

TRI-SPORTS

Bally MIDWAY

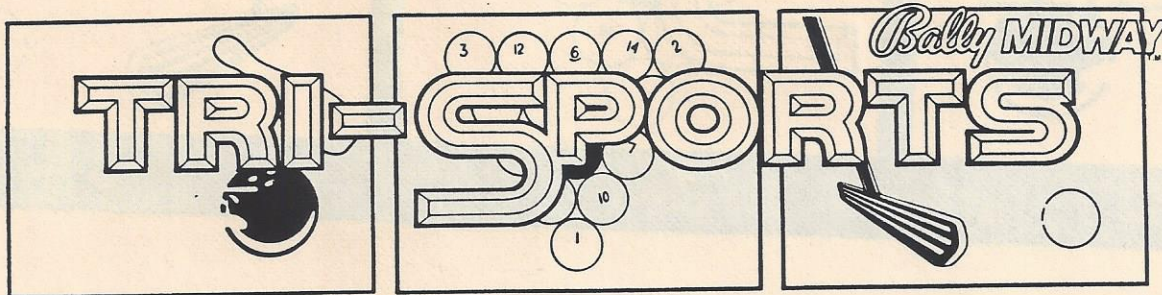
LIGHT SIDE ~~WITH~~ WHITE SWITCH

TEAM

- GRAY
- BLK
- BLK TAP
- BLK
- BLK w yellow dot
- GRAY
- GRAY
- GREEN dot
- GREEN
- BROWN
- BLK TAP

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p
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s

& Parts Information Manual



BOWLING

Regulation Bowling
Flash Bowling
Triple Strike Bowling

POOL

Straight Pool
Rotation Pool
9-Ball Pool
8-Ball Pool

GOLF

Mini-Golf Deluxe

TABLE OF CONTENTS

Section 1 Operation and Troubleshooting

Safety.....	1-2
Set-up Procedure	
Installation & Inspection.....	1-3
Location Requirements.....	1-4
Cabinet Assembly Diagram.....	1-4
Servicing	1-5
Game Rules and Features	
Starting-up.....	1-7
Player Controls.....	1-7
Control Panel Diagram.....	1-7
POOL SHARK Game Play.....	1-8
POOL SHARK House Rules.....	1-9
POWER STRIKE Game Play.....	1-10
MINI-GOLF DELUXE Game Play.....	1-11
Game Operation	
Control Switches.....	1-12
Control Switch Location Diagram.....	1-12
Game Adjustment & Diagnostics	
Starting-up.....	1-13
Main Test Menu.....	1-13
ROM Test, Screen Alignment, Color Test, Switch Test Battery RAM.....	1-14
DIP Switch Chart.....	1-15
Bookkeeping.....	1-16
Typical Bookkeeping Menu.....	1-16
Troubleshooting	1-17

3
Row

Section 2 Parts Information

Electrical Parts.....	2-2
Semiconductors & ICs.....	2-4
Hardware.....	2-6

Section 3 Diagrams and Schematics

JAMMA Edge Connector Chart.....	3-2
JAMMA Interface Board Layout.....	3-3
JAMMA Interface Board Schematic.....	3-4
Trak-ball Board Layout.....	3-5
Trak-ball Board Schematic.....	3-6
Audio Board Layout.....	3-7
Audio Board Schematic.....	3-8
CPU Layout.....	3-9
CPU Parts List.....	3-10
CPU Schematic.....	3-11
Cabinet Wiring Diagram.....	3-21
Interboard Wiring Diagram.....	3-23
Power Wiring Diagram.....	3-25

TRI-SPORTS

SECTION one

Operation and Troubleshooting Information

Safety Notices

The following safety hints apply to all game operators and service personnel. Specific warnings and cautions will be found throughout this manual where they apply. We recommend that you read this page, and also all of Section 1, before preparing your game for play.

WARNINGS

AC POWER CONNECTION. Before connecting the game to the AC power source, verify that the "line voltage selection chart" jumper wires are installed correctly for the line voltage in your area. For details, refer to Section 3.

PROPERLY GROUND THE GAME. To avoid electrical shocks, do not plug in the game until it has been inspected and properly grounded. Bally/Midway games should only be plugged into a grounded 3-wire outlet. Shocks will also result, if the control panel is not properly grounded! After servicing any parts on the panel, assure that the grounded wires are secure. Only then should you lock up the game.

DISCONNECT POWER DURING REPAIRS. To avoid electrical shock, disconnect the game from the AC power source before removing or repairing any part of the game. When removing or repairing the monitor, extra precautions must be taken to avoid electrical shock because high voltages may exist within the monitor circuitry and cathode ray tube (CRT) even after power has been disconnected. Do not touch internal parts of the display with your hands or metal objects! Always discharge the CRT: attach one end of a large, well-insulated, 20-kV jumper to ground. Momentarily touch the free end of the grounded jumper to the anode by sliding it under the anode cap. Wait two minutes and discharge the anode again.

USE THE PROPER FUSE. To avoid electrical shock, use the replacement fuse which is specified in the parts list for this game. The replacement fuse must match the original fuse replaced in fuse type, voltage rating, and current rating.

HANDLE FLUORESCENT TUBE AND CRT WITH CARE. If you drop a fluorescent tube or CRT and it breaks, it will implode! Shattered glass can fly eight feet or more from the implosion.

CAUTION

PROPERLY ATTACH ALL CONNECTORS. Make sure that the connectors on each printed circuit board (PCB) are properly connected. If they do not slip on easily, do not force them. A reversed connector may damage your game and void the warranty. All connectors are keyed to fit specific pins on each board.

Setup Procedure

Installation and Inspection

- [] 1. Remove the game from its shipping carton and inspect the exterior of the cabinet for any signs of damage.
- [] 2. Remove keys from the taped coin return slot to unlock and open the cabinet's coin door.
- [] 3. Remove the shipping cleats from the bottom of the cabinet.
- [] 4. After locating four threaded holes on the bottom of the cabinet (one in each corner), install one leg leveller (with its hex nut) in each hole and level the cabinet.
- [] 5. Stand the cabinet upright and make certain that it is in a stable position.
- [] 6. Unscrew and remove the rear doors of the cabinet and inspect the interior for any signs of damage. The cabinet's front access door can be removed by reaching through the coin door and unfastening the inside latches that keeps the door locked. Slide the Video Board out and inspect it for any damage.
- [] 7. Refer to the game's cabinet wiring diagram (located in Section 3 of this manual), and check to see that all cable connectors and cable plugs are correctly secured and firmly seated. **DO NOT FORCE PLUGS ONTO CONNECTORS.** Watch for damaged plugs or connectors and avoid making reversed connections.
- [] 8. Check all major subassemblies to assure that they are mounted securely.
- [] 9. **Line Voltage Selection.** Your game is designed to work properly on the line voltage where you are located. Check your line voltage with a meter to determine what its value is. Then, check the power input wires to the main power supply transformer on your game to be sure they are connected to taps which correspond to your local line voltage value.

If the power input wires to the main power supply transformer are not connected to taps that correspond to your local voltage, move them to the proper taps.

If the line voltage in your area falls outside the upper or lower limits of the range of voltage inputs covered by the main power supply transformer, **DO NOT PLUG YOUR GAME IN** until you have contacted your distributor or the Bally/Midway Service Department and obtained a solution to the problem. Other wise, you could damage your game.

LOCATION REQUIREMENTS

Power: Domestic 115V @ 60 Hz

Foreign 230V @ 50 Hz

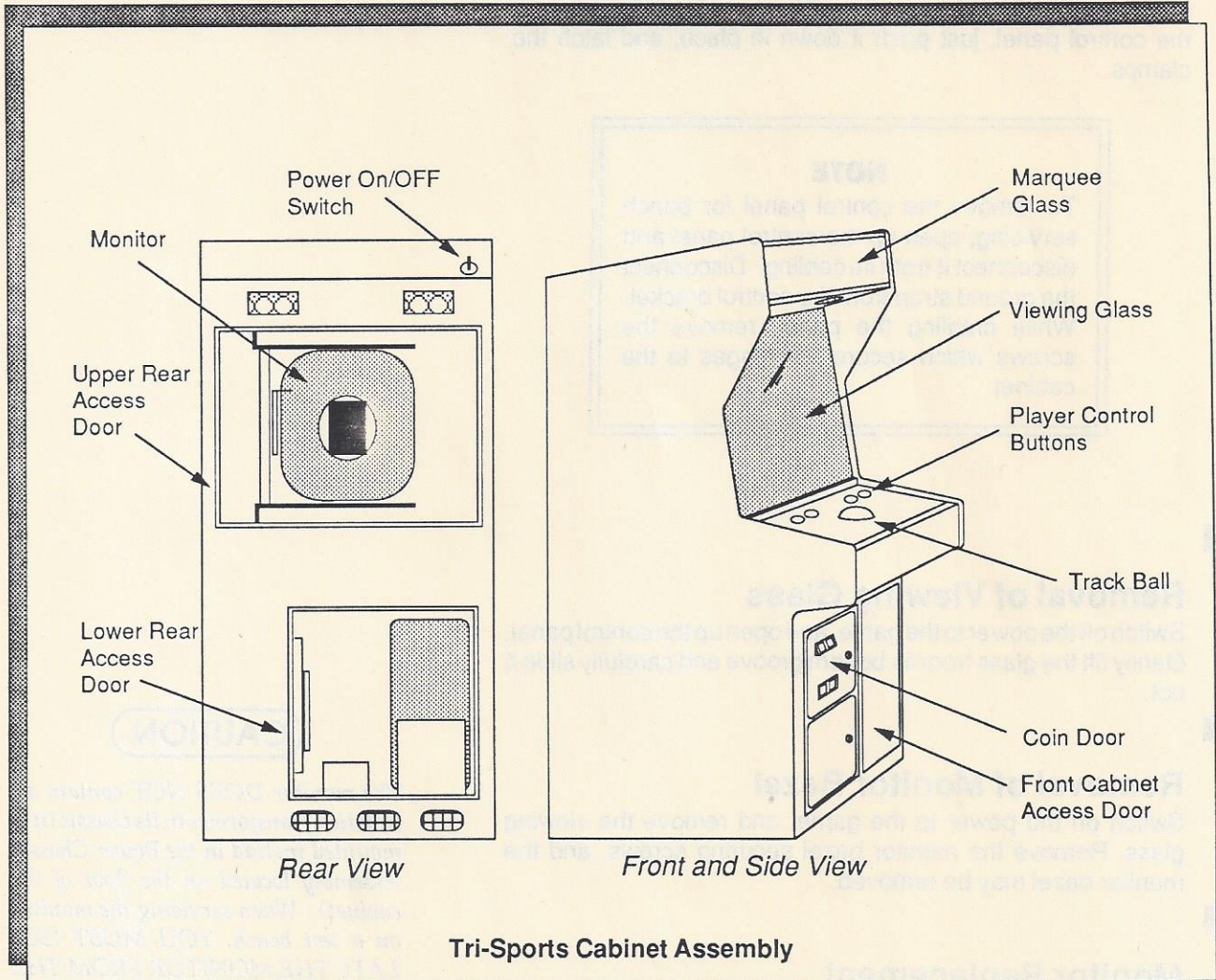
Temp.: 32 F to 100 F (0 C to 38 C)

Humidity: Not to exceed 95% relative.

[] 10. After lifting out the three-pronged line cord (connected to the Power Chassis), close and lock the front and screw in the rear doors.

[] 11. Connect the three-pronged line cord to a three-slot AC wall outlet to insure proper grounding.

[] 12. Switch the ON/OFF switch, located on top of the cabinet towards the left rear side, to the ON position..



Servicing

■ Servicing the Control Panel

Switch off power to the game. The control panel is held in place by two latch clamps (located on the left and right sides of the cabinet) which provide constant pressure on the strikes. The left clamp can be reached through the coin door, and the right clamp can be reached through the front access door. To release the clamps, lift the latch handle and unhook the wire fasteners. While firmly holding the cabinet viewing glass in place, use the joystick to gently pull the panel out. To resecure the control panel, just push it down in place, and latch the clamps.

NOTE

To remove the control panel for bench servicing, open up the control panel and disconnect it from its cabling. Disconnect the ground strap from the control bracket. While cradling the panel, remove the screws which secure the hinges to the cabinet.

■ Removal of Viewing Glass

Switch off the power to the game, and open up the control panel. Gently lift the glass from its bottom groove and carefully slide it out.

■ Removal of Monitor Bezel

Switch off the power to the game, and remove the viewing glass. Remove the monitor bezel securing screws, and the monitor bezel may be removed.

■ Monitor Replacement

We recommend that you read the WARNINGS section thoroughly before beginning this procedure.

Switch off the power to the game. Open up the upper rear door. Remove the viewing glass and the monitor bezel. Completely disconnect the monitor from all of its cabling, including its chassis ground strap. The monitor's mounting flanges are secured by four bolts to the monitor's mounting panel. Remove these bolts to unsecure the monitor. The monitor can then be removed from the front.

CAUTION

The monitor DOES NOT contain an isolation transformer in its chassis (it is mounted instead in the Power Chassis Assembly located on the floor of the cabinet). When servicing the monitor on a test bench, YOU MUST ISOLATE THE MONITOR FROM THE LINE VOLTAGE WITH AN ISOLATION TRANSFORMER.

CAUTION

While removing the four bolts, firmly support the monitor from the front of the CRT so that it will not slip.

WARNING

If you drop a fluorescent tube and it breaks, it will implode! Use care in handling.

■ Removal of the Header Attract Glass

Switch off the power to the game. The glass is held in place by retaining brackets at the top and bottom of the glass. The top retaining bracket is secured to the cabinet by five torx® tamper-resistant screws. Remove these screws using the proper torx® tool.

The fluorescent light tube starter may also be replaced at this time. Grasp the starter (located on the back of the mounting bracket of fluorescent light assembly), give it a quarter turn, and remove it from its socket. Carefully place a new tube starter into the socket, and turn to reinstall.

■ Removal of the Fluorescent Light Assembly

After switching off the power to the game, remove the header glass. Disconnect the fluorescent light assembly from its power cable. Remove the screws which secure the assembly to the cabinet and lift out the assembly.

■ Removal of the Speakers

Switch off the power to the game. Take out the tamper-resistant screws which secure the speaker grille to the cabinet, and remove the speaker grille. Remove the rear cabinet door. Disconnect the speaker from its cabling. The speaker is secured to the cabinet with two carriage bolts and two hex nuts. Remove the speaker by removing the nuts and sliding the bolts out of the cabinet.

■ Volume Control and Diagnostics Switches

Looking inside the coin door, you will find the game's control switches. Located towards the near left corner is the Power Interlock Switch. The Volume Control Potentiometer is the white knob located on left side of the bracket which is mounted at the rear of the coin box. Turning the knob clockwise will increase volume. The upper right switch on the bracket is the Test/Diagnostics Switch which enables you to enter the game's test mode. Finally, the lower right switch located on the bracket is the Service Credit Switch, which enables you to add credits to a game for service testing without affecting the game's book-keeping total.

■ Option Switch Settings

The option switch controls all game options. It is located on the 68000 Video Board which is mounted inside the lower portion of the cabinet. Refer to the Video Board Reference Drawing for option switch settings.

Game Rules and Features

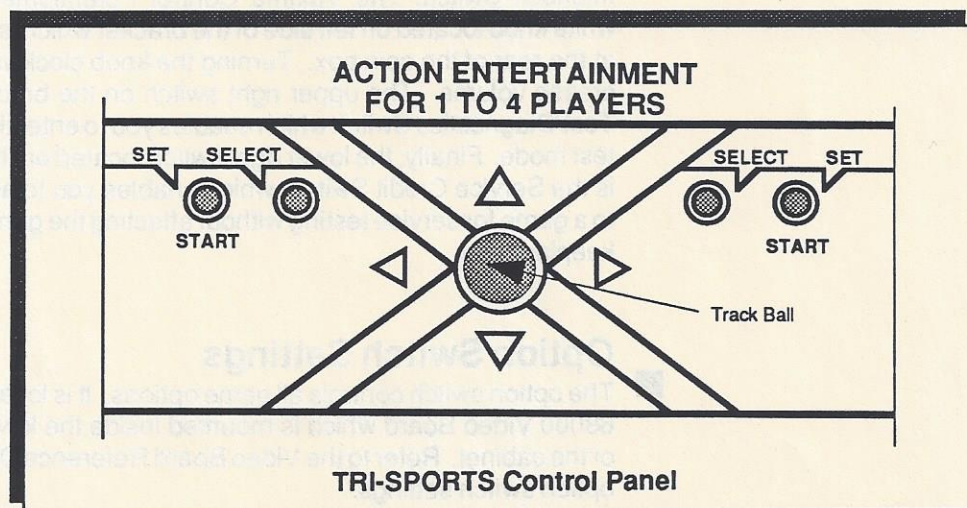
Starting Up

Switch on the power to the game. After the proper coinage has been inserted, the game exits the attract mode and enters the play mode. Play mode halts momentarily until the number of players participating in the game has been selected by using either SELECT button or the TRAK-BALL. Tri-Sports is a one- to four-player game. Players then choose the game they want to play, again using the SELECT button or the TRAK-BALL. Tri-Sports offers three different games to choose from: Pool Shark; Power Strike; or Mini-Golf Deluxe.

Tri-Sports is a one- to four-player game.

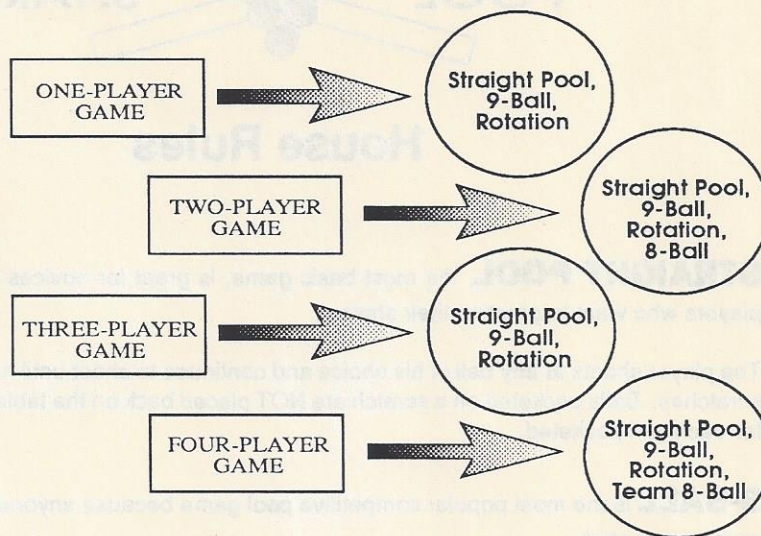
Player Controls

- **SELECT** buttons allow players to manipulate the cursor to make their selection from the choices presented on the monitor screen during the Play mode. In Mini-Golf Deluxe, the SELECT button allows players to shift the starting position of the tee. In Power Strike, it can be used to control the degree of the hook of the bowling ball. In Pool Shark, it controls the ball spin.
- **SET** buttons allow players to enter selections in the Play mode and set the positions of the balls during game play.
- **THE TRAK BALL** allows players to position balls during game play and also control their speed and direction. It also allows players to make selections during the beginning of the Play mode. In Pool Shark, the TRAK-BALL only controls cue ball positioning and speed.



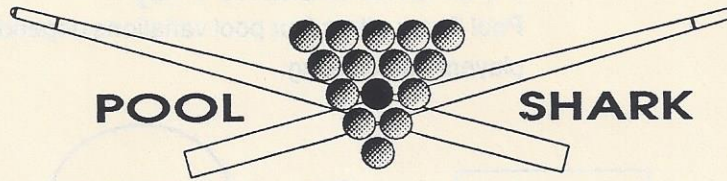
Pool Shark Game Play

Pool Shark offers four pool variations depending on the number of players participating.



The following game play rules apply to all four variations of Pool Shark:

1. On breaks and scratches, position the cue ball anywhere behind the line and press the SET button to secure the ball's placement.
2. Position the flashing AIMING SPOT and press the SET button to freeze the spot. While in motion, the cue ball will travel on a straight path to the positioned AIMING SPOT.
3. Use the SELECT button to choose the style of ball spin: CENTER, FOLLOW (overspin), or DRAW (underspin).
4. Complete the shot by spinning the TRAK-BALL in any direction. The speed of a shot is controlled by varying the force of the spin on the TRAK-BALL.
5. There is a predetermined number of turns for each player that is displayed in a box on the lower left side of the screen. A turn ends when a player either fails to sink a ball or scratches the cue ball.
6. A timer is located above the box displaying the number of turns. If a player is taking too much time for a shot, a whistle blows and the timer begins to decrement. If the timer runs out before a shot is made, another whistle blows and the turn is forfeited.
7. When all turns are expended, players may buy-in to continue the game where they left off.



House Rules

STRAIGHT POOL, the most basic game, is great for novices as well as advanced players who want to practice their shots.

The player shoots at any ball of his choice and continues to shoot until he fails to sink a ball or scratches. Balls pocketed on a scratch are NOT placed back on the table. One point is scored for each ball pocketed.

9-BALL is the most popular competitive pool game because anyone can potentially win a rack on any shot.

This is a game of rotation. An "X" cursor mark indicates the ball that the player must hit first. As long as that ball is hit first, any ball pocketed awards a point to the player, and he continues his turn with another shot. If the 9-Ball was among the balls pocketed, the player wins the rack. Ten points are awarded for the 9-Ball plus one point for each other ball remaining on the table. When all turns are expended, the winner is the one with the most cumulative points.

House rules bring the 9-Ball back on the table whenever it is sunk illegally. On any scratch, the cue ball is placed behind the scratch line. There is no "ball in hand" rule.

ROTATION is generally a game for the advanced player. Like 9-Ball, a player must hit the cursored ball (indicated by the "X" mark) first. As long as the cursored ball is hit first, any ball pocketed awards that ball's numerical value.

8-BALL is an old favorite for competitive play. This variation is only offered in a two-player game or as a four-player team competition.

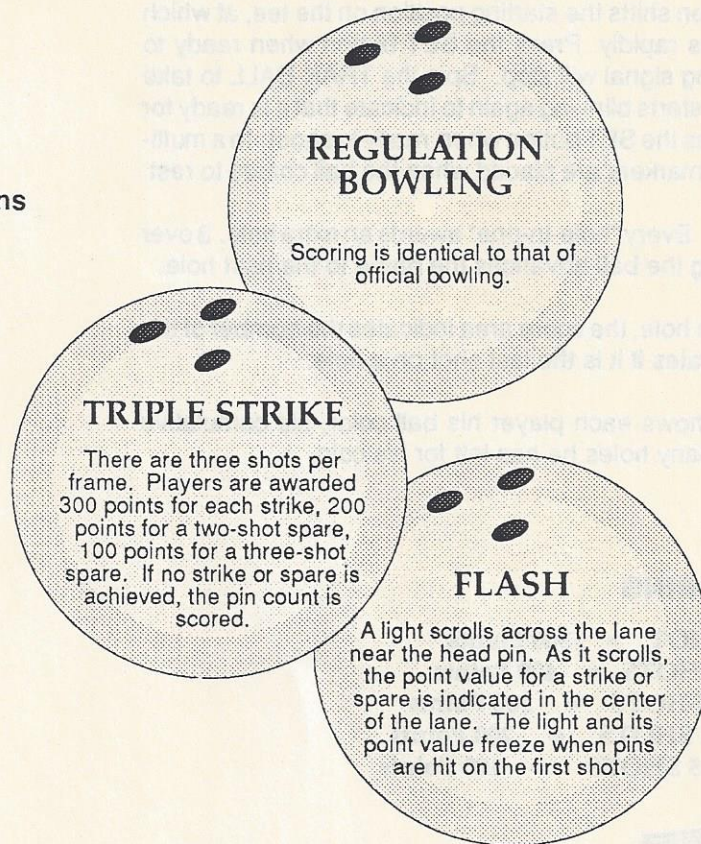
Players shoot for stripes or solids. The first ball pocketed on a rack shot determines which type of ball to shoot for, unless more than one ball is pocketed. In this case, the majority of one type of ball (stripe or solid) pocketed determines what the player will shoot for. Any ball sunk awards a point, which is displayed beneath the score areas, to the appropriate player. When a player or team pockets all of their balls, the 8-Ball becomes the object ball. If the 8-Ball is pocketed without scratching, the player or players win the rack and 10 points are awarded for the 8-Ball plus a point for each remaining ball on the table. If the 8-Ball is pocketed prematurely or on a scratched cue ball, the rack is lost and all points go to the opponent. The winner of the match is the one with the most cumulative points.

House rules allow players to hit any ball legally as long as one of their own ball type is pocketed. If the 8-Ball is sunk on the break, the shooter loses the game.

Power Strike Game Play

Power Strike offers three variations of bowling to choose from- Regulation, Flash, or Triple Strike.

