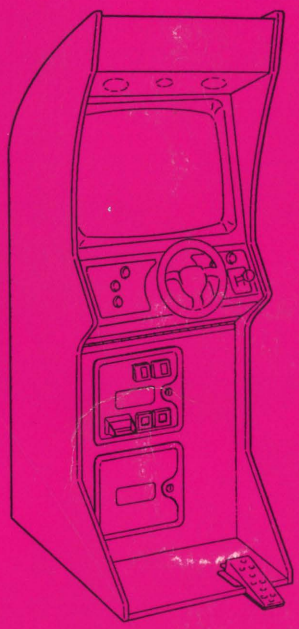
MIDWAY

October 1994
16-40037-101

CRUIS'N USA

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FINAL MANUAL

Operations Manual Includes

- Operations & Adjustments
- Testing & Problem Diagnosis
- Parts Information
- Reference Diagrams & Schematics

Midway Manufacturing Company
3401 North California Avenue
Chicago, Illinois 60618

CRUIS'N USA

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SECTION
ONE

Operation

Safety Notices

The following safety instructions 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 before preparing your game for play.

CAUTION

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. 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, be sure that the ground 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.

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 in fuse type, voltage rating, and current rating.

MONITOR PRECAUTIONS. When removing or repairing the monitor, extra precautions must be taken to avoid electrical shock. 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 monitor with your hands or metal objects! Always discharge the CRT by the following method: 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.

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.

ATTENTION!

PROPERLY ATTACH ALL CONNECTORS. *Make sure that the connectors on each printed circuit board (PCB) are properly connected. If the connectors 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

Game Location Requirements

Power: Domestic 115V @ 60 Hz, 15 Amps
Foreign 230V @ 50 Hz, 7 Amps
Japan 100V @ 50 Hz, 15 Amps

Dimensions (assembled): Width: 30"
Depth: 61"
Height: 67"

Temp.: 32^{O} F to 100^{O} F
(0^{O} C to 38^{O} C)

Humidity: Not to exceed 95% relative.

Weight: Crated 402 Lbs. (approx.)

Installation And Inspection

1. Remove all items from shipping containers and set them aside. Inspect the exterior of the cabinet for any signs of damage. Remove shipping cleats from the bottom of the cabinet.

2. Remove keys from the taped coin return slot. Unlock and open the coin and cash box doors. (Leg levelers and spare parts are stored in the cash box).

3. Tilt or lay the cabinet down. Locate four threaded holes on the bottom of the cabinet and install one leg leveler (with its hex nut) in each hole.

4. Stand cabinet upright and make certain it is in a stable position. Level the cabinet.

5. Remove rear door of cabinet. Inspect cabinet interior for any signs of damage. Check all major assemblies to assure that they are mounted securely.

6. Refer to the games Cabinet Wiring Diagram (section 3), and check to see that all cable connectors are correctly secured. DO NOT FORCE CONNECTIONS. Watch for damaged connectors and avoid making reversed connections.

7. Install the foot pedal assembly. Slide the foot pedal bracket onto the cut-out of the cabinet base. The plug under the cabinet will line up with the socket in the foot pedal assembly. Press firmly into place to insure a solid connection. Using the T27 wrench and six 1/4-20x2" tamper proof screws, mount into place.

8. Determine the value of your line voltage with a meter. Then, check the jumper wire to the main power supply transformer. Be sure it is jumpered to correspond to your local line voltage value. If necessary, change the jumper wire to the transformer in accordance with the Jumper Chart in Section Three.

9. Replace rear cabinet door and screw (lock) it securely. NOTICE: Tamper proof screws are included with the spare parts. These screws are optional and may be used to secure the rear door panel. The T20 wrench is used for the installation of these screws. Close and lock the front coin and cash box doors.

10. To attach line cord, remove the four Phillips-head screws that mount the line cord cover plate to the rear cabinet. Match the prongs on the plug with the holes in the receptacle and push line cord securely into place. Make sure cord aligns with the indentation of plate (indentation should point toward bottom of cabinet). Remount line cord cover plate. If desired, tamper resistant screws are provided to remount cover plate.

11. Connect the line cord to a grounded (3-terminal) AC wall outlet.

12. Switch ON the game using the ON/OFF switch located on the upper left top of the cabinet, to verify proper operation.

SERVICING

Always turn off power to game before servicing.

- **Control Panel**
  The control panel is held in place by two latches (located inside the cabinet, on the left an right sides of the control panel) which provide constant pressure on the strikes. The latches can be reached through the coin door opening. Hold the control panel in place and release the latches; lift the latch handle and unhook the wire fasteners. Carefully lower the control panel until it rests on its support chains. To reinstall the control panel, check for proper cable connection, including the ground strap. Raise it into position, avoiding pinched wires. Re-clamp the latches.

- **Speakers**
  To access the speakers, remove five 1/4" hex-head wood screws holding the plastic strip above marquee glass. Set strip aside and carefully lift glass. Store glass carefully to prevent damage. It may be necassary to remove the fluorescent light assembly to replace speakers. If so, disconnect the fluorescent light assembly from its power cable. Remove the four hex-head screws fastening the assembly to the cabinet and lift out.

- **Viewing Glass**
  The control panel is held in place by two latches (located inside the cabinet, on the left an right sides of the control panel) which provide constant pressure on the strikes. The latches can be reached through the coin door opening. Hold the control panel in place and release the latches; lift the latch handle and unhook the wire fasteners. Carefully lower the control panel until it rests on its support chains. Lift up on the viewing glass at the bottom support ledge, then slide out.

- **Monitor Bezel**
  The control panel is held in place by two latches (located inside the cabinet, on the left an right sides of the control panel) which provide constant pressure on the strikes. The latches can be reached through the coin door opening. Hold the control panel in place and release the latches; lift the latch handle and unhook the wire fasteners. Carefully lower the control panel until it rests on its support chains. Lift up on the viewing glass at the bottom support ledge, then slide out. Monitor bezel can now be easily accessed and removed. Lift the bezel at the bottom support ledge, and slide out.

- **Marquee Glass**
  Remove five 1/4" hex-head wood screws holding the plastic strip above marquee glass. Set strip aside and carefully lift glass. Store glass carefully to prevent damage.

- **Fluorescent Light Assembly**
  Remove five 1/4" hex-head wood screws holding the plastic strip above marquee glass. Set strip aside and carefully lift glass. Store glass carefully to prevent damage. Disconnect the fluorescent light assembly from its power cable. Remove the screws four hex-head screws fastening the assembly to the cabinet and lift out.

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

- **Fluorescent Lamp**
  Remove five 1/4" hex-head wood screws holding the plastic strip above marquee glass. Set strip aside and carefully lift glass. Store glass carefully to prevent damage Remove the fluorescent lamp retainer brackets. Grasp the tube, give it a quarter turn and remove it from its socket. Carefully place a new tube into the socket and turn to reinstall.

- **Monitor**
  We recommend that you read the WARNINGS section thoroughly before beginning this procedure.
  Switch OFF power to the game. Remove the viewing glass and the monitor bezel. Completely disconnect the monitor from all of its cabling, including its chassis ground strap.
  Remove the six flange nuts securing the monitors mounting flanges to its mounting panel. Pull the monitor carefully from the cabinet front.

  ⚠**CAUTION** *While removing the four flange nuts, firmly support the monitor from the front of the CRT so that it will not slip.*

  ⚠**CAUTION** *The monitor DOES NOT contain an isolation transformer in its chassis. It is mounted instead in the Power Chassis Assembly locate 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.*

Game Features

Cruis'n USA is a one player game.

Starting Up

Switch ON power to the game. A "rug" pattern appears on the CRT screen. When the "rug" pattern ends, the screen shows a CPU Board map. Bad chips are indicated in red, good chips are in green. The software revision level is shown at the top of the screen.

NOTE: When an error is detected during Start-up Tests, game start-up does not progress, and an error message appears on the screen.

Insert the desired amount of coins or tokens.

Player Controls

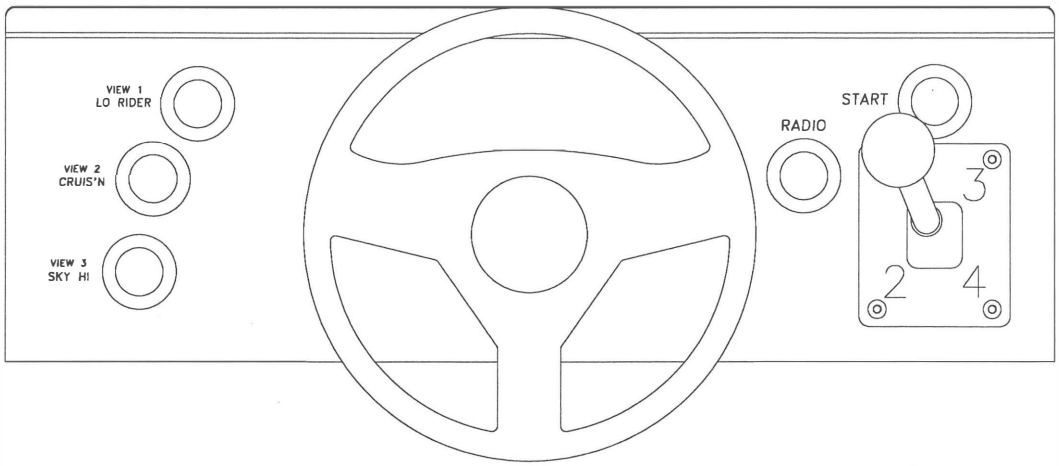
- **Start Button (Green)**
  The start button allows the player to begin game play.

- **Radio Button (Orange)**
  The radio button allows the player to turn radio sounds on and off, and change stations.

- **View 1-Lo Rider Button (Red)**
  View 1 drives the car from inside.

- **View 2-Cruis'n Button (White)**
  View 2 drives the car from directly behind.

- **View 3-Sky Hi Button (Blue)**
  View 3 drives the car from an aerial view.



Game Operation

The Cruis'n' USA Control Switches are located inside the coin door. These switches allow the operator to customize some features of the game.

CABINET SWITCHES

- The **SLAM TILT SWITCH** detects any forceful vibrations against the Coin Door. This eliminates pounding for free games. It is located on the inside of the coin door.

- The **ON/OFF SWITCH** is located on the top right side of the cabinet.

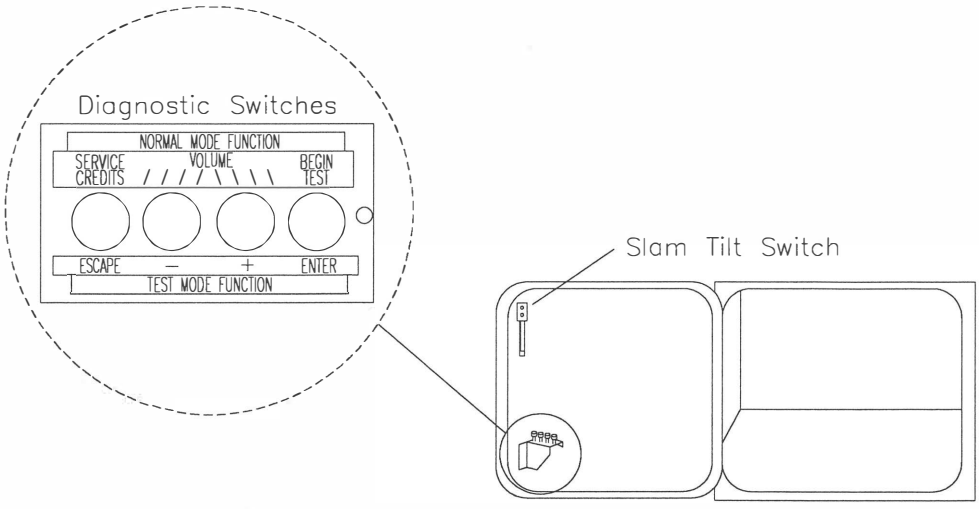
CONTROL SWITCHES

- The **TEST MODE SWITCH** activates the games Menu System. Press the Test Mode Switch to access the Main Menu. To exit the menu system, use the Volume Down Switch and select EXIT TO GAME OVER from the Main Menu, then press the Test Mode Switch or use the Service Credit Switch.

- The **VOLUME UP SWITCH** moves up through the menu selections or adjustment choices, and raises the sound level of the game when in game play.

- The **VOLUME DOWN SWITCH** moves down through the menu selections or adjustment choices, and lowers the sound level of the game when in game play.

- The **SERVICE CREDIT SWITCH** is a special feature switch that allots credit without affecting the game's bookkeeping total and is used to get out of a menu selection or return to the main menu.



Control Switch Locations

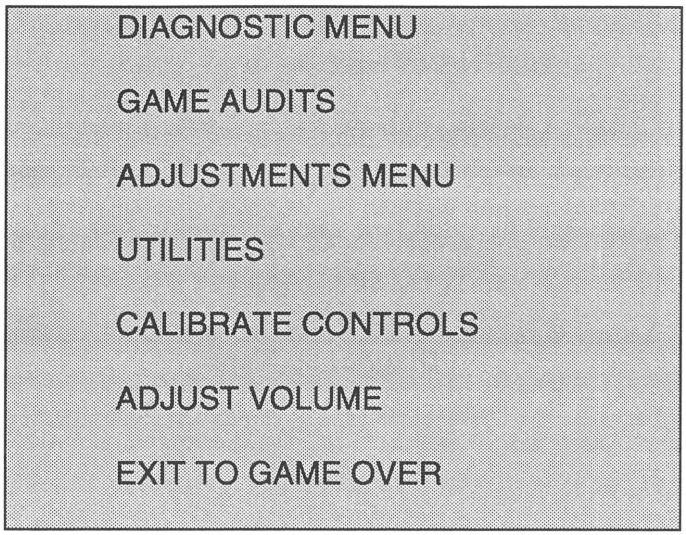
Menu System Operation

OPERATION
All CRUIS'N' USA Game Audits, Adjustments, and Diagnostics are options of the Main Menu. Each option, in turn, has its own menu, listing several choices that may be acted upon as desired.

Press the Test Mode Switch to activate the Main Menu (shown below). Game adjustments, bookkeeping, and diagnostics are all accessible from this menu.

Press the Volume Up Switch or Volume Down Switch to cycle through the menu options. Notice that the options are highlighted in sequence. Press Test Mode Switch to activate a highlighted option.

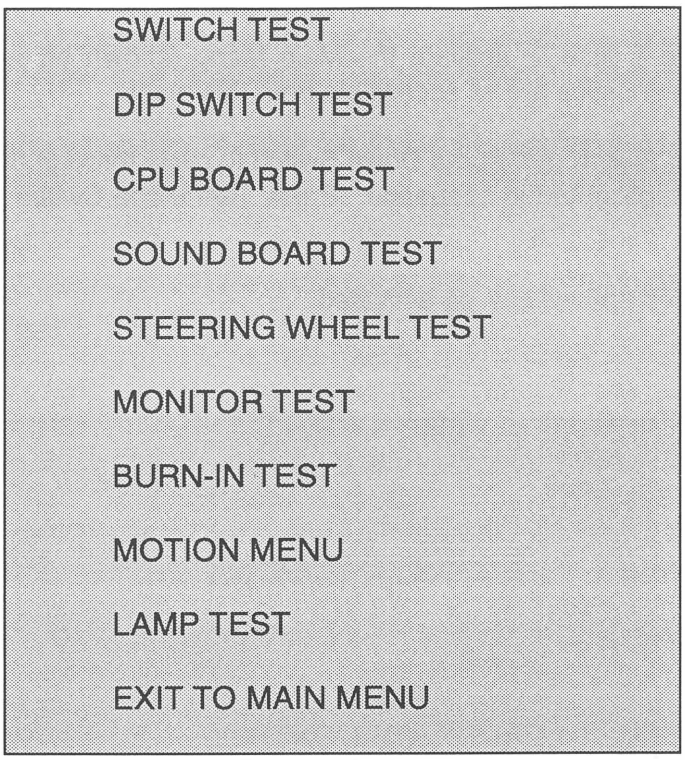
Note: Only highlighted options can be activated.



Main Test Menu

DIAGNOSTIC MENU

To enter the Diagnostic Menu from the Main Menu, press the Volume Up or Down Switch to highlight the option, then press the Test Mode Switch to activate. To exit the Diagnostic Menu, press the Volume Up or Down Switch to highlight EXIT TO MAIN MENU or press the Service Credit Switch.



Diagnostic Menu

Switch Test

The Switch Test allows the operator to test the switches on the control panel and the coin door.

Select the Switch Test by pressing the Volume Up or Down Switch to highlight the option; then press Test Mode Switch to activate. Pressing a switch on the control panel or coin door causes the corresponding switch location on the screen to light.

Press the Test Mode Switch to return to the Diagnostic Menu.

Dip Switch Test

The DIP Switch Test allows the operator to check the location of the two 8-position DIP switches on the CPU Board. The operator can also change the setting of each position of each DIP Switch during this mode.

To enter the test, press the Volume Up or Down Switch to highlight the DIP Switch Test; then, press the Test Mode Switch to activate. The screen displays a layout of their current settings.

To change a DIP Switch setting, move the switch to the desired setting, then check the screen to verify that the switch now shows the new setting.

Press Test Mode Switch to return to the Diagnostic Menu.

DIP Switch 2 Settings Table (U97)

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
NOT USED	OFF* ON							
MOTION OFF MOTIN ON		OFF* ON						
UP RIGHT SIT DOWN			OFF ON*					
NOT USED				OFF* ON	OFF* ON			
LINK OFF LINK ON						OFF* ON		
NOT USED							OFF* ON	
SLAVE MASTER								OFF* ON

DIP Switch 3 Settings Table (U19)

COIN MODE	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
USA1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	
GERMAN1	ON	OFF	OFF	OFF	OFF	OFF	OFF	
FRENCH1	OFF	ON	OFF	OFF	OFF	OFF	OFF	
CANADA1	ON	ON	OFF	OFF	OFF	OFF	OFF	
SWISS1	OFF	OFF	ON	OFF	OFF	OFF	OFF	
ITALY1	ON	OFF	ON	OFF	OFF	OFF	OFF	
UK1	OFF	ON	ON	OFF	OFF	OFF	OFF	
SPAIN1	ON	ON	ON	OFF	OFF	OFF	OFF	
AUSTRALIA1	OFF	OFF	OFF	ON	OFF	OFF	OFF	
JAPAN1	ON	OFF	OFF	ON	OFF	OFF	OFF	
TAIWAN1	OFF	ON	OFF	ON	OFF	OFF	OFF	
AUSTRIA1	ON	ON	OFF	ON	OFF	OFF	OFF	
BELGIUM1	OFF	OFF	ON	ON	OFF	OFF	OFF	
CHILE1	ON	OFF	ON	ON	OFF	OFF	OFF	
MEXICO1	OFF	ON	ON	ON	OFF	OFF	OFF	
ARGENTINA1	ON	ON	ON	ON	OFF	OFF	OFF	
SWEDEN1	OFF	OFF	OFF	OFF	ON	OFF	OFF	
FINLAND1	ON	OFF	OFF	OFF	ON	OFF	OFF	
NETHERLAND1	OFF	ON	OFF	OFF	ON	OFF	OFF	
NORWAY1	ON	ON	OFF	OFF	ON	OFF	OFF	
DENMARK1	OFF	OFF	ON	OFF	ON	OFF	OFF	
HOLLAND1	ON	OFF	ON	OFF	ON	OFF	OFF	
Coin Counter Mode One Counter Two Counters								OFF* ON

CPU Board Test
The CPU Board Test (much like the Start-up Test) allows the operator to check the RAMs and ROMs.

Highlight the CPU Board Test with the Volume Up or Down Switch; then, press the Test Mode Switch to activate. When this test is activated, a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMs and ROMs on the CPU. Any chip that is shown as gray with a white outline and should turn green during the CPU Test. During the test, chips are good if they turn green; they are faulty if they turn red.

Sound Board Test
The Sound Test allows listening to some of the sounds that Cruis'n' USA is capable of producing.

To enter the test, press the Volume Up or Down Switch to highlight the Sound Board Test; then, press the Test Mode Switch to activate.

Press the Volume Up Switch to change the music selection. Press the Volume Down Switch to trigger a sound effect. Press the Test Mode Switch to exit to the Diagnostic Menu.

Steering Wheel Test (Not Used)

Monitor Patterns
The Monitor Patterns Test provides a menu for testing the monitor. Highlight the test with the Volume Up or Down Switch and activate with the Test Mode Switch. Continue pressing the Test Mode Switch to cycle through the test and automatically return to the Main Menu.

The **COLOR BARS** test fills the screen with several gradated colors to help with red, green and blue level adjustments. Each color should appear sharp and clear.

The **RED, GREEN,** and **BLUE SCREEN** tests fill the screen with either red, green or blue.

The **CROSSHATCH PATTERNS** test fills the screen with a grid and should be clear.

If any of the Monitor Pattern Tests shows a need for adjustment, use the proper white knobs on the Monitor Board.

Burn-in Test
The Burn-in Test continually repeats the CPU Board Test. Press the Volume Up or Down Switch to highlight the Burn-in Test; then, press the Test Mode Switch activate. When the Burn-in Test detects an error, the test stops and displays an error message on the screen. Use this test to find intermittent CPU problems.

To exit this test, switch the game OFF then ON again.

Motion Test (Not Used)

Lamp Test (Not Used)

GAME AUDITS

To enter Game Audits from the Main Menu, press the Volume Up or Down Switch to highlight the option; then, press the Test Mode Switch to activate. To advance to the next page of the Game Audit Table, press the Volume Up or Down Switch. Press the Test Mode Switch to exit.

The Game Audits Table records the game play statistics. The left side of the table names the Audit item; the right side shows the amount of play.

LEFT COIN	0
RIGHT COIN	0
THIRD COIN	0
FOURTH COIN	0
SERVICE CREDITS	0
TOTAL STARTS	0
TOTAL CONTINUES	0
FREE RACES	0
EXPIRED RACES	0
FREE RACE PERCENTAGE	0
POWER ON TIME SECS	0
GAME TIME SECS	0
AVERAGE GAME TIME SECS	0

Page 1 of Audit Table

AUTOMATIC SELECTED	0
MANUAL SELECTED	0
63 MUSCLE SELECTED	0
LABOMBA SELECTED	0
DEVASTATOR SELECTED	0
ITALIA SELECTED	0
JEEP SELECTED	0
COPCAR SELECTED	0
VIEW1 TIME SECS	0
VIEW2 TIME SECS	0
VIEW3 TIME SECS	0

Page 2 of Audit Table

EVENT	0
U-GAMES	0
WATCHDOGS	0
BURNIN LOOPS	0
GAME DIFFICULTY	0

Page 3 of Audit Table

SELECT ARIZONA	0
SELECT US101	0
SELECT LA	0
SELECT IOWA	0
SELECT DEATH VALLEY	0
SELECT USA	0
SELECT BEVHILLS	0
SELECT APPALACHIA	0
SELECT REDWOOD	0
SELECT RUSHMORE	0
SELECT CHICAGO	0
SELECT SANFRAN	0
SELECT INDIANA	0
SELECT GGATE	0

Page 4 of Audit Table

START GGATE	0
START SF	0
START US101	0
START REDWOOD	0
START BEVHILLS	0
START LA	0
START DV	0
START ARIZONA	0
START GC	0
START IOWA	0
START CHICAGO	0
START INDIANA	0
START APPALACHIA	0
START DC	0

Page 5 of Audit Table

GGATE WINS	0
SANFRAN WINS	0
US101 WINS	0
REDWOOD WINS	0
BEVHILLS WINS	0
LA WINS	0
DEATHVALLEY WINS	0
ARIZONA WINS	0
GRAND CANYON WINS	0
IOWA WINS	0
CHICAGO WINS	0
INDIANA WINS	0
APPALACHIA WINS	0
DC WINS	0

Page 6 of Audit Table

ADJUSTMENTS MENU

NOTE: Game Adjustments are explained in more detail on the following page.

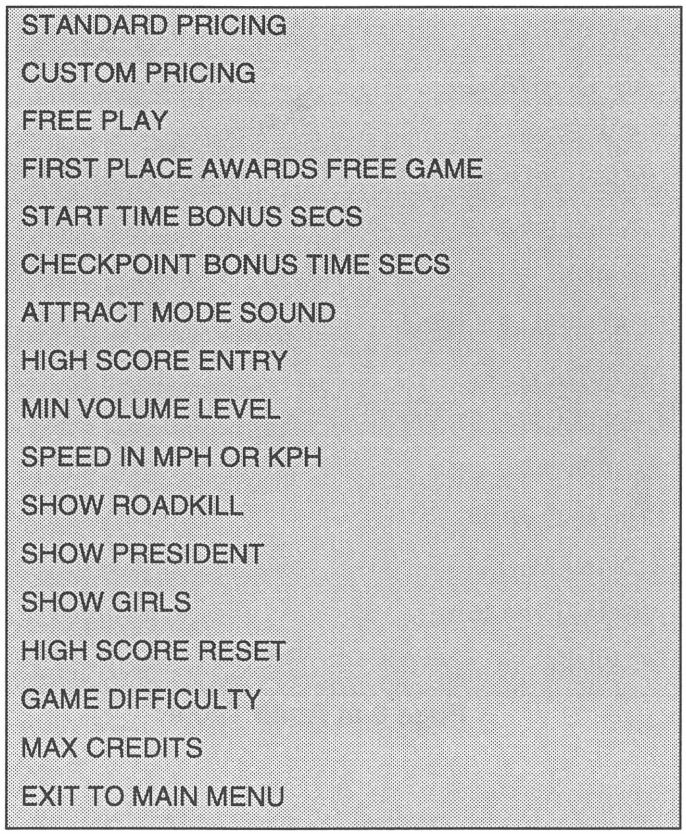
Press the Volume Up or Down Switch to highlight the Adjustments Menu option on the Main Menu; then, press the Test Mode Switch to activate.

The Adjustments Menu option allows the owner/operator to change the Game Pricing and Game Difficulty.

The Adjustments Menu offers several options. Press the Volume Up or Down Switch to highlight an option; then, press the Test Mode Switch to activate. The activated item provides a setting choice. Press the Volume Up or Down Switch to change the current setting value. After an item has been changed a confirmation box appears. For example:



Press the Volume Up or Down Switch to YES or NO, then press the Test Mode Switch to lock in the new setting.



