MIDWAY

May 1994
16-40019-101

REVOLUTION -X-

MUSIC IS THE WEAPON.

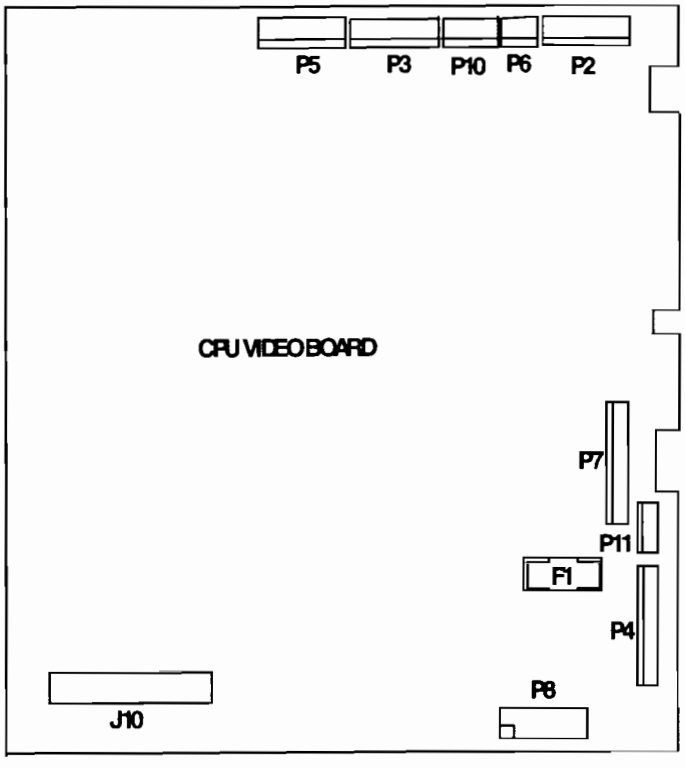
2-PLAYER
OPERATIONS MANUAL

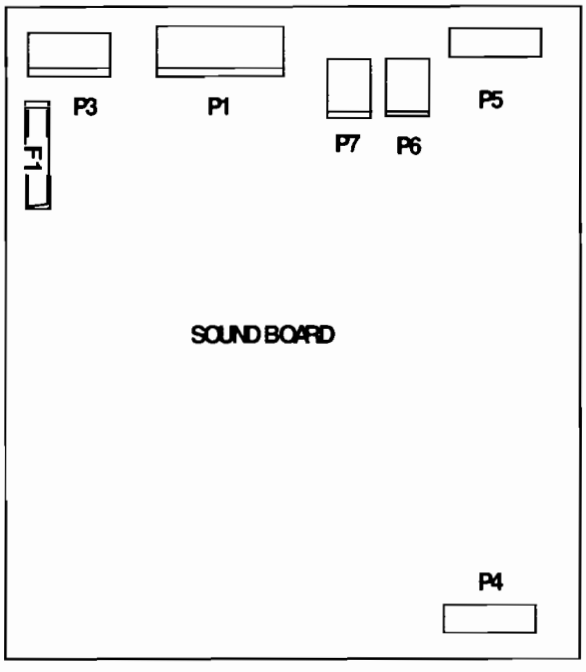
operation & adjustments
testing & problem diagnostic
parts information
wiring diagrams & schematics

REVOLUTION X

2 PLAYER

FUSE LIST





CPU Video Board
F1 - 1/4A F.B. 5 x 20mm

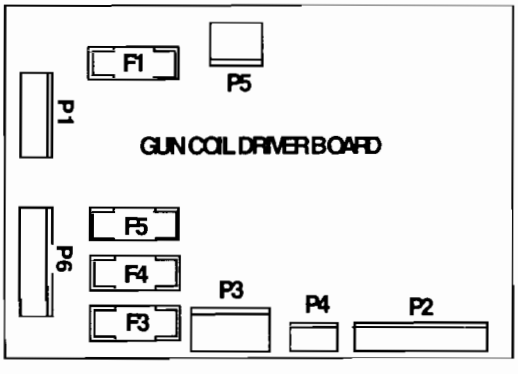
Sound Board
F1 - 2A S.B. 5 x 20mm

Gun Coil Driver Board
F1 - 5A S.B.
F3, F4, F5- 1.5A S.B.

Line Fuse*
(Country Specific)

G.I. Fuse*
1A S.B.

*Not shown



REVOLUTION X

Monday, November 11, 1996: The New Order Nation - a corrupt alliance of government and big business led by "Headmistress Helga" - has abducted rock superstars Aerosmith from a Los Angeles concert hall and launched an offensive to control the world's youth. Legions of NON party troops now control the world's cultural and technological centers.

You, one of the world's last free youth, are armed with an AUTOLOAD MULTI-CD LAUNCHER/SONIC ASSAULT WEAPON. You must battle all New Order Forces to get backstage at LA'S "Club X" to receive a secret message left for you by AEROSMITH!

Continuing on, you illegally requisition a New Order Chopper and take it on a devastating joy ride above the streets of LA. You must ultimately locate AEROSMITH'S "X" car where you will receive another message from AEROSMITH, letting you choose your next destination from the Pacific Rim, the Amazon and the Middle East.

When you have successfully Completed all four levels of the game, you arrive on stage at Wembley Arena in England for the final surprising confrontation with Headmistress Helga. You must defeat Headmistress Helga to overthrow the New Order Nation and make you contribution to the Revolution!

- Remember, Music Is The Weapon!

game rules...

You need two credits to start a game, and two credits to continue.

Use trigger and yellow Bomb button on gun in combination to discover secret weapons.

Look for hidden passages and entry ways into unknown areas.

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Section 1 Operation and Troubleshooting

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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

WEIGHT. This game cabinet weights apx. 425Lbs crated.

