal — "ROM OK" will appear on the screen, and the test will proceed to the next step.

When abnormal — "ROM . " will appear, and the test will be suspended.



(2) RAM Test:

When normal — "RAM OK" will appear on the screen, and the test will proceed to the next step.

When abnormal — "RAM " will appear, and the test will be suspended.



(3) Sound OFF:

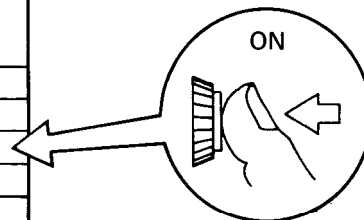
"SOUND OFF" will appear on the screen, and the sound that has been made to that time will stop, then, the test will proceed to the next step. The machine is out of order if the sound does not stop or the test does not proceed to the next step.

(4) Switch Test:

Switch names are displayed on the left side of the screen, while input conditions will be displayed on the right side. When the switch is ON, "0" is displayed for input, and when it is OFF, "1" is displayed. Conduct test while turning each switch ON-OFF — the test will advance to the next step after a minute.

Switch name

TILT		Input condition
SELECT	— 2P	1
"	— 1P	1
1P side pushbutton		0
1P side joystick	Up	1
"	Right	1
"	Down	1
"	Left	1
COIN	Right	1
	Left	1
	Not used	1
2P side pushbutton		1
2P side joystick	Up	1
"	Right	1
"	Down	1
"	Left	1



"0" will appear when pushing the pushbutton on the 1st player's side.

Dip switch A	1	0	1	1	0	1	1	1
" B	1	1	1	1	1	1	1	0

(5) TV Monitor Test:

Cross hatch pattern will appear on the entire screen. Monitor adjustment can be done by means of the pattern.

- Self-testing will stop at this point. Turn ON power again when you want to resume game or execute self-test again.

* In case you have found any abnormality as a result of the self-test, contact the dealer who sold the machine to you.

VI. VOLUME CONTROL

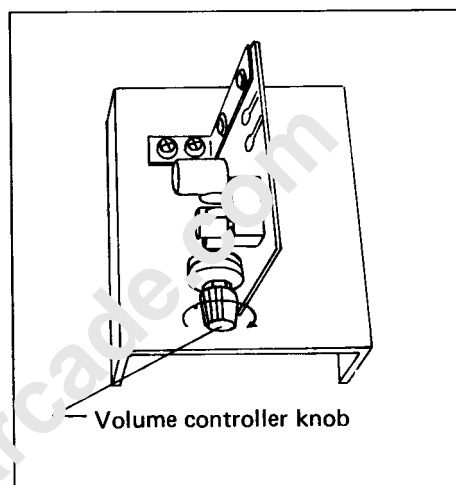
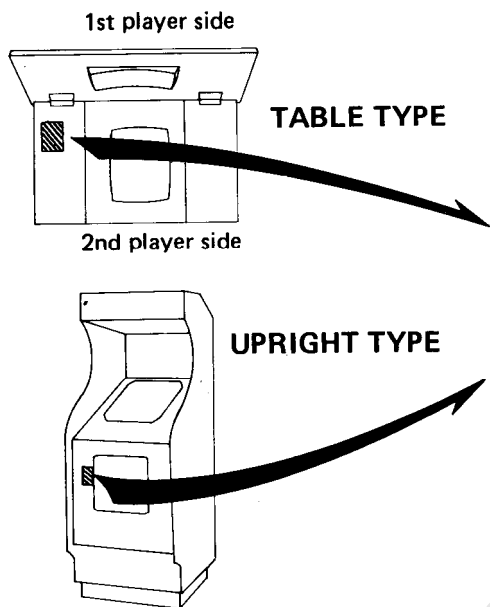


Fig. 1 Position of Volume Controller Knob

VII. TV MONITOR

A. ADJUSTMENT OF TV PICTURE SCREEN

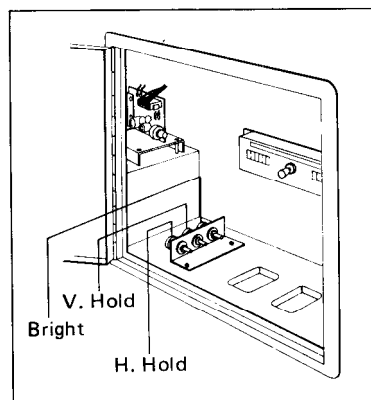
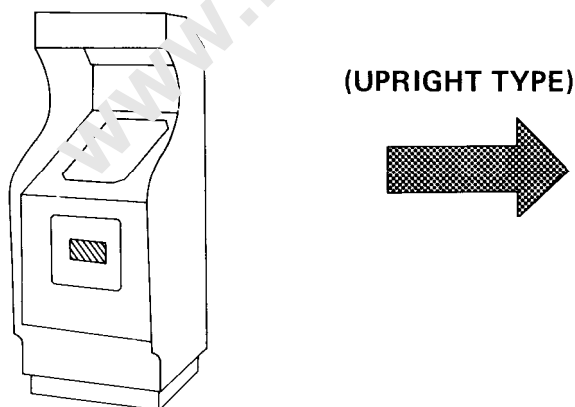


Fig. 2 Positions of TV Monitor Controllers (Upright type)

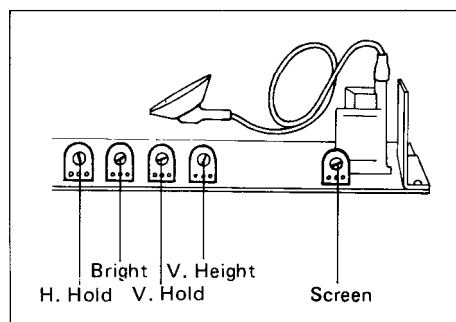
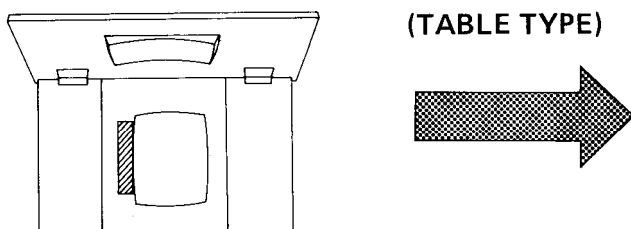


Fig. 3 Positions of TV Monitor Controllers (Table type)

UPRIGHT TYPE



SPECIFICATIONS

▽ 95-1653

800(D) x 640(W) x 1750(H) mm

AC100V/115V/230V 50/60Hz

180W (20'')

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

VIII. UPRIGHT TYPE PARTS CATALOG

A. COMPONENT PARTS RELATED TO CABINET (OUTSIDE)

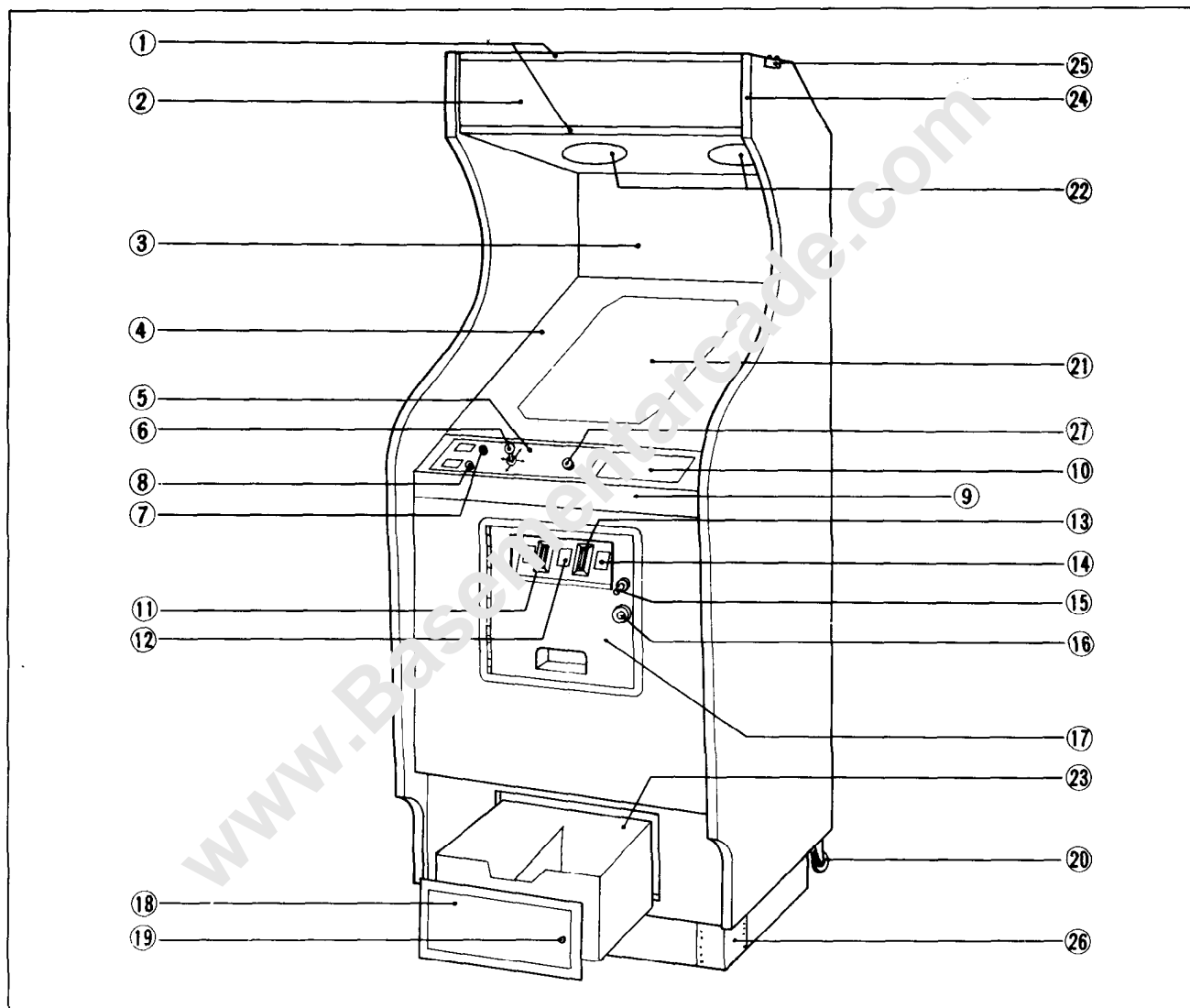


Fig. 4 Component Parts Related to Cabinet (Outside)

OUTSIDE CABINET PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Title panel fixture (Twin)	15	Cancel button
2	Title panel (153 x 596mm)	16	Door key
3	Illustrated glass (B) (295 x 596mm)	17	Main door
4	Illustrated glass (A) (566 x 596mm)	18	Cash box door
5	Operating indication panel (110 x 400mm)	19	Cash box door key
6	Control lever (general name)	20	Caster
7	Push button (for 1 player)	21	CRT (20" color)
8	Push button (for 2 players)	22	Speaker (x2)
9	Operating base plate	23	Cash box
10	Sticker for game rules (110 x 180mm)	24	T-Moulding
11	Coin slot (1)	25	Hook metal
12	Coin indication panel (1)	26	L-shaped reinforcing metal fittings
13	Coin slot (2)	27	Push button
14	Coin indication panel (2)		

