

BARRICADE

TM

SHOP

OPERATOR'S MANUAL

ramtek

Our Experience Shows

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SALES & SERVICE
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5/10/8

TABLE OF CONTENTS

| | | |
|----|---------------------------------------|---|
| 1. | INTRODUCTION | 1 |
| 2. | GAME OPERATION | 1 |
| 3. | OPERATOR SELECTABLE OPTIONS | 4 |
| 4. | BLOCK DIAGRAM DESCRIPTION | 6 |
| 5. | TROUBLESHOOTING TECHNIQUES | 8 |

TABLE OF ILLUSTRATIONS

| | | |
|----|-------------------------------------|----------|
| 1. | BARRICADE PROCESSOR BOARD | FIGURE 1 |
| 2. | BARRICADE BLOCK DIAGRAM | FIGURE 2 |
| 3. | CABINET REAR VIEW | FIGURE 3 |
| 4. | T.V. MONITOR | FIGURE 4 |

1.0

INTRODUCTION

Barricade is another Ramtek Amusement Device which is engineered to provide the highest degree of reliability using the most advanced techniques available. All solid state circuitry ensures years of dependable service.

Barricade is a two (2) or four (4) player game in which each player tries to construct a barricade which will force his opponents to crash while avoiding a crash himself. Each player is allowed from one (1) to eight (8) collisions per game, and the game ends when only one player has any collisions remaining.

2.0

GAME OPERATION

While the Barricade game is not coined, it displays an attract sequence which consists of a simulated two (2) player game, a simulated four (4) player game, and an attract message, all of which alternate.

An actual game begins when the players insert one (1) or two (2) coins in the coin drop slot. One coin gives a two (2) player game, and two (2) coins a four (4) player game. Each game is made up of individual matches, and each player is allowed from one (1) to eight (8) collisions per game, an operator adjustment.

When the coins are dropped into the slot, the attract sequence "freezes". The actual game is started either when the Game Start button on the coin door is pressed or when eight seconds have elapsed from the last coin drop. At this point, the screen is cleared, except for the playing field borders, and the number of collisions allowed each player per game is displayed as arrows next to each player position. Player 1 is to the left on the screen, player 2 is to the right, player 3 is at the bottom of the screen and player 4 is at the top.

Play begins with each player (represented by an arrow followed by the player's number) moving toward the center of the screen. Players are each moved in turn; e.g., player 1 moves first, followed by player 2, etc. When each player moves, the position which he had occupied before the move is filled with a block containing an arrow, creating a continuous barricade behind the player. Also, a distinctive sound is produced when each player moves.

The direction of movement is controlled by the front panel buttons. Each player has a choice of four directions of movement: up, down, to the right, and to the left. When a player presses a button, his arrow on the screen will move in the selected direction the next time it moves.

A player continues to move until he has a collision with the border, another players' barricade, his own barricade, or another players' arrow. If he collides with a barricade on the border, play momentarily stops, a flashing collision character is shown, and the player and his barricade disappear from the screen. If he collides with another players' arrow head-on, both players and their barricades disappear from the screen. In either case, the player is eliminated from further play in that match.

A match ends when there is only one player left on the screen. At that point, the screen displays the message: WINNER IS #____, with the number of the sole survivor. After a delay, the screen clears, and a new match is started. The number of arrows on the border for each player except the winner are reduced by one, indicating that the losing players have one less collision to play. If any player uses up all of his collisions, he is eliminated from further play.

The game is over when only one player has any collisions left. The game then stops, and the screen displays the message: GAME OVER - WINNER IS #____. After a delay, the attract sequence begins again.

3.0

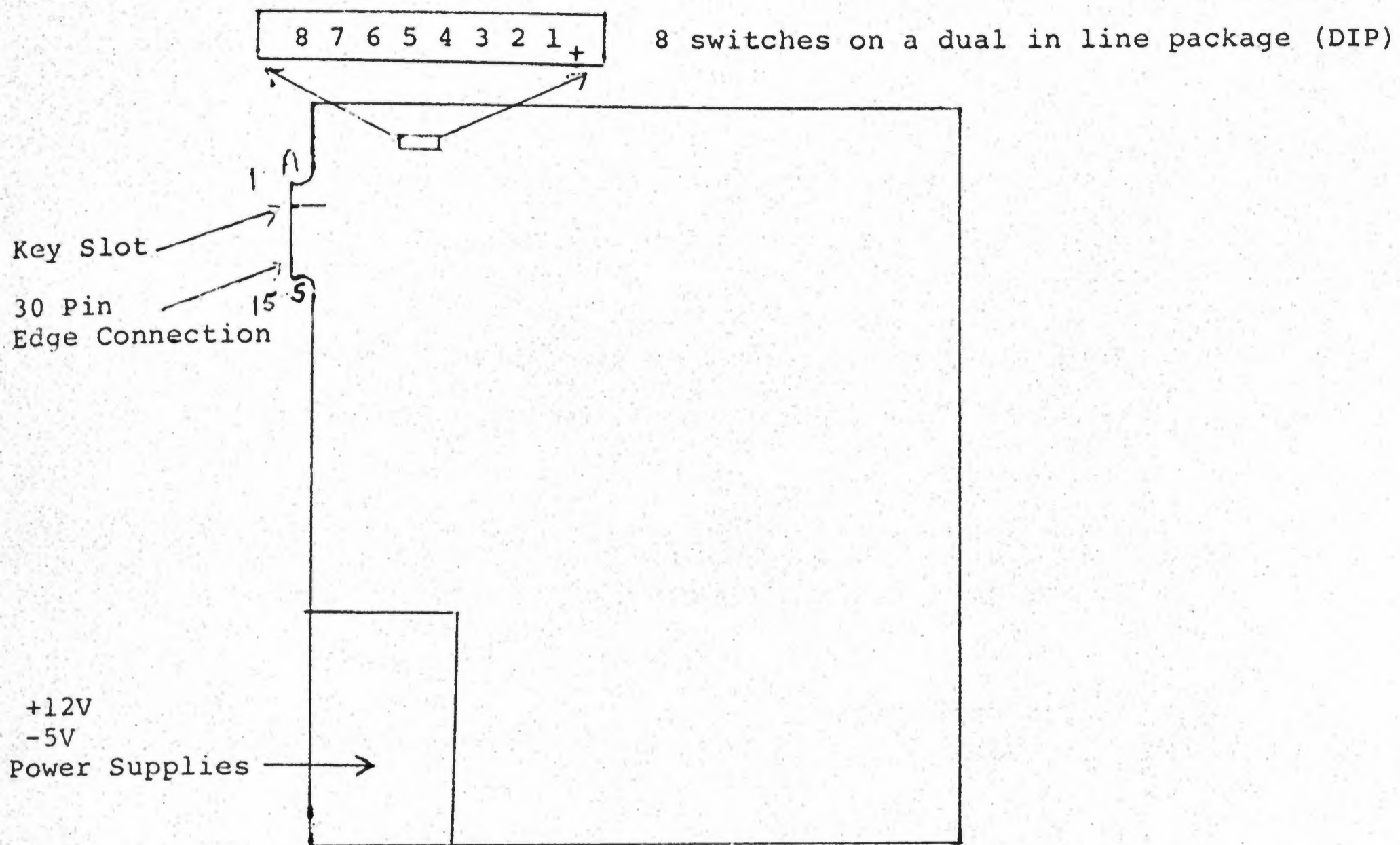
OPERATOR SELECTABLE OPTIONS

The characteristics of the game which may be altered by the operator are the number of collisions allowed each player, and the overall playing speed of the game. These characteristics are selected by positioning switches mounted on the microprocessor board as shown in Figure 1.

