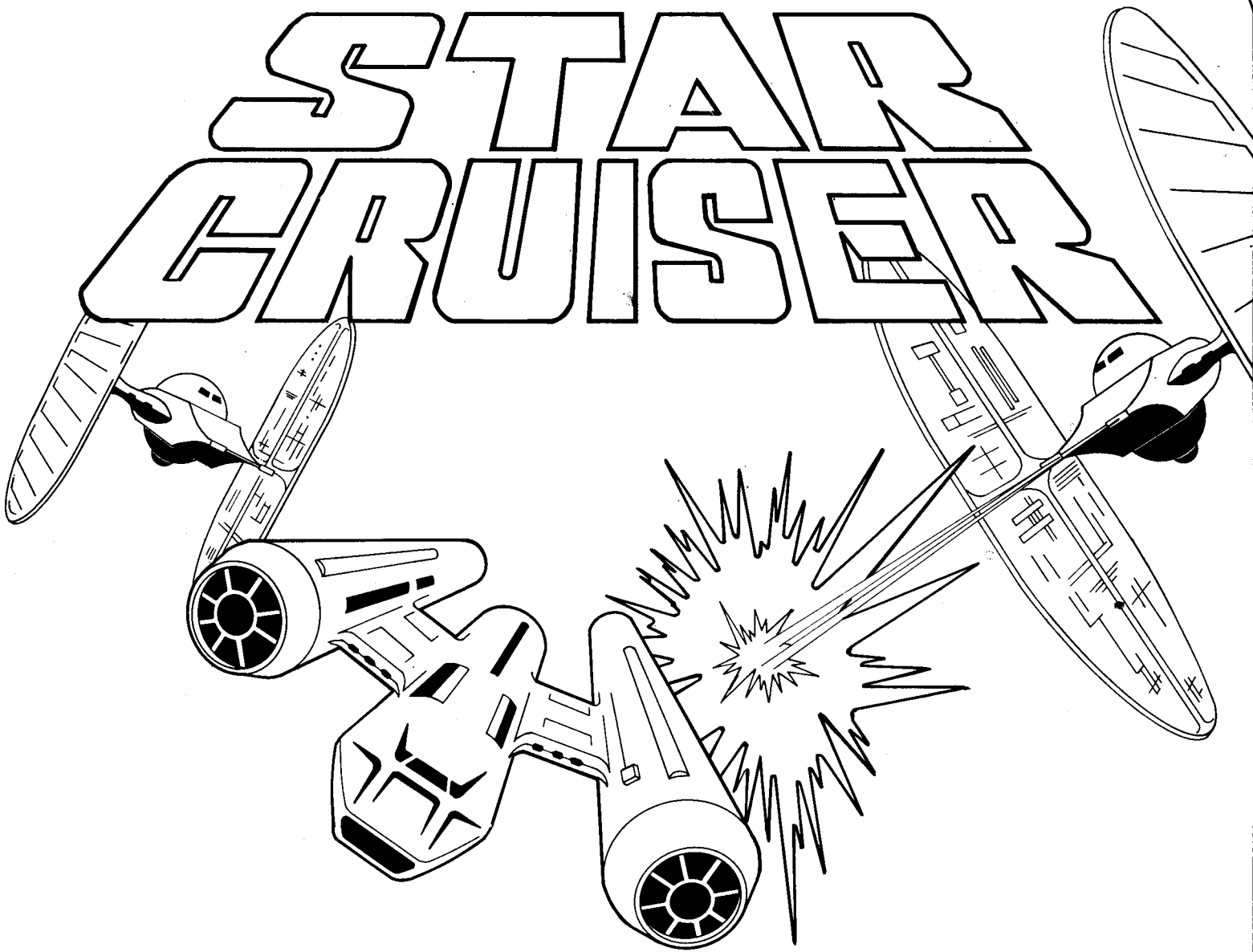


# STAR CRUISER



## OPERATOR'S MANUAL

SALES AND  
SERVICE  
**(800) 538-1733**

**ramtek**  
Our Experience Shows  
292 COMMERCIAL ST.  
SUNNYVALE, CA 94686

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## 1. INTRODUCTION

Star Cruiser 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.

Star Cruiser is a two-player driving/shooting game where players use heavy cast aluminum steering wheels and aluminum pedals to control starships. The object of the game is to avoid being hit by your opponent's torpedoes and phasers while you try to hit his star cruiser.

Exciting firing and explosion sounds accompany the sound of the vehicles to provide a dynamic audio presentation.

## 2. GAME OPERATION

While the Star Cruiser game is not coined, it displays an attract mode which consists of two star cruisers moving across the screen.

An actual game begins when players insert one or two coins (operator adjustable to work on one or two coins per play).

The star cruisers are now positioned at the upper left and lower right corners of the screen. Turning the steering wheel to the left rotates the star cruiser to the left, and to the right rotates the star cruiser to the right.

Actuating the foot pedal causes the ship to move forward accompanied by a "whooshing" sound. The ships can exit the screen only to reappear on the opposite side. The players can fire at their opponent by depressing a switch on the right-hand side of the steering wheel. As long as the switch is depressed, the phaser continues in motion, wrapping around the screen and re-entering on the other side. Releasing the switch causes the phaser to explode. A switch on the left side of the steering wheels actuates the steerable torpedo. The torpedo is steered by turning the steering wheel. When a torpedo is in motion, the steering wheel does not actuate the star cruiser. Only one torpedo or phaser may be in motion for each player at one time. A hit on an opponent's ship scores one point. The score for each player is displayed on the upper portion of the screen. The score does not appear when a torpedo or phaser is in motion. The game is over when one player reaches a score of seven (7) or the set time is exceeded (operator adjustable for 60, 90, 120 or 150 seconds). A light indicates the game is over. The score is displayed then the game goes back into the attract mode.

### 3. INSTALLATION

Any shipping container that appears damaged should be unpacked with the Carrier Agent present. Carefully inspect the unit for

external damage, then remove the back cover and inspect for internal damage. If any damage is found, notify the Carrier and Ramtek Corporation immediately. Retain containers for Carrier inspection.

Plug in the unit and operate to ensure proper operation.

#### 4. OPERATOR SELECTABLE OPTIONS

The characteristics of the game which can be altered by the operator are:

1. The maximum length of time allowed to play each game.
2. The number of coins per game.

A component top view of the microprocessor board used on Star Cruiser is shown in Figure 3 and the option settings are clearly indicated.

#### 5. WIRING DIAGRAM DESCRIPTION

The wiring diagram in Figure 6 basically describes the major components of Star Cruiser. The functional description of each block is as follows:

##### COIN DOOR

Coin drop provides a logic signal to the logic board to initiate the game when a coin drop is sensed through the switch closer. A tilt switch is provided to reset the game if the unit is abused.

#### POWER SUPPLY ASSEMBLY

The power supply assembly generates all the regulated DC voltages required for the logic/sound board.

#### CONTROL PANEL ASSEMBLY

The control panel assembly provides a logic signal indicating the steering wheel position. It also provides a signal to the logic board when phasers or torpedoes are fired. See Figure 2 for more detail.

#### FOOT PEDAL ASSEMBLY

Provides a signal to cause the star cruiser to move forward.

#### LOGIC/SOUND BOARD

The logic/sound board contains the necessary logic circuitry to enable Star Cruiser operation. Its heart is an 8080 microprocessor. The logic/sound board receives input signals from the steering wheel/foot pedal controls and the coin door. It provides output signals to the T. V. monitor to generate the video display.

#### MONITOR

The monitor provides the video display of the signal from the logic board. See Figure 7 for schematic.

#### SPEAKER

Provides the sound.

#### PANEL LAMPS

Provides general glass illumination and indication when game is over.

## INTERLOCK SWITCH

Disconnects AC power when the back door is removed.

## COIN COUNTER

Counts the coins put in the game.

## 6. TROUBLE SHOOTING TECHNIQUES

The following diagrams are provided to assist in trouble shooting the unit:

Figure 1	Rear View of Cabinet
Figure 2	Steering Wheel Control Panel
Figure 3	Logic/Sound Board
Figure 4	Power Supply Front View
Figure 5	Power Supply Rear View
Figure 6	Wiring Diagram
Figure 7	T. V. Monitor Schematic

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.

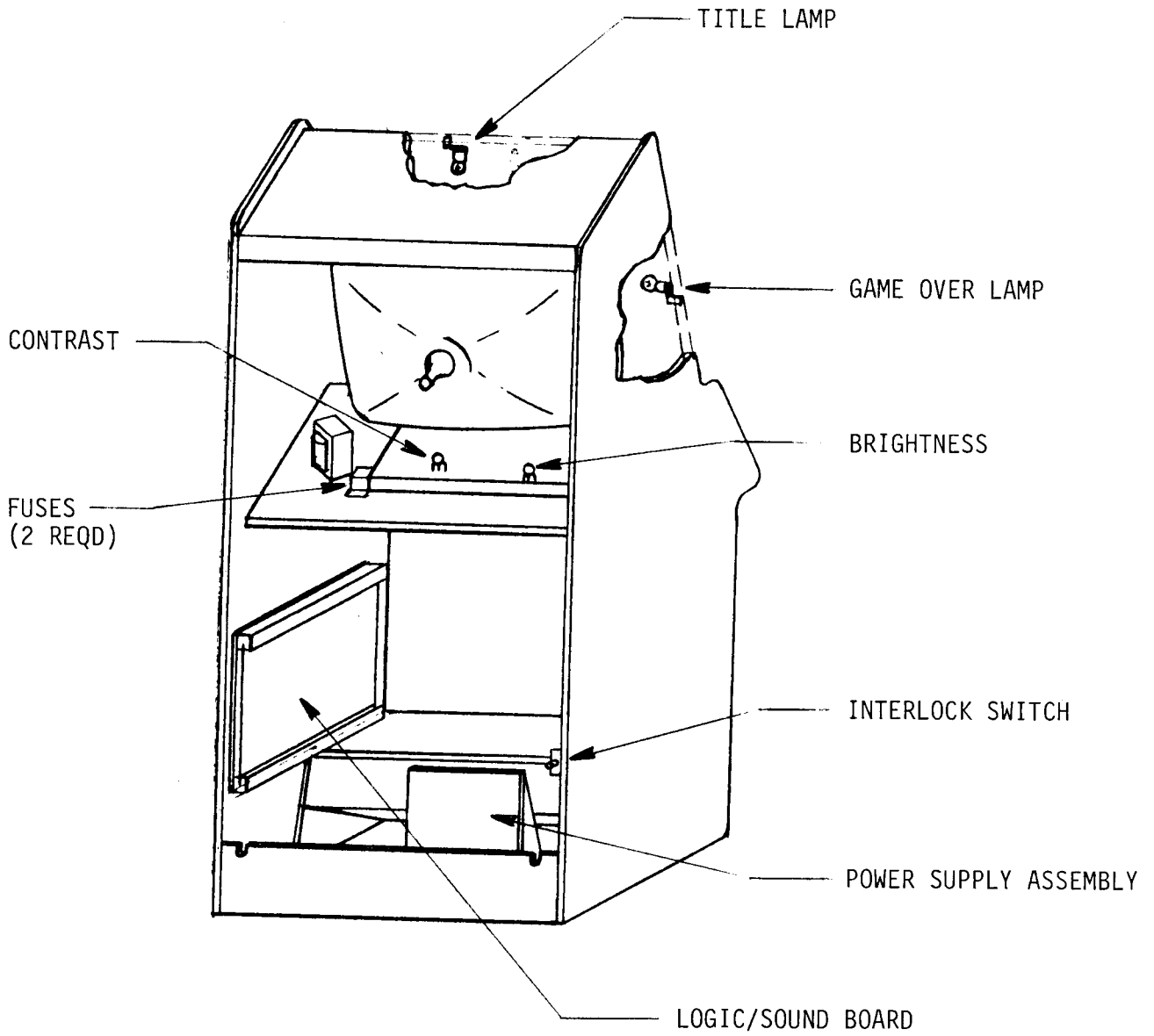
Check all three(3) fuses in the game -- the system power fuse located on the rear of power supply assembly and two(2) fuses mounted on the T. V. monitor. See Figures 1 and 5.