MIRROR. This game cabinet contains a front-silvered mirror and a horizontal monitor.

AC POWER CONNECTION. Before connecting the game to the AC power source, verify 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 may result if the control panel is not properly grounded! After servicing any parts on the panel, assure 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 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 monitor with you hands or metal objects! Always discharge the CRT by the following method: Attach one end of a large, well-insulated, 20kV 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.

TRANSFORMER. This video game uses a monitor that requires an isolation transformer. This transformer also provides power for the gun coils and the audio amp.

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. *Be 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.*

REVOLUTION X

SECTION
one

Operation

SETUP PROCEDURE

INSTALLATION & INSPECTION

Game Location Requirements	*Power*	*Temp*	*Humidity*
	Domestic 115V @ 60 Hz Foreign 230V @ 50 Hz	32° F to 100° (0° C to 38° C)	Not to exceed 95% relative.

1. Remove all items from the shipping containers and set them aside. Inspect the exterior of the cabinet and the control panel for any damage. Remove the packing material from around the guns.

2. The coin door keys are attached to one of the guns. Unlock and open the coin and cash box doors. Remove the spare parts stored in the cash box and remove the rear door keys located on a key hook inside the coin door.

3. Remove the screws holding the rear door then unlock and remove the door. *Be careful. The marquee and the marquee glass are shipped in a cardboard carton attached to the rear door.* Inspect the cabinet interior for any signs of damage. Check all major assemblies to assure that they are mounted securely.

4. Refer to the Cabinet Wiring Diagram (Section 3), and check to see that all cable connectors are correctly secured. *Do not force connectors.* Watch for damaged connectors and avoid making reversed connections.

5. If a padlock is desired, turn the rear door hasp so that it protrudes from the hole in the back of the cabinet. Remove the two nuts inside the cabinet, at the top and middle of the rear door opening. Then slide the hasp off of the bolts. Turn the hasp, slide it back on the bolts and replace the nuts.

6. Slowly, flip the header forward. *Be careful. Do not let the header slam down onto the cabinet.* Fasten the header into place with two 1/4-20x1-1/2 hex-head bolts (shipped in the cash box). Remove the marquee carton from the rear door. Unscrew and remove the black marquee retaining strip at the top of the header. Fit the marquee into the grooves, then slide the glass in in front of the marquee. Replace the marquee retaining strip.

7. Next, locate the four leg levelers among the spare parts in the cash box. There are four threaded holes on the bottom of the cabinet; one in each corner. Place one leg leveler (with its hex nut) in each of the threaded holes. Lower each leg leveler until the cabinet is stable and level.

!! WARNING !!

The cabinet is top heavy. Do not tilt the cabinet.

8. Determine the value of your line voltage with a meter. Then, check the power input wires to the main power supply transformer. Be sure they are connected to the taps which correspond to your local line voltage value. If necessary, reconnect the power input wires to the transformer in accordance with the Transformer Chart in Section 3.

9. Lay the line cord (connected to the power chassis) in the slot along the bottom edge of the rear cabinet door. Replace the rear cabinet door. Close and lock the front coin and cash box doors. Plug the game into a grounded (3-terminal) AC wall outlet. Switch on the game, using the On/Off switch located on the upper left rear of the cabinet.

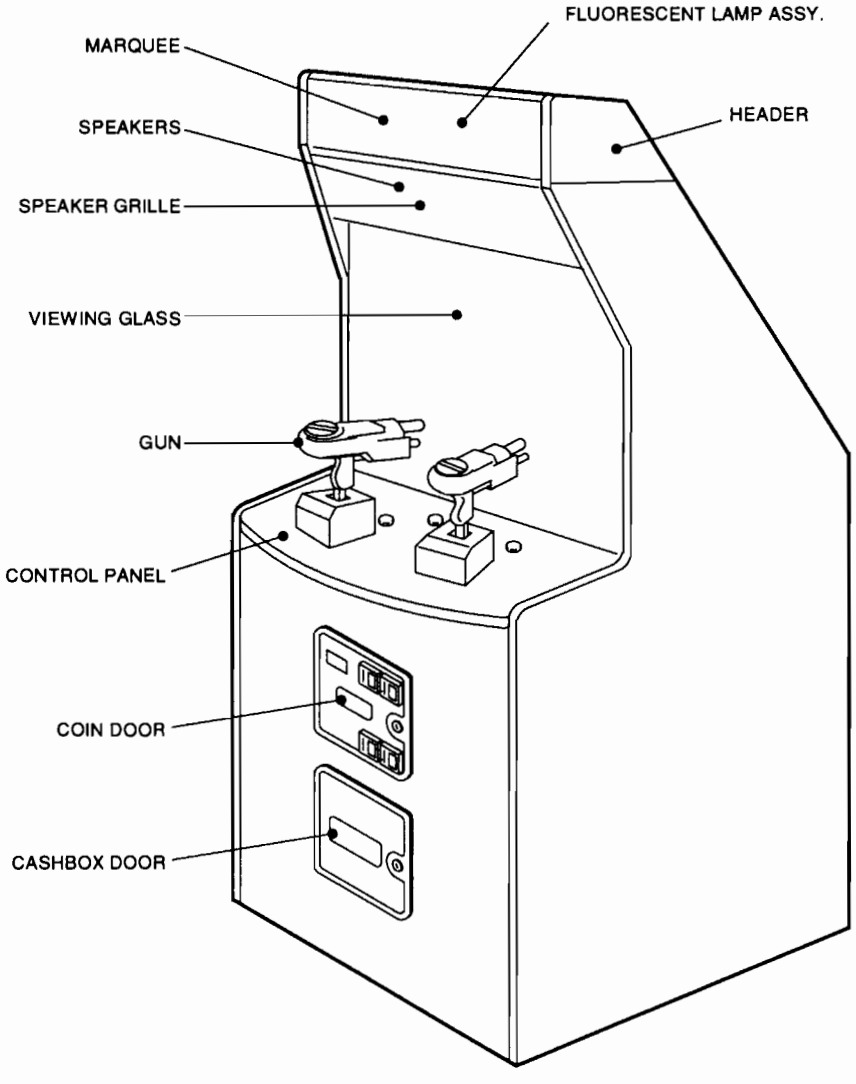
10. If the following message appears on the screen when the game is turned on, the guns must be calibrated.

