# No Man's Land

# OPERATION and MAINTENANCE Manual

**Gottlieb™**

**AMUSEMENT GAMES**

165 W. Lake Street, Northlake, IL 60164
(312) 562·7400    Telex 72·8463
A Columbia Pictures Industries Company

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## GAME PLAY

1. Destroy the assaulting enemy tanks by maneuvering your tank (with the control stick) and firing your tank cannon (with the fire button). Score is accumulated by destroying enemy tanks.

2. Your tank can move and fire in eight directions but the enemy tanks can move and fire in only four directions. Your tank can move and fire diagonally.

3. Each time an assaulting enemy tank is destroyed, a reserve tank located at the top of the screen is alerted (flickers) and joins the remaining assaulting tanks.

4. By dodging assaulting tank fire, you can penetrate the reserve tank positions and destroy them accumulating a higher score.

5. As the number of reserve tanks decreases either by joining the assaulting tanks or by being destroyed, the speed of the remaining assaulting tanks increases.

6. Your score progressively increases as the number of screens cleared increases. When you destroy a reserve tank, you are awarded a score twice as high as that awarded when you hit an assaulting tank.

| Number of Screens Cleared | Assaulting Tank | Reserve Tank |
|:---:|:---:|:---:|
| 1 | 100 Pts. | 200 Pts. |
| 2 | 150 Pts. | 300 Pts. |
| 3 | 200 Pts. | 400 Pts. |
| 4 | 250 Pts. | 500 Pts. |
| 5 | 300 Pts. | 600 Pts. |
| 6 | 350 Pts. | 700 Pts. |
| 7 | 400 Pts. | 800 Pts. |
| 8 | 450 Pts. | 900 Pts. |

7. Dependent on the option switch setting, an extra tank can be awarded after accumulating a set amount of points.

## GAME POWER-UP AND OPERATION

### A. POWER SWITCHES

The game On-Off Switch is located on the top of the cabinet in the right rear corner. Switching it on applies power to the game.

The Interlock Power Switch is mounted in the cabinet on the lower left side (facing the rear). With the rear panel in place, the interlock switch is on, allowing power to the game. With the rear panel removed, the interlock switch is off and no power is applied to the game no matter what the position of the On-Off Switch. The Interlock Switch can be overridden when the rear panel is off by pulling the switch plunger. Power is now applied to the game with the rear panel off.

### B. GAME POWER-UP

1) Remove the rear panel and lift the line cord out of the cabinet insuring that the cord is placed in the slot at the bottom of the cabinet. Plug the AC power line cord into a properly grounded 3-wire receptacle of the correct voltage.

2) Set option switches on the main control board for desired game features. See option switch setting tables.

3) Adjust the volume control knob located on the sound circuit board. See Fig. 2. Turn the knob approximately 1/4 turn from the low volume position.

4) Replace the rear panel. Position the game and level. Turn the On-Off Switch on. The game is ready to be played.

### C. GAME OPERATION

1) Insert coin(s) into coin chute(s). Credits will be displayed at lower right of screen. Option dip switches will determine coin/credit combination.

2) Push the one player cr the two players button. Two players button uses two credits. Player buttons are located on the right side of the control panel.

3) Assaulting tank and reserve tank score will be displayed momentarily.

4) Number of player tanks remaining is displayed at lower left of the screen.

5) 1st player score is located at the upper left corner of the screen. 2nd player score is located at upper right of screen.

6) Hi score is positioned between 1st and 2nd players score.

7) Player-up score will flash. Flashing stops when player begins to score.

## D. RESET SWITCH AND SLAM SWITCH

The reset and slam switches are both normally open switches located on the front door of the cabinet. Pressing the reset pushbutton switch by the operator or closing the slam switch through pounding on the front door will cause the game to go "Game Over" for all players. All credits will be lost and hi score will be erased and reset to zero. NOTE: Turning the game off then on will give the same result as the reset and slam switch.

## E. VOLUME CONTROL

Volume is adjusted by the volume control knob on the sound circuit board.
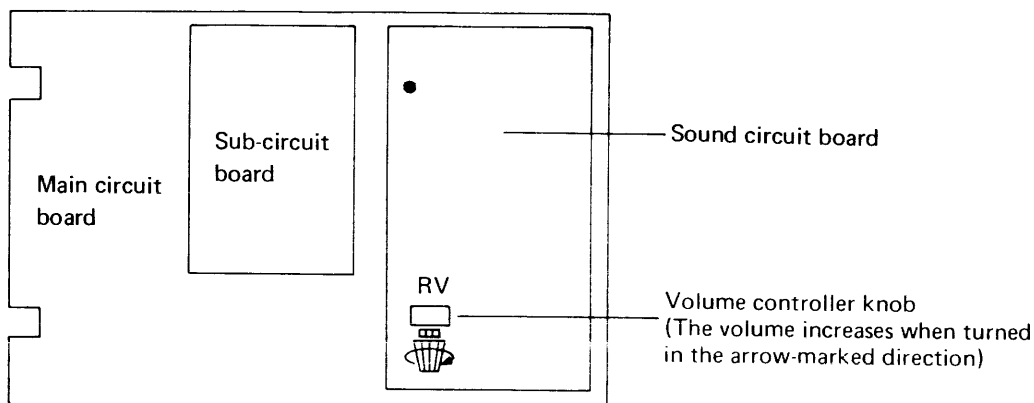


**Fig. 2   Position of Volume Controller Knob**

**WARNING: Do not plug the Video Monitor directly into an AC line power receptacle.**
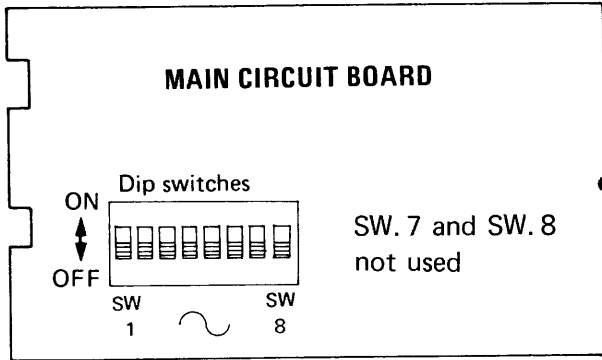
# A. POSITIONS OF DIP SWITCHES



MAIN CIRCUIT BOARD

Dip switches

ON

OFF

SW 1 ~ SW 8

SW. 7 and SW. 8
not used

Fig. 1  Positions of Dip Switches

# B. SETTING THE OPTION (DIP SWITCHES)

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

| Style | SW1 |
|---|---|
| Table | OFF |
| Stand up table | OFF |
| Upright | ON |

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

| Coin, Credit | SW3 | SW4 |
|---|---|---|
| 1 coin 1 credit | ON | ON |
| 1 coin 2 credits | OFF | ON |
| 2 coins 1 credit | ON | OFF |
| 4 coins 4 credits | OFF | OFF |

2. Setting the number of tanks for game (SW2)

| Number of tanks | SW2 |
|---|---|
| 2 tanks | ON |
| 3 tanks | OFF |

(Set at 3 tanks when shipped)

4. Setting the required score for an additional tank (SW 5, 6)

| Score for Extra | SW5 | SW6 |
|---|---|---|
| 3000 | ON | OFF |
| 5000 | OFF | ON |
| 8000 | OFF | OFF |
| No extra | ON | ON |