Check the brightness and contrast control on the monitor, and turn them in the direction to give maximum brightness and contrast. Turn brightness and contrast up. Check to see that screen lights up indicating the monitor is working properly.

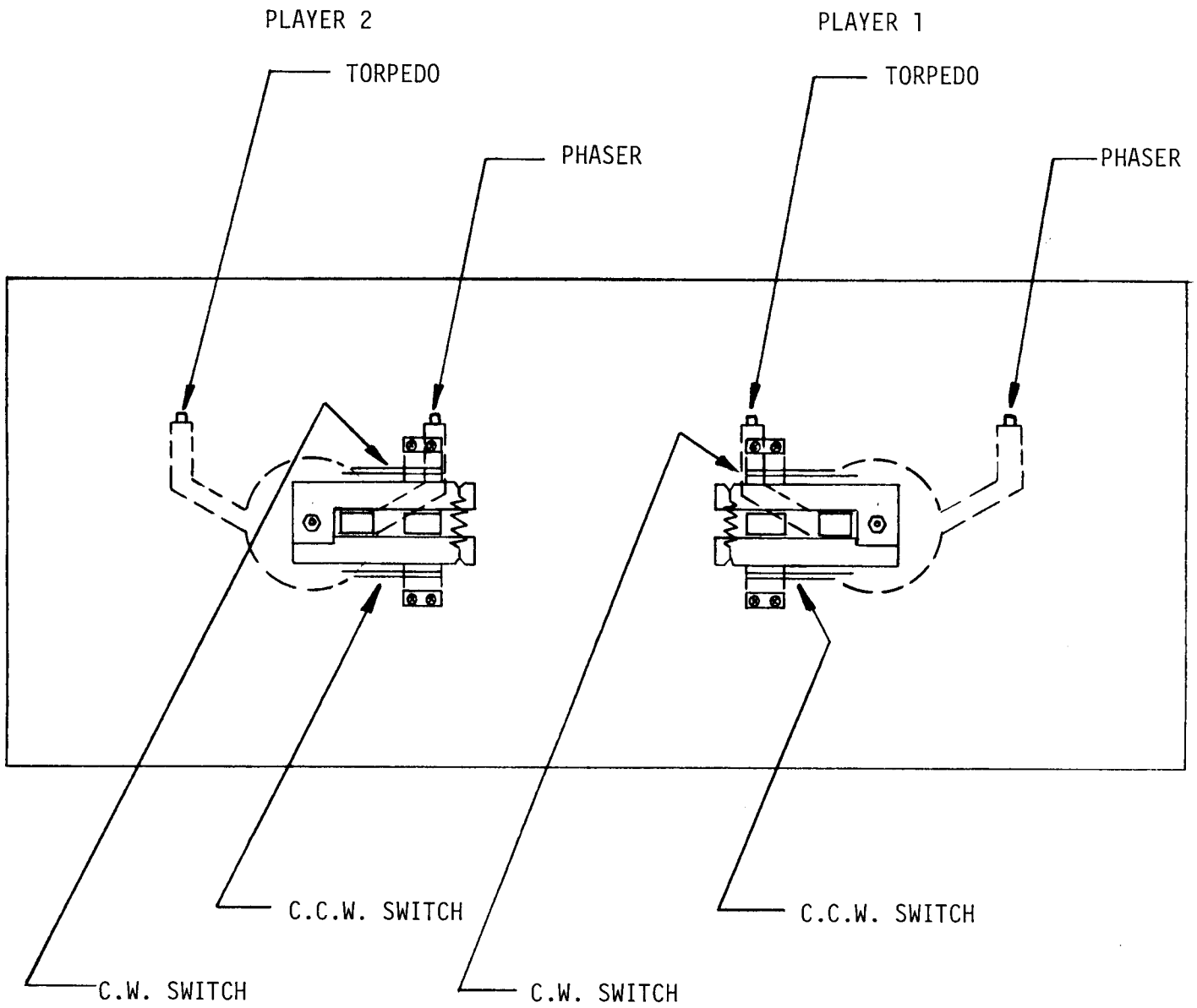
If there is no sound associated with the game, check the volume control located on the logic/sound board. See Figure 3. Check the +24V DC on the power supply. See Figure 4.

Whenever the game malfunctions, the +5V, -5V and +12V DC supplies should be checked. Use any standard voltmeter. These DC voltages can be measured as shown in Figure 4. Be careful not to short these supplies when making measurement.