****CMOS RAM Error****
Unable to read gun calibration values.

NOTE

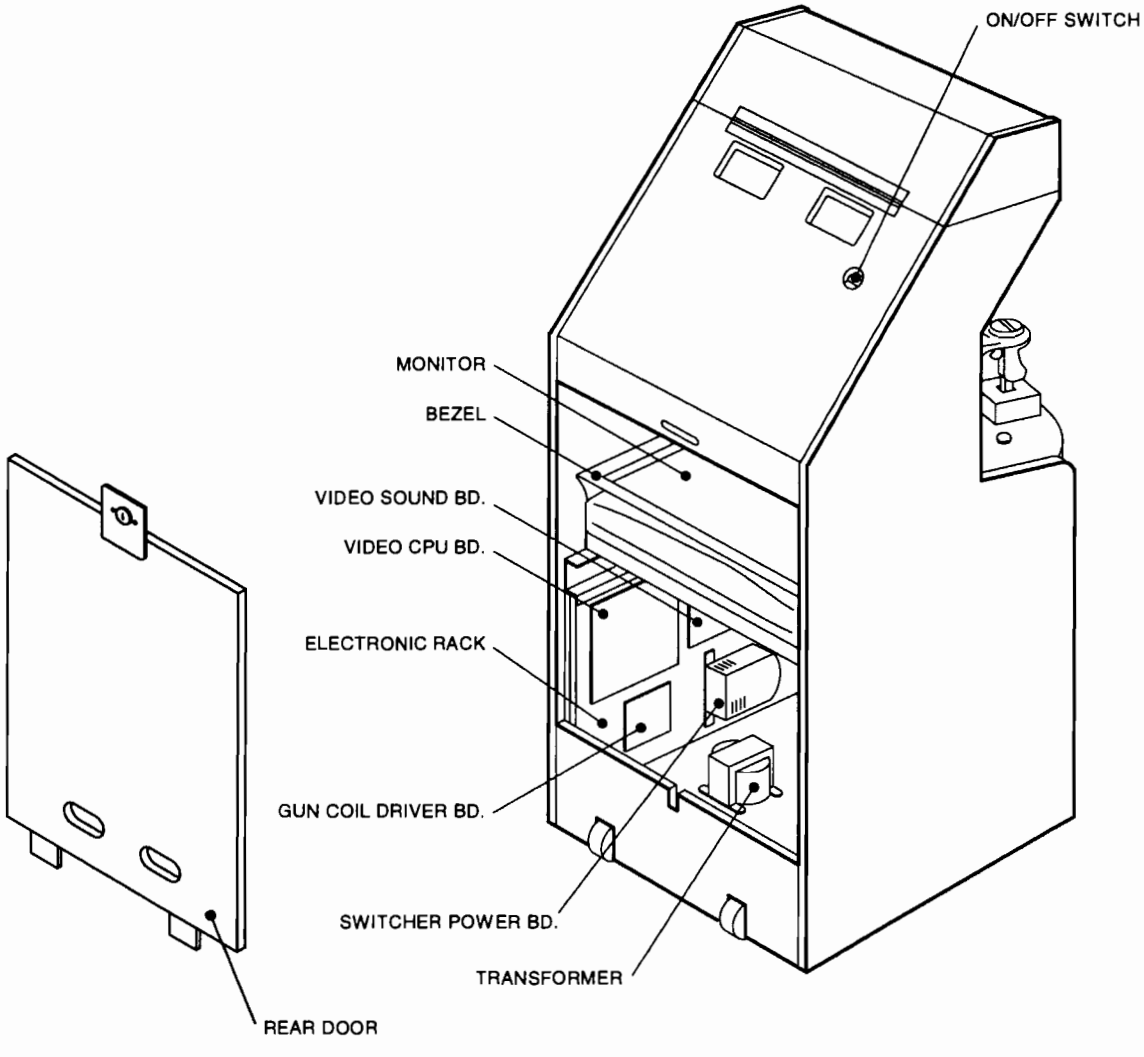
Check the gun calibration when you receive the game. Guns might of been jarred during shipping and be in need of calibration. The guns are calibrated from the factory. However, if you change PC boards or replace ROMs, RAMs, or the battery, they must be re-calibrated. Guns do not operate unless they are calibrated. ***DO NOT ATTEMPT TO CALIBRATE BY OPENING THE GUNS AND ADJUSTING THE POTENTIOMETERS MANUALLY. GUN CALIBRATION INSTRUCTIONS ARE ON PAGE 1-26 OF THIS MANUAL.***

CABINET ASSEMBLY



Front View

CABINET ASSEMBLY



Rear View

SERVICING

Servicing the Control Panel

Switch off power to the game and open the coin door. The control panel is held in place by four latches (located inside the cabinet) which provide constant pressure on the strikes. To release the latches, reach through the coin door opening toward the right, left and front of the cabinet. Do not reach straight back through the coin door or you could damage the monitor control board. Lift the latch handle and unhook the wire fasteners.

There are three cables with Z-header connectors; one for each gun and one for all of the buttons. Unplug the connectors. Lift the control panel off of the cabinet and place it on a work surface.