Game Adjustment Menu

To exit the Adjustments Menu, press the Volume Up or Down Switch to highlight EXIT TO MAIN MENU; then, press Test Mode Switch to activate, or press the Service Credits Switch.

Standard Pricing
Standard Pricing allows the operator to choose any of the "Standard" selections for the Standard Pricing Table.

Custom Pricing
Custom Pricing allows the operator to install pricing other than that of the Standard Pricing Table. Custom Pricing also allows the operator to select the amount of credits required to start a game and the amount of credits required to continue a game. This option is adjusted from the Dip Switch Settings.

Free Play
This option selects free play. The setting choices for this adjustment are:
-Off **(factory setting)**
-On

First Place Awards Free Game
Awards a player a free game on 1st position. The setting choices for this adjustment are:
-On **(factory setting)**
-Off

Start Time Bonus Secs
This determines the initial time a player is given to finish a race. The setting range is:
-Maximum: 90
-Minimum: 60
-Factory Setting: 75

Checkpoint Bonus Time Secs
This awards the player a time bonus for passing a checkpoint.
-Maximum: 10
-Minimum: 25
-Factory Setting: 20

Attract-Mode Sound
This determines whether the game will make sounds in the attract mode. The settings for this adjustment are:
-On
-Off **(factory setting)**

High Score Entry
This determines whether the game will allow High Score Entry and Display Table. The setting choices are:
-On **(factory setting)**
-Off

Min Volume Level
This determines the minimum level allowed when setting the volume of the Sound Board. The setting range is:
-Maximum: 30
-Minimum: 0
-Factory Setting: 11

Speed in MPH or KPH
This determines speedometer setting in miles per hour or kilometers per hour.
-MPH **(factory setting)**
-KPH

Show Road Kill
This determines whether the game will show road kill. The settings are:
-On **(factory setting)**
-Off

Show President
This determines whether the game will show the president. The settings are:
-On **(factory setting)**
-Off

Show Girls
This determines whether the game will show girls. The settings are:
-On **(factory setting)**
-Off

High Score Reset
The number of games played before an automatic reset of High Score occurs. The setting range is1000 to 25,000.
-Factory Setting: 5000

Game Difficulty
This allows the operator to select the difficulty level of the game. The setting range is::
-Easiest: 0
-Hardest: 9
-Factory Setting: 5

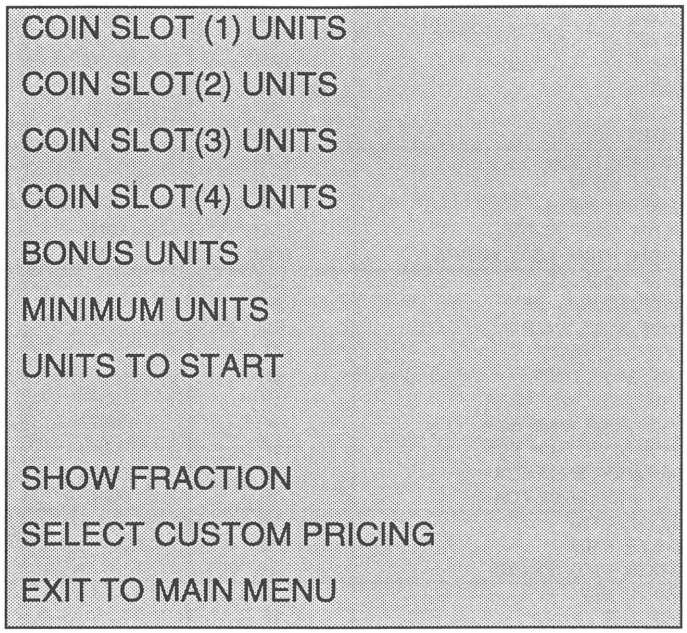
Max Credits
This determines the maximum credits allowed to begin a game. The setting range is:
-Maximum: 10
-Minimum: 30
-Factory Setting: 30

Wheel Sensitivity
This controls the responsiveness of the steering wheel. The setting range is:
-Maximum: 5
-Minimum: 1
-Factory Setting: 5

Standard Pricing Table

NAME	Settings Credit/Coin	Left Chute	Center Chute	Right Chute	Fourth Chute
USA1	1/3X25	.25	$1.00	.25	
USA2	1/2X25	.25	$1.00	.25	
USA3	1/4X25	.25	$1.00	.25	
USA4	1/5X25	.25	$1.00	.25	
USA5	1/6X25	.25	$1.00	.25	
USA6	1/8X25	.25	$1.00	.25	
GERMAN1	1/3X1DM, 2/5DM	1DM		5DM	
GERMAN2	1/1DM, 5/5DM	1DM		5DM	
GERMAN3	1/2X1DM, 3/5DM	1DM		5DM	
GERMAN4	2/5DM, 1/3X1DM ECA	5DM	1DM	2DM	
GERMAN5	3/5DM, 1/2DM, 1/2X1DM ECA	5DM	1DM	2DM	
FRENCH1	1/10F, 2/20F, 4/30	10F		20F	
FRENCH2	1/10F, 2/20F, 5/40F	10F		20F	
FRENCH3	1/10F, 3/20F, 7/40F	10F		20F	
FRENCH4	1/5F, 2/10F, 5/20F	5F		10F	
FRENCH5	1/5F, 3/10F, 7/20F	5F		10F	
FRENCH6	1/10F 2/20F, 4/30F ECA	1F	10F	5F	20F
FRENCH7	1/10F 2/20F, 5/40F ECA	1F	10F	5F	20F
FRENCH8	1/10F 3/20F, 7/40F ECA	1F	10F	5F	20F
FRENCH9	1/5F 2/10F, 5/20F ECA	1F	10F	5F	20F
FRENCH10	1/5F 3/10F, 7/20F ECA	1F	10F	5F	20F
CANADA1	1/2X25, 2/100	.25		$1.00	
CANADA2	1/4X25, 1/100	.25		$1.00	
CANADA3	1/4X25, 1/100, 3/2X100	.25		$1.00	
SWISS1	1/3X1F, 2/5F	1F		5F	
SWISS2	1/1F, 5/5F	1F		5F	
SWISS3	1/2X1F, 3/5F	1F		5F	
ITALY1	1/500LIRE	500 LIRE		500 LIRE	
ITALY2	1/2X500LIRE	500 LIRE		500 LIRE	
ITALY3	1/4X500LIRE	500 LIRE		500 LIRE	
UK1	2/100P, 1/50P, ECA	#1.00	20P	50P	10P
UK2	1/100P, 1/2X50P, ECA	#1.00	20P	50P	10P
UK3	1/3X20P, 1/50P	20P		50P	
SPAIN1	1/100PESETA, 6/500PESETA	100P		500P	
SPAIN2	3/2X100PESETA, 7/500PESETA	100P		500P	
SPAIN3	100PESETA, 5/500PESETA	100P		500P	
SPAIN4	1/2X100PESETA, 3/500PESETA	100P		500P	
SPAIN5	2/100PESETA, 10/500PESETA	100P		500P	
SPAIN6	1/100PESETA ECA	25P	200P	100P	500P
AUSTRALIA1	1/5X20, 1/100	.20		$1.00	
AUSTRALIA2	1/10X20, 1/2X100	.20		$1.00	
AUSTRALIA3	1/2X100	$1.00		$2.00	
AUSTRALIA4	1/3X100	$1.00		$2.00	
JAPAN1	1/100	100 YEN		100 YEN	
JAPAN2	1/2X100	100 YEN		100 YEN	
TAIWAN1	1/NT10	NT10		NT10	
TAIWAN2	1/2X US .25	.25 US		.25 US	
TAIWAN3	2/1 2 PLAYS FOR 1 COIN	1 COIN		1 COIN	
AUSTRIA1	1/5SCHIL, 2/10SCHIL	5 schilling		10 schilling	
AUSTRIA2	1/10SCHIL, 3/20SCHIL	10 schilling		20 schilling	
AUSTRIA3	1/2X5SCHIL, 1/10SCHIL	5 schilling		10 schilling	
BELGIUM1	1/20F	20F		20F	
BELGIUM2	1/2X20F	20F		20F	
BELGIUM3	1/20FB 3/50FB ECA	5F	50F	20F	
CHILE1	1 COIN 1 PLAY	1 COIN		1 COIN	
CHILE2	2 COINS 1 PLAY	1 COIN		1 COIN	
CHILE3	3 COINS 1 PLAY	1 COIN		1 COIN	
MEXICO1	4 COINS 1 PLAY	1 COIN		1 COIN	
MEXICO2	3 COINS 1 PLAY	1 COIN		1 COIN	
MEXICO3	2 COINS 1 PLAY	1 COIN		1 COIN	
ARGENTINA1	1 COIN 1 PLAY	1 COIN		1 COIN	
ARGENTINA2	2 COINS 1 PLAY	1 COIN		1 COIN	
ARGENTINA3	3 COINS 1 PLAY	1 COIN		1 COIN	
SWEDEN1	1/5 KRONA ECA	1 KRONA	10 KRONA	5 KRONA	
FINLAND1	1/5 MARKKA ECA	1 MARKKA	10 MARKKA	5 MARKKA	
NETHERLAND1	1/2.50 HFI	2.5 HFI		2.5 HFI	
NORWAY1	1/5 KRONE ECA	5 KRONE	20 KRONE	10 KRONE	
DENMARK1	1/5 KRONE ECA	1 KRONE	10 KRONE	5 KRONE	20 KRONE
HOLLAND1	1/1NLG, 3/1X2.50NLG	1 NLG		2.5 NLG	

Custom Pricing



Coin Slot (1) Unit:
Coin Slot (2) Unit:
Coin Slot (3) Unit:
Coin Slot (4) Unit: Coins inserted accumulate units. This adjustment specifies the number of units given for each coin in each chute (see "units/credit").

Bonus Units: One bonus credit is awarded after this many coin units have accumulated.

Minimum Units: No credits will be awarded until this many coin units have accumulated.

Units to Start: Units needed for one credit.

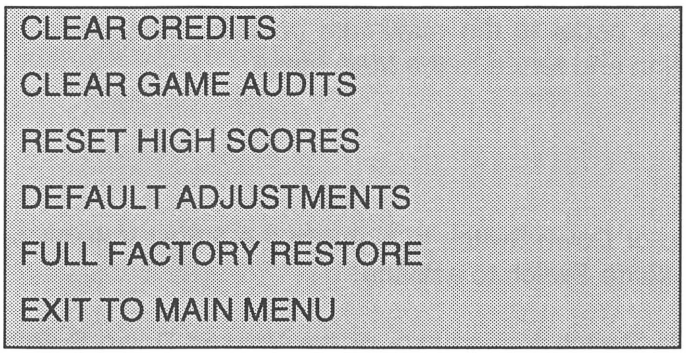
Show Fractions: When set to yes, fractional credits will be seen on the credits screen.

Select Custom Pricing: When set to yes custom pricing is enabled.

UTILITIES

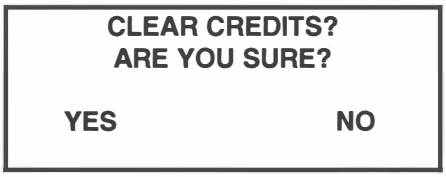
Press the Volume Up or Down Switch to highlight the Utilities option on the Main Menu; then, press the Test Mode Switch to activate.

The Utilities Menu allows the owner/operator to clear the games bookkeeping memory and to install a custom message.



Utilities Menu

Press the Volume Up or Down Switch to highlight an item from the Utilities Menu; then, press the Test Mode Switch to activate. After an item has been activated, you are given the option of resetting that item or not. For example:



Press the Volume Up or Down Switch to choose YES or NO, then press the Test Mode Switch to lock the choice and return to the Utilities Menu.

To exit the Utilities Menu, press the Volume Up or Down Switch to highlight EXIT TO MAIN MENU; then, press Test Mode Switch to activate selection or press the Service Credit Switch.

CALIBRATE CONTROLS

Press the Volume Up or Down Switch to highlight the Calibrate Controls option on the Main Menu; then, press the Test Mode Switch to activate.

Remove hands and feet from all controls. Set the steering wheel to the center position, then press the Test Mode Switch. Turn the steering wheel to the left-most position, then press the Test Mode Switch. Turn the steering wheel to the right-most position, then press the Test Mode Switch. Push the gas pedal to the maximum position, then press the Test Mode Switch to complete the calibration and return to the Main Menu.

ADJUST VOLUME

Press the Volume Up or Down Switch to highlight the Adjust Volume option on the Main Menu; then, press the Test Mode Switch to activate.

Press the Volume Up Switch to increase, or the Volume Down Switch to decrease the sound level of the game. Press the Test Mode Switch to lock the volume level and return to the Main Menu.

Troubleshooting

PROBLEM	POSSIBLE SOLUTION
NO PICTURE OR DISTORTED PICTURE.	Check for faulty video board or monitor. Check for disconnected video signal cable.
TURN GAME ON & NOTHING HAPPENS.	Check line fuse. Check for +5VDC at pins C, D, 3, and 4 of the JAMMA Connector.
NO SOUND.	Check the speaker and speaker connection to pins L and 10 on the JAMMA Connector. Check volume control setting. Check for +12VDC at pins F and 6 on the JAMMA Connector. Check inter-board wiring on CPU Board. Check sound fuses.
NO GENERAL ILLUMINATION.	Check the 1.0A., F.B. fuse located in the Power Chassis Assembly.
PRESS START BUTTON AND NOTHING HAPPENS.	Check for open wires between the button and CPU Board. Check for contamination on CPU Board pins or the button switch blade contacts. Check for proper ground.
NO CREDIT GIVEN WHEN COINS ARE INSERTED.	Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on the JAMMA Connector or Coin Switch 2 and pin T of the JAMMA Connector.
TOO MANY CREDITS FOR NUMBER OF COINS INSERTED.	Check Game Pricing setting. Check for a Short between pins T & 16 on the JAMMA Connector.
GAME STAYS IN THE TEST MODE.	Check that the Test Switch in the coin door and the Test Switch (Position 1) on DIP Switch 2 are set to Off.

Notes...

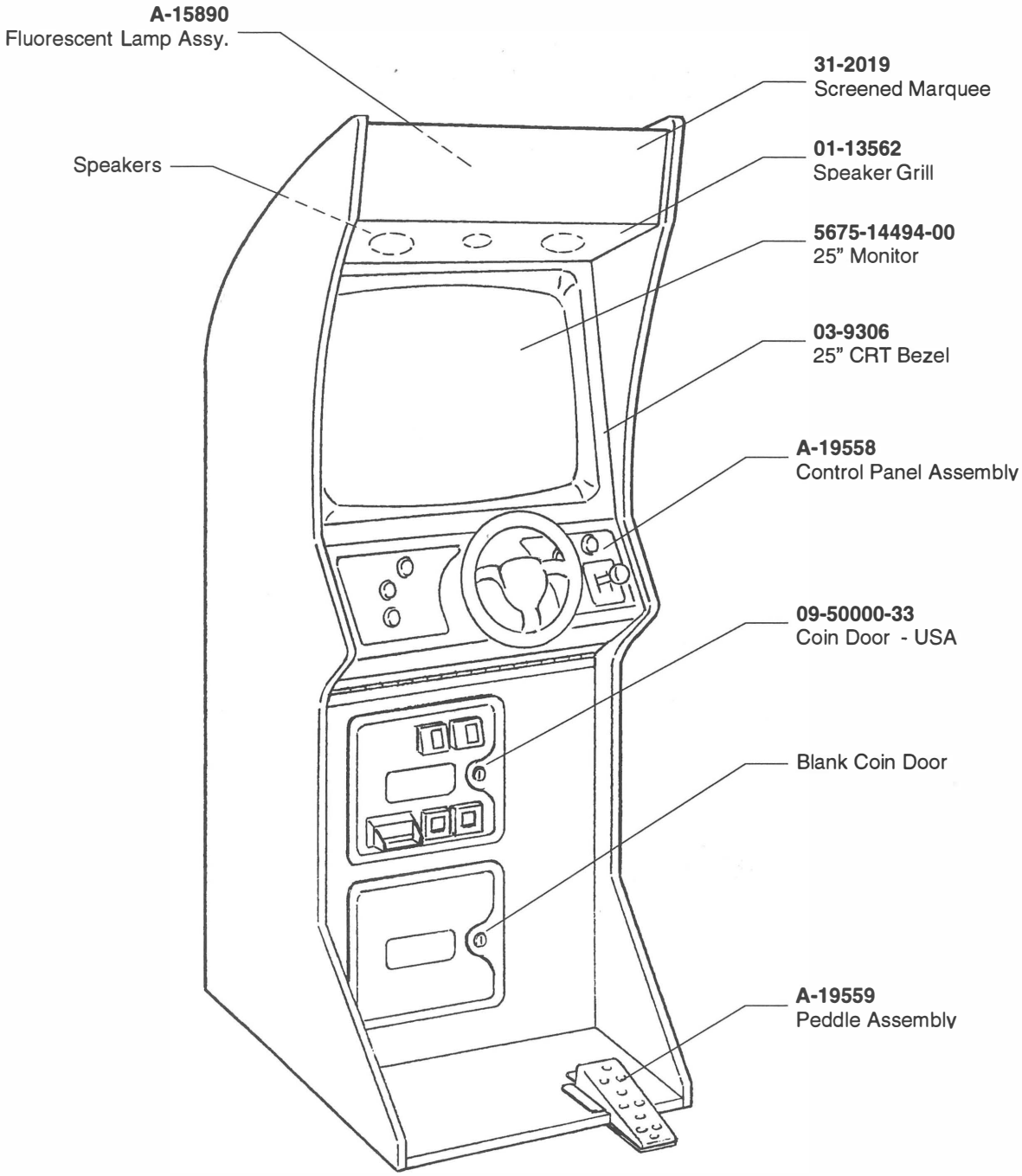
CRUIS'N USA

DEDICATED UP RIGHT

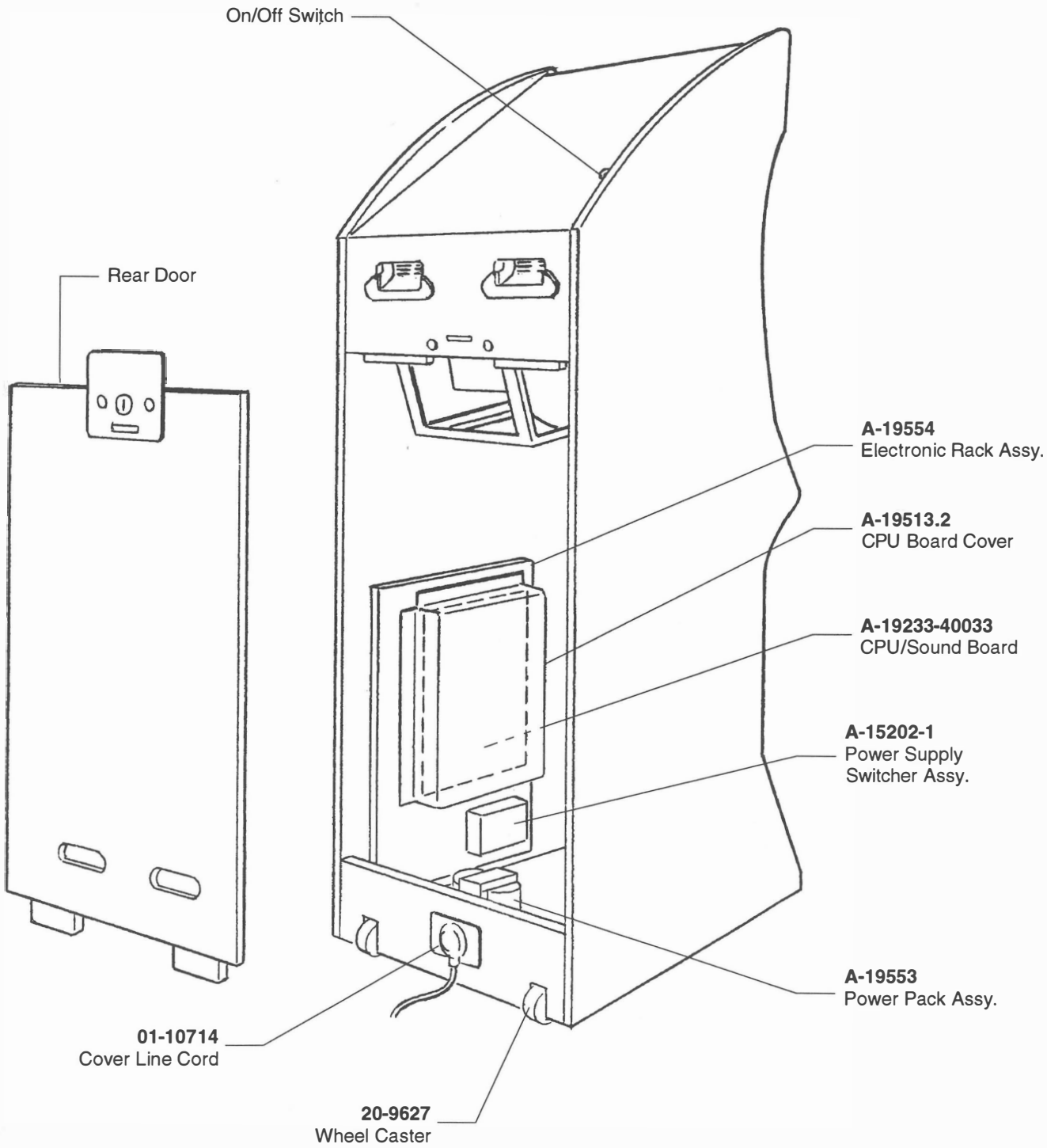
SECTION
TWO

Parts Information

Cabinet Assembly
(Front View)



Cabinet Assembly
(Rear View)



Cabinet Hardware

Cabinet Assembly	A-19557
Lock Retainer Plate	01-7264
Upper Door Lock Cam	01-8989
Leg Leveler Plate	01-9155
Lock Plate	01-11285
Door Bracket	01-11291
Shaft Caster	02-4404
20" Vent Hole Cover	03-7602
Pull Vent	03-8326
Door Cam Lock	20-6542-TB
Wheel Caster	20-9627
Cover Line Cord	01-10714
Monitor Mounting Bracket	01-10819
Cover Plate	01-11275
Pad Lock Bracket	01-11286
Key Lock Bracket	01-11287
Plate Meter w/o Slot	01-11298-1
Leg Leveler Adjuster, 3.0"	08-7377
CRT Glass	08-7456-16
Toggle Latch	20-9347
Tamper Proof Screw Tool, t-20	20-9620
Floor Mat	23-6743
#555 Bulb, 6.3v	24-8768
Interlock Switch	5643-09286-00
Marquee Glass	08-7456-17
Screened Marquee	31-2019
Coin Door Assembly - USA	09-50000-33
Coin Chute Assembly	01-12324
Coin Meter w/Diode, 5v, 2w	5580-13476-00

Cables

Line Voltage Cable	A-17877-5
Dixie-Mars Interconnect Cable	H-17019
DBV Adapter Cable - USA	H-18136
Cable-AC Y	H-19297
Ferrite Bead 2-Piece, 1-1/4"	5556-13956-00

Control Panel

Control Panel	A-19558

Electronic Rack

Electronic Rack	A-19554
Power Supply Switcher Assy.	A-15202-1
CPU/Sound Board Assembly	A-19233-40033
CPU Mounting Plate Assy.	A-19539
CPU Board Cover	A-19513.2

Fluorescent Lamp Assembly

Fluorescent Housing & Bracket	A-15890
18" Fluorescent Bulb, 15w	24-8809

Manuals

Instruction Manual	16-40037-101
DBV Installation Instructions	16-9637
FCC Warning Domestic Label	16-9306

Monitor

25" CRT Bezel	03-9306
Monitor, 25"	5675-14494-00

Speakers

Speaker, 5-1/4", 4Ω, 25w	5555-12856-00
Speaker, 4Ω Tweeter, 15w	5555-12924-00
Speaker, 4Ω, 6", 25w	5555-12929-00
Speaker Grill	01-13562

Transformer

Power Pack Assembly	A-19553

A-19233-40033
CPU/Sound Board Assembly

Part Number	Designator	Description
5880-11056-00	B1	Battery-Litium 3V
5731-14468-00	F1,F2	Fuse SB 3A 5x20mm
A-19668	U52	Assy. Plfd. Crusin CPU
A-19669	U38	Assy. Plfd. Crusin CPU
A-19670	U43	Assy. Plfd. Crusin CPU
A-16971	U54	Assy. Plfd. Crusin CPU
A-19672	U114	Assy. Plfd. Crusin CPU
A-19673	U111	Assy. Plfd. Crusin CPU
A-5343-40033-2, -29	U2-U29	E-PROM Assembly
A-19234	-	**CPU Sub-Assembly**
5040-13417-00	C191, C192	Capelectro, 10,000MF, 35v
5370-12602-00	U122	ULN2064-Quad High Current Darlington Switch
5070-09054-00	D1-D4	Diode, 1N4004
5370-13419-00	U78, U81	TDA2030
5370-12730-00	U79, U80	TL084
5340-13304-00	U35, U41, U42	2K x 8 SRAM
5340-13597-00	U85, U87	62256, 32Kx8 BIT SRAM, 55nS
5340-12558-00	U31	8Kx8 CMOS SRAM, 120nS
5371-13299-00	U61	AS1851
5372-12901-00	U130	ADC0844-8 BIT A TO D Converter w/4 CH. Multiplexer
5340-12958-00	U92	AM26LS31 - Quad Differential Line Drivers
5340-12959-00	U91	AM26LS32 - Quad Differential Line Receivers
5344-14130-00	U45, U58	IDT7204, CMOS Parallel FIFO 4K x 9 BIT, 20nS
5434-12255-00	U30	Max691, Power ON Reset/ WATCHDO/CMOS CTL Circuit
5283-10551-00	U62	74F00
5286-14178-00	U55	74AS02 - ALS TTL Quad 2 Input NOR GATE
5280-09309-00	U82	7407-TTL Hex Buffer w/ High Voltage Output
5311-12538-00	U63	74HC14
5281-09500-00	U36	74LS32
5281-09487-00	U64	74LS74
5311-10948-00	U34	74HC138
5317-12023-00	U88	74ALS138-ALS TTL 3/8 Decoder
5311-12043-00	U40, U51	74HC174
5430-14290-00	U126-U129	74176B-Bidirectional Transceiver
5317-12208-00	U44, U46, U48, U49, U98, U107, U108, U113	74ALS245, ALS TTL Octal Bus Transceiver
5311-12287-00	U33, U39, U50, U93, U104, U105, U109, U112, U116, U119, U120, U121, U125	74HC541 - HC TTL Octal Buffer
5317-12211-00	U32, U47, U65, U66, U86, U110	74ALS541 - ALS TTL Octal Buffer
5317-12212-00	U37, U53, U99, U100, U103, U106, U115, U118, U123	74ALS574 - ALS TTL Octal Flip-Flop
5430-13598-00	U117, U124	75160 - Octal Interface Bus Trans.
5250-13303-00	U1085	LM79L05T
5250-13302-00	U1010	LM78L05T
5521-13806-06	U67	Xtal Oscillator, 33mHz
5521-13806-05	U89	Xtal Oscillator, 40mHz
5521-13603-01	U96	Xtal Oscillator, 50mHz
5520-13301-00	Y1	Y10H 10mHz
5671-13732-00	D5-D7	Light Emitting Diode, Red