B. DRAWING OF CIRCUIT BOARD MOUNTING POSITIONS

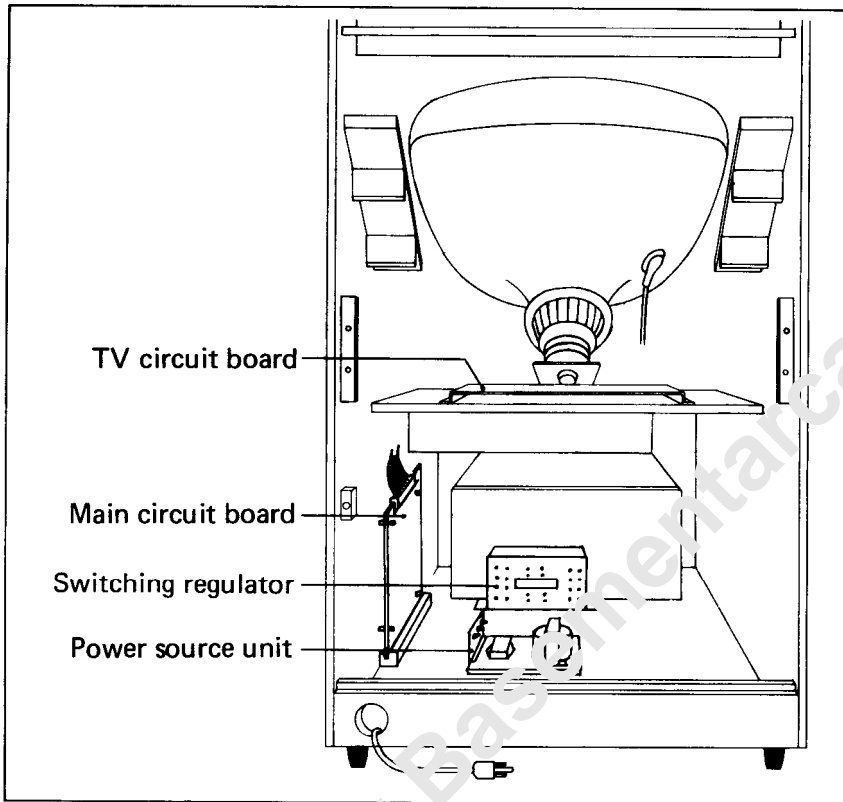


Fig. 5 Circuit Board Mounting Positions

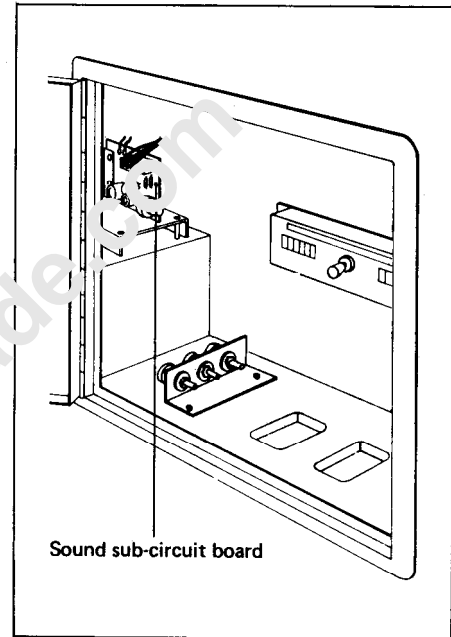


Fig. 6 Sound Circuit Board Mounting Positions

C. FUSES

Fuses in the power source unit

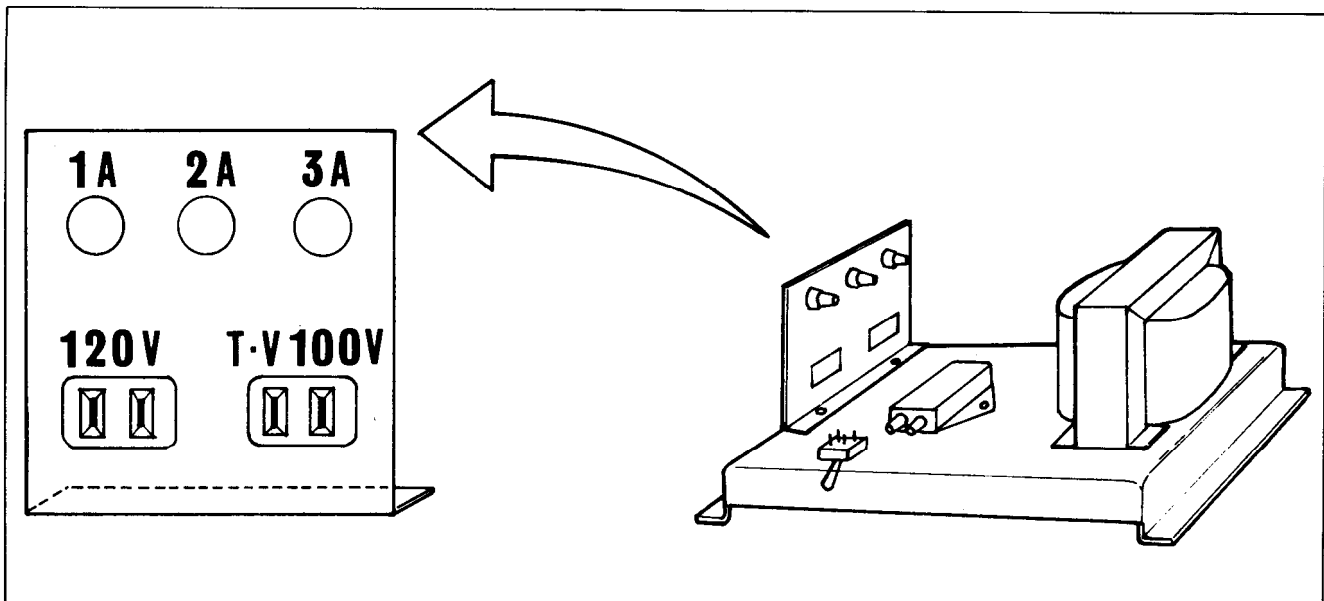


Fig. 7 Fuses in the Power Source Unit

D. COMPONENT PARTS RELATED TO CABINET (INSIDE)

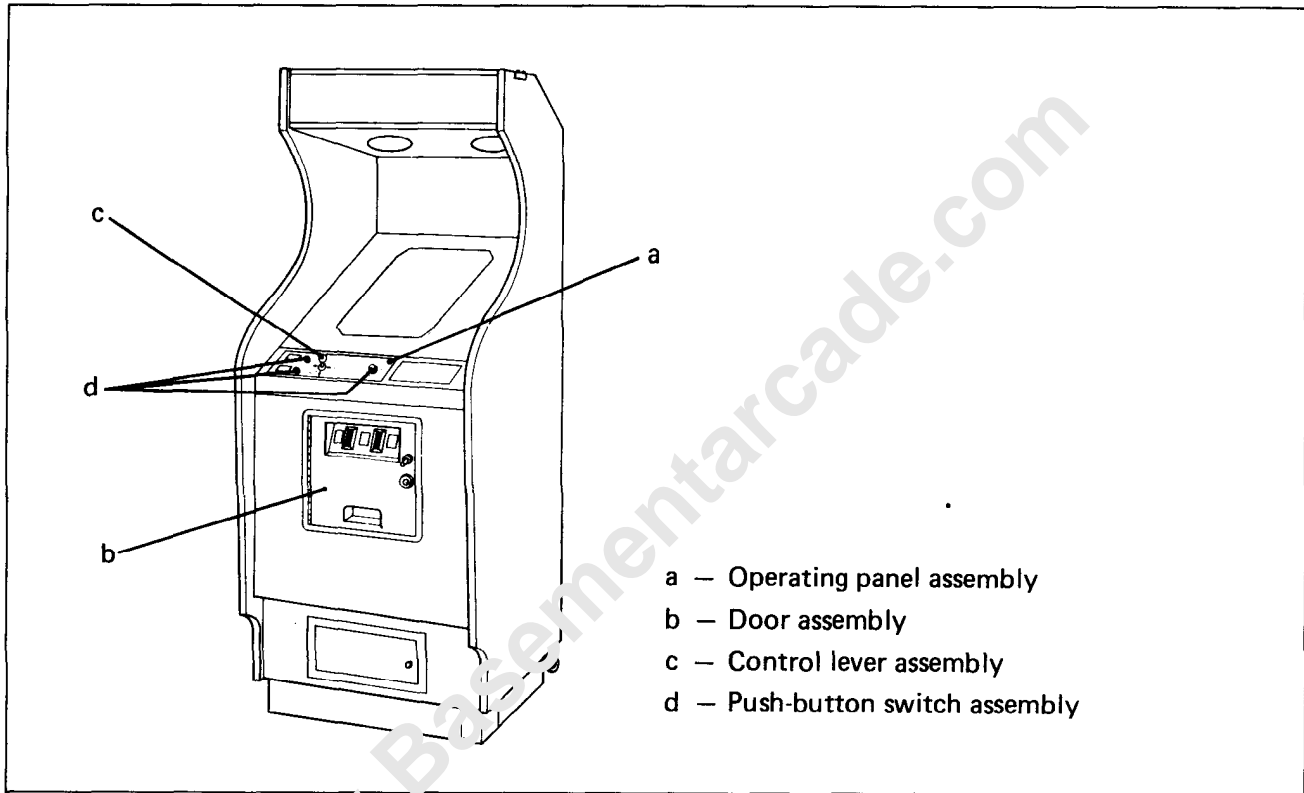


Fig. 8 Main Assemblies Related to Cabinet (Inside)

a) Operating panel assembly

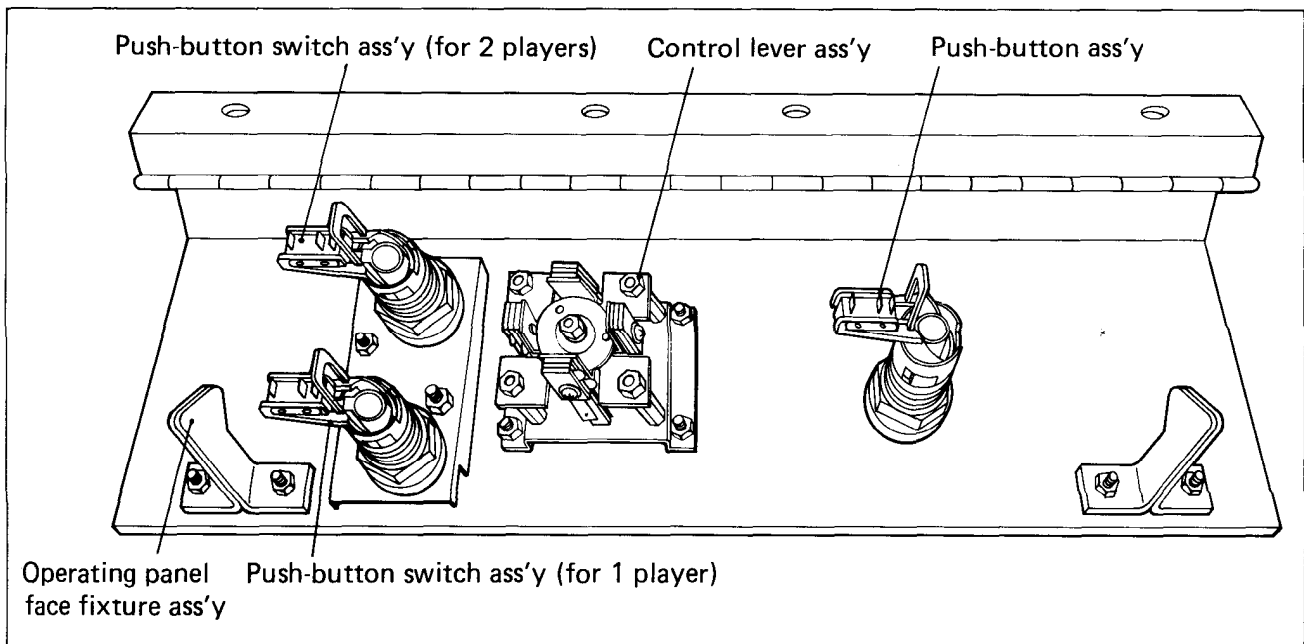


Fig. 9 Operating Panel Assembly

b) Door assembly and parts list

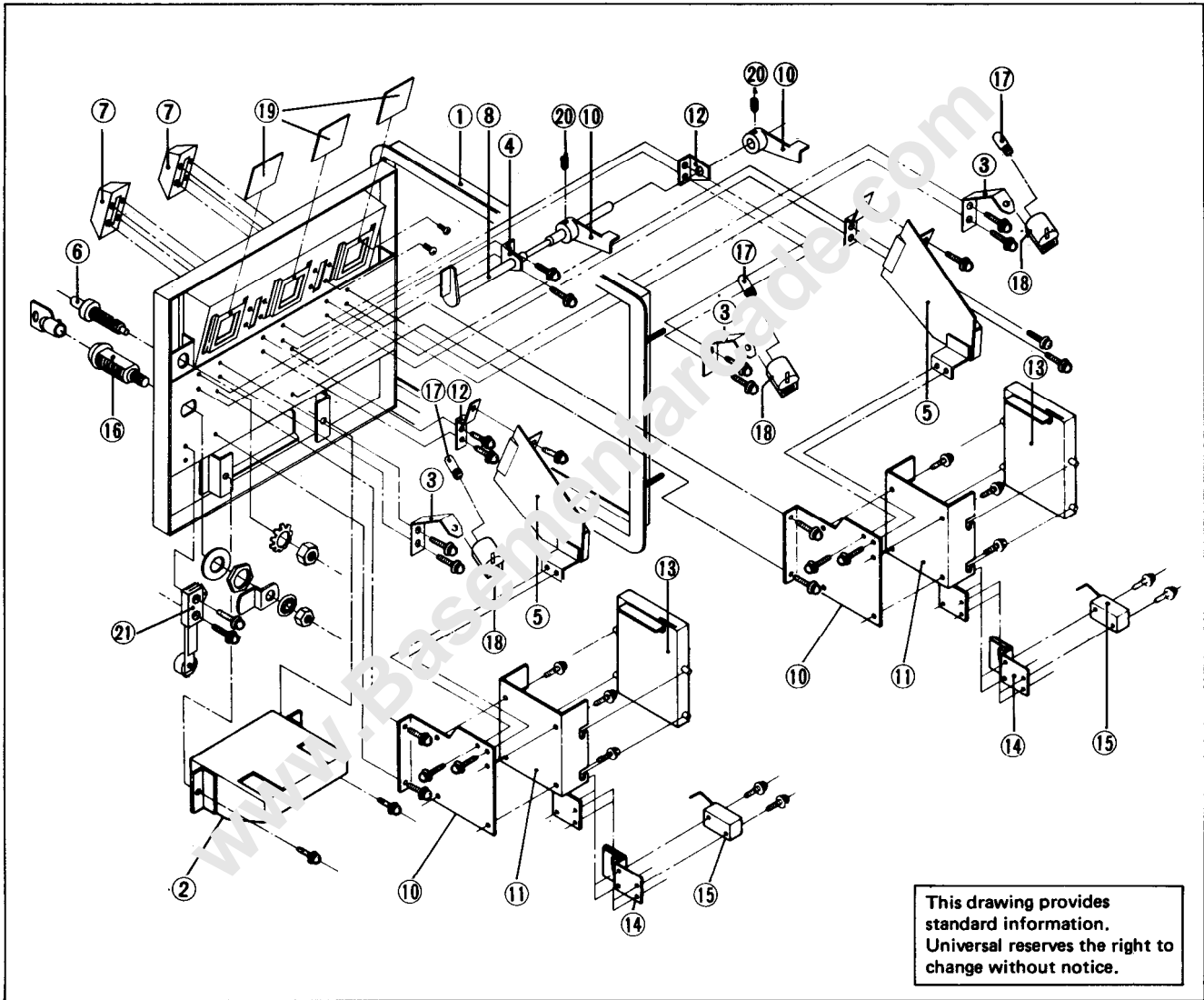


Fig. 10 Inside View of Door Assembly

DOOR ASSEMBLY PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Main door	12	Coin slot chute holder (x 2)
2	Returning saucer	13	Rejector (x 2)
3	Lamp bracket (x 3)	14	Sensor slot (x 2)
4	Rearing (x 2)	15	Micro switch
5	Coin slot chute (x 2)	16	Key sets
6	Returning button	17	Miniature lamp (x 3)
7	Coin slot (x 2)	18	Miniature lamp socket (x 3)
8	Transmission shaft	19	Coin indication panel (25φ x 2, coin slot)
9	Rotary bracket (x 2)	20	Hexagon socket head screw (x 2)
10	Rejector bracket (x 2)	21	Tilt switch
11	Rejector case (x 2)		