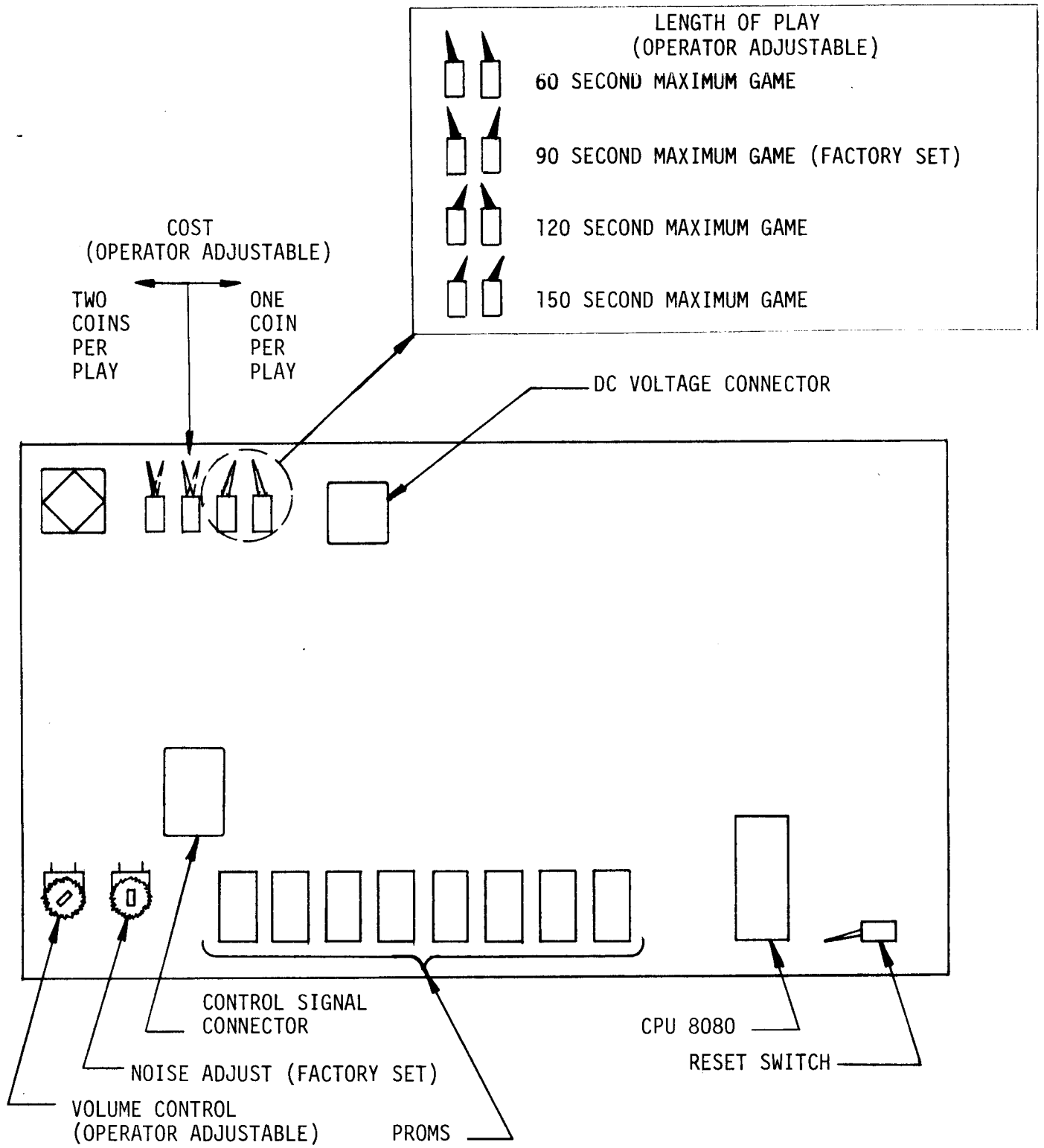
REAR VIEW OF CABINET  
FIGURE 1



CONTROL PANEL ASSEMBLY

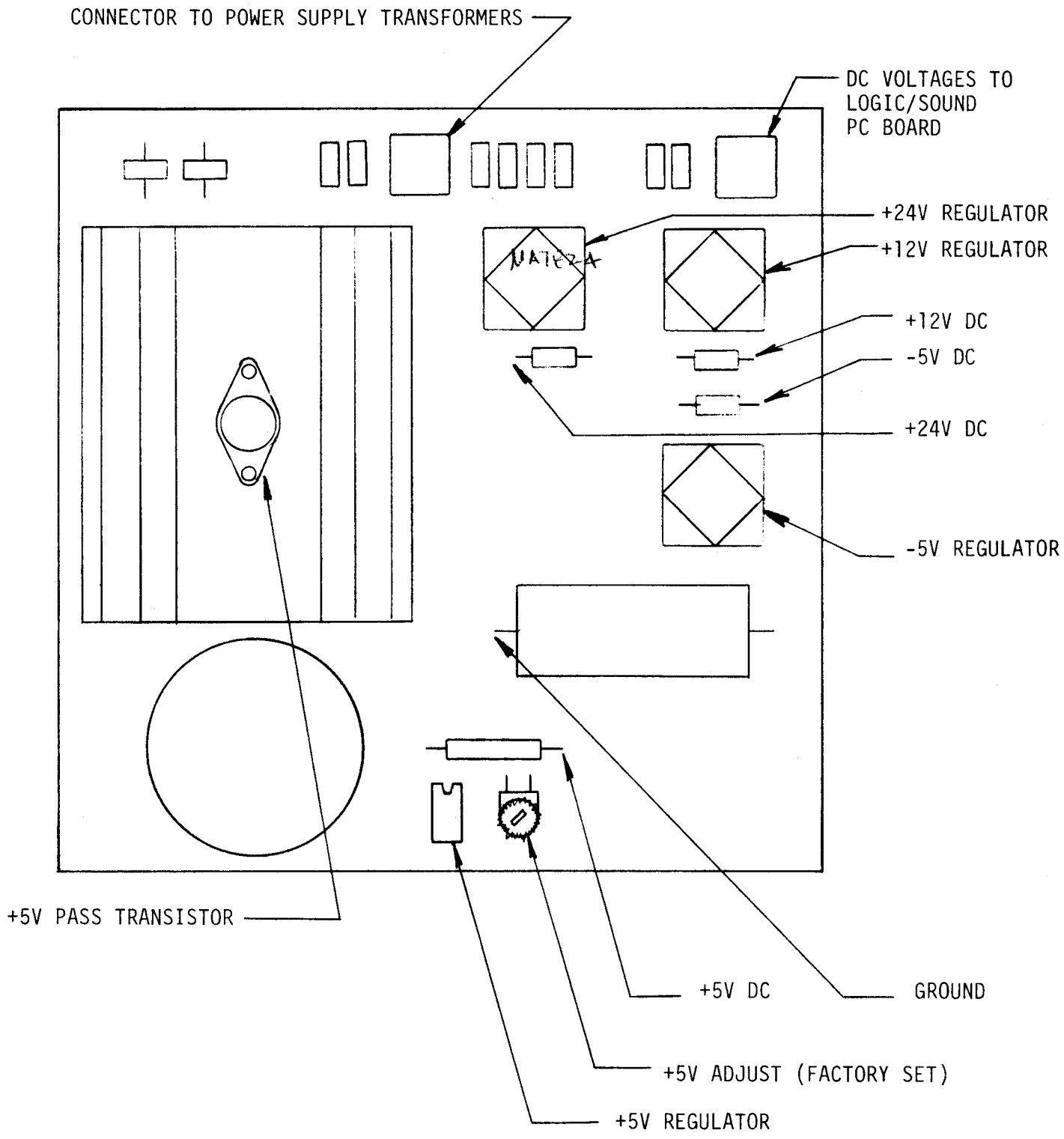
REAR VIEW

FIGURE 2

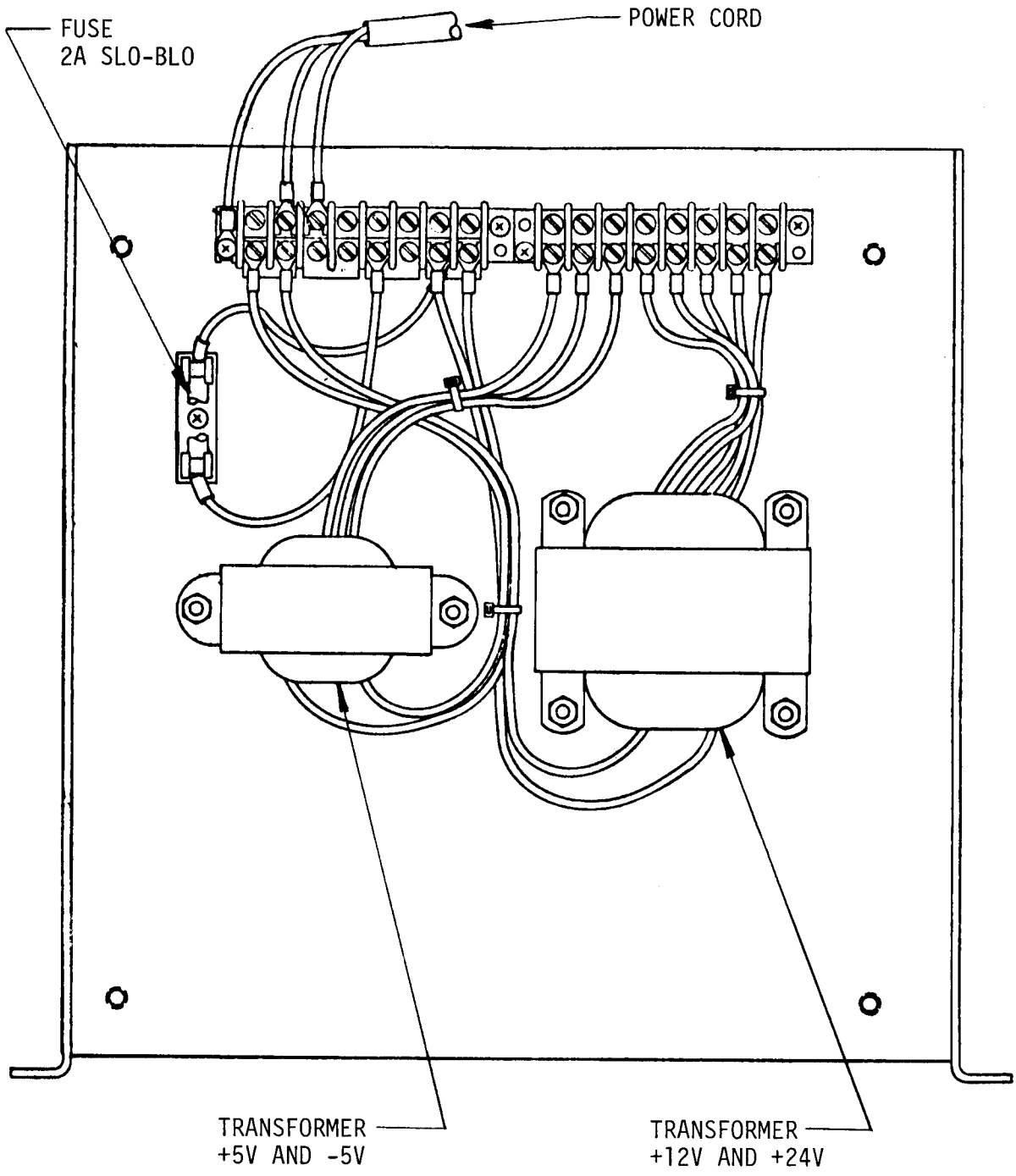


LOGIC/SOUND BOARD

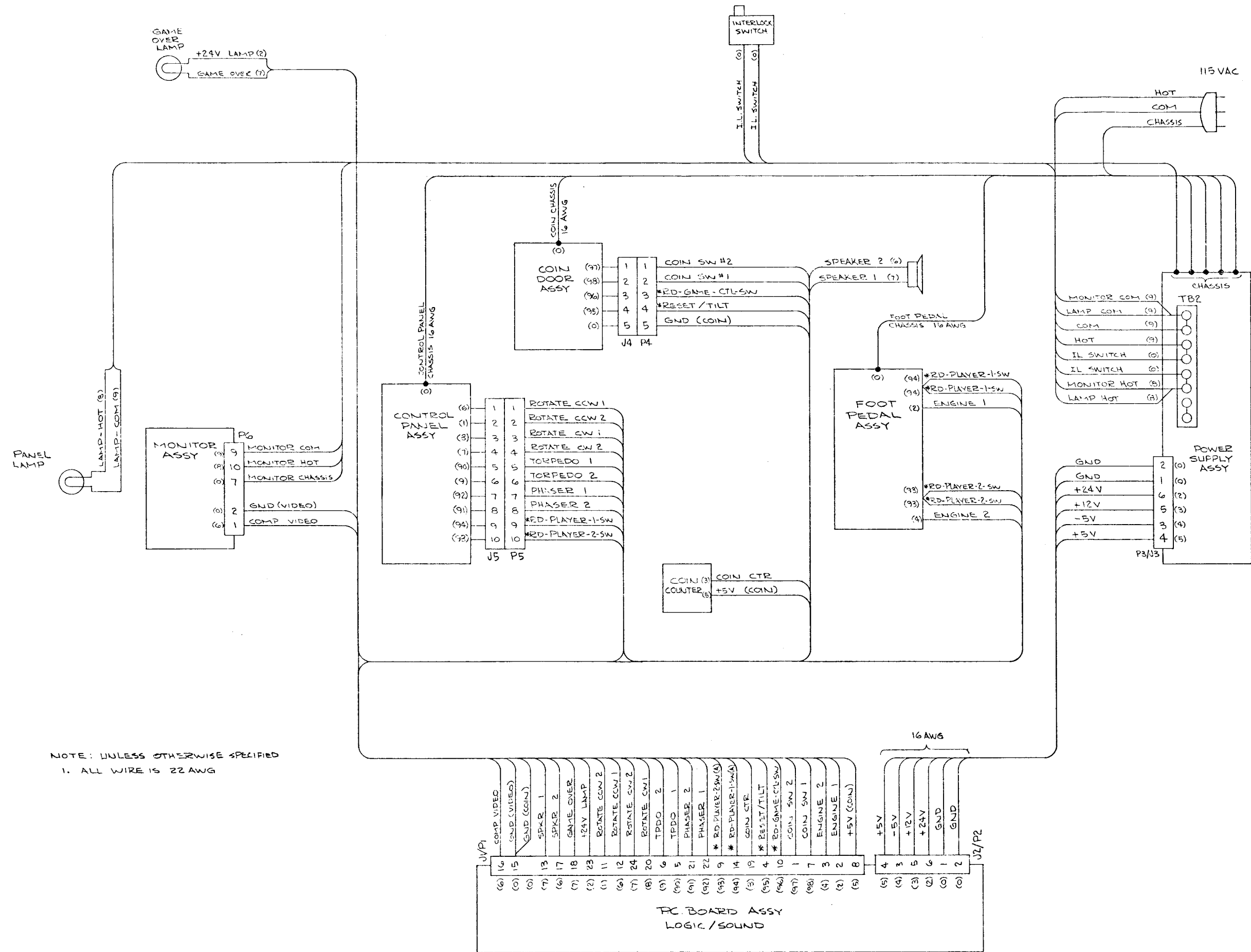
FIGURE 3



P.C.B. ASSY. POWER SUPPLY  
 FRONT VIEW  
 FIGURE 4



POWER SUPPLY ASSEMBLY  
REAR VIEW  
FIGURE 5

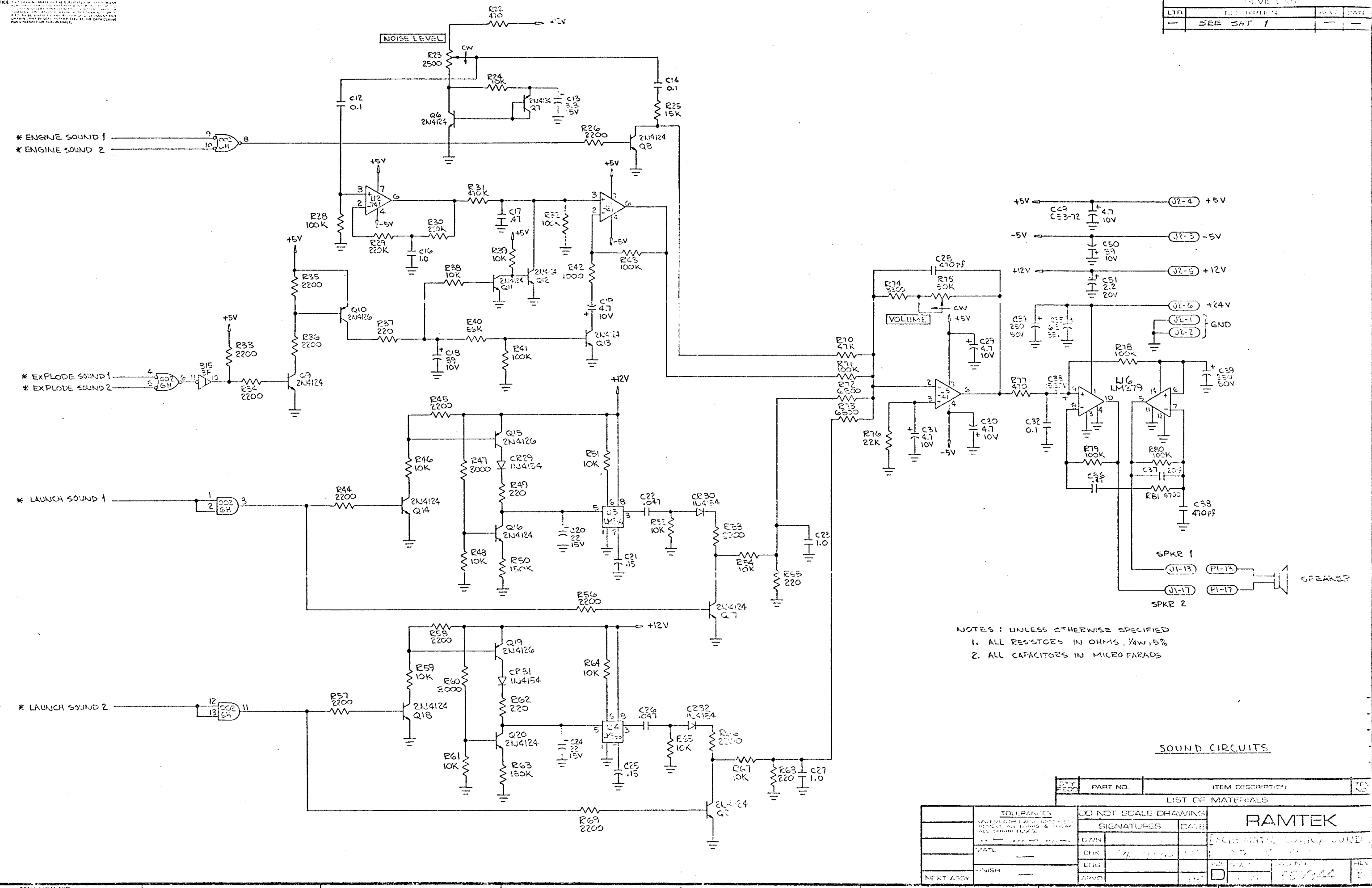


NOTE: UNLESS OTHERWISE SPECIFIED  
 1. ALL WIRE IS 22 AWG

WIRING DIAGRAM  
 FIGURE 6

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REVISED		DATE
LTR	DESCRIPTION	DATE
1	SEE SH 1	



NOTES: UNLESS OTHERWISE SPECIFIED  
 1. ALL RESISTORS IN OHMS, 1/4W, 5%  
 2. ALL CAPACITORS IN MICRO FARADS

SOUND CIRCUITS

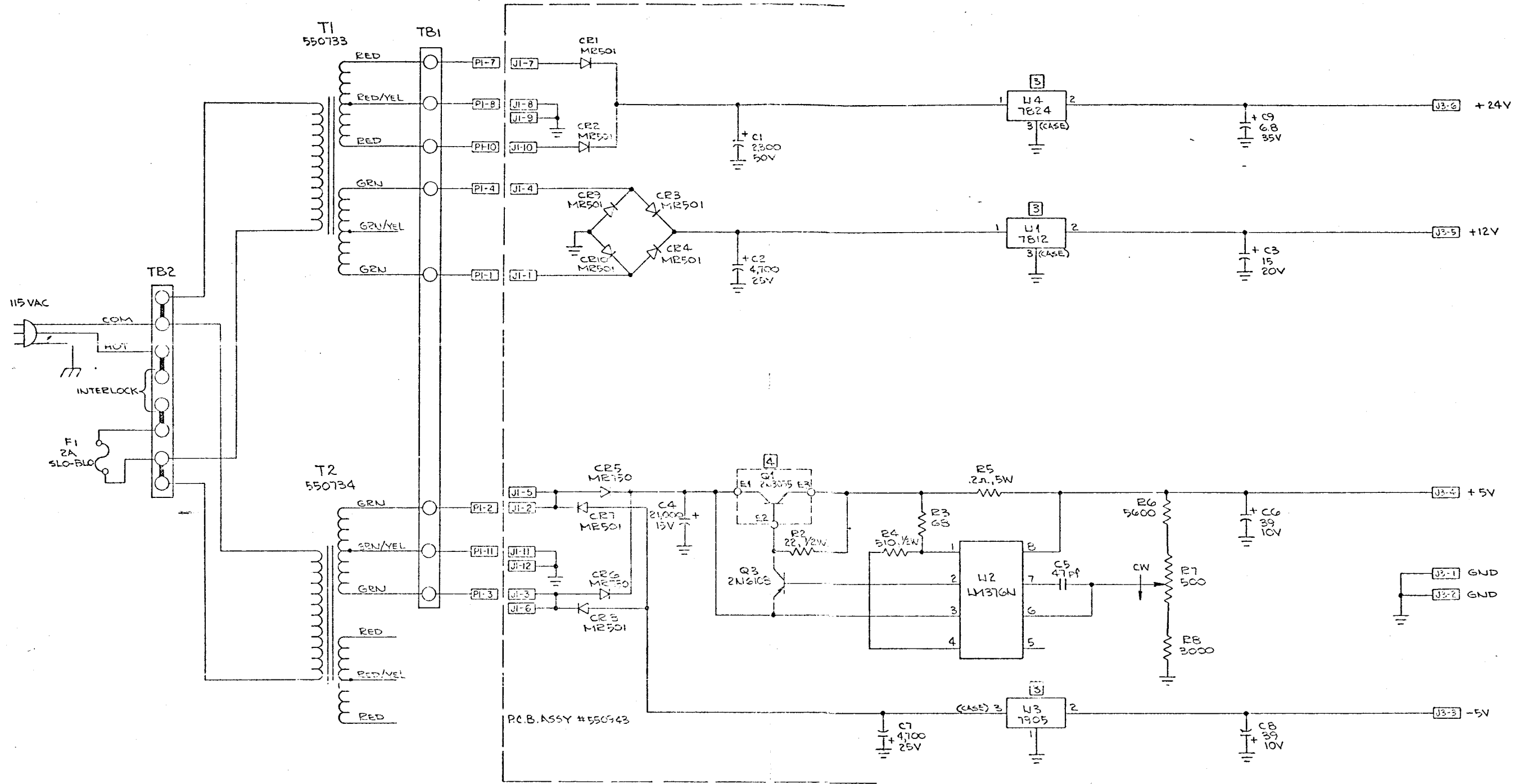
REV	EDD	PART NO.	ITEM DESCRIPTION	QTY
LIST OF MATERIALS				
RAMTEK				
SOUND CIRCUITS				
REV 1				

TOLERANCES	DO NOT SCALE DRAWING	SIGNATURES		DATE