Game Variations



Basic game play is the same for all variations.

- 1. The SELECT button controls the degree of hook which is displayed at the left side of the lane.*
- 2. Direction and speed are controlled by rolling the TRAK-BALL.*
- 3. Players use the TRAK-BALL to position the bowling ball behind the foul line. If the ball crosses the foul line while positioning, the ball is rolled down the lane rather than penalizing the player with a gutter ball.*
- 4. If a player is taking too much time on a shot, a timer is activated in the ball hook selection area. If the time elapses, the player is penalized with the equivalent of a gutter ball.*

Mini-Golf Deluxe

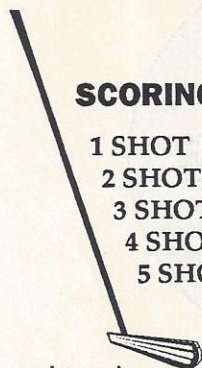
Mini-Golf Deluxe offers eighteen different holes to master.

The TRAK-BALL controls the speed and direction of the golf ball. The SELECT button shifts the starting position on the tee, at which time the ball blinks rapidly. Press the SET button when ready to shoot. The blinking signal will stop. Spin the TRAK-BALL to take the shot. The ball starts blinking again to indicate that it is ready for the next shot. Press the SET button when ready to shoot. In a multi-player game, ball markers are placed when the ball comes to rest.

All holes are par 2. Every "hole-in-one" awards an extra hole. 3 over par without sinking the ball advances the game to the next hole.

At the start of each hole, the score area indicates the number of the hole. A sign indicates if it is the last shot on a hole.

The score area shows each player his ball color, his cumulative score, and how many holes he has left for his coin.



SCORING

1 SHOT	=	500 Points
2 SHOTS	=	400 Points
3 SHOTS	=	300 Points
4 SHOTS	=	200 Points
5 SHOTS	=	100 Points

When a player is out of holes, he has the option of buying more holes. The player always receives a message indicating this option when he is on his last hole.

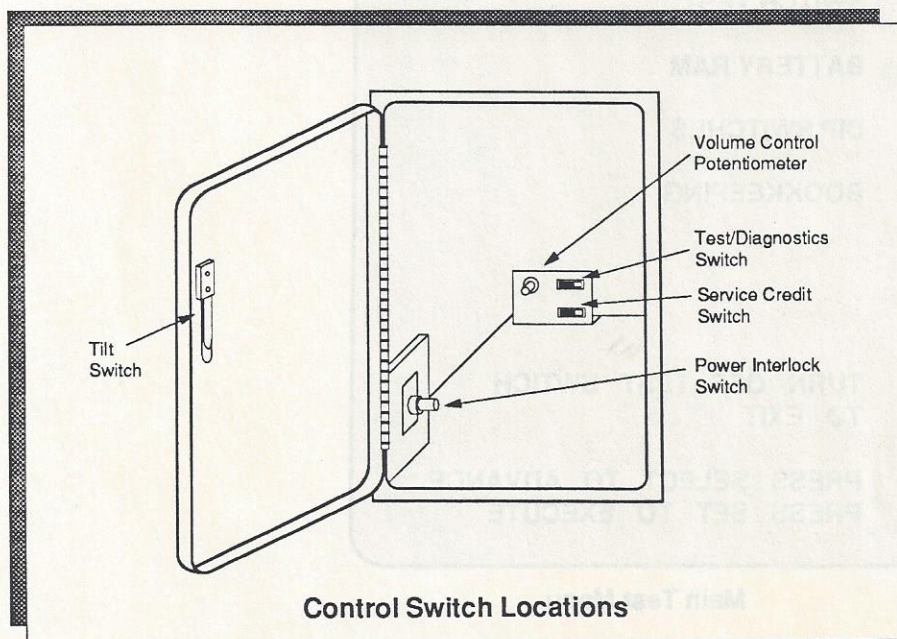
If a player is taking too much time, a timer counts down in the score area. When the timer runs out, the player loses his turn.

Game Operation

Tri-Sports is a one- to four-player video game with a color monitor. From the player's perspective, the game has two modes of operation: Ready-to-Play and Play. From the service technician's perspective, the game has an additional mode of operation called Game Diagnostics, which contains Self-Test and Game Adjustment features.

Control Switches

- **COIN DOOR SLAM/TILT SWITCH** detects any forceful vibrations against the Coin Door. The Tilt Switch is also used to control certain option features within the Diagnostics mode.
- **VOLUME CONTROL POTENTIOMETER** can be used to increase or decrease the volume level of the game music and speech. For greater profits, set your game's volume level at its maximum.
- **TEST/DIAGNOSTICS SWITCH** allows you to enter into the game's Diagnostic mode. Turn the game off. Push the Test Switch towards the left to enter the Diagnostics mode, turn the game on. To exit this mode, simply turn off the Test Switch.
- **SERVICE CREDIT SWITCH** is a special feature switch that allots credit without affecting the game's bookkeeping total.
- **POWER INTERLOCK SWITCH** is a safety switch to assure that the power to the game is turned off during servicing.



Game Adjustments & Diagnostics

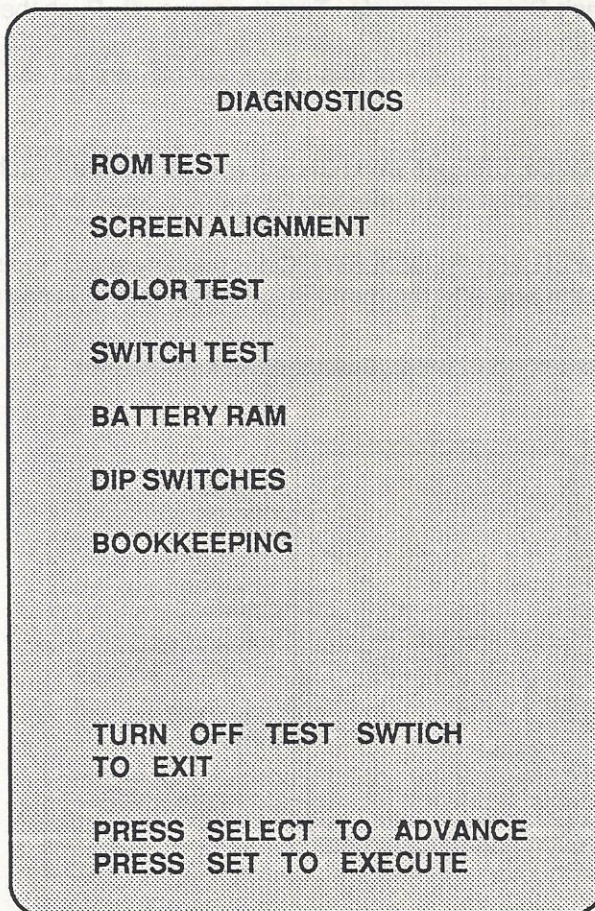
Starting Up

All Tri-Sports game adjustments and diagnostics are menu-driven features. Each menu lists several choices that you may act upon as desired. Tri-Sports contains many menu levels (i.e., one menu selection will send the game to another menu).

Switch off the power to the game. Locate the Test Switch and push it towards the left to activate the Tri-Sports Diagnostics mode. Turn the game on. The first menu you see is the main test menu. Game adjustments, bookkeeping, and diagnostics are all available from this menu.

Once in the main test menu, use the SELECT button to select an option and the SET button to enter into it. Notice that the selected option is always the one that is highlighted.

The main test menu lists seven diagnostic options to enter.



Main Test Menu

NOTE

TRI-SPORTS provides front mounted monitor controls located inside the control panel opening and beneath the monitor.

NOTE

The extra video cable from the JAMMA Harness, located on the Sliding Rack Assembly, is for standard JAMMA monitor connection. This cable can be used to aid in future game conversions. Also for future game conversions, the monitor may be mounted horizontally as well as vertically.

ROM Test

The ROM Test lists the four game ROMs and identifies any non-functional ROMs. Also, the location slot number is listed beside each ROM number. The word "PASSED" signifies that the ROM is in working order. A "FAILED" message indicates a bad ROM. Press the SET button to exit this test.

Screen Alignment

The Convergence Grid Display Test displays a crosshatch pattern to aid in adjusting the monitor's convergence, vertical/horizontal linearity, and vertical/horizontal sizing. To assure that the monitor is balanced, adjust the small white knobs located on the monitor board until the two vertical red lines on either side of the grid pattern accurately join the horizontal red line at the endpoints, on the lower portion of the screen. Beneath the horizontal red line is a thick area of blue, and one line of red. To double-check your adjustment, enter the game's Attract mode to see if the number next to the score area on the bowling screen is clearly visible. The ball should appear round, and the return gutter should be completely visible. Press the SET button to exit this test.

Color Test

Use the SELECT button to choose the color you want to check or adjust, and then press the SET button. Check the screen for any color imbalance. You can use the knobs located on the monitor board to adjust screen colors. If white is pure white, your colors are correct. To exit this test, use the SELECT button to advance to "EXIT" and press the SET button.

Switch Test

The Switch Test allows you to determine whether all game switches and the TRAK-BALL are operating properly. Run through this test by activating the switches listed on the screen one at a time, and checking to see if the game acknowledges them. When a switch is activated, the word "ON" (in blue letters) will flash next to the switch name. The TRAK-BALL should acknowledge 15 position points in the positive and negative x and y directions (up, down, left, and right). Roll the TRAK-BALL in the four different directions to assure that its directional sensors are in proper working order. To exit the Switch Test, hit Tilt, or slide the Test Switch to the off position.

Battery RAM

The Battery RAM game adjustment feature allows you reset high scores and game bookkeeping. Use the SELECT button to choose what you want to reset, and execute it with the SET button. This adjustment feature has an added safety menu that is activated if you select "RESET BOOKKEEPING" and press the SET button. This is to assure that bookkeeping totals are not cleared accidentally. The third selection enables you to reset both high scores and bookkeeping simultaneously. To exit the Battery RAM feature, advance to "EXIT" and press SET.

DIP Switches

Many game options are adjustable by changing the bit switch settings on the DIP switch unit, located at pin position 12A on the 68000 Video Board. The 68000 Video Board can be found just inside the right front access door, on the sliding rack assembly. The DIP switch unit combines ten bit switches, which are set to the ON ("OPEN") or OFF position. All DIP switch options are contained in the DIP Switch Settings Table.

DIP Switch Settings Table

	SW 1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9*	SW10*
COIN SETTINGS:										
1 Coin;1 Credit	OFF	OFF	OFF							
2 Coins;1 Credit	ON	OFF	OFF							
1 Coins;2 Credit	OFF	ON	OFF							
1 Coins;3 Credit	ON	ON	OFF							
3 Coin; 1 Credit	OFF	OFF	ON							
4 Coin; 1 Credit	ON	OFF	ON							
FREE PLAY	OFF	ON	ON							
BATTERY OPTIONS	ON	ON	ON							
POOL TURNS:										
6 TURNS				OFF	OFF					
5 TURNS				ON	OFF					
7 TURNS				OFF	ON					
8 TURNS				ON	ON					
BOWLING DIFFICULTY:										
STANDARD						ON				
ADVANCES						OFF				
SHOT TIMER:										
STANDARD							OFF			
SLOWER							ON			
GOLF HOLES:										
3 HOLES								ON		
4 HOLES								OFF		

* Switches 9 and 10: Not Used

Bookkeeping

The final selection in the Diagnostics mode is Bookkeeping. The Tri-Sports Bookkeeping tables cover all variations of Pool Shark, Power Strike, and Mini-Golf Deluxe. Bookkeeping also provides a summary total for all games. Use the SELECT button to advance from one table to the next.

The first five bookkeeping tables each consist of six categories which detail various game characteristics. To see if your game is earning the best it can for the location it is at, go to the last bookkeeping table, "Summary of All Games", and check average game time. If the game time is longer then desired check to see which game is being played the longest and make the necessary adjustments.

To clear bookkeeping tables, enter the Battery RAM adjustment feature and select "RESET BOOKKEEPING".

TIME COUNTS breaks down the **TOTAL PLAYS** to indicate how long the games are lasting.

SCORE COUNTS feature breaks down the **TOTAL PLAYS** to keep an account of how many players have earned what scores.

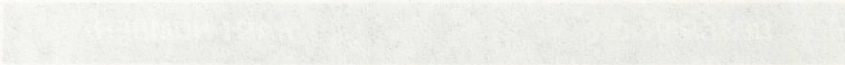
STRAIGHT POOL SUMMARY		
TOTAL PLAYS		0
TOTAL COINS		0
AVERAGE TIME		0
AVERAGE SCORE		0
TIME COUNTS		
0 TO 1 MIN		0
1 TO 2 MIN		0
2 TO 3 MIN		0
3 TO 4 MIN		0
4 TO 5 MIN		0
OVER 5 MIN		0
SCORE COUNTS		
0 TO 10		0
TO 20		0
TO 30		0
TO 40		0
TO 50		0
OVER 60		0
PRESS SELECT FOR NEXT PAGE		

Typical Coin Bookkeeping Menu

Troubleshooting

Problem	Possible Solution
NO PICTURE OR DISTORTED PICTURE	Faulty video board or monitor. Missing or disconnected video signal cable.
TURN GAME ON & NOTHING HAPPENS	Check that +5V is going to pins C, D, 3 and 4 of the JAMMA Connector.
NO SOUND	Check interboard wiring from video board to sound board. Check the speaker and speaker connection to pins L and 10 on JAMMA Connector. Check that +12V is going to pins F and 6 on the JAMMA Connector. Check volume control setting. Check wiring from Jamma Board and Sound Board.
NO GENERAL ILLUMINATION	Check the 1A S.B. fuse on the wall of the cabinet above the coin box.
MOVE TRAK-BALL & CURSOR DOES NOT MOVE	Check for open wires between Trak-ball & JAMMA Interface Board, and between JAMMA Interface Board & video board. Check for contamination on video board pins. Check for proper grounding on Trak-ball.
PRESS SET OR SELECT BUTTON & NOTHING HAPPENS	Check for open wires between button & JAMMA Interface Board, and JAMMA Interface Board & video board. Check for contamination on video board pins or switch blades. Check for proper grounding of buttons.
PUT IN COINS & DO NOT RECEIVE A CREDIT	Check DIP switch coin setting and for contamination on switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on JAMMA Connector or Coin Switch 2 and pin 16 of JAMMA Connector.
PUT IN COINS & GET TOO MANY CREDITS	Check coinage setting and for short between pins T & 16 on JAMMA Connector.

TRI-SPORTS



Battery

5880-11028-00 Lithium Battery, 3V (used for video board)
 P/N C-10248-1028 only

Cables

H-12718 Coin Door Cable
 H-12714 Control Panel Cable
 H-12716 Main Harness
 H-12703 Power 10 Cable
 H-12685 Power Fax Jumper Cable
 A-12740 Power Supply Cord Assembly
 H-12708 Sound Board Jumper Cable
 H-12713 Speaker Cable
 H-12732 Video Line Voltage Cable
 H-12048-3 Video Signal Cable
 H-12748-1 Video Signal Cable
 H-12525 JAMMA Interface Cable
 H-8885-4 Voltage Control Cable

SECTION two

Electrolytic Capacitors

5040-08343-00 100µF at 50V ±50%
 5040-08385-00 100µF at 50V
 5040-08778-00 470µF at 16V ±50-10%
 5040-10874-00 100µF at 35V
 5040-12008-00 1000µF at 16V ±50%
 5041-08243-00 10 µF at 10V ±10%
 5043-08880-00 0.01µF at 50V ±50-20%
 5043-08936-00 0.1µF at 50V ±50%
 5043-08065-00 470pF at 50V ±50%
 5043-09482-00 100pF at 50V ±50%
 5043-08845-00 1.000µF at 50V ±50%
 5046-09346-00 1500pF at 50V ±5%
 5048-09350-00 180pF at 100V ±5%
 5048-10982-00 0.0047µF at 50V 10%AX

Parts Information

Fluorescent Lamp Parts

50-8749-8 Ballast (Replacement)
 50-8890 Fluorescent Light Fixture -60W
 51-8809 Fluorescent Light, 15", 15W
 50-8748-1 Starter (Replacement)

Electrical Parts

DESCRIPTION	PART NUMBER
-------------	-------------

Battery

Lithium Battery, 3V (used for video board p/n C-13246-4002 only)	5880-11056-00
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Cables

Coin Door Cable	H-13215
Control Panel Cable	H-13214
Main Harness	H-13216
Power I/C Cable	H-12933
Power Pak Jumper Cable	H-13265
Power Supply Cord Assembly	A-13340
Sound Board Jumper Cable	H-12758
Speaker Cable	H-13213
Video Line Voltage Cable	H-12732
Video Signal Cable	H-10046-3
Video Signal Cable	H-12746-1
JAMMA Interface Cable	H-13255
Voltage Control Cable	H-8865-4

Electrolytic Capacitors

10uF at 20V +/-20%	5040-09343-00
1uF at 63V +50-10%	5040-09365-00
470uF at 16V +50-10%	5040-09776-00
100uF at 35V	5040-10974-00
1000uF at 16V +/-20%	5040-12006-00
10 uF at 10V +/-10%	5041-09243-00
0.01uF at 50V +80-20%	5043-08980-00
0.1uF at 50V +/-20%	5043-08996-00
470pF at 50V +/-20%	5043-09065-00
100pF at 50V +/-20%	5043-09492-00
1,000pF at 50V +/-20%	5043-09845-00
1200pF at 50V +/-5%	5046-09346-00
180pF at 100V +/-5%	5046-09350-00
0.0047uF at 50V 10%AX	5048-10992-00

Fluorescent Lamp Parts

Ballast (Replacement)	20-8749-8
Fluorescent Light Fixture -60H	20-9590
Fluorescent Light, 18" 15W	24-8809
Starter (Replacement)	20-8748-1

Electrical Parts

DESCRIPTION	PART NUMBER
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Inductors

4.7 UH, 3 Amp Coil Transformer	5551-09822-00 5610-12559-00
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Line Filter

5 Amp Line Filter	5102-08895-00
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Pots and Switches

DPST, 227V, 15Amps	5640-10932-00
10K Ohm Pot	5014-12363-00
Interlock Cheater Switch	5643-09556-00
Universal Switch, Molded	03-7614

Single Inline Packages

4.7K, 9R 10.5%	5019-09362-00
4.7K & 470pF x 8	5060-10396-00

Speakers

6", 4 Ohm Speaker	5555-12015-00
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Semiconductors & ICs

DESCRIPTION

PART NUMBER

Analog ICs

2002 Audio Amplifier	5370-09156-00
1458 Op Amp	5370-09321-00

Oscillators

8 MHz Oscillator	5521-10931-00
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RAM ICs

5516-2 CMOS RAM 2K x 8	5340-10139-00
2064 150nS SRAM	5340-12278-00
NURM 8K x 8 250nS	5347-12394-00

Random Logic

74LS139 2/4 Decoder	5281-09246-00
74LS138 Demultiplexer	5281-09745-00
74LS74 Dual D Flip-Flop	5281-09487-00
74LS04 Hex Inverter	5281-09215-00
74LS10 Triple NAND	5281-09235-00
74LS175	5281-10043-00

Transistors

2N4123 NPN	5160-12510-00
2N3904 NPN	5160-10269-00

Diodes & Varistors

1N4148, 150mAmps Diode	5070-08919-00
130V, 10Joules Varistor	5017-09044-00

VLSI Chips

68B09E Microprocessor	5400-10320-00
68B21 PIA	5430-10322-00
YM2151 Yamaha Synthesizer	5370-11086-00

Semiconductors & ICs

Hardware

DESCRIPTION	PART NUMBER
-------------	-------------

Misc Electronic Parts

1408 D/A Converter	5371-09152-00
YM3012 D/A Converter	5371-11087-00
3.58 MHz Crystal	5520-09020-00
55536 CVSD	5370-09691-00

Rubber, Glass & Plastic Parts

31-1518-4002	ORT Glass, Screened
31-1519-4002	Screened Matglass
31-1520-4002	Screened Overlay

Major Assemblies

D-11581-4002	Audio Board Assembly
D-13130	Control Panel Assembly
5875-12860-00	Monitor, 19" Horizontal 50 US
C-12610-4002	CPU 68000 Final Assy
C-13252	Power PAK Assembly, USA
C-13253	Power Supply Switcher Assembly

Hardware

DESCRIPTION

PART NUMBER

Metal & Wooden Parts

Cabinet	11-910-4002
Coin Door-USA QTR	09-20000-V-1
Back Door, Top	11-918-2
Back Door, Bottom	11-918-3
Interlock Sw Brkt Assy	A-13186
Leg Leveller Plate	01-9155
Mounting Plate Toggle Assy	A-9958
Power Pak Chassis Assy (Transformer)	C-13251
Speaker Grille	01-9348
Test Switch Bracket	01-9383

Rubber, Glass & Plastic Parts

CRT Glass, Screened	31-1518-4002
Screened Marquee	31-1519-4002
Screened Overlay	31-1520-4002

Major Assemblies

Audio Sound Board Assembly	D-11581-4002
Control Panel Assembly	D-13130
Monitor, 19" Horizontal 50 uS	5675-12560-00
CPU 68000 Final Assy	C-12610-4002
Power PAK Assembly, USA	C-13252
Power Supply Switcher Assembly	C-13253

TRI-SPORTS

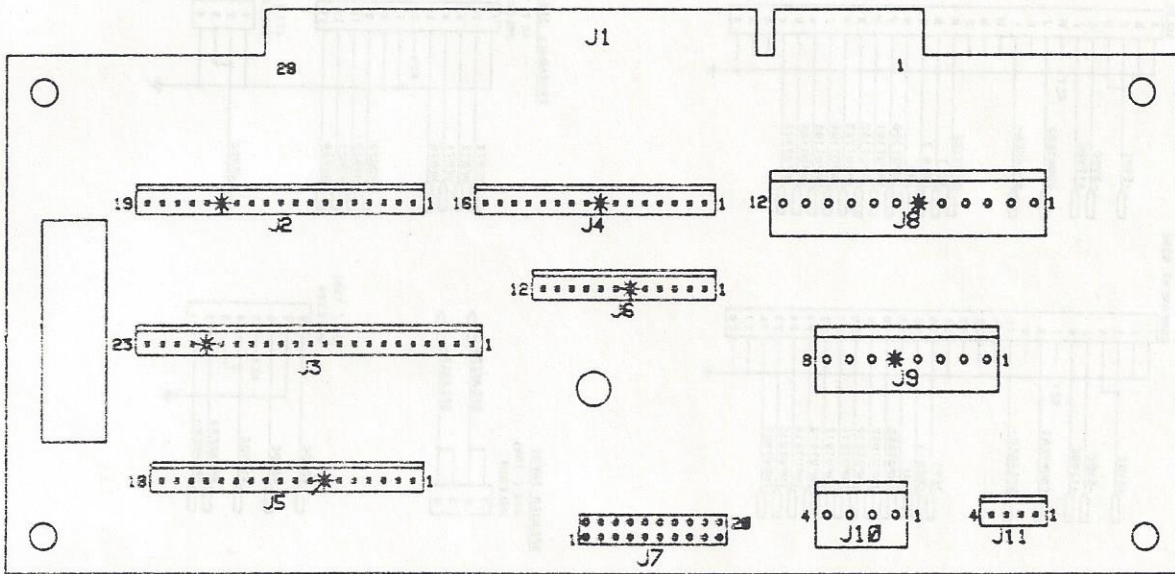
Function	Wire Color	Pin	Pin	Wire Color	Function
GROUND	BLK	A	1	BLK	GROUND
GROUND	BLK	B	2	BLK	GROUND
1-5	GRY	C	3	GRY	1-5
2-5	GRY-GRN	E	5	GRY-GRN	2-5
3-5	GRY-GRN	F	6	GRY-GRN	3-5
KEY	GRY-GRN	H	7	GRY-GRN	KEY
NO NC		J	9		NO NC
NO NC		K	9		NO NC
NO NC		M	11		NO NC
VIDEO GRN	GRN	K	12	GRN	VIDEO GRN
VIDEO SYNC	WHT	P	13	WHT	VIDEO SYNC
TEST	WHT-GRN	R	14	GRN	TEST
TEST	WHT-GRN	S	15	GRN	TEST
START 2	WHT-GRN	T	16	GRN	START 2
START 1	YEL-GRN	U	17	YEL-GRN	START 1
1 DOWN	YEL-GRN	V	18	YEL-GRN	1 DOWN
1 DOWN	YEL-BRN	W	19	YEL-BRN	1 DOWN
1 LEFT	YEL-RED	X	20	YEL-RED	1 LEFT
1 RIGHT	YEL-GRN	Y	21	YEL-GRN	1 RIGHT
2-5	YEL-GRN	Z	22	YEL-GRN	2-5
2-5	YEL-GRN	1	23	YEL-GRN	2-5
SPARE	GRN-GRN	2	24	GRN-GRN	SPARE
SPARE	GRN-GRN	3	25	GRN-GRN	SPARE
NO NC		4	26		NO NC
GROUND	BLK	5	27	BLK	GROUND