c) Control lever assembly and parts list

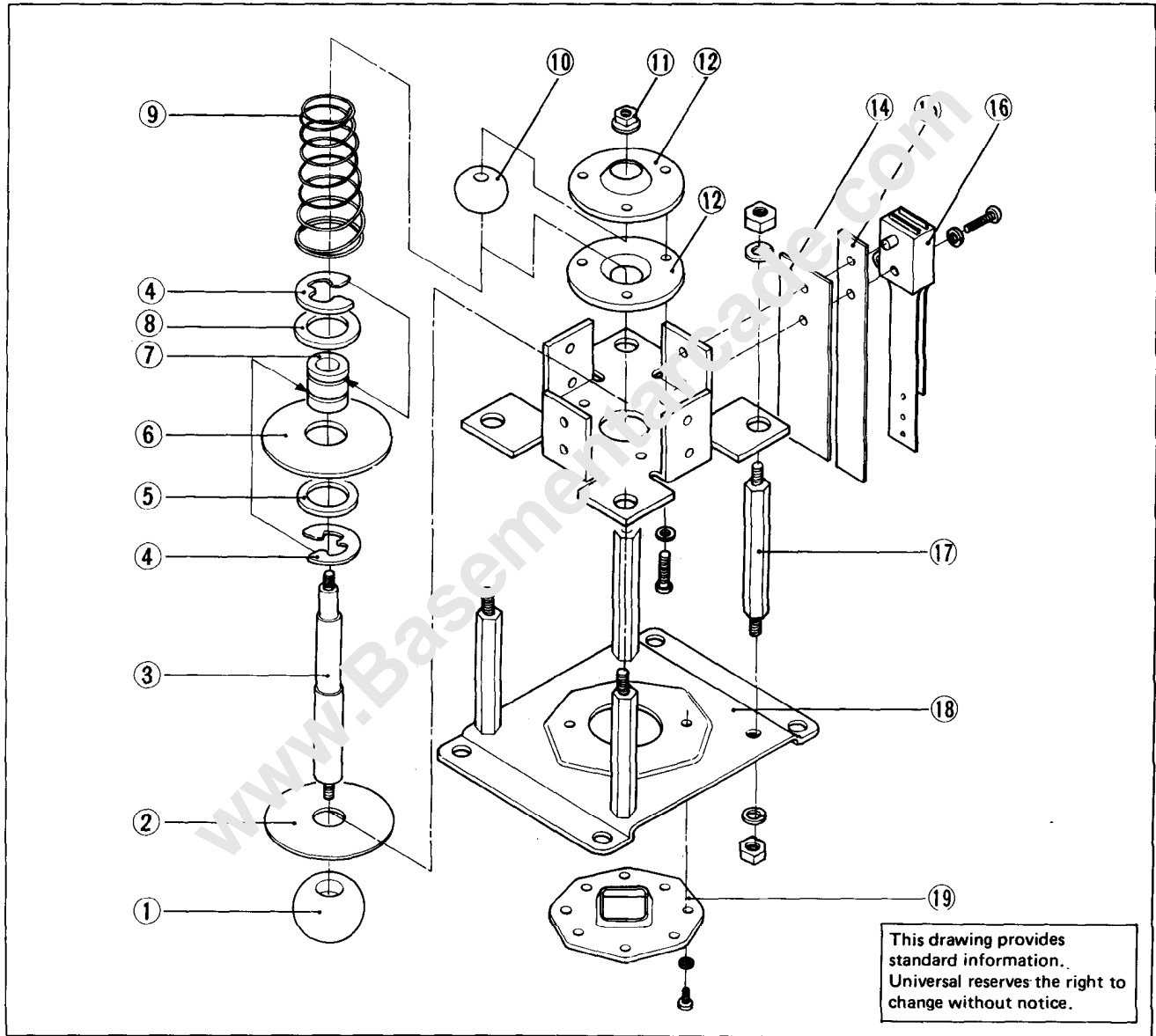


Fig. 11 Control Lever Assembly

CONTROL LEVER ASSEMBLY PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Knob (Upright 32 Dim, Table 24 Dim)	11	Rock nut
2	Resinboard (Black)	12	Bracket (x2)
3	Lever shaft	13	Blades mounting plate
4	Returning rings (E type) (x2)	14	Plate spring (x4)
5	Flat washer (Large)	15	Insulating fiber (x4)
6	Detecting disc	16	Blade switch (x4)
7	Shaft sleeve	17	Stud bolt (x4)
8	Flat washer (Small)	18	Mounting base
9	Spring	19	Selector plate
10	Steel ball		

E. COMPONENT PARTS RELATED TO SWITCHES IN THE CABINET

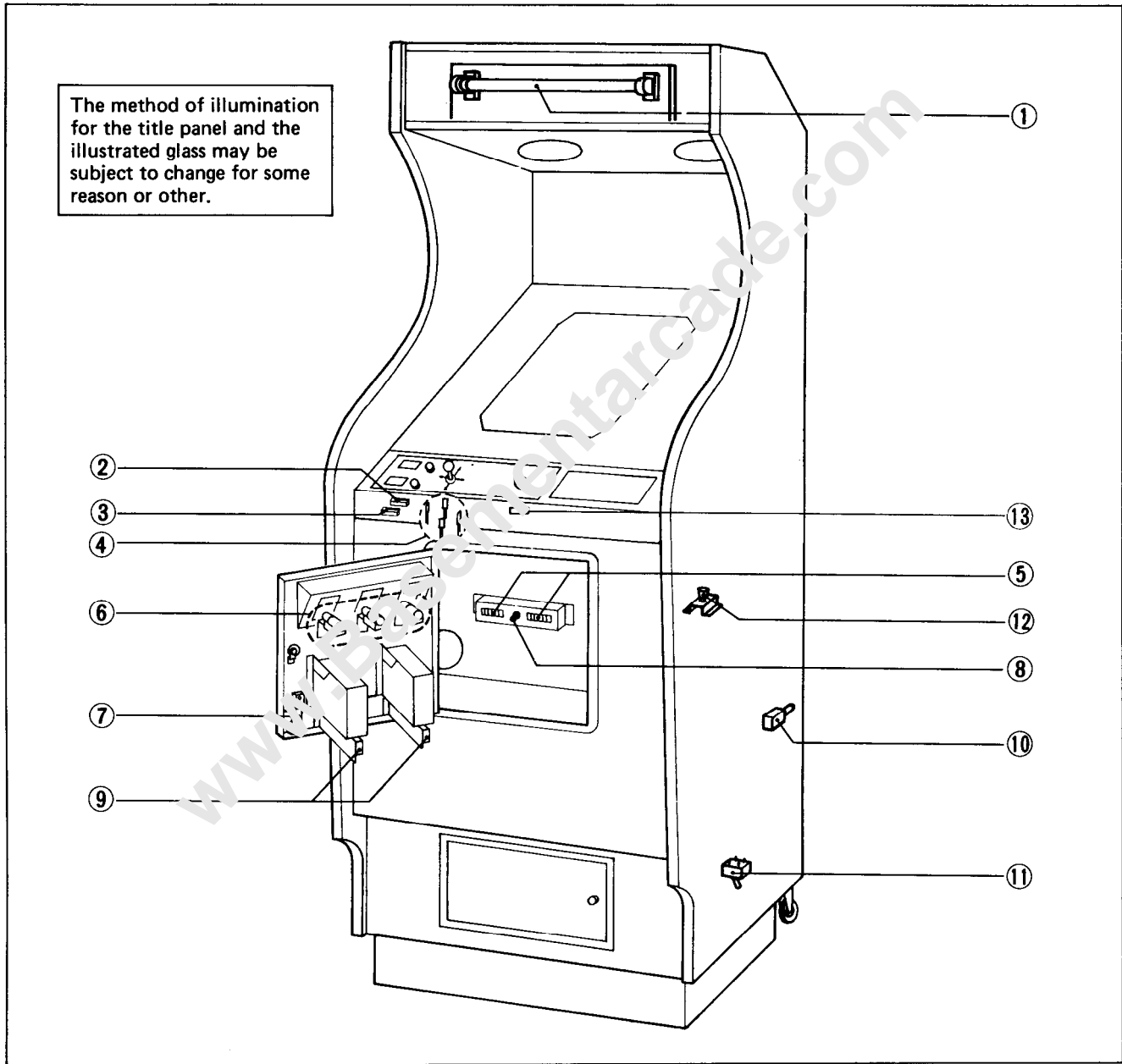
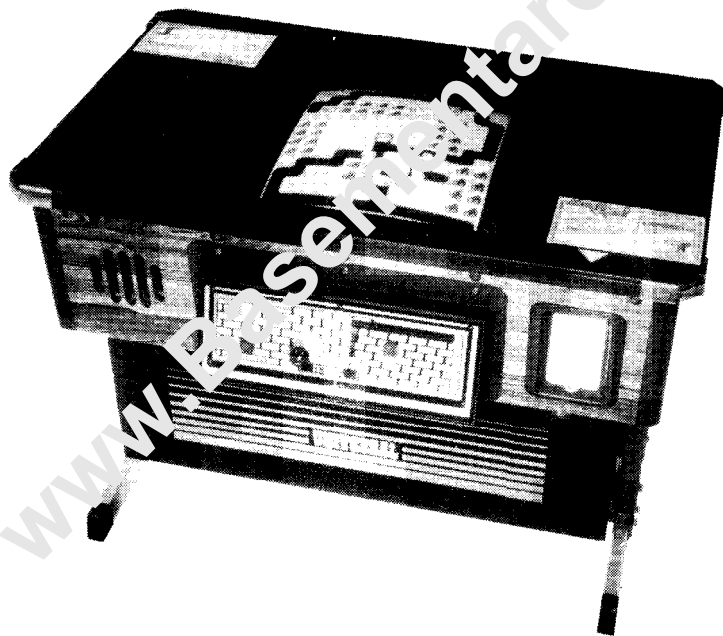


Fig. 12 Component Parts Related to Switches in the Cabinet

INSIDE CABINET PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Fluorescent lamp (for title panel)	8	Micro SW (for resetting)
2	1 player select button micro SW	9	Micro SW (for rejector x 2)
3	2 players select button micro SW	10	Door SW
4	Control lever 4-directional use blade SW (x4)	11	Toggle SW (for main SW)
5	Coin counter (x 2)	12	Micro SW (for demagnetizations)
6	Miniature lamp (for money display x 3)	13	Micro SW (for push button)
7	Blade SW (for tilt SW)		

TABLE TYPE



[Both 14" and 20" types are available.]

SPECIFICATIONS

▽ 95-2447

572(D) x 842(W) x 613 – 733(H)mm

AC100V/115V/230V 50/60Hz

140W (14") 180W (20")

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

IX. TABLE TYPE PARTS CATALOG

A. COMPONENT PARTS RELATED TO CABINET (OUTSIDE)

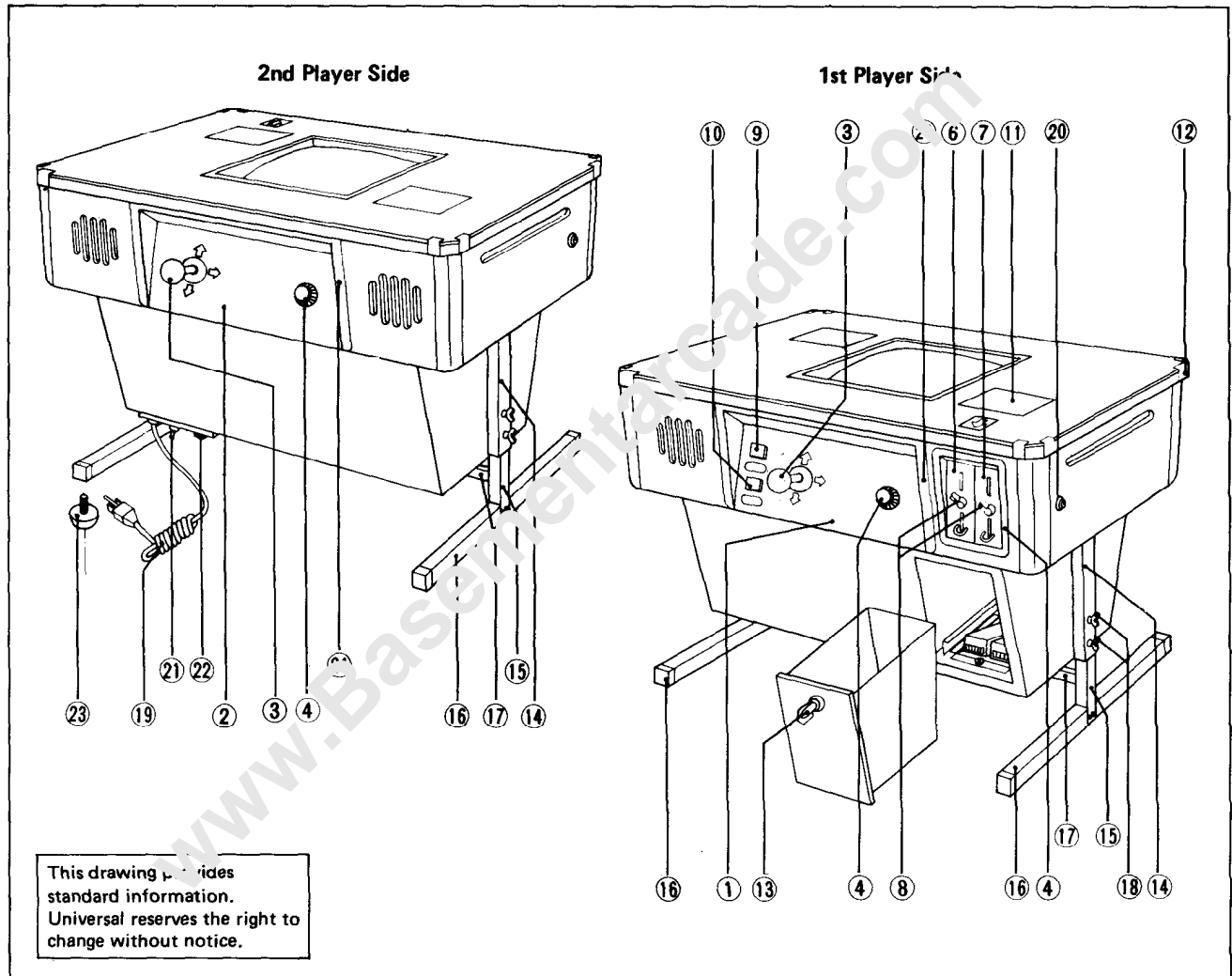


Fig. 13 Component Parts Related to Cabinet (Outside)

OUTSIDE CABINET PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	Operating indication illustrated panel A (for 1st player side)	12	Glass fittings (x4)
2	Operating indication illustrated panel B (for 2nd player side)	13	Cash box key
3	Control lever ass'y	14	Leg (x2)
4	Push button ass'y	15	Foot adjuster (x2)
5	Coin slot frame	16	Foot
6	Selector plate (1)	17	Foot support
7	Selector plate (2) [not used in case of 1-way]	18	Butterfly bolt
8	Cancel lever	19	Power cord (AC)
9	Push button ass'y (for 1 player)	20	Table key (x2)
10	Push button ass'y (for 2 players)	21	Toggle SW (Main)
11	Sticker for game rules (x2)	22	Fuse (5A for power input)
		23	Leg adjuster
		24	Operating panel frame