UNLESS OTHERWISE SPECIFIED		DWN		
RESISTORS: 5% 1/4W		CHK		
CAPACITORS: 5% 1/4W		ENG		
FINISH		APVD		
NEXT ASSY				

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REVISIONS			
LT#	DESCRIPTION	DATE	BY
A	RELEASED PER ECO # C1021/11/11-7		



- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS 1/4 OHMS, 1/4W, 5%
  2. ALL CAPACITORS IN MICROFARADS
  - 3 MOUNTS ON TO3 HEATSINK 0701102
  - 4 HEATSINK ASSY, POWER SUPPLY 550963

QTY REQD	PART NO.	ITEM DESCRIPTION	ITEN NO.
LIST OF MATERIALS			

TOLERANCES		DO NOT SCALE DRAWING		SIGNATURES		DATE	
UNLESS OTHERWISE SPECIFIED	REMOVE ALL DIMS & BREAK ALL DIMMED LINES	OWN					
MATL	2%	CHK					
FINISH	5%	ENG					
NEXT ASSY		APPR					

**RAMTEK**

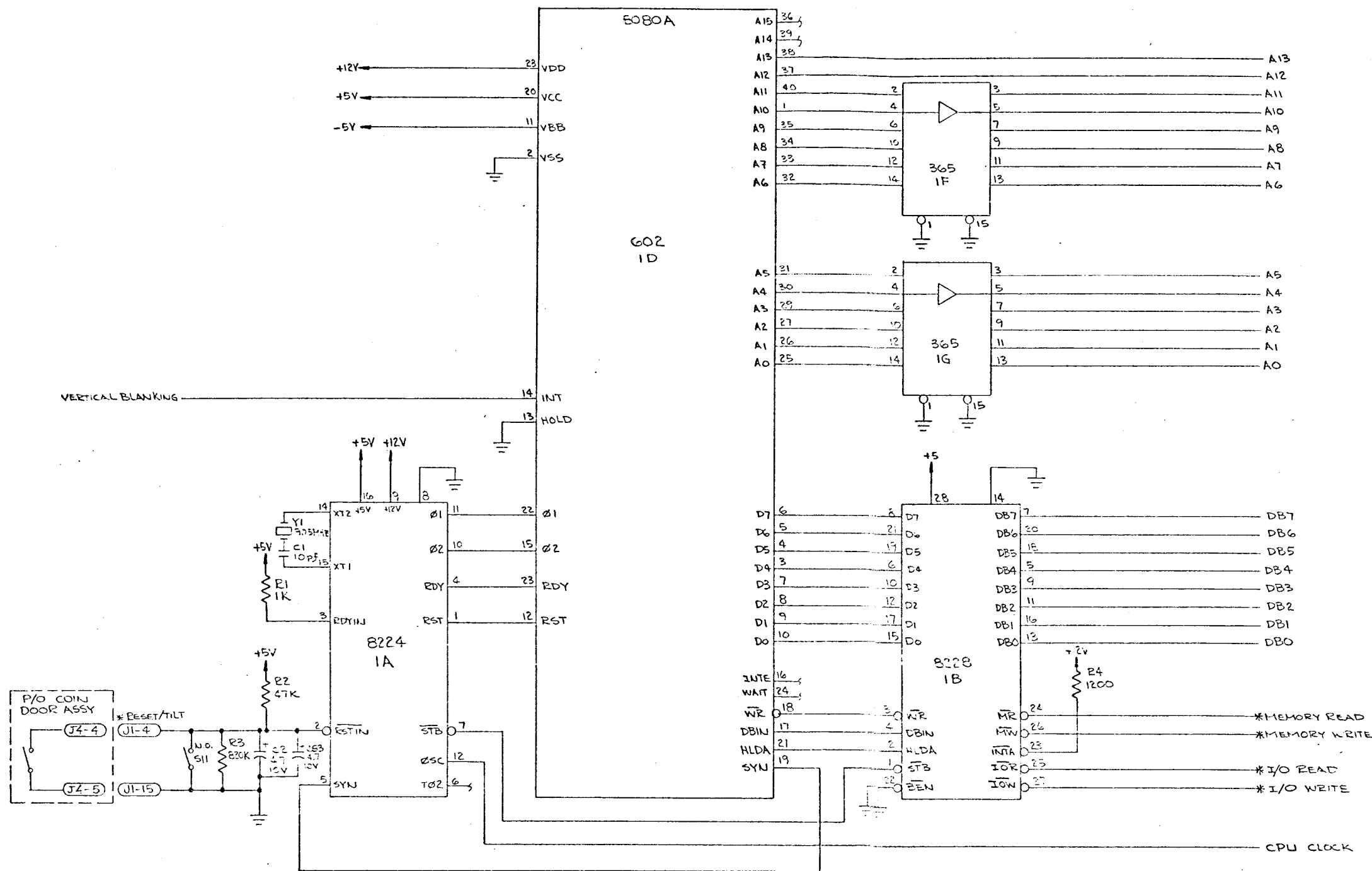
SCHEMATIC, POWER SUPPLY ASSEMBLY

REV NO. 550941 A



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LTR	DESCRIPTION	DATE	DATE
A	ENG DRAWING		
B	RFV PER ECO# 0080	1/16	7-11-77
B	PROD REL. ECO# 0102	1/16	7-12-77



- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS IN OHMS, 1/4W, 5%
  2. ALL CAPACITORS IN MICROFARADS
  3. \* DENOTES LOGIC SIGNAL

MICRO-PROCESSOR

QTY REQD	PART NO.	ITEM DESCRIPTION	ITER NO.
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LIST OF MATERIALS

TOLERANCES		DO NOT SCALE DRAWING		SIGNATURES		DATE	
UNLESS OTHERWISE SPECIFIED	RESISTOR: ±1%	DRAWN					
ALL DIMENSIONS	±0.005"	CHKD					
FINISH		ENG					
NEXT ASSY		APPROV					

RAMTEK

SCHEMATIC, LOCK/SCHEMATIC

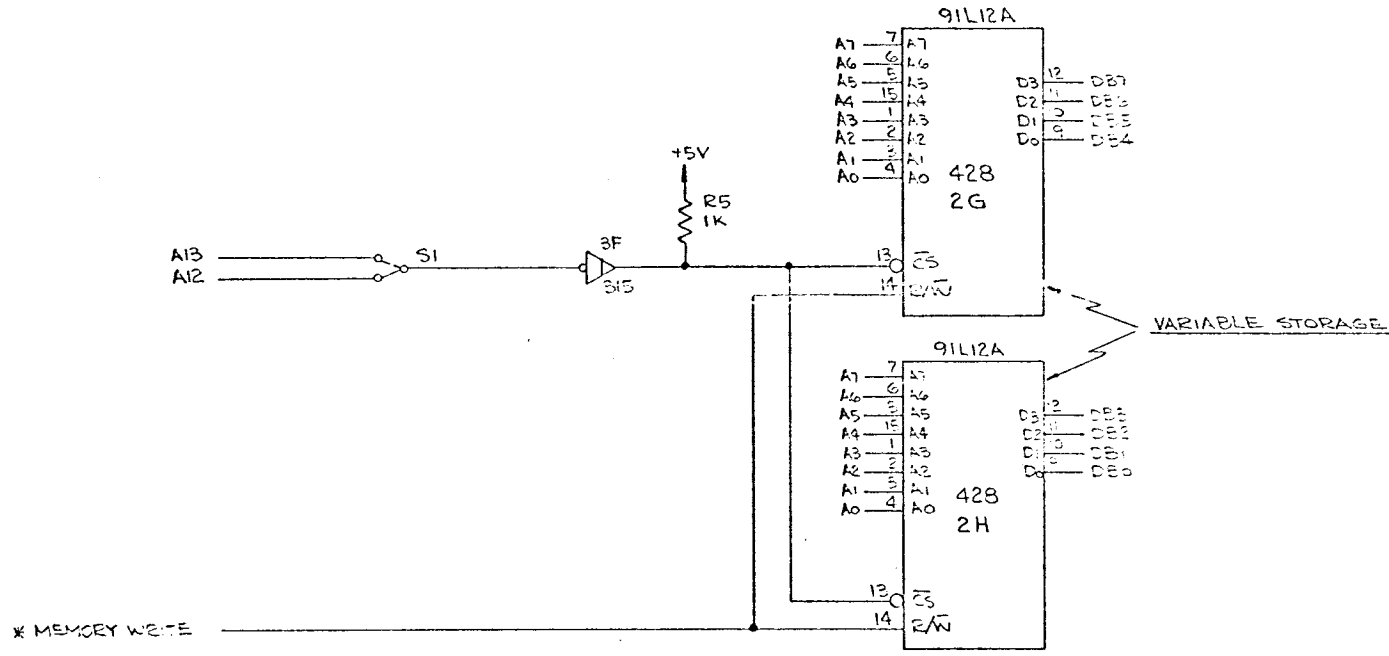
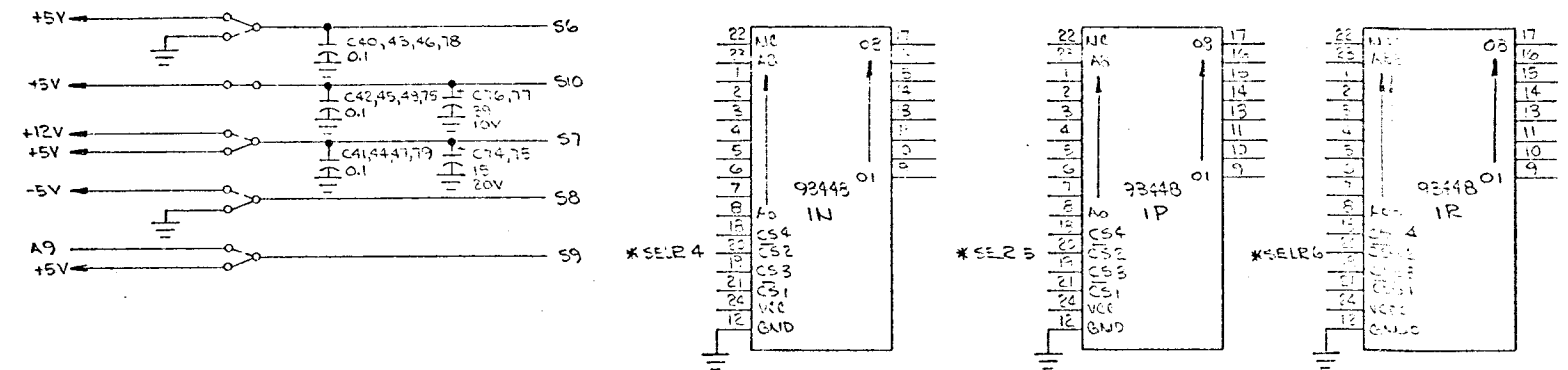
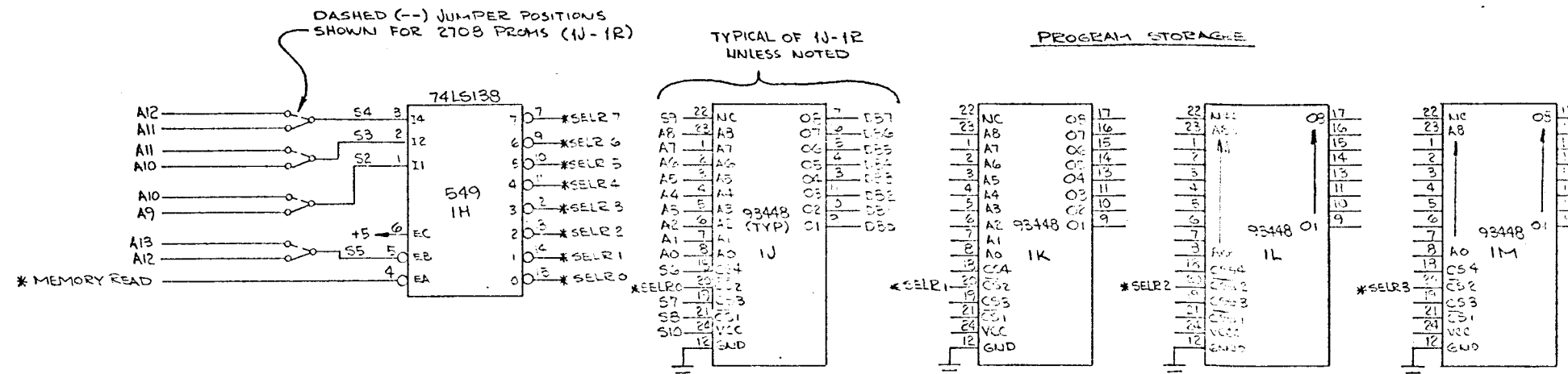
DRAWN BY: [Signature]

DATE: [Date]