To replace the control panel, position it so that it fits in the cabinet opening. Be sure that the cables do not get caught between the cabinet and the underside of the control panel. Carefully, lower it into position. Do not let the guns hit the viewing glass. Reach through the coin door and reconnect the three cables and the four latches.

Removal of the Viewing Glass

Switch off power to the game, open the coin door and unlatch the control panel. Carefully, lift and slide the control panel away from the viewing glass. Do not slide the control panel so far as that it could lean back and fall off of the cabinet. Reach the center bottom of the viewing glass and carefully, lift the glass out of its bottom groove and slide it clear of the cabinet. Lower the control panel to its original position.

Removal of the Monitor Bezel

Switch off power to the game. Remove the rear door. Remove the two hex-head screws holding the bezel to the monitor bracket. Lift the bezel off of the monitor and slide it out the rear of the cabinet.

Monitor Replacement

We recommend that you read the SAFETY NOTICES section thoroughly before beginning this procedure. Switch off power to the game. Remove the rear door and the monitor bezel. Completely disconnect the monitor from all of its cables, including its chassis ground strap. Remove the four bolts securing the monitor's mounting flanges. CAREFULLY, pull the monitor from the back of the cabinet.

CAUTION

This video game uses a monitor that requires an isolation transformer. The monitor does not contain an isolation transformer. It is mounted instead to 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 LINE VOLTAGE WITH AN ISOLATION TRANSFORMER.

THE 25" MONITOR IS HEAVY. BE SURE IT IS FIRMLY SUPPORTED IF IT MUST BE REMOVED FROM THE CABINET.

Removal of the Marquee

Switch off power to the game. Remove the hex-head screws from the black marquee retaining strip located on top of the header. Remove the strip and carefully lift the marquee and the marquee glass from the top of the header. Store the marquee carefully to prevent damage.

Removal of the Fluorescent Light Assembly

Switch off power to the game. Remove the marquee glass and the marquee. The fluorescent bulb is now accessible for replacement. Remove the plastic lamp locks. Grasp the bulb, give it a quarter turn, and remove it from its socket. Carefully, place a new bulb into the socket, and turn to reinstall.

To remove the entire light fixture, disconnect the fluorescent light assembly from its power cable. Remove the screws that hold the assembly to the cabinet then lift out the assembly.

!! WARNING !!

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

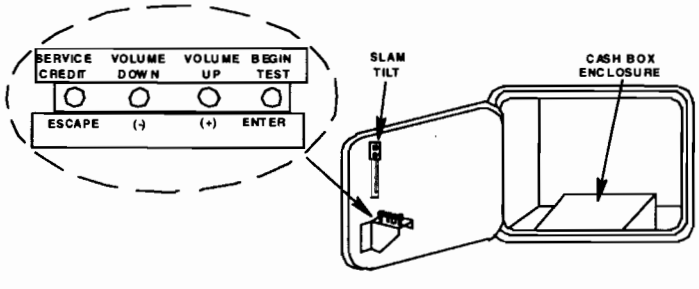
Removal of the Speakers

Switch off power to the game. Remove the marquee and the marquee glass. Unbolt the header from the cabinet and flip it back until it rests on the cabinet. The speakers come out from the top of the cabinet. Be sure to disconnect the cabling and remove the nuts on the mounting screws before attempting to remove the speakers from the enclosure. Carefully, reinstall the seals upon completing any task in the speaker enclosure.

Volume Control, Begin Test Switch, and Service Credit Switch

Open the coin door. The game's volume control and diagnostic push-button switches are located on a small bracket on the door. The volume is controlled by the two center buttons. Press the Volume Up or the Volume Down button until the desired sound level is reached. The Begin Test switch, on the right, activates the game's menu system. The Service Credit switch, on the left, allows credits to be allotted for service testing without affecting the game's bookkeeping total.

CONTROL SWITCHES LOCATION



GAME FEATURES

STARTING UP

Switch on power to the game. A "rug" pattern appears on the CRT screen. When the "rug" pattern ends, the screen shows CHECKING SCRATCH RAMS, and then CHECKING ROMS. The next screen shows **REVOLUTION X** revision level, CMOS test, coin settings and the serial number of the game. The software also performs a security test. If the security test fails, the game will not power up. After the Start-up tests have been successfully completed, the game begins the Attract Mode.

Insert the desired amount of coins, bills or tokens. Select which player receives the credit by pressing the appropriate Start button.

NOTE

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

PLAYER CONTROLS

Start Button

Each player has two Start buttons located to the left and right of the guns. The Start buttons allow one or two players to begin or continue play.

Guns

Each player has a gun. The guns allow the player to aim for and shoot at moving targets.

Bomb Buttons

Each player has a bomb button located on the front left side of their gun. This button allows the player to fire bombs at targets.

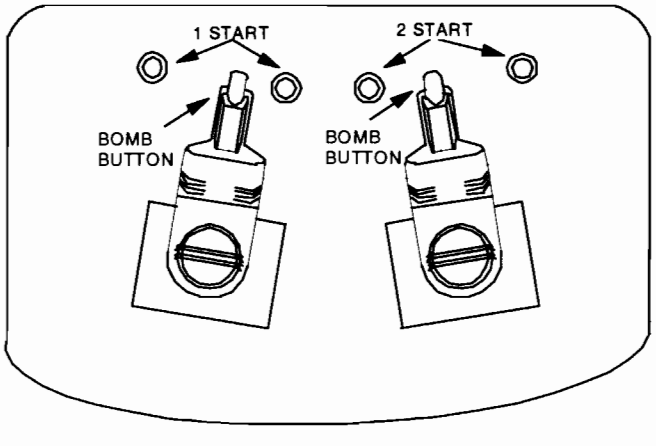
LEDs

Each player has two red LEDs located on each side of their gun. The LEDs are illuminated during game play.