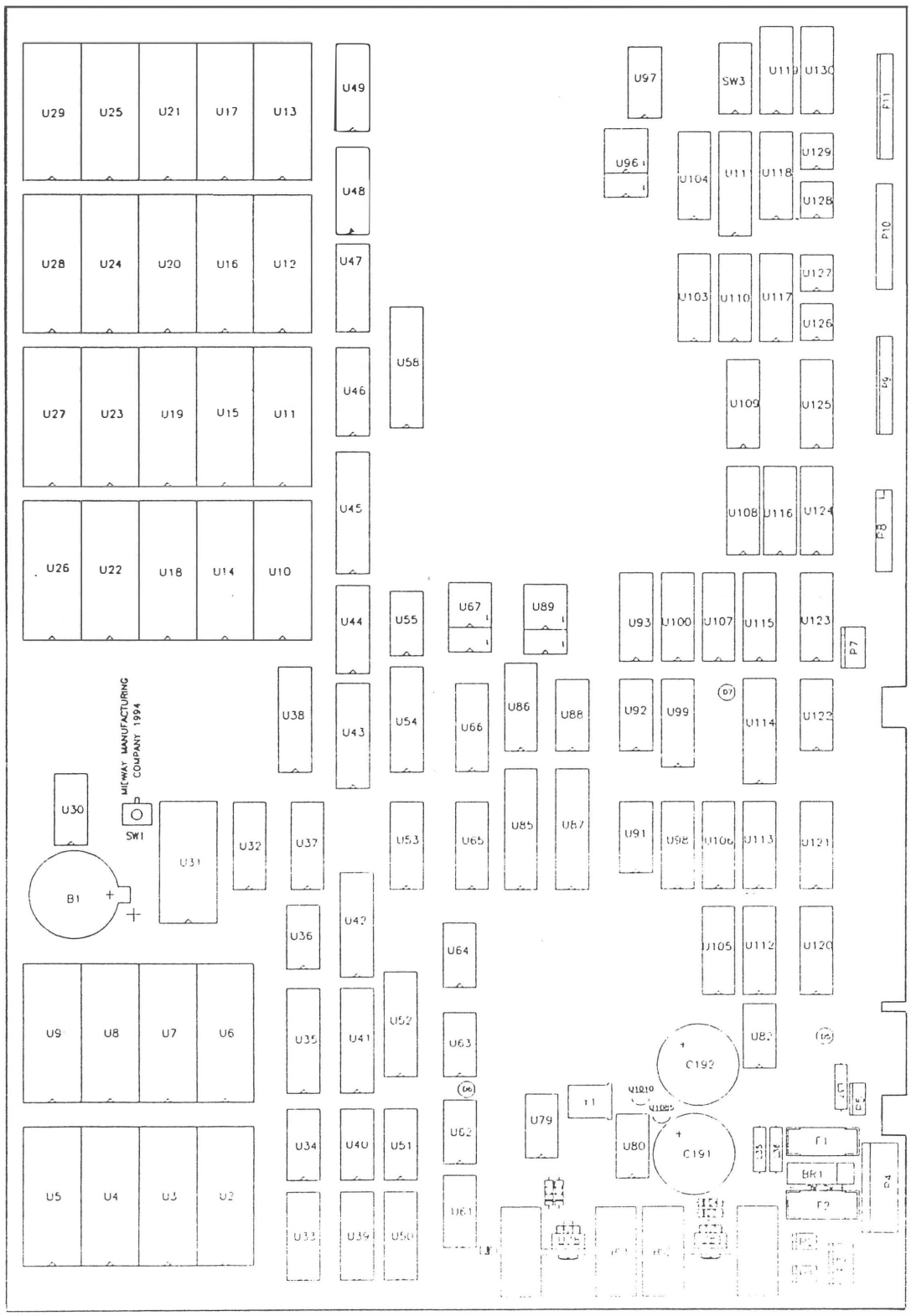
Part Number	Designator	Description
5556-14181-00	L35-L37	FB700
5100-13945-02	BR1	Bridge 4A
5733-14113-00	F1, F2	Fuse Holder
5700-12047-00	U38, U43, U52, U54, U111, U114	I.C. Socket, 24-pin , .3"
5700-12088-00	U2-U29	I.C. Socket, 32-pin, .6"
5881-12315-00	B1	Battery Holder
5645-09025-00	U97, SW3	DIP Switch, 16-Pin
5641-12551-00	SW1	Switch PCB Mount MC
5791-10862-02	P1, P2	Connector, C156x2 2-pin
5791-12461-04	P5	Connector, C100x5 5-pin
5791-12461-05	P3, P7	Connector, C100x5 5-pin
5791-10862-07	P4	Connector, C156x7 7-pin
5791-12461-12	P9	Connector, C100x12 12-pin
5791-12461-13	P11	Connector, C100x13 13-pin
5791-09437-00	P8	Connector, 20-pin Ribbon, .1"
5791-10850-00	P10	Connector, 26-pin Ribbon , .1"
5705-12638-00	HS1, HS2	Heatsink 5299B
5791-12994-00	J6	Header
4004-01005-06	-	Mach. Screw, 4-40 x 3/8"
4404-01124-00	-	Nut 4-40 KEPS
A-19331		**CPU Surface Mount**
5052-14149-00	C173, C174	Cap., 0805 22PF, 10%, 50v
5052-14366-00	C88, C118, C159, C160, C164, C197, C198, C212, C224-C226, C229-C234, C255, C274, C275, C277, C279, C298, C299-C303	Cap., 0805, 47PF, 10%, 50v
5052-14169-00	C115, C151-C153, C155-C157, C235, C237-C239, C241, C242, C256-C273, C280-C297	Cap., 0805, 100PF, 10%,50V
5052-14367-00	C123, C190	Cap., 0805PF, 5%, 50v
5052-14167-00	C169	Cap., 0805, 470PF, 20%, 50v
5052-14171-00	C95, C98, C111, C128	Cap., 0805, 680PF, 5%, 50v
5052-14166-00	C94, C96, C99, C110, C127, C228, C252	Cap., 0805, 1000PF, 5%, 50v
5052-14168-00	C97, C100, C129	Cap., 0805, 3900PF, 5%, 50v
5052-14350-00	C109	Cap., 0805, 4700PF, 5%, 50v
5052-14164-00	C1-C8, C10, C11, C13- C16, C18, C19, C21-C31, C33-C41, C43-C48, C52, C54, C55, C57-C64, C66, C67, C69, C70, C72-C75, C77-C80, C83, C85, C87, C90, C101, C102, C104, C105, C107, C116, C117, C120, C131, C132, C135-C138, C140, C142-C144, C150, C162, C163, C166, C175, C178-C187, C193-C196, C199-C209, C213-C218, C221-C223, C236, C244-C251, C305, C306	Cap., 0805, 0.01MF, 10%,50v
5052-14435-00	C56, C71, C84, C89, C103, C119, C165, C219	Cap., 0805 10PF, 5%, 50v
5052-14385-00	C148	Cap.,0805 0.022MF,10%,50v
5052-14369-00	C145-C147	Cap.,0805 0.047MF,10%, 50v
5052-14165-00	C20, C51, C53, C65, C81, C82, C91, C93, C106, C112-C114, C121, C124, C125, C130, C133, C139, C141, C149, C167, C170, C176, C210, C211, C254	Cap.,0805 0.1MF, 20%, 50v
5051-14150-00	C108, C168	B5328 0.22 MF TANT ±10%, 50v
5052-13633-00	C1109, C1130, C1032	Cap.,1206,0.33MF, ±20%, 50v
5051-14371-00	C126, C171, C172, C189	Cap., 1MF,± 20%, 35v TANT

A-19233-40033
CPU/Sound Board Assembly
(Continued)

Part Number	Designator	Description
5051-14151-000	C9, C12, C17, C32, C42, C68, C86, C92, C134, C154, C158, C161, C177, C220, C227, C20, C243, C253, C276, C278, C304	Cap., 10MF, ±20%, 16vTANT
5051-14148-00	C122, C188	Cap., 22MF, ±20%, 16v
5020-14349-00	R2, R3, R6, R7, R9, R11, R16, R18, R19, R21, R23,R24, R97, R192, R193, R238, R251, R372, R761	Resistor, 0Ω, 1/10w
5020-14372-00	R337, R553	Resistor, 15Ω, 1/10w, 5%
5020-14373-00	R12-R14, R35-R42, R60, R61, R63, R64, R66-R76, R89, R90, R92, R93, R96, R98, R99-R104, R107, R110, R111, R112, R114-R122, R124-R147, R149, R153-R155, R157-R159, R161-R163, R166-R168, R172-R175, R180-R188, R191, R195, R197-R200, R205, R206, R208, R209, R211, R212, R222, R223, R225, R226, R228, R229, R231-R233, R235, R239, R241-R243, R245, R247, R250, R254-R258, R260, R264-R273, R276, R277, R279, R282, R284, R295-R299, R301, R304, R306-R310, R312, R314-R333, R335, R357, R359-R368, R370, R373-R375, R380-R414, R425, R426, R428-R432, R434, R435, R437- R467, R472, R484-R487, R491, R493, R494, R497, R499, R501, R508-R524, R527, R528, R532, R537-R552, R567-R586, R632, R637, R688, R691, R694, R696, R697, R699, R700, R702, R703, R705, R726-R732, R734, R736, R738, R740, R742, R744, R746, R748, R751, R753, R754, R756, R759, R762, R764, R533	Res., 0805 33Ω,1/10w, 5%
5020-14161-00	R26, R28, R30, R32, R34, R43-R49, R78-R87, R148, R215, R218, R219, R342, R344-R356, R358, R369, R420, R422, R423, R482, R483, R554, R556	Res., 0805 47 Ω, 1/10w, 5%
5020-14152-00	R25, R77, R123, R150, R178, R217, R341, R427, R436, R601, R609, R647	Res., 0805 100 Ω, 1/10w, 5%
5020-14374-00	R737, R739, R743, R749	Res., 0805 120 Ω, 1/10w, 5%
5020-14375-00	R488	Res., 0805, 220 Ω, 1/10w, 5%
5020-14160-00	R343, R610, R650	Res., 0805 330 Ω, 1/10w, 5%
5020-14376-00	R489, R628, R630, R634, R635, R639, R641, R651, R654, R656, R658, R659, R662, R663, R666, R667, R670, R673, R674, R677, R678, R680, R681, R685, R686, R709, R710, R712, R713, R715, R716, R718, R720	Res., 0805 470 Ω, 1/10w, 5%
5020-14377-00	R504, R560, R565	Res., 0805 487 Ω, 1/10w, 1%
5020-14378-00	R473, R595	Res., 0805 680 Ω, 1/10w, 5%
5020-14379-00	R475, R505, R561, R566, R619, R623, R626	Res., 0805 1K Ω, 1/10w, 1%
5020-14380-00	R506, R557, R562,	Res., 0805 2K Ω, 1/10w, 1%

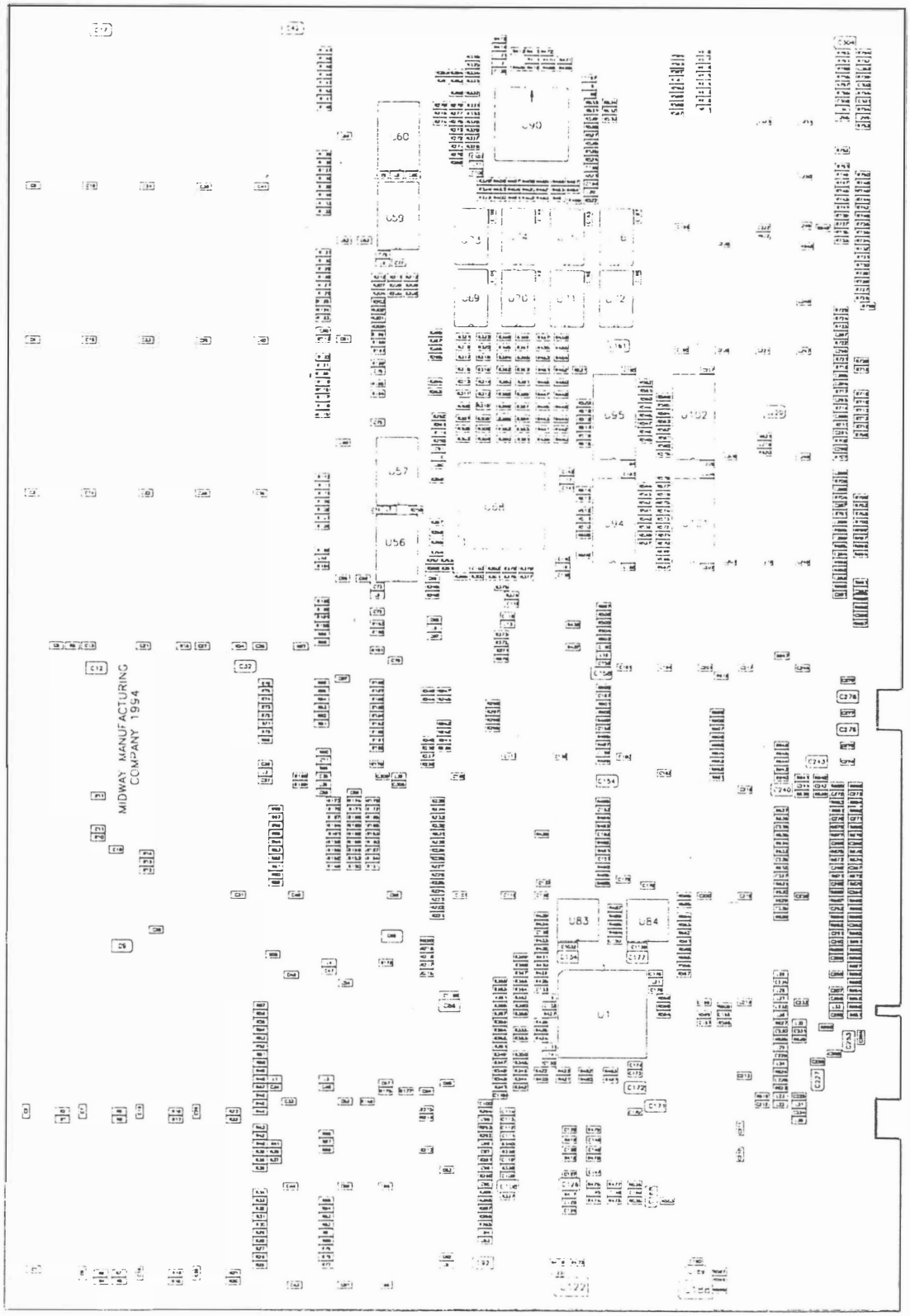
Part Number	Designator	Description
5020-14380-00	R602-R605, R607, R608, R640, R643	
5020-14345-00	R285, R287	Res., 0805 3.32KΩ, 1/10w, 1%
5020-14155-00	R507, R558, R563	Res., 0805 4.7K Ω, 1/10w, 5%
5020-14172-00	R10, R27, R29, R31, R33, R50-R59, R62, R65, R88, R91, R94, R95, R106, R108, R109, R151, R152, R156, R160, R164, R165, R169, R170, R176, R179, R194, R201-R204, R207, R210, R213,	Res., 0805 4.7K Ω, 1/10w, 5%
5020-14172-00	R214, R216, R220, R221, R224, R227, R230, R234, R252, R259, R261-R263, R274, R275, R278, R280, R281, R283, R300, R302, R303, R305, R311, R313, R334, R336, R376, R377-R379, R415, R421, R468, R469, R471, R480, R481, R490, R492, R495, R496, R498, R500, R502, R525, R526, R529-R531, R534, R555, R587-R594, R606, R611-R618, R622, R629, R631, R633, R636, R638, R642, R644-R646, R652, R653, R655, R657, R660, R661, R664, R665, R668, R669, R671, R672, R675, R676, R679, R682-R684, R687, R689, R690, R692, R693,	Res., 0805 4.7KΩ, 1/10w, 5%
5020-14172-00	R695, R698, R701, R704, R706-R708, R711, R714, R717, R719, R721, R722, R755, R757, R758, R760, R470	Res., 0805 4.7KΩ, 1/10w, 5%
5020-14173-00	R288, R289, R290-R294, R338-R340, R419	Res., 0805 6.19KΩ,1/10w, 1%
5020-14158-00	R477, R478, R559, R564, R625	Res., 0805 8.2KΩ, 1/10w, 5%
5020-14383-00	R476	Res., 0805 9.09KΩ, 1/10w, 1%
5020-14156-00	R648, R649, R723-R725, R733, R735, R741, R745, R747, R750, R752	Res., 0805 10KΩ, 1/10w, 5%
5020-14384-00	R474	Res., 0805 11KΩ, 1/10w, 1%
5020-14381-00	R416, R417, R479, R535, R596, R597	Res., 0805 22KΩ, 1/10w, 5%
5020-14174-00	R418, R536	Res., 0805 47KΩ, 1/10w, 5%
5349-14131-00	U94, U95, U101, U102	256K x 8 BIT VRAM, 70nS
5349-13599-00	U69-U76	44C1000, 1Megx4BIT CMOSDynamic RAM, 60nS
5349-14132-00	U56, U57, U59, U60	6226X, 128Kx8BIT Fast Static RAM 20nS
5400-13298-00	U1	ADSP2105
5410-13465-00	U68	IC, VR1 ASIC
5285-14342-00	U83, U84	74ALS374 20PSOL
5400-14129-00	U90	DSP TMS320C31, 50MHZ
5556-14348-00	L1-L34, L38, L39, R765	Inductor, FB0805
5020-14347-00	R286, R424, R433	Res., 0805, 4.75KΩ,1/10w,1%

A-19233-40033
CPU/Sound Board Assembly



A-19234 CPU Sub-Assembly

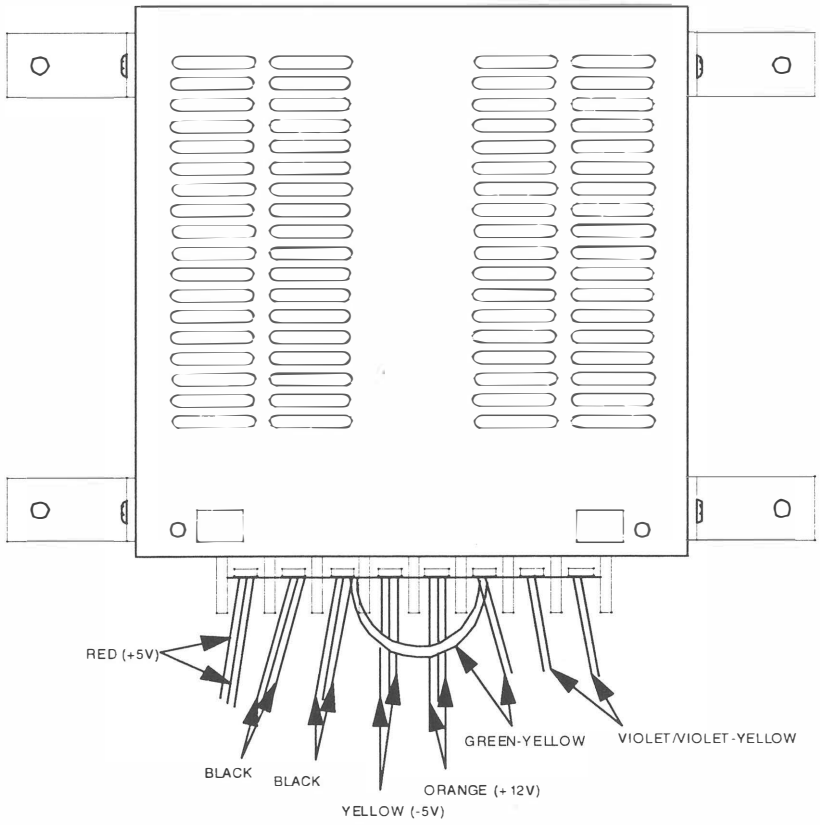
A-19233-40033
CPU/Sound Board Assembly

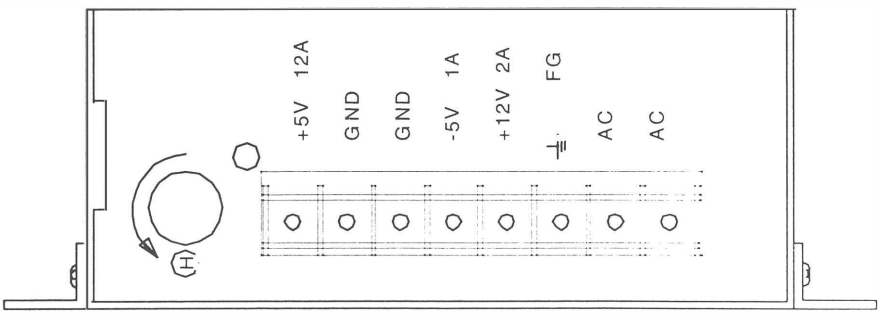


A-19331 CPU Surface Mount Sub-Assembly

A-15202-1
Power Supply Switcher Assembly

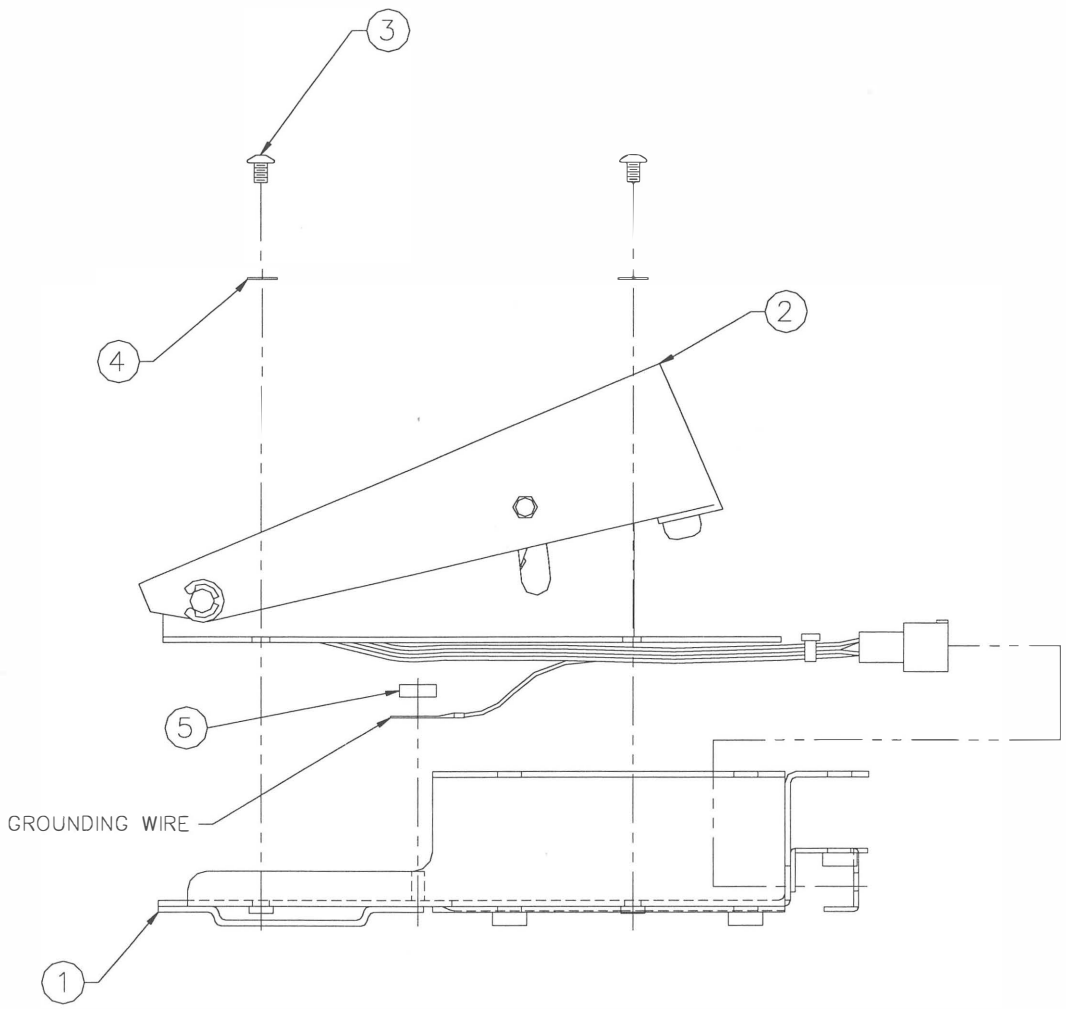
Part Number	Description
H-17914	Switcher Power Cable
01-10500	Mounting Bracket
01-12162	Shield
20-9920	P/S Switcher Supply