REV: 550044 B

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REVISIONS			
LTR	DESCRIPTION	APVD	DATE
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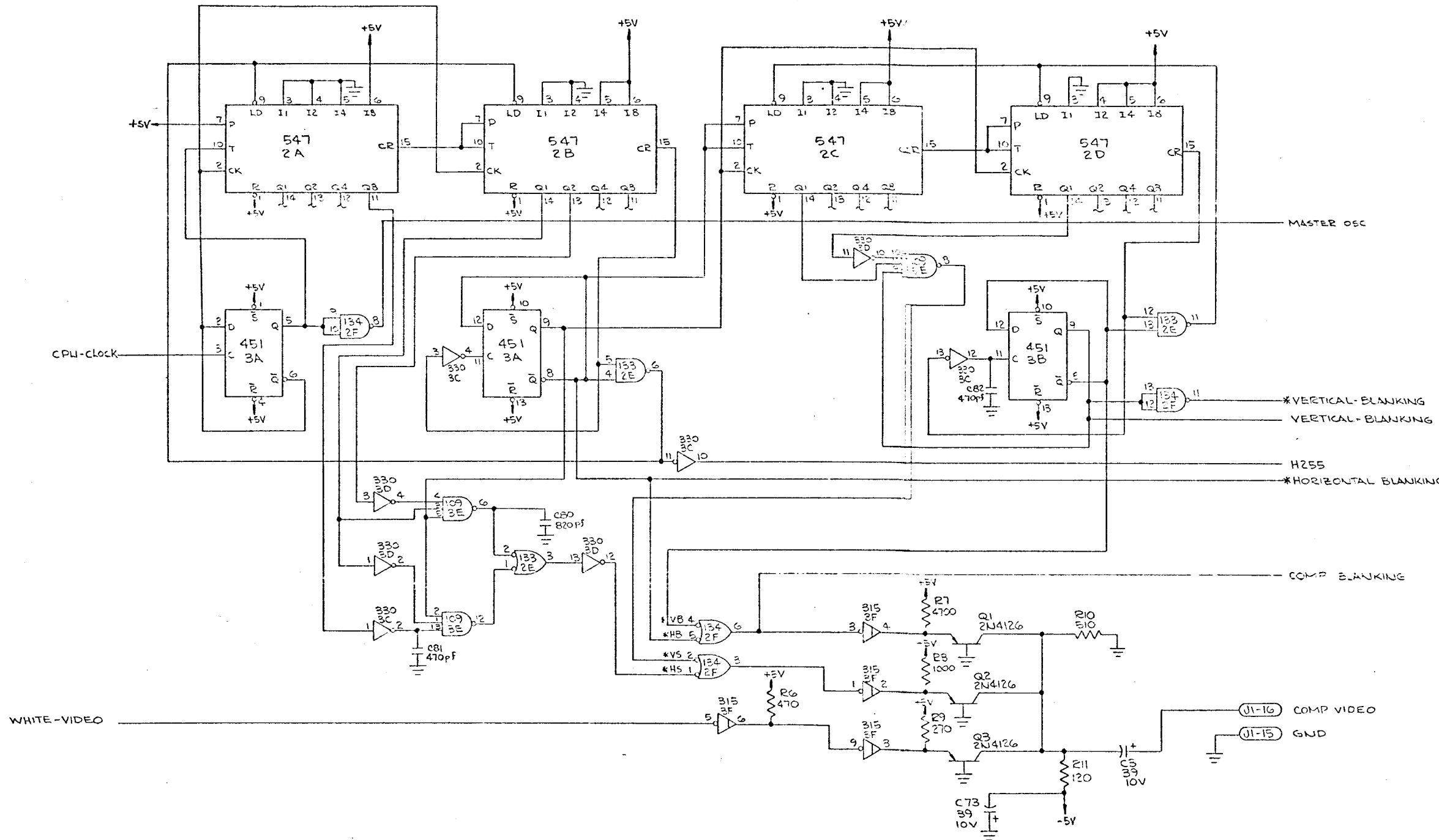
MICRO-PROCESSOR-STORAGE

QTY REQD	PART NO	ITEM DESCRIPTION	ITEM NO.
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TOLERANCES UNLESS OTHERWISE SPECIFIED FURNISH ALL DIMENSIONS TO TOLERANCE ALL SHARP EDGES		DO NOT SCALE DRAWING	
SIGNATURES		DATE	
DRAWN		DATE	
CHECKED		DATE	
FINISH		DATE	
NEXT ASSY		DATE	
SCALE		DWS NO.	
PART NO.		REV	
501003		B	

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REVISIONS			
LT#	DESCRIPTION	DATE	BY
1	SEE SH# 1		



SYNC-GENERATOR

QTY REQD	PART NO.	ITEM DESCRIPTION	TEN NO.
LIST OF MATERIALS			
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED		SIGNATURES	
.XX - .XXX - .XXX - .XXX		DATE	
MATERIAL		DWN	
FINISH		CHK	
NEXT ASSY		ENG	
		APV	

**RAMTEK**

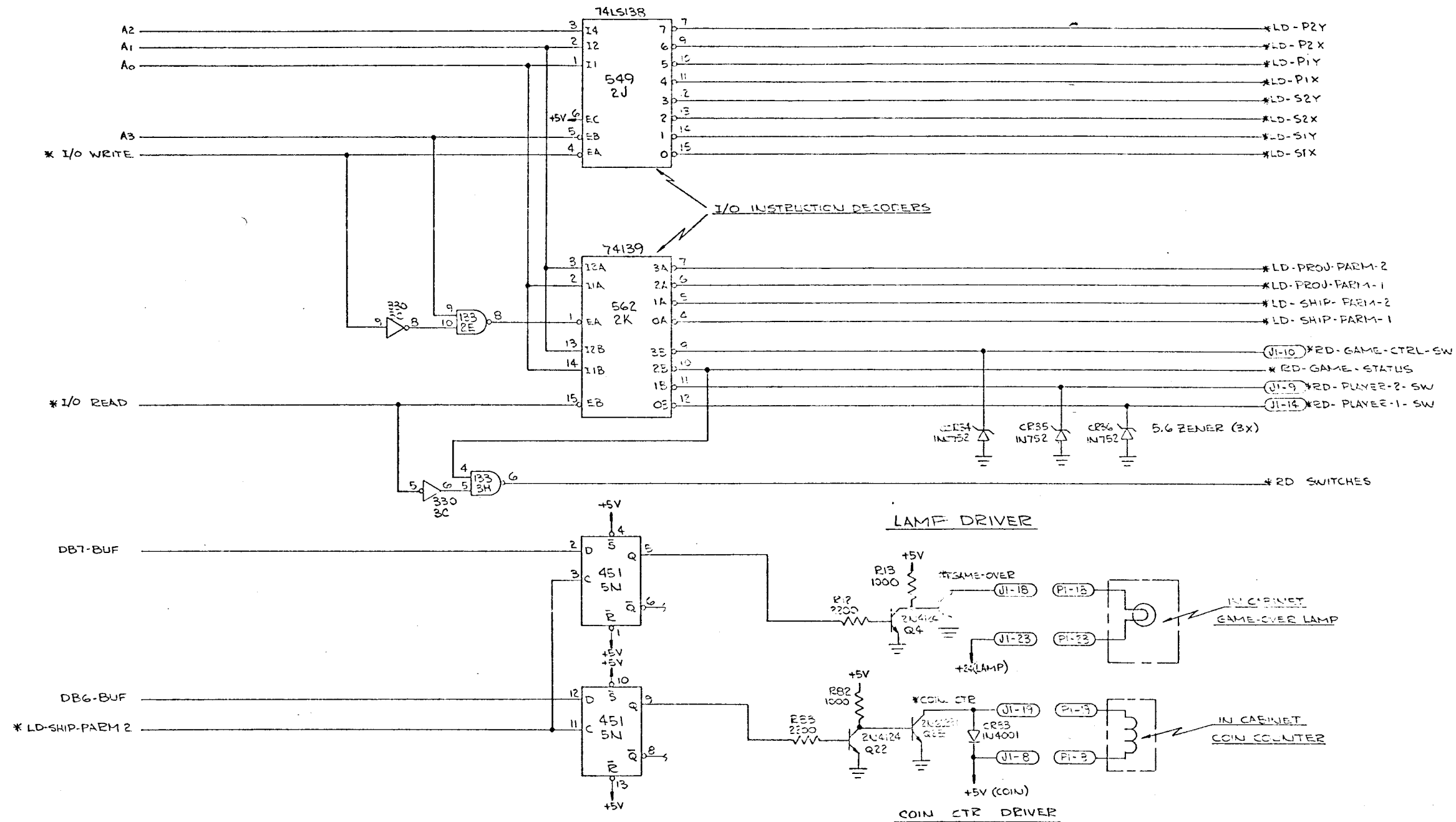
SCHEMATIC LOGIC/SOUND

REV. NO. 100744

REV. B

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REVISIONS			
LT#	DESCRIPTION	DATE	BY
-	SEE SHT 1		

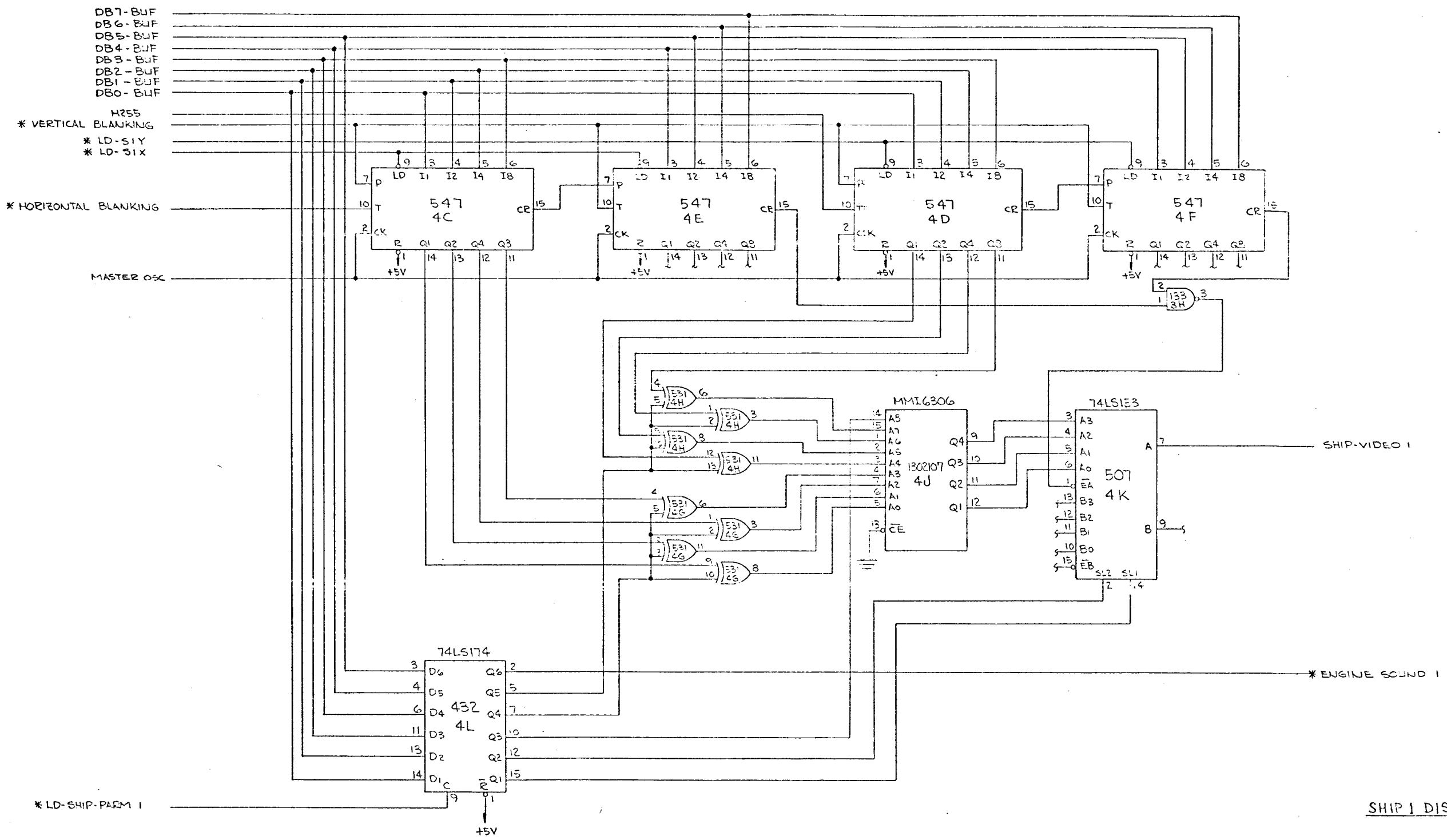


I/O DECODE LOGIC

QTY REQD	PART NO	ITEM DESCRIPTION	ITEM NO
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CIRCUIT LOGIC BOARD			
STAR BOARD			
JWB NO. 500011			
REV. B			