SECTION three

Diagrams and Schematics

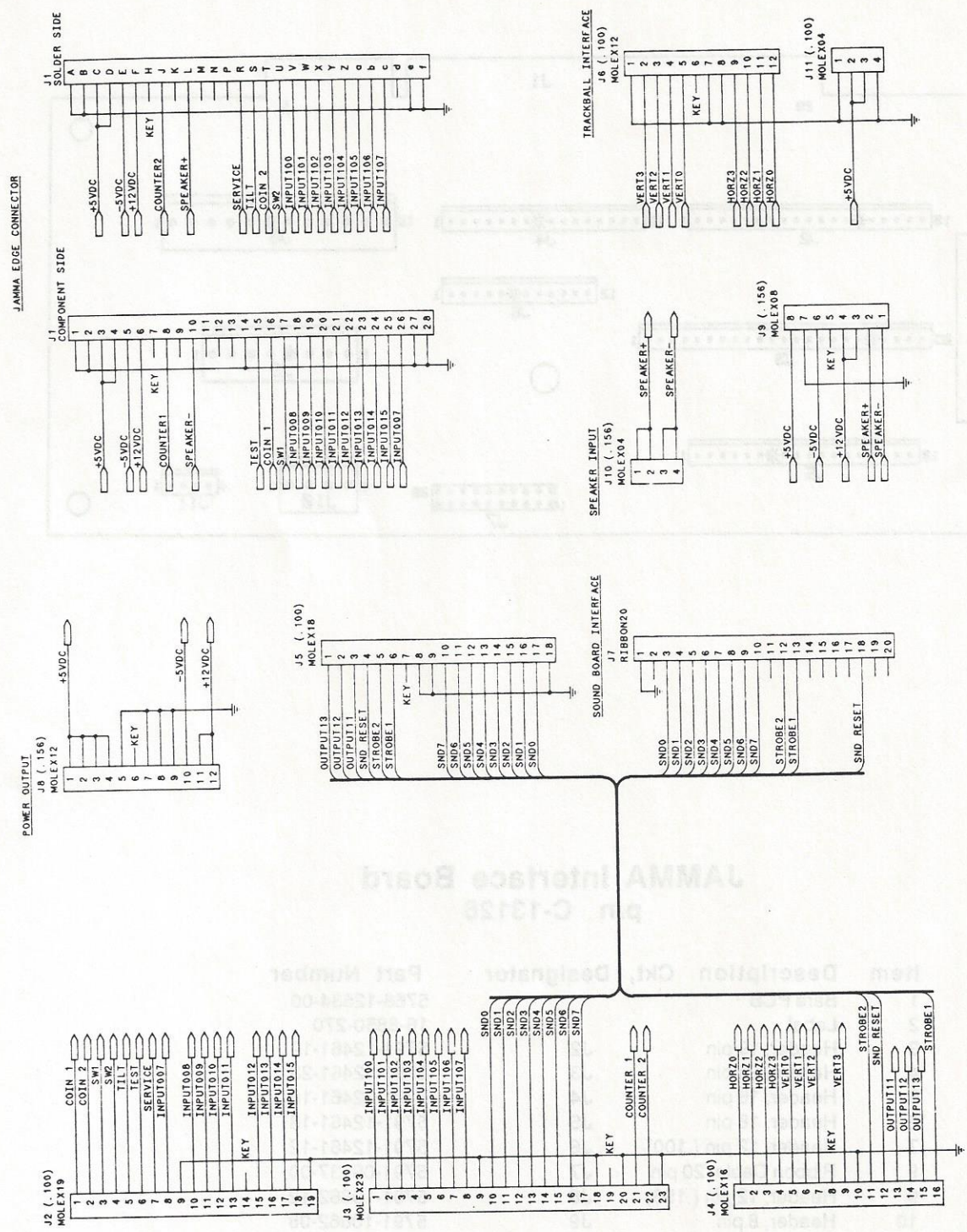
Jamma Edge Connector

Function	Wire Color	Pin	Pin	Wire Color	Function
GND	BLK	1	A	BLK	GND
GND	GRN-BRN	2	B	BLK	GND
+5	GRY	3	C	GRY	+5
+5	GRY	4	D	GRY	+5
-5	GRY-GRN	5	E	GRY-GRN	-5
+12	GRY-YEL	6	F	GRY-YEL	+12
KEY		7	H		KEY
COUNTER	WHT-ORG	8	J		N/C
N/C		9	K		N/C
SPEAKER	GRN-VIO	10	L	RED-VIO	SPEAKER+
N/C		11	M		N/C
VIDEO RED	RED	12	N	GRN	VIDEO GRN
VIDEO BLU	BRN	13	P	WHT	VIDEO SYNC
VIDEO GND	SHIELD	14	R	WHT-RED	SERVICE
TEST	GRN	15	S	WHT-VIO	TILT
COIN 1	YEL-WHT	16	T	WHT-BLU	COIN 2
START 1	YEL-GRN	17	U	YEL-BLU	START 2
1 UP	ORG-BLK	18	V	YEL-BLK	2 UP
1 DOWN	ORG-BRN	19	W	YEL-BRN	2 DOWN
1 LEFT	ORG-RED	20	X	YEL-RED	2 LEFT
1 RIGHT	ORG	21	Y	YEL-ORG	2 RIGHT
1 S1	ORG-YEL	22	Z	YEL-VIO	2 S1
1 S2	ORG-GRN	23	a	YEL-GRY	2 S2
1 S3	ORG-BLU	24	b	VIO-BLK	2 S3
SPARE	ORG-VIO	25	c	VIO-BRN	SPARE
SPARE	ORG-GRY	26	d	VIO-RED	SPARE
N/C		27	e		N/C
GND	BLK	28	f	BLK	GND



JAMMA Interface Board p/n C-13126

Item	Description	Ckt,	Designator	Part Number
1	Bare PCB			5768-12534-00
2	Label			16-8850-270
3	Header, 19 pin	J2		5791-12461-19
4	Header, 23 pin	J3		5791-12461-23
5	Header, 16 pin	J4		5791-12461-16
6	Header, 18 pin	J5		5791-12461-18
7	Header, 12 pin (.100)	J6		5791-12461-12
8	Ribbon Cable, 20 pin	J7		5791-09437-00
9	Header, 12 pin (.156)	J8		5791-10862-12
10	Header, 8 pin	J9		5791-10862-08
11	Header, 4 pin (.156)	J10		5791-10862-04
12	Header, 4 pin (.100)	J11		5791-12461-04



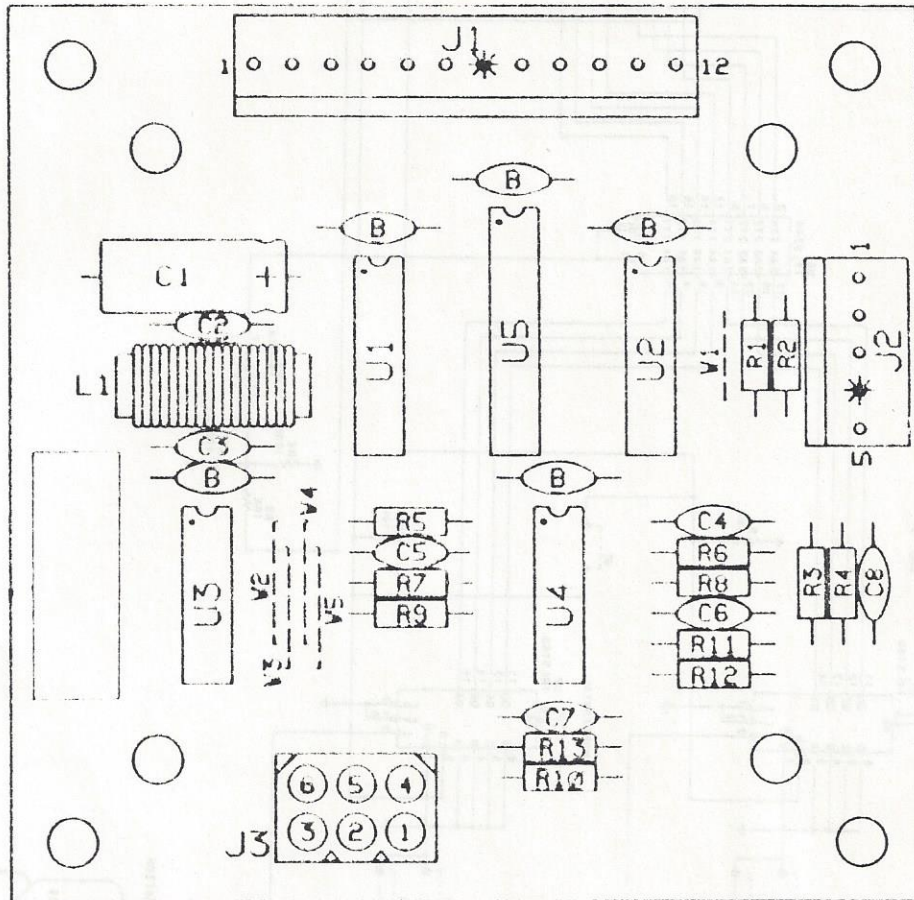
JAMMA EDGE CONNECTOR

ITEM	PART NUMBER	DESCRIPTION	QTY	UNIT	PART NUMBER	DESCRIPTION	QTY
PROJ ENGR	G SHIPP	REMOVE BURRS - BREAK SHARP CORNERS & EDGES					
DATE	11-15-85	UNLESS OTHERWISE SPECIFIED					
CHECKED BY	DATE	DECIMAL	XXX	ANGULAR	XXX	FRACTIONAL	E/64
APPROVAL	DATE	FIRST PROJECT NO	4002-U	MATERIAL			
		FIRST USAGE	C-1312G	QTY			

WILLIAMS ELECTRONICS, INC.
 3401 N. CALIFORNIA AVE.
 CHICAGO, IL 60618

NAME: JAMMA INTERFACE SCHEMATIC
 SCALE: -/-
 PART NO: 16-9077
 REV: 11-15-85

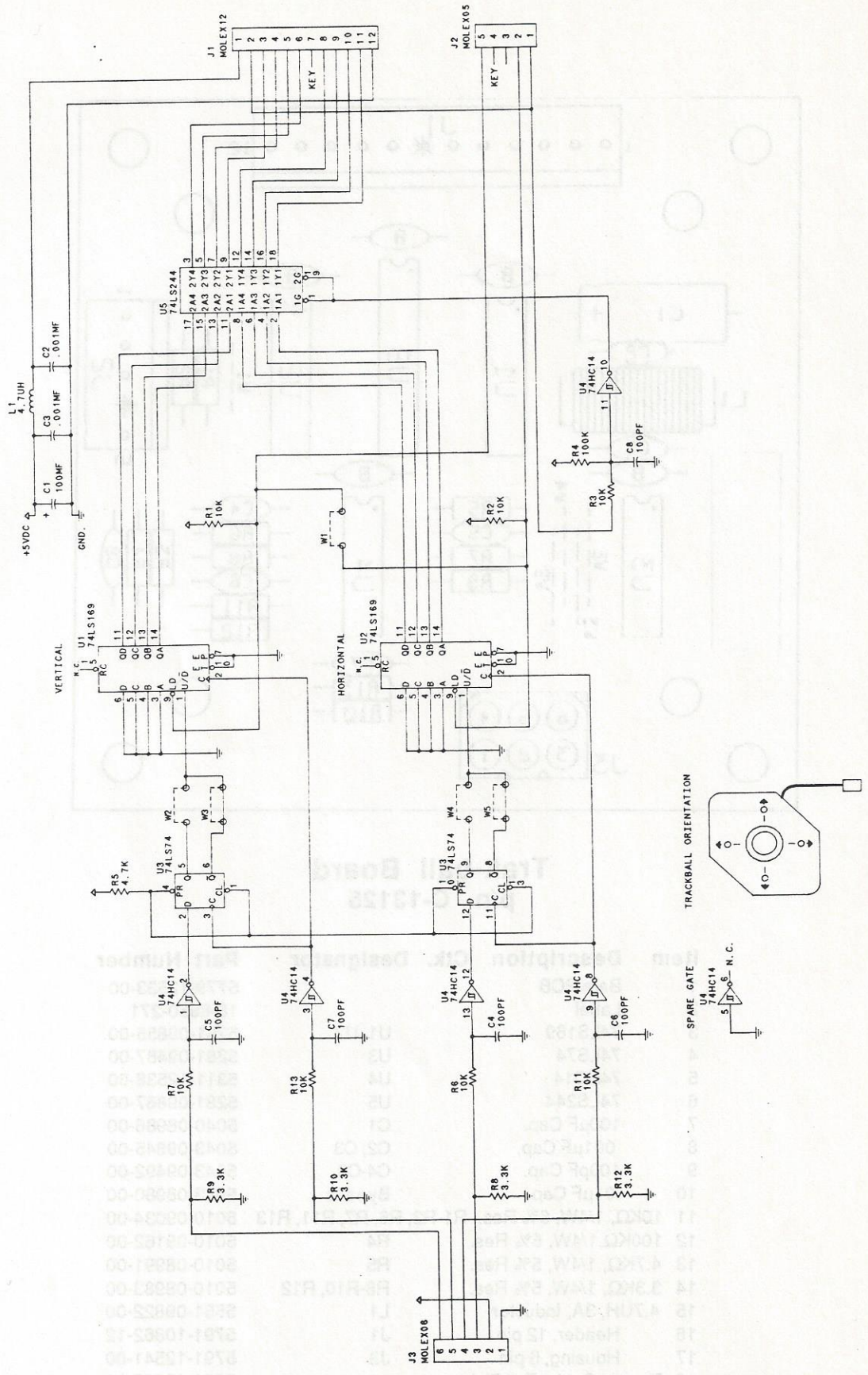
REV	DESCRIPTION OF CHANGE	DATE
1	NEW PART RELEASE	11-15-85



Trak-ball Board
p/n C-13125

Item	Description	Ctk.	Designator	Part Number
1	Bare PCB			5779-12533-00
2	Label			16-8850-271
3	74LS169		U1, U2	5281-09855-00
4	74LS74		U3	5281-09487-00
5	74HC14		U4	5311-12538-00
6	74LS244		U5	5281-09867-00
7	100 μ F Cap.		C1	5040-08986-00
8	.001 μ F Cap.		C2, C3	5043-09845-00
9	100pF Cap.		C4-C8	5043-09492-00
10	.01 μ F Cap.		Bypass	5043-08980-00
11	10K Ω , 1/4W, 5% Res.		R1-R3, R6, R7, R11, R13	5010-09034-00
12	100K Ω , 1/4W, 5% Res.		R4	5010-09162-00
13	4.7K Ω , 1/4W, 5% Res.		R5	5010-08991-00
14	3.3K Ω , 1/4W, 5% Res.		R8-R10, R12	5010-08983-00
15	4.7UH, 3A, Inductor		L1	5551-09822-00
16	Header, 12 pin		J1	5791-10862-12
17	Housing, 6 pin		J3	5791-12541-00
18	Female Solder Tail Pin			5821-12537-00

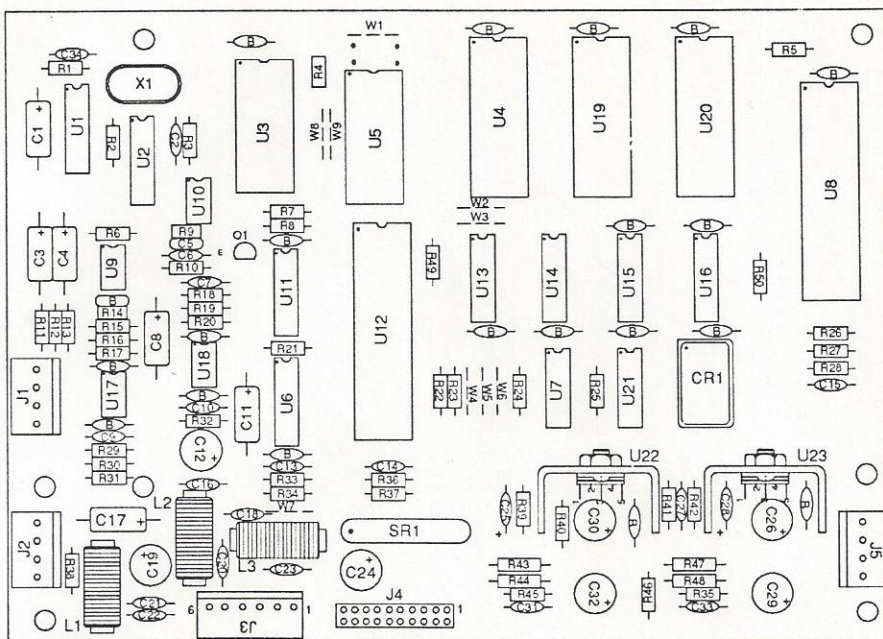
REV	DESCRIPTION OF CHANGE	CON NO	DATE
1	NEW PART RELEASE	22526	10-11-67



ITEM	PART NUMBER	QUANTITY	DESCRIPTION	QTY
1	74LS169	2	COUNTER	2
2	74HC14	5	INVERTER	5
3	RESISTORS			
4	CAPACITORS			
5	FUSE	1	1.7UH	1

DO NOT SCALE	REMOVE BURRS - BREAK SHARP CORNERS & EDGES
WORK TO DIMENSIONS SHOWN	UNLESS OTHERWISE SPECIFIED
DECIMAL	1/100 ANGULAR
FRACTIONAL	1/64

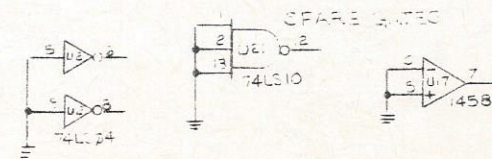
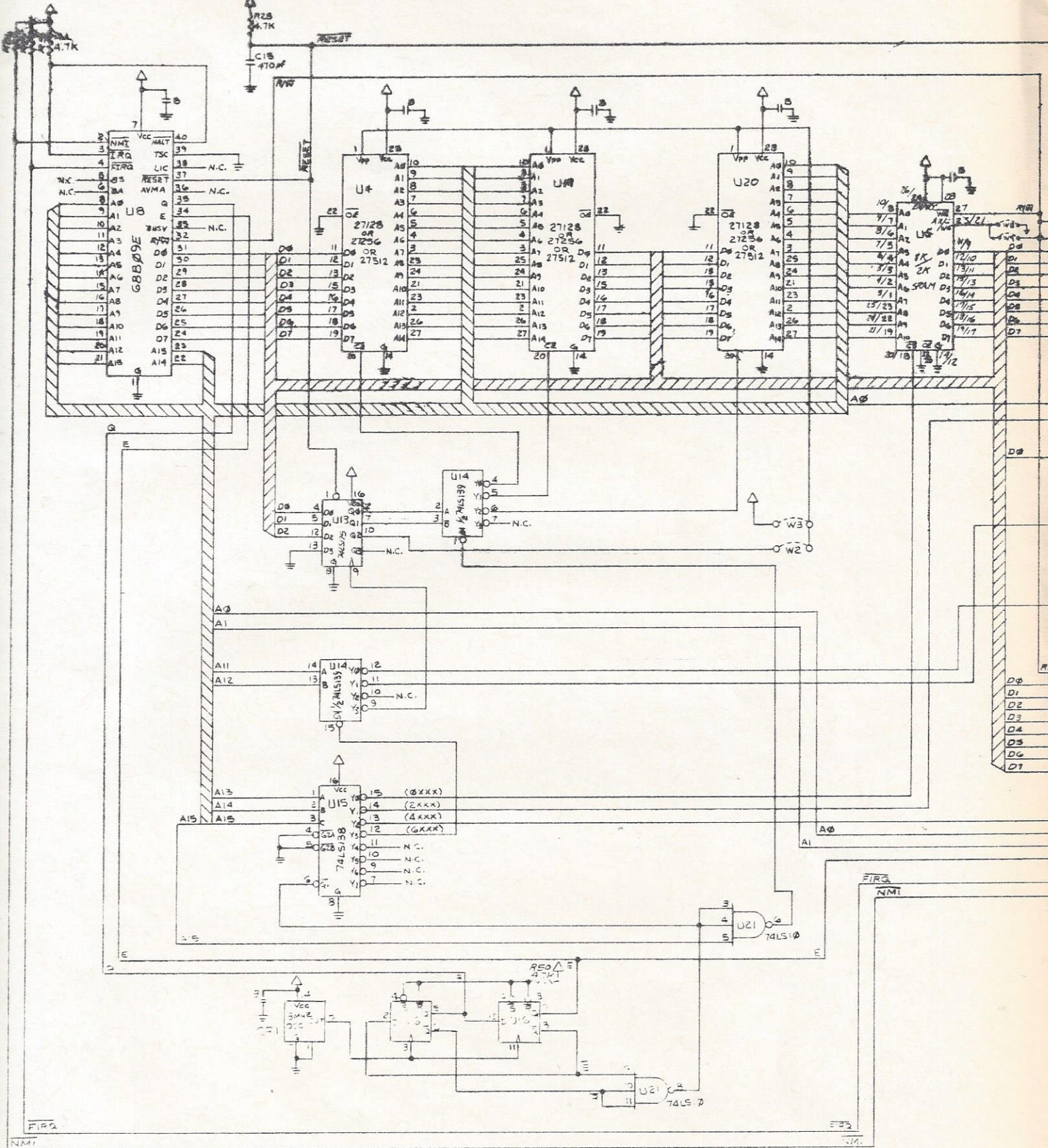
WILLIAMS ELECTRONICS, INC.	CHICAGO, ILL.
1410 N. CALIFORNIA AVE.	
NAME	TRACKBALL BOARD SCHEMATIC
SCALE	1:1
REV	16-9076



Audio Board
p/n D-11581-4002

Description	Ckt. Designation	Part Number	Description	Ckt. Designator	Part Number
15K Ω , 1/4W, 5% Res.	R18	5010-08772-00	74LS04	U2	5281-09215-00
43K Ω , 1/4W, 5% Res.	R32	5010-08824-00	74LS10	U21	5281-09235-00
220K Ω , 1/4W, 5% Res.	R31	5010-08846-00	74LS139	U14	5281-09246-00
3.3K Ω , 1/4W, 5% Res.	R7-R9	5010-08983-00	74LS74	U16, U17	5281-09487-00
4.7K Ω , 1/4W, 5% Res.	R1, R4, R5, R11, R33, R25-R28, R36, R37, R49, R50	5010-08991-00	74LS175	U13	5281-10043-00
2.2K Ω , 1/4W, 5% Res.	R2, R3	5010-08998-00	5516 RAM	U5	5340-10139-00
10K Ω , 1/4W, 5% Res.	R34, R17, R22-R24	5010-09034-00	2002 AUD AMP	U22, U23	5370-09321-00
2.2 Ω , 1/4W, 5% Res.	R35, R45	5010-09161-00	1458 OP AMP	U9, U10, U17, U18	5370-09321-00
100K Ω , 1/4W, 5% Res.	R39	5010-09162-00	55536-9 CVSD	U6	5370-09691-00
3.3M Ω , 1/4W, 5% Res.	R10	5010-09179-00	1408D/A CONV.	U11	5371-09152-00
1 Ω , 1/2W, 5% Res.	R44, R48	5010-09181-00	68B21 PIA	U12	5430-10322-00
2.7K Ω , 1/4W, 5% Res.	R6, R19, R20, R21	5010-09324-00	3.58MHZ CRYSTAL	X1	5520-09020-00
180K Ω , 1/4W, 5% Res.	R29	5010-09333-00	8MHZ OSC.	CR1	5521-10931-00
36K Ω , 1/4W, 5% Res.	R30	5010-09324-00	4.7UH IND.	L1, L2, L3	5551-09822-00
1K Ω , 1/4W, 5% Res.	R41, R42	5010-09358-00	IC Soc. 40 pin	U8	5700-08985-00
220 Ω , 1/2W, 5% Res.	R43, R46, R47	5010-09361-00	IC Soc. 24 pin	U3	5700-09004-00
1M Ω , 1/4W, 5% Res.	R40	5010-10258-00	IC Soc. 16 pin	U1	5700-09006-00
10 μ F Cap.	C1, C3, C4, C8, C17	5040-09343-00	IC Soc. 28 pin	U4, U19, U20	5700-10176-00
1 μ F Cap.	C11	5040-09365-00	Bare PCB.		5766-12130-00
470 μ F Cap.	C26, C30	5040-09776-00	Header, 20 pin	J4	5791-09437-00
100 μ F Cap.	C12, C19, C24	5040-10974-00	Header, 4 pin	J1, J2, J3	5791-10862-04
1000 μ F Cap.	C29, C32	5040-12006-00	Header, 6 pin	J3	5791-10862-00
10 μ F Cap.	C25, C28	5041-09243-00	74LS138	U15	5281-09745-00
.01 μ F Cap.	C5, Bypass	5043-08980-00	6.8K Ω , 1/4W, 5% Res.	R16	5010-09086-00
.1 μ F Cap.	C31, C33	5043-08996-00	Heat Sink		5705-09199-00
470pF Cap.	C13, C14, C15	5043-09065-00	6-32 x 3/8 P-PH-S		4006-01003-06
100pF Cap.	C2, C34	5043-09492-00	6-32 Hex Nut		4406-01117-00
47pF Cap.	C6	5043-09844-00	#6 Ext. Lock Washer		4703-00007-00
1Kp Cap.	C16, C18, C20, C23, C27	5043-09845-00	Thermal Compound		20-9229
			0 Ω , 1/4W Res.		5010-09534-00
1200pF Cap.	C7	5046-09346-00	4.99K Ω , 1/4W, 1% Res.	R13	5013-09427-00
4700pF Cap.	C10	5048-10992-00	4.7K Ω , 1/4W, 5% Res.	R12	5010-08991-00
180pF Cap.	C9	5046-09350-00	20K Ω , 1/4W, 5% Res.	R14	5010-10985-00
4.7K Ω & 470pF SIP	SP1	5060-10396-00	20K Ω , 1/4W, 5% Res.	R15	5010-10985-00
2N3904 Trans.	Q1	5160-10269-00	13K Ω , 1/4W, 5% Res.	R16	5010-09331-00
			8.2K Ω , 1/4W, 5% Res.	R38	5010-09219-00
IC, YM2151	U3	5370-11086-00	ROMs & ICs		
IC, YM3012	U1	5371-11087-00	D-11579-3		PCB Sub-Assy.
MPU, 68B09E	U8	5400-10320-00	IC, ROM	U4	A-5343-4002-1
PCB LABEL		16-8850-260	IC, ROM	U19	A-5343-4002-2
			IC, ROM	U20	A-5343-4002-3