B. COMPONENT PARTS RELATED TO CABINET (INSIDE)

a) Inside cabinet

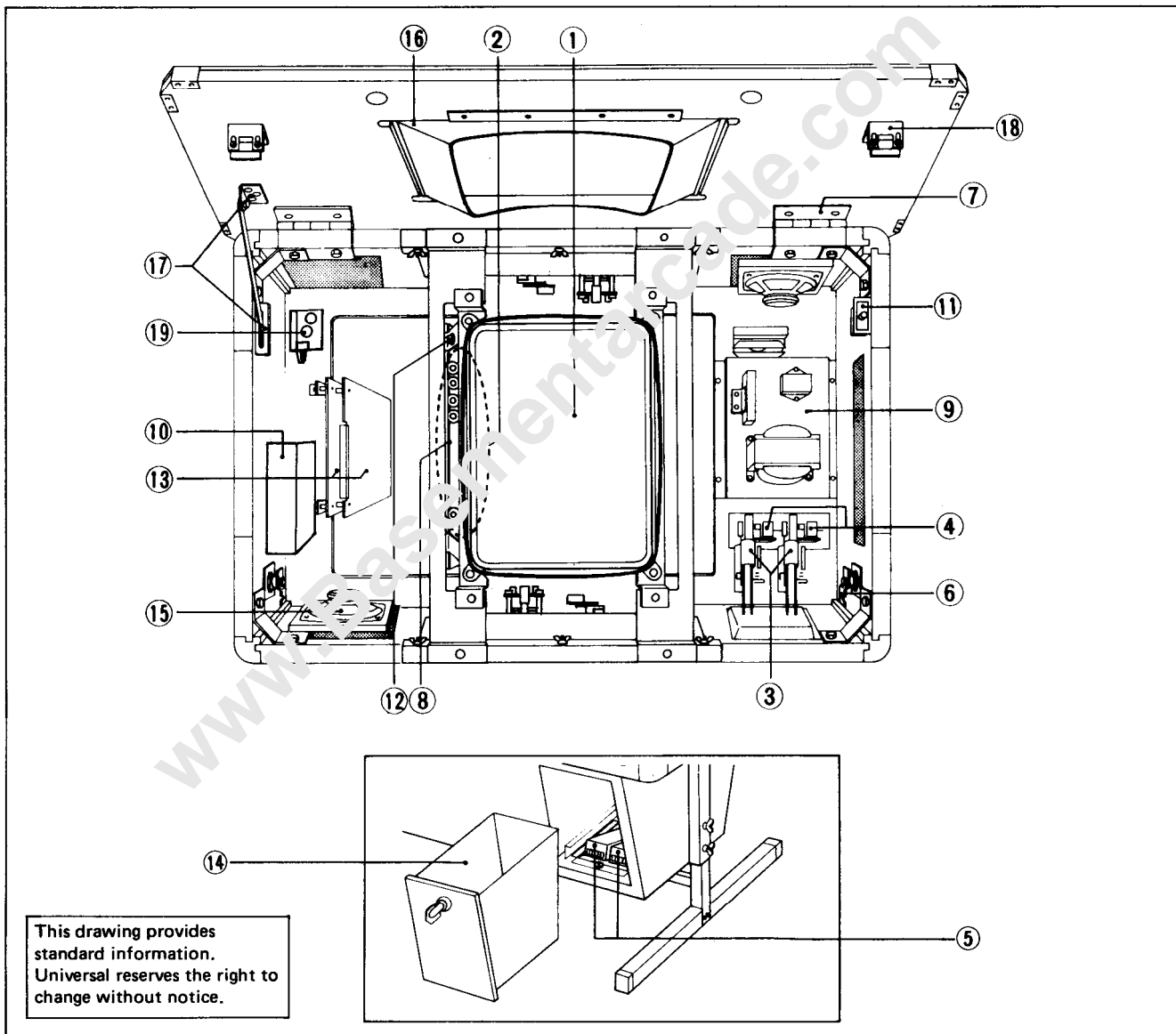


Fig. 14 Component Parts Related to Cabinet (Inside)

INSIDE CABINET PARTS LIST

Ref. No.	Name	Ref. No.	Name
1	CRT (14", 20" color)	11	Door switch
2	TV monitor control	12	Demagnetization switch
3	Rejector ass'y	13	Main circuit board (A, B)
4	Coin micro switch	14	Cash box
5	Coin counter (x2)	15	Speaker (x2)
6	Table lock hook	16	TV monitor mask
7	Butterfly palte ass'y	17	Hood guide ass'y
8	TV monitor circuit board	18	Table lock bracket
9	Power source unit	19	Sound circuit board
10	Switching regulator		

b) Fuses

Fuses in the Power Source Circuit Board

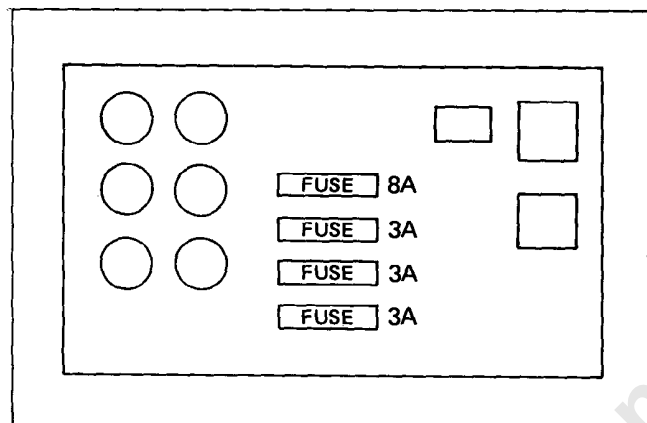


Fig. 15 Fuses in the Power Source Circuit Board

Fuse on the cabinet bottom

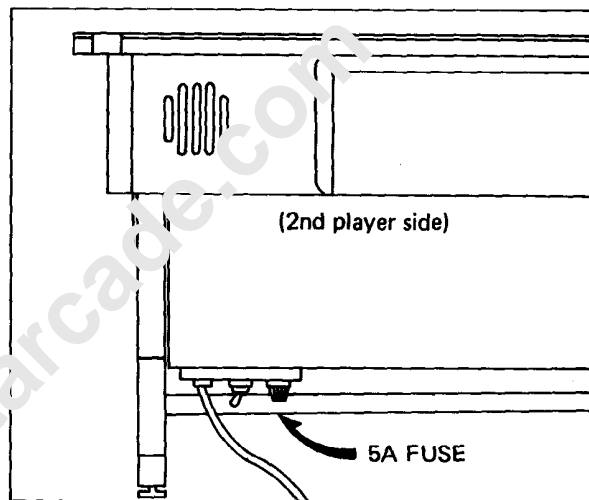


Fig. 16 Fuse on the Cabinet Bottom

c) Operating panel assembly

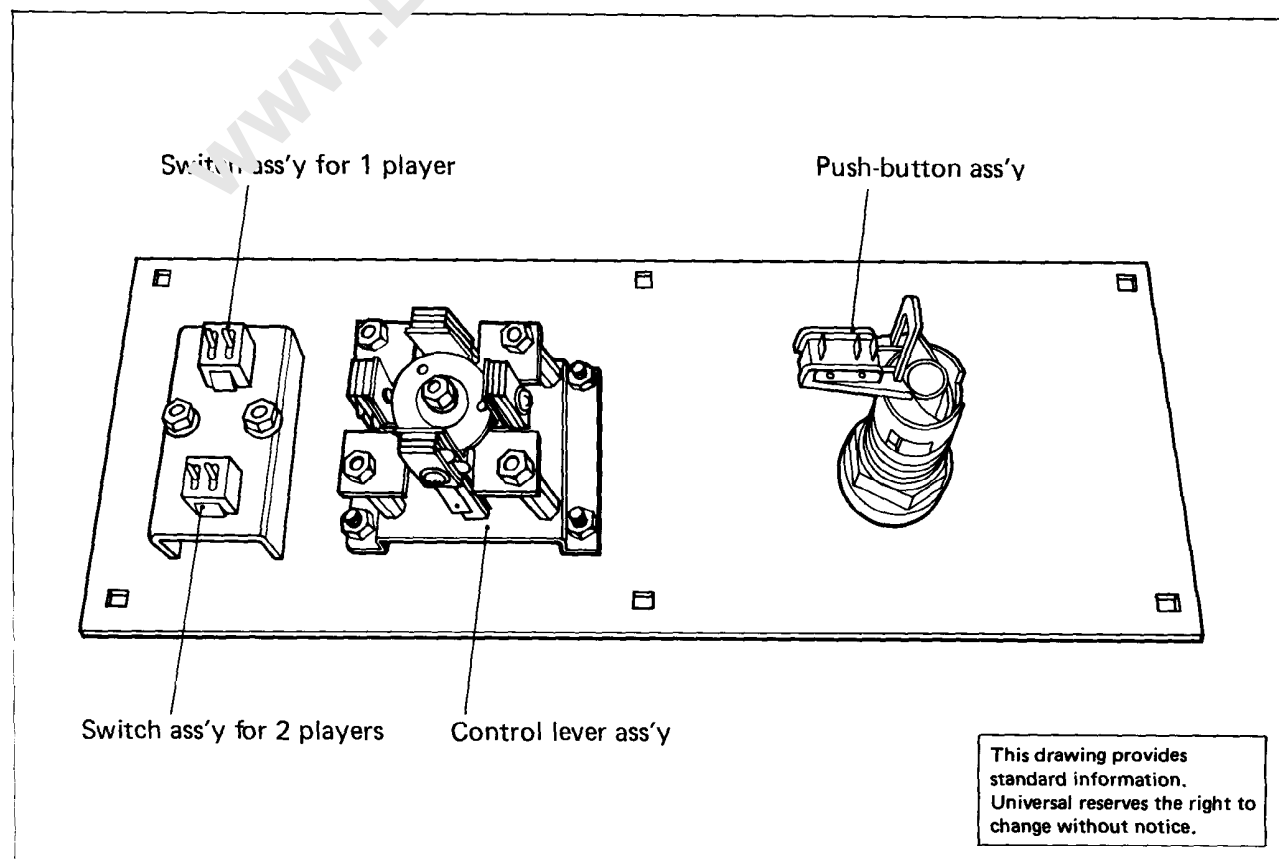


Fig. 17 Operating Panel Assembly

X. CIRCUIT BOARD

A. CIRCUIT BOARD IC LOCATION AND PARTS LIST

a) Main circuit board IC location and parts list

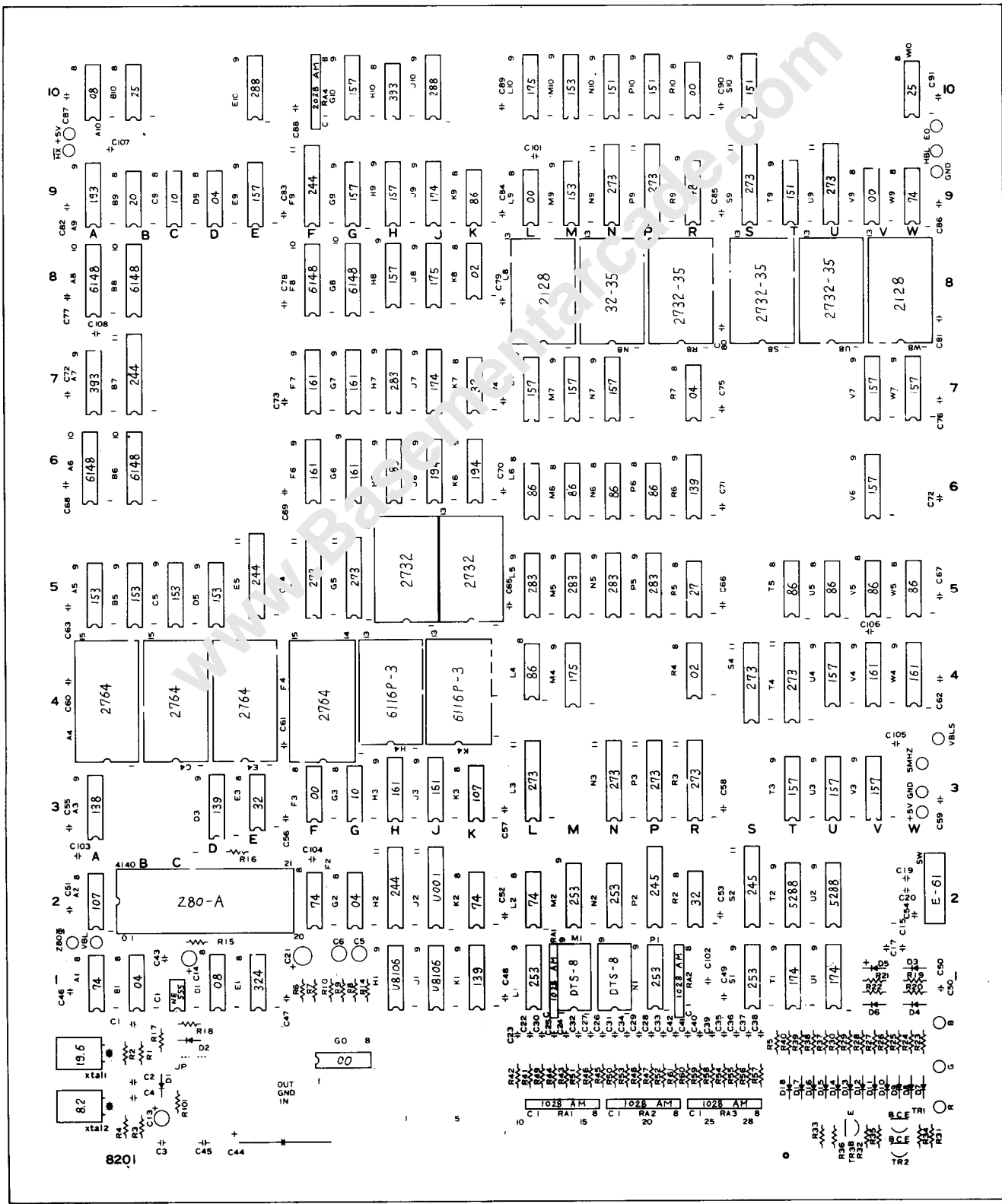


Fig. 18 Main Circuit Board

[1] Integrated Circuit

Item No.	Q'ty	Description
74LS 00	6	TTL
74LS 02	2	"
74LS 04	3	"
74 S 04	1	"
74LS 08	2	"
74LS 10	2	"
74LS 20	1	"
74 25	2	"
74LS 27	1	"
74LS 32	3	"
74LS 74	5	"
74LS 86	10	"
74LS107	2	"
74 148	1	"
74LS151	4	"
74LS153	6	"
74LS138	1	"
74LS139	3	"
74LS157	15	"
74LS161	8	"
74LS174	4	"
74LS175	3	"
74LS193	1	"
74LS194	2	"
74LS224	4	"
74LS245	2	"
74LS253	5	"
74LS273	13	"
74LS283	6	"
74LS393	2	"
74 S288 (TBP18S030)	4	256 bits Fuse ROM
U001	1	Special Function
NE555	1	Timer
Z80A	1	NMOS CPU (4MHz)
2732	6	NMOS 32K bits EP ROM (Access 350nsec)
2764	4	NMOS 64K bits EP ROM (Access 300nsec)
6148P	6	CMOS 4K bits High Speed RAM (Access 70nsec)
6116R-3	2	CMOS 16K bits Static RAM (Access 150nsec)
2128	2	NMOS 16K bits Static RAM (Access 200nsec)
LM324	1	Quad Operational Amplifiers
U8106	2	Programmable Sound Generator