A-19559
Pedal Assembly

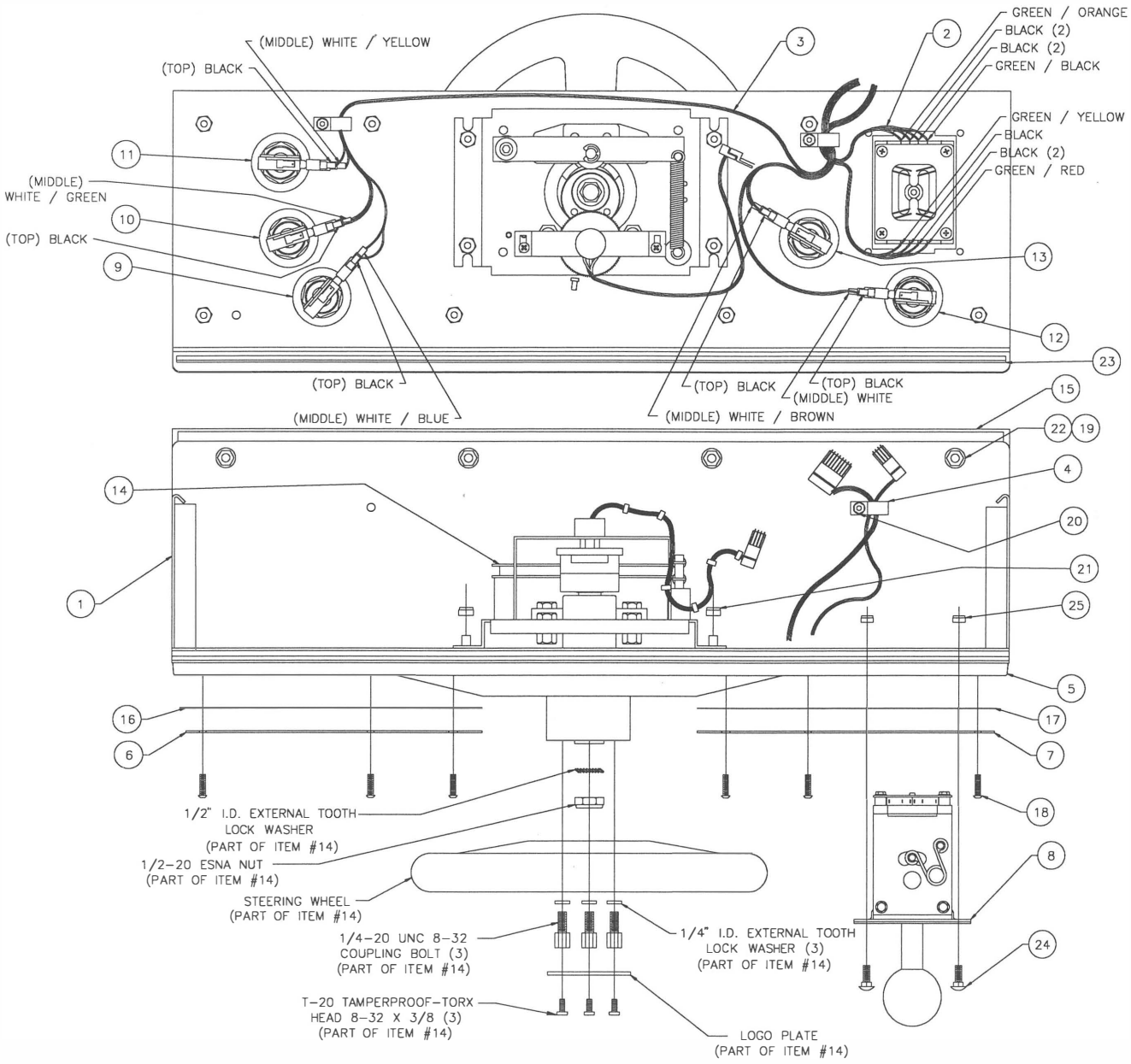
Item	Part Number	Description
1	A-19744	Peddle Mounting Bracket
2	20-10161	Peddle Assembly
3	4008-01093-04B	Mach. Screw, 8-32
4	4703-00008-00	Lockwasher, #8 External Tooth
5	4408-01128-00	Nut 8-32 KEPS



A-19558
Control Panel Assembly

Item	Part Number	Description
1	A-19634	Dash Bracket
2	H-18737	Four Speed Shifter Cable
3	H-19556	Control Panel Cable
4	03-7655-8	Cable Clamp, 1/2"
5	03-9308	Overlay-Control Panel
6	03-9312	Overlay, Clear Left
7	03-9313	Overlay, Clear Right
8	20-10141	4-Speed Shifter
9	20-9687-1	Push Button, Red
10	20-9687-2	Push Button, White
11	20-9687-3	Push Button, Blue
12	20-9687-4	Push Button, Green
13	20-9687-7	Push Button, Orange
14	20-10145	Steering Wheel Assy., w/Pot.
15	20-10157	Hinge
16	31-2218	Overlay Screened, Left
17	31-2219	Overlay Screened, Right
18	4008-01093-10B	Mach. Screw, 8-32 x 5/8"
19	4320-01123-10B	Bolt, 1/4-20 x 5/8"
20	4406-01128-00	Nut, 6-32 KEPS
21	4420-01119-00	Nut, 1/4-20 ESN/NE
22	4420-01141-00	Nut, 1/4-20 Flangrip
23	RM-22-14	PVC Single Foam Tape
24	4310-01123-10B	Bolt, 10-24 x 5/8"
25	4410-01119-00	Nut, 10-24 ESN

A-19558
Control Panel Assembly



Notes

CRUIS'N USA

DEDICATED UP RIGHT

SECTION
THREE

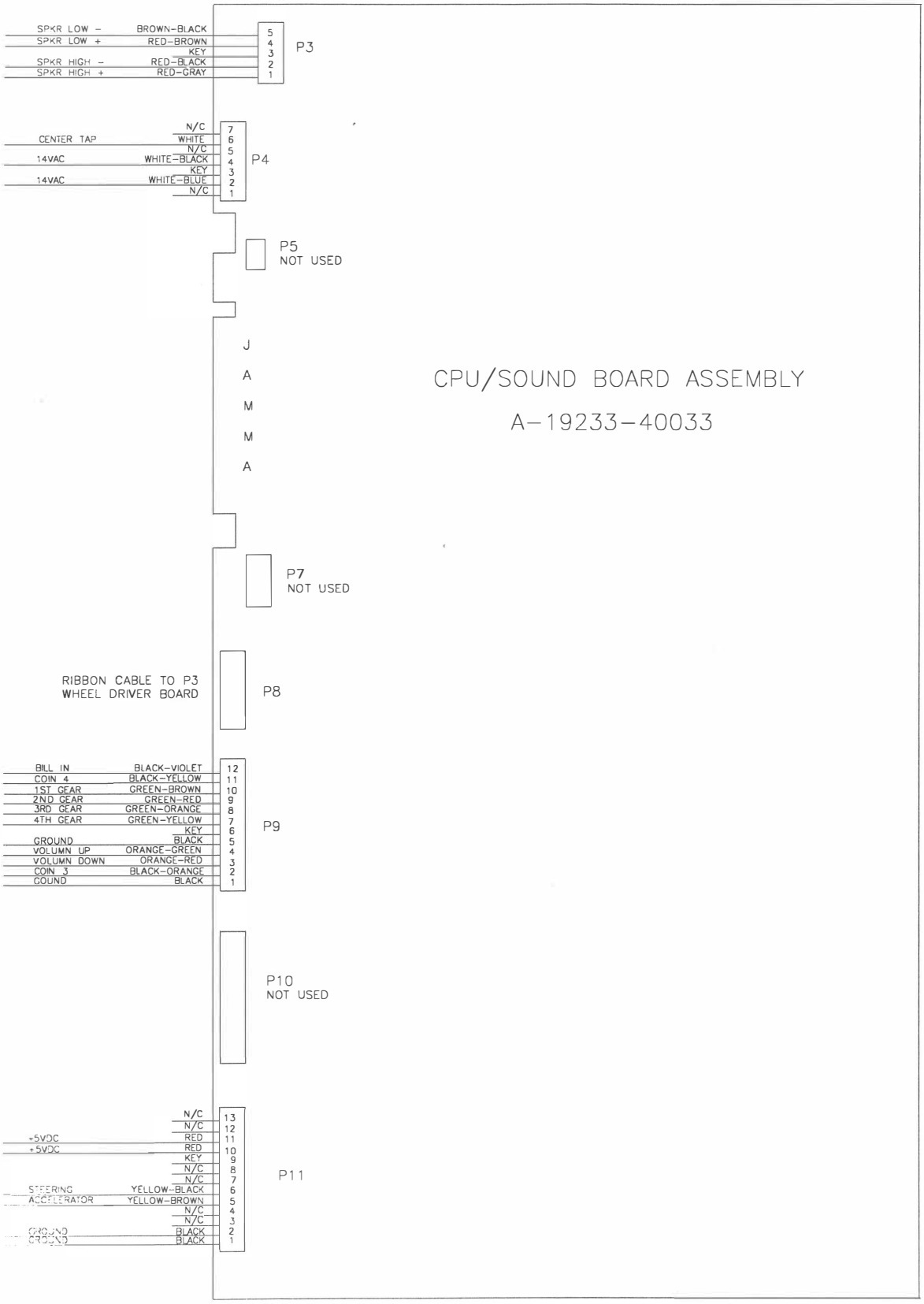
Schematics and Wiring Diagrams

NOTES

JAMMA CHART

FUNCTION	*WIRE COLOR*	*PIN*	*PIN*	*WIRE COLOR*	*FUNCTION*
Ground	Black	1	A	Black	Ground
Ground	Black	2	B	Black	Ground
+5VDC	Red	3	C	Red	+5VDC
+5VDC	Red	4	D	Red	+5VDC
-5VDC	Yellow	5	E	Yellow	-5VDC
+12VDC	Orange	6	F	Orange	+12VDC
	Key	7	H	Key	
Coin Counter 1	Brown	8	J	Brown-Red	Coin Counter 2
	N/C	9	K	N/C	
	N/C	10	L	N/C	
	N/C	11	M	N/C	
Video Red	Red	12	N	Green	Video Green
Video Blue	Brown	13	P	White	Video Sync
Video Ground	Shield	14	R	White-Gray	Service
Test	Black-Blue	15	S	Black-Green	Slam
Coin 1	Black-Brown	16	T	Black-Red	Coin 2
Start	White	17	U	N/C	
Not Used	White-Black	18	V	Violet-Black	CPU 1 (safety)
Radio	White-Brown	19	W	Violet-Brown	CPU 2 (safety)
Not Used	White-Red	20	X	Violet-Red	CPU 3 (safety)
	N/C	21	Y	Violet-Orange	CPU 4 (safety)
View 1	White-Yellow	22	Z	Violet-Yellow	CPU 5 (safety)
View 2	White-Green	23	a	Violet-Green	CPU 6 (safety)
View 3	White-Blue	24	b	Violet-Blue	CPU 7 (safety)
Motion Stop	White-Violet	25	c	Violet	CPU 8 (safety)
	N/C	26	d	N/C	
	N/C	27	e	Black	Ground
Ground	Black	28	f	Black	Ground

INTERBOARD WIRING

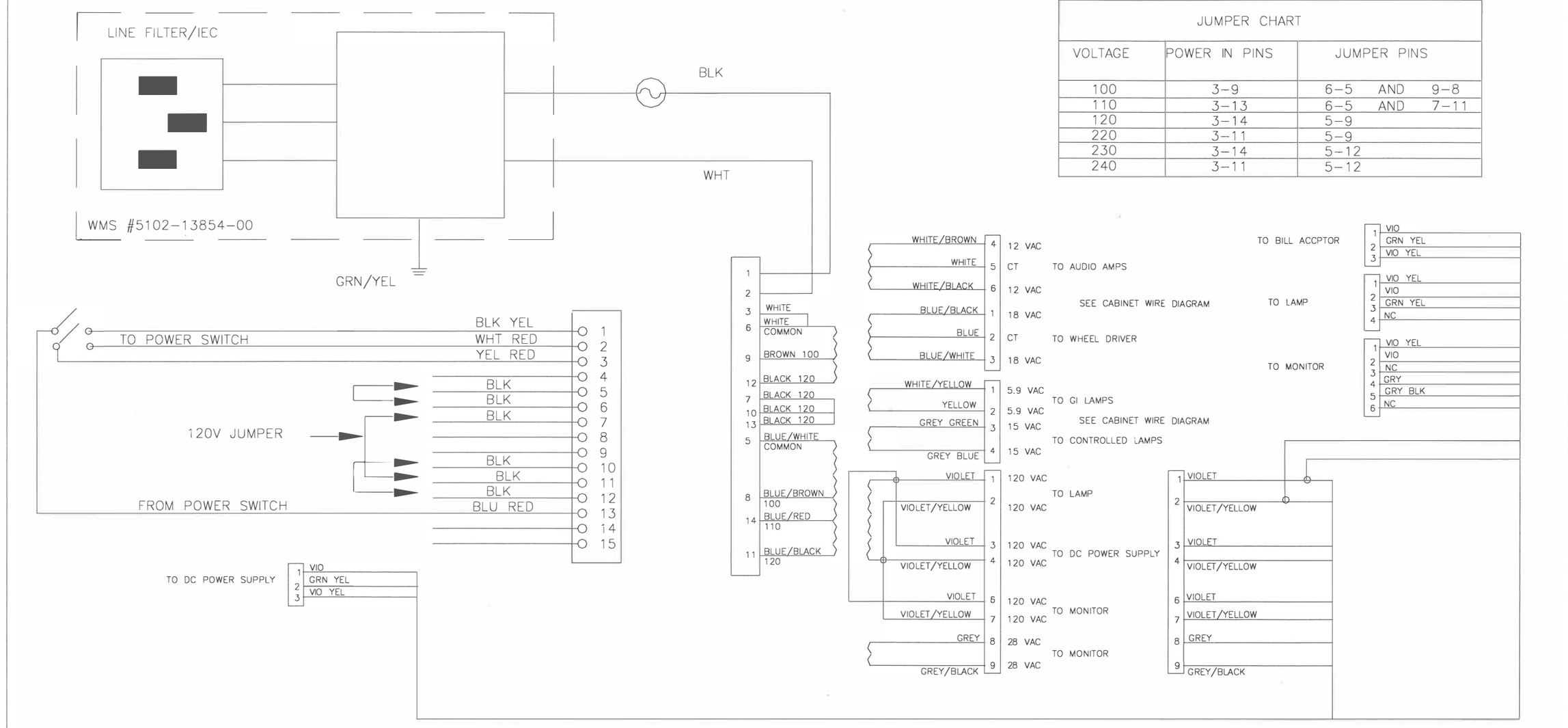


NOTES

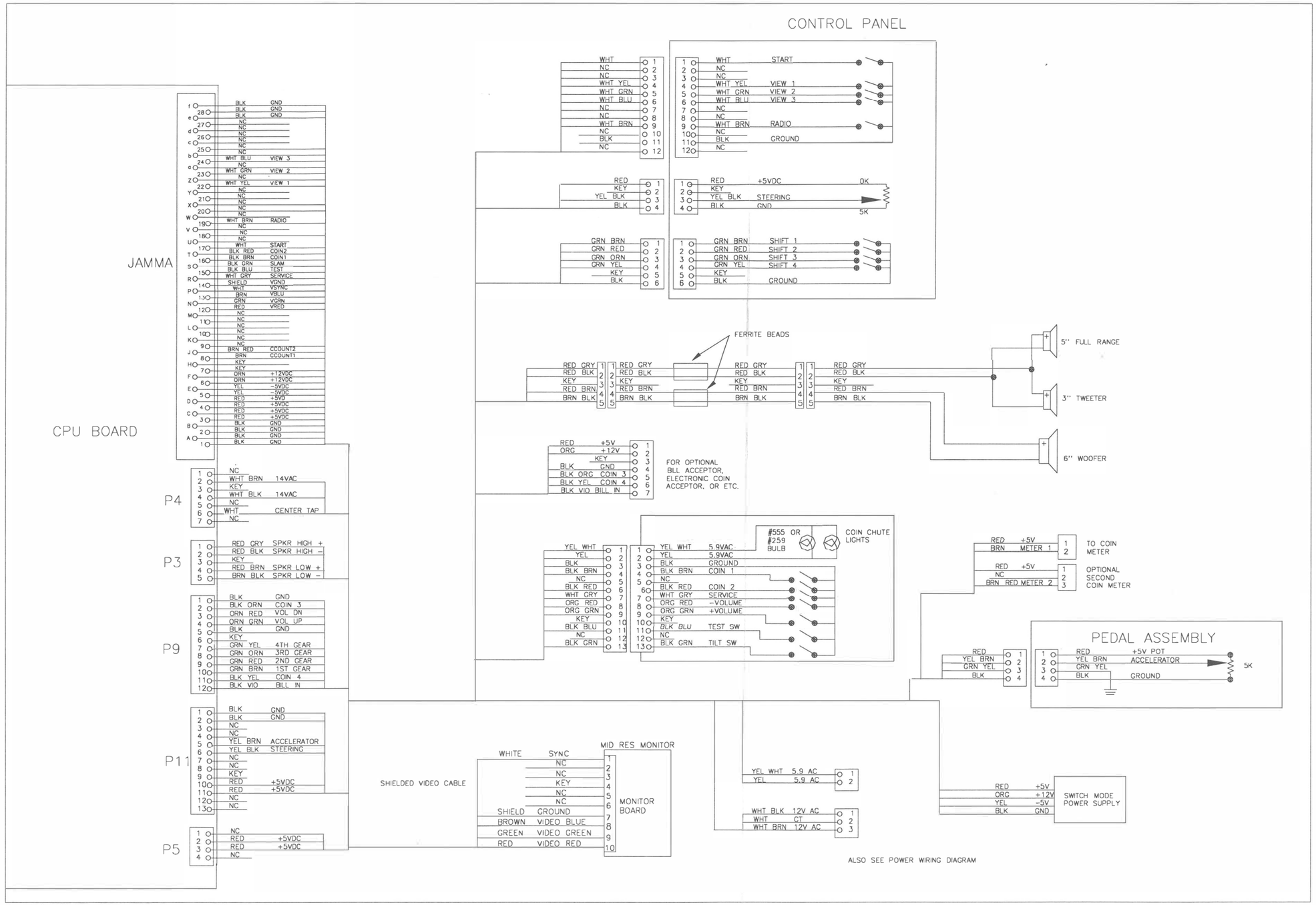
NOTES

POWER WIRING

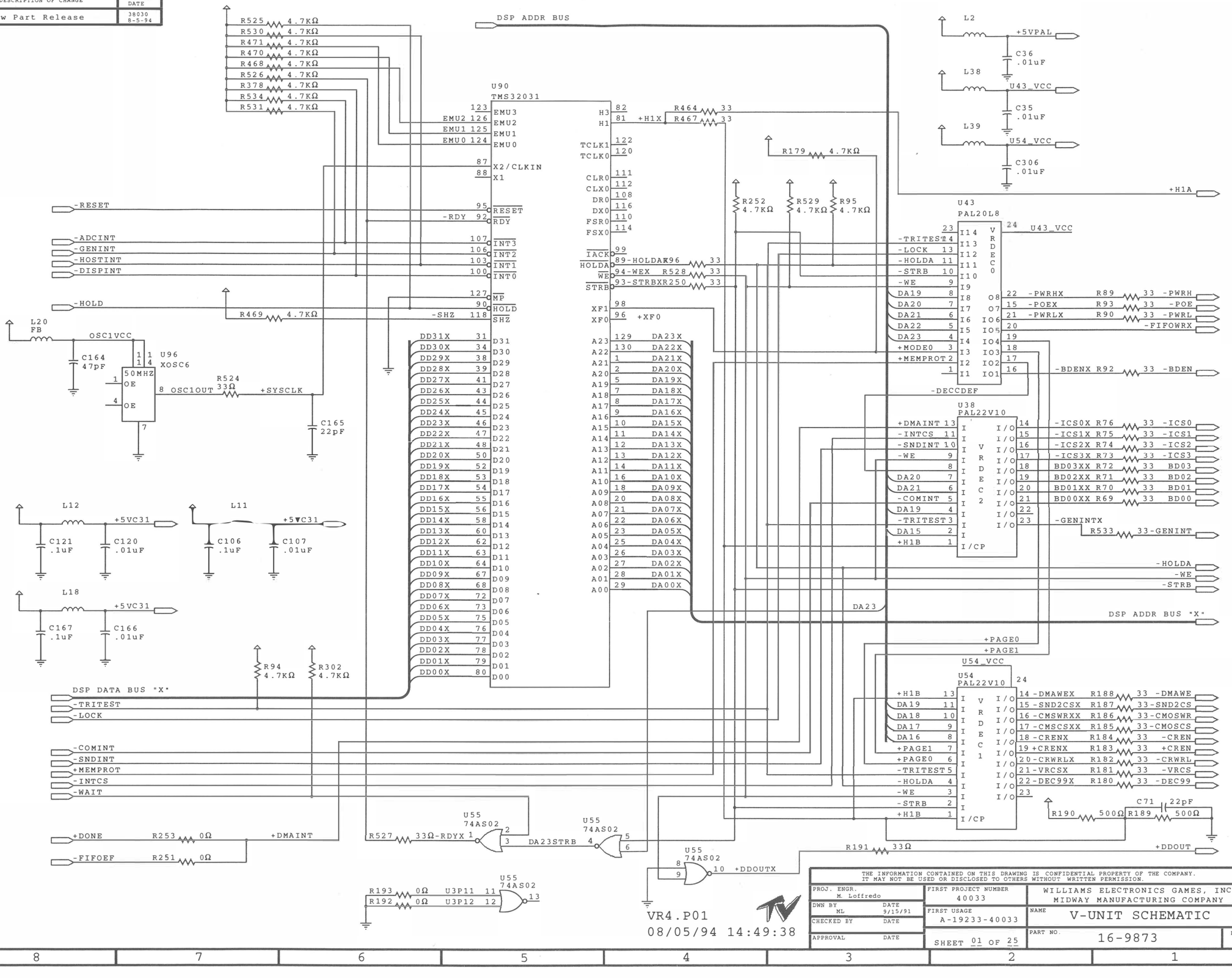
JUMPER CHART		
VOLTAGE	POWER IN PINS	JUMPER PINS
100	3–9	6–5 AND 9–8
110	3–13	6–5 AND 7–11
120	3–14	5–9
220	3–11	5–9
230	3–14	5–12
240	3–11	5–12



CABINET WIRING



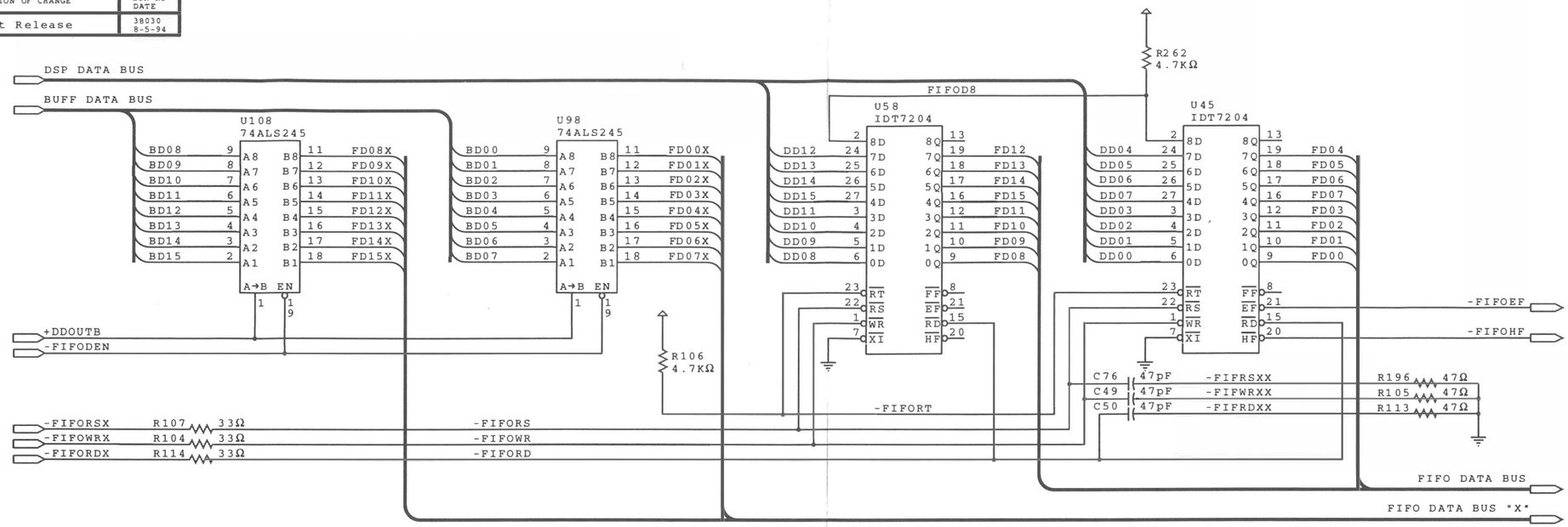
REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94



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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE	SHEET 01 OF 25	PART NO. 16-9873 REV -
APPROVAL DATE		