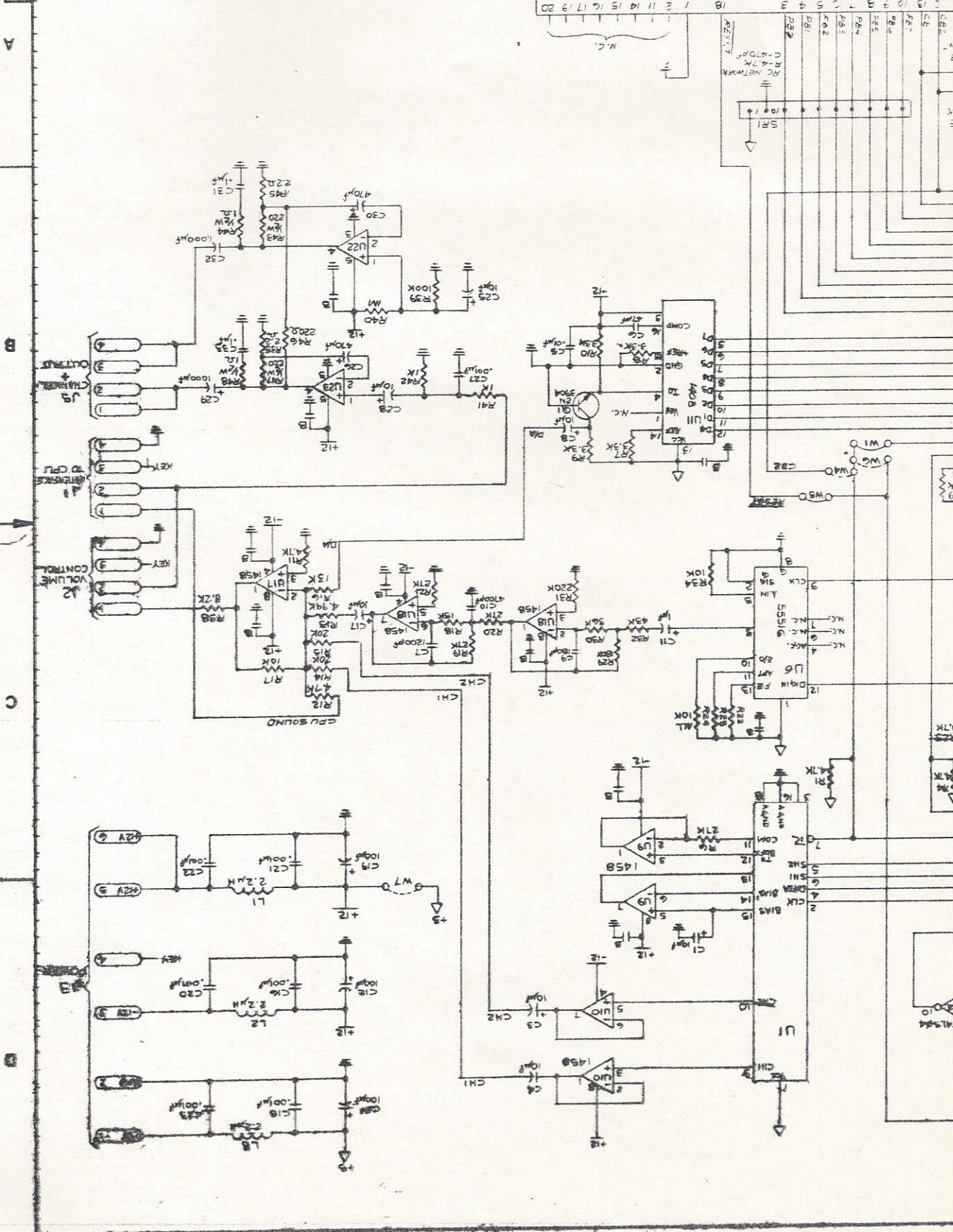
REV	DESCRIPTION OF CHANGE	ECN NO.	DATE	REV	DESCRIPTION OF CHANGE	ECN NO.	DATE
-	N.A.R.	22535	10-17-89				



NOTES:
 - ALL CAPACITORS WITH 4 AND 5 ARE 10% TOLERANCE
 - U13, U14, U15, U21, U22, U23, U24, U25, U26, U27, U28, U29, U30, U31, U32, U33, U34, U35, U36, U37, U38, U39, U40, U41, U42, U43, U44, U45, U46, U47, U48, U49, U50, U51, U52, U53, U54, U55, U56, U57, U58, U59, U60, U61, U62, U63, U64, U65, U66, U67, U68, U69, U70, U71, U72, U73, U74, U75, U76, U77, U78, U79, U80, U81, U82, U83, U84, U85, U86, U87, U88, U89, U90, U91, U92, U93, U94, U95, U96, U97, U98, U99, U100, U101, U102, U103, U104, U105, U106, U107, U108, U109, U110, U111, U112, U113, U114, U115, U116, U117, U118, U119, U120, U121, U122, U123, U124, U125, U126, U127, U128, U129, U130, U131, U132, U133, U134, U135, U136, U137, U138, U139, U140, U141, U142, U143, U144, U145, U146, U147, U148, U149, U150, U151, U152, U153, U154, U155, U156, U157, U158, U159, U160, U161, U162, U163, U164, U165, U166, U167, U168, U169, U170, U171, U172, U173, U174, U175, U176, U177, U178, U179, U180, U181, U182, U183, U184, U185, U186, U187, U188, U189, U190, U191, U192, U193, U194, U195, U196, U197, 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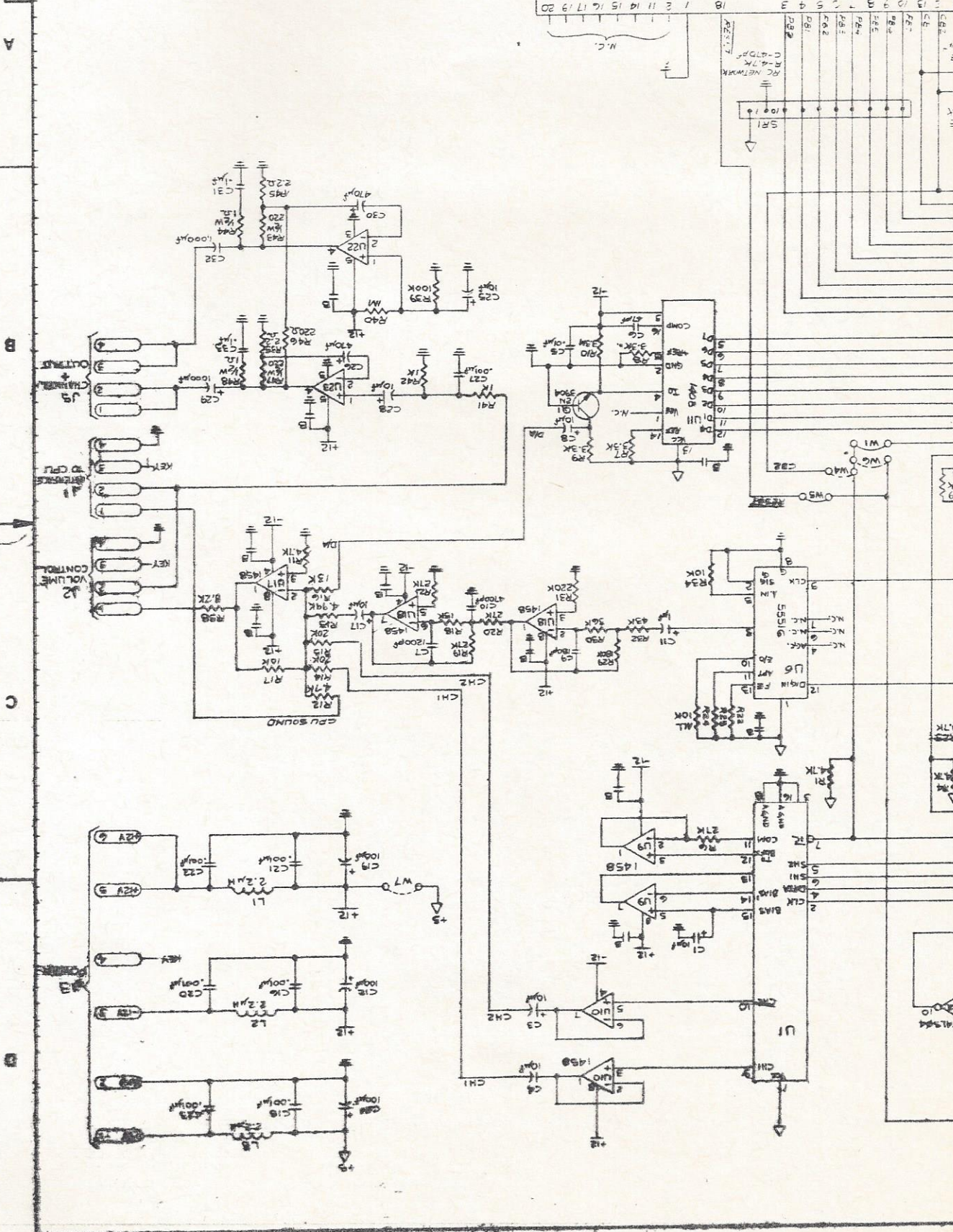
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DO NOT SCALE	WORK TO DIMENSIONS SHOWN	REMOVE BURRS-BREAK SHARP CORNERS & EDGES	TOLERANCES UNLESS OTHERWISE SPECIFIED	1/20	NAME	AUDIO SYSTEM SCHEMATIC	60618
PROJ ENGR	C. BLEICH	DATE	11/21/87	CHECKED BY	DATE	11/21/87	4002
FIRST USAGE	QTY	MATERIAL	SCALE	N/S	SHT	1/6-9084	REV
APPROVAL DATE	0-11579-3						

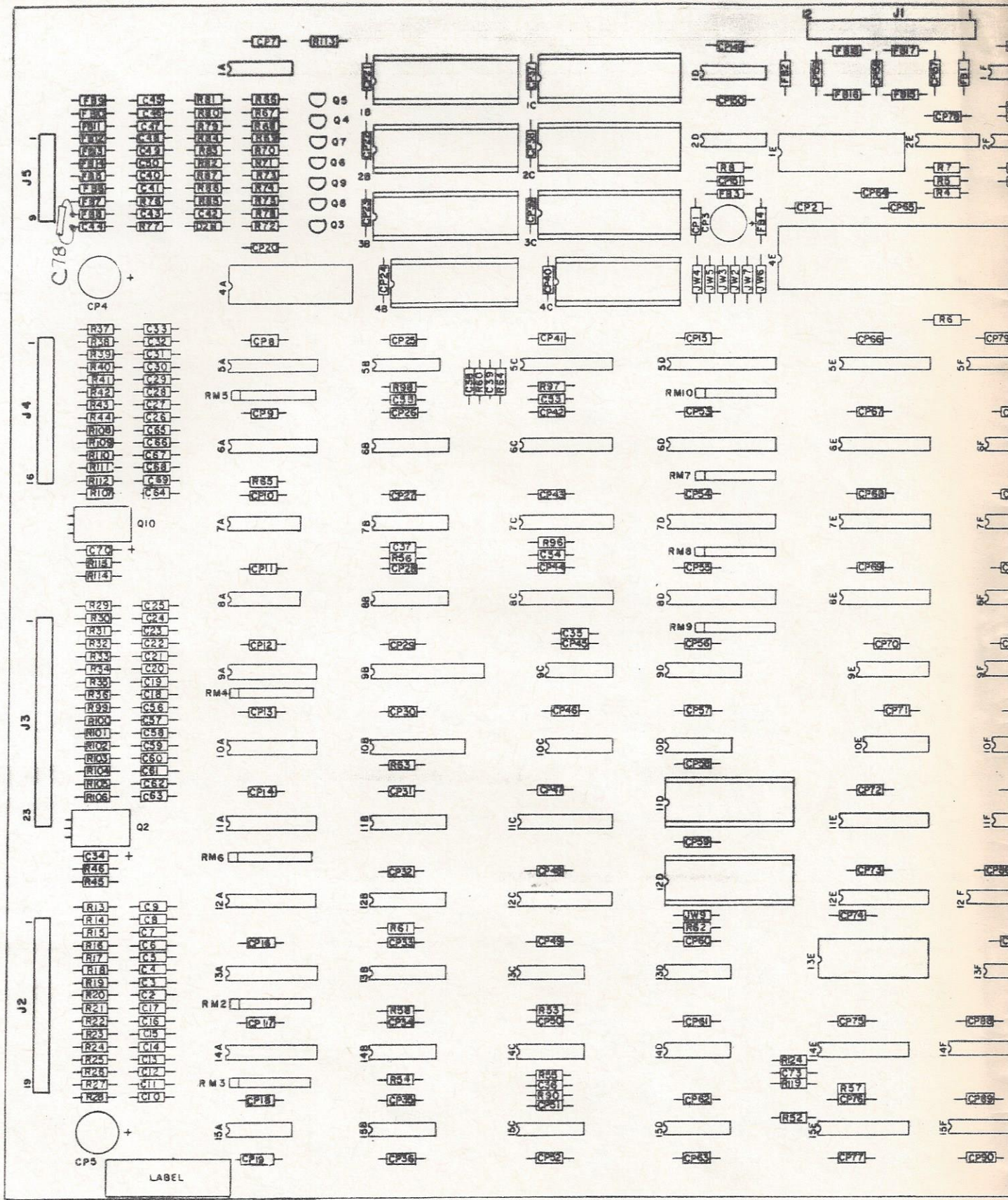
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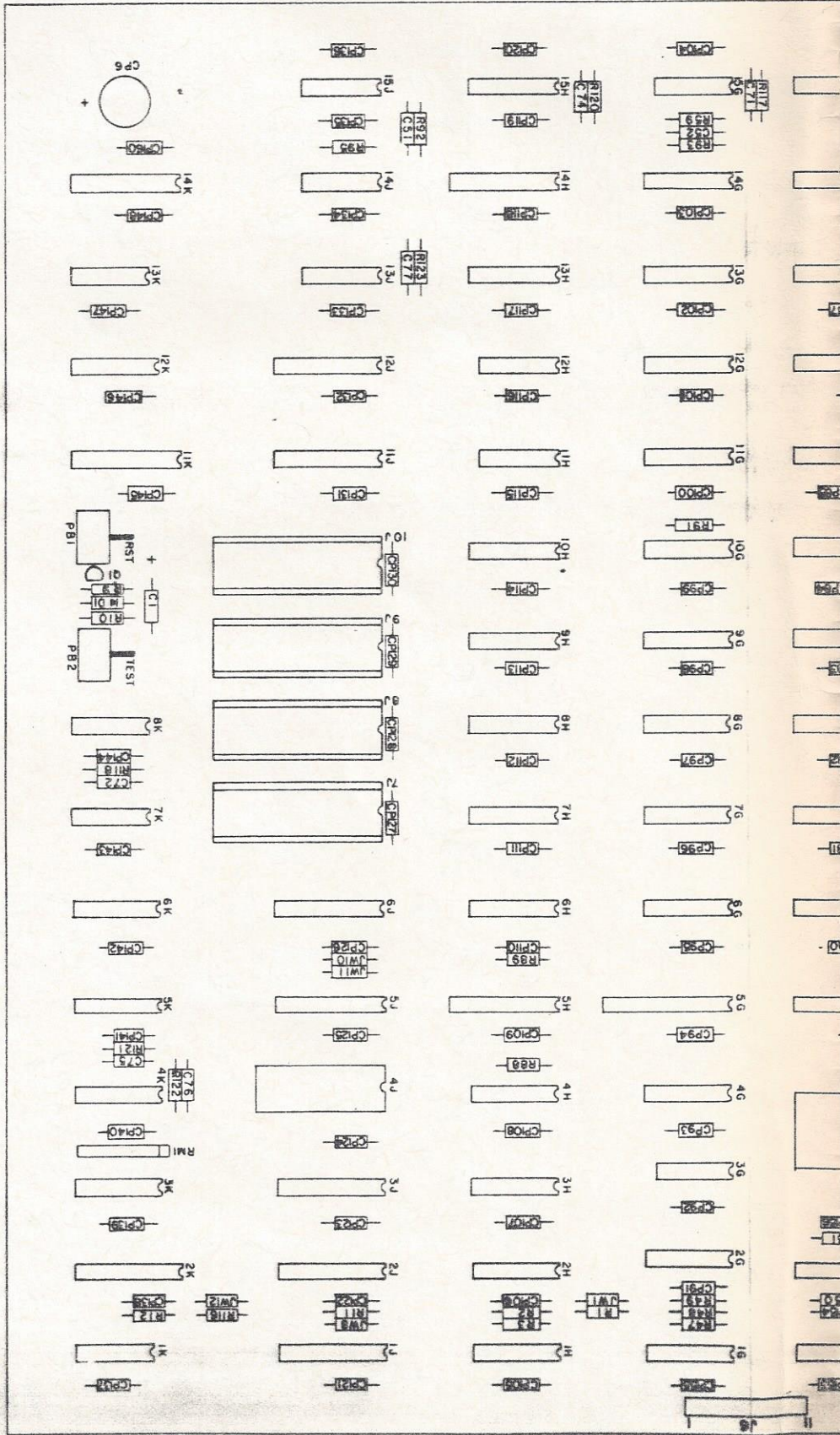


ITEM	PART NUMBER	DESCRIPTION	QTY	ITEM	PART NUMBER	DESCRIPTION	QTY
DO NOT SCALE	WORK TO DIMENSIONS SHOWN	REMOVE BURRS-BREAK SHARP CORNERS & EDGES	TOLERANCES UNLESS OTHERWISE SPECIFIED	1/2°	NAME	AUDIO SYSTEM SCHEMATIC	60618
PROJ ENGR	C. BLEICH	DATE	11/21/87	CHECKED BY	DATE	11/21/87	4002
FIRST USAGE	QTY	MATERIAL	SCALE	N/S	SHT	OFF	16-9084
APPROVAL DATE	0-11579-3						