[2] Other Semiconductor Devices

Item No.	Q'ty	Description
2SC2785	3	Transistor
10D-1	4	Diode
1S1588	12	"

[3] Capacitors

Rating	Q'ty	Description
50PF/ 12V	2	Ceramic Capacitor
100PF/ "	1	"
220PF/ "	3	"
470PF/ "	1	"
0.001/ "	2	"
0.1/ "	70	"
10μF/ 16V	2	Chemical Capacitor
47μF/ "	1	"
1μF/ "	2	" (Nonpolar)

[4] Resistors

Rating	Q'ty	Description
47Ω ¼W	1	Carbon Solid
51Ω "	3	"
75Ω "	3	"
100Ω "	7	"
120Ω "	3	"
150Ω "	3	"
200Ω "	24	"
220Ω "	3	"
330Ω "	1	"
1KΩ "	1	"
3KΩ "	1	"
10KΩ "	2	"
47KΩ "	2	"
100KΩ "	3	"
MS1028AM	5	1KΩ Resistor Array
MS2028AM	1	2KΩ Resistor Array

[5] Misc

Name	Q'ty	Description
Dip SW	2	8 Elements Switch Array
X tal	2	8.2MHz 19.6MHz
E61-00A	1	Micro SW

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

b) Switching regulator location and parts list

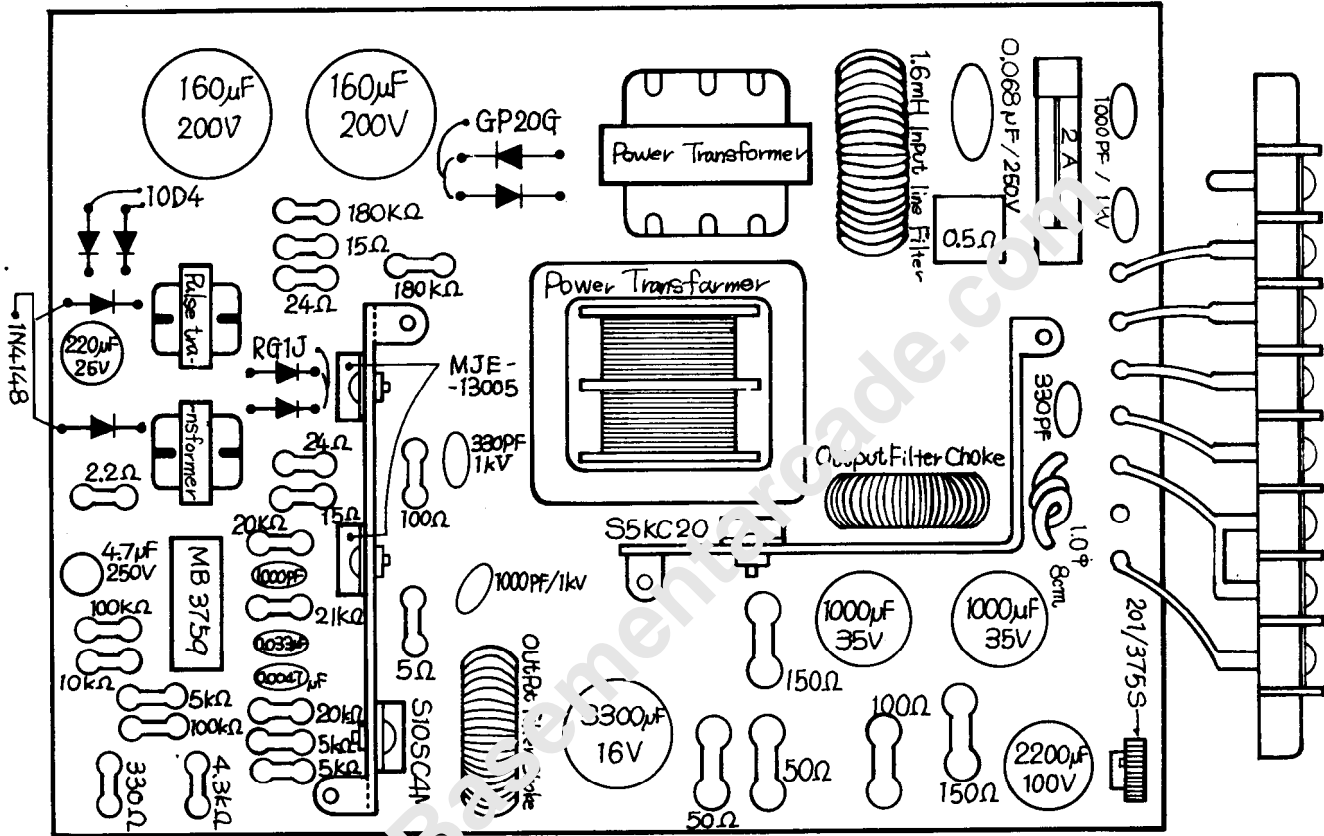


Fig. 19 Switching Regulator

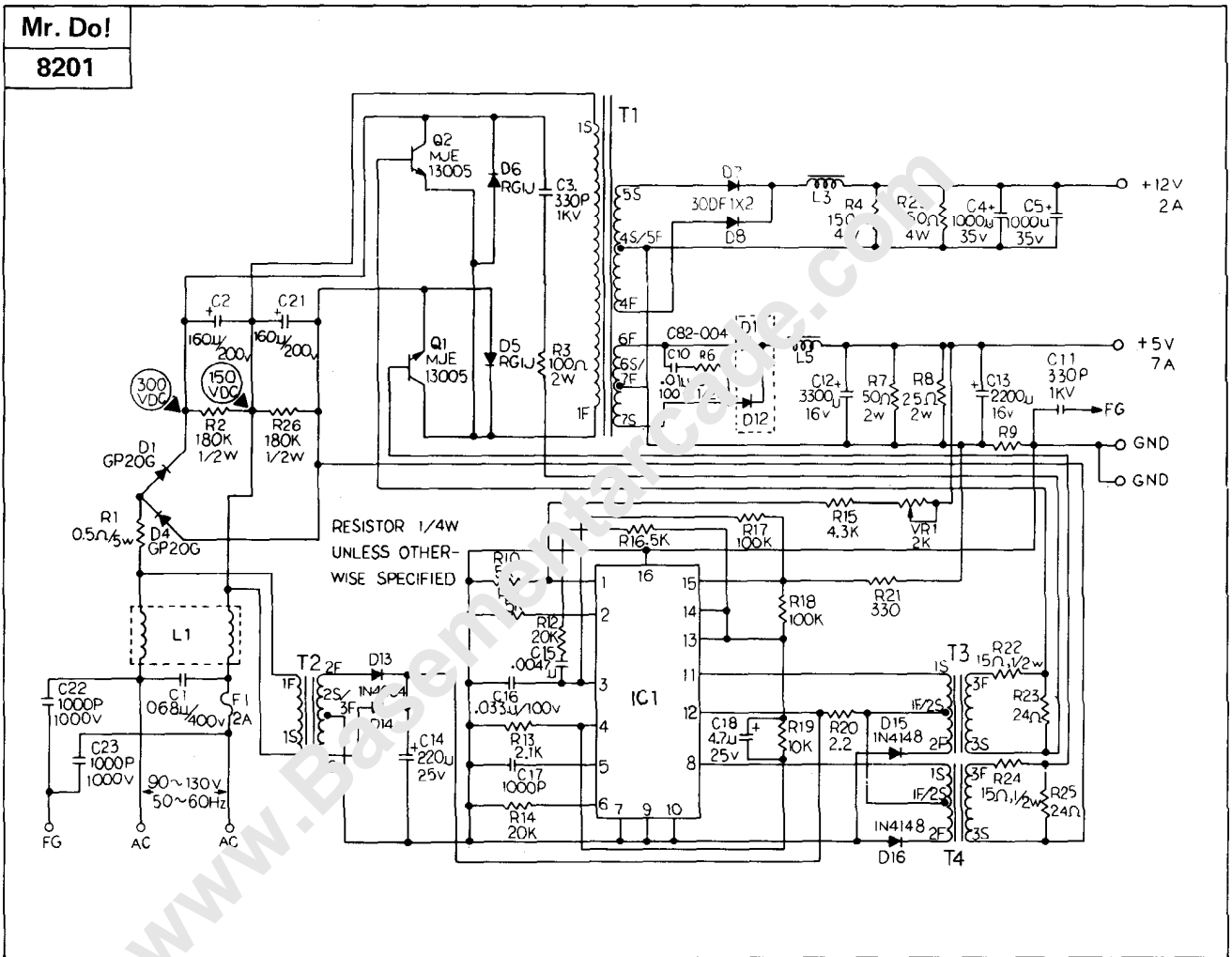
Rating	Q'ty	Description
0.5Ω 5W	1	Wire wound resistor
100Ω 2W	2	"
150Ω 4W	2	"
50Ω 2W	2	"
180kΩ ½W	2	Carbon film resistor
5Ω ½W	1	"
100kΩ ¼W	2	"
2.1kΩ "	1	"
20kΩ "	2	"
10kΩ "	1	"
2.2Ω "	1	"
330Ω "	1	"
15Ω "	2	"
24Ω "	2	"
5kΩ	3	Metal film resistor
4.3kΩ	1	"
1.0φ, 8cm	1	Resistor for current sensing
25kΩ 201/375S	1	Variable resistor
0.068μF/250V	1	PPN capacitor
160μF/200V	2	Electrolytic capacitor
1000μF/35V	2	"
220μF/25V	1	"
2200μF/16V	1	"
4.7μF/25V	1	"

Rating	Q'ty	Description
3300μF/16V	1	Electrolytic capacitor
330PF/1000V	2	Ceramic capacitor
1000PF/1000V	3	"
0.0047μF/100V	1	Mylar capacitor
0.033μF/100V	1	MEF capacitor
1000PF/100V	1	PEE capacitor

Item No.	Q'ty	Description
MJE13005	2	Switching power transistor
MB3759	1	PWM control circuit
RG1J	2	Fast recovery diode
GP20G	2	Rectifier
10D4	2	"
S5KC20	1	TO-220 package
S10SC4M	1	"
1N4148	2	Switching diode

Name	Q'ty	Description
Power transformer	1	For inverter
"	1	For MB3759 control circuit
Pulse transformer	2	For base drive
1.6mH input line filter	1	
+12V output filter chock	1	
+5V "	1	
Fuse	1	2A

B. SWITCHING REGULATOR SCHEMATIC DIAGRAM



C. SOUND CIRCUIT BOARD IC LOCATION AND PARTS LIST

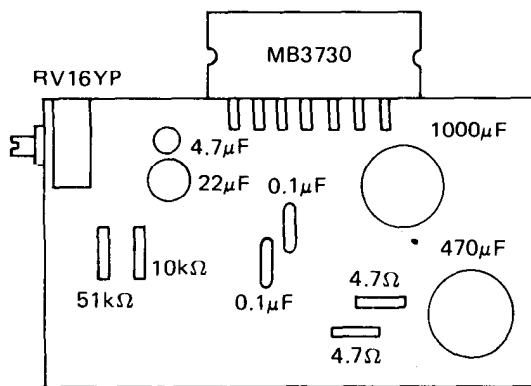
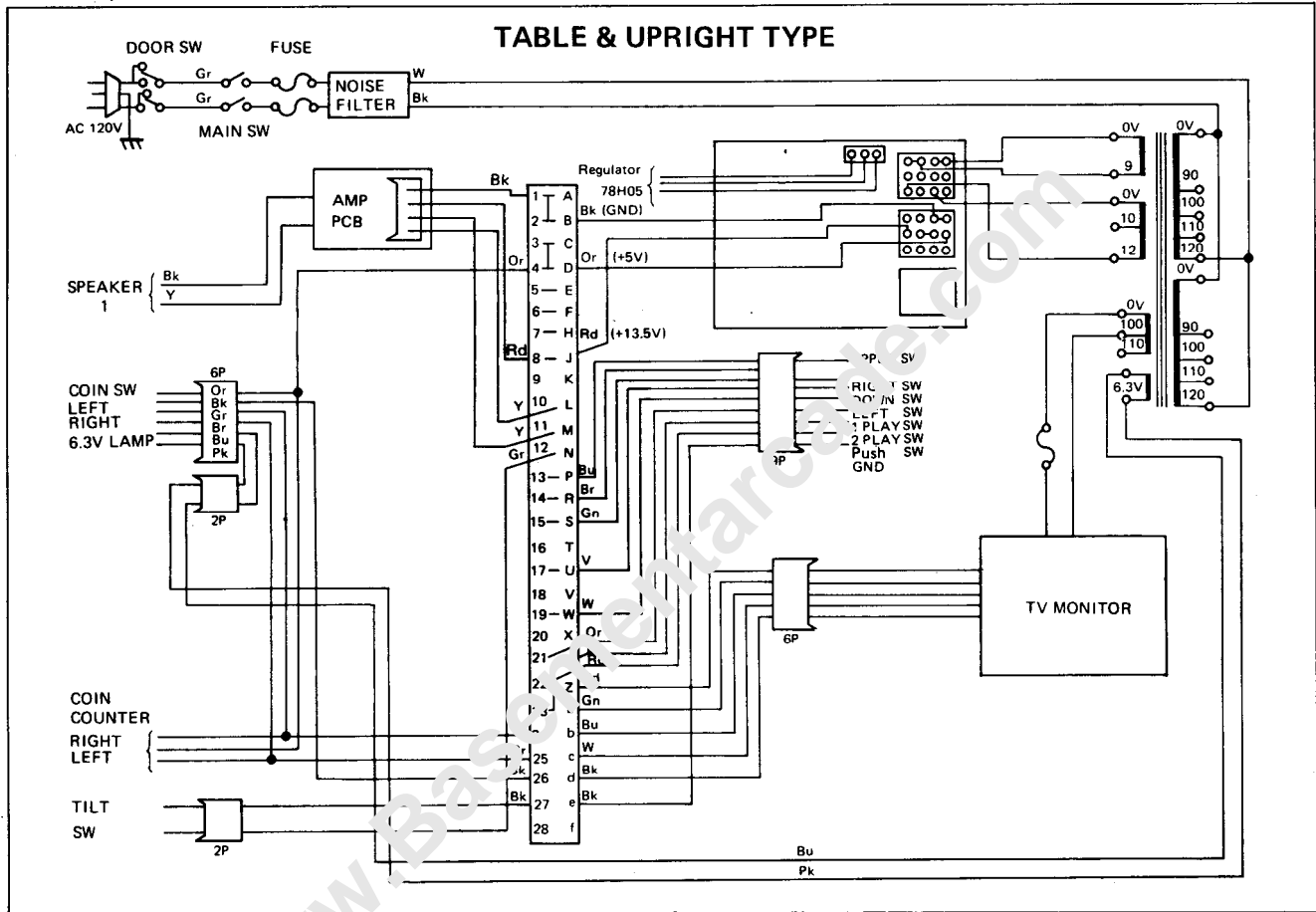