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

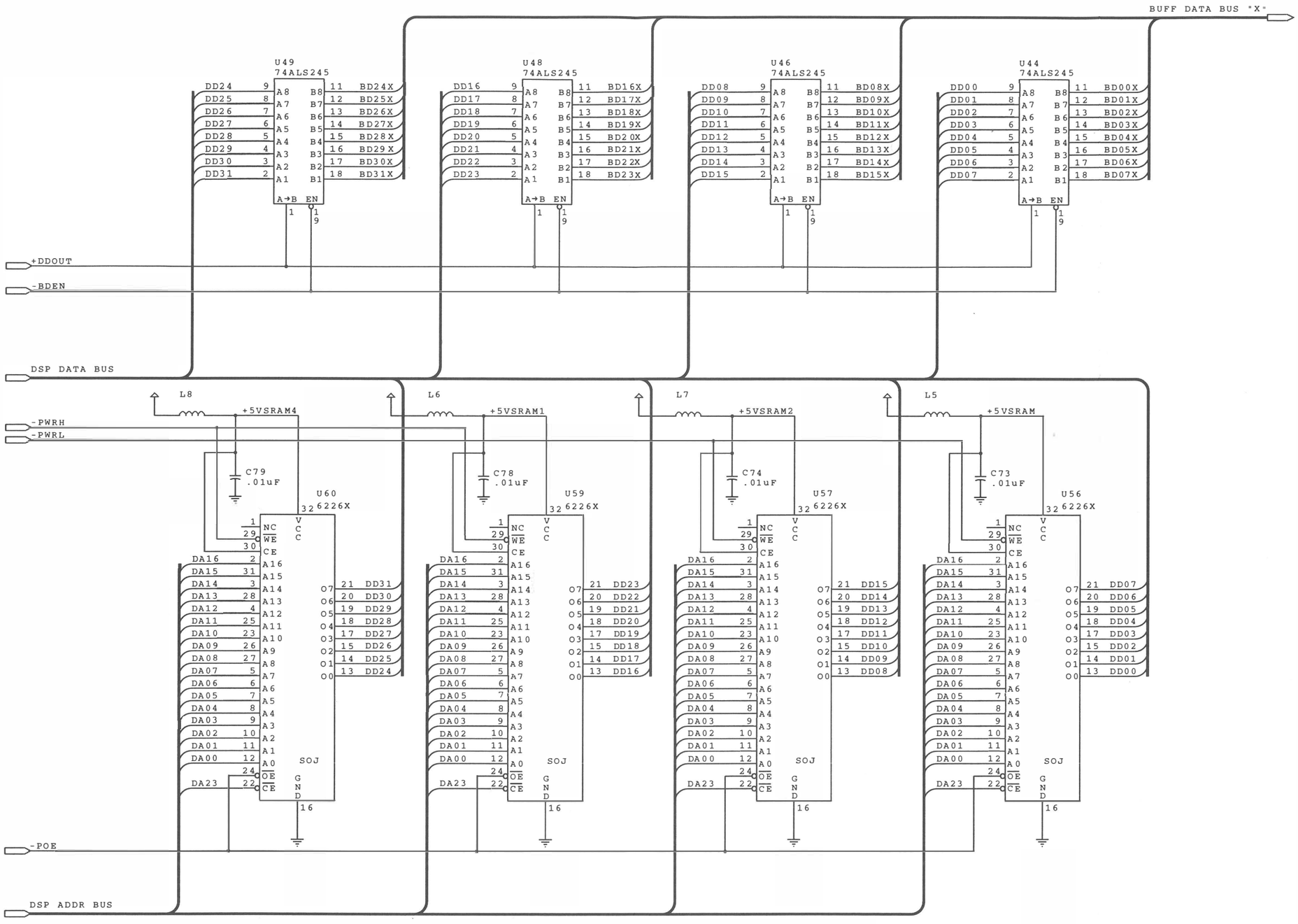


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CHECKED BY DATE		
APPROVAL DATE	SHEET 02 OF 25	PART NO. 16-9873 REV -

VR4.P02
08/05/94 14:49:41

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94



FAST RAM

VR4.P03
08/05/94 14:49:43

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CHECKED BY DATE		
APPROVAL DATE	SHEET 03 OF 25	PART NO. 16-9873 REV -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

FIFO DATA BUS "X"

FD15X	R200	33Ω	FD15
FD14X	R199	33Ω	FD14
FD13X	R198	33Ω	FD13
FD12X	R197	33Ω	FD12
FD11X	R268	33Ω	FD11
FD10X	R267	33Ω	FD10
FD09X	R266	33Ω	FD09
FD08X	R265	33Ω	FD08
FD07X	R112	33Ω	FD07
FD06X	R258	33Ω	FD06
FD05X	R111	33Ω	FD05
FD04X	R110	33Ω	FD04
FD03X	R257	33Ω	FD03
FD02X	R256	33Ω	FD02
FD01X	R255	33Ω	FD01
FD00X	R254	33Ω	FD00

FIFO DATA BUS

BUFF ADDR BUS "X"

BA19X	R239	33Ω	BA19
BA18X	R241	33Ω	BA18
BA17X	R242	33Ω	BA17
BA16X	R243	33Ω	BA16
BA15X	R295	33Ω	BA15
BA14X	R296	33Ω	BA14
BA13X	R297	33Ω	BA13
BA12X	R298	33Ω	BA12
BA11X	R14	33Ω	BA11
BA10X	R68	33Ω	BA10
BA09X	R13	33Ω	BA09
BA08X	R12	33Ω	BA08
BA07X	R124	33Ω	BA07
BA06X	R125	33Ω	BA06
BA05X	R126	33Ω	BA05
BA04X	R127	33Ω	BA04
BA03X	R128	33Ω	BA03
BA02X	R129	33Ω	BA02
BA01X	R130	33Ω	BA01
BA00X	R131	33Ω	BA00

BUFF ADDR BUS

DSP ADDR BUS "X"

DA23X	R472	33Ω	DA23
DA22X	R413	33Ω	DA22
DA21X	R411	33Ω	DA21
DA20X	R410	33Ω	DA20
DA19X	R412	33Ω	DA19
DA18X	R409	33Ω	DA18
DA17X	R260	33Ω	DA17
DA16X	R264	33Ω	DA16
DA15X	R195	33Ω	DA15
DA14X	R332	33Ω	DA14
DA13X	R414	33Ω	DA13
DA12X	R276	33Ω	DA12
DA11X	R335	33Ω	DA11
DA10X	R333	33Ω	DA10
DA09X	R284	33Ω	DA09
DA08X	R282	33Ω	DA08
DA07X	R206	33Ω	DA07
DA06X	R209	33Ω	DA06
DA05X	R212	33Ω	DA05
DA04X	R205	33Ω	DA04
DA03X	R208	33Ω	DA03
DA02X	R211	33Ω	DA02
DA01X	R277	33Ω	DA01
DA00X	R279	33Ω	DA00

DPS ADDR BUS

BUFF DATA BUS "X"

BD31X	R140	33Ω	BD31
BD30X	R141	33Ω	BD30
BD29X	R142	33Ω	BD29
BD28X	R143	33Ω	BD28
BD27X	R144	33Ω	BD27
BD26X	R145	33Ω	BD26
BD25X	R146	33Ω	BD25
BD24X	R147	33Ω	BD24
BD23X	R132	33Ω	BD23
BD22X	R133	33Ω	BD22
BD21X	R134	33Ω	BD21
BD20X	R135	33Ω	BD20
BD19X	R136	33Ω	BD19
BD18X	R137	33Ω	BD18
BD17X	R138	33Ω	BD17
BD16X	R139	33Ω	BD16
BD15X	R115	33Ω	BD15
BD14X	R116	33Ω	BD14
BD13X	R117	33Ω	BD13
BD12X	R118	33Ω	BD12
BD11X	R119	33Ω	BD11
BD10X	R120	33Ω	BD10
BD09X	R121	33Ω	BD09
BD08X	R122	33Ω	BD08
BD07X	R632	33Ω	BD07
BD06X	R98	33Ω	BD06
BD05X	R99	33Ω	BD05
BD04X	R100	33Ω	BD04
BD03X	R101	33Ω	BD03
BD02X	R102	33Ω	BD02
BD01X	R103	33Ω	BD01
BD00X	R637	33Ω	BD00

BUFF DATA BUS

DSP DATA BUS "X"

DD31X	R331	33Ω	DD31
DD30X	R330	33Ω	DD30
DD29X	R329	33Ω	DD29
DD28X	R273	33Ω	DD28
DD27X	R326	33Ω	DD27
DD26X	R328	33Ω	DD26
DD25X	R327	33Ω	DD25
DD24X	R272	33Ω	DD24
DD23X	R271	33Ω	DD23
DD22X	R270	33Ω	DD22
DD21X	R269	33Ω	DD21
DD20X	R323	33Ω	DD20
DD19X	R324	33Ω	DD19
DD18X	R325	33Ω	DD18
DD17X	R403	33Ω	DD17
DD16X	R400	33Ω	DD16
DD15X	R406	33Ω	DD15
DD14X	R404	33Ω	DD14
DD13X	R407	33Ω	DD13
DD12X	R401	33Ω	DD12
DD11X	R402	33Ω	DD11
DD10X	R408	33Ω	DD10
DD09X	R405	33Ω	DD09
DD08X	R466	33Ω	DD08
DD07X	R465	33Ω	DD07
DD06X	R462	33Ω	DD06
DD05X	R460	33Ω	DD05
DD04X	R461	33Ω	DD04
DD03X	R459	33Ω	DD03
DD02X	R522	33Ω	DD02
DD01X	R463	33Ω	DD01
DD00X	R523	33Ω	DD00

DSP DATA BUS

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CHECKED BY DATE		
APPROVAL DATE	SHEET 04 OF 25	PART NO. 16-9873 REV -

VR4.P04
08/05/94 14:49:43

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

R3 0Ω

IVPP3

IN FOR 8M ROM

R237 0Ω

BA19

U29 27040

U28 27040

U27 27040

U26 27040

1	VPP			1	VPP		
BA18 31	A18	O7	21 BD31	BA18 31	A18	O7	21 BD23
BA17 30	A17	O6	20 BD30	BA17 30	A17	O6	20 BD22
BA16 2	A16	O5	19 BD29	BA16 2	A16	O5	19 BD21
BA15 3	A15	O4	18 BD28	BA15 3	A15	O4	18 BD20
BA14 29	A14	O3	17 BD27	BA14 29	A14	O3	17 BD19
BA13 28	A13	O2	15 BD26	BA13 28	A13	O2	15 BD18
BA12 4	A12	O1	14 BD25	BA12 4	A12	O1	14 BD17
BA11 25	A11	O0	13 BD24	BA11 25	A11	O0	13 BD16
BA10 23	A10			BA10 23	A10		
BA09 26	A9			BA09 26	A9		
BA08 27	A8			BA08 27	A8		
BA07 5	A7			BA07 5	A7		
BA06 6	A6			BA06 6	A6		
BA05 7	A5			BA05 7	A5		
BA04 8	A4			BA04 8	A4		
BA03 9	A3			BA03 9	A3		
BA02 10	A2			BA02 10	A2		
BA01 11	A1			BA01 11	A1		
BA00 12	A0			BA00 12	A0		
24	OE			24	OE		
22	CE			22	CE		

1	VPP			1	VPP		
BA18 31	A18	O7	21 BD15	BA18 31	A18	O7	21 BD07
BA17 30	A17	O6	20 BD14	BA17 30	A17	O6	20 BD06
BA16 2	A16	O5	19 BD13	BA16 2	A16	O5	19 BD05
BA15 3	A15	O4	18 BD12	BA15 3	A15	O4	18 BD04
BA14 29	A14	O3	17 BD11	BA14 29	A14	O3	17 BD03
BA13 28	A13	O2	15 BD10	BA13 28	A13	O2	15 BD02
BA12 4	A12	O1	14 BD09	BA12 4	A12	O1	14 BD01
BA11 25	A11	O0	13 BD08	BA11 25	A11	O0	13 BD00
BA10 23	A10			BA10 23	A10		
BA09 26	A9			BA09 26	A9		
BA08 27	A8			BA08 27	A8		
BA07 5	A7			BA07 5	A7		
BA06 6	A6			BA06 6	A6		
BA05 7	A5			BA05 7	A5		
BA04 8	A4			BA04 8	A4		
BA03 9	A3			BA03 9	A3		
BA02 10	A2			BA02 10	A2		
BA01 11	A1			BA01 11	A1		
BA00 12	A0			BA00 12	A0		
24	OE			24	OE		
22	CE			22	CE		

-ICS3

BUFF DATA BUS

BUFF ADDR BUS

-RESET

-WDOUT

+VCMOS

C20 0.1uF

U31 5564

1	NC	VCC	28
BA12 2	A12	I\O7	19 BD31
BA11 23	A11	I\O6	18 BD30
BA10 21	A10	I\O5	17 BD29
BA09 24	A9	I\O4	16 BD28
BA08 25	A8	I\O3	15 BD27
BA07 3	A7	I\O2	13 BD26
BA06 4	A6	I\O1	12 BD25
BA05 5	A5	I\O0	11 BD24
BA04 6	A4		
BA03 7	A3		
BA02 8	A2		
BA01 9	A1		
BA00 10	A0		
27	R\W		
26	CE2		
20	CE1		
22	OE		

CPU RESET SWITCH

SW1

U30 MAX691

	BAT	VO	2
-WDOG 11	WDI	BON	5
-CMOSCS 13	CSI	RST	16
		RST	15
7	OSI	WDO	14
8	OSS	LL	6
		PFO	10
9	PFI		
		CSO	12 -CMOSCSX
3	VCC	GND	4

R11 0Ω

+VBATT

-WDOGX

B1 3.0V

U115 74ALS574

BD00 9	8D	8Q	12 -FIFORSX
BD01 8	7D	7Q	13 -SND2RST
BD02 7	6D	6Q	14 HDRESET
BD03 6	5D	5Q	15 -WDOG
BD04 5	4D	4Q	16 +MEMPROT
BD05 4	3D	3Q	17 -ATODWR
BD06 3	2D	2Q	18 -ATODRD
BD07 2	1D	1Q	19 -LED
	CK	OE	1
	1		
	1		

-SYSCTLE

R647 100Ω

-CMOSWR

-SYSCTL

CMOS RAM

VR4.P05
08/05/94 14:49:45

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PROJ. ENGR. M. Loffredo	FIRST PROJECT NUMBER 40033	WILLIAMS ELECTRONICS GAMES, INC. MIDWAY MANUFACTURING COMPANY
DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 05 OF 25	PART NO. 16-9873 REV -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

ROM

R19 0Ω

IVPP1

IN FOR 8M ROM

R244 0Ω

BA19

U21 27040

U20 27040

U19 27040

U18 27040

	VPP	A18	A17	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0	OE	CE	O7	O6	O5	O4	O3	O2	O1	O0
U21	1	31	30	2	3	29	28	4	25	23	26	27	5	6	7	8	9	10	11	12	24	22	21	20	19	18	17	15	14	13
		BA18	BA17	BA16	BA15	BA14	BA13	BA12	BA11	BA10	BA09	BA08	BA07	BA06	BA05	BA04	BA03	BA02	BA01	BA00			BD31	BD30	BD29	BD28	BD27	BD26	BD25	BD24
U20	1	31	30	2	3	29	28	4	25	23	26	27	5	6	7	8	9	10	11	12	24	22	21	20	19	18	17	15	14	13
		BA18	BA17	BA16	BA15	BA14	BA13	BA12	BA11	BA10	BA09	BA08	BA07	BA06	BA05	BA04	BA03	BA02	BA01	BA00			BD23	BD22	BD21	BD20	BD19	BD18	BD17	BD16
U19	1	31	30	2	3	29	28	4	25	23	26	27	5	6	7	8	9	10	11	12	24	22	21	20	19	18	17	15	14	13
		BA18	BA17	BA16	BA15	BA14	BA13	BA12	BA11	BA10	BA09	BA08	BA07	BA06	BA05	BA04	BA03	BA02	BA01	BA00			BD15	BD14	BD13	BD12	BD11	BD10	BD09	BD08
U18	1	31	30	2	3	29	28	4	25	23	26	27	5	6	7	8	9	10	11	12	24	22	21	20	19	18	17	15	14	13
		BA18	BA17	BA16	BA15	BA14	BA13	BA12	BA11	BA10	BA09	BA08	BA07	BA06	BA05	BA04	BA03	BA02	BA01	BA00			BD07	BD06	BD05	BD04	BD03	BD02	BD01	BD00

-ICS1

R24 0Ω

IVPP0

IN FOR 8M ROM

R236 0Ω

BA19

U17 27040

U16 27040

U15 27040

U14 27040

	VPP	A18	A17	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0	OE	CE	O7	O6	O5	O4	O3	O2	O1	O0
U17	1	31	30	2	3	29	28	4	25	23	26	27	5	6	7	8	9	10	11	12	24	22	21	20	19	18	17	15	14	13
		BA18	BA17	BA16	BA15	BA14	BA13	BA12	BA11	BA10	BA09	BA08	BA07	BA06	BA05	BA04	BA03	BA02	BA01	BA00			BD31	BD30	BD29	BD28	BD27	BD26	BD25	BD24
U16	1	31	30	2	3	29	28	4	25	23	26	27	5	6	7	8	9	10	11	12	24	22	21	20	19	18	17	15	14	13
		BA18	BA17	BA16	BA15	BA14	BA13	BA12	BA11	BA10	BA09	BA08	BA07	BA06	BA05	BA04	BA03	BA02	BA01	BA00			BD23	BD22	BD21	BD20	BD19	BD18	BD17	BD16
U15	1	31	30	2	3	29	28	4	25	23	26	27	5	6	7	8	9	10	11	12	24	22	21	20	19	18	17	15	14	13
		BA18	BA17	BA16	BA15	BA14	BA13	BA12	BA11	BA10	BA09	BA08	BA07	BA06	BA05	BA04	BA03	BA02	BA01	BA00			BD15	BD14	BD13	BD12	BD11	BD10	BD09	BD08
U14	1	31	30	2	3	29	28	4	25	23	26	27	5	6	7	8	9	10	11	12	24	22	21	20	19	18	17	15	14	13
		BA18	BA17	BA16	BA15	BA14	BA13	BA12	BA11	BA10	BA09	BA08	BA07	BA06	BA05	BA04	BA03	BA02	BA01	BA00			BD07	BD06	BD05	BD04	BD03	BD02	BD01	BD00

-ICS0

BUFF ADDR BUS

BUFF DATA BUS

VR4.P06
08/05/94 14:49:46

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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 06 OF 25	PART NO. 16-9873 REV -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

ROM

R97 0Ω

VRVPP

IN FOR 8M ROM

R246 0Ω

BA19

U13 27040 — U12 27040 — U11 27040 — U10 27040

	U13	U12	U11	U10
VPP	1	1	1	1
BA18	31	31	31	31
BA17	30	30	30	30
BA16	2	2	2	2
BA15	3	3	3	3
BA14	29	29	29	29
BA13	28	28	28	28
BA12	4	4	4	4
BA11	25	25	25	25
BA10	23	23	23	23
BA09	26	26	26	26
BA08	27	27	27	27
BA07	5	5	5	5
BA06	6	6	6	6
BA05	7	7	7	7
BA04	8	8	8	8
BA03	9	9	9	9
BA02	10	10	10	10
BA01	11	11	11	11
BA00	12	12	12	12
OE	24	24	24	24
CE	22	22	22	22
O7	21 BD31	21 BD23	21 BD15	21 BD07
O6	20 BD30	20 BD22	20 BD14	20 BD06
O5	19 BD29	19 BD21	19 BD13	19 BD05
O4	18 BD28	18 BD20	18 BD12	18 BD04
O3	17 BD27	17 BD19	17 BD11	17 BD03
O2	15 BD26	15 BD18	15 BD10	15 BD02
O1	14 BD25	14 BD17	14 BD09	14 BD01
O0	13 BD24	13 BD16	13 BD08	13 BD00

-VRCS

R238 0Ω

IVPP2

IN FOR 8M ROM

R240 0Ω

BA19

U25 27040 — U24 27040 — U23 27040 — U22 27040

	U25	U24	U23	U22
VPP	1	1	1	1
BA18	31	31	31	31
BA17	30	30	30	30
BA16	2	2	2	2
BA15	3	3	3	3
BA14	29	29	29	29
BA13	28	28	28	28
BA12	4	4	4	4
BA11	25	25	25	25
BA10	23	23	23	23
BA09	26	26	26	26
BA08	27	27	27	27
BA07	5	5	5	5
BA06	6	6	6	6
BA05	7	7	7	7
BA04	8	8	8	8
BA03	9	9	9	9
BA02	10	10	10	10
BA01	11	11	11	11
BA00	12	12	12	12
OE	24	24	24	24
CE	22	22	22	22
O7	21 BD31	21 BD23	21 BD15	21 BD07
O6	20 BD30	20 BD22	20 BD14	20 BD06
O5	19 BD29	19 BD21	19 BD13	19 BD05
O4	18 BD28	18 BD20	18 BD12	18 BD04
O3	17 BD27	17 BD19	17 BD11	17 BD03
O2	15 BD26	15 BD18	15 BD10	15 BD02
O1	14 BD25	14 BD17	14 BD09	14 BD01
O0	13 BD24	13 BD16	13 BD08	13 BD00

-ICS2

BUFF ADDR BUS

BUFF DATA BUS

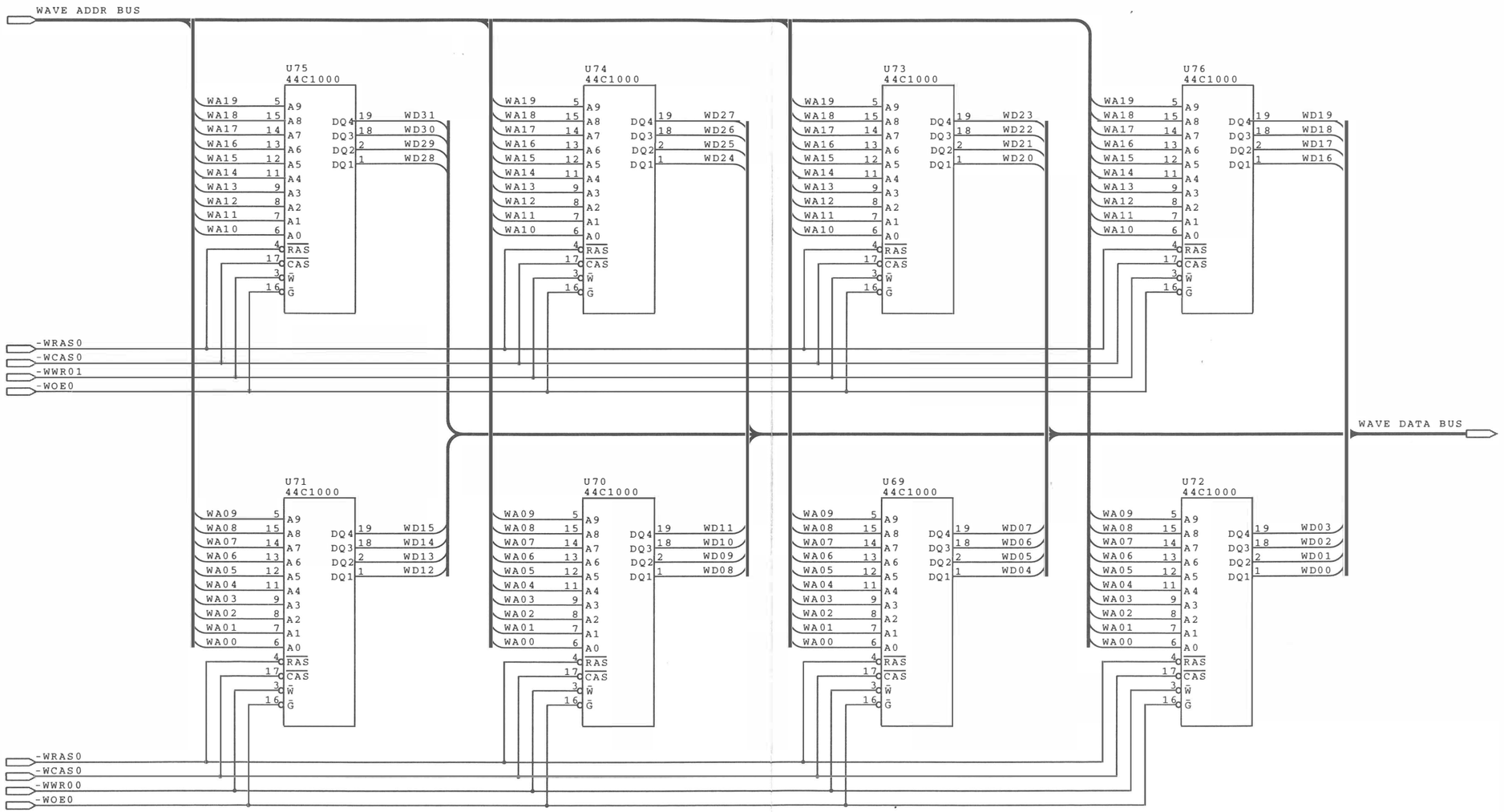
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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 07 OF 25	PART NO. 16-9873 REV -

VR4.P07
08/05/94 14:49:47

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

WAVE RAM



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CHECKED BY DATE		
APPROVAL DATE	SHEET 08 OF 25	PART NO. 16-9873 REV -

VR4.P08
08/05/94 15:12:30

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

U68
VR1

+5VVR1	1	VCC	
+5VVR1	2	VCC	
-FLOAT	3	FLOATZ	
+DONE	4	DONE	
-FIFODEN	5	FIFODENZ	
-FIFORDX	6	FIFORDZ	
GND	7	GND	
+DMACLK	8	SYSCLK	
+VIDCLK	9	VIDCLK	
+H1A	10	H1	
-RESET	11	RESETZ	
-DMAWE	12	WEZ	
-STRB	13	STRBZ	
GND	14	GND	
-BLANKX	15	BLANKZ	
+BLANKX	16	BLANK	
HSYNCXX	17	HSYNC	
VSYNCXX	18	VSYNC	
CSYNCXX	19	CSYNC	
+DOTCLKX	20	DOTCLK	
-WAIT	21	WAITZ	
GND	22	GND	
	23	OPTOCLK1	
	24	OPTOCLK0	
+DMACLK	25	DMACLK	
+5VVR1	26	VCC	
GND	27	GND	
	28	OPTODAT1	
	29	OPTODAT0	
BD03	30	BD03	
BD02	31	BD02	
BD01	32	BD01	
BD00	33	BD00	
-TEST2	34	TESTOUT	
-TEST1	35	TEST1Z	
-TEST0	36	TEST0Z	
-DISPINT	37	DISPINTZ	
-VWR1X	38	VWR1Z	
-VWR0X	39	VWR0Z	
-VRASX	40	VRASZ	
-VCASX	41	VCASZ	
-TROEX	42	TROEZ	
-SOE1X	43	SOE1Z	
-SOE0X	44	SOE0Z	
+SCLKX	45	SCLK	
VA08X	46	VA08	
VA07X	47	VA07	
VA06X	48	VA06	
VA05X	49	VA05	
VA04X	50	VA04	
GND	51	GND	
GND	52	GND	