WILLIAMS ELECTRONICS, INC. 3401 N CALIFORNIA AVE CHICAGO IL 60618



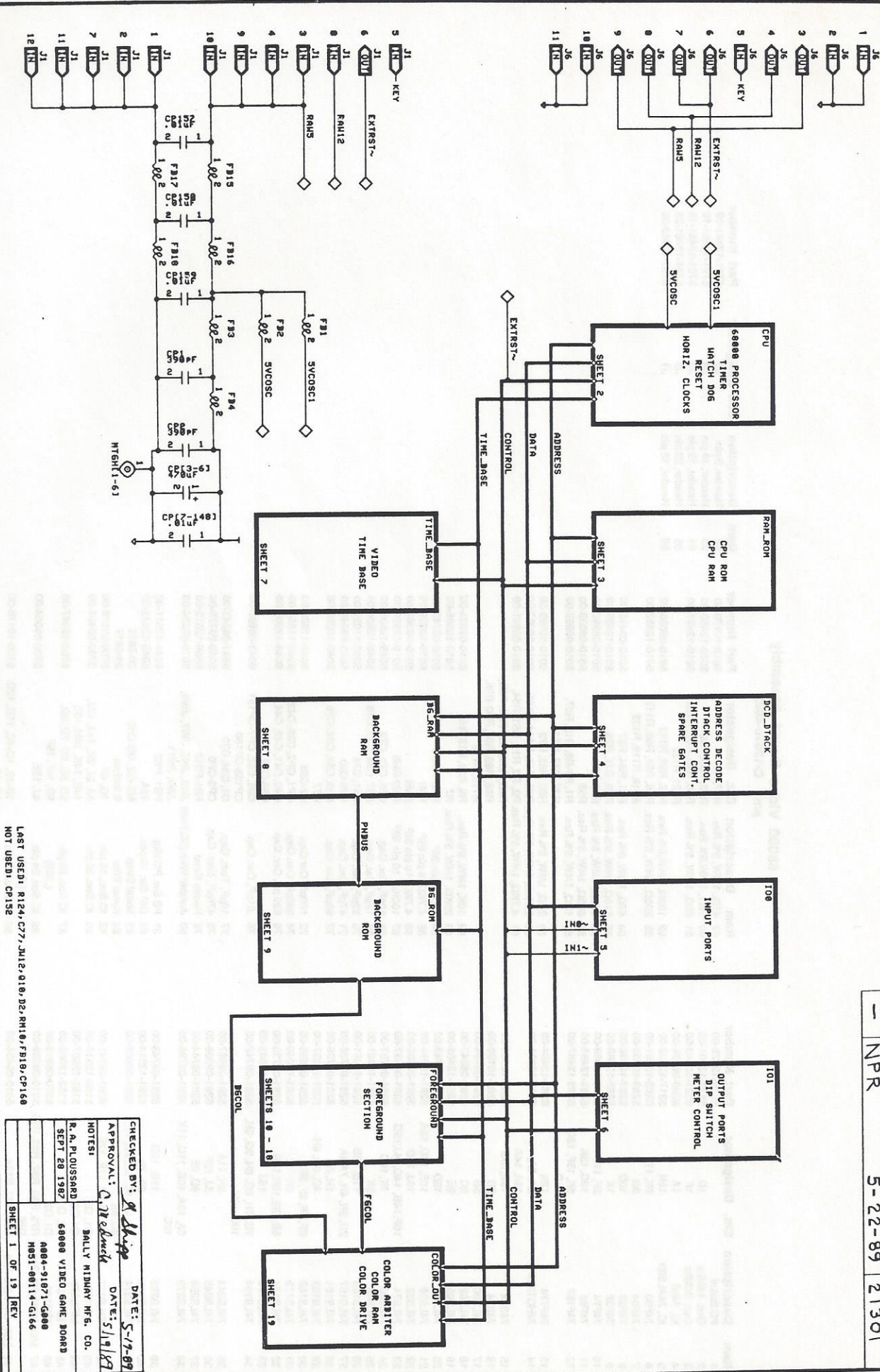




68000 Video Board Assembly
p/n C-12610-4002

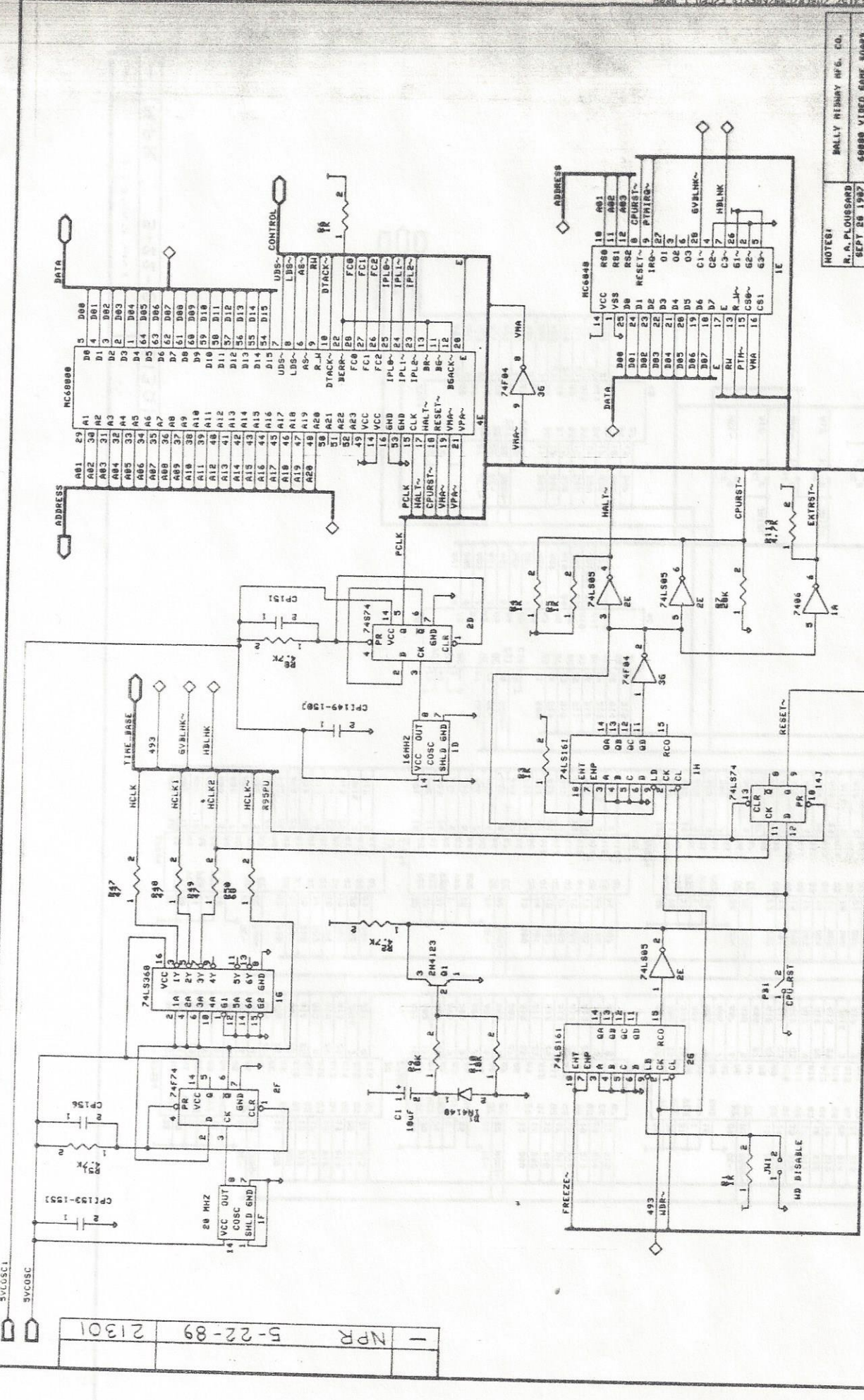
Item	Description	Ckt. Designator	Part Number	Item	Description	Ckt. Designator	Part Number	Item	Description	Ckt. Designator	Part Number
1	PC Board		5570-12478-00	49	47K, 1/4W, 5% Res.	R47, R49	5010-10170-00	92	Header, 9 pin	J5	5791-12461-09
2	Osc. 16Mhz	1D	5521-12501-00	50	68K, 1/4W, 5% Res.	R50, R53, R90	5010-12480-00	93	Header, 16 pin	J4	5791-12461-16
3	Osc. 20Mhz	1F	5521-10743-00	51	82K, 1/4W, 5% Res.	R60, R96, R97, R120	5010-12481-00	94	Header, 19 pin	J2	5791-12461-19
4	IC, 7406	1A	5280-09574-00	52	100K, 1/4W, 5% Res.	R92, R99, R112	5010-09036-00	95	Header, 23 pin	J3	5791-12461-23
5	IC, 74ALS20	12H	5517-12502-00	53	200K, 1/4W, 5% Res.	R56, R64, R98, R117, R118, R119, R122	5010-12482-00	96	Header, 12 pin	J1	5791-10862-00
6	74F00	8K, 11F	5283-10551-00	54	47K, 1/4W, 5% Res.	R81, R84, R87	5010-09416-00				
7	74F04	3G	5283-10552-00	55	510K, 1/4W, 5% Res.	R68, R71, R75	5010-12483-00				
8	74F08	10D	5283-12488-00	56	560K, 1/4W, 5% Res.	R76-R78	5010-08992-00				
9	74F32	1K	5283-12489-00	57	680K, 1/4W, 5% Res.	R58	5010-09033-00				
10	74F74	2F, 11H	5283-10468-00	58	1K, 1/4W, 5% Res.	R1, R3-R6, R12, R67, R70, R72, R74	5010-09358-00				
11	74F86	13C, 13K	5283-12486-00	59	2K, 1/4W, 5% Res.	R66, R69, R73	5010-09999-00				
12	74F157	5K, 13F, 13G, 14G	5283-12487-00	60	2.7K, 1/4W, 5% Res.	R45, R46, R114, R115	5010-08997-00				
13	74F174	12K	5283-12484-00	61	4.7K, 1/4W, 5% Res.	R2, R8, R11, R51, R54, R55, R59, R61-R63, R65, R88, R89, R91, R93-R95, R113, R116	5010-08991-00				
14	74HCT244	5A, 9A, 13A, 14A	5315-12031-00	62	10K, 1/4W, 5% Res.	R9, R10, R13-R44	5010-09034-00				
15	74S04	15B, 15C	5282-10186-00	63	20K, 1/4W, 5% Res.	R7	5010-10985-00				
16	74S74	2D	5282-10190-00	64	1K, 9 pin SIP	RM7-RM10	5019-05748-00				
17	74LS00	5B	5281-09499-00	65	4.7K, 9 pin SIP	RM1	5019-10029-00				
18	74LS02	9C	5281-09247-00	66	4.7K, 10 pin SIP	RM6	5019-09362-00				
19	74LS05	2E	5281-12485-00	67	100K, 10 pin SIP	RM2-RM5	5019-12509-00				
20	74LS08	15D	5281-09743-00	68	10pF, Cer. Cap.	C55, C71, C72	5048-12503-00				
21	74LS20	10E, 13D, 15A	5281-10014-00	69	18pF, Cer. Cap.	C37, C38, C73, C75	5048-12504-00				
22	74LS32	13J, 14D	5281-09500-00	70	33pF, Cer. Cap.	C51, C74	5048-11027-00				
23	74LS74	10F, 14B, 14C, 14J, 15G	5281-09487-00	71	47pF, Cer. Cap.	C45-C50	5043-09844-00				
24	74LS86	7K, 10C	5281-09737-00	72	88pF, Cer. Cap.	C39, C53, C54, C76	5043-10264-00				
25	74LS48	3K	5281-10461-00	73	100pF, Cer. Cap.	C2-C33	5048-11029-00				
26	74LS153	11B, 12B	5281-10061-00	74	390pF, Cer. Cap.	CP1, CP2, C35, C42	5048-11064-00				
27	74LS157	2H, 3H, 4H, 7A, 8A	5281-09738-00	75	820 pF, Cer. Cap.	C40, C41, C43, C44, C36-C69	5048-12506-00				
28	74LS161	1H, 2G	5281-09735-00	76	.01uF, Cer. Cap.	CP153-CP160	5043-08980-00				
29	74LS163	4G, 6G, 6H	5281-10037-00	77	10uF, Tant. Cap.	C1, C34, C70	5041-09243-00				
30	74LS169	6F, 7F, 9F, 9F	5281-09855-00	78	470uF, Elec. Cap.	CP3-CP6	5040-09776-00				
31	74LS173	6K	5281-10040-00	79	Ferrite Bead	FB1-FB18	5556-12513-00				
32	74LS174	8B, 13B, 13H, 15H	5281-09733-00	80	Jumper Wire (0.0 Res)	JW3, JW5, JW7, JW8, JW9, JW11	5010-09534-00				
33	74LS175	15J	5281-10043-00	81	PB Sw, PC Mfg.	PB1, PB2	5641-12511-00				
34	74LS194	7G, 7H, 8G, 8H, 9G, 9H, 10G, 10H	5281-09742-00	82	DIP Sw, 10 pos.	12A	5645-12512-00				
35	74LS244	5H, 11A	5281-09867-00	83	Metal Strap	MS-Q2, MS-Q10	20-9619				
36	74LS245	3J, 12F	5281-09308-00	84	Kynar Wire	6 Inches	20-9617				
37	74LS258	9D, 9E	5281-09744-00	85	IC Soc. 16 pin	1G, 4K	5700-09006-00				
38	74LS273	6A, 10A, 10B, 11C, 11K, 12C	5281-09736-00	86	IC Soc. 20 pin	1J, 2J, 2K, 11J, 12J, 14E, 14K, 14H, 15E	5700-09498-00				
39	74LS283	11G, 12G	5281-09743-00	87	IC Soc. 24 pin	5D, 5G, 6D, 7D, 8D, 9B, 14F, 15F	5700-12047-00				
40	74LS298	6B, 7B	5281-12514-00	88	IC Soc. 24 pin (-300)	4J, 15E	5700-09004-00				
41	74LS374	5C, 5K, 6C, 6E, 7C, 7E, 8C, 8E	5281-09486-00	89	IC Soc. 28 pin (-600)	1B-4B, 1C-4C, 11D, 12D 1E, 4A	5700-10176-00				
42	74LS377	5F, 5J, 6J, 11E, 12E	5281-09741-00	90	IC Soc. 32 pin	7J-10J	5700-12088-00				
43	2N4123	C1, C3	5160-12510-00	91	IC Soc. 64 pin	4E	5700-10453-00				
44	MPSA70	C4-Q9	5192-12507-00								
45	TIP110NPN	C2, C10	5162-12508-00								
46	1N4148	D1, D2	5070-08919-00								
47	10K, 1/4W, 5% Res.	R79, R80, R82, R83, R85, R86	5010-09039-00								
48	22K, 1/4W, 5% Res.	R52, R57, R124	5010-09434-00								

REV	DESCRIPTION OF CHANGE	ECN NO
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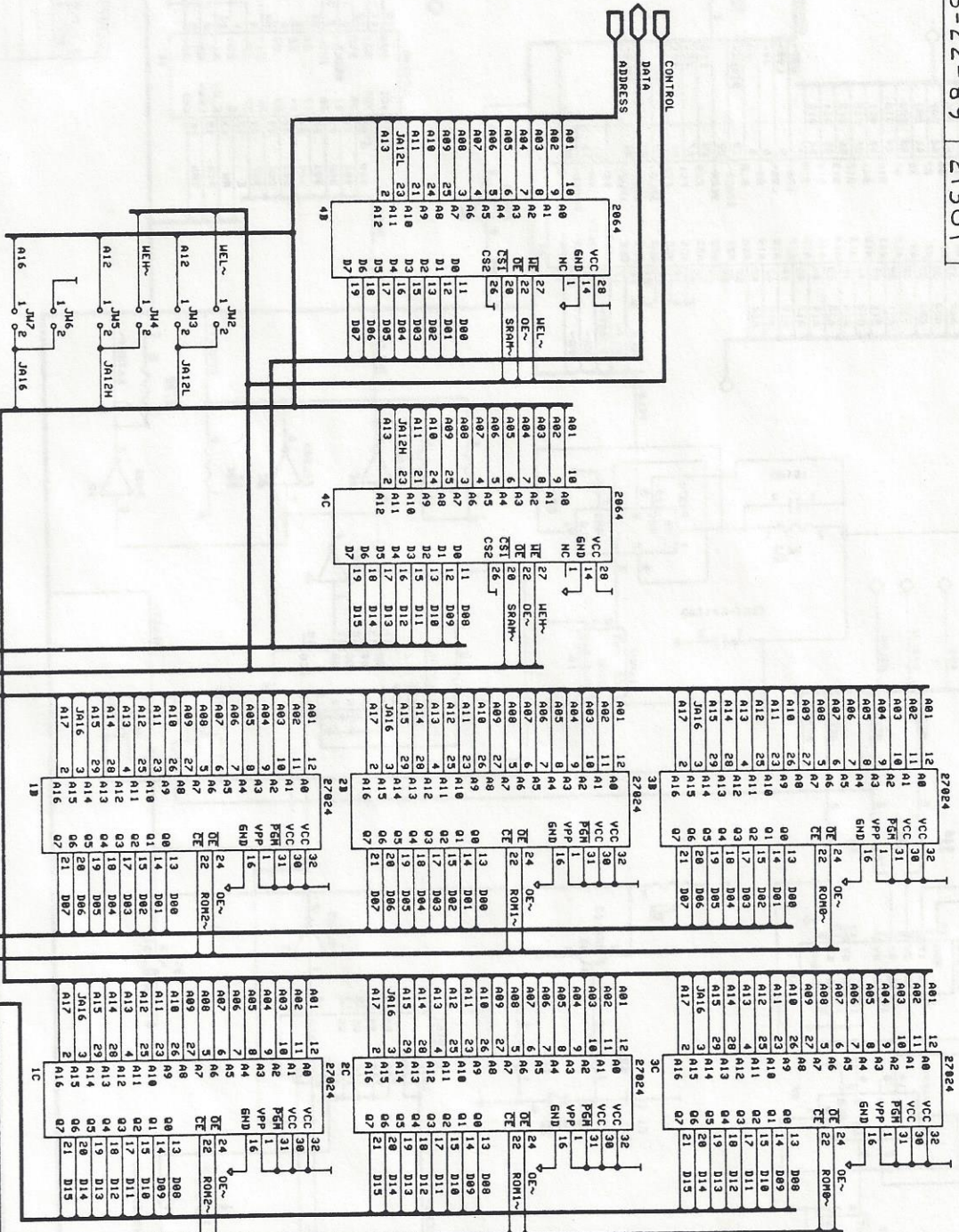
LAST USED: R124, C77, JH12, Q10, D2, RH10, FB10, CP150
NOT USED: CP158

CHECKED BY: <i>A. Shipp</i>	DATE: 5-12-87
APPROVAL: <i>C. J. Schmitt</i>	DATE: 5/11/87
NOTES:	
R. A. PLOUSSARD	BALLY MIDWAY MFG. CO.
SEPT 28 1987	
	68000 VIDEO GAME BOARD
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	8051-00114-0166
	SHEET 1 OF 19 REV



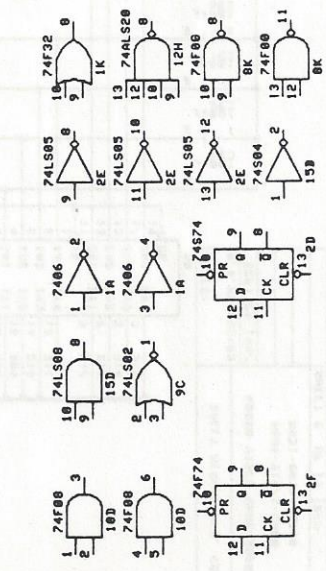
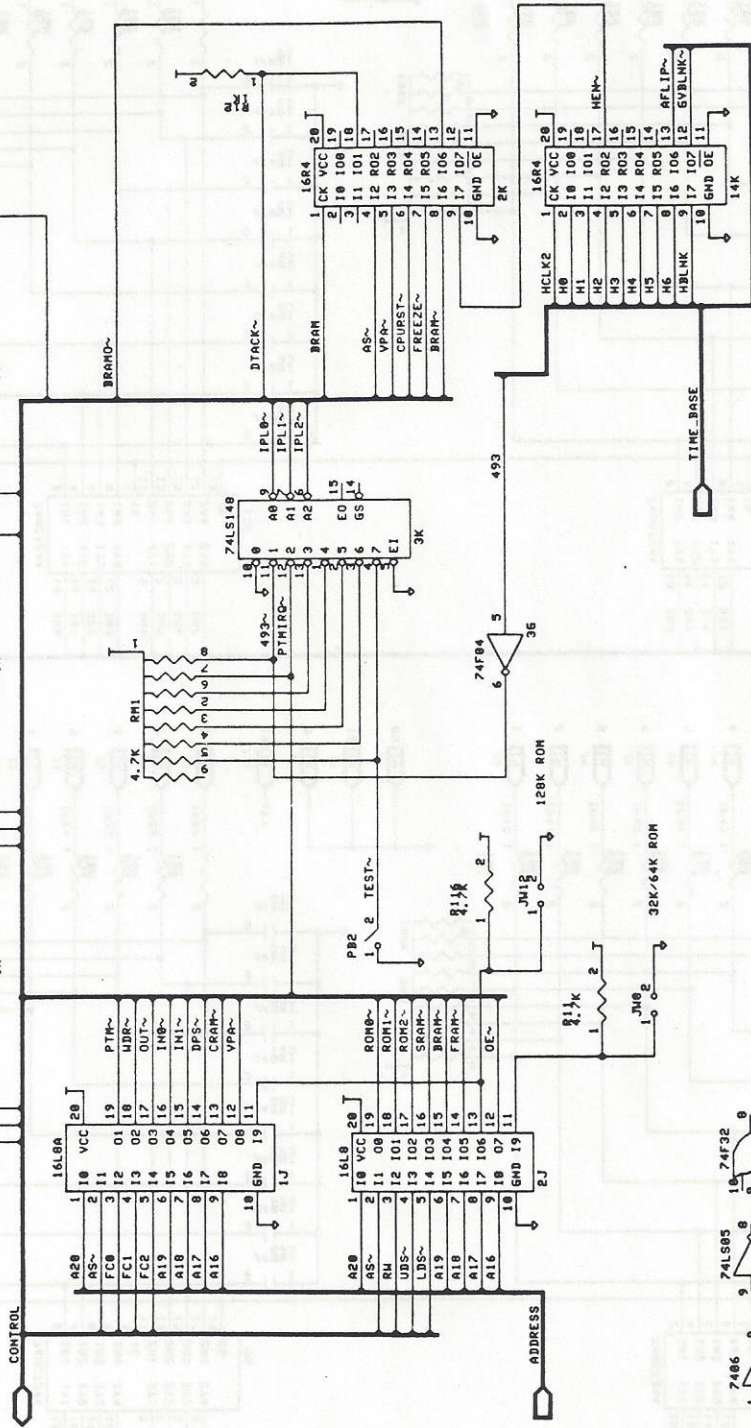
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RALLY RICHWAY MFG. CO.	
R.A. PLOUSSARD	60880 VIDEO GAME BOARD
SEPT 28 1987	
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	MS1-08114-G168
	SHEET 2 OF 13 REV



NOTES:
 R. A. ROUSSARD
 SEPT 20 1987
 BALLY MIDWAY MFG. CO.
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 A084-91871-G000
 A051-00114-C166
 SHEET 3 OF 19 REV

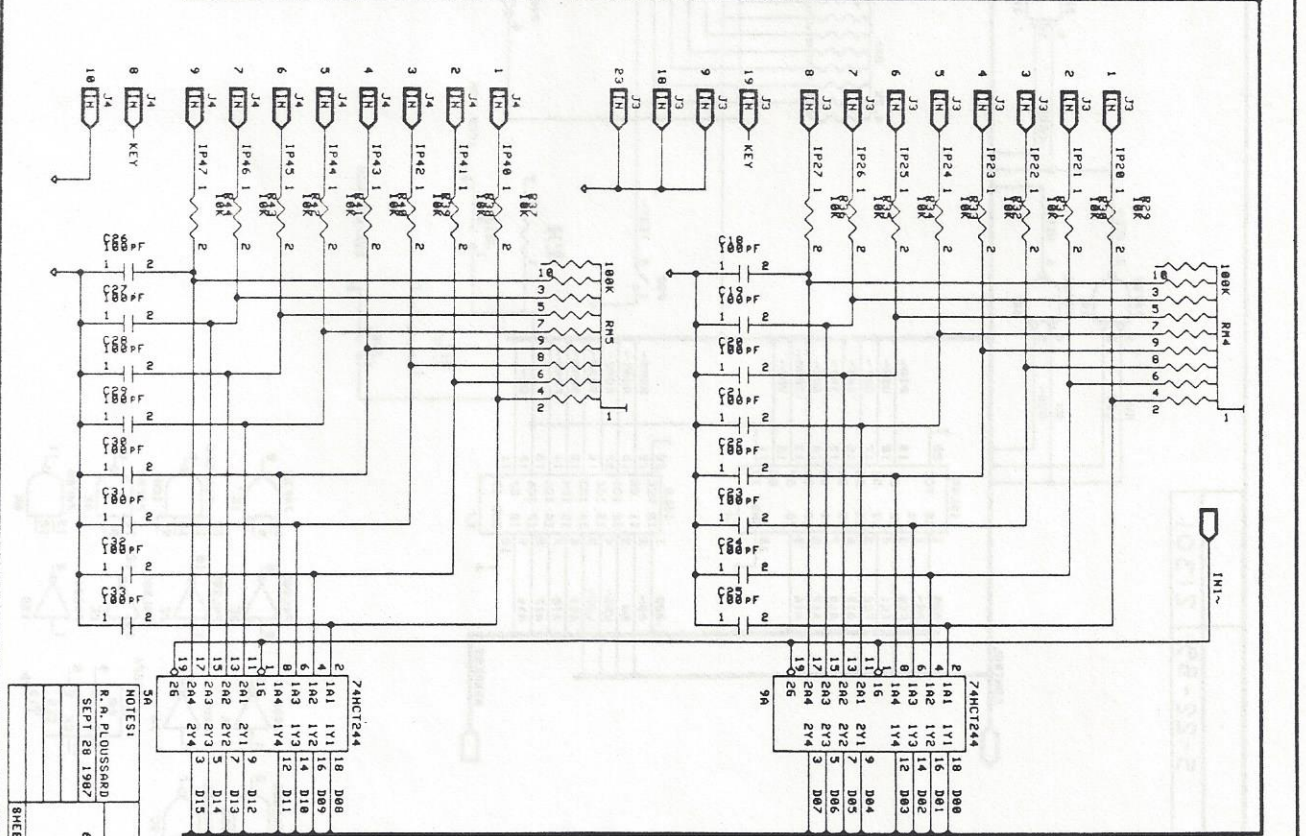
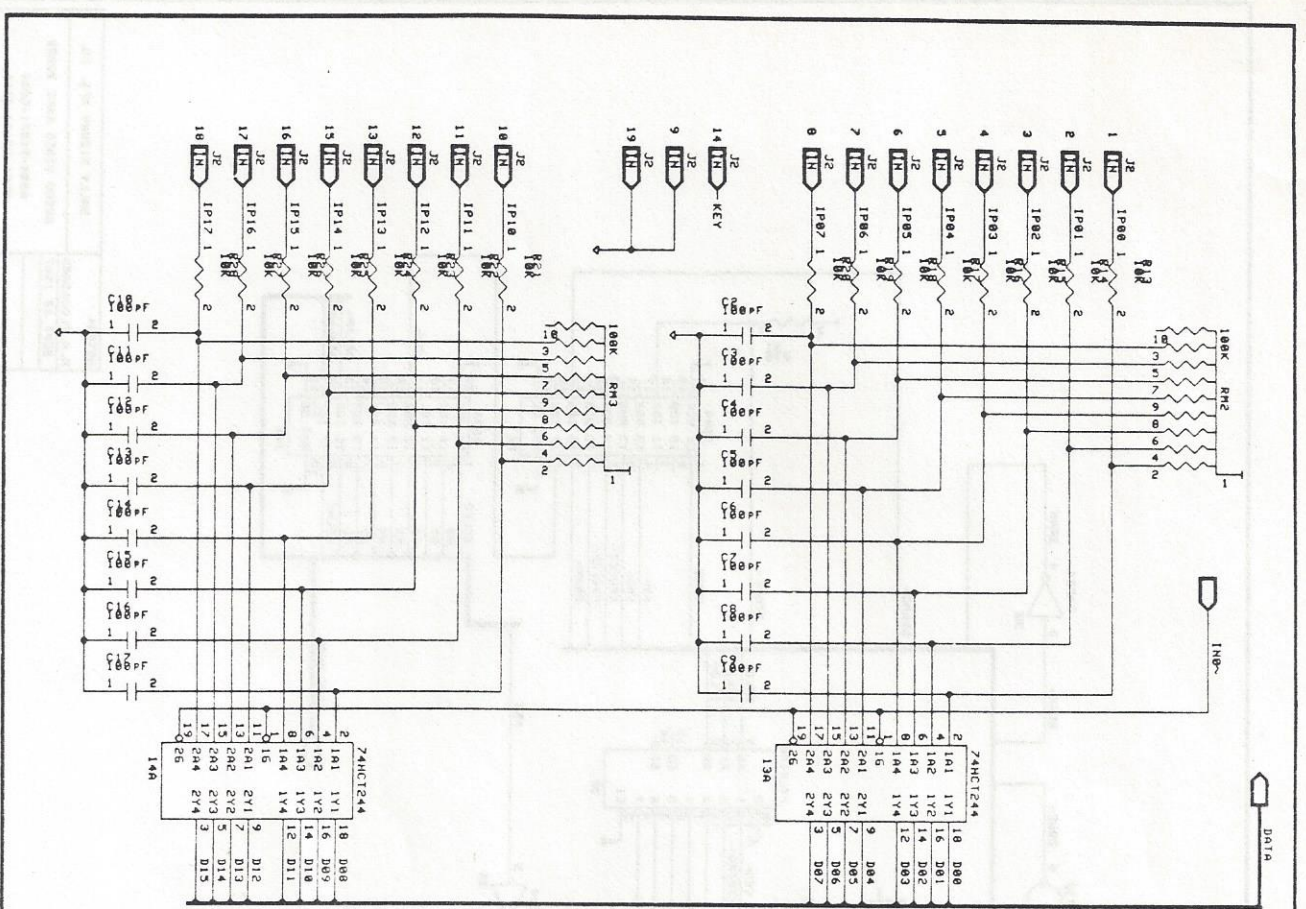
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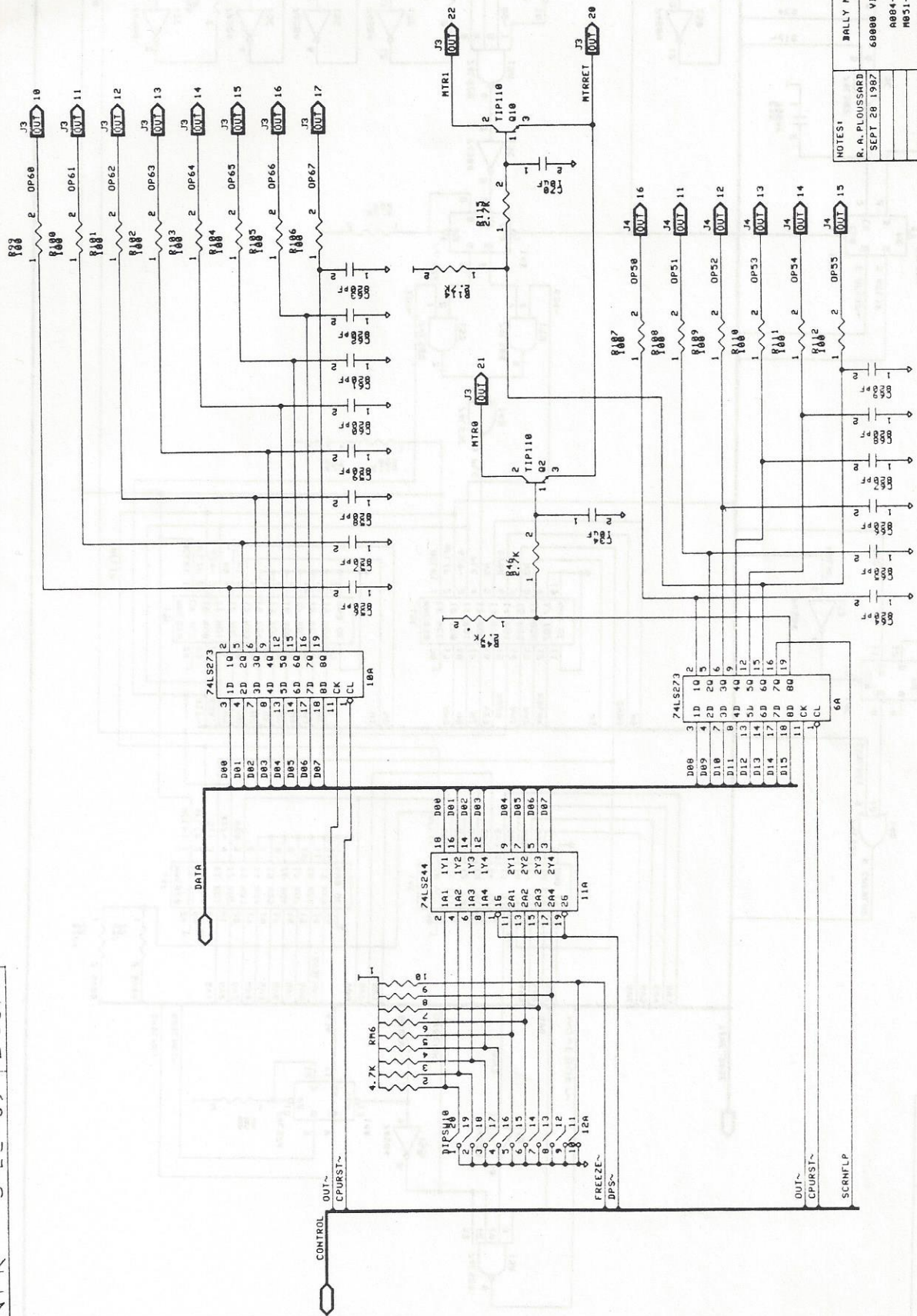
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SEPT 28 1987	68800 VIDEO GAME BOARD
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	SHEET 4 OF 19 REV