# POWER SUPPLY DIAGRAM



# BLOCK DIAGRAM



5
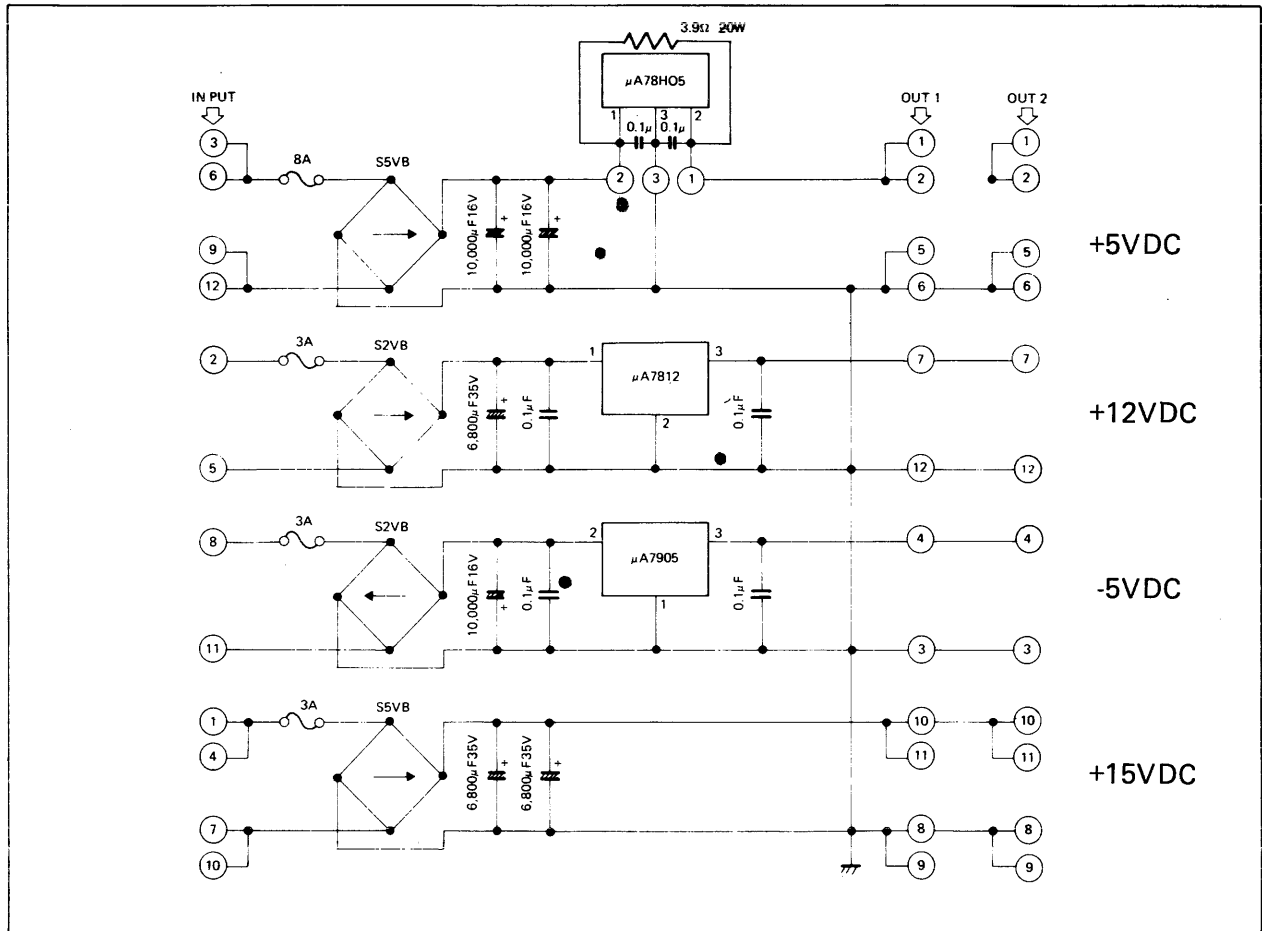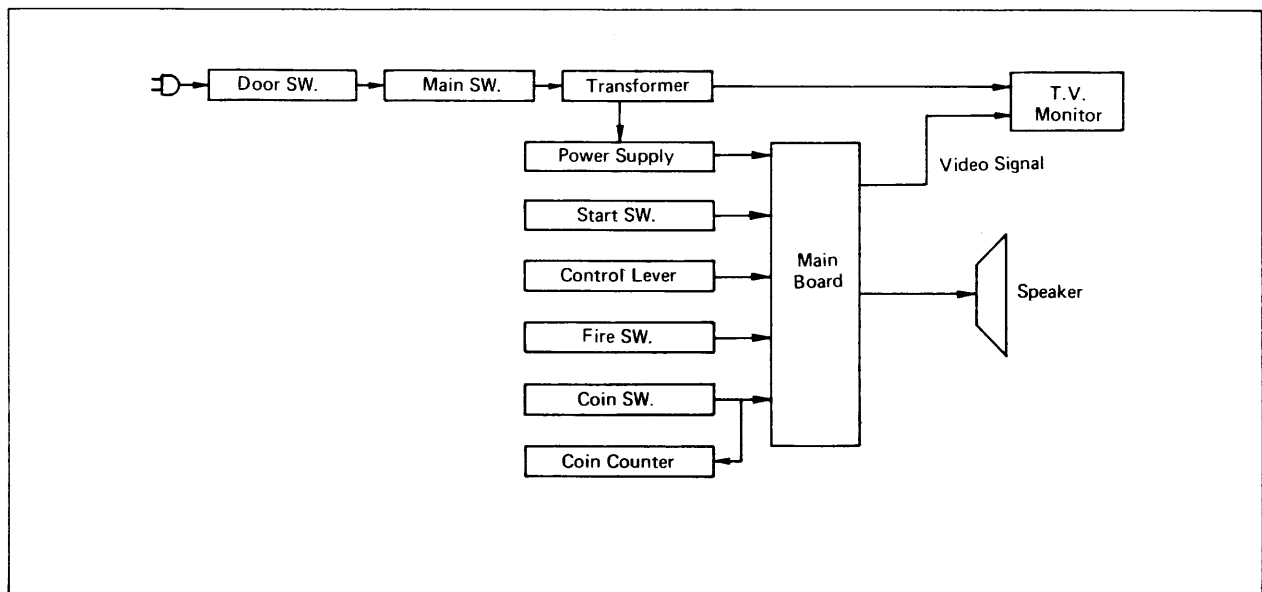
**NO MAN'S LAND**