GND	156	GND	
GND	155	GND	
WD25	154	WD25X	
WD24	153	WD24X	
WD23	152	WD23X	
WD22	151	WD22X	
WD21	150	WD21X	
WD20	149	WD20X	
WD19	148	WD19X	
WD18	147	WD18X	
WD17	146	WD17X	
WD16	145	WD16X	
WD15	144	WD15X	
WD14	143	WD14X	
WD13	142	WD13X	
WD12	141	WD12X	
WD11	140	WD11X	
WD10	139	WD10X	
WD09	138	WD09X	
WD08	137	WD08X	
WD07	136	WD07X	
WD06	135	WD06X	
WD05	134	WD05X	
WD04	133	WD04X	
WD03	132	WD03X	
VCC	131	+5VVR1	
GND	130	GND	
WD02	129	WD02X	
WD01	128	WD01X	
WD00	127	WD00X	
WA19	126	WA19X	
WA18	125	WA18X	
WA17	124	WA17X	
WA16	123	WA16X	
WA15	122	WA15X	
WA14	121	WA14X	
WA13	120	WA13X	
WA12	119	WA12X	
WA11	118	WA11X	
WA10	117	WA10X	
WA09	116	WA09X	
WA08	115	WA08X	
WA07	114	WA07X	
WA06	113	WA06X	
WA05	112	WA05X	
WA04	111	WA04X	
WA03	110	WA03X	
WA02	109	WA02X	
WA01	108	WA01X	
WA00	107	WA00X	
VCC	106	+5VVR1	
VCC	105	+5VVR1	

R248 500Ω
R249 500Ω
C89 22PF

L16 +5VVR1
C139 .1uF
C140 .01uF

L17 +5VVR1
C141 .1uF
C142 .01uF

L10 +5VVR1
C91 .1uF
C90 .01uF

L9 FB +5VOSC2
C88 47pF
U67 XOSC6
33MHZ
OE
OE
8 OSC2OUT
R299 33Ω
+VIDCLK
C103 22PF

L13 FB +5VOSC3
C118 47pF
U89 XOSC6
40MHZ
OE
OE
8 OSC3OUT
R374 33Ω
+DMACLK
C119 22PF

VR4.P09
08/05/94 15:12:33

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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 09 OF 25	PART NO. 16-9873 REV -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

WAVE ADDR BUS "X"

WA19X	R393	33Ω	WA19
WA18X	R456	33Ω	WA18
WA17X	R451	33Ω	WA17
WA16X	R457	33Ω	WA16
WA15X	R395	33Ω	WA15
WA14X	R453	33Ω	WA14
WA13X	R394	33Ω	WA13
WA12X	R458	33Ω	WA12
WA11X	R455	33Ω	WA11
WA10X	R399	33Ω	WA10
WA09X	R439	33Ω	WA09
WA08X	R447	33Ω	WA08
WA07X	R449	33Ω	WA07
WA06X	R441	33Ω	WA06
WA05X	R445	33Ω	WA05
WA04X	R443	33Ω	WA04
WA03X	R448	33Ω	WA03
WA02X	R450	33Ω	WA02
WA01X	R444	33Ω	WA01
WA00X	R446	33Ω	WA00

WAVE ADDR BUS

WAVE CTRL BUS "X"

-WCAS0X	R452	33Ω	-WCAS0
-WRAS0X	R521	33Ω	-WRAS0
-WOE0X	R440	33Ω	-WOE0
-WWR01X	R454	33Ω	-WWR01
-WWR00X	R442	33Ω	-WWR00

WAVE CTRL BUS

VIDEO ADDR BUS "X"

VA08X	R550	33Ω	VA08
VA07X	R575	33Ω	VA07
VA06X	R551	33Ω	VA06
VA05X	R576	33Ω	VA05
VA04X	R552	33Ω	VA04
VA03X	R544	33Ω	VA03
VA02X	R514	33Ω	VA02
VA01X	R543	33Ω	VA01
VA00X	R513	33Ω	VA00

VIDEO ADDR BUS

VIDEO CTRL BUS "X"

-VRASX	R574	33Ω	-VRAS
-VCASX	R520	33Ω	-VCAS
-VWR1X	R542	33Ω	-VWR1
-VWR0X	R549	33Ω	-VWR0
+SCLKX	R508	33Ω	+SCLK
-TROEX	R537	33Ω	-TROE
-SOE1X	R568	33Ω	-SOE1
-SOE0X	R516	33Ω	-SOE0

VIDEO CTRL BUS

+DOTCLKX	R375	33Ω	+DOTCLK
CSYNCXX	R437	33Ω	CSYNCX
VSYNCXX	R438	33Ω	VSYNCX
HSYNCXX	R301	33Ω	HSYNCX
+BLANKX	R370	33Ω	+BLANK
-BLANKX	R373	33Ω	-BLANK

WAVE DATA BUS "X"

WD31X	R321	33Ω	WD31
WD30X	R315	33Ω	WD30
WD29X	R317	33Ω	WD29
WD28X	R319	33Ω	WD28
WD27X	R396	33Ω	WD27
WD26X	R392	33Ω	WD26
WD25X	R322	33Ω	WD25
WD24X	R320	33Ω	WD24
WD23X	R307	33Ω	WD23
WD22X	R309	33Ω	WD22
WD21X	R390	33Ω	WD21
WD20X	R388	33Ω	WD20
WD19X	R397	33Ω	WD19
WD18X	R316	33Ω	WD18
WD17X	R398	33Ω	WD17
WD16X	R318	33Ω	WD16
WD15X	R304	33Ω	WD15
WD14X	R306	33Ω	WD14
WD13X	R310	33Ω	WD13
WD12X	R312	33Ω	WD12
WD11X	R382	33Ω	WD11
WD10X	R386	33Ω	WD10
WD09X	R308	33Ω	WD09
WD08X	R383	33Ω	WD08
WD07X	R314	33Ω	WD07
WD06X	R391	33Ω	WD06
WD05X	R385	33Ω	WD05
WD04X	R380	33Ω	WD04
WD03X	R381	33Ω	WD03
WD02X	R384	33Ω	WD02
WD01X	R389	33Ω	WD01
WD00X	R387	33Ω	WD00

WAVE DATA BUS

VIDEO DATA BUS "X"

VD31X	R569	33Ω	VD31
VD30X	R570	33Ω	VD30
VD29X	R571	33Ω	VD29
VD28X	R572	33Ω	VD28
VD27X	R573	33Ω	VD27
VD26X	R567	33Ω	VD26
VD25X	R577	33Ω	VD25
VD24X	R578	33Ω	VD24
VD23X	R509	33Ω	VD23
VD22X	R510	33Ω	VD22
VD21X	R511	33Ω	VD21
VD20X	R512	33Ω	VD20
VD19X	R541	33Ω	VD19
VD18X	R540	33Ω	VD18
VD17X	R539	33Ω	VD17
VD16X	R538	33Ω	VD16
VD15X	R517	33Ω	VD15
VD14X	R518	33Ω	VD14
VD13X	R515	33Ω	VD13
VD12X	R519	33Ω	VD12
VD11X	R548	33Ω	VD11
VD10X	R547	33Ω	VD10
VD09X	R546	33Ω	VD09
VD08X	R545	33Ω	VD08
VD07X	R581	33Ω	VD07
VD06X	R582	33Ω	VD06
VD05X	R583	33Ω	VD05
VD04X	R584	33Ω	VD04
VD03X	R586	33Ω	VD03
VD02X	R585	33Ω	VD02
VD01X	R580	33Ω	VD01
VD00X	R579	33Ω	VD00

VIDEO DATA BUS

VR4.P10
08/05/94 14:49:49

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CHECKED BY DATE		
APPROVAL DATE	SHEET 10 OF 25	PART NO. 16-9873 REV -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

VIDEO RAM

VIDEO DATA BUS

VIDEO ADDR BUS

U101 2MVRAM

VA08	15	A8	D7	34	VD31
VA07	16	A7	D6	33	VD30
VA06	17	A6	D5	32	VD29
VA05	18	A5	D4	31	VD28
VA04	19	A4	D3	11	VD27
VA03	22	A3	D2	10	VD26
VA02	23	A2	D1	9	VD25
VA01	24	A1	D0	8	VD24
VA00	25	A0			
	14	RAS	D7	39	SD115X
	27	CAS	D6	38	SD114X
	13	R/W	D5	37	SD113X
	7	TR/OE	D4	36	SD112X
	35	SOE	D3	6	SD111X
	2	SCLK	D2	5	SD110X
			D1	4	SD109X
			D0	3	SD108X
	29	DSF1			
	28	DSF2	QSF	26	

R159 33Ω SD15
R155 33Ω SD14
R61 33Ω SD13
R64 33Ω SD12
R161 33Ω SD11
R173 33Ω SD10
R67 33Ω SD09
R168 33Ω SD08

U94 2MVRAM

VA08	15	A8	D7	34	VD23
VA07	16	A7	D6	33	VD22
VA06	17	A6	D5	32	VD21
VA05	18	A5	D4	31	VD20
VA04	19	A4	D3	11	VD19
VA03	22	A3	D2	10	VD18
VA02	23	A2	D1	9	VD17
VA01	24	A1	D0	8	VD16
VA00	25	A0			
	14	RAS	D7	39	SD107X
	27	CAS	D6	38	SD106X
	13	R/W	D5	37	SD105X
	7	TR/OE	D4	36	SD104X
	35	SOE	D3	6	SD103X
	2	SCLK	D2	5	SD102X
			D1	4	SD101X
			D0	3	SD100X
	29	DSF1			
	28	DSF2	QSF	26	

R223 33Ω SD07
R225 33Ω SD06
R157 33Ω SD05
R166 33Ω SD04
R175 33Ω SD03
R235 33Ω SD02
R229 33Ω SD01
R232 33Ω SD00

-VRAS
-VCAS
-VWR1
-TROE
-SOE1
+SCLK

U95 2MVRAM

VA08	15	A8	D7	34	VD15
VA07	16	A7	D6	33	VD14
VA06	17	A6	D5	32	VD13
VA05	18	A5	D4	31	VD12
VA04	19	A4	D3	11	VD11
VA03	22	A3	D2	10	VD10
VA02	23	A2	D1	9	VD09
VA01	24	A1	D0	8	VD08
VA00	25	A0			
	14	RAS	D7	39	SD015X
	27	CAS	D6	38	SD014X
	13	R/W	D5	37	SD013X
	7	TR/OE	D4	36	SD012X
	35	SOE	D3	6	SD011X
	2	SCLK	D2	5	SD010X
			D1	4	SD009X
			D0	3	SD008X
	29	DSF1			
	28	DSF2	QSF	26	

R153 33Ω SD15
R149 33Ω SD14
R60 33Ω SD13
R63 33Ω SD12
R158 33Ω SD11
R167 33Ω SD10
R66 33Ω SD09
R162 33Ω SD08

U102 2MVRAM

VA08	15	A8	D7	34	VD07
VA07	16	A7	D6	33	VD06
VA06	17	A6	D5	32	VD05
VA05	18	A5	D4	31	VD04
VA04	19	A4	D3	11	VD03
VA03	22	A3	D2	10	VD02
VA02	23	A2	D1	9	VD01
VA01	24	A1	D0	8	VD00
VA00	25	A0			
	14	RAS	D7	39	SD007X
	27	CAS	D6	38	SD006X
	13	R/W	D5	37	SD005X
	7	TR/OE	D4	36	SD004X
	35	SOE	D3	6	SD003X
	2	SCLK	D2	5	SD002X
			D1	4	SD001X
			D0	3	SD000X
	29	DSF1			
	28	DSF2	QSF	26	

R222 33Ω SD07
R226 33Ω SD06
R154 33Ω SD05
R163 33Ω SD04
R172 33Ω SD03
R233 33Ω SD02
R228 33Ω SD01
R231 33Ω SD00

-VWR0
-SOE0

R620 500Ω
R621 500Ω
C219 22PF

SERIAL DATA BUS

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PROJ. ENGR. M. Loffredo	FIRST PROJECT NUMBER 40033	WILLIAMS ELECTRONICS GAMES, INC. MIDWAY MANUFACTURING COMPANY
DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 11 OF 25	PART NO. 16-9873 REV -

VR4.P11
08/05/94 14:49:51

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

COLOR RAM

COLOR ADDR BUS

SERIAL DATA BUS

BUFF ADDR BUS

+DOTCLK

-CAOE

+CREN

BUFF DATA BUS

+DDOUTB

-CREN

-CRWRL

-CROE

COLOR DATA BUS

U32
74ALS541

BA15	2	A8	Y8	18	CA15
BA14	3	A7	Y7	17	CA14
BA13	4	A6	Y6	16	CA13
BA12	5	A5	Y5	15	CA12
BA11	6	A4	Y4	14	CA11
BA10	7	A3	Y3	13	CA10
BA09	8	A2	Y2	12	CA09
BA08	9	A1	Y1	11	CA08
		G1	G2		
		1	19		

U37
74ALS574

R156 4.7KΩ	SD15	SD15	2	8Q	19 CA15
R152 4.7KΩ	SD14	SD14	3	7Q	18 CA14
R59 4.7KΩ	SD13	SD13	4	6Q	17 CA13
R62 4.7KΩ	SD12	SD12	5	5Q	16 CA12
R164 4.7KΩ	SD11	SD11	6	4Q	15 CA11
R170 4.7KΩ	SD10	SD10	7	3Q	14 CA10
R65 4.7KΩ	SD09	SD09	8	2Q	13 CA09
R165 4.7KΩ	SD08	SD08	9	1Q	12 CA08
				CK	OE
				11	1

U65
74ALS541

BA07	2	A8	Y8	18	CA07
BA06	3	A7	Y7	17	CA06
BA05	4	A6	Y6	16	CA05
BA04	5	A5	Y5	15	CA04
BA03	6	A4	Y4	14	CA03
BA02	7	A3	Y3	13	CA02
BA01	8	A2	Y2	12	CA01
BA00	9	A1	Y1	11	CA00
		G1	G2		
		1	19		

U53
74ALS574

R221 4.7KΩ	SD07	SD07	2	8Q	19 CA07
R224 4.7KΩ	SD06	SD06	3	7Q	18 CA06
R151 4.7KΩ	SD05	SD05	4	6Q	17 CA05
R160 4.7KΩ	SD04	SD04	5	5Q	16 CA04
R169 4.7KΩ	SD03	SD03	6	4Q	15 CA03
R234 4.7KΩ	SD02	SD02	7	3Q	14 CA02
R227 4.7KΩ	SD01	SD01	8	2Q	13 CA01
R230 4.7KΩ	SD00	SD00	9	1Q	12 CA00
				CK	OE
				11	1

R171
500Ω

R174
500Ω

C56
22PF

R150
100Ω

R436
100Ω

U107
74ALS245

BD15	2	A8	B8	18	CD15
BD14	3	A7	B7	17	CD14
BD13	4	A6	B6	16	CD13
BD12	5	A5	B5	15	CD12
BD11	6	A4	B4	14	CD11
BD10	7	A3	B3	13	CD10
BD09	8	A2	B2	12	CD09
BD08	9	A1	B1	11	CD08
		A→B	EN		
		1	19		

U113
74ALS245

BD07	2	A8	B8	18	CD07
BD06	3	A7	B7	17	CD06
BD05	4	A6	B6	16	CD05
BD04	5	A5	B5	15	CD04
BD03	6	A4	B4	14	CD03
BD02	7	A3	B3	13	CD02
BD01	8	A2	B2	12	CD01
BD00	9	A1	B1	11	CD00
		A→B	EN		
		1	19		

U85
62256/64

CA14	1	A14			
CA13	26	A13	I\O7	19	CD15
CA12	2	A12	I\O6	18	CD14
CA11	23	A11	I\O5	17	CD13
CA10	21	A10	I\O4	16	CD12
CA09	24	A9	I\O3	15	CD11
CA08	25	A8	I\O2	13	CD10
CA07	3	A7	I\O1	12	CD09
CA06	4	A6	I\O0	11	CD08
CA05	5	A5			
CA04	6	A4			
CA03	7	A3			
CA02	8	A2			
CA01	9	A1			
CA00	10	A0			
	27	R/W			
	22	OE			
	20	CS			

U87
62256/64

CA14	1	A14			
CA13	26	A13	I\O7	19	CD07
CA12	2	A12	I\O6	18	CD06
CA11	23	A11	I\O5	17	CD05
CA10	21	A10	I\O4	16	CD04
CA09	24	A9	I\O3	15	CD03
CA08	25	A8	I\O2	13	CD02
CA07	3	A7	I\O1	12	CD01
CA06	4	A6	I\O0	11	CD00
CA05	5	A5			
CA04	6	A4			
CA03	7	A3			
CA02	8	A2			
CA01	9	A1			
CA00	10	A0			
	27	R/W			
	22	OE			
	20	CS			

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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 12 OF 25	PART NO. 16-9873 REV -

VR4.P12
08/05/94 14:49:52

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

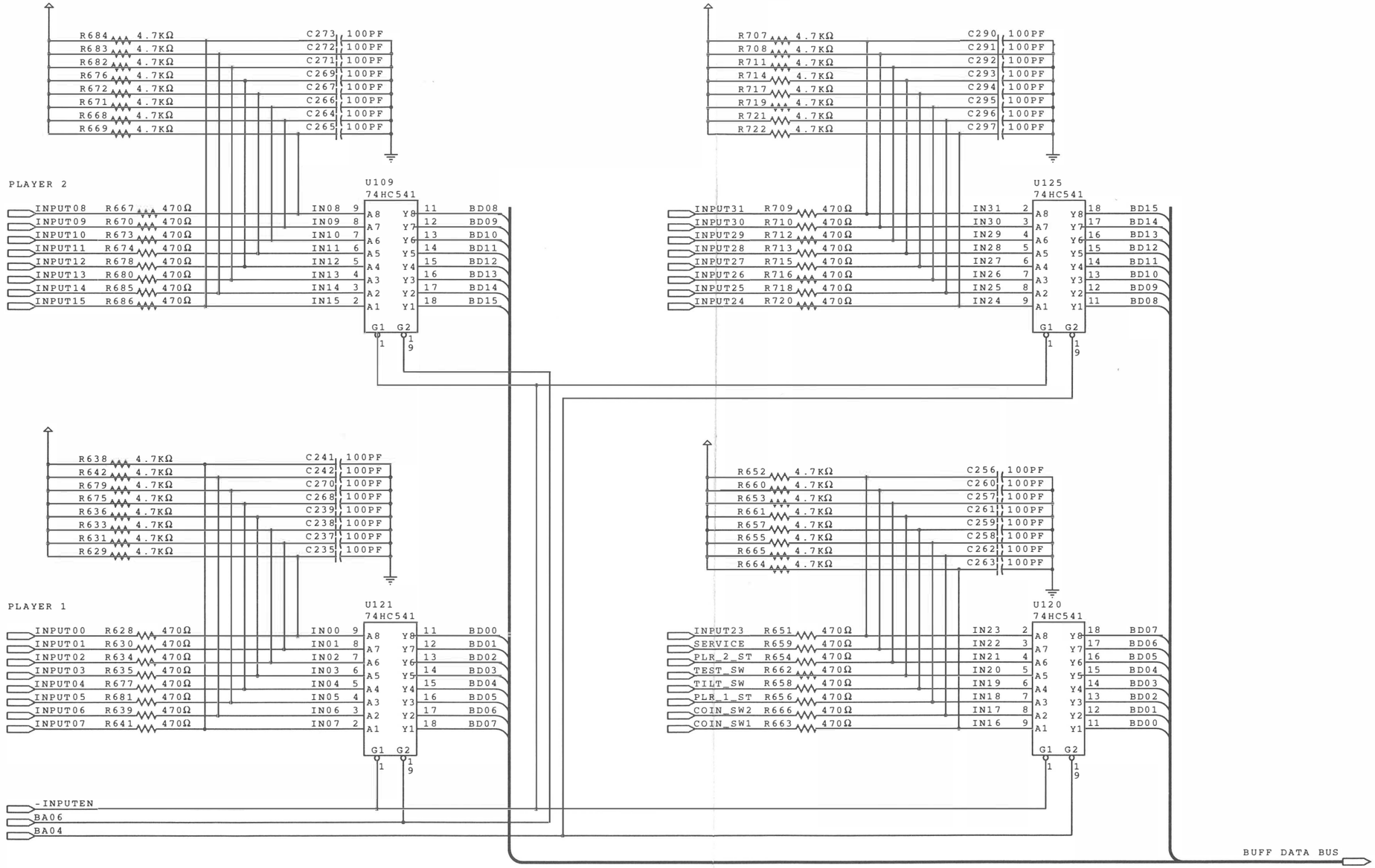
L19 FB
+5VDAC
C160 47pF
C159 47pF
C158 10uF
COLOR DATA BUS
U100 74ALS574
U106 74ALS574
U93 74HC541
U105 74HC541
C181 .01uF
C199 .01uF
R503 (NOT USED)
R627 (NOT USED)
R600 (NOT USED)
R598 (NOT USED)
R599 (NOT USED)
R624 (NOT USED)
ROUTX
GOUTX
BOUTX
U82 7407
L26 FB
L27 FB
L28 FB
L29 FB
L24 FB
L25 FB
ROUT
GOUT
BOUT
REDGUN
GRNGUN
BLUGUN
C230 47pF
C232 47pF
C198 47pF
C234 47pF
C197 47pF
C229 47pF
+DOTCLK
-GDOE
R609 100Ω
R626 1KΩ
R619 1KΩ
R623 1KΩ
+BLANK
-BLANK
R371 0Ω
R372 0Ω
BLANK
CSYNCX
VSYNCX
HSYNCX
CSYNCBX
VSYNCBX
HSYNCBX
CSYNCB
VSYNCB
HSYNCB
L32 FB
L33 FB
L22 FB
L30 FB
L23 FB
L31 FB
C231 47pF
C255 47pF
C212 47pF
C224 47pF
C226 47pF
C225 47pF
CSYNC
VSYNC
HSYNC

VR4.P13
08/05/94 14:49:53

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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 13 OF 25	PART NO. 16-9873 REV -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

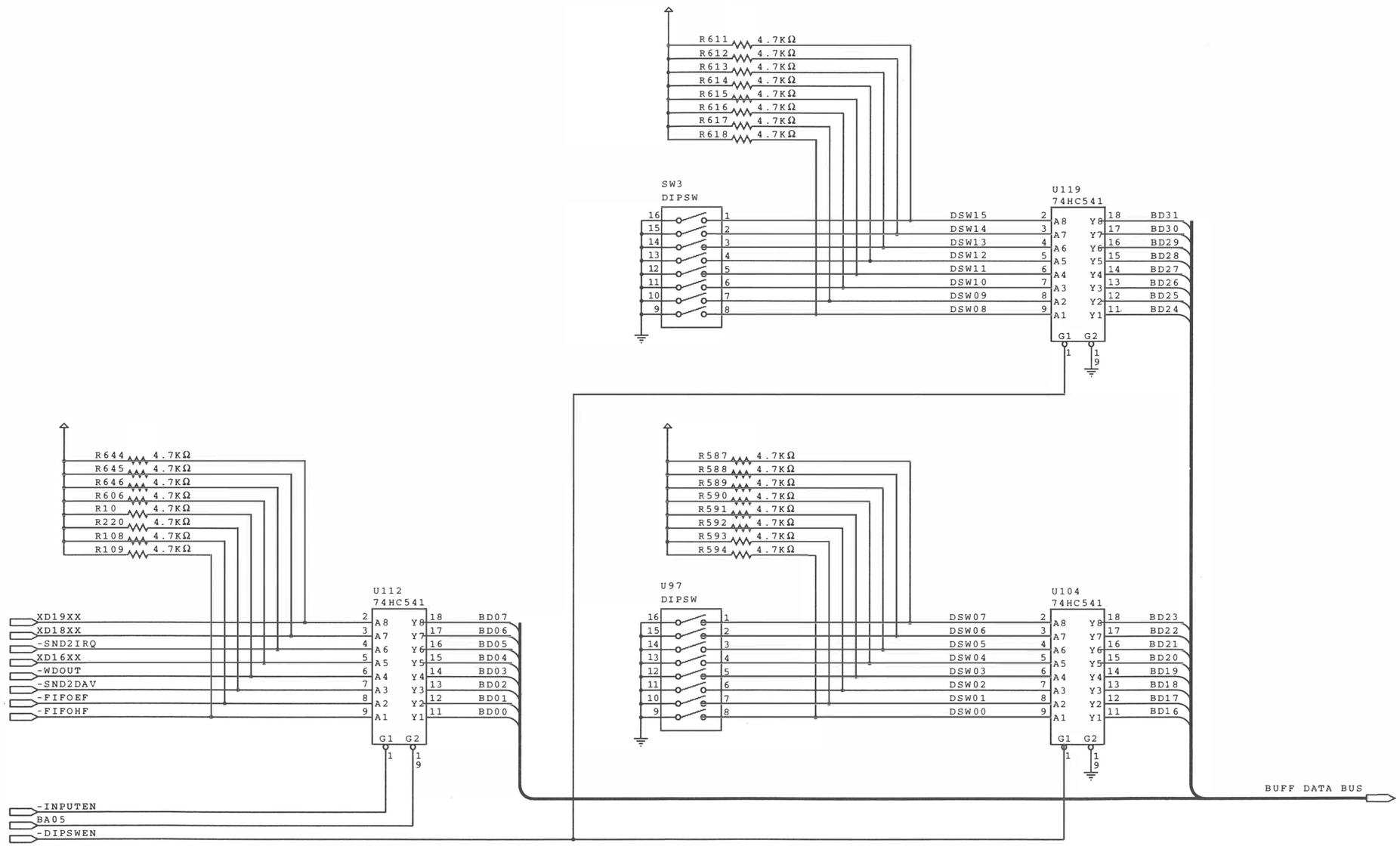


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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 14 OF 25	PART NO. 16-9873 REV -

VR4.P14
08/05/94 14:49:54

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94



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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 15 OF 25	PART NO. 16-9873 REV -

VR4.P15
08/05/94 14:49:55

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

+5VADC

L34 FB

R761 0Ω

ADCVREF

C300 47pF

C298 47pF

R763 N.U.