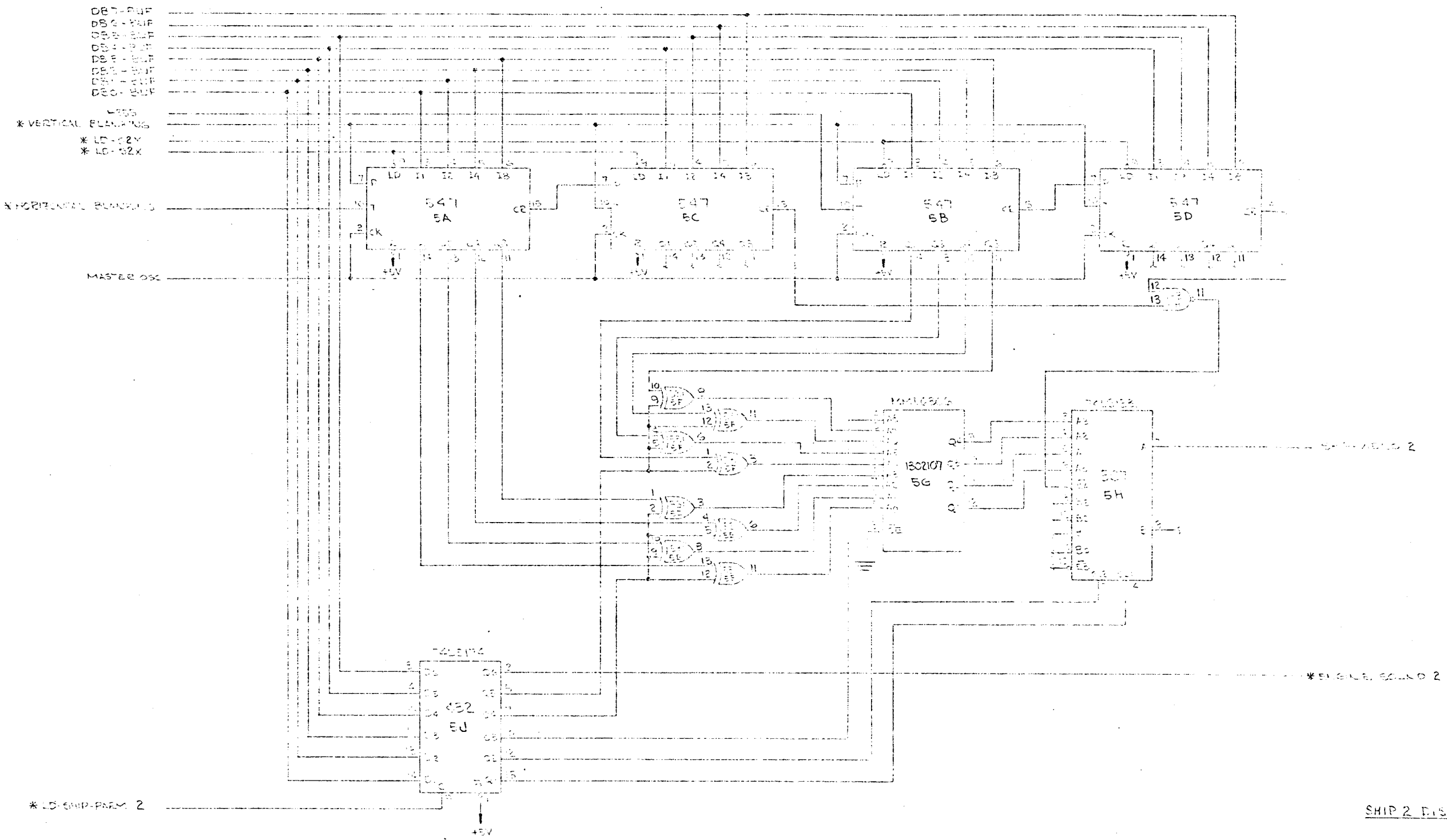
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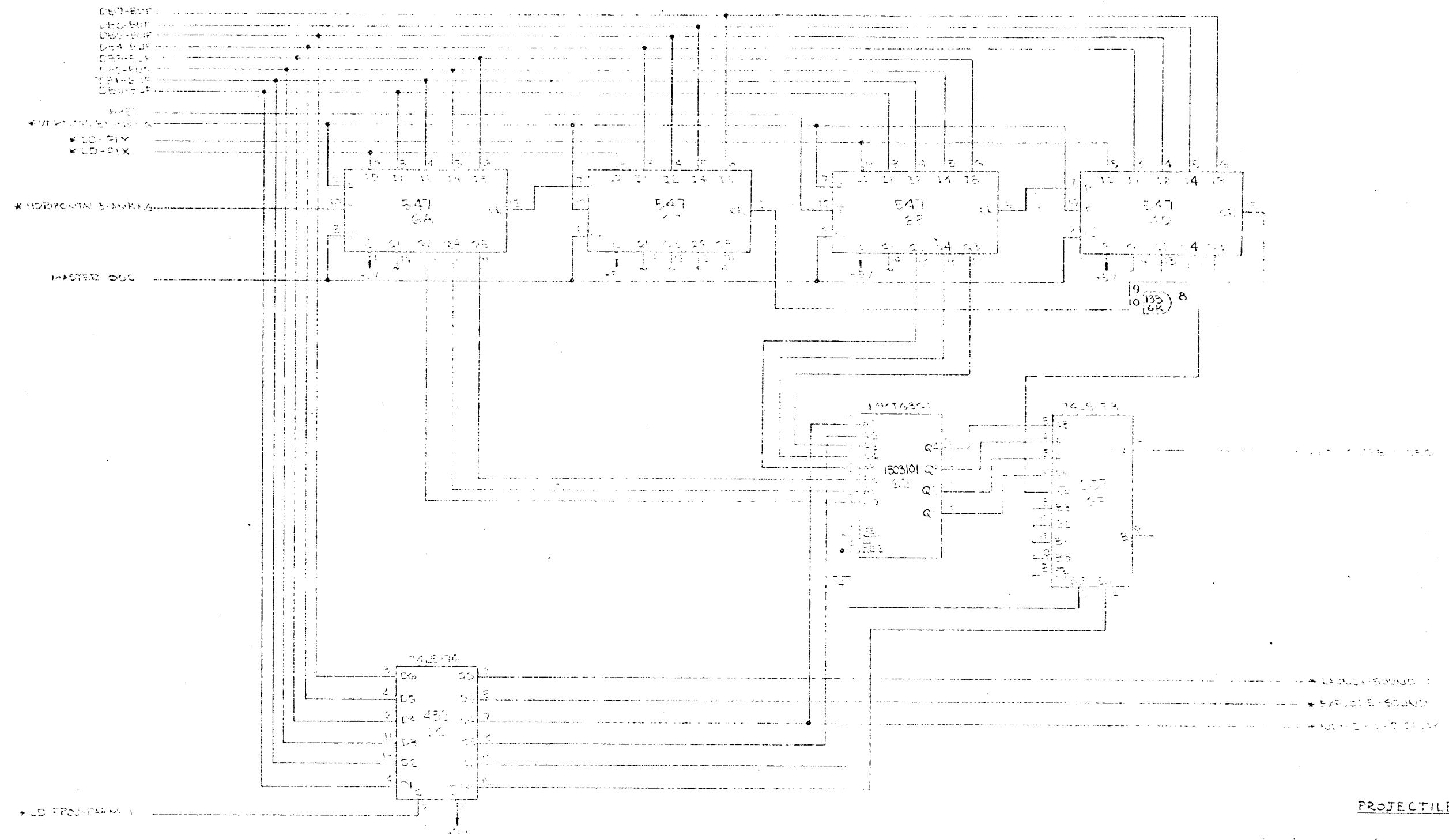
SHIP 1 DISPLAY & MOTION

QTY	PART NO	ITEM DESCRIPTION	ITEM NO																								
LIST OF MATERIALS																											
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FINISH		CHK																									
NEXT ASSY		ENG																									
		APVD																									
RAMTEK																											
AUTOMATIC LOCK/UNLOCK																											
DRAWN BY																											
SCALE	REV NO	REV																									
1:1	000	B																									



SHIP 2 DISPLAY & MOTION

DATE	DESIGNED BY	CHECKED BY	APPROVED BY
PROJECT			FRONTIER
SCHEMATIC			LOG 2/1000
DRAWN BY			
CHECKED BY			
APPROVED BY			B



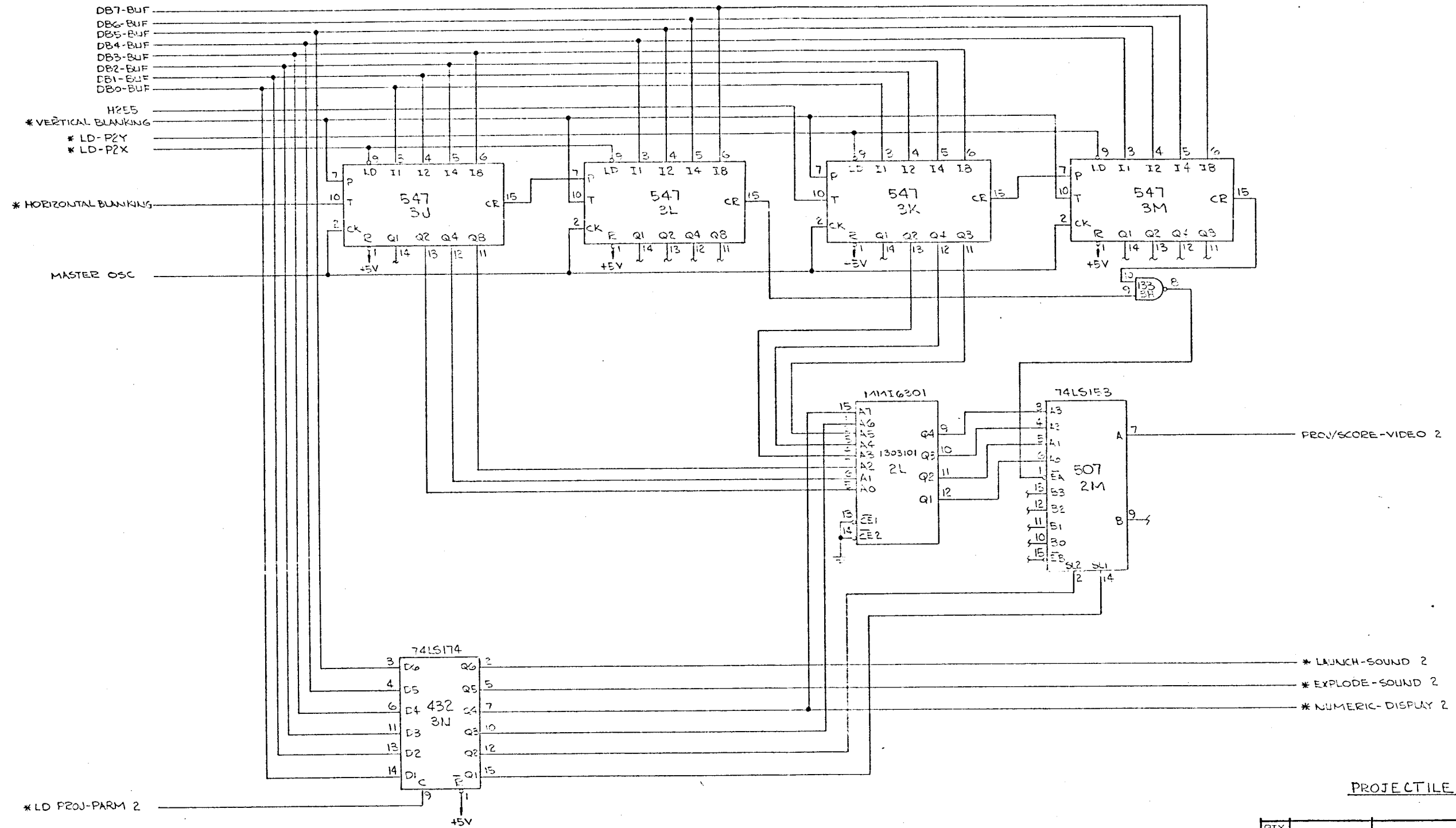
PROJECTILE & SCORE 1

REV	DATE	BY	DESCRIPTION
1			SCHEMATIC, LOGIC/SOUND
2			
3			
4			
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6			
7			
8			
9			
10			