8003

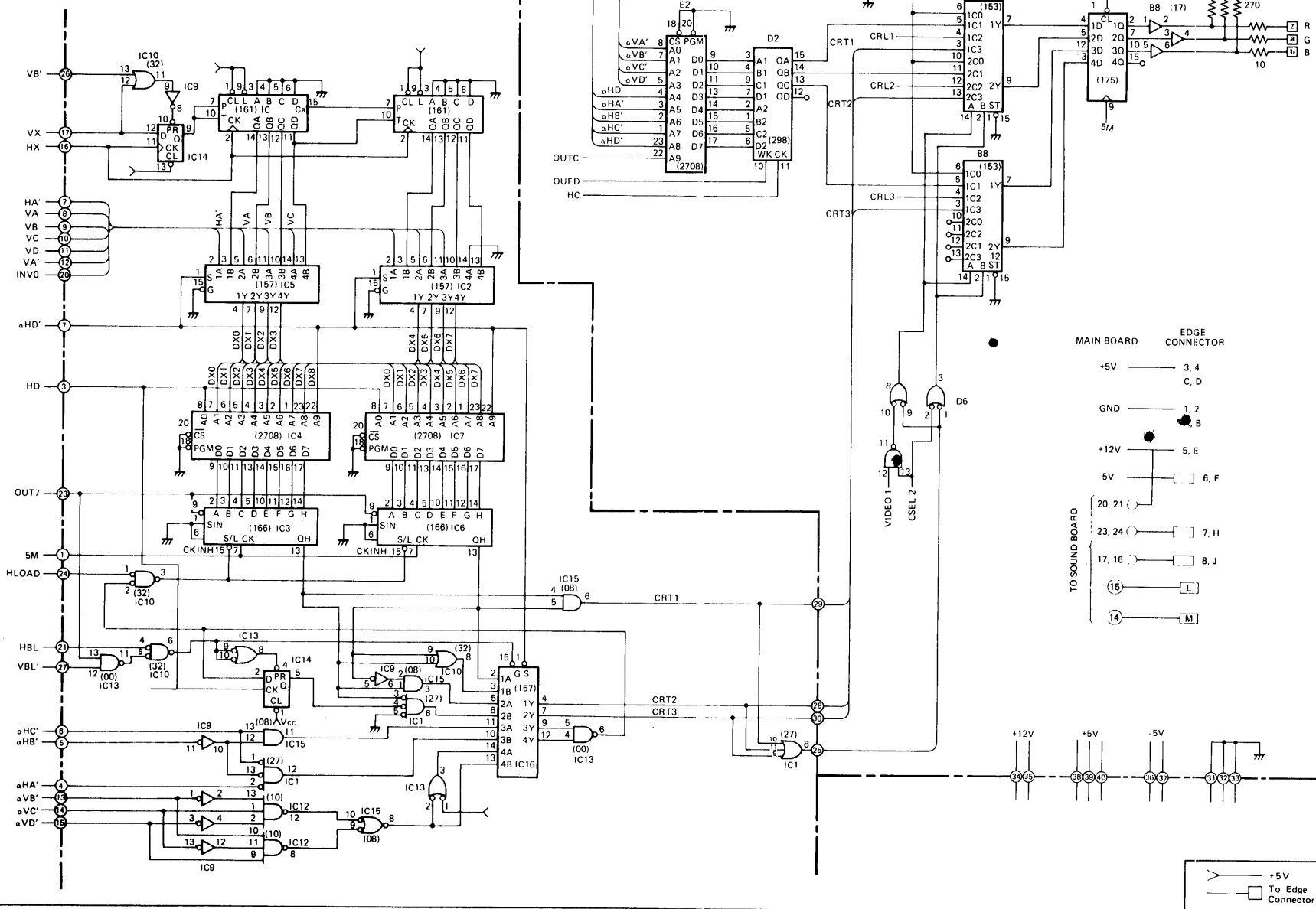# MAIN BLOCK DIAGRAM

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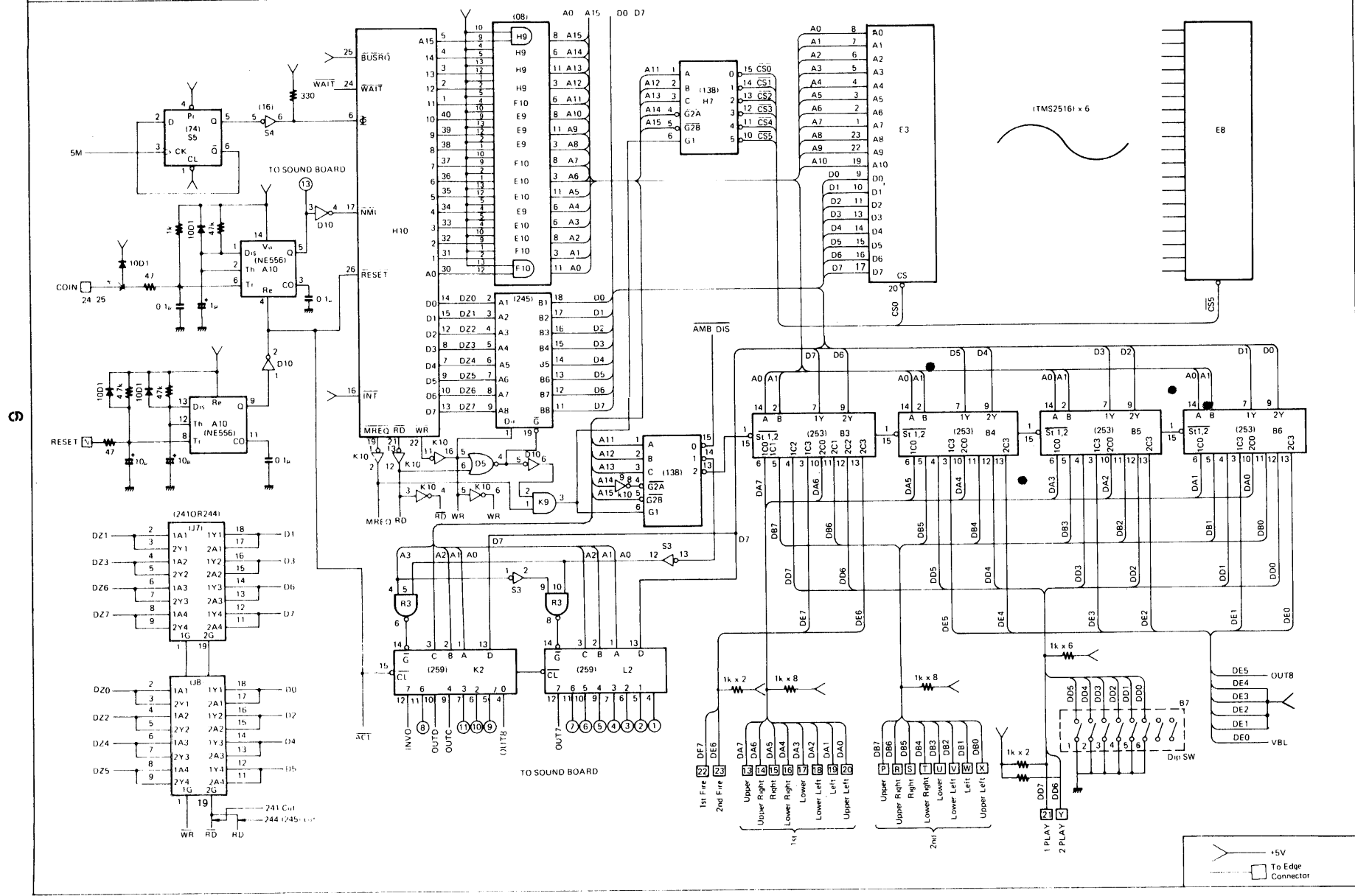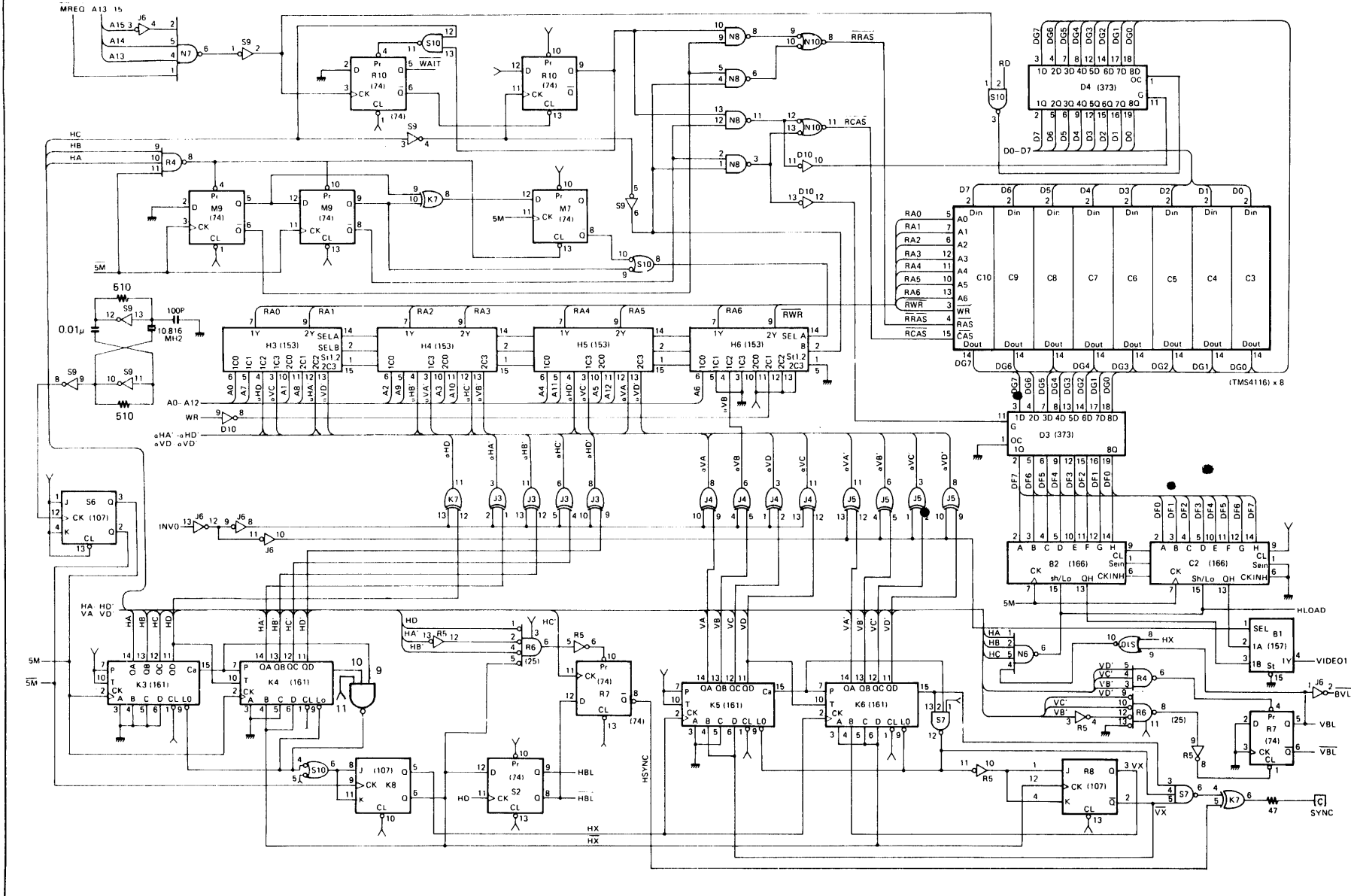