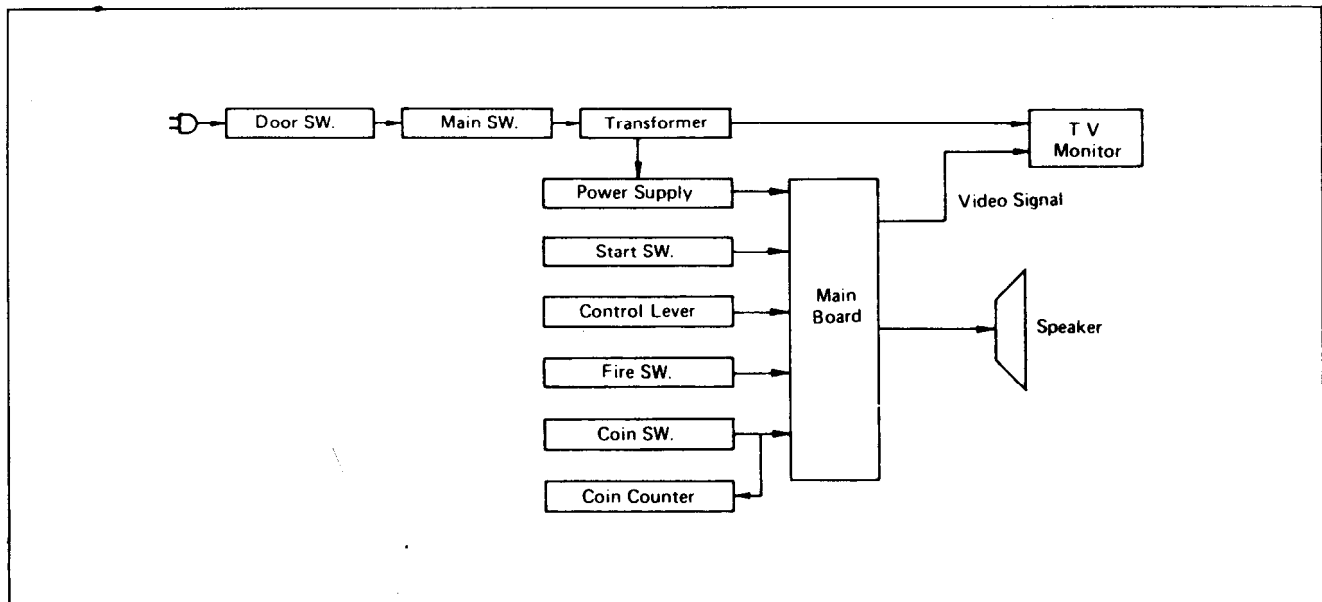
Fig. 20 Sound Circuit Board

Rating	Q'ty	Description
MB3730	1	Audio Amplifier
1000 μ F/25V	1	Chemical Capacitor
22 μ F/25V	1	"
4.7 μ F/25V	1	"
0.1 μ F/25V	2	Ceramic Capacitor
10k Ω 1/4W	1	Carbon Solid Resistor
51k Ω 1/4W	1	"
4.7 Ω 1/4W	2	"
RV16YP 1k Ω	1	Carbon Variable Resistor
470 μ F/16V	1	Chemical Capacitor

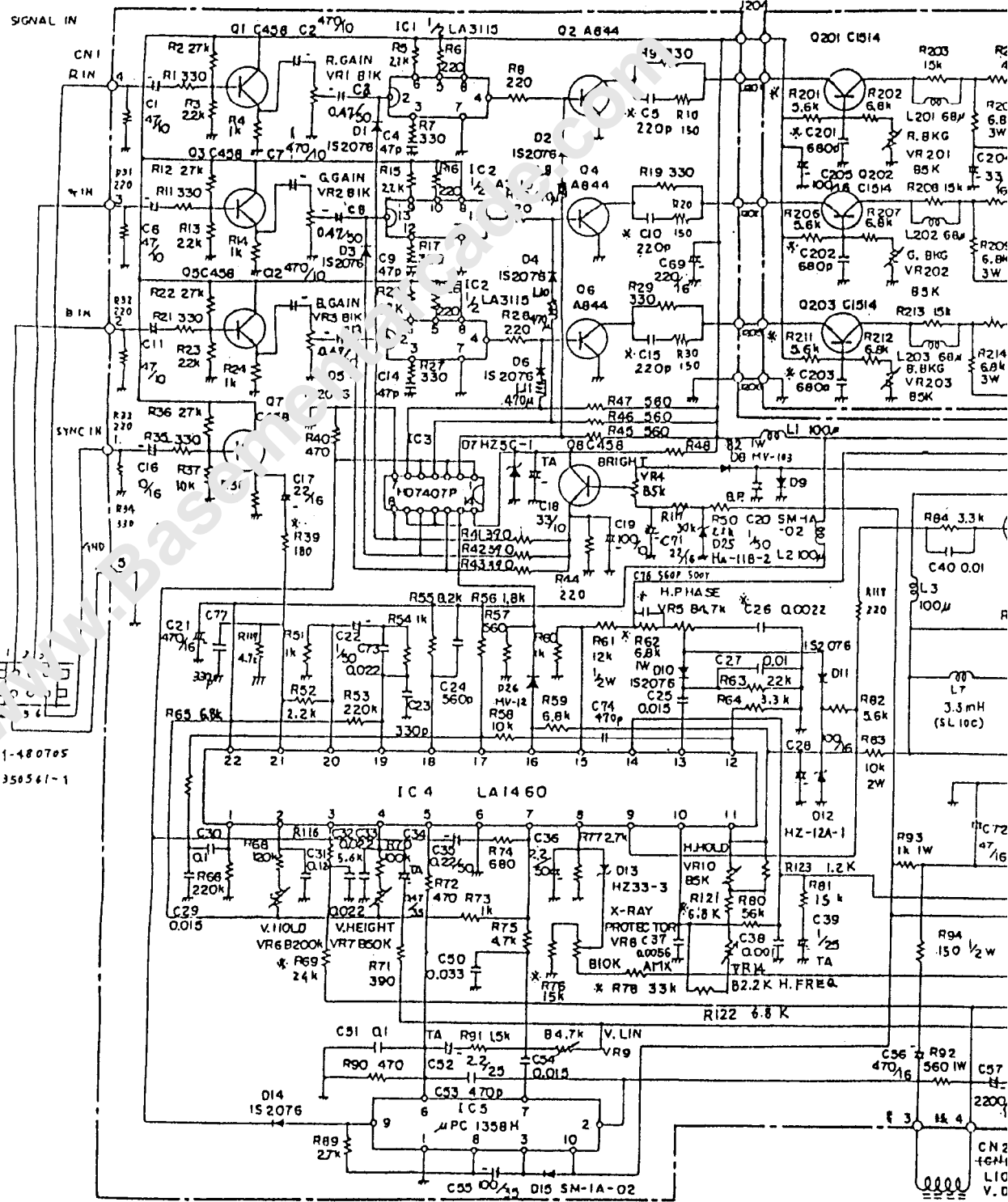
WIRING DIAGRAM (CONNECTOR)

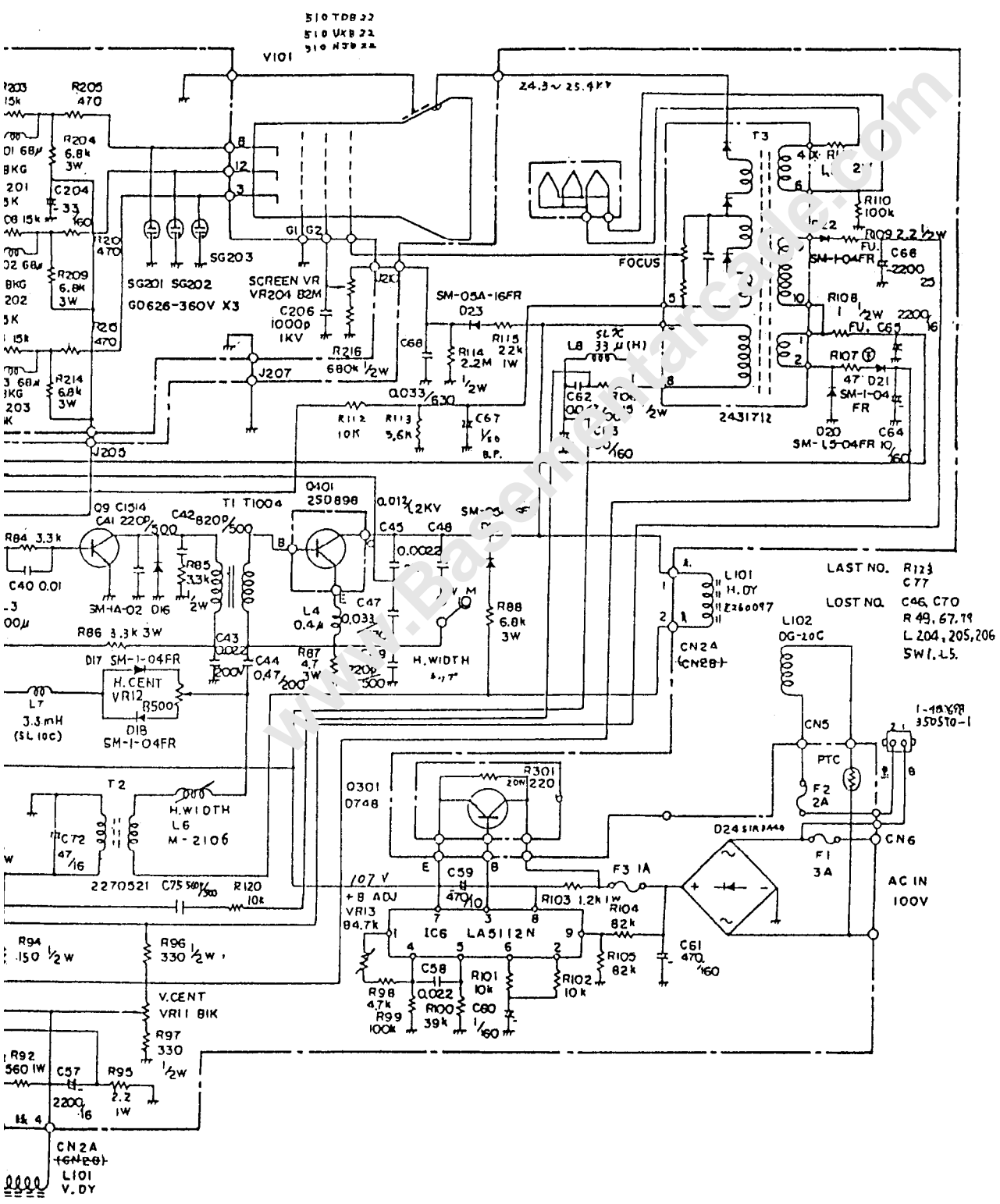


BLOCK DIAGRAM



SCHEMATIC DIAGRAM (20" color)