RAMTEK  
SCHEMATIC, LOGIC/SOUND

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REVISIONS			
LTR	DESCRIPTION	APVD	DATE
-	SEE SHG 1	-	-



PROJECTILE & SCORE 2

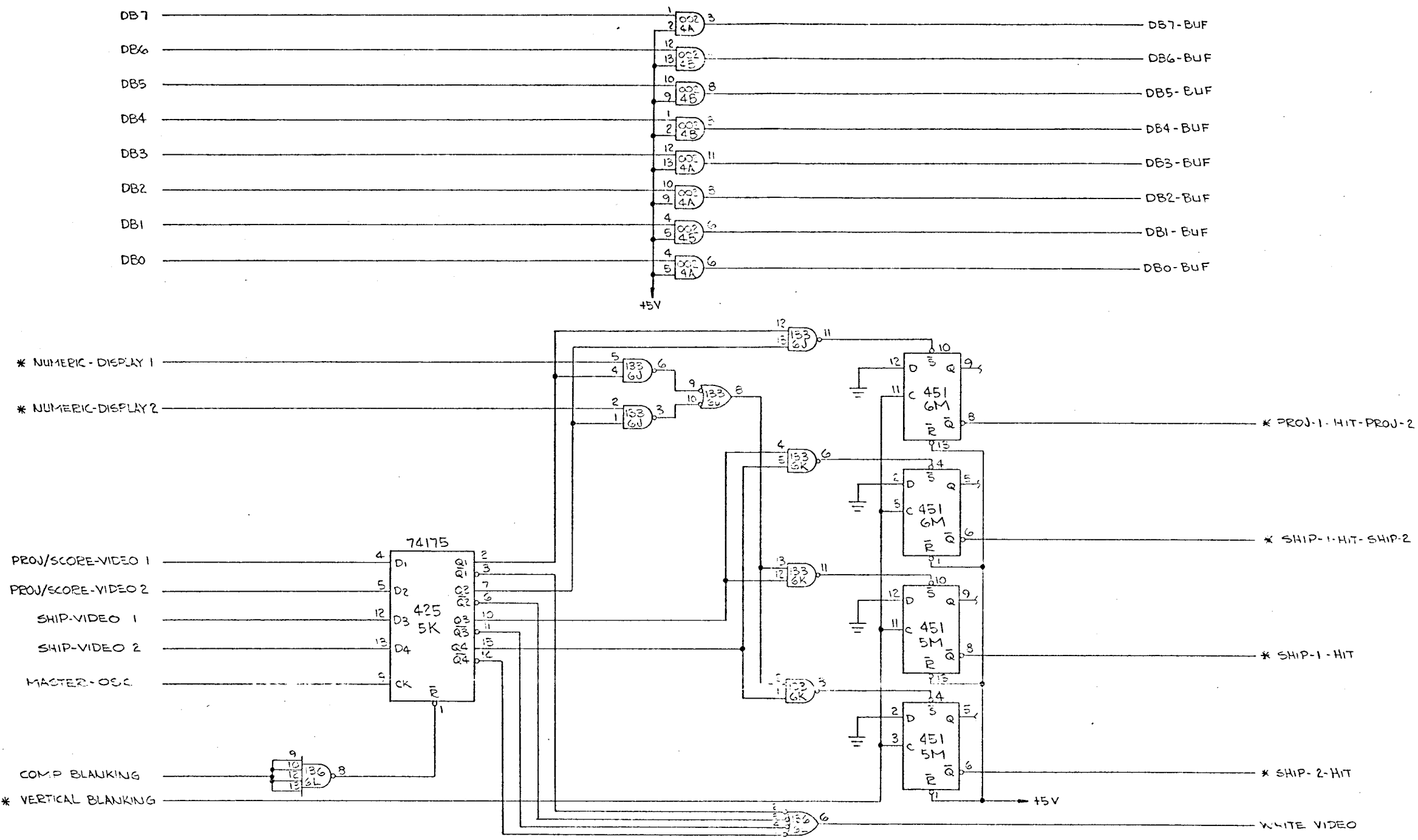
QTY REQD	PART NO.	ITEM DESCRIPTION	ITEM NO.
LIST OF MATERIALS			

TOLERANCES		DO NOT SCALE DRAWING		SIGNATURES		DATE	
UNLESS OTHERWISE SPECIFIED	REMOVE ALL DIMS & BREAK ALL SHARP EDGES	DWN					
MATL		CHK		RAMTEK SCHEMATIC, PROJ/SOUND *EXPLODE			
FINISH		ENC					
NEXT ASSY		APVD		DRG NO.	REV	DATE	
				570946	B		



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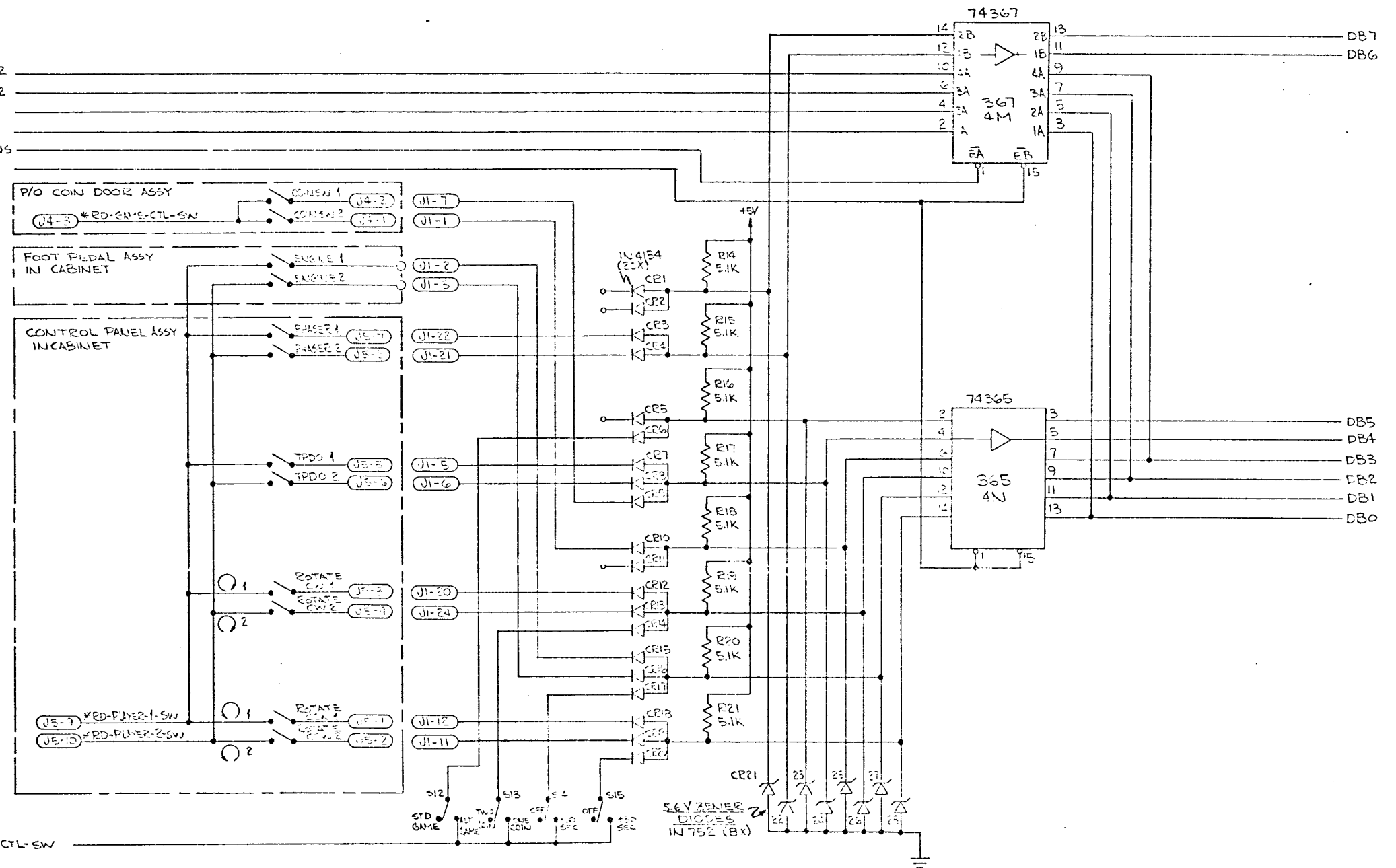
VIDEO CORRELATION LOGIC

QTY	PART NO.	ITEM DESCRIPTION	TEA NO.
LIST OF MATERIALS			
<b>RAMTEK</b>			
TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS & BREAK ALL SHARP EDGES.		SIGNATURES DATE	
XX	XXX	DWN	
AATL		CH1	
FINISH		ENG	
NEXT ASSY		APLD	

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REVISIONS			
LTR	DESCRIPTION	APPROV	DATE
-	SEE SET 1	-	-

- \* SHIP-1-HIT-SHIP 2
- \* PROJ-1-HIT-PROJ 2
- \* SHIP-1-HIT
- \* SHIP-2-HIT
- \* RD-GAME-STATUS
- \* RD-SWITCHS



I/O READ CIRCUITS

QTY REQD	PART NO.	ITEM DESCRIPTION	ITEM NO.
LIST OF MATERIALS			

TOLERANCES		DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED		SIGNATURES	
RESISTORS: 1% (R), 5% (R), 10% (R)		OWN	DATE
CAPACITORS: 5% (C), 10% (C)		CHK	
DIODES: 5% (D)		ENG	
TRANSISTORS: 5% (T)		APPV	
NEXT ASSY		REV	
		550844	
		B	