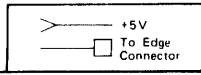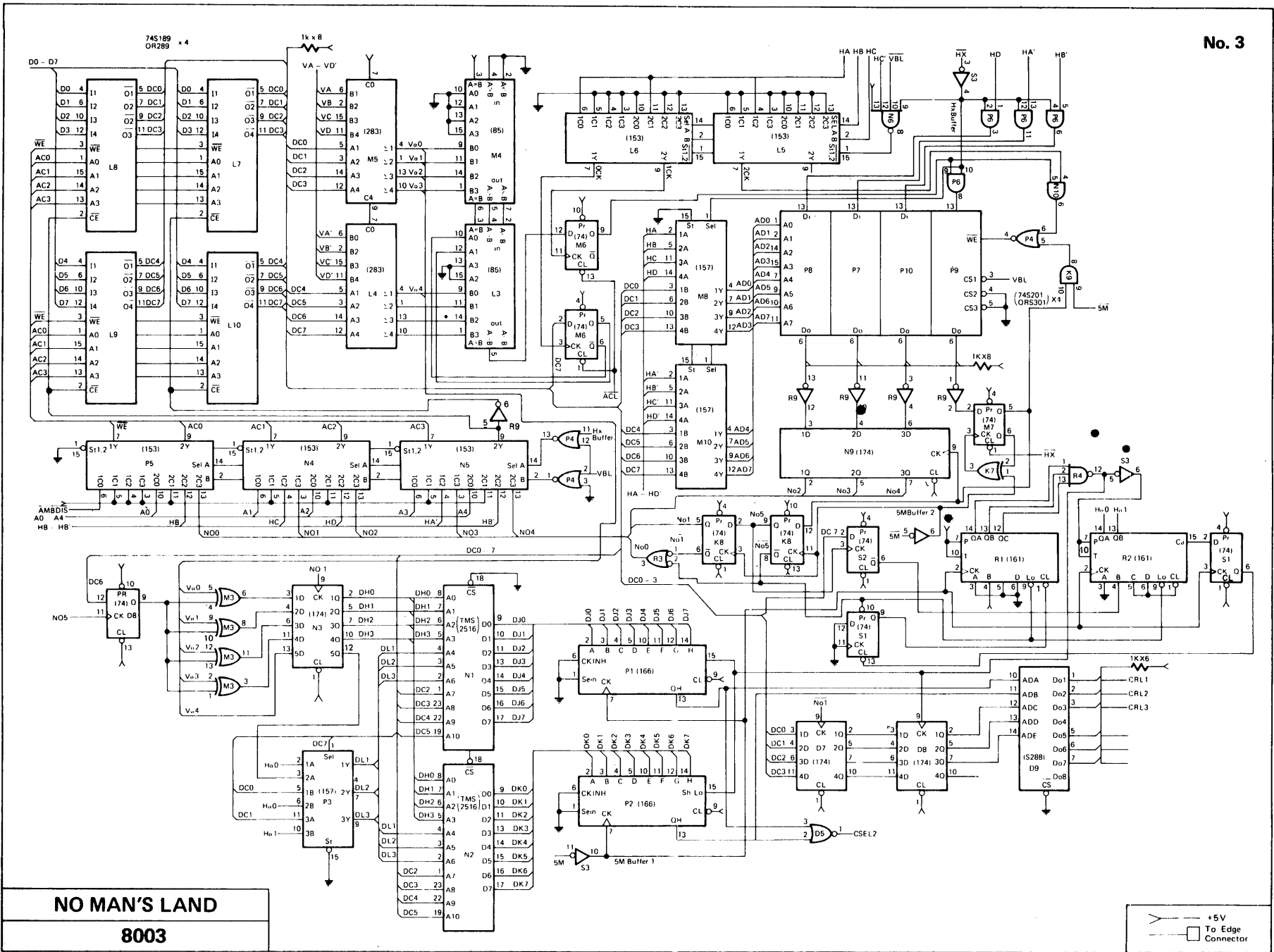
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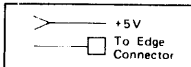
**8003**