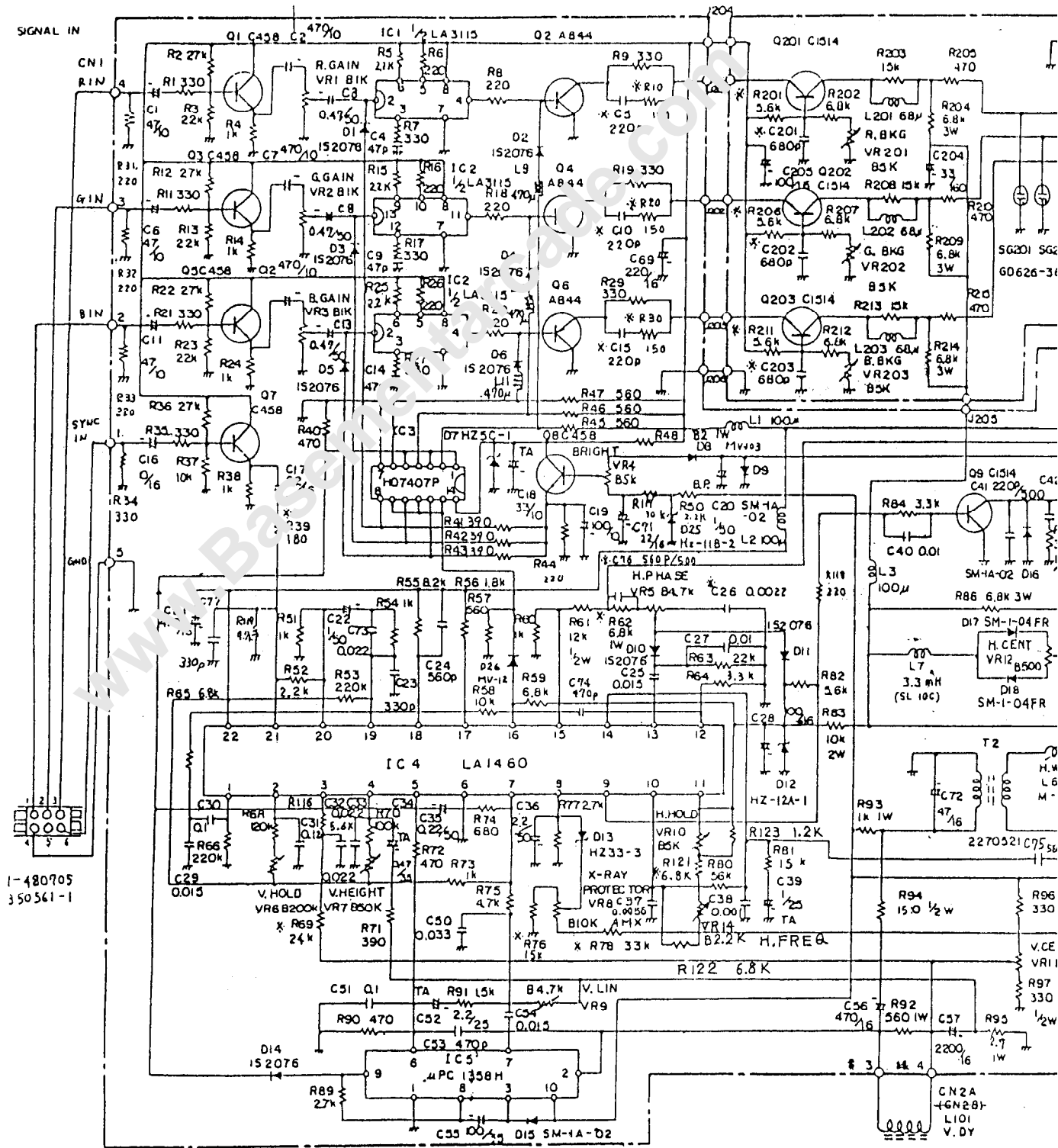


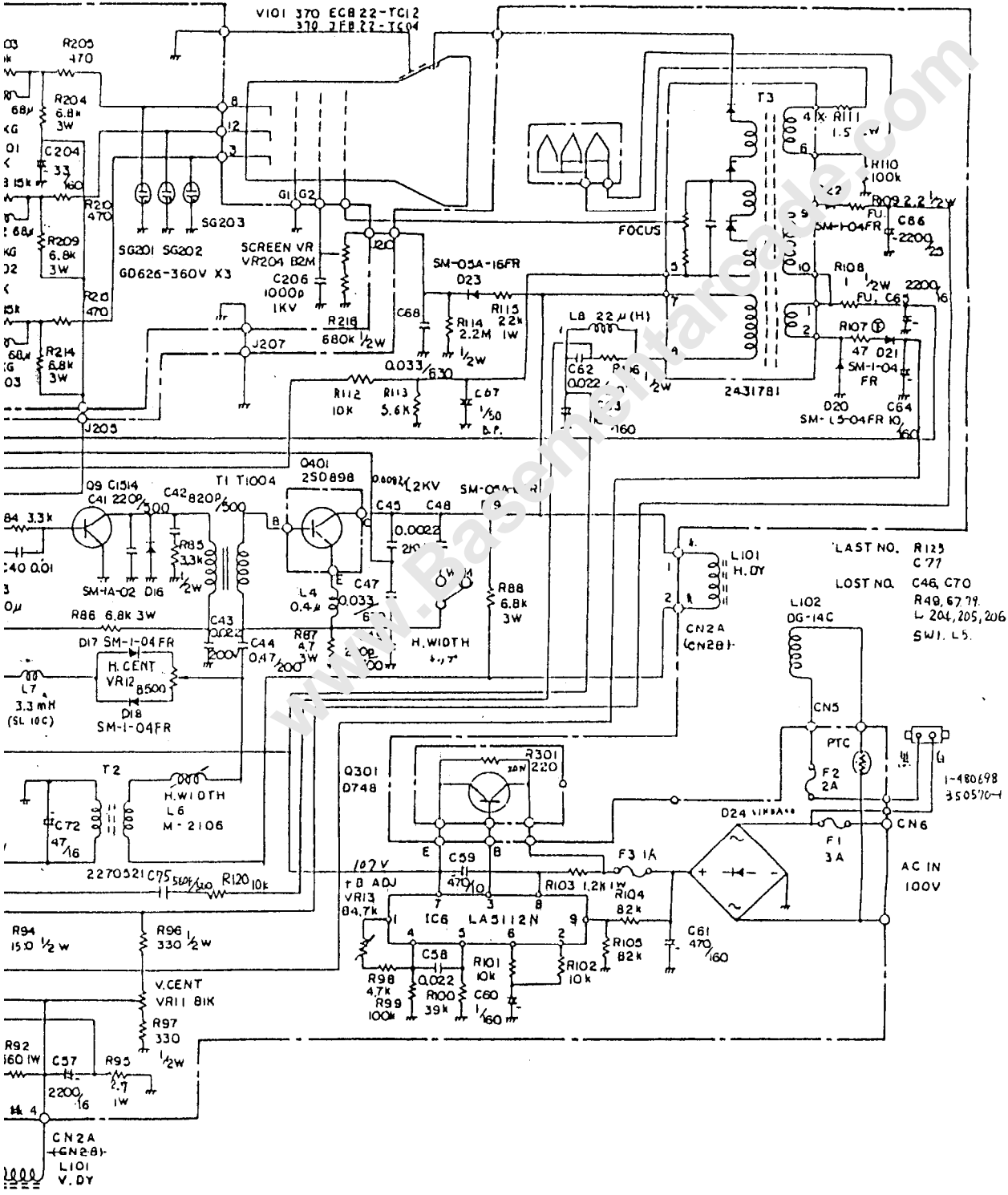


LAST NO. R123
C77
LOST NO. C46, C70
R49, 67, 79
L 204, 205, 206
SW1, L5.

MR. DO!
8201

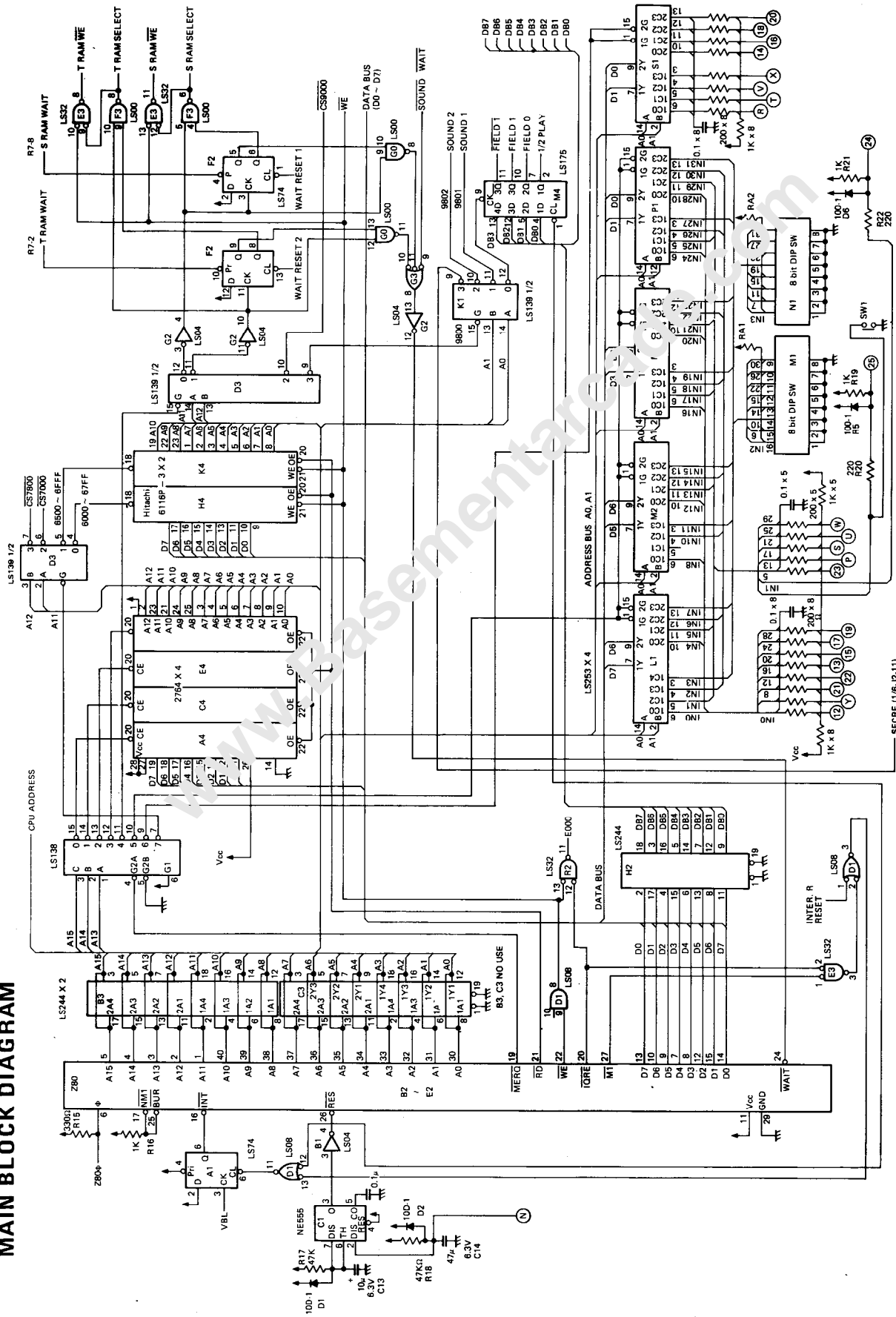
SCHEMATIC DIAGRAM (14" color)