The chart below explains the setting of the switches, which are mounted in a Dual In-line Package, or DIP. A plus sign indicates that the switch is up on the plus side of the DIP.

| 321 | Collisions per Player | 654 | Game Speed |
|-----|-----------------------|-----|------------|
| 000 | One | 000 | Fastest |
| 00+ | Two | 00+ | |
| 0+0 | Three | 0+0 | |
| 0++ | Four | 0++ | |
| +00 | Five | +00 | |
| +0+ | Six | +0+ | |
| ++0 | Seven | ++0 | |
| +++ | Eight | +++ | Slowest |

Switches 7 and 8 are not used.



BARRICADE PROCESSOR BOARD

FIGURE 1

4.0

BLOCK DIAGRAM

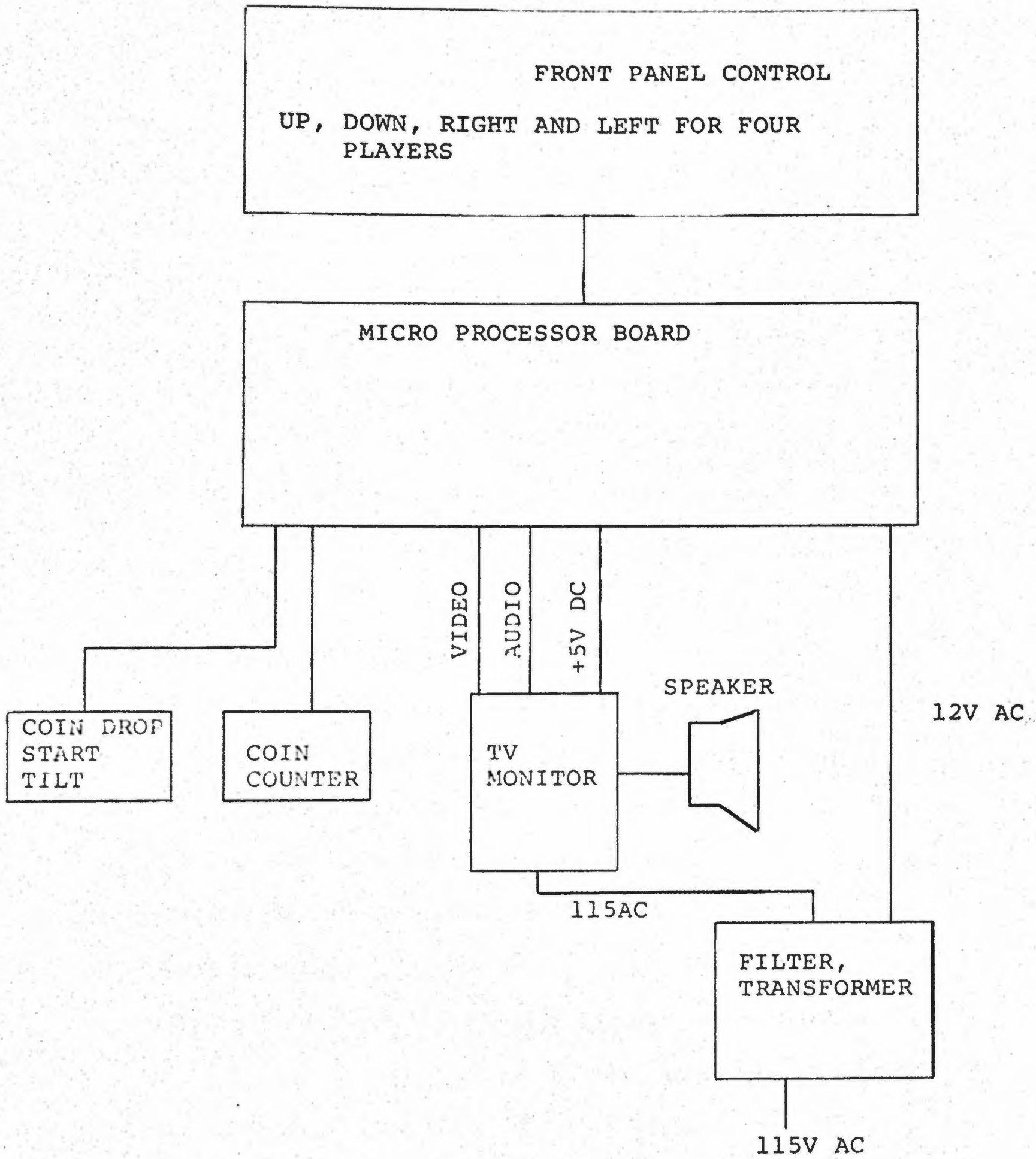
A block diagram in Figure 2 describes the interconnection of the major components of a Barricade game.

Front Panel Controls -- the front panel controls consists of an "up", "down", "right", and "left" button for each of four potential players.

The coin drop box contains three signals for the processor board. Besides the COIN drop signal, the START and TILT signals originate here.

The coin drop signal also supplies a pulse for the coin counter.

The TV monitor plug receives video and audio signals from the processor board. The monitor amplifies the audio received from the processor board and transmits it to the speaker. Additionally, the monitor provides the +5 Volt power needed by the processor board.



BARRICADE BLOCK DIAGRAM

FIGURE 2

The Filter, Transformer block provides 115V to the TV monitor as well as 12V AC to the processor board. The processor board converts the 12V AC to +12V DC and -5V DC for use by logic elements on the board.

The microprocessor board contains the necessary logic circuitry to enable Barricade operation. Its heart is an 8080 microprocessor.

5.0 TROUBLE SHOOTING TECHNIQUES

Make sure the power cord is plugged in the wall socket and the interlock switch is ON. The interlock switch is on when it is fully depressed -- this requires the back cover to maintain closure; or when the switch is pulled fully out -- maintains self in this position.

Check all four fuses in the game -- the system power fuse located on the transformer filter board and three fuses mounted on the TV monitor.

Check the brightness and contrast control on the monitor and turn them in the direction to give maximum brightness and contrast. Adjust the Vertical and Horizontal Holds if necessary.

Disconnect the edge connector from the processor board and touch pins M and 11 on connector with your fingers. This should put random lines on the screen indicating that the monitor functions properly.

With the sound control on the monitor set to maximum output touch pin L with your fingers. If you hear a sound, any problem with sound is probably on the processor board, otherwise it is probably in the monitor.