C304 10uF

C251 .01uF

U130 ADC0844

8 REF VCC 20

-ATODEN 2 CS

-ATODRD 1 RD

-ATODWR 19 WR

18 INT -ADCINTX

R532 33Ω -ADCINT

BD31 9 D7 CH4 6 ADCCH4XX R760 4.7KΩ ADCCH4

BD30 11 D6 CH3 5 ADCCH3XX R758 4.7KΩ ADCCH3

BD29 12 D5 CH2 4 ADCCH2XX R757 4.7KΩ ADCCH2

BD28 13 D4 CH1 3 ADCCH1XX R755 4.7KΩ ADCCH1

BD27 14 D3

BD26 15 D2 AGND 7

BD25 16 D1

BD24 17 D0 DGND 10

C303 47pF C302 47pF C301 47pF C299 47pF

BUFF DATA BUS

XDXX BUS

U123 74ALS574

BD00 9 8D 8Q 12 XD00XX

BD01 8 7D 7Q 13 XD01XX

BD02 7 6D 6Q 14 XD02XX

BD03 6 5D 5Q 15 XD03XX

BD04 5 4D 4Q 16 XD04XX

BD05 4 3D 3Q 17 XD05XX

BD06 3 2D 2Q 18 XD06XX

BD07 2 1D 1Q 19 XD07XX

CK OE

1 1

U116 74HC541

XD07XX 2 A8 Y8 18 BD15

XD06XX 3 A7 Y7 17 BD14

XD05XX 4 A6 Y6 16 BD13

XD04XX 5 A5 Y5 15 BD12

XD03XX 6 A4 Y4 14 BD11

XD02XX 7 A3 Y3 13 BD10

XD01XX 8 A2 Y2 12 BD09

XD00XX 9 A1 Y1 11 BD08

G1 G2

1 1 9

U99 74ALS574

BD08 9 8D 8Q 12 XD08XX

BD09 8 7D 7Q 13 XD09XX

BD10 7 6D 6Q 14 XD10XX

BD11 6 5D 5Q 15 XD11XX

BD12 5 4D 4Q 16

BD13 4 3D 3Q 17

BD14 3 2D 2Q 18

BD15 2 1D 1Q 19 XD15XX

CK OE

1 1

U115OE

R601 100Ω

-SNDINT

-LOCK

+XDTE

R607 2KΩ

R605 2KΩ

R603 2KΩ

R643 2KΩ

U114 PAL22V10

-WEB 13

BD08 11

BD09 10

BD10 9

BD11 8

-RESET 7

XD16XX 6

-SND2IRQ 5

XD18XX 4

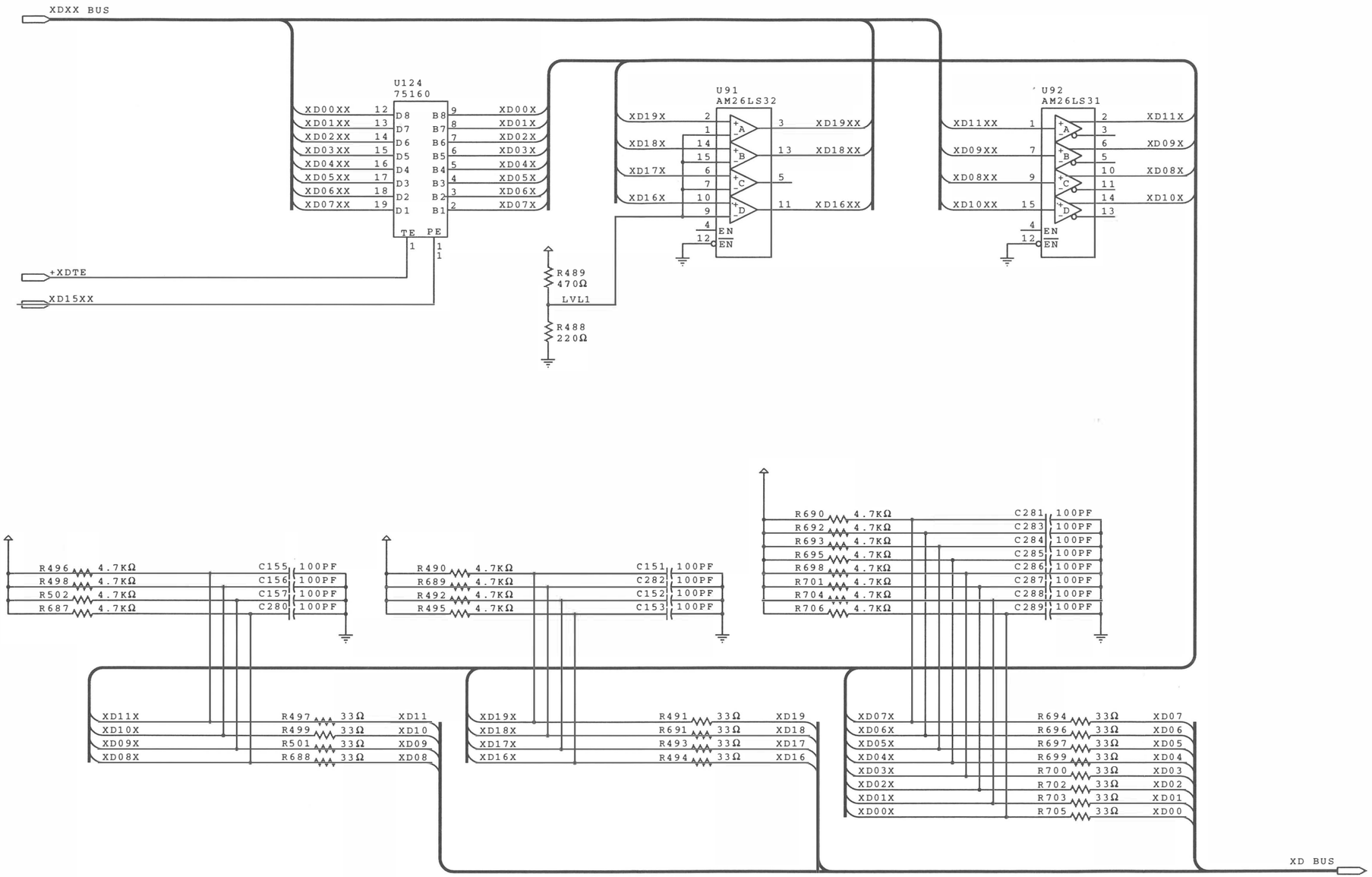
XD19XX 3

BA05 2

-SOUNDCS 1

I I I

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94



VR4.P17
08/05/94 14:49:56

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DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 17 OF 25	PART NO. 16-9873 REV -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

BD[31:16]

EXCOMINT

R752 10K COM27TRI
R649 10K COM26TRI
R724 10K COM25TRI
R648 10K COM24TRI

U118
74ALS574

BD31	2 8D	8Q 19	COM27TRI
BD30	3 7D	7Q 18	COM26TRI
BD29	4 6D	6Q 17	COM25TRI
BD28	5 5D	5Q 16	COM24TRI
BD27	6 4D	4Q 15	COM27OUT
BD26	7 3D	3Q 14	COM26OUT
BD25	8 2D	2Q 13	COM25OUT
BD24	9 1D	1Q 12	COM24OUT

CK OE

U103
74ALS574

BD23	2 8D	8Q 19	COMD07XX
BD22	3 7D	7Q 18	COMD06XX
BD21	4 6D	6Q 17	COMD05XX
BD20	5 5D	5Q 16	COMD04XX
BD19	6 4D	4Q 15	COMD03XX
BD18	7 3D	3Q 14	COMD02XX
BD17	8 2D	2Q 13	COMD01XX
BD16	9 1D	1Q 12	COMD00XX

CK OE

R622
4.7K

-COMTEST

U111
PAL22V10

-RESET	11 I	I/O 22	-COMDOE
-WEB	10 I	I/O 21	-COMCOE
BA02	9 I	I/O 20	-COMRD
BA01	8 I	I/O 19	BD27
BA00	7 I	I/O 18	
	6 I	I/O 17	BD31
	5 I	I/O 16	BD30
	4 I	I/O 15	BD29
	3 I	I/O 14	-COMOC
-COMCS	1 I/CP		

COMCTL

-COMCLK 23 I/O

-COMINT

U110
74ALS541

BD16	11 Y8	A8 9	COMD00XX
BD17	12 Y7	A7 8	COMD01XX
BD18	13 Y6	A6 7	COMD02XX
BD19	14 Y5	A5 6	COMD03XX
BD20	15 Y4	A4 5	COMD04XX
BD21	16 Y3	A3 4	COMD05XX
BD22	17 Y2	A2 3	COMD06XX
BD23	18 Y1	A1 2	COMD07XX

G1 G2

U129
75176B

COM27TRI	3	6 COM27AX
COM27OUT	4	7 COM27BX

R749 120

U128
75176B

BD26	1	7 COM26BX
COM26TRI	3	6 COM26AX
COM26OUT	4	

R743 120

U126
75176B

BD25	1	7 COM25BX
COM25TRI	3	6 COM25AX
COM25OUT	4	

R739 120

U127
75176B

BD24	1	7 COM24BX
COM24TRI	3	6 COM24AX
COM24OUT	4	

R737 120

R750 10K
R741 10K
R723 10K
R735 10K

R747 10K
R745 10K
R725 10K
R733 10K

P10
RIBBON26

COMGND

R751 33Ω	COM27B	26
R748 33Ω	COM27A	25
R744 33Ω	COM26B	24
R746 33Ω	COM26A	23
R740 33Ω	COM25B	22
R742 33Ω	COM25A	21
R736 33Ω	COM24B	20
R738 33Ω	COM24A	19
	COMD00	18
	COMD01	17
	COMD02	16
	COMD03	15
	COMD04	14
	COMD05	13
	COMD06	12
	COMD07	11
		10
		9
		8
		7
		6
		5
		4
		3
		2
		1

U117
75160

COMD00XX	12 D8	B8 9	COMD00X
COMD01XX	13 D7	B7 8	COMD01X
COMD02XX	14 D6	B6 7	COMD02X
COMD03XX	15 D5	B5 6	COMD03X
COMD04XX	16 D4	B4 5	COMD04X
COMD05XX	17 D3	B3 4	COMD05X
COMD06XX	18 D2	B2 3	COMD06X
COMD07XX	19 D1	B1 2	COMD07X

TE PE

R734 33Ω
R732 33Ω
R731 33Ω
R730 33Ω
R729 33Ω
R728 33Ω
R727 33Ω
R726 33Ω

R765 120

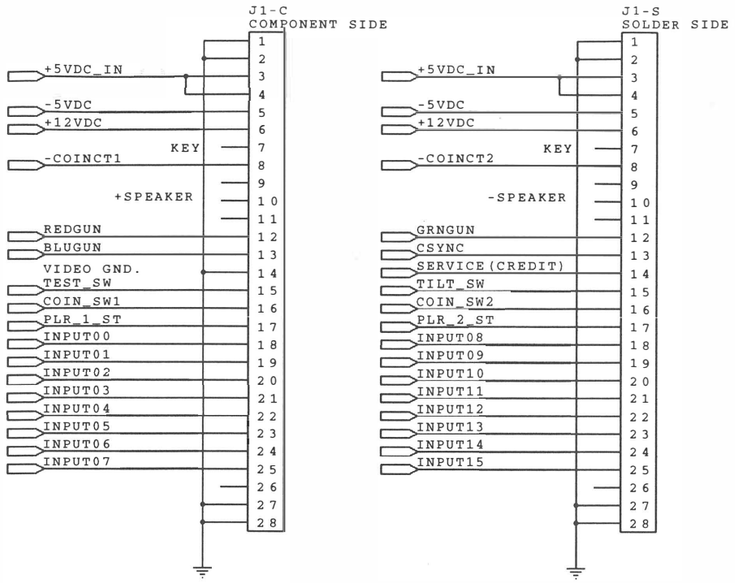
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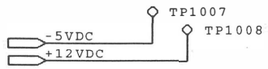
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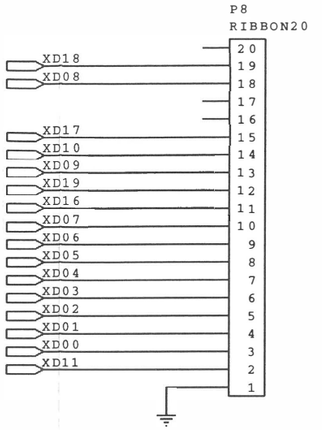
PROJ. ENGR. M. Loffredo	FIRST PROJECT NUMBER 40033	WILLIAMS ELECTRONICS GAMES, INC. MIDWAY MANUFACTURING COMPANY
DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 18 OF 25	PART NO. 16-9873 REV -

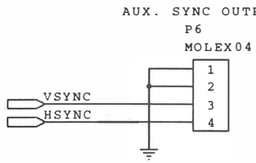
REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

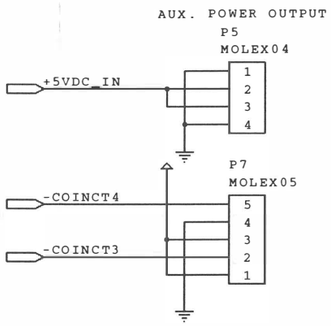
JAMMA INTERFACE



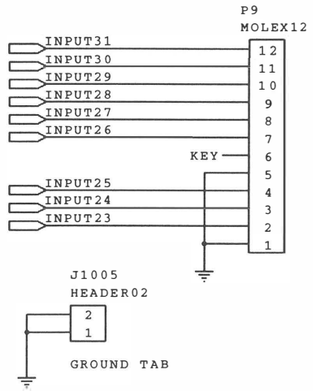


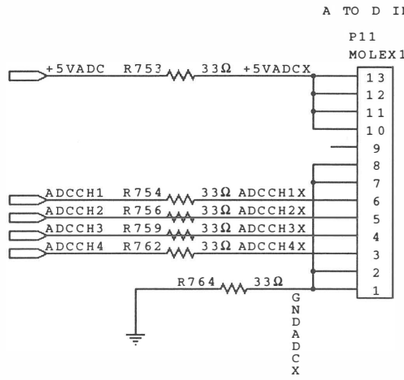


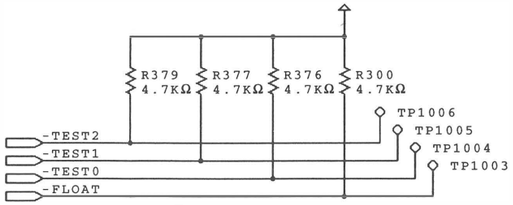


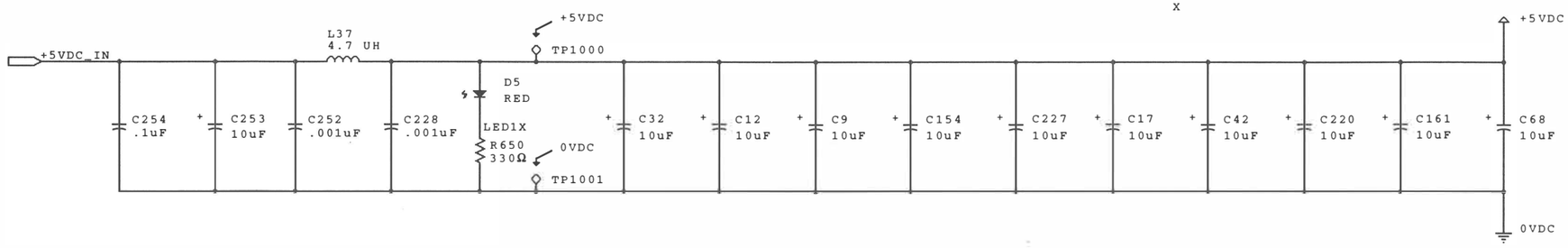


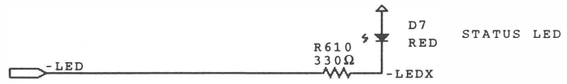
ADDITIONAL INPUTS











VR4.P19
08/05/94 14:49:59

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PROJ. ENGR. M. Loffredo	FIRST PROJECT NUMBER 40033	WILLIAMS ELECTRONICS GAMES, INC. MIDWAY MANUFACTURING COMPANY
DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 19 OF 25	PART NO. 16-9873 REV -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	New Part Release	38030 8-5-94

C217 .01uF
C182 .01uF
C195 .01uF
C205 .01uF
C138 .01uF
C137 .01uF
C24 .01uF
C196 .01uF
C250 .01uF
C249 .01uF
C104 .01uF
C44 .01uF
C2 .01uF
C135 .01uF
C187 .01uF

C221 .01uF
C244 .01uF
C200 .01uF
C46 .01uF
C75 .01uF
C25 .01uF
C150 .01uF
C185 .01uF
C204 .01uF
C83 .01uF
C26 .01uF
C18 .01uF
C10 .01uF
C1 .01uF
C207 .01uF

C194 .01uF
C214 .01uF
C178 .01uF
C69 .01uF
C57 .01uF
C116 .01uF
C62 .01uF
C179 .01uF
C105 .01uF
C223 .01uF
C184 .01uF
C202 .01uF
C201 .01uF
C233 .01uF
C144 .01uF

C236 .01uF
C215 .01uF
C59 .01uF
C245 .01uF
C38 .01uF
C27 .01uF
C3 .01uF
C39 .01uF
C29 .01uF
C5 .01uF
C16 .01uF
C186 .01uF
C222 .01uF
C206 .01uF
C43 .01uF

C247 .01uF
C117 .01uF
C55 .01uF
C102 .01uF
C85 .01uF
C21 .01uF
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C22 .01uF
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C80 .01uF
C72 .01uF
C246 .01uF

C52 .01uF
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C193 .01uF
C213 .01uF
C162 .01uF
C48 .01uF
C6 .01uF
C4 10uF
C208 .01uF

C180 .01uF
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C218 .01uF
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C11 .01uF
C19 .01uF
C136 .01uF
C60 .01uF

C15 10uF
C8 .01uF
C203 .01uF
C13 .01uF
C28 .01uF
C23 .01uF
C30 .01uF
C64 .01uF
C14 .01uF
C41 .01uF
C58 .01uF
C163 .01uF
C248 .01uF
C31 .01uF

MH1 MTGHOLE
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MH6 MTGHOLE
MH7 MTGHOLE
MH8 MTGHOLE
MH9 MTGHOLE

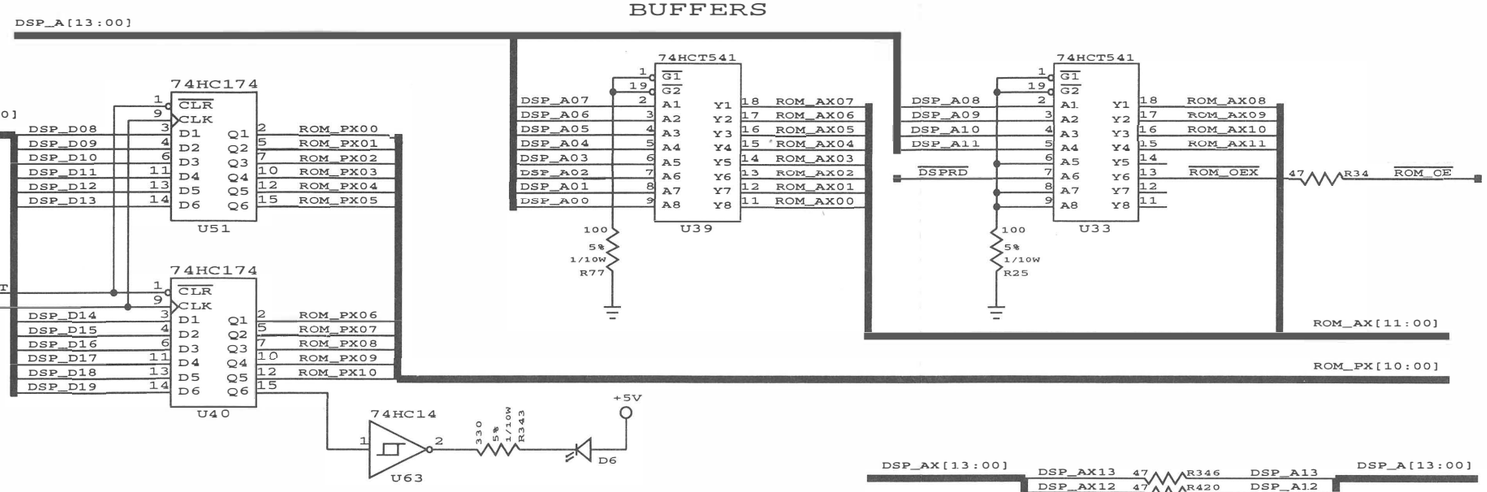
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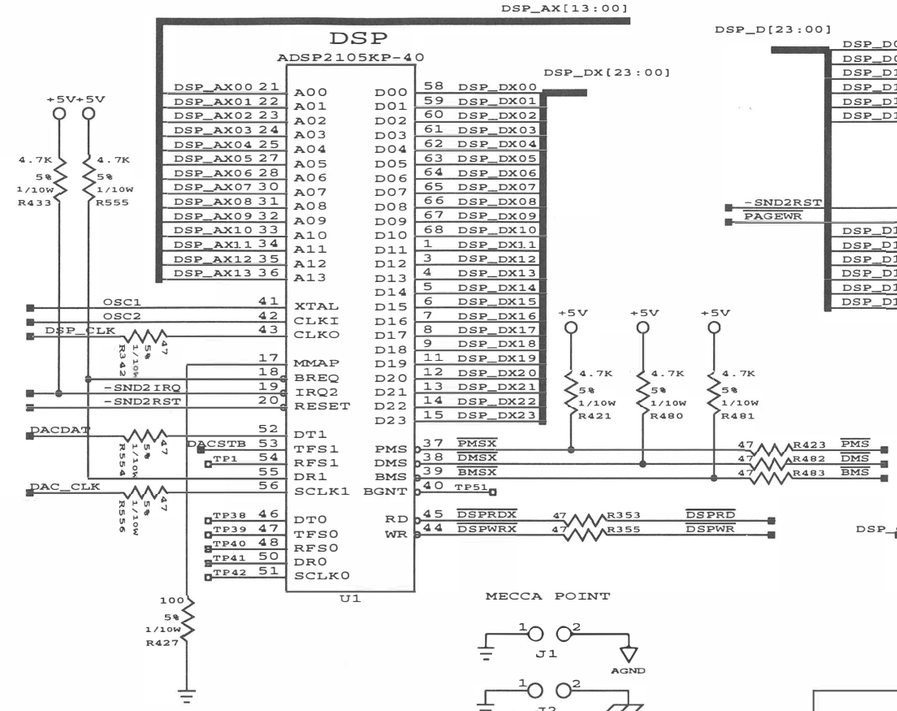
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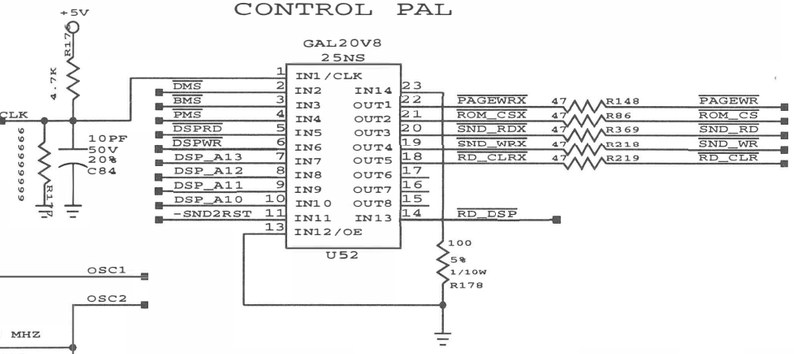
PROJ. ENGR. M. Loffredo	FIRST PROJECT NUMBER 40033	WILLIAMS ELECTRONICS GAMES, INC. MIDWAY MANUFACTURING COMPANY
DWN BY ML DATE 9/15/91	FIRST USAGE A-19233-40033	NAME V-UNIT SCHEMATIC
CHECKED BY DATE		
APPROVAL DATE	SHEET 20 OF 25	PART NO. 16-9873 REV -

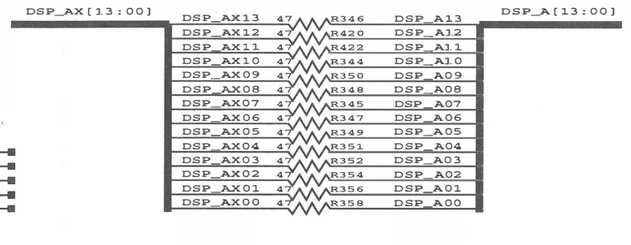
REV	DESCRIPTION OF CHANGE	ECN NO DATE
–	NEW PART RELEASE	38030 8-5-94

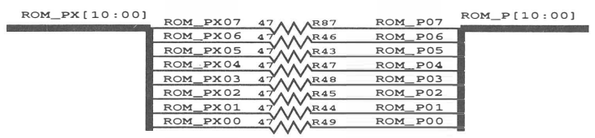
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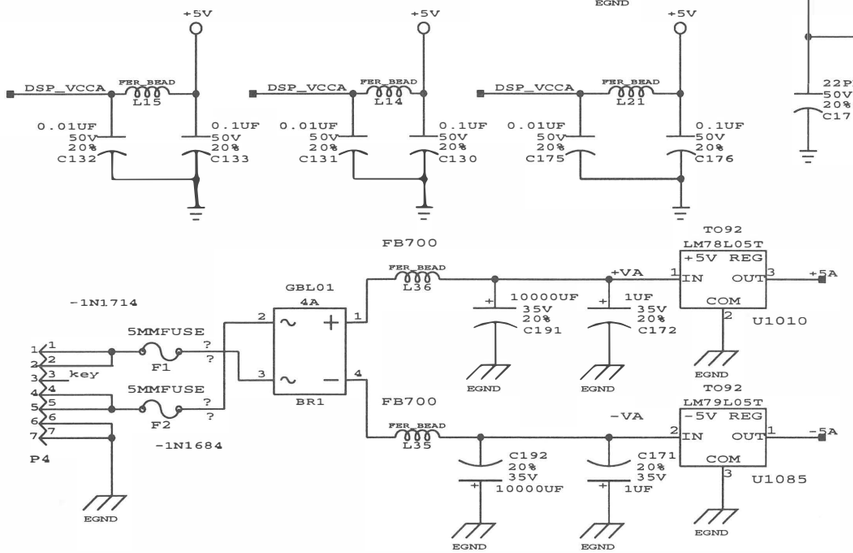