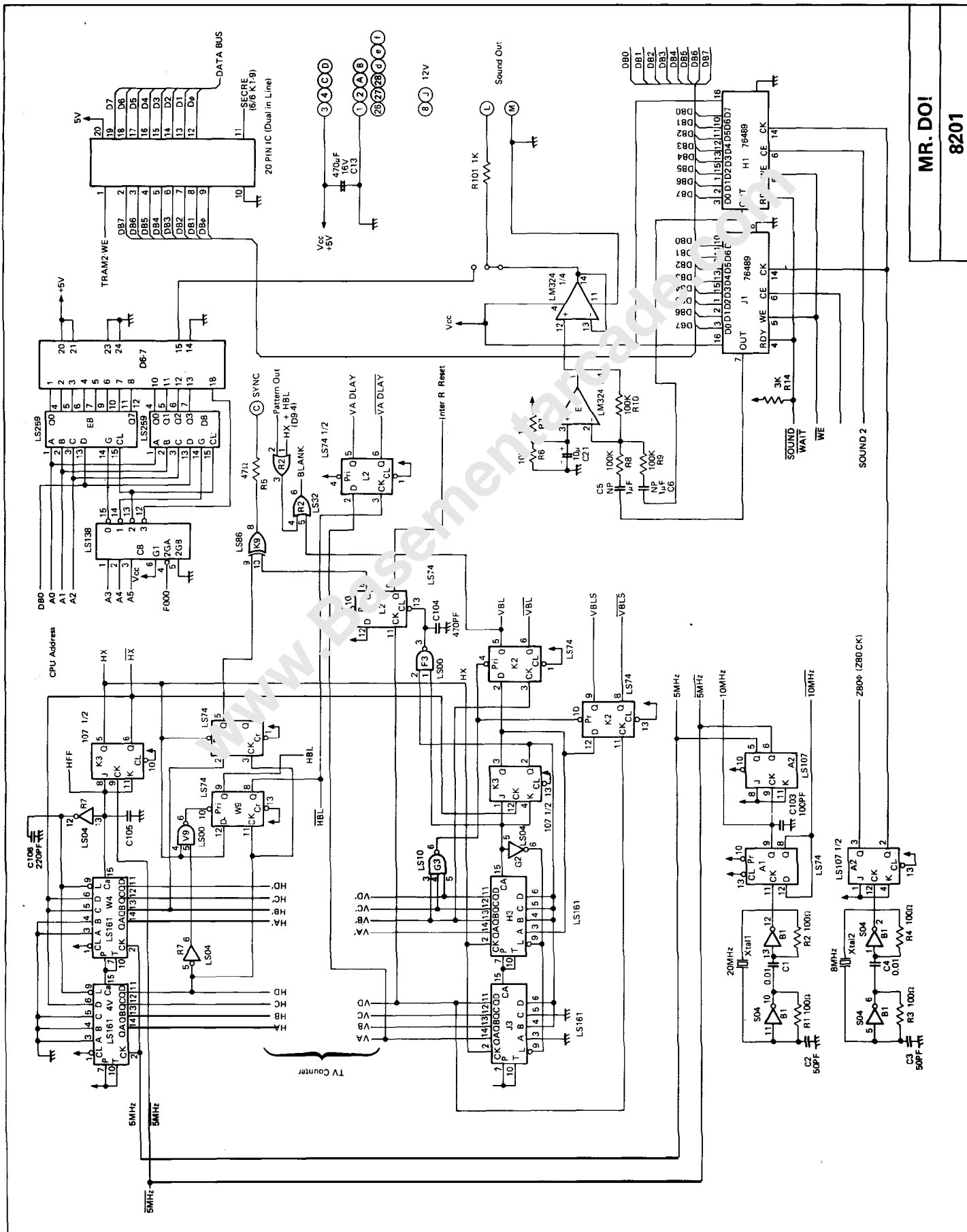
MR. DO!
8201

MAIN BLOCK DIAGRAM

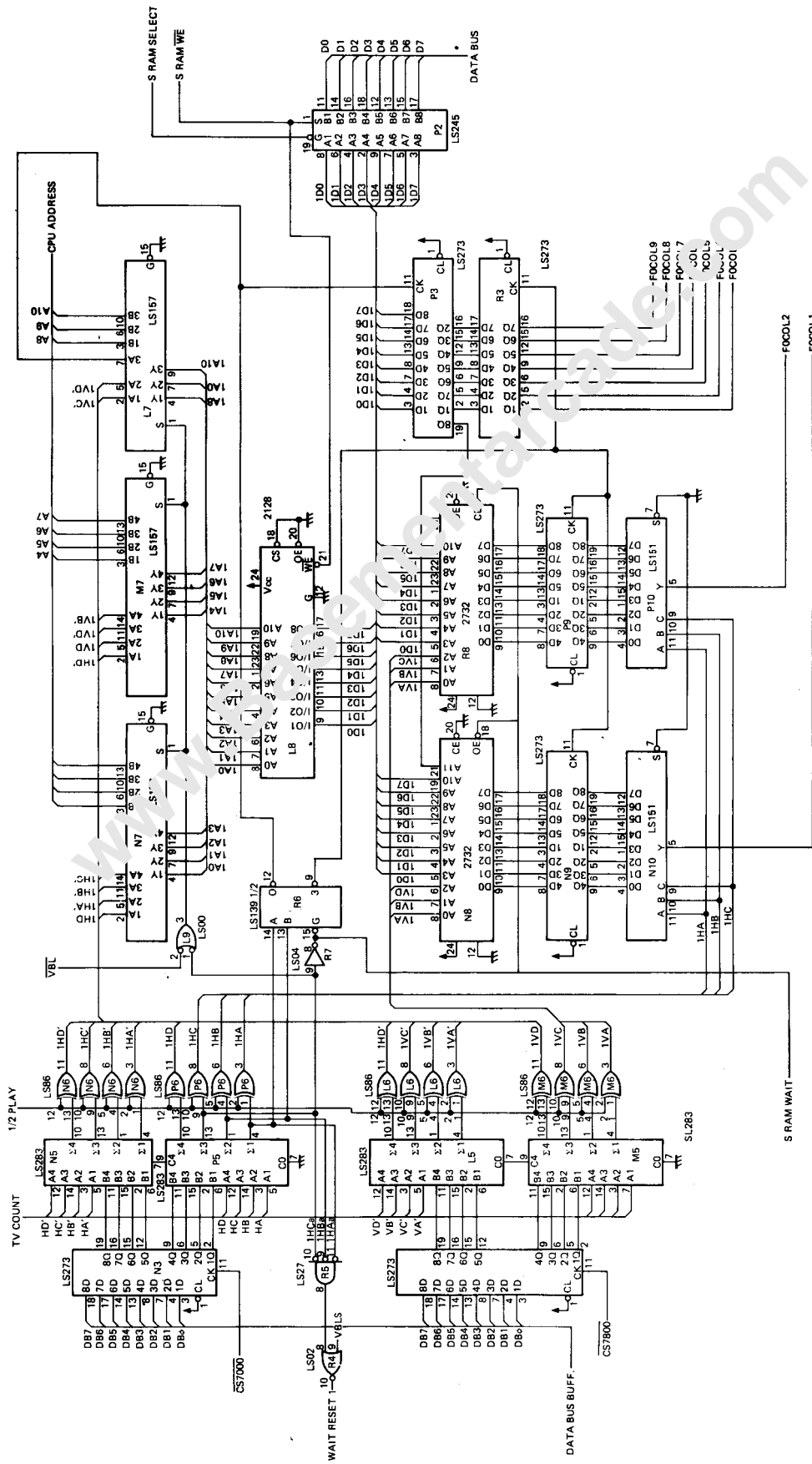


MR. DO!
8201

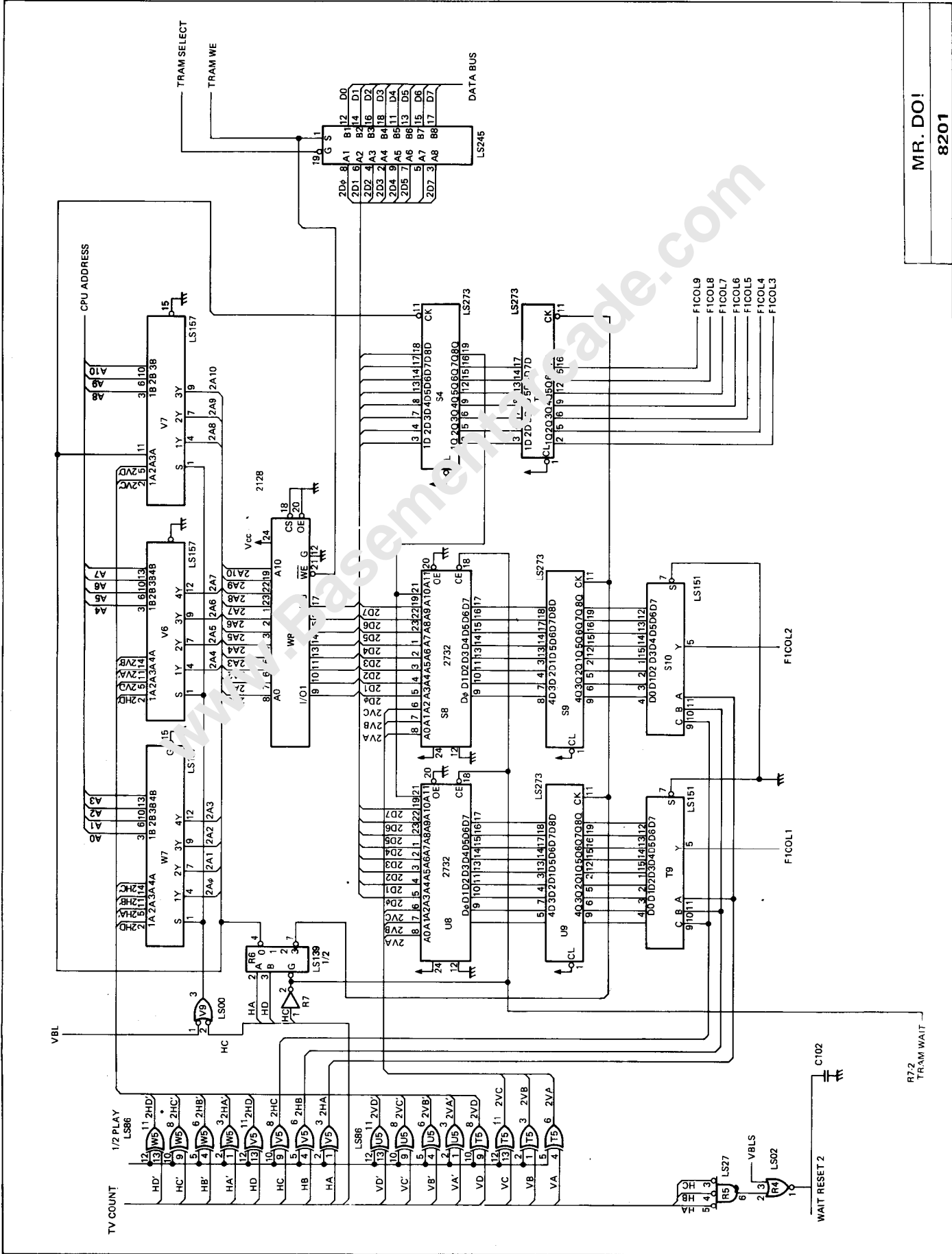




MR. DO!
8201

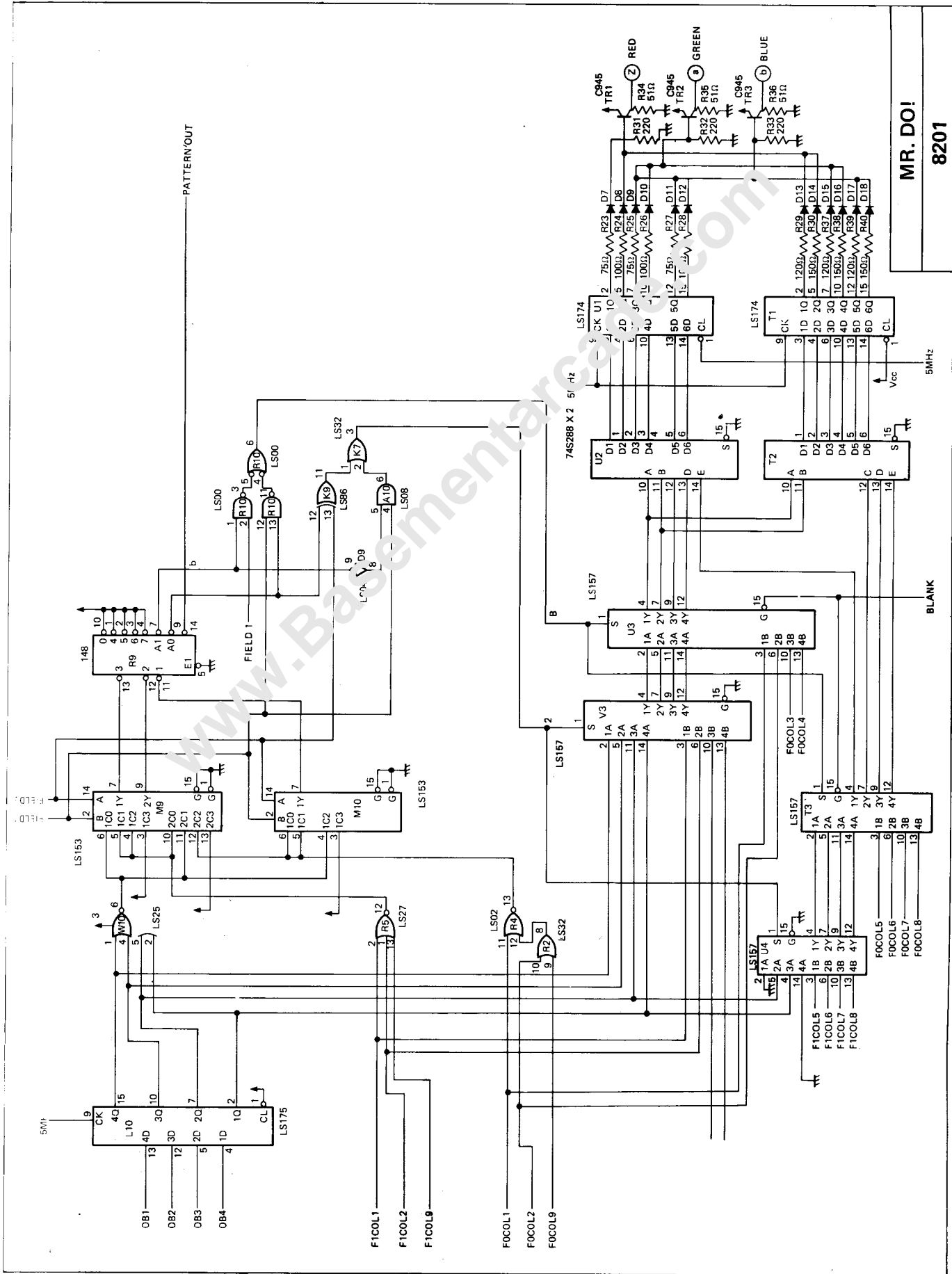


MR. DO!
8201



MR. DO!

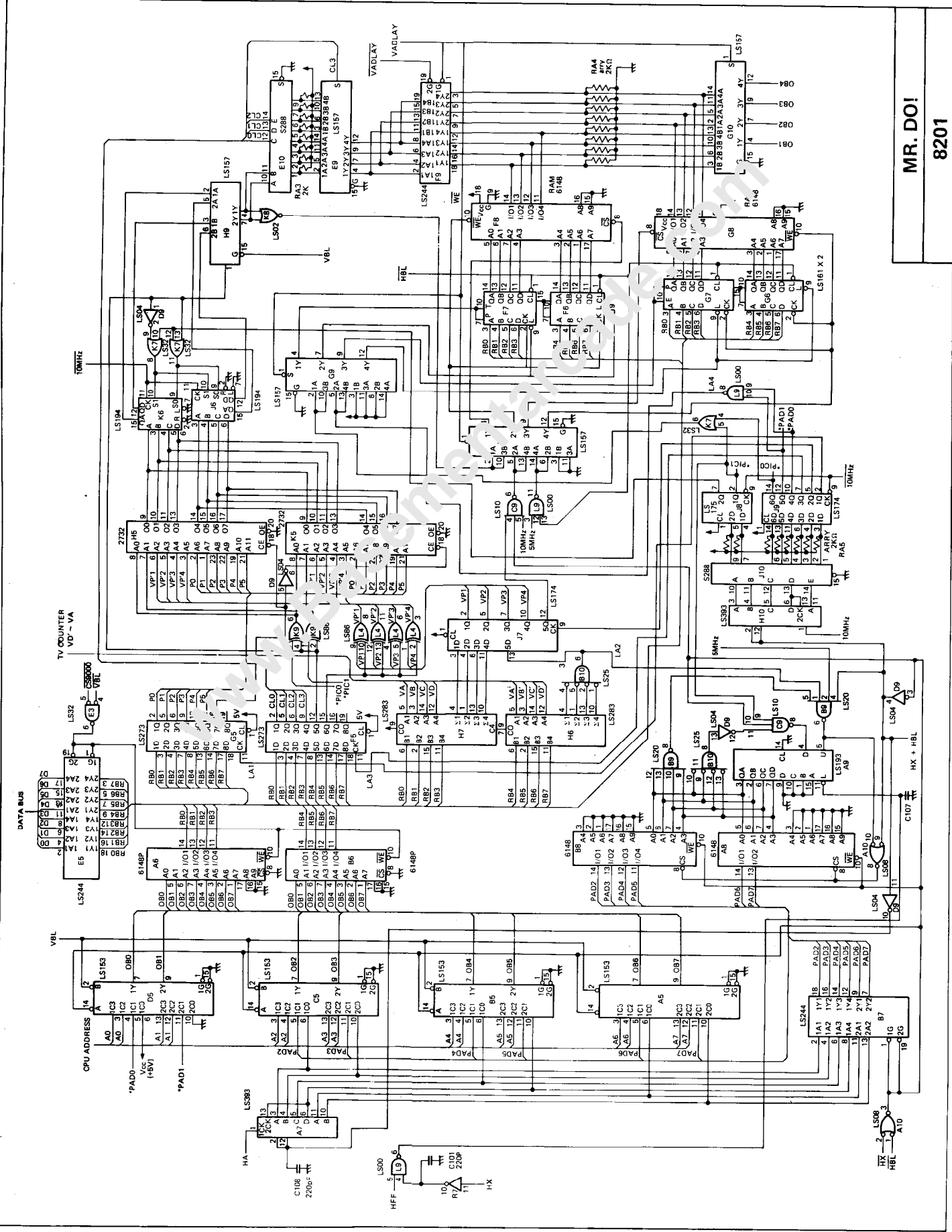
8201



MR. DO!
8201

DATA BUS

VBL



MR. DO!
8201

CAUTION (to prevent X-ray exposure from the CRT)

Two variable resistors, the +B ADJ VR (VR11 8-1K ohm) and the X-ray protector VR (VR8 B-10K ohms) are found within the monitor.

They are rigidly adhered for both safety and to prevent X-ray exposure from the CRT.

(IMPORTANT: Please do not remove or change them!)

When a component has to be replaced due to damage to the VR(s) please follow the following procedure when exchanging it.

(IMPORTANT: The monitor must be synchronized with the signal when adjusting.)

- (1) To set for +B ADJ VR (VR11)
 - +B line voltage is to be set at 107V DC \pm 1V when adjusting VR11.
- (2) To set for X-ray protector VR8
 - (2)-1. Place VR in a counter clockwise position to stop it before turning the monitor power switch to "ON" and decrease AC power supply voltage by approximately 10%.
 - (2)-2. To be shorted for resistor of 220 ohms 20W R201 which is installed on heat sink plate.
 - (2)-3. Power supply should be placed in the "On" position to keep the surface of the CRT slightly fluorescent – i.e. bright.
 - (2)-4. +B line voltage is to be set at 123V DC \pm 1V while increasing AC power supply voltage.
 - (2)-5. When the VR8 to be fixed is in the horizontal oscillation position it may be stopped by slowly rotating it clock wise.
 - (2)-6. Once the power supply switch is turned "OFF" and AC power has decreased approximately 10% it can be turned "ON" again. Horizontal oscillation may then be confirmed by stopping +B line voltage at 123V DC \pm 1V while slowly increasing AC voltage.
- (3) The VR must again be rigidly adhered thus making any further adjustments impossible.

If you have any question about the above, please feel free to contact us directly or your nearest Universal distributor at any time.

POSTFACE

Although the products of UNIVERSAL have been manufactured with the utmost care, if you are at all dissatisfied, please contact either the head office or any of the sales offices of UNIVERSAL.

Please note that the specifications may be subject to change along with quality improvement.

MEMO

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