NOTE

Discover secret weapons by using trigger and Bomb button combinations.
Discover hidden passages and entry ways into unknown areas.

CONTROL PANEL



GAME OPERATION

The **REVOLUTION X** Control switches are located inside the coin door.

CONTROL SWITCHES

Control switches are located on a bracket inside the coin door. Each control switch (except Slam Tilt) performs two functions: one during normal operation and one during the menu system operation.

NORMAL OPERATION

The **Slam Tilt** switch detects any forceful vibrations against the coin door. This eliminates pounding for free games.

The **Volume Down** and **Volume Up** push-button switches increase or decrease the volume level of the music and speech. The volume level can be adjusted during the Attract Mode or during menu system operation. For greater profits, set your game's volume level at a nice loud setting.

The **Begin Test** push-button switch enters the game's menu system. Press the Begin Test switch to access any of the menu system functions.

The **Service Credit** push-button switch is a special feature switch that allots credit without affecting the game's bookkeeping total.

NOTE

The coin door must be open for the control switches to work.

MENU SYSTEM OPERATION

The **(-)** and **(+)** push-button switches move the cursor up and down the screen, raise and lower the volume level, and increase and decrease adjustment setting values.

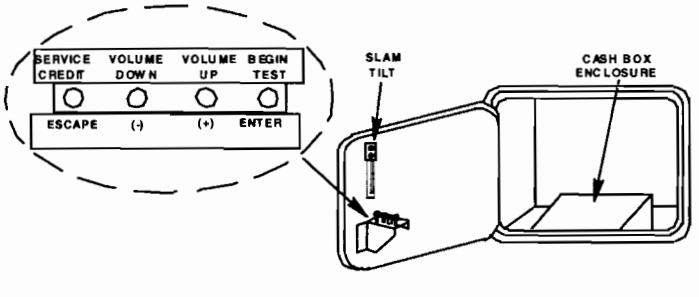
The **Enter** push-button switch moves into the next menu. This switch also locks in an adjustment setting value.

The **Escape** push-button switch backs out of a menu and returns to the previous menu.

NOTE

Control panel switches can substitute for the control switches in the coin door.
Player 1 Start button = (-); Player 2 Start button = (+); Bomb button = Escape; Trigger = Enter.

CONTROL SWITCHES LOCATION



MENU SYSTEM OPERATION

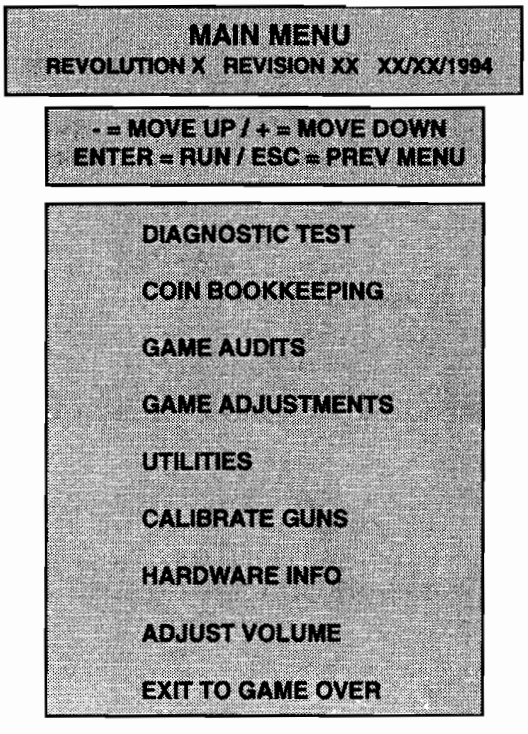
OPERATION

All game audits, adjustments and diagnostics are options of the Main Menu. Each option, in turn, has its own menu that lists several choices which you may act upon as desired.

Press the Begin Test switch on the coin door or close switch #8 of DIP switch bank #2, to open the Main Menu (shown below). Game adjustments, bookkeeping and diagnostics are all accessible from this menu.

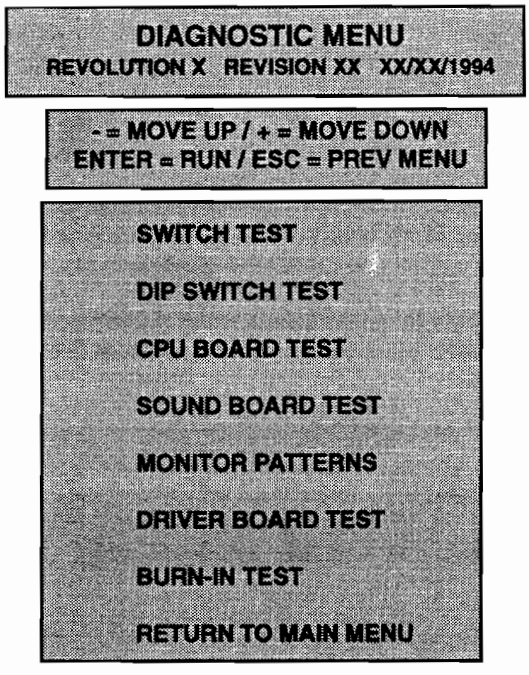
Press the (-) button, to move the cursor up the menu screen. Press the (+) button to move the cursor down the screen. Notice that the options are highlighted in sequence. Press the Enter button to open a highlighted option. *Only highlighted options can be opened.*

To exit the Main Menu, press the (-) or (+) button to select EXIT TO GAME OVER, then press the Escape button. **It is necessary to turn off switch #8 of DIP switch bank #2, if this switch was used to enter the menu system.**



DIAGNOSTIC TESTS

To enter the diagnostic tests from the Main Menu, use the (-) or (+) button to highlight Diagnostic Menu, then press the Enter button to open the menu. The Diagnostic Menu is shown below.



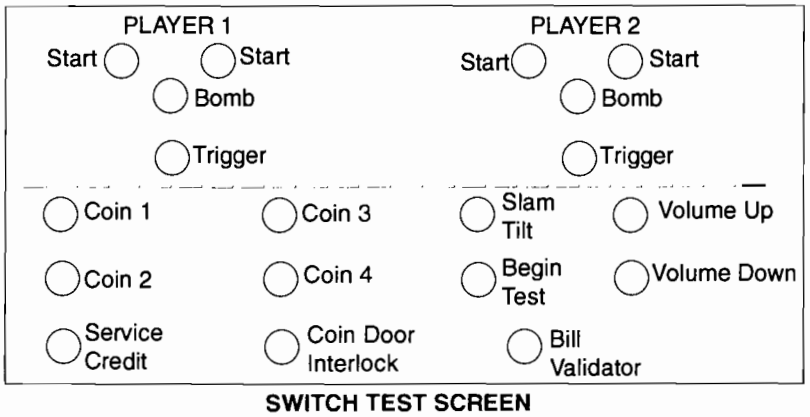
Switch Test

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

Press the (-) or (+) button to highlight the Switch Test, then press the Enter button to begin the test.

During the Switch Test the top of the screen shows the control panel switches while the bottom of the screen shows the coin door switches. Press a control panel or coin door switch and the switch location on the screen lights. Release the switch and the screen returns to normal.

To exit the Switch Test press the Enter and Escape buttons together, or press the player one Start button and trigger together.



SWITCH TEST SCREEN

DIP Switch Test

The DIP Switch Test allows the operator to check or change the position of the DIP Switches on the CPU Board.

Use the (-) or (+) button to select the DIP Switch Test. Press the Enter button to access the DIP Switch Setting Tables. The screen displays the current DIP Switch settings. To change a setting, slide the switch to the desired position, then check the screen to verify the new setting. *In some cases, setting a function to OFF actually enables the function. For example, setting DIP Switch Coinage to Off enables DIP Switch Coinage.*

Press the Escape button to return to the Diagnostic Menu.

DIP Switch 1 (U105) Setting Table

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Mirror Display	Off*							
	On							
DIP Switch Coinage		Off*						
CMOS Coinage		On						
Coinage								
USA1 Ger1 Fr1			Off*	Off*	Off*			
USA2 Ger2 Fr2			On	Off	Off			
USA3 Ger3 Fr3			Off	On	Off			
USA4 Ger4 Fr4			On	On	Off			
USAECA GerECA FrECA			Off	Off	On			
N/N N/U N/U			On	Off	On			
N/U N/U N/U			Off	On	On			
Free play Free play Free play			On	On	On			
Credits								
2 to Start - 2 to Continue						Off*	Off*	Off*
1 to Start - 1 to Continue						On	Off	Off
1 to Start - 1 to Continue						Off	On	Off
1 to Start - 2 to Continue						On	On	Off
2 to Start - 1 to Continue						Off	Off	On
2 to Start - 3 to Continue						On	Off	On
3 to Start - 1 to Continue						Off	On	On
1 to Start - 4 to Continue						On	On	On

DIP Switch 2 (U108) Setting Table

	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Country								
USA	Off*	Off*						
German	On	Off						
French	Off	On						
Not Used	On	On						
Dollar Bill Validator Not Installed			Off*					
Dollar Bill Validator Installed			On					
One Counter				Off*				
Two Counters				On				
Players								
3 Players					Off*			
2 Players					On			
Rev. X Cabinet						Off*		
T2 Retrofit Cabinet						On		
Video Freeze							Off*	
							On	
Test Switch								
Game Mode								Off*
Test Mode								On

* Indicates Factory Setting.

CPU Board Test

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

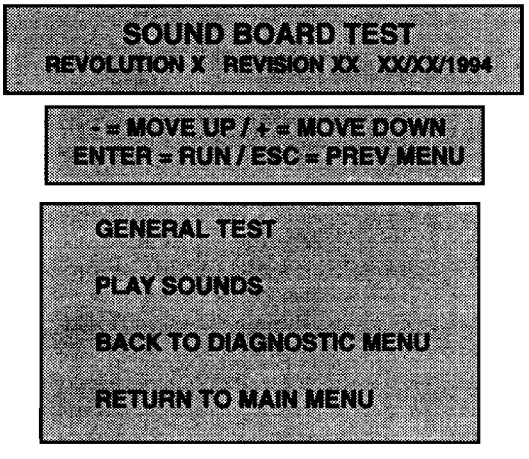
Select the CPU Board Test with the (-) or (+) button, then press the Enter button to start the automatic test of the CPU Board's RAMs and ROMs. When this test is activated, a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMs, and ROMs. During the test, ROMs or RAMs are good if they turn green: they are faulty if they turn red. The CPU Test pauses when a bad ROM or RAM is detected. Press the (-) or (+) button to continue the test.

This test returns to the Diagnostic Menu automatically.

Sound Board Test

This test allows the operator to listen to some of the sounds this game is capable of producing.

Use the (-) or (+) button to select the test, then press the Enter button to open the test menu. The screen displays two test options. Use the (-) or the (+) button to select an option and press the Enter button to access the option.



GENERAL TEST analyzes the sound circuitry. The screen shows a list of error codes. A successful test causes a single "tone" to sound. Detection of a fault causes a series of tones or no tone at all to sound. Press the Escape button to return to the Sound Test Menu.

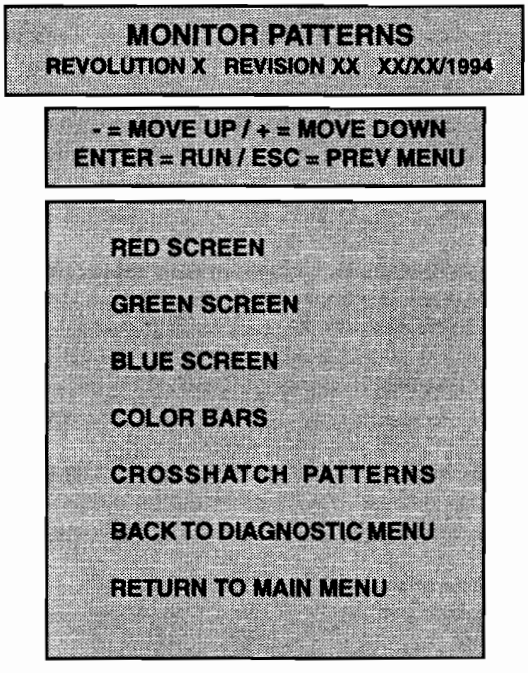
PLAY SOUNDS test synthesized and digitized sounds from the Sound Board. Advance to the next sound with the (-) or (+) button. Repeat a sound by pressing Enter button. Press the Escape button to end the test.

Select RETURN TO MAIN MENU or BACK TO DIAGNOSTIC MENU and press the Escape button.

Monitor Patterns

The Monitor Patterns Test provides a menu for testing the monitor.

Select the test with the (-) or (+) button. Press the Enter button to open the test menu. Once the Monitor Patterns Test menu is open, use the (-) or (+) button to select an option, then press the Enter button access the option.



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

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

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

If any of the Monitor Patterns Test shows a need for adjustment, use the proper knobs on the Monitor Controls Board. Press the Escape button to return to the Monitor Patterns Menu.

Use the (-) or (+) button to select RETURN TO MAIN MENU or BACK TO DIAGNOSTIC MENU. Press the Escape button to activate the selection.

Driver Board Test

This test provides the operator with a way to test the gun coils and the gun LEDs. Press the (-) or (+) button to select the Driver Board Test. Press the Enter button to begin the test.

The test cycles through and pulses the gun coils and the gun LEDs. As each device is activated the name is displayed on the screen.

Press the Escape button or the Bomb button to return to the Diagnostic Test.

Burn-in Test

The Burn-in Test continually repeats the CPU Board Test. Use this test to find intermittent CPU Board problems.

Press the (-) or (+) button to select the test, then press the Enter to begin the test. When the Burn-in Test detects an error the test stops and an error message is displayed on the screen.

The Audit Table specifies the number of Burn-in cycles that have been successfully completed.

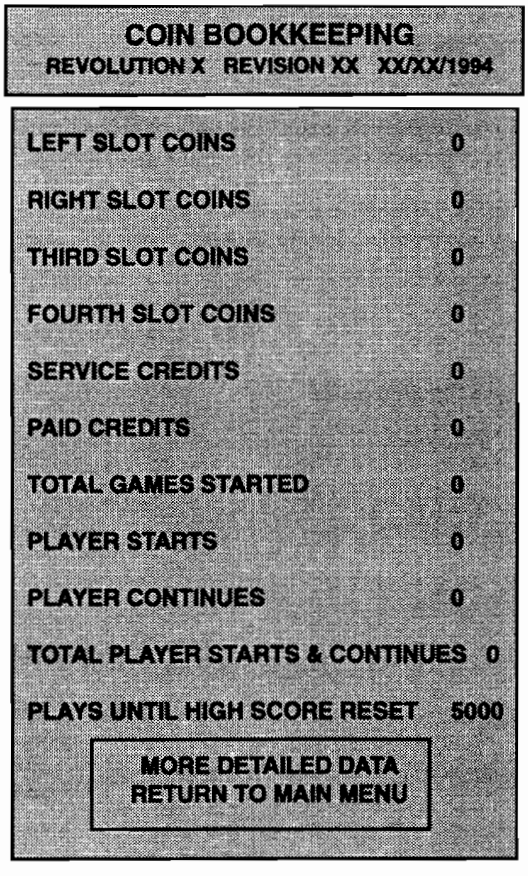
To exit this test, switch the game off, then on again.

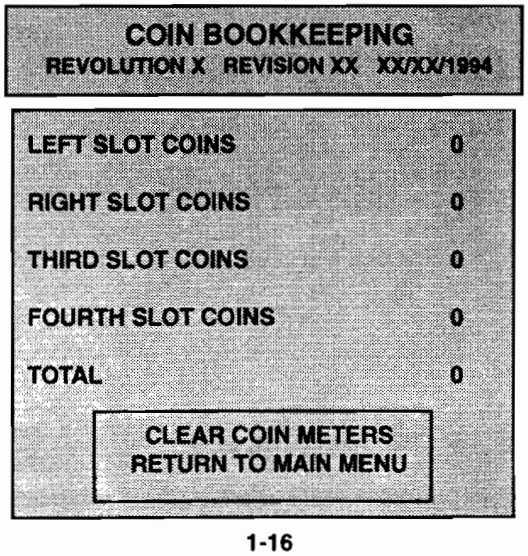
COIN BOOKKEEPING

Use the (-) or (+) button to select the Coin Bookkeeping Menu, then press the Enter button to open the menu.

The Coin Bookkeeping Table records the coin box totals and the game play counters.

To exit Coin Bookkeeping, use the (-) or (+) button to select RETURN TO MAIN MENU, then press the Escape button.



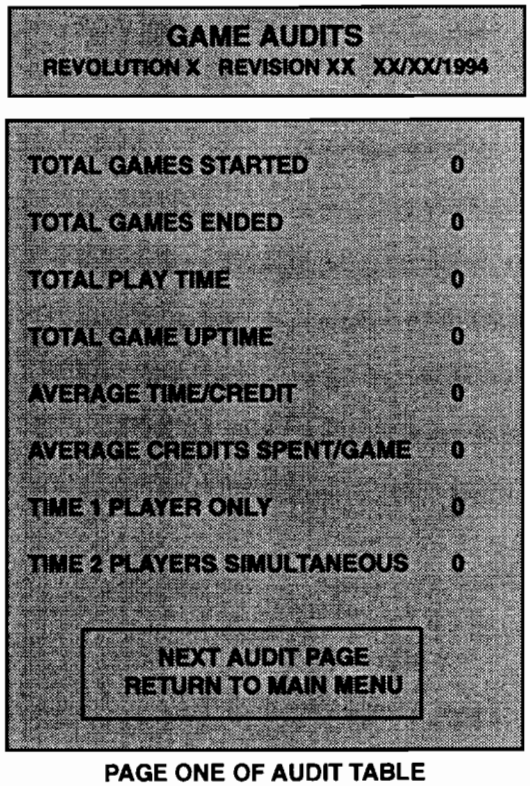


GAME AUDITS

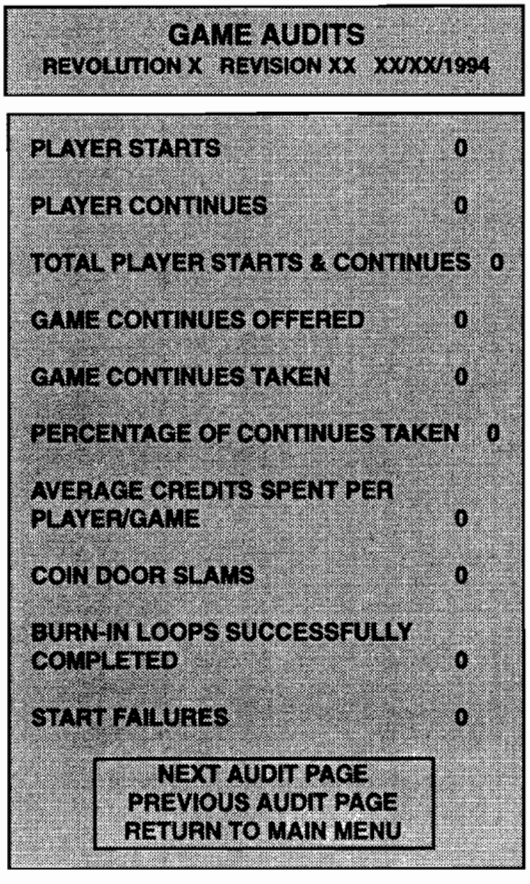
Use the (-) or (+) button to select the Game Audits Menu, then press the Enter button to open it. Page through the available audits by selecting NEXT AUDIT PAGE or PREVIOUS AUDIT PAGE. Select RETURN TO MAIN MENU and press the Escape button to exit Game Audits.

NOTE

Game audits cannot be set. They can only be cleared.

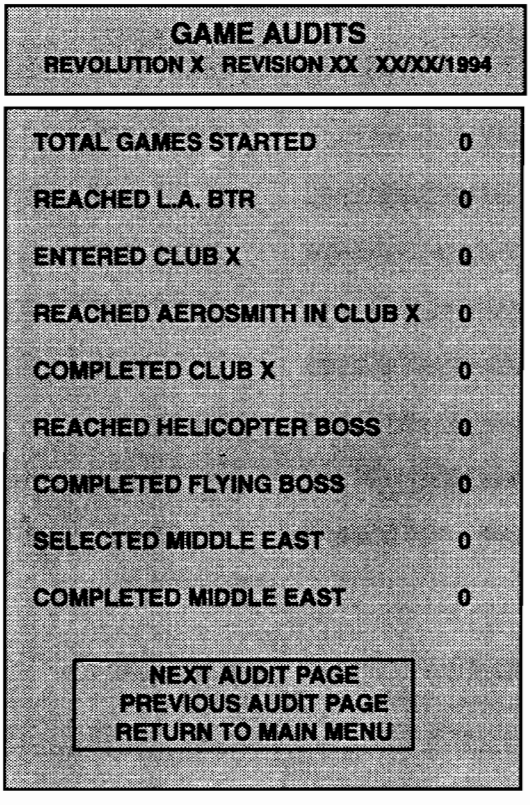


PAGE ONE OF AUDIT TABLE

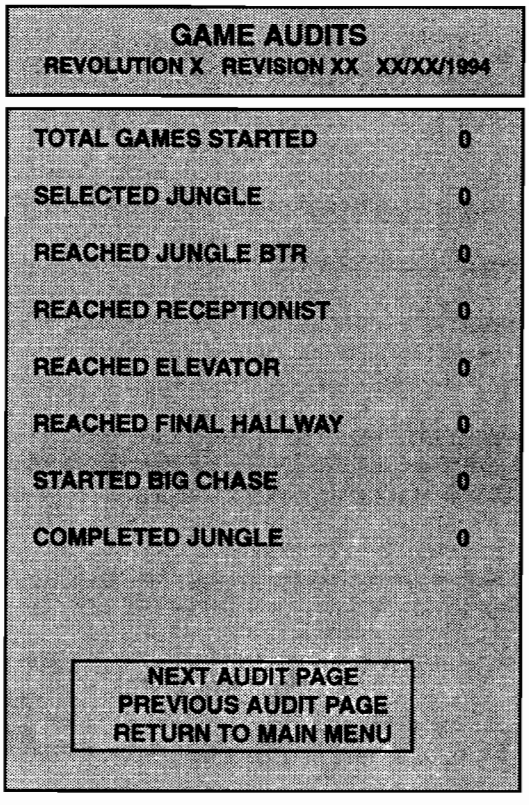


PAGE TWO OF AUDIT TABLE

Game Audits continued...