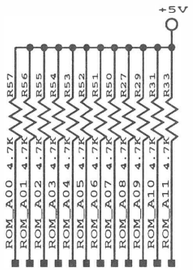


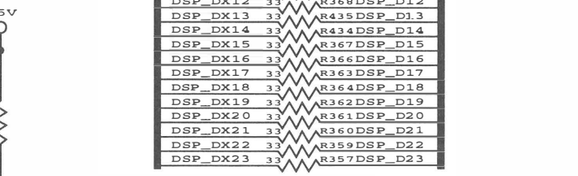


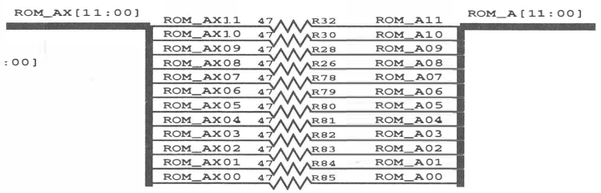












CPU BOARD
sheet 21 of 25
3-27

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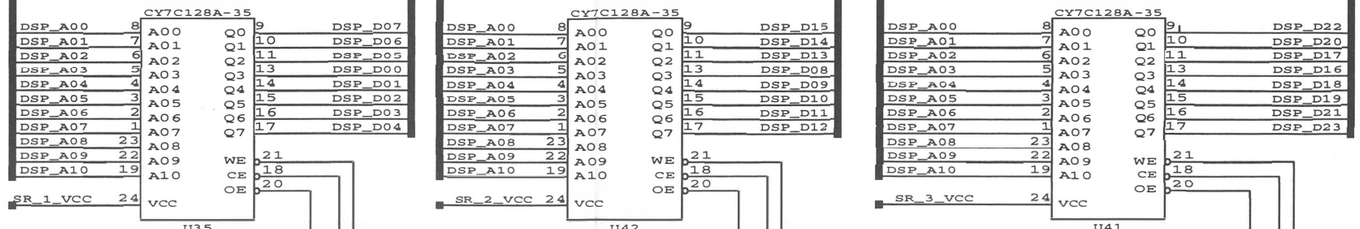
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DWN. BY DATE EJK 8-5-1994_14:22	1ST USEAGE A-19233-40033	TITLE Cruisin' USA Sound Board DSP/BUS Interface
CHECKED DATE	CURRENT PROJ. 40033	
APPROVED DATE	SHEET 21 OF 25	PART NO. 16-9873 REV. –

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	NEW PART RELEASE	38030 8-5-94

DSP_A[13:00]

DSP_D[23:00]

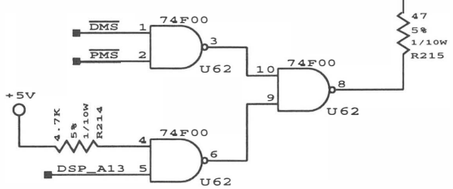
2K RAMs



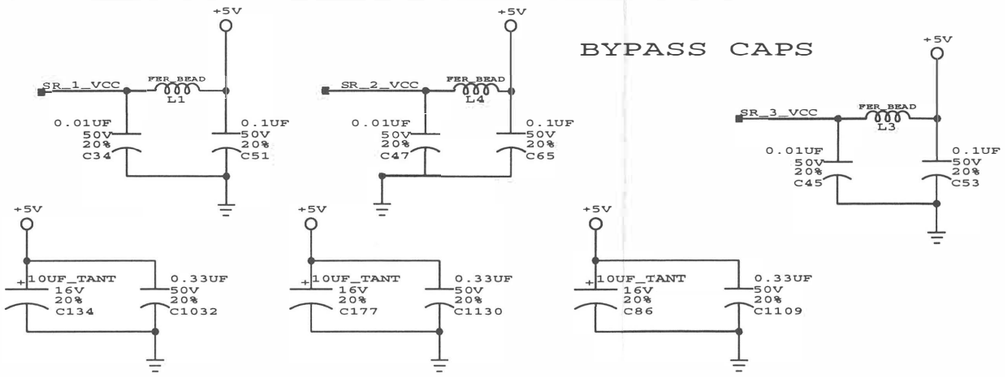
$\overline{DSPWR}$

$\overline{DSPRD}$

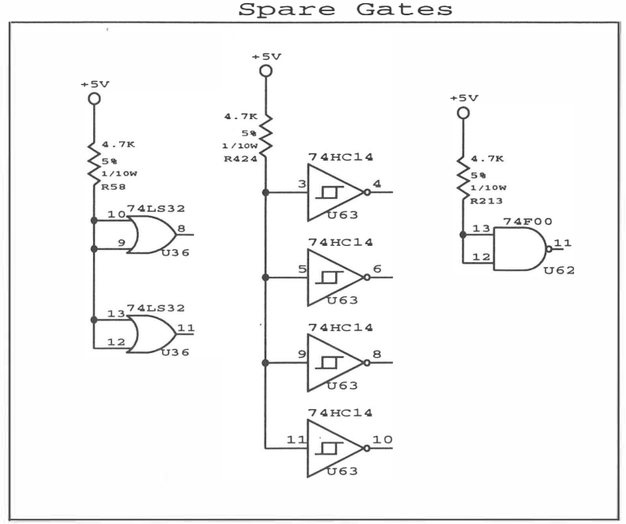
$\overline{RAM_CS}$



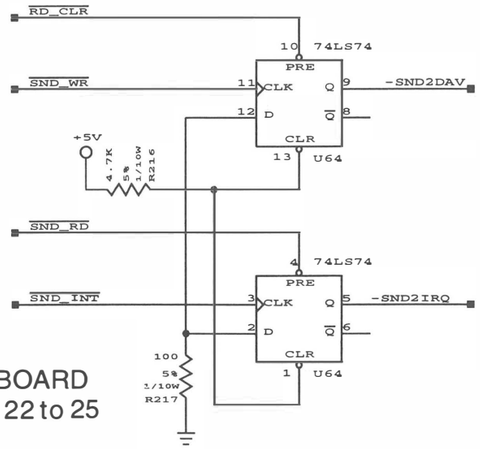
BYPASS CAPS

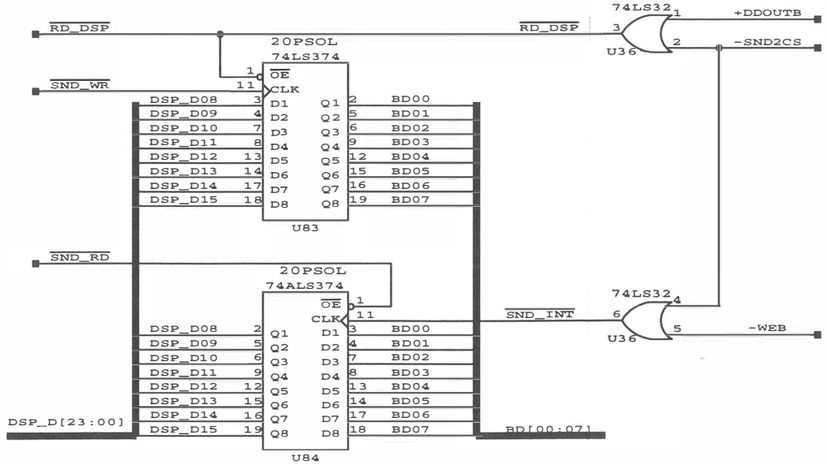


Spare Gates



SOUND INTERFACE



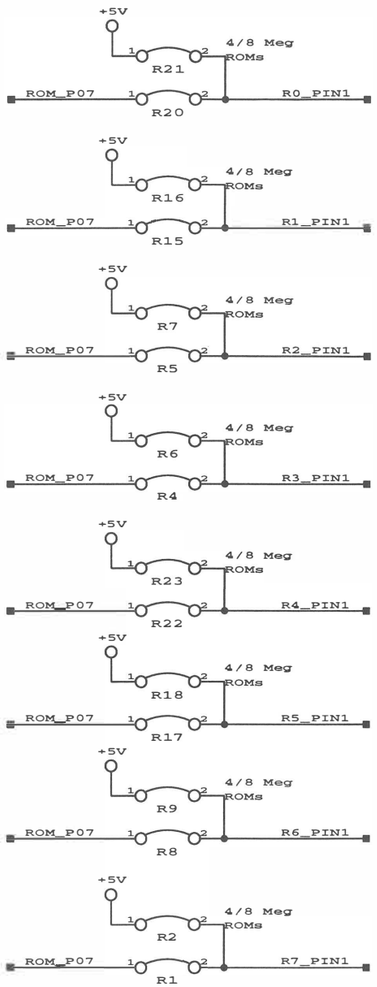


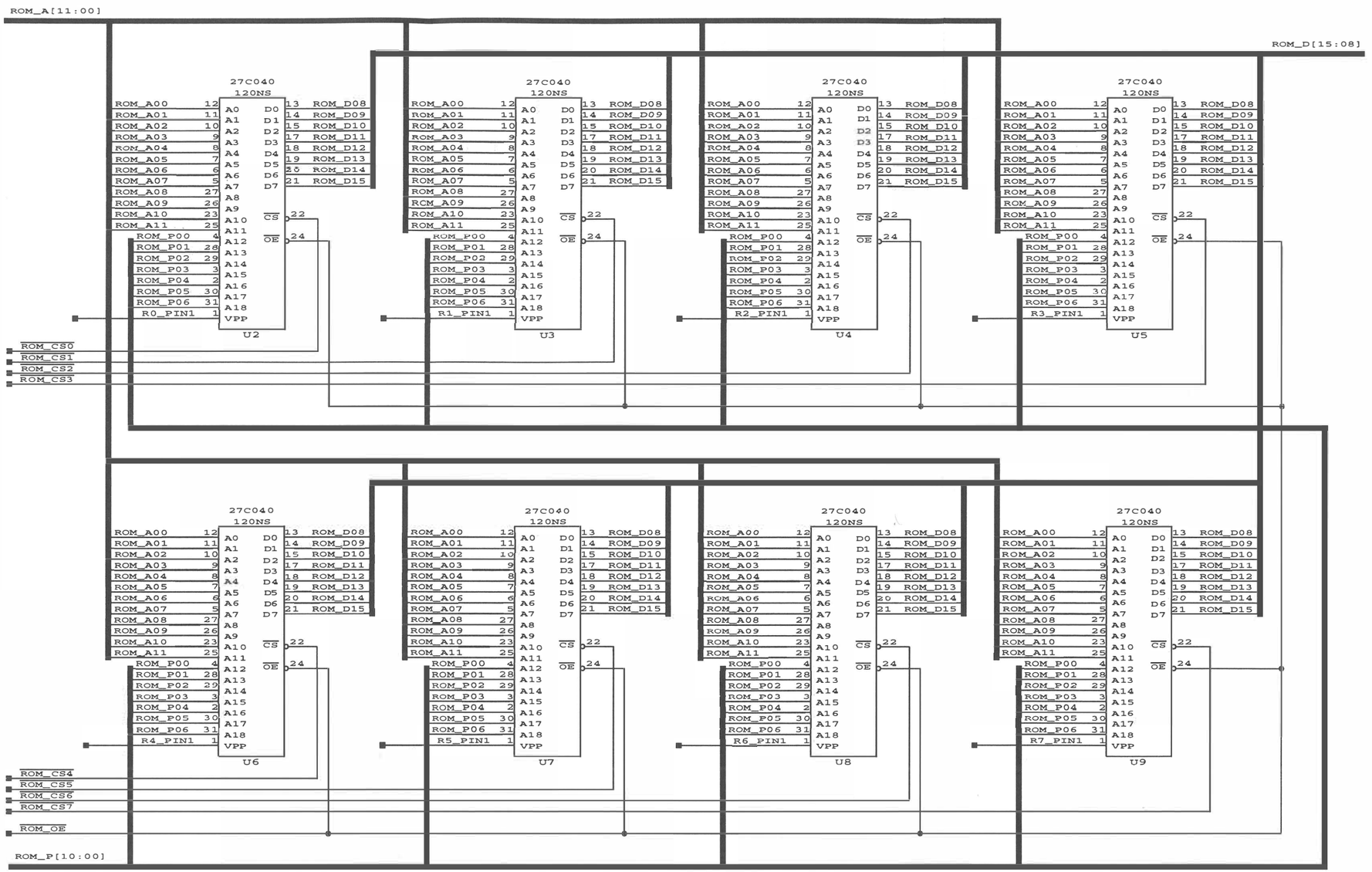
CPU BOARD
sheet 22 to 25
3-28

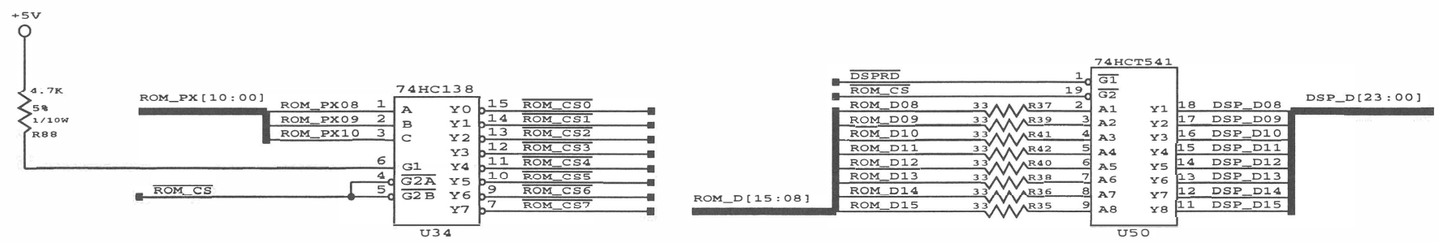
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PROJECT ENG. EJK	1ST PROJ. NO. 40033	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY EJK DATE 8-5-1994_14:16	1ST USEAGE A-19233-40033	TITLE Cruisin' USA Sound Board System RAMs
CHECKED DATE	CURRENT PROJ. 40033	
APPROVED DATE	SHEET 22 OF 25	PART NO. 16-9873 REV. -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	NEW PART RELEASE	38030 8-5-94





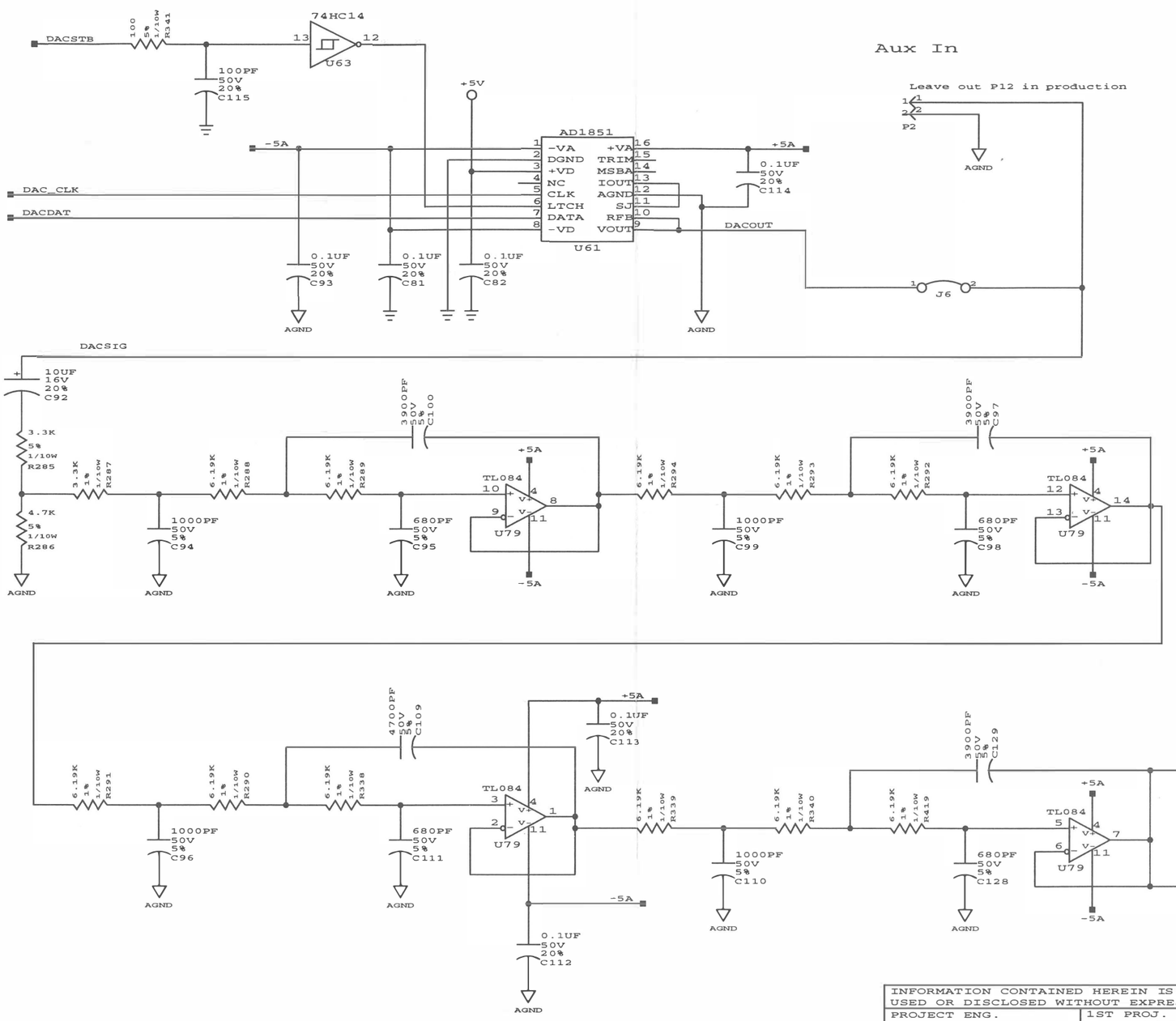


CPU BOARD
sheet 23 of 25
3-29

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PROJECT ENG. EJK	1ST PROJ. NO. 40033	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE EJK 8-5-1994_14:24	1ST USEAGE A-19233-40033	TITLE Cruisin' USA Sound Board Program/Data Roms
CHECKED DATE	CURRENT PROJ. 40033	
APPROVED DATE	SHEET 23 OF 25	PART NO. 16-9873 REV. -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
-	NEW PART RELEASE	38030 8-5-94



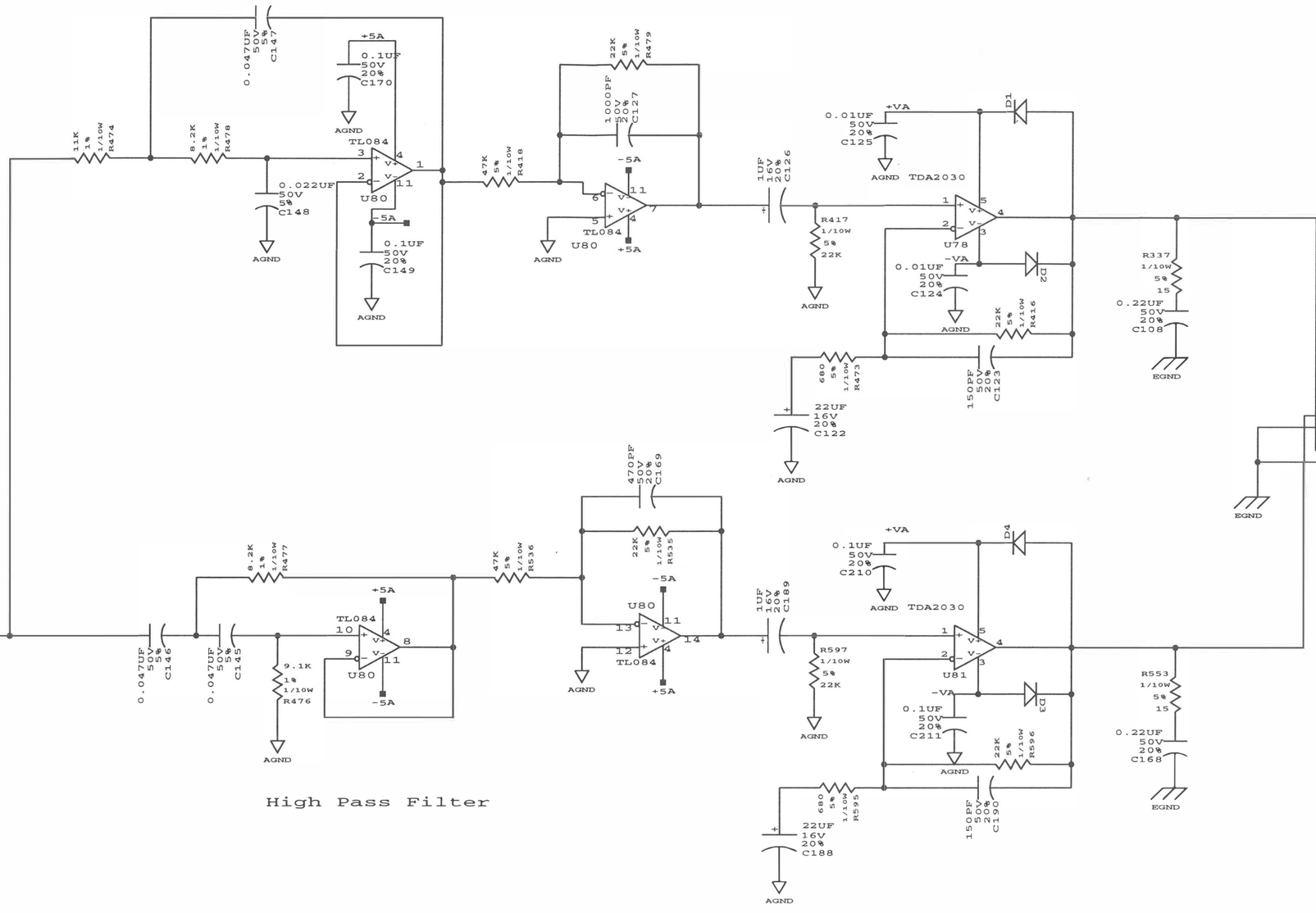
CPU BOARD
sheet 24 to 25
3-30

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PROJECT ENG. EJK	1ST PROJ. NO. 40033	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE EJK 8-5-1994_14:25	1ST USEAGE A-19233-40033	TITLE Cruisin' USA Sound Board Digital To Analog Converter Anti-Aliasing Filter
CHECKED DATE	CURRENT PROJ. 40033	
APPROVED DATE	SHEET OF 24 25	PART NO. 16-9873 REV. -

REV	DESCRIPTION OF CHANGE	ECN NO DATE
–	NEW PART RELEASE	38030 8-5-94

Low Pass Filter



High Pass Filter

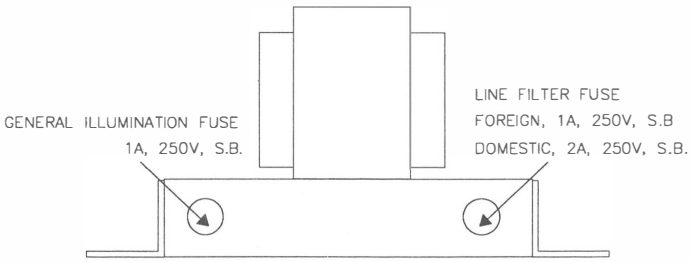
CPU BOARD
sheet 25 of 25
3-31

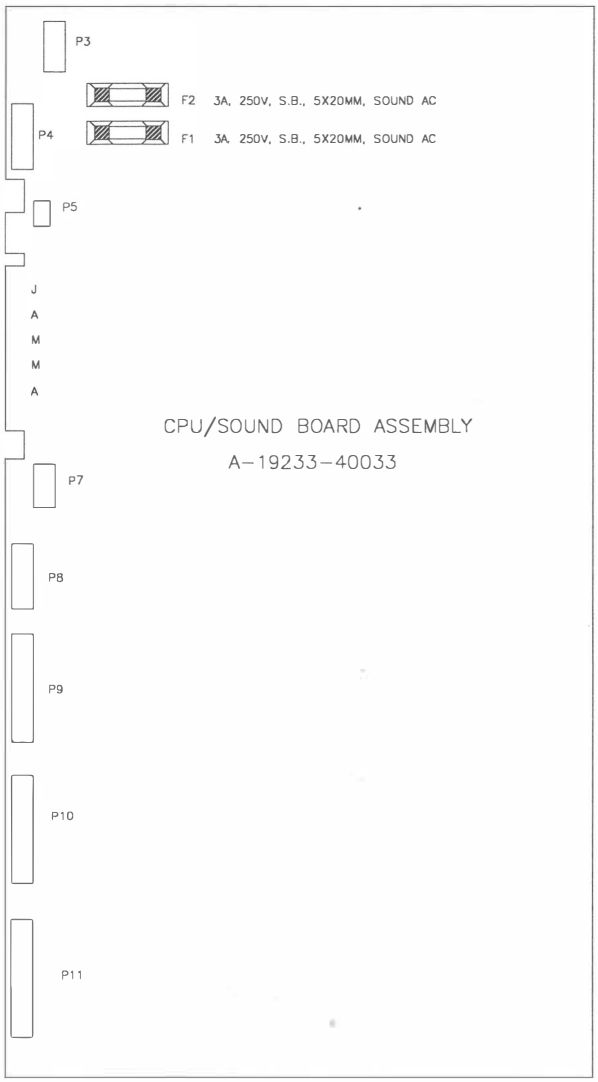
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PROJECT ENG. EJK	1ST PROJ. NO. 40033	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY EJK DATE 8-5-1994_14:18	1ST USEAGE A-19233-40033	TITLE Cruisin' USA Sound Board Active Crossover Power Amplifiers
CHECKED DATE	CURRENT PROJ. 40033	
APPROVED DATE	SHEET 25 OF 25	PART NO. 16-9873 REV. –

NOTES

FUSES


GENERAL ILLUMINATION FUSE
1A, 250V, S.B.
LINE FILTER FUSE
FOREIGN, 1A, 250V, S.B
DOMESTIC, 2A, 250V, S.B.


P3
F2 3A, 250V, S.B., 5X20MM, SOUND AC
P4
F1 3A, 250V, S.B., 5X20MM, SOUND AC
P5
J
A
M
M
A
CPU/SOUND BOARD ASSEMBLY
A-19233-40033
P7
P8
P9
P10
P11

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, facsimiles of MIDWAY equipment (or any feature thereof) may be illegal under federal law, regardless of whether or not such facsimiles 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.

Notice

When MIDWAY ships a game, it is in compliance with FCC regulations. Your sticker is proof. If the sticker is missing or damaged, legal repercussions to the owner or distributor of the game may result. If your game does not contain an FCC sticker, call MIDWAY immediately.

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