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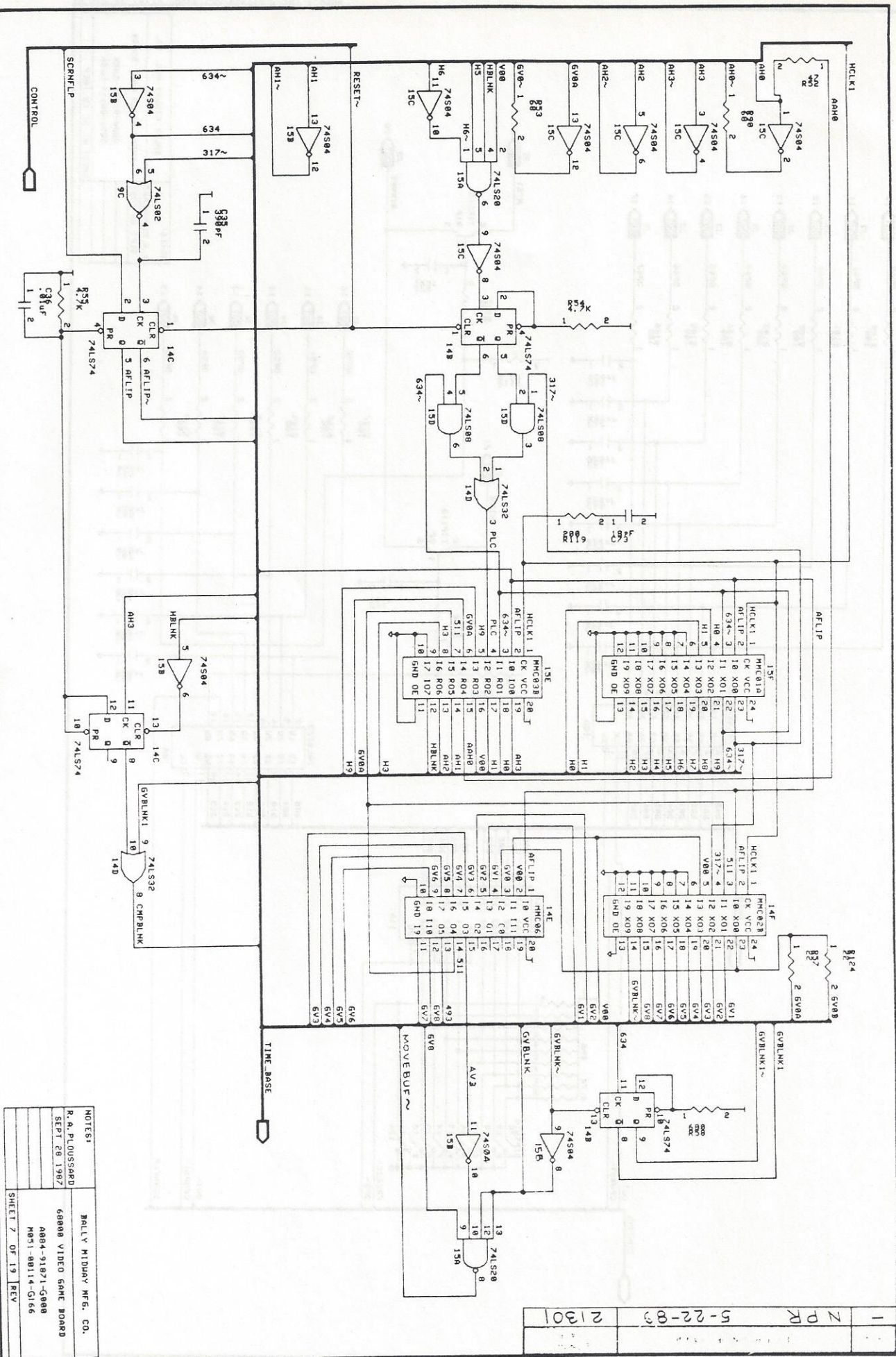
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BALLY MIDWAY MFG. CO. SHEET 5 OF 19 REV			

NPR 5-22-89 21301



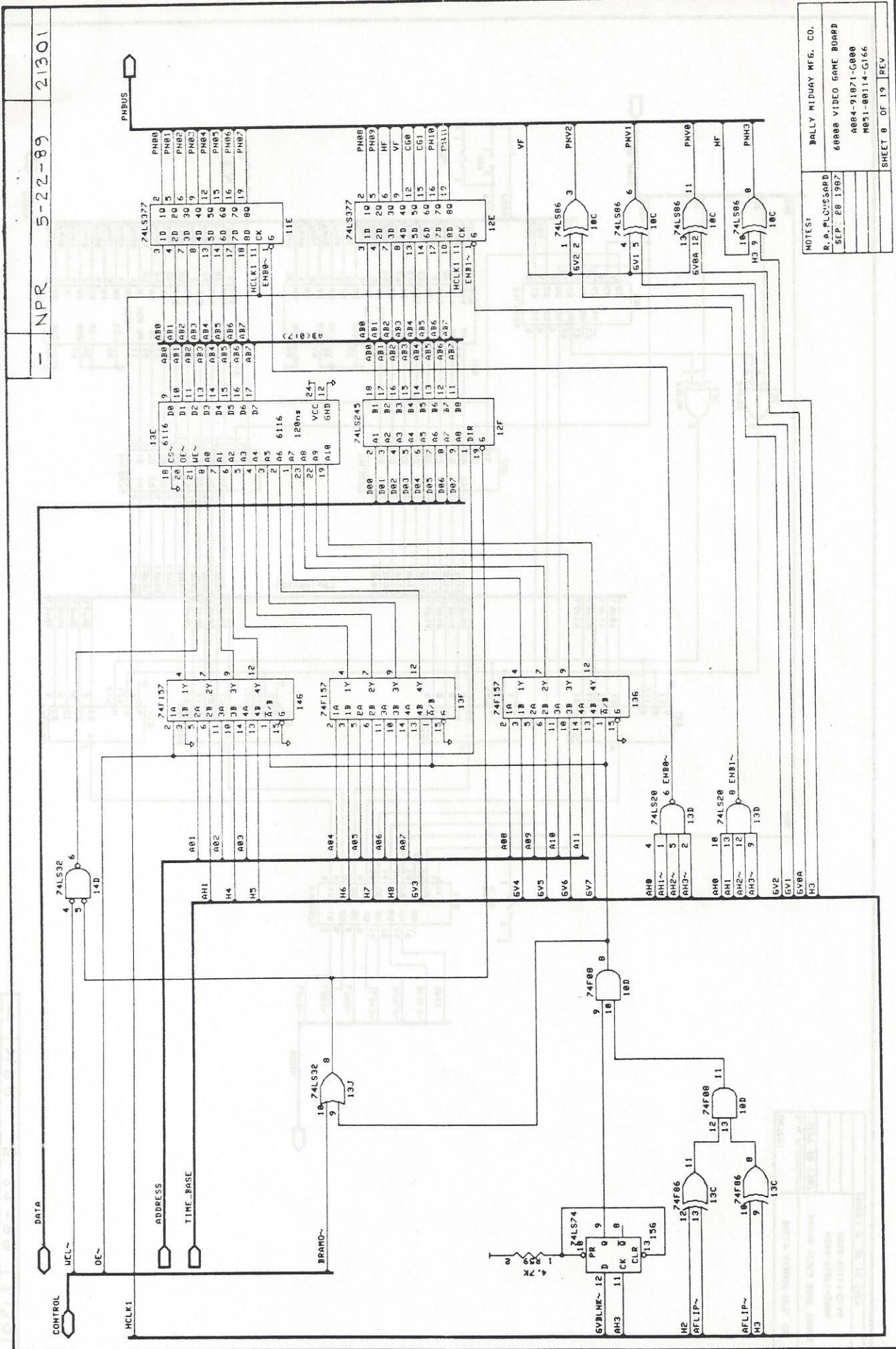
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 SEPT 28 1987
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 BALLY MIDWAY MFG. CO.
 SHEET 6 OF 19 REV

88 SEP 87 1113 USER/CNH/88K13/J101 L.DRAN

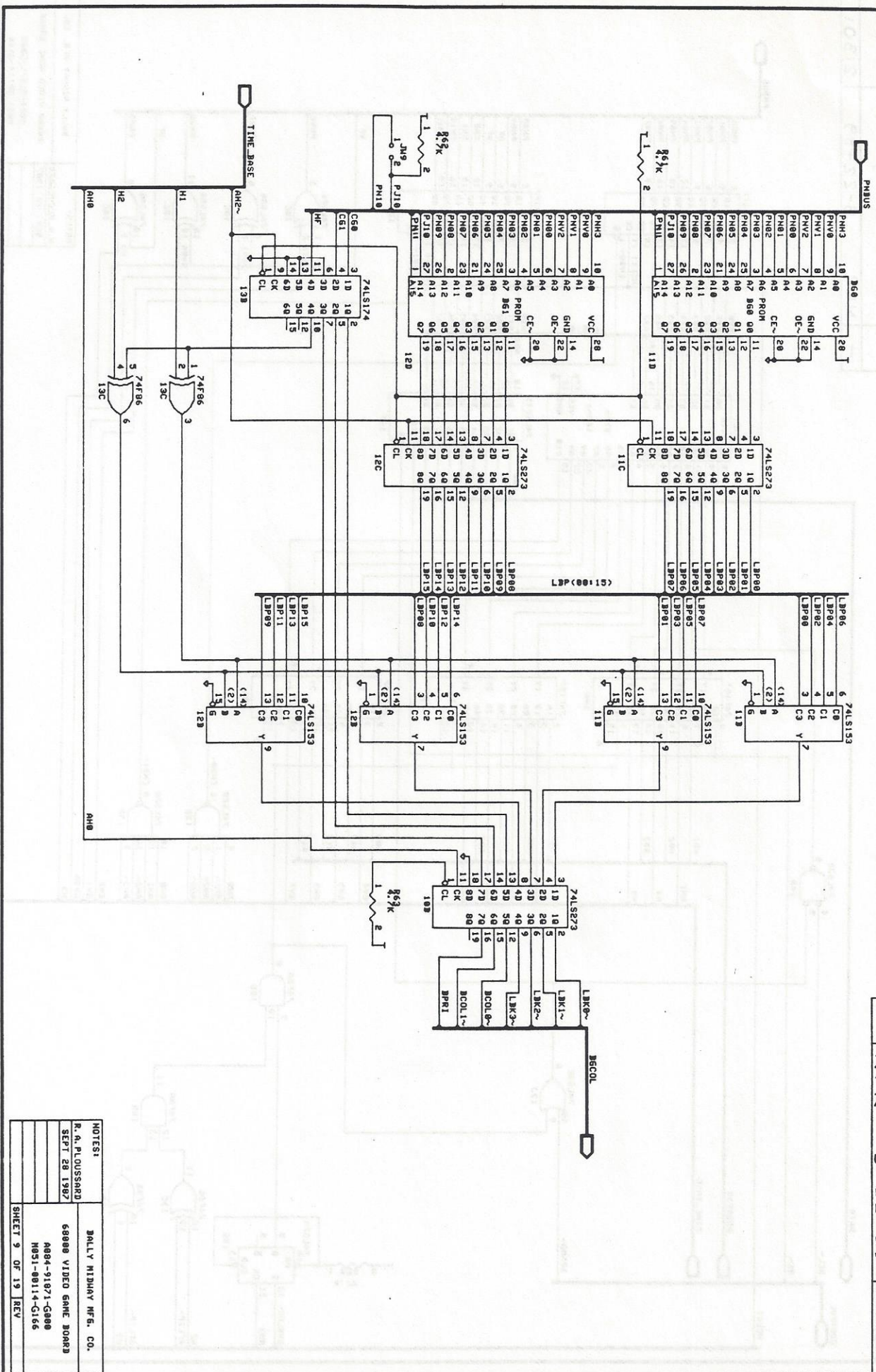


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 SHEET 7 OF 19 REV

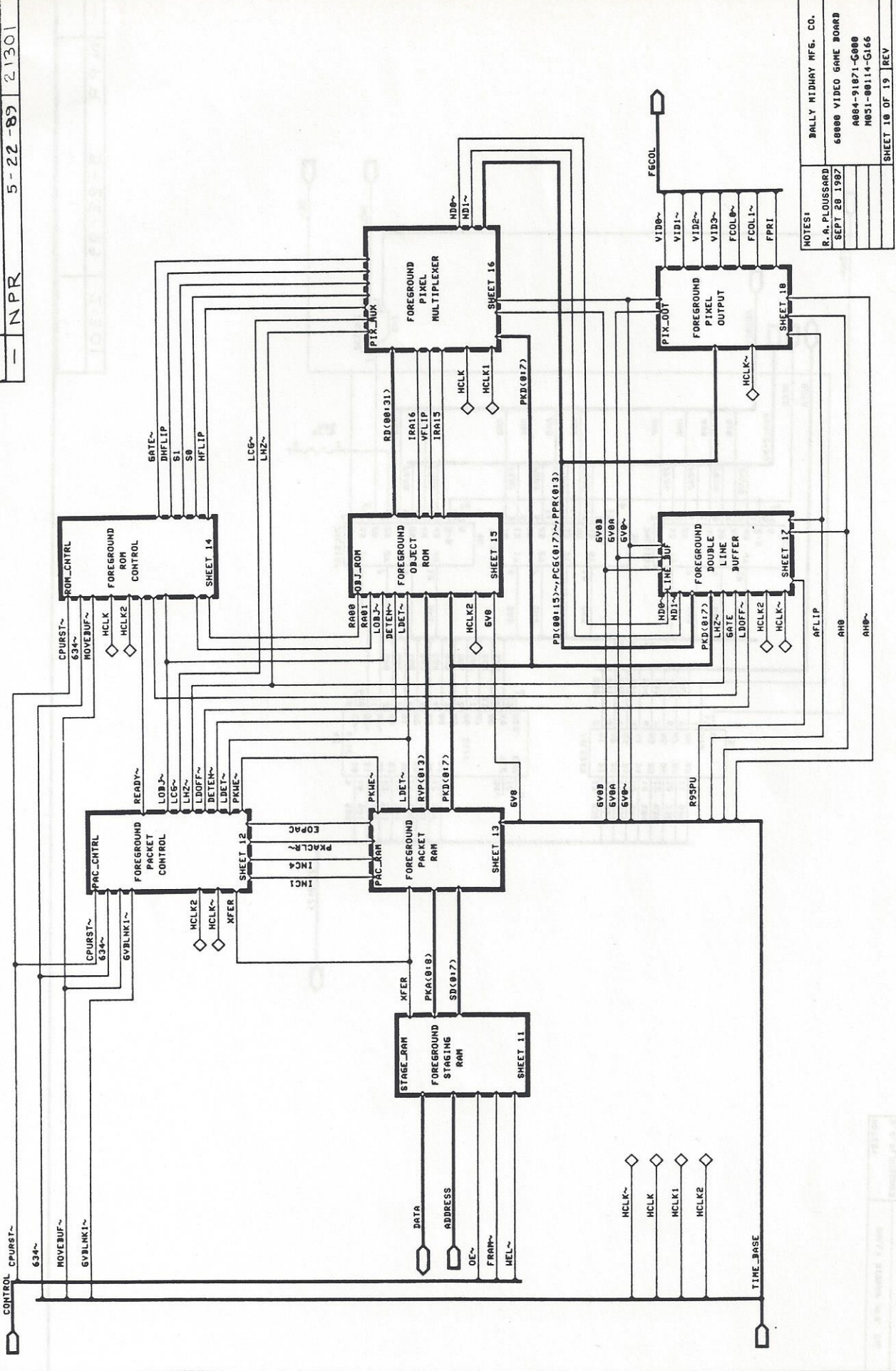
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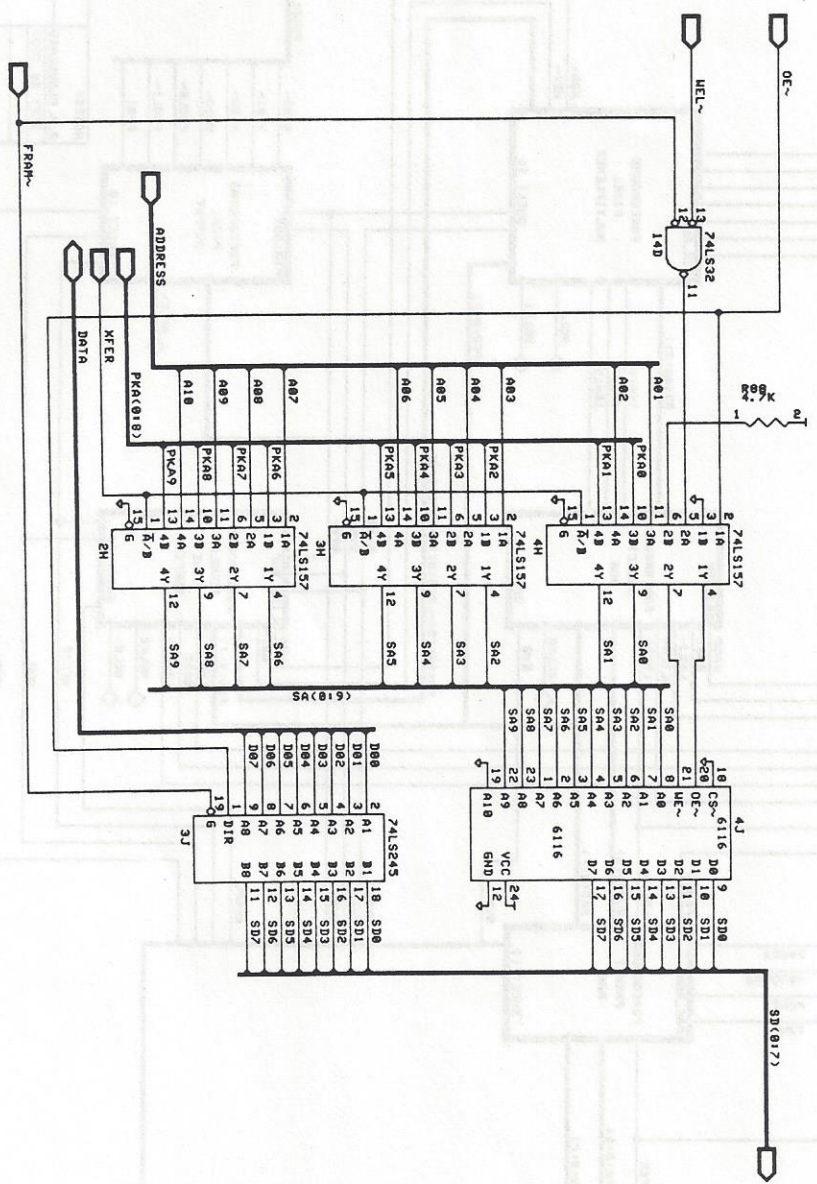
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 R. P. MALONE
 68000 VIDEO GAME BOARD
 SEP. 28 1987
 M051-00114-G166
 SHEET 8 OF 19 REV



NOTES:
 R. A. PLOUSSARD
 SEPT 28 1987
 68080 VIDEO GAME BOARD
 8084-91871-G000
 8081-00114-G166
 BALLY MIDWAY MFG. CO.
 SHEET 9 OF 19 REV



NOTES	
R.A. PLOUSSARD	BALLY MIDWAY MFG. CO.
SEPT 28 1987	68000 VIDEO GAME BOARD
	A884-91871-G000
	M851-00114-G166
	SHEET 18 OF 19 REV



NOTES:
 R.A. PLOUSSARD
 SEPT 28 1987
 BALLY MIDWAY MFG. CO.
 68000 VIDEO GAME BOARD
 A884-91871-G000
 A831-88114-G166
 SHEET 11 OF 19 REV