> — +5V
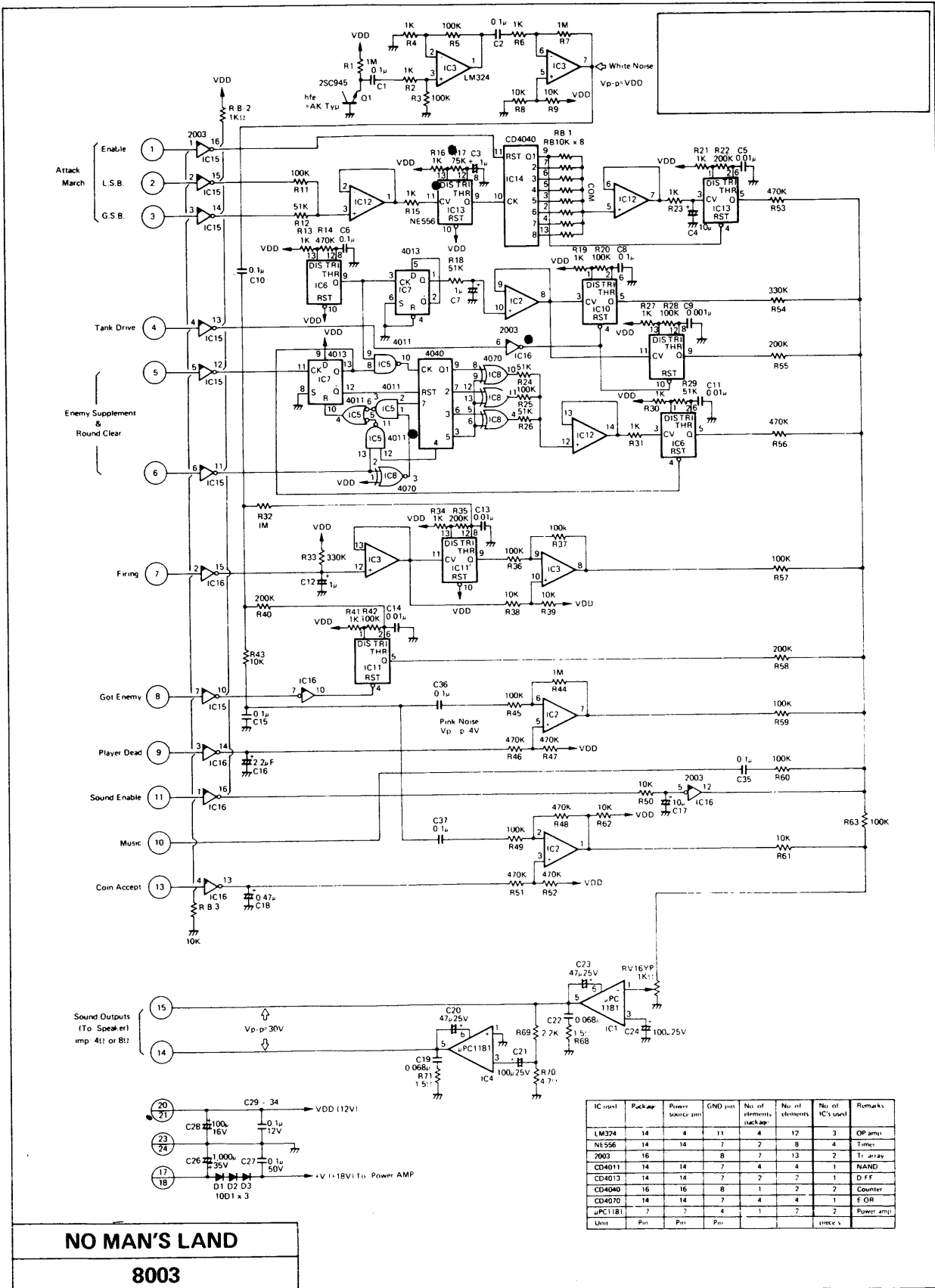> — To Edge Connector

# SOUND BLOCK DIAGRAM



**NO MAN'S LAND**

**8003**

# A. CIRCUIT BOARD IC LOCATION AND PARTS LIST

## a) Main circuit board IC location and parts list
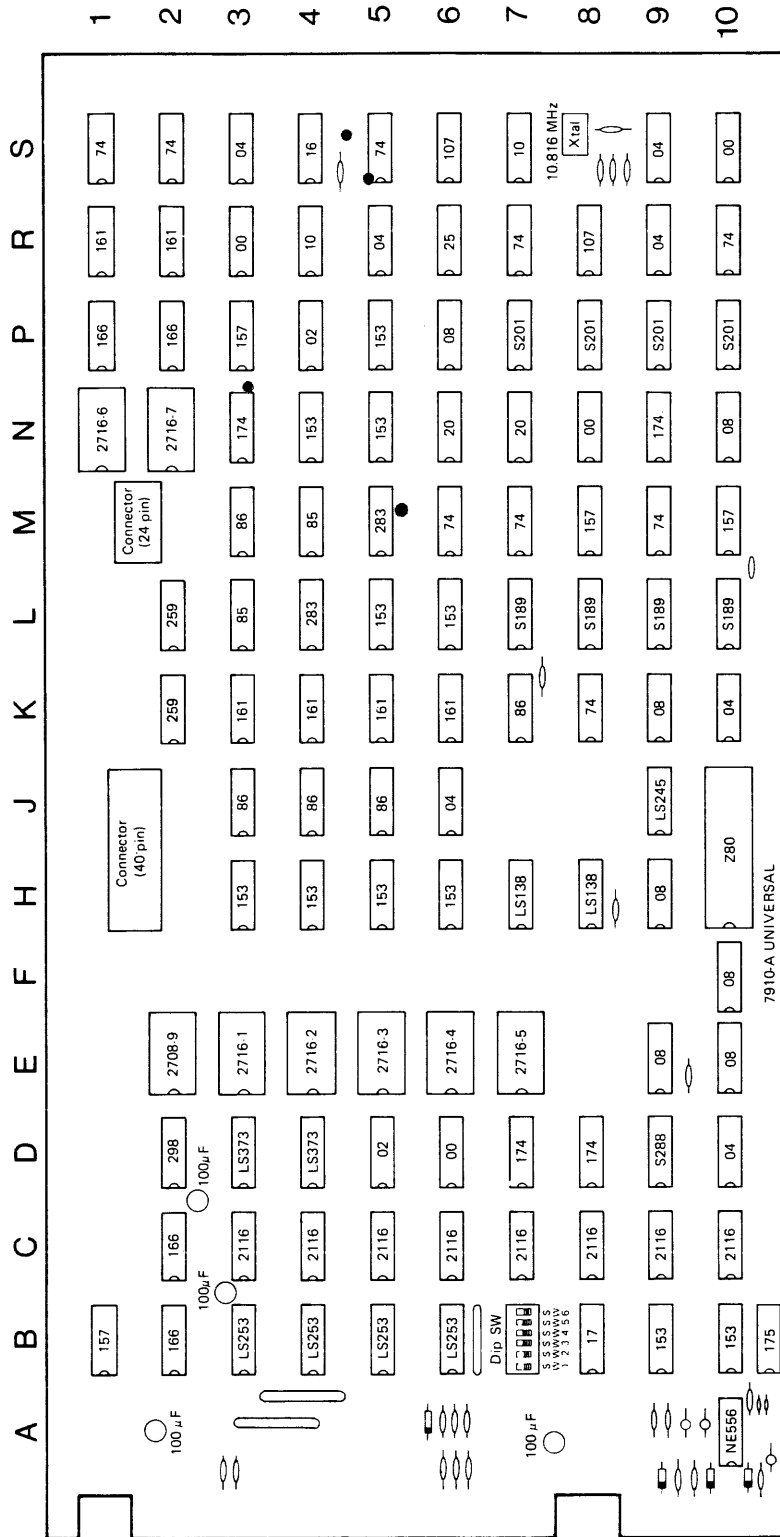
Fig. 15  Main Circuit Board

7910-A UNIVERSAL

# MAIN CIRCUIT BOARD PARTS LIST

## [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 | " |
| 74S153N | 11 | " |
| 74S157N | 4 | " |
| 74S161N | 6 | " |
| 74S166N | 4 | " |
| 74S174N | 4 | " |
| 74S175N | 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 |
| 74S288 | 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 | " | 2 | " |
| 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
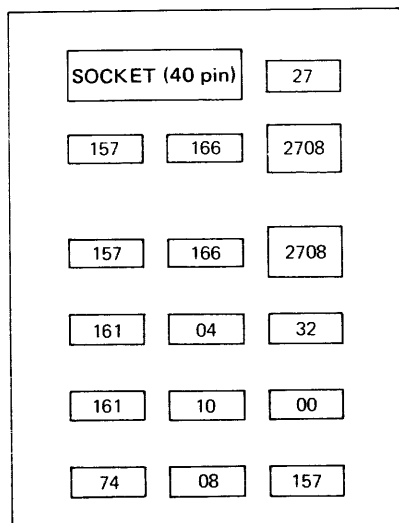


**Fig. 16  Sub-circuit Board**

### [1] Integrated Circuit

| Item No. | Q'ty | Description |
|---|---|---|
| 7400N | 1 | Transistor Logic |
| 7404N | 1 | " |
| 7408N | 1 | " |
| 7410N | 1 | " |
| 7427N | 1 | " |
| 7432N | 1 | " |
| 7474N | 1 | " |
| 74157N | 3 | " |
| 74161N | 2 | " |
| 74166N | 2 | " |
| 2708 | 2 | Nch MOS 8k bits EPROM |

### [2] Capacitors

| Rating | Q'ty | Description |
|---|---|---|
| 0.1m/12V | 13 | Chemical Capacitor |

## c) Sound circuit board IC location and parts list
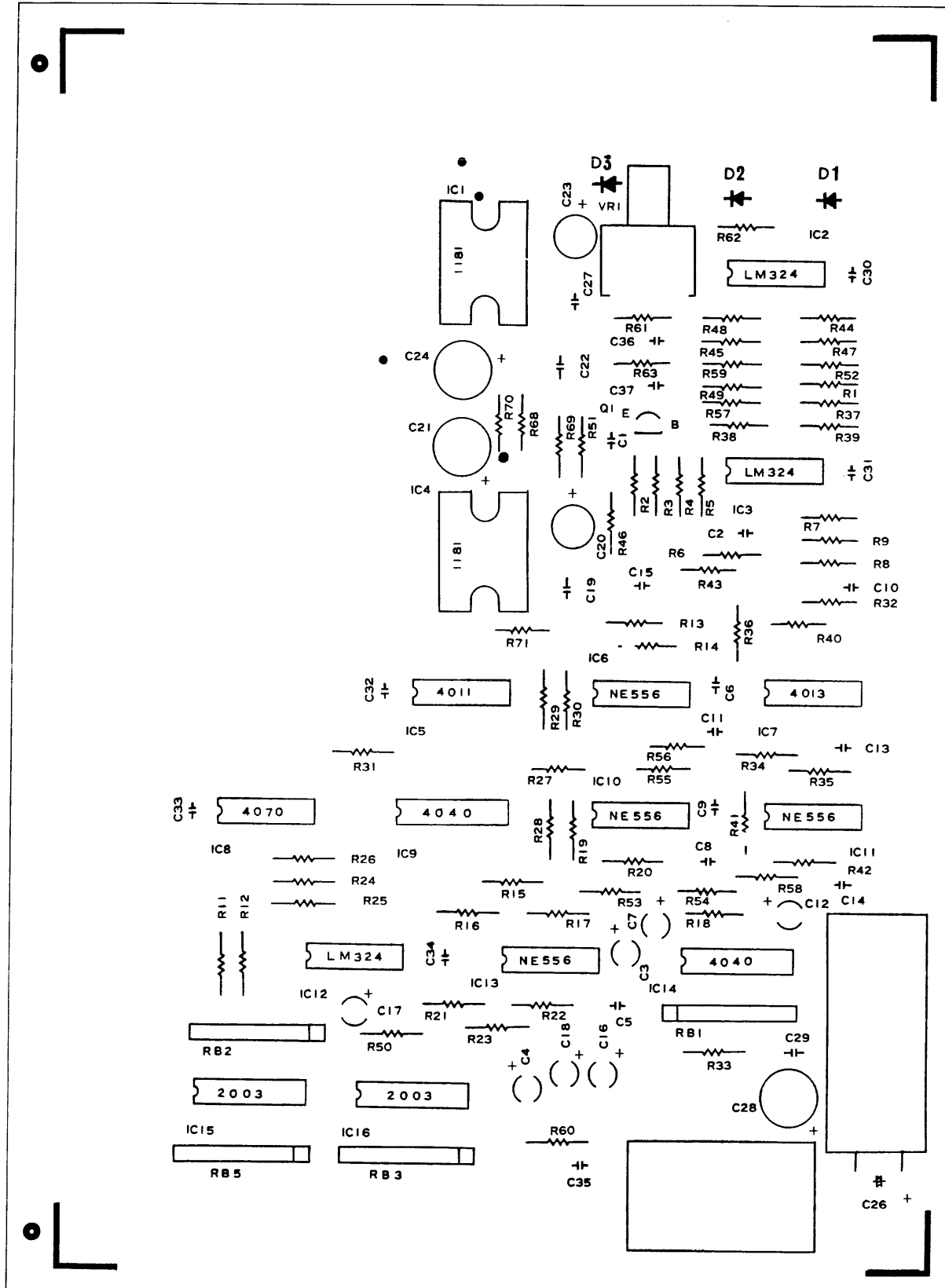


Fig. 17 Sound Circuit Board

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# SOUND BOARD PARTS LIST

| Location | Rating | Description |
|---|---|---|
| R1 | 1M | Carbon solid resistor |
| 2 | 1K | " |
| 3 | 100K | " |
| 4 | 1K | " |
| 5 | 100K | " |
| 6 | 1K | " |
| 7 | 1M | " |
| 8 | 10K | " |
| 9 | 10K | " |
| 11 | 100K | " |
| 12 | 51K | " |
| 13 | 1K | " |
| 14 | 470K | " |
| 15 | 1K | " |
| 16 | 1k | " |
| 17 | 75K | " |
| 18 | 51K | " |
| 19 | 1K | " |
| 20 | 100K | " |
| 21 | 1K | " |
| 22 | 200K | " |
| 23 | 1K | " |
| 24 | 51K | " |
| 25 | 100K | " |
| 26 | 51K | " |
| 27 | 1K | " |
| 28 | 100K | " |
| 29 | 1K | " |
| 30 | 75K | " |
| 31 | 1K | " |
| 32 | 1M | " |
| 33 | 330K | " |
| 34 | 1K | " |
| 35 | 200K | " |
| 36 | 100K | " |
| 37 | 100K | " |
| 38 | 10K | " |
| 39 | 10K | " |
| 40 | 200K | " |
| 41 | 1K | " |
| 42 | 100K | " |
| 43 | 10K | " |
| 44 | 470K | " |
| 45 | 100K | " |
| 46 | 470K | " |
| 47 | 470K | " |
| 48 | 1M | " |
| 49 | 100K | " |
| 50 | 10K | " |
| 51 | 470K | " |
| 52 | 470K | " |
| 53 | 470K | " |
| 54 | 200K | " |
| 55 | 200K | " |
| 56 | 470K | " |
| 57 | 100K | " |
| 58 | 200K | " |
| 59 | 100K | " |
| 60 | 100K | " |
| 61 | 100K | " |
| 63 | 10K | " |
| 68 | 1.5Ω | " |
| 69 | 2.2K | " |
| 70 | 4.7Ω | " |
| 71 | 1.5Ω | " |

| Location | Rating | Description |
|---|---|---|
| VR1 | RV16YP | 1KΩ(B) Variable Resistor |
| RB1 | MS1038AM | 10KM Resistor Arroy |
| 2 | MS1028AM | 1KΩ " |
| 3 | MS1038AM | 10KΩ " |
| 5 | MS1038AM | 10KΩ " |

| Location | Rating | Description |
|---|---|---|
| C1 | 0.1μ | Ceramic |
| 2 | 0.1μ | " |
| 3 | 1μ | Electrolytic |
| 4 | 10μ | " |
| 5 | 0.01μ | Ceramic |
| 6 | 0.1μ | " |
| 7 | 1μ | Electrolytic |
| 8 | 0.1μ | Ceramic |
| 9 | 0.001μ | " |
| 10 | 0.1μ | " |
| 11 | 0.01μ | " |
| 12 | 1μ | Electrolytic |
| 13 | 0.01μ | Ceramic |
| 14 | 0.01μ | " |
| 15 | 0.1μ | " |
| 16 | 2.2μ | Electrolytic |
| 17 | 10μ | " |
| 18 | 0.47μ | Tantalum |
| 19 | 0.068μ | Mila |
| 20 | 47μ | Electrolytic |
| 21 | 100μ | " |
| 22 | 0.068μ | Mila |
| 23 | 47μ | Electrolytic |
| 24 | 100μ | " |
| 26 | 1000μ | " |
| 27 | 0.1μ | Ceramic |
| 28 | 100μ | Electrolytic |
| 29 | 0.1μ | Ceramic |
| 30 | 0.1μ | " |
| 31 | 0.1μ | " |
| 32 | 0.1μ | " |
| 33 | 0.1μ | " |
| 34 | 0.1μ | " |

| Location | Item No. | Description |
|---|---|---|
| IC1 | μPC1181H | Power Amplifier |
| 2 | LM324N | Quadruple Operational Amplifiers |
| 3 | LM324N | " |
| 4 | μPC1181H | Power Amplifier |
| 5 | CD4011CN | Quad 2-input NAND Gate |
| 6 | NE556N | Dual Timer |
| 7 | CD4013CN | Dual D Frip Flop |
| 8 | CD4070CN | Quad 2-input E-OR Gate |
| 9 | CD4040CN | 14-Stage Binary Counter |
| 10 | NE556N | Dual Timer |
| 11 | NE556N | " |
| 12 | LM324N | Quadruple Operational Amplifiers |
| 13 | NE556N | Dual Timer |
| 14 | CD4040N | 14-Stage Binary Counter |
| 15 | ULN2003AN | Darlington Transistor Array |
| 16 | ULN2003AN | " |
| Q1 | 2SC945 | N-P-N Transistor |
| D1 | 10D1 | Diode |
| 2 | " | " |
| 3 | " | " |

# CONTROL STICK PARTS LIST
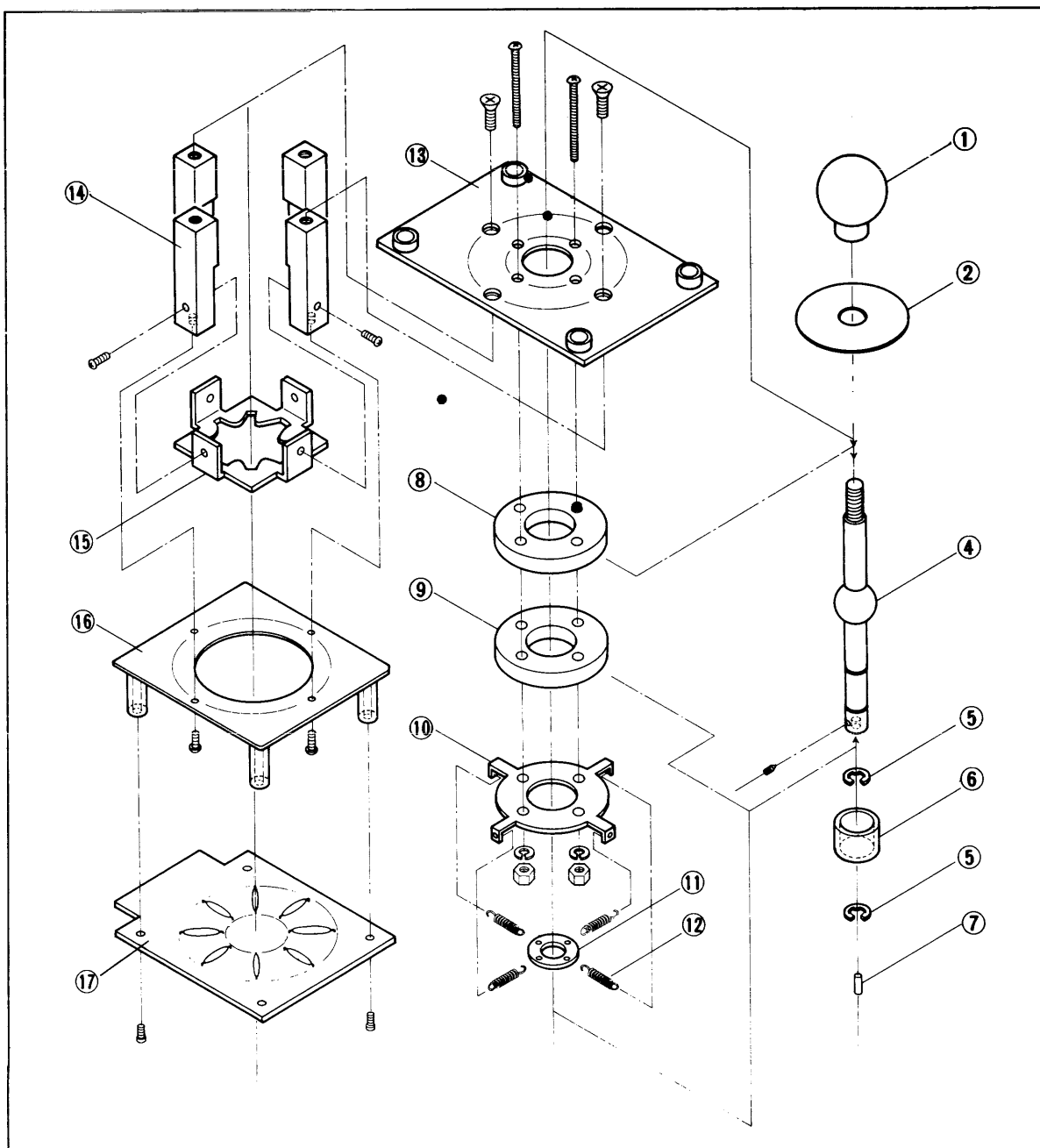


| Ref. No. | Name | Ref. No. | Name |
|----------|------|----------|------|
| 1 | Knob. 24 or 32 Dim. | 10 | Spring hook |
| 2 | Resin board | 11 | Spring fixture |
| 3 | | 12 | Spring |
| 4 | Lever shaft | 13 | Mounting base |
| 5 | E-ring | 14 | Support |
| 6 | Collar | 15 | Stopper |
| 7 | Magnet | 16 | Base |
| 8 | Bearing | 17 | Reed SW circuit board |
| 9 | Bearing | | |
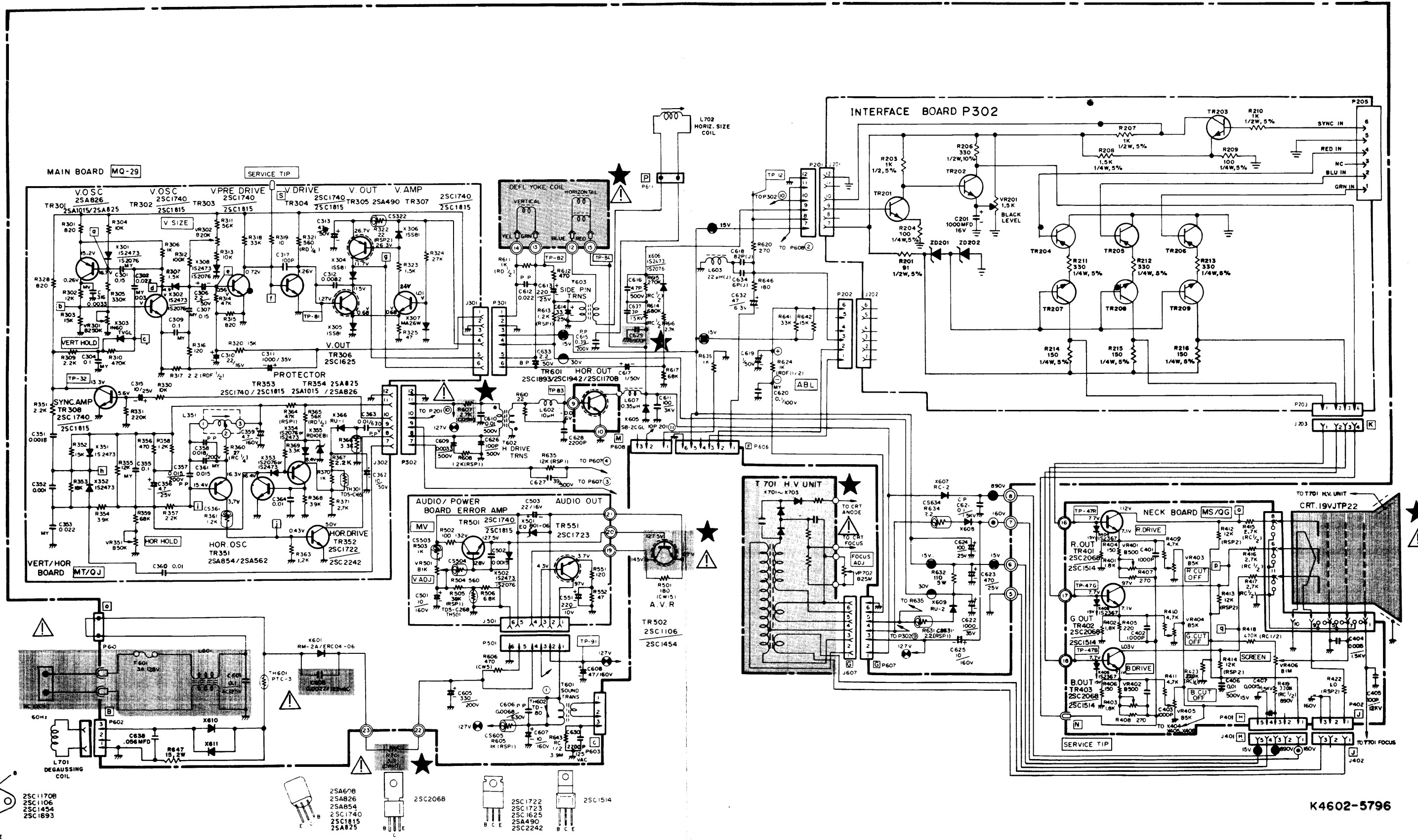
K4602-5796
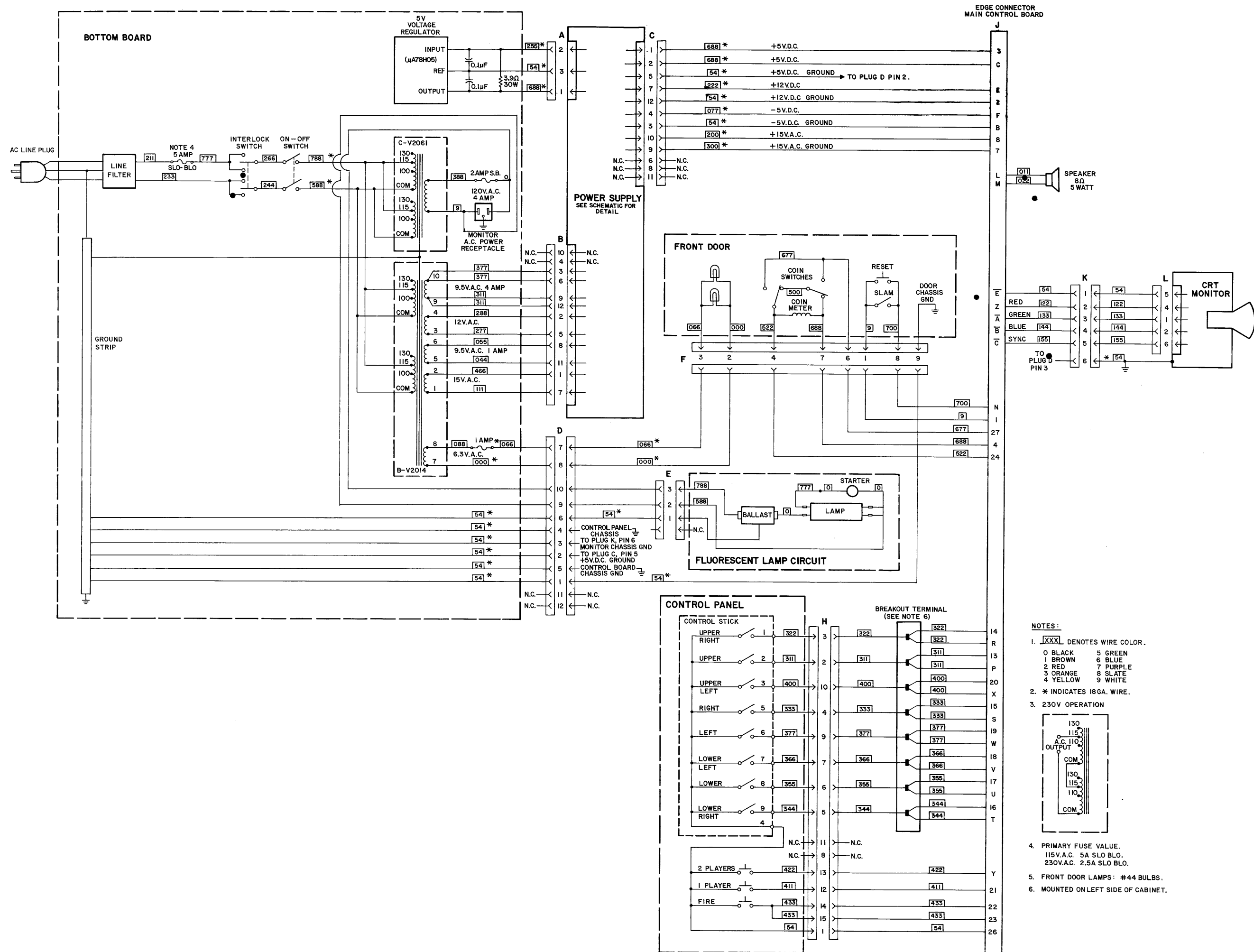
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