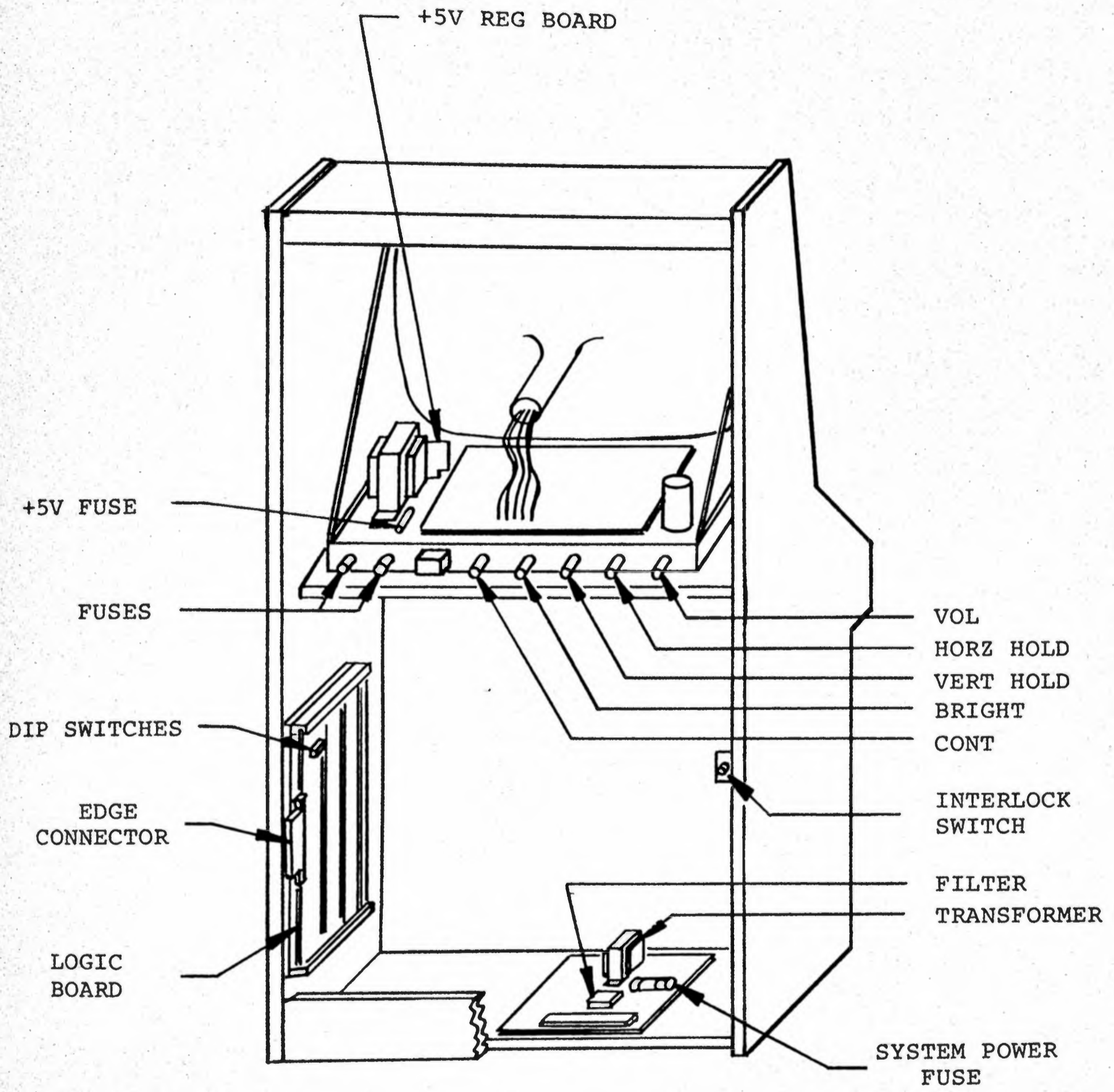
Whenever the game malfunctions, the +5V, -5V and +12V DC supplies should be checked. Use any standard voltmeter. The +5V can be measured by using any two buss bars bracketing each row of IC's. Plus 5V, -5V, and +12V and GND points are etched on the PC board in the lower left hand corner section shown in Figure 1 where the +12V and -5V are generated. Remember, the +5V is coming from the TV monitor. Be careful not to short these supplies when making measurements.

If the +5V is out of specification, that is below 4.75 or above 5.25, disconnect the processor board from its edge connector after power has been shut down.

After turning power back on, check the 5V between pins 1 and A on the connector. If the supply is still out of spec, adjust the 5V supply output by turning the pot on the small PC board on the monitor located just behind the monitor power transformer. If the +5V is alright when the processor board is disconnected but is below spec. once it is connected, something on the processor board is overloading the supply or the +5V supply in the monitor is not able to supply its rated 3A.

If the +12V or -5V supplies or both are out of spec. (+12V \pm 5%, or -5V \pm 5%), check to see if the 12.6V AC input to the processor board is within spec. (12.6V \pm 2V AC). This voltage comes in on pins 15 and 14. Be careful not to short these pins. If this voltage is alright, something is wrong with the processor board voltage regulators or they are being overloaded with a malfunctioning chip on the board. In any case, another processor board should replace the one with the problem.

Trouble shooting the processor board to a point further than this is beyond the scope of this manual.



-REAR VIEW-
BARRICADE CABINET

FIGURE 3

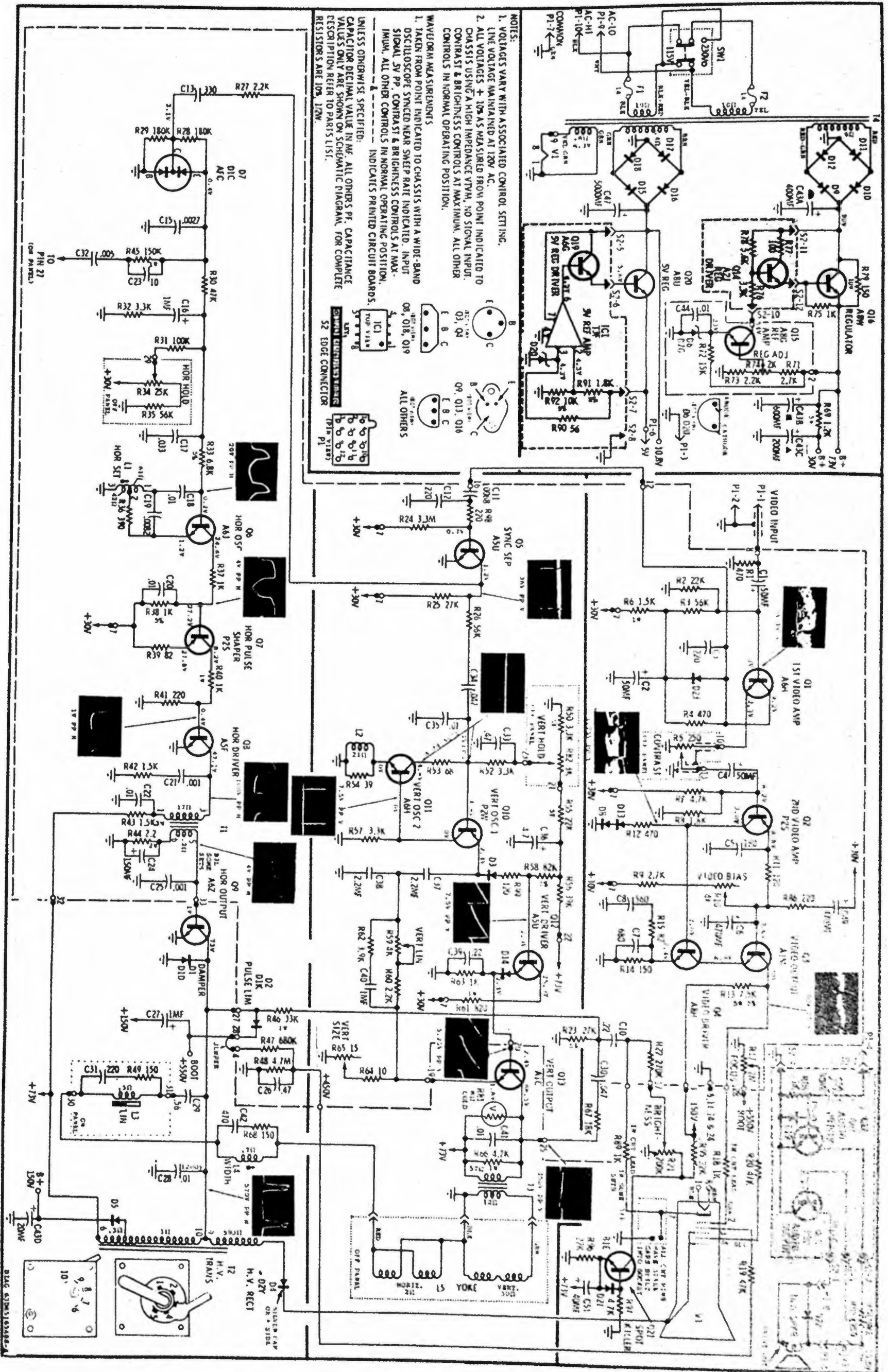
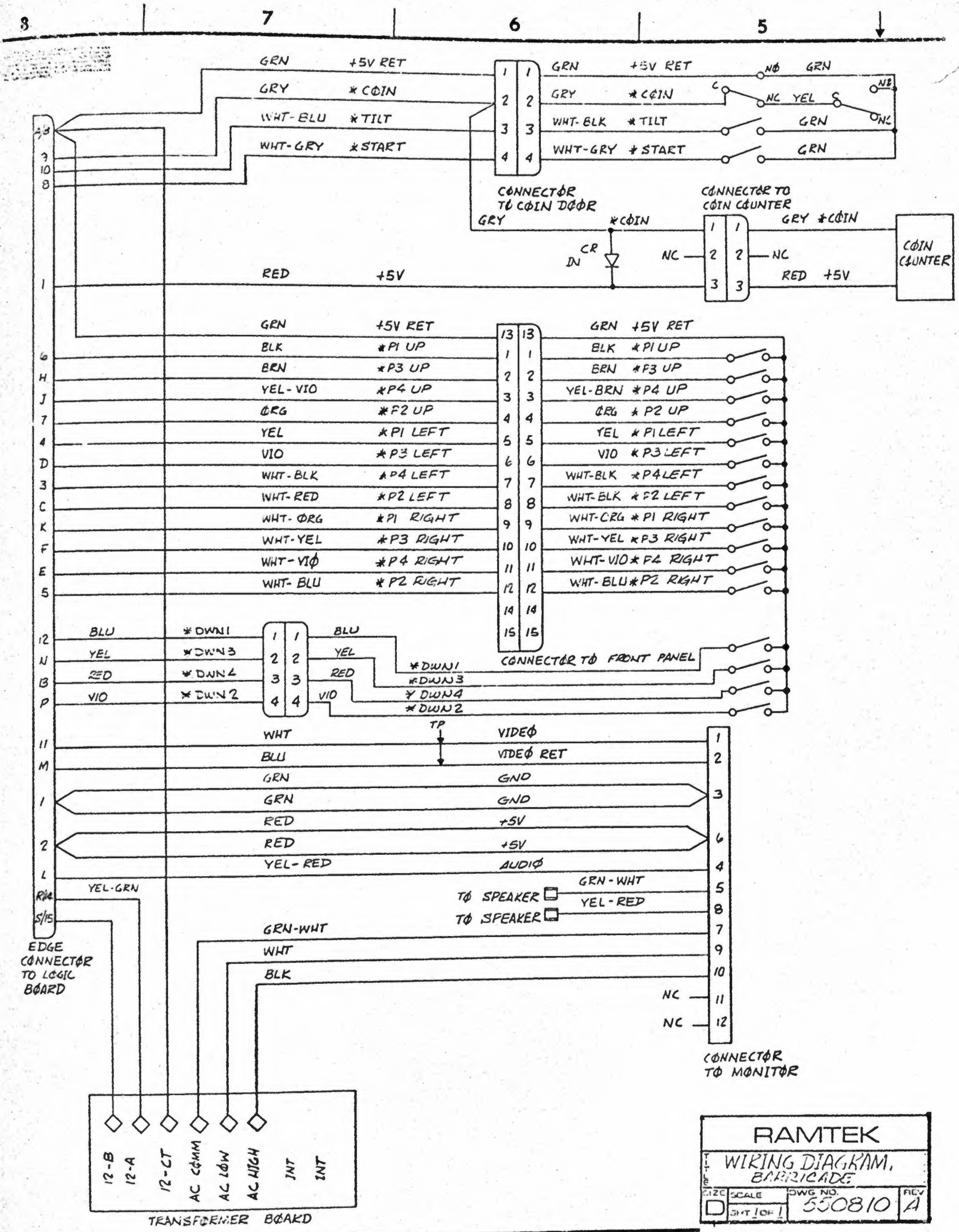


FIGURE 4: T.V. MONITOR Schematic Diagram

NOTES:
 1. VOLTAGES VARY WITH ASSOCIATED CONTROL SETTING.
 2. LINE VOLTAGE MAINTAINED AT 120V AC.
 3. ALL VOLTAGES + 10% AS MEASURED FROM POINT INDICATED TO CHASSIS USING A HIGH IMPEDANCE VTVM, NO SIGNAL INPUT. CONTRAST & BRIGHTNESS CONTROLS AT MAXIMUM, ALL OTHER CONTROLS IN NORMAL OPERATING POSITION.
 WAVEFORM MEASUREMENTS
 1. TAKEN FROM POINT INDICATED TO CHASSIS WITH A WIDE-BAND OSCILLOSCOPE SYNCD NEAR SWEEP RATE INDICATED. INPUT SIGNAL, 5V PP, CONTRAST & BRIGHTNESS CONTROLS AT MAXIMUM, ALL OTHER CONTROLS IN NORMAL OPERATING POSITION.
 UNLESS OTHERWISE SPECIFIED:
 CAPACITOR DECIMAL VALUE IN MF. ALL OTHERS PP. CAPACITANCE VALUES ONLY ARE SHOWN ON SCHEMATIC DIAGRAM. FOR COMPLETE DESCRIPTION REFER TO PARIS LIST.
 RESISTORS ARE 10% 12W.



| | | | |
|------------------------------|-------|---------|-----|
| RAMTEK | | | |
| WIRING DIAGRAM, BARRICADE | | | |
| SIZE | SCALE | DWG NO. | REV |
| | | 550810 | A |

BARRICADE SWITCH SETTINGS

| # OF GAMES | SWITCHES → | 1 | 2 | 3 |
|------------|------------|-----|-----|-----|
| | 1 | | OFF | OFF |
| 2 | | ON | OFF | OFF |
| 3 | | OFF | ON | OFF |
| 4 | | ON | ON | OFF |
| 5 | | OFF | OFF | ON |
| 6 | | ON | OFF | ON |
| 7 | | OFF | ON | ON |
| 8 | | ON | ON | ON |

COIN

Switch is off if depressed on + side.

| SPEED | SWITCHES → | 4 | 5 | 6 |
|-------|------------|-----|-----|-----|
| | Fast | | OFF | OFF |
| | | ON | OFF | OFF |
| | | OFF | ON | OFF |
| | | ON | ON | OFF |
| | | OFF | OFF | ON |
| | | ON | OFF | ON |
| | | OFF | ON | ON |
| Slow | | ON | ON | ON |

Switch is off if depressed on + side

NOTE #1: SWITCH #7 & 8 ARE NOT USED.

NOTE #2:

FACTORY SET

Switch #5 - Up + Side

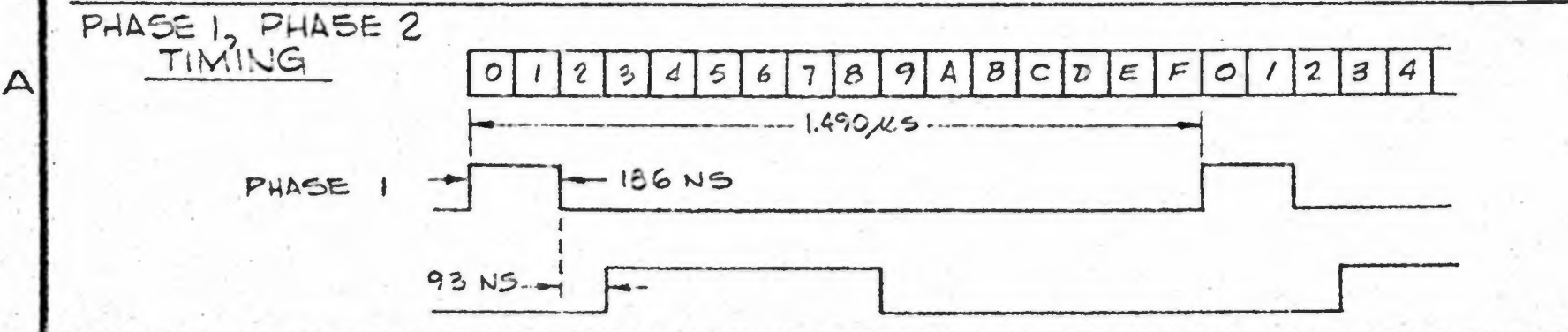
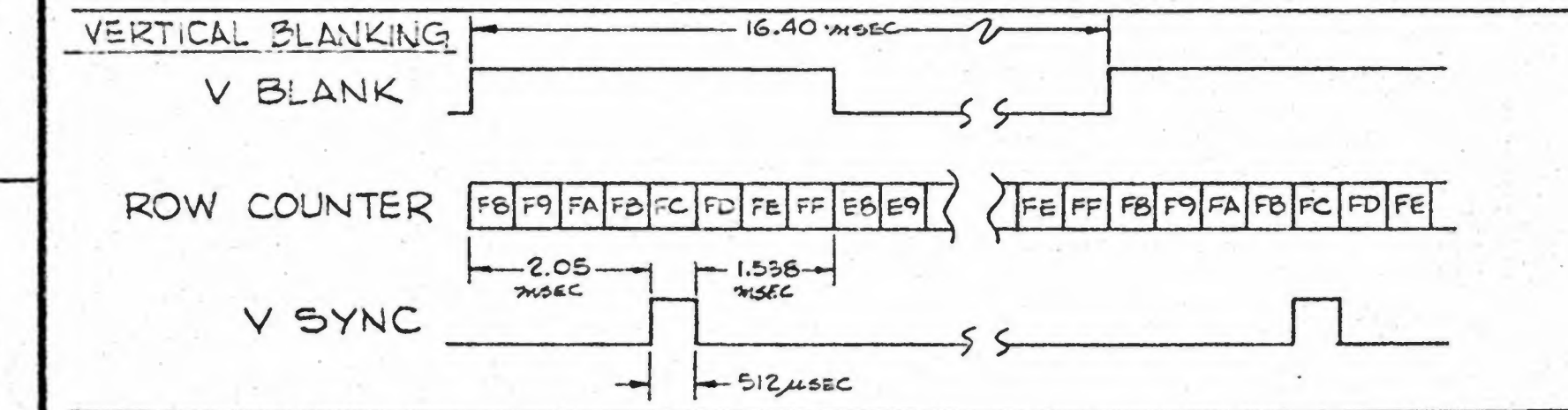
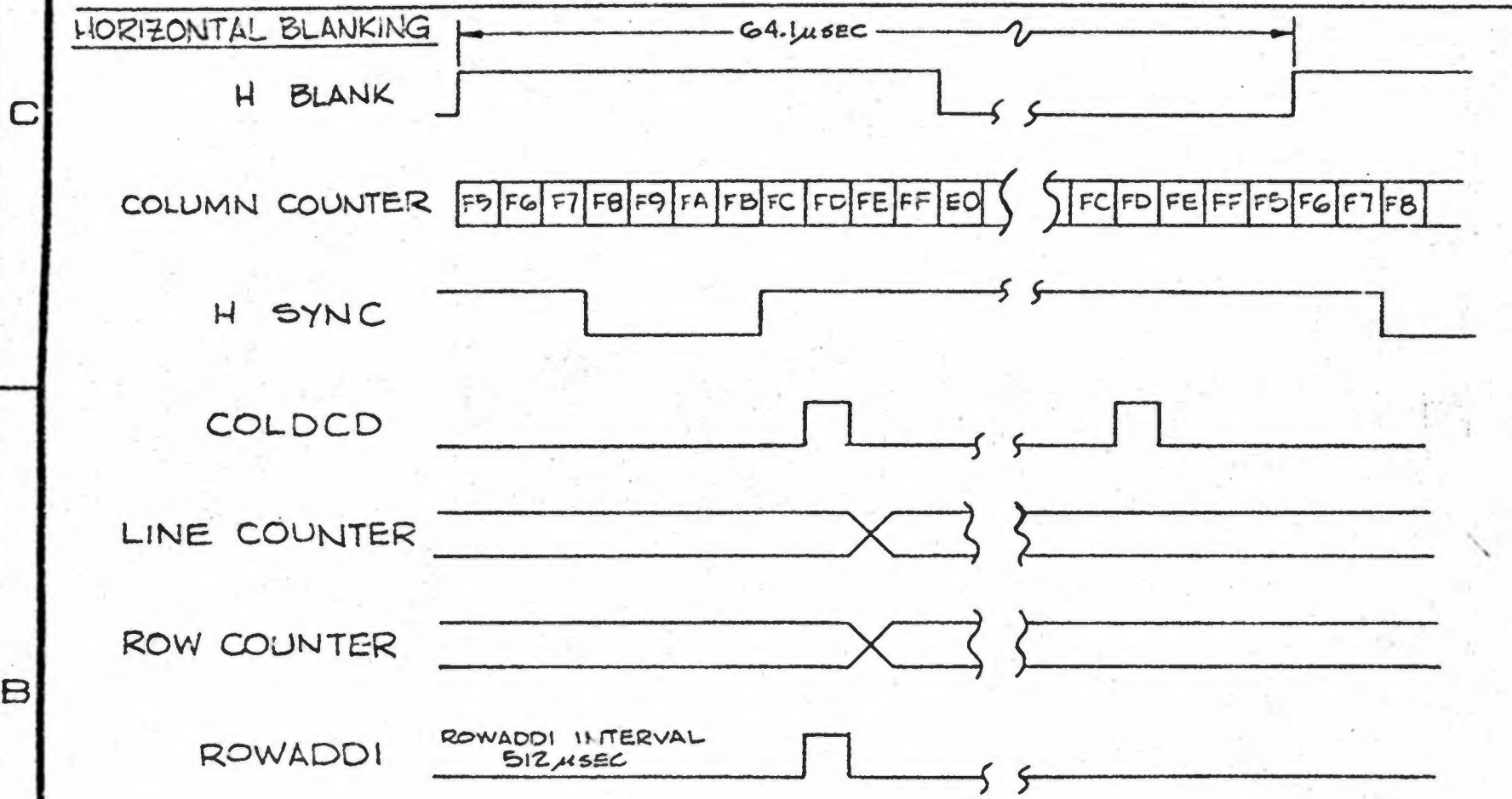
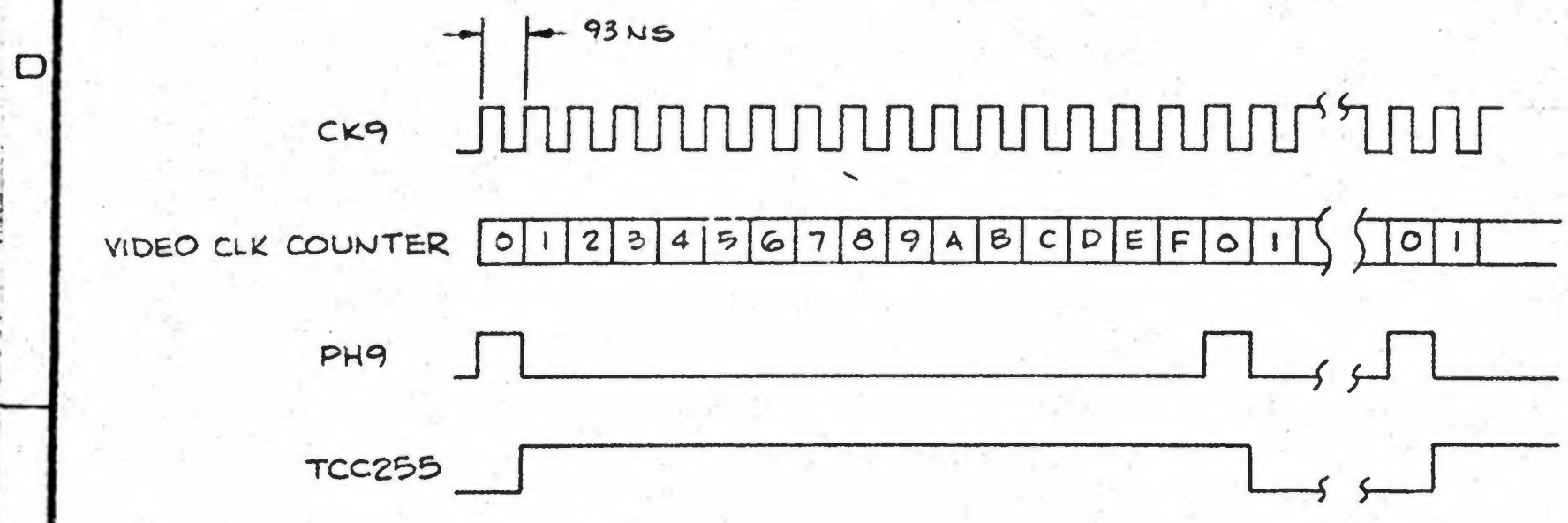
Switch #2 - Up + Side

Volume High

12/76

C. A. ROBINSON & CO.

COLUMN, LINE & ROW COUNTERS



| REVISIONS | | | |
|-----------|------------------------|------|----------|
| LTR | DESCRIPTION | APVD | DATE |
| A | PROD. REL. ECO# 507235 | KA | 1/4-20-7 |

Fixed

CK9 TIME = 93 NS
 PH9 TO PH9 IS 16 x 93 NS = 1.490 μS
 H BLANK TIME IS 11 x 1.490 = 16.39
 VISIBLE COL TIME IS 1.490 x 32 = 45.088
 H BLANK TO H BLANK = 64.10
 VERTICAL BLANK TIME IS 6 x 64.10 = 4.102 μSEC
 VERTICAL BLANK TO VERTICAL BLANK IS 256 x 64.10 = 16.409 μSEC

~ TIMING DIAGRAM ~

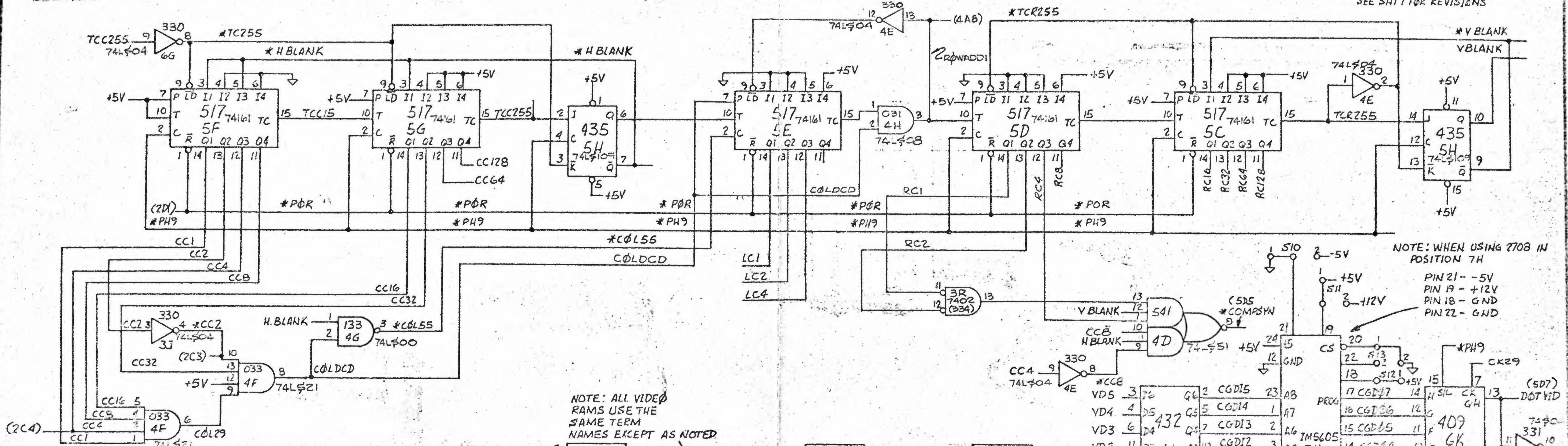
| QTY | PART NO | ITEM DESCRIPTION |
|------------------------------------|---------|------------------|
| LIST OF MATERIALS | | |
| RAMTEK | | |
| LOGIC DIAGRAM, GAME D BARRICADE | | |
| 507235 | | |

COLUMN COUNTER

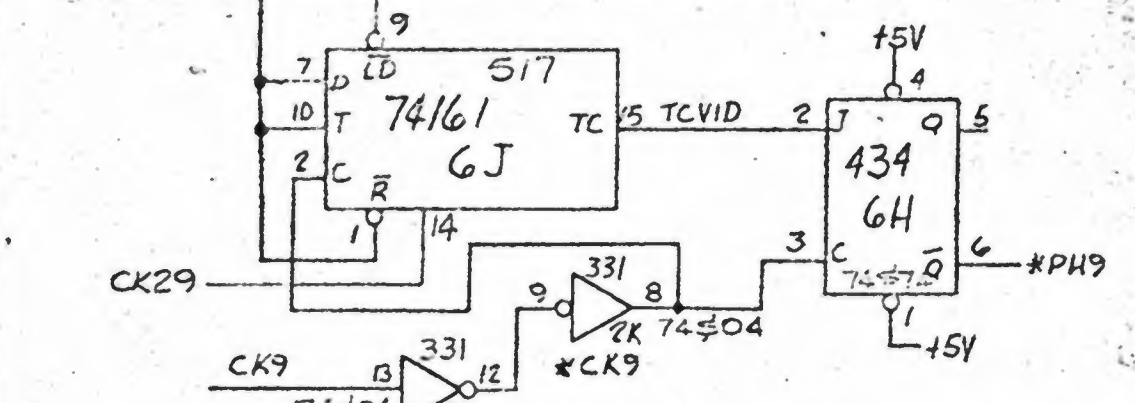
LINE COUNTER

ROW COUNTER

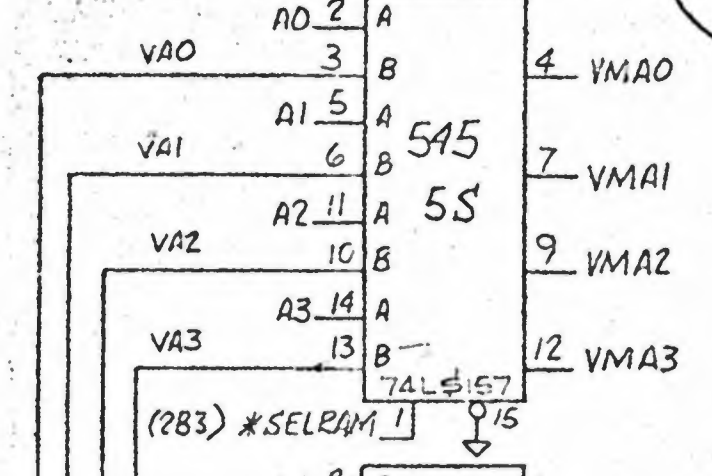
| REVISIONS | | | |
|-----------------------|-------------|--------|------|
| LT# | DESCRIPTION | APPROV | DATE |
| SEE SH1 FOR REVISIONS | | | |



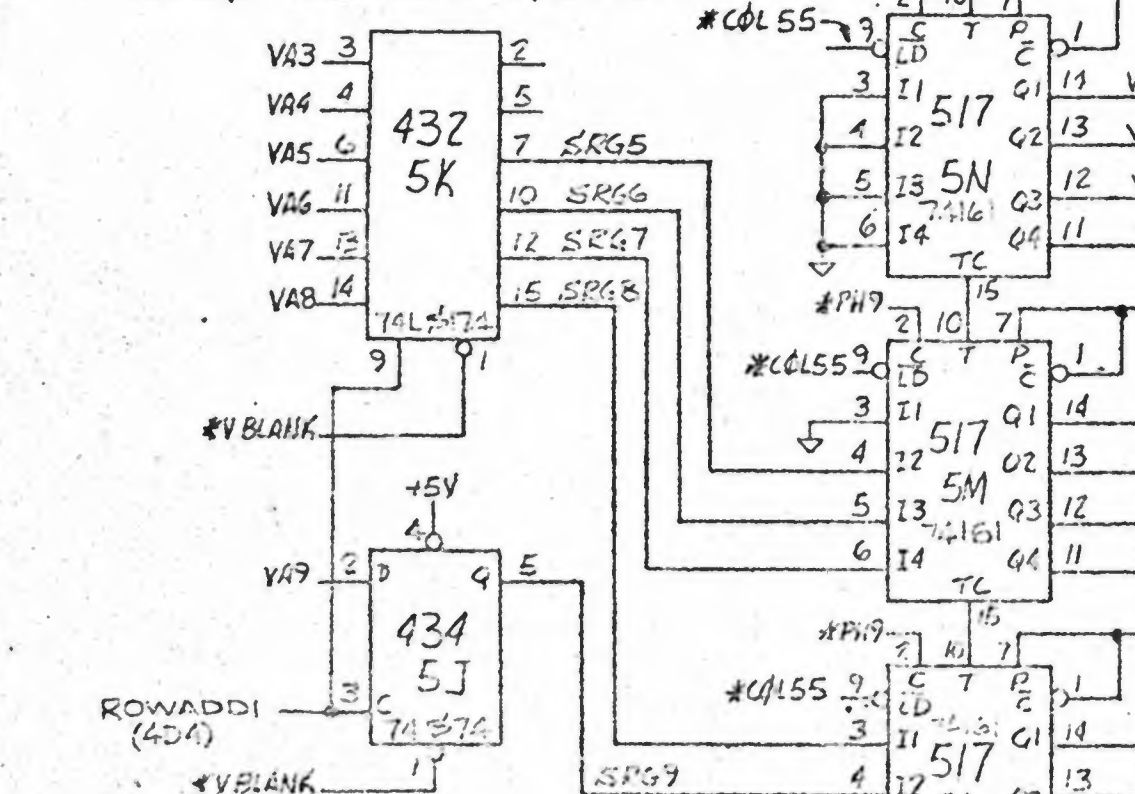
VIDEO CLOCKS



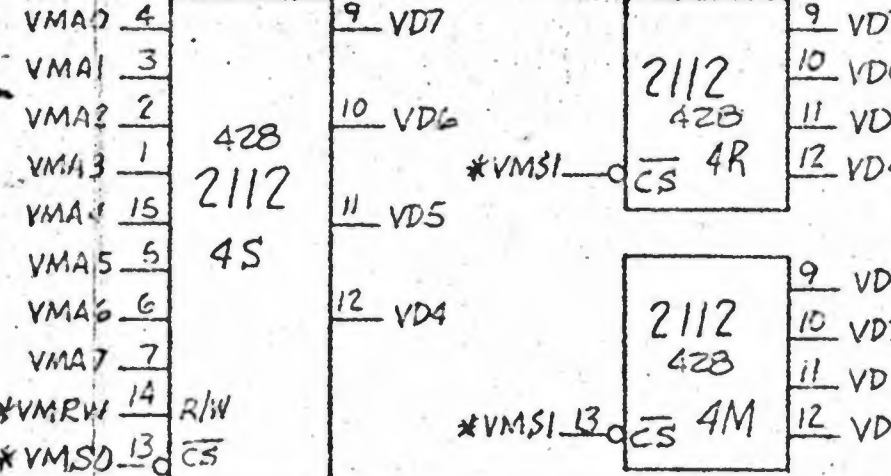
NOTE: ALL VIDEO RAMS USE THE SAME TERM NAMES EXCEPT AS NOTED



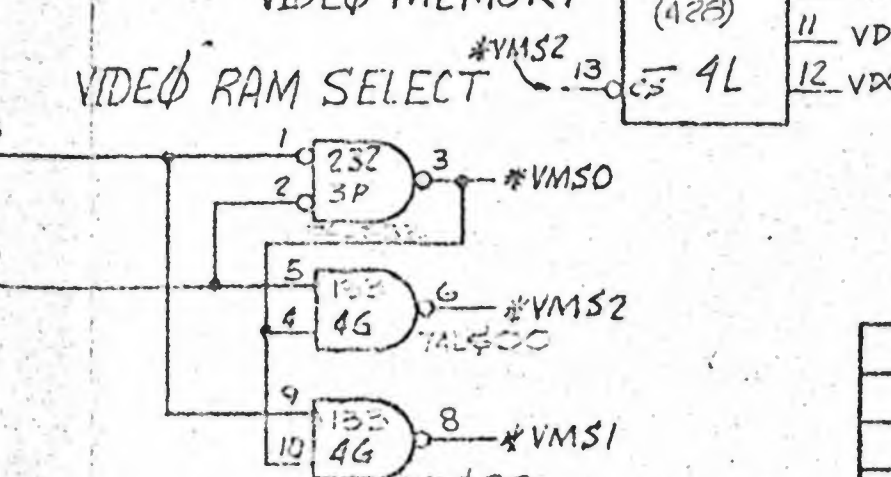
VIDEO ADDRESS COUNTER



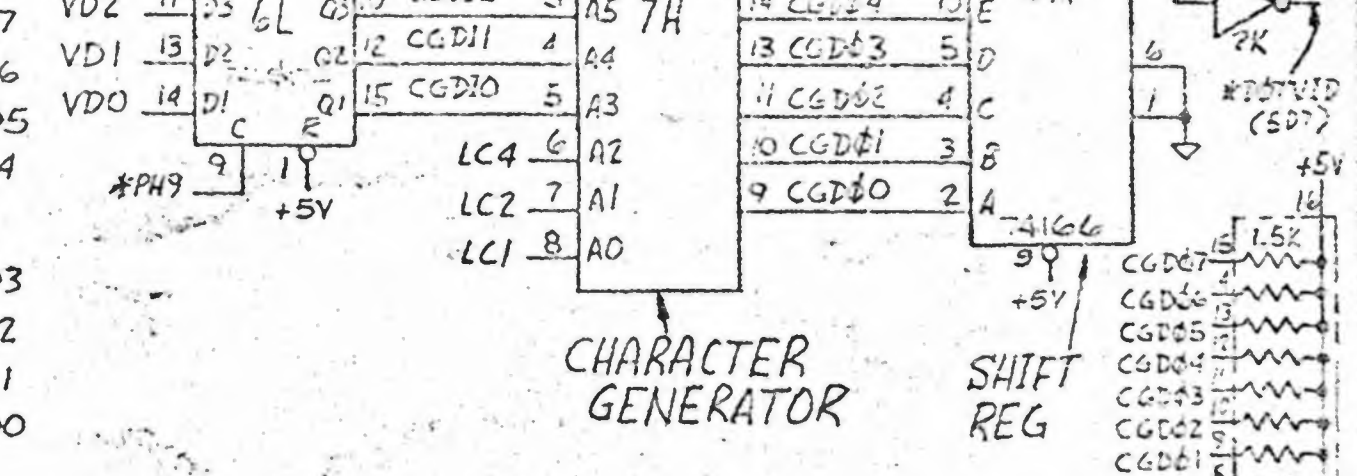
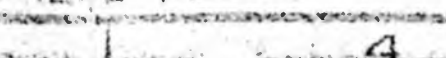
VIDEO RAM SELECT



VIDEO MEMORY

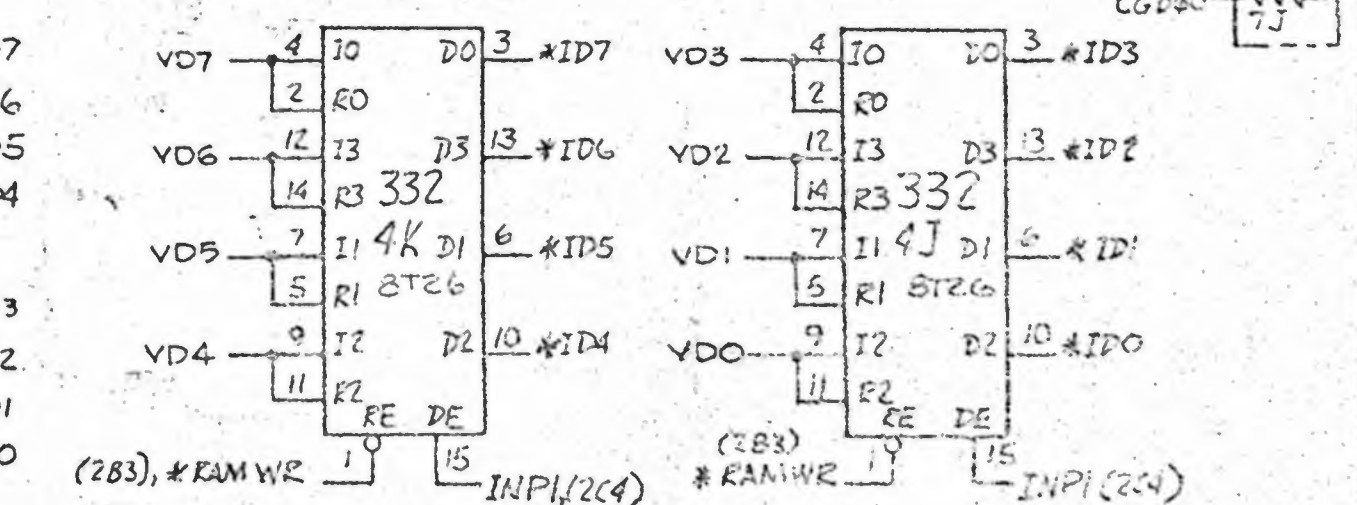


VIDEO ADDRESS MUX



CHARACTER GENERATOR

SHIFT REG



| QTY | PART NO. | NEW DESCRIPTION |
|-----|----------|---------------------------|
| | | LIST OF MATERIALS |
| | | FRAMTEK |
| | | LOGIC DESIGNER'S USE ONLY |
| | | DATE |
| | | 550732 |