5-22-89 21301

NPR

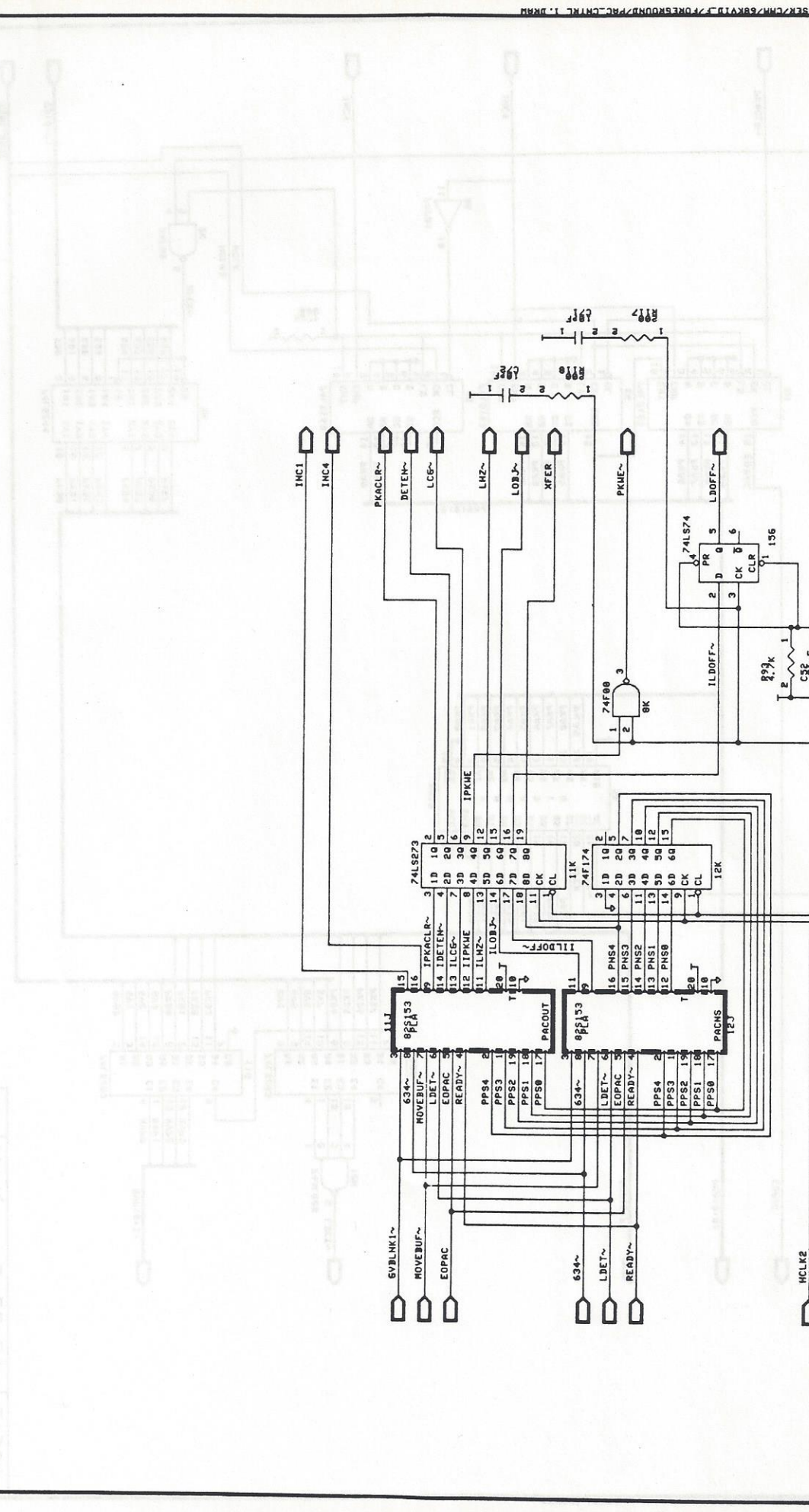
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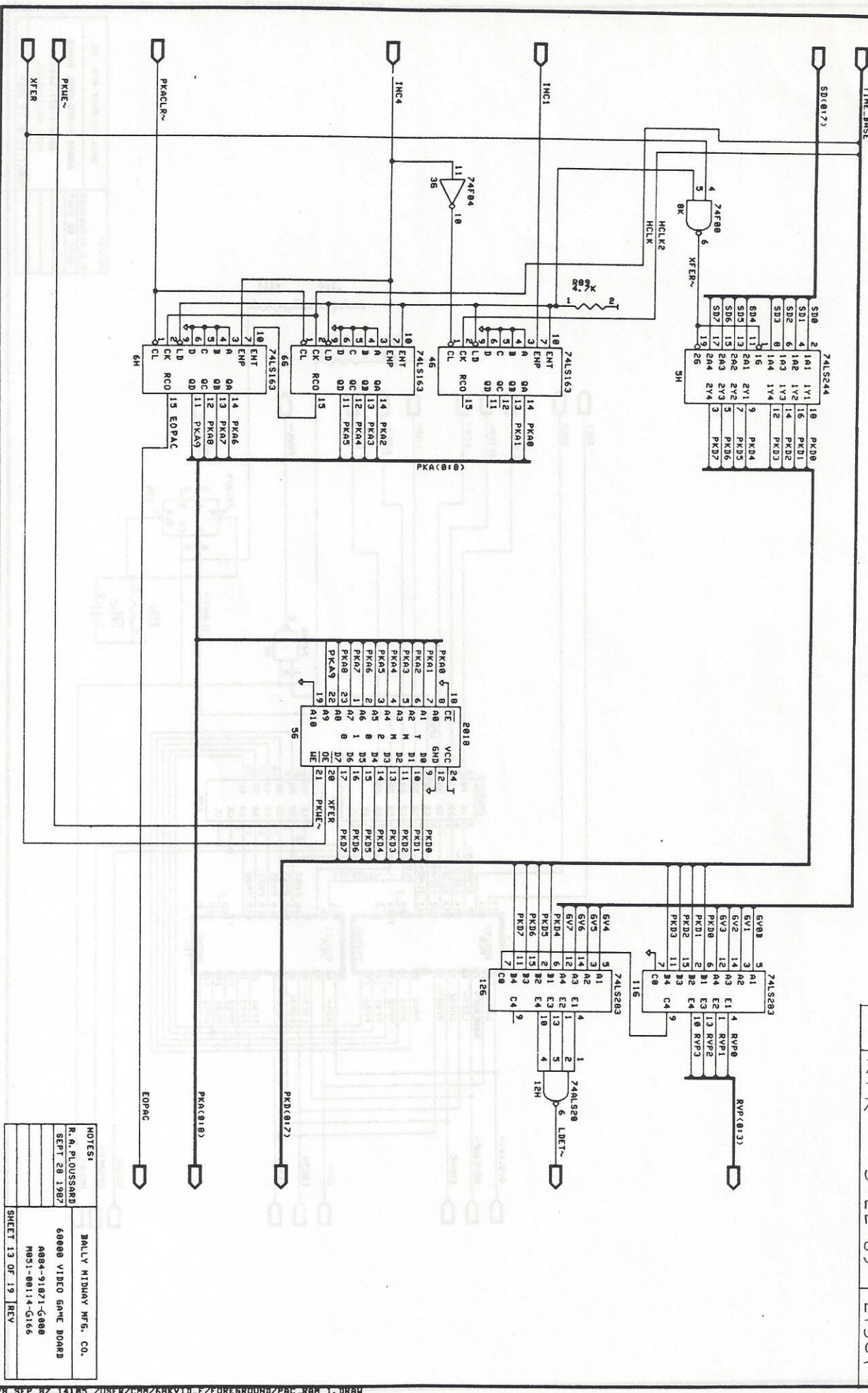
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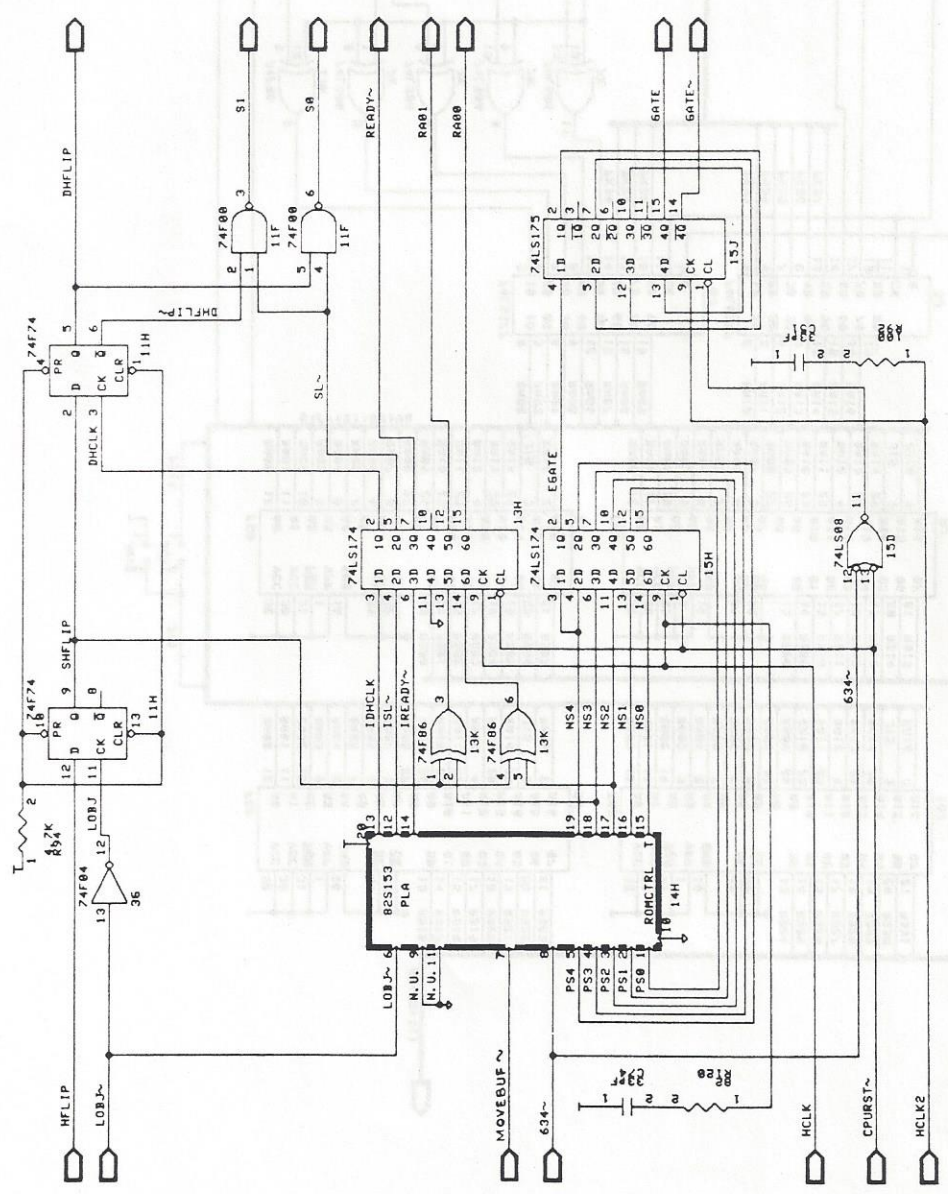


NOTES:	BALLY MIDWAY MFG. CO.
R.A. PLOUSSARD	68000 VIDEO GAME BOARD
SEPT 28 1987	A884-91871-G000
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	SHEET 12 OF 19 REV

28 SEP 87 14184 /05EK/CM/68KVID /FOREKOUND/PAC-CHKL 1.DKRM

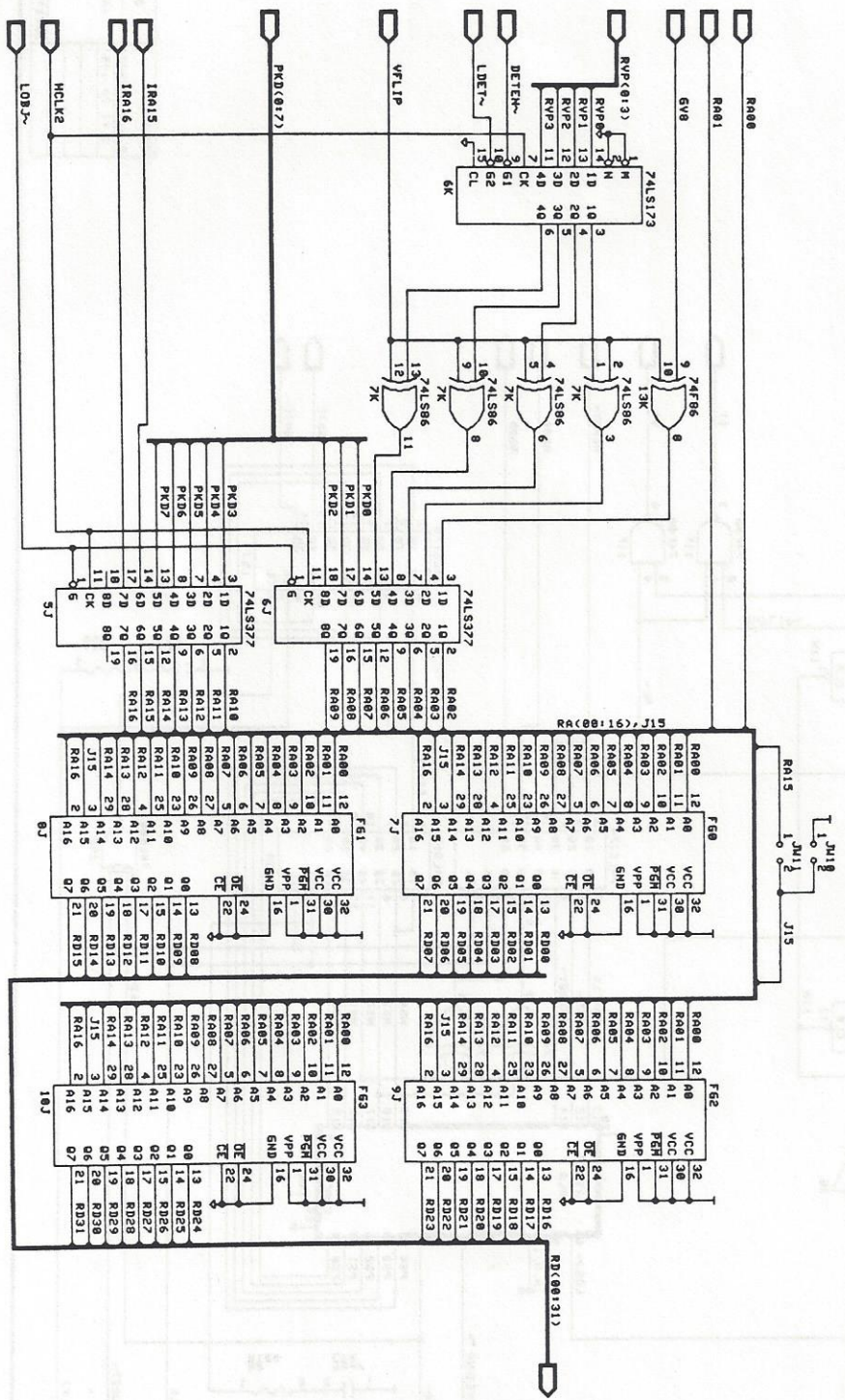


NOTES
 R.A. PLOUSSARD
 SEPT 28 1987
 68088 VIDEO SMP# BOARD
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 8851-88114-G166
 BALLY MIDWAY MFG. CO.
 SHEET 13 OF 19 REV

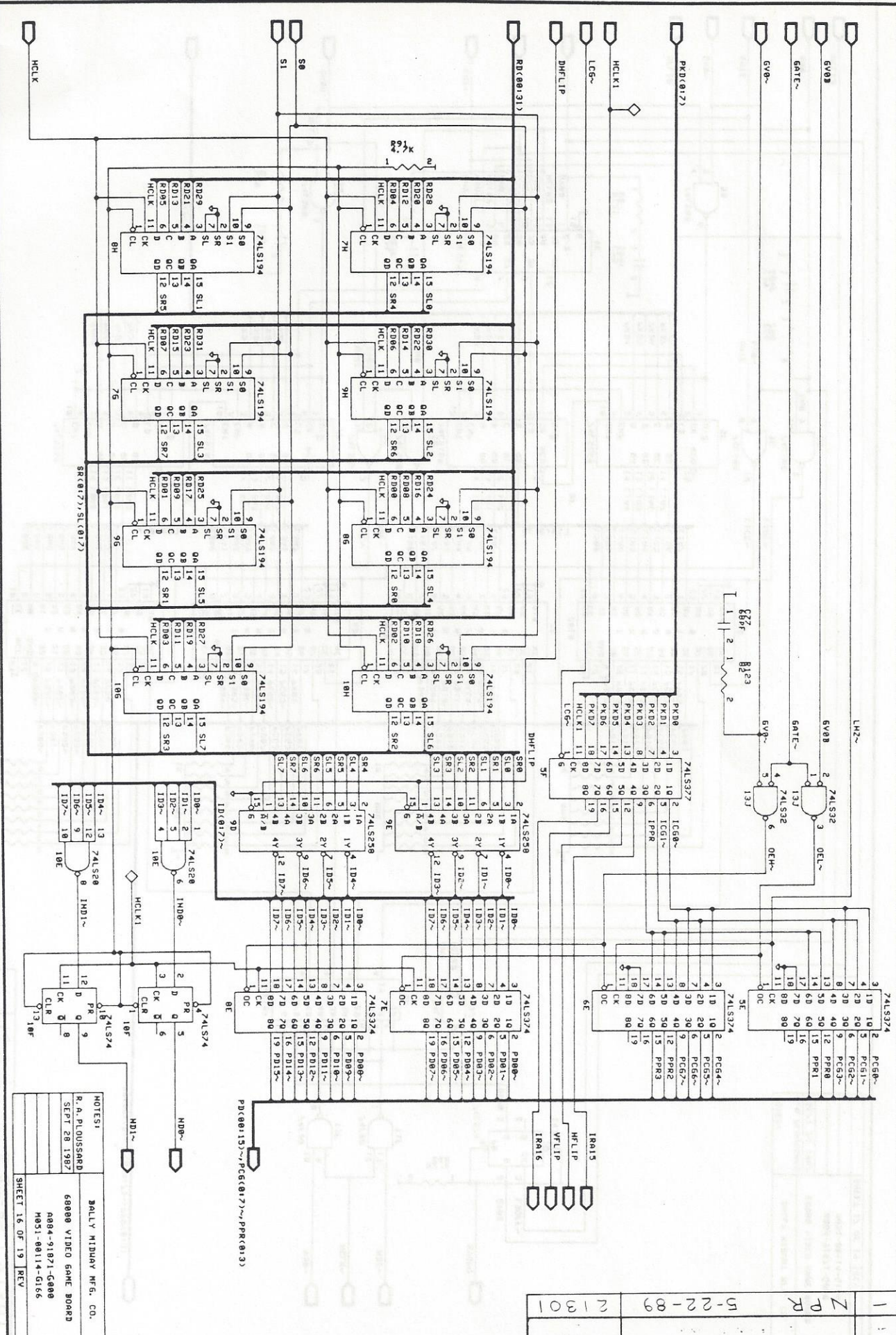


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R-A. PLOUSSARD	68000 VIDEO GAME BOARD
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	SHEET 14 OF 19 REV

28 SEP 87 14:09 USER/CMM/68KX1017/FRESHBOND/ROM.CH.R.L.1.DRAW

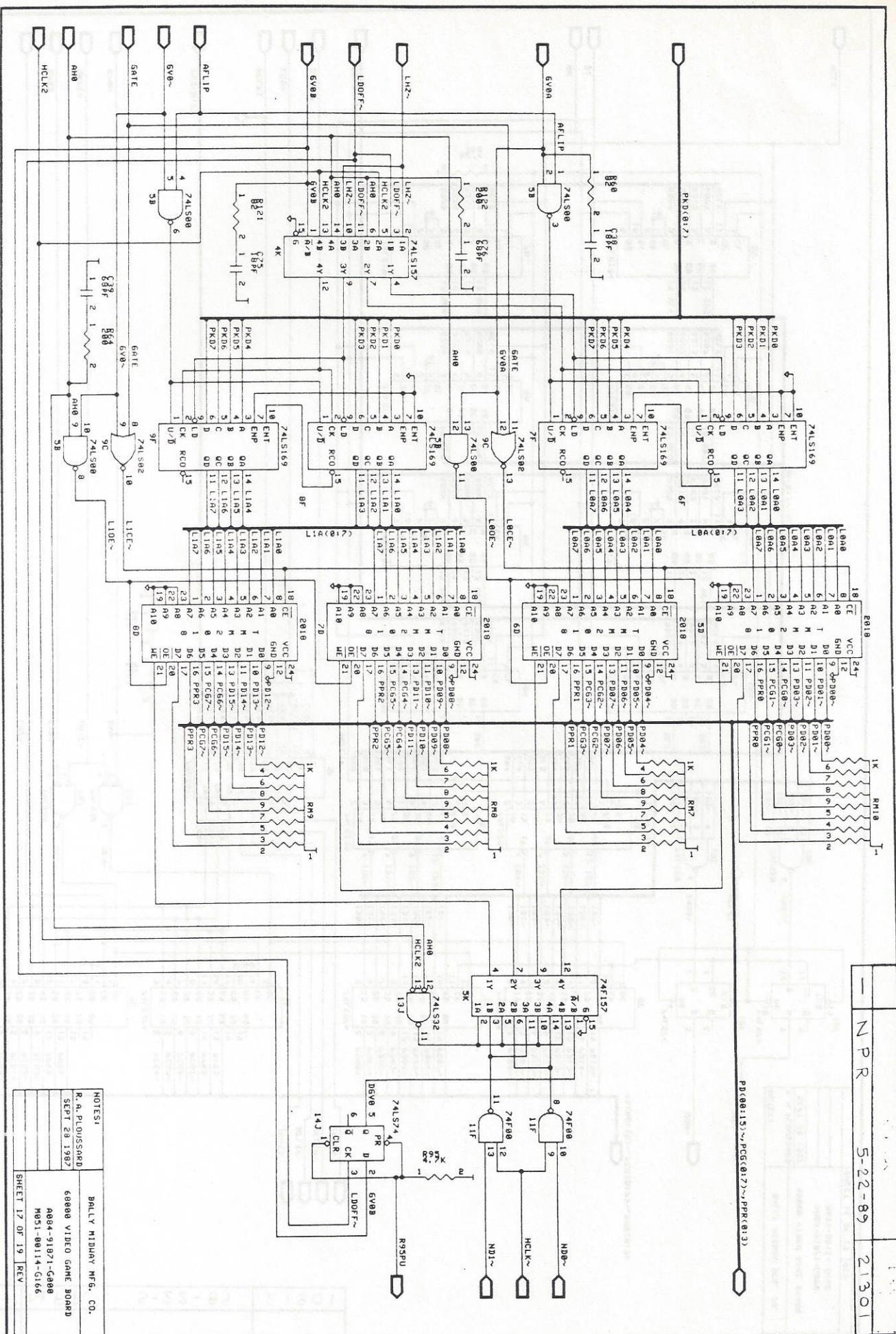


NOTES:
 R.A. PLOUSSARD
 SEPT 28 1987
 60000 VIDEO GAME BOARD
 A084-91871-000
 M051-00114-G166
 SHEET 15 OF 19 REV



NOTES:
 R.A. PLOUSSARD
 SEPT 28 1987
 68800 VIDEO GAME BOARD
 A084-91871-G000
 M031-00114-G166
 SHEET 16 OF 19 REV

1 1
 ZFR
 5-22-89
 21301



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5-22-89

21301

NOTES:

R.A. PLOUSSARD

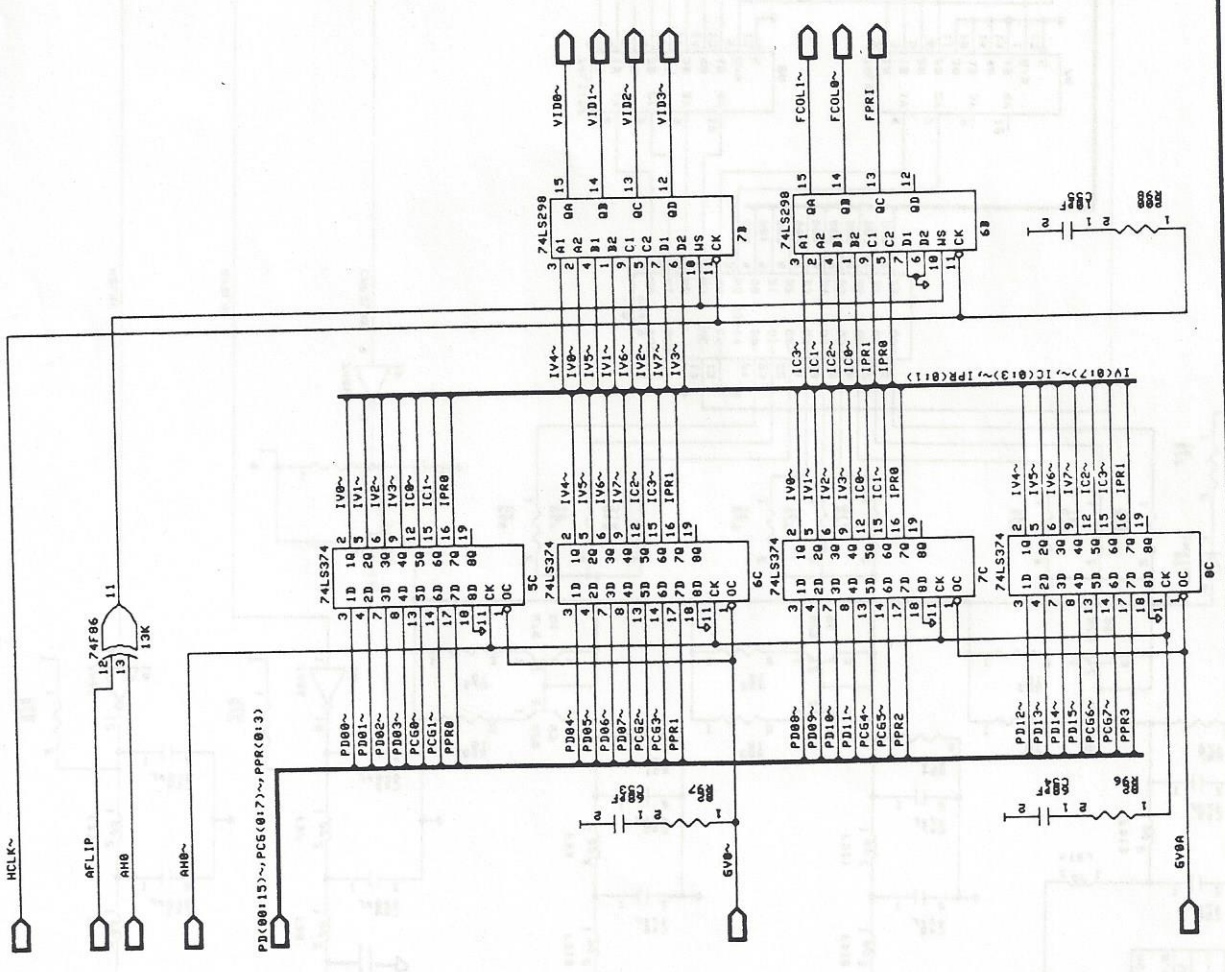
SEPT 28 1987

68000 VIDEO GAME BOARD

A884-91871-GA00

M051-80114-G166

SHEET 17 OF 19 REV

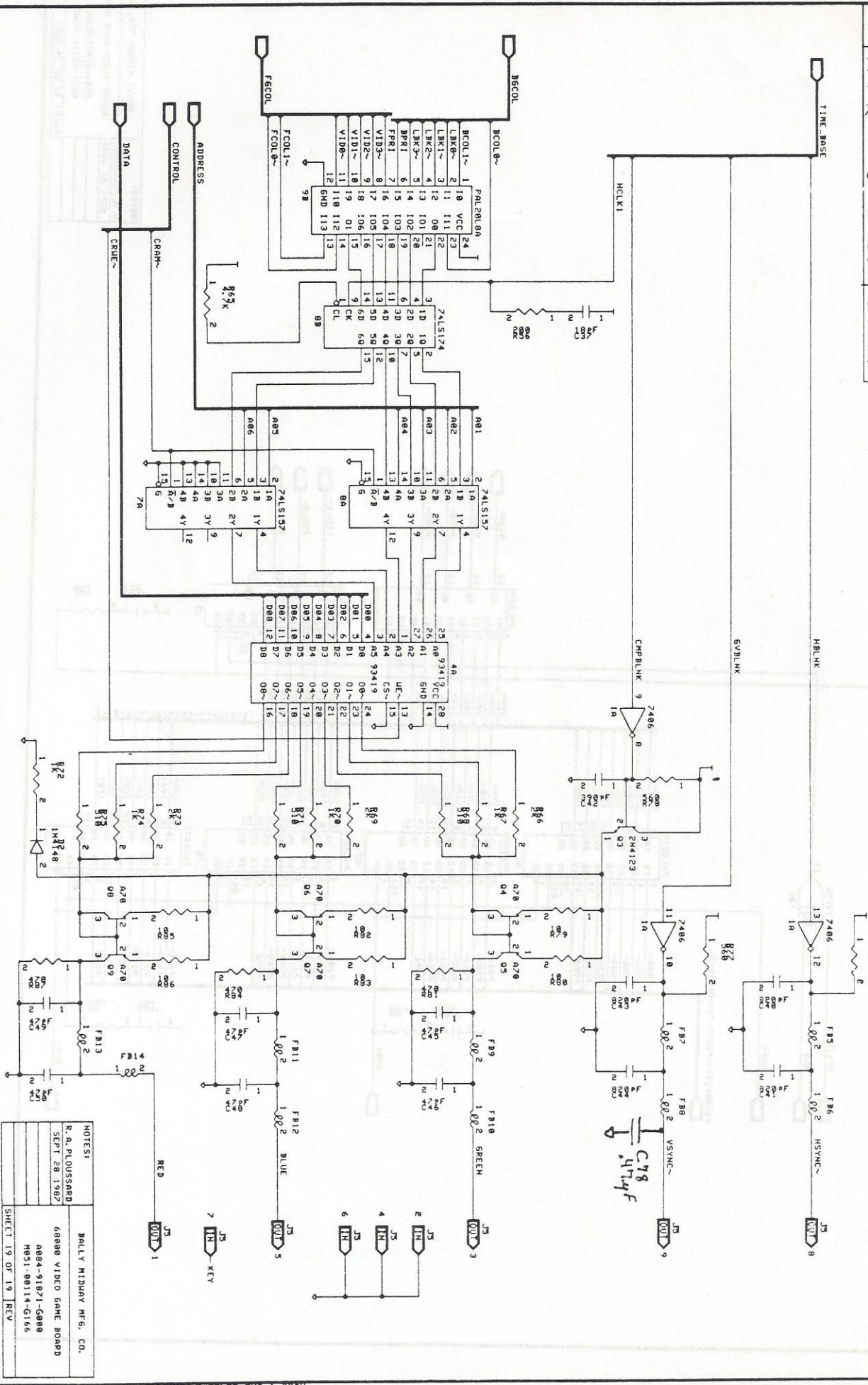


NOTES:
 R. A. PLOUSSARD
 SEPT 28 1987

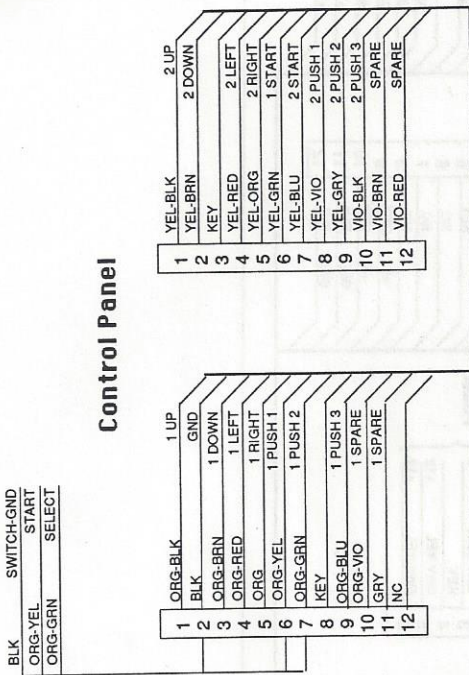
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SHEET 18 OF 19 REV

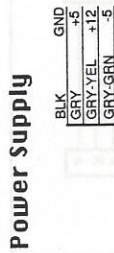
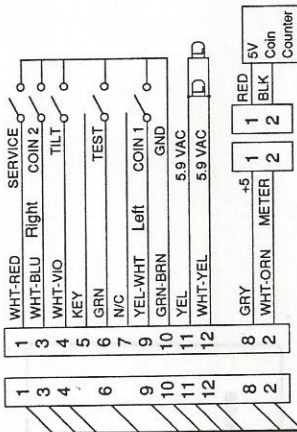
88 REP 87 14188 /08EK/CM/8K/1D /FOREGROUND/PIX-OUT 1-DRAW



R. A. PLOUSSARD
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 68888 VIDEO GAME BOARD
 8884-91871-G888
 H031-00114-G166
 SHEET 19 OF 19 REV

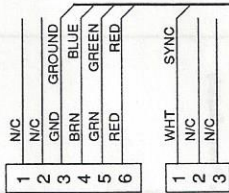


Coin Door



JAMMA EDGE CONNECTOR

Video

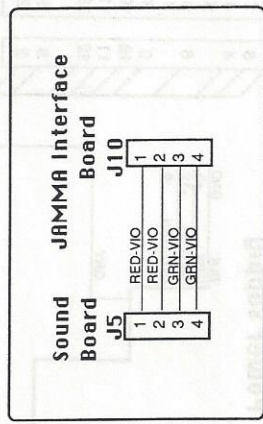
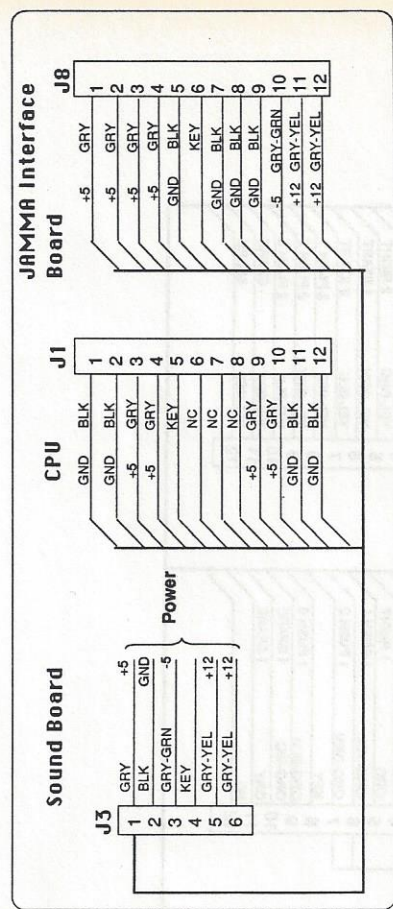
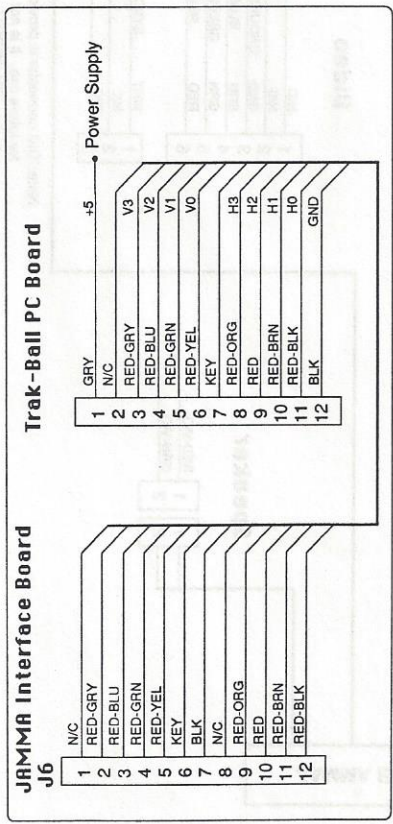
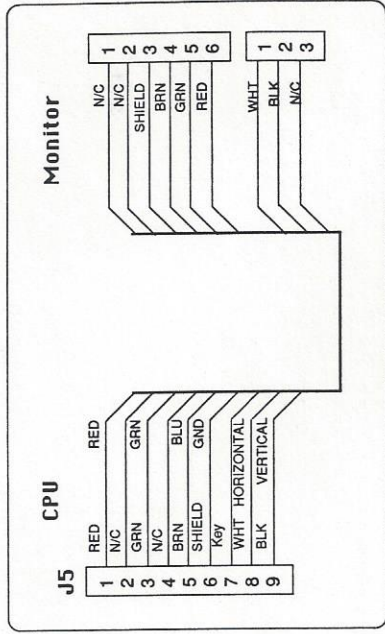


Speaker

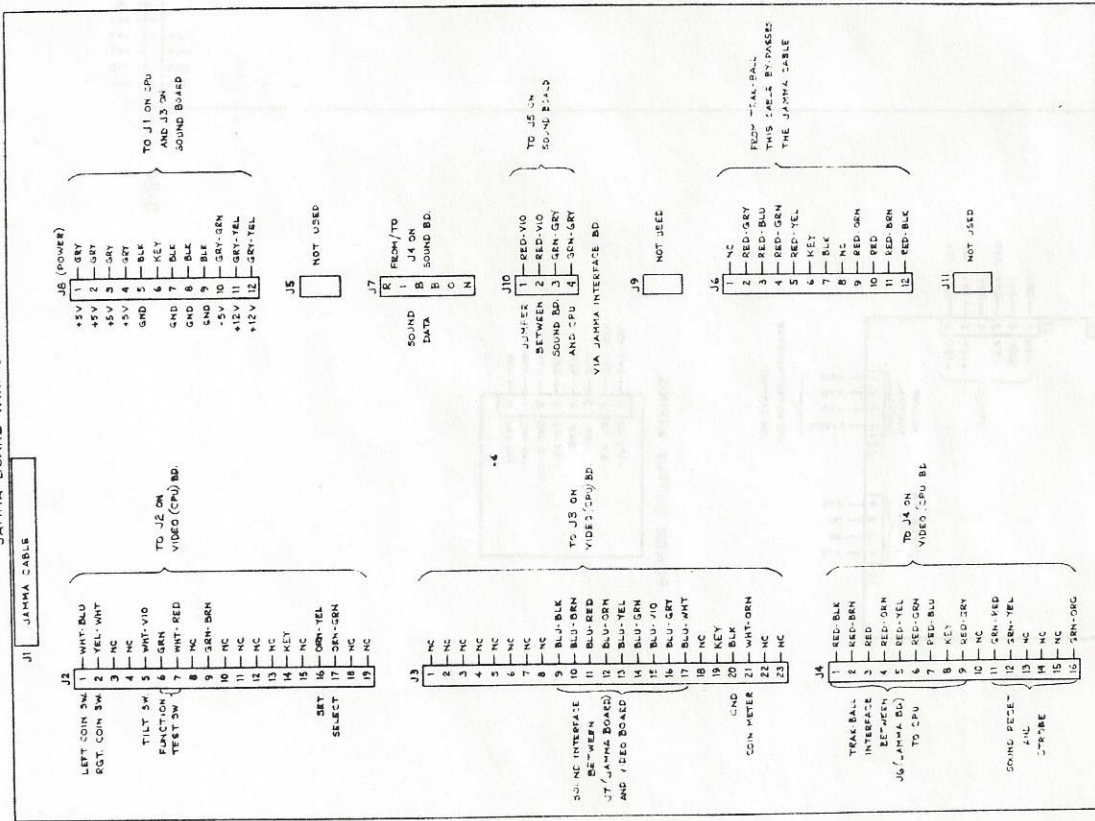


Note: This connector is provided for future use. It is not used on TRI-SPORTS.

**TRI-SPORTS Cabinet
Wiring Diagram**

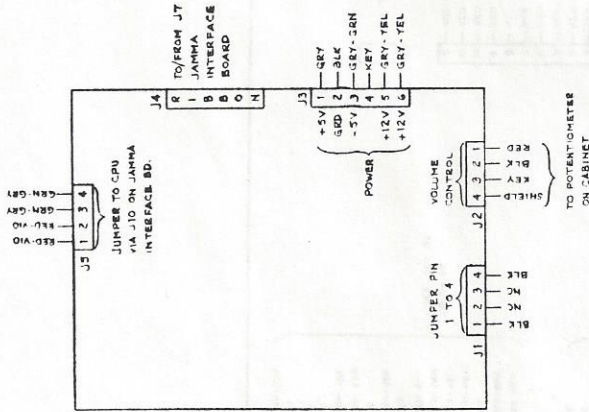


JAMMA BOARD WIRING

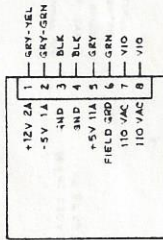


TRI-SPORTS
Interboard Wiring
Diagram

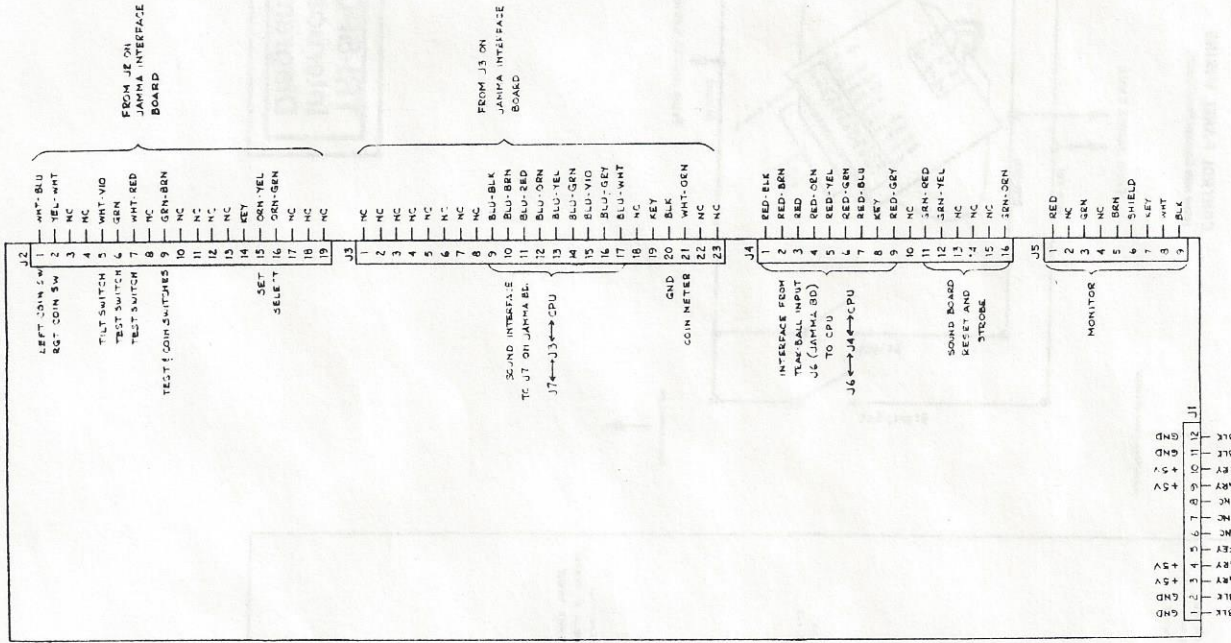
SOUND BOARD WIRING



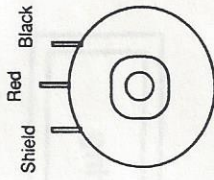
POWER SUPPLY WIRING



VIDEO (CPU) BOARD WIRING

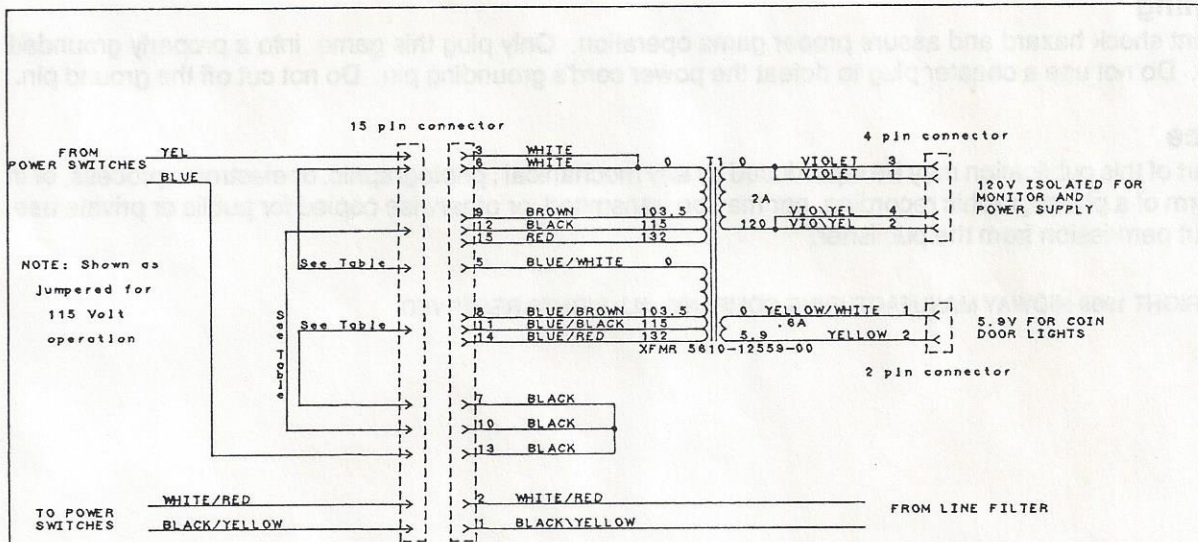
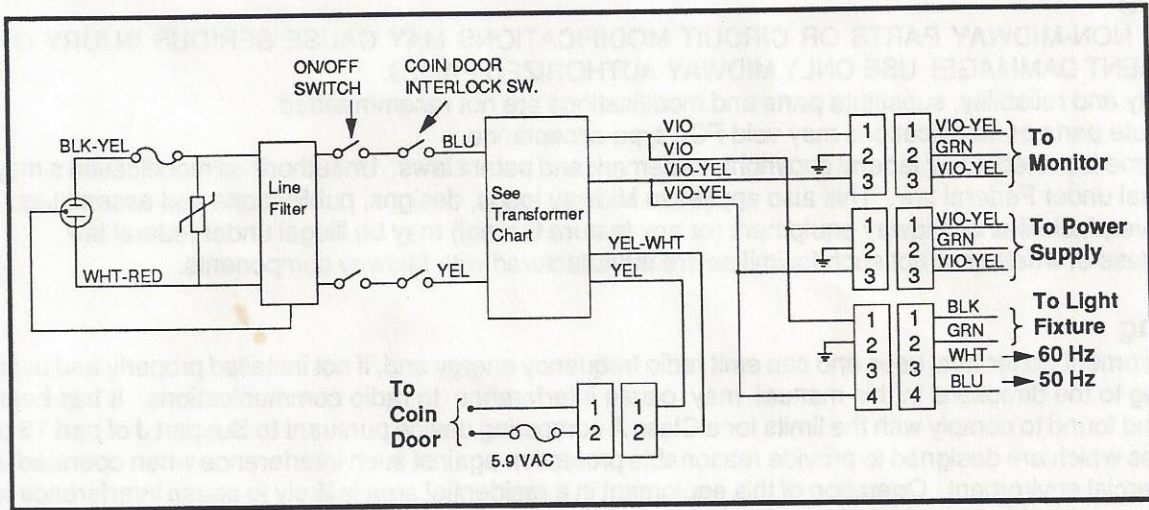


Volume Control Wiring Diagram



Viewed from Back of Cabinet

POWER WIRING DIAGRAM



Voltage Selection Table

VOLTAGE	JUMPER PINS
103.5	5-6, 7-8, 10-9
115	5-6, 7-11, 10-12
132	5-6, 7-14, 10-15
207	5-9, 10-8
218.5	5-9, 10-11
230	5-12, 10-11
247	5-12, 10-14

NOTE: ALL WIRES 18Gø 600V

WARNINGS & NOTICES

Warning

USE OF NON-MIDWAY PARTS OR CIRCUIT MODIFICATIONS MAY CAUSE SERIOUS INJURY OR EQUIPMENT DAMAGE! USE ONLY MIDWAY AUTHORIZED PARTS.

- * For safety and reliability, substitute parts and modifications are not recommended.
- * Substitute parts or modifications may void FCC type acceptance.
- * This game is protected by federal copyright, trademark and patent laws. Unauthorized modifications may be illegal under Federal law. This also applies to Midway logos, designs, publications and assemblies. Moreover, facimiles of Midway equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facimilies are manufactured with Midway components.

Warning

This equipment generates, uses and can emit radio frequency energy and, if not installed properly and used according to the directions in this manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of part 15 of FCC rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference to radio communications, in which the user, at his or her own expense, will be required to take whatever measures may be needed to correct the interference.

Warning

Prevent shock hazard and assure proper game operation. Only plug this game into a properly grounded outlet. Do not use a cheater plug to defeat the power cord's grounding pin. Do not cut off the ground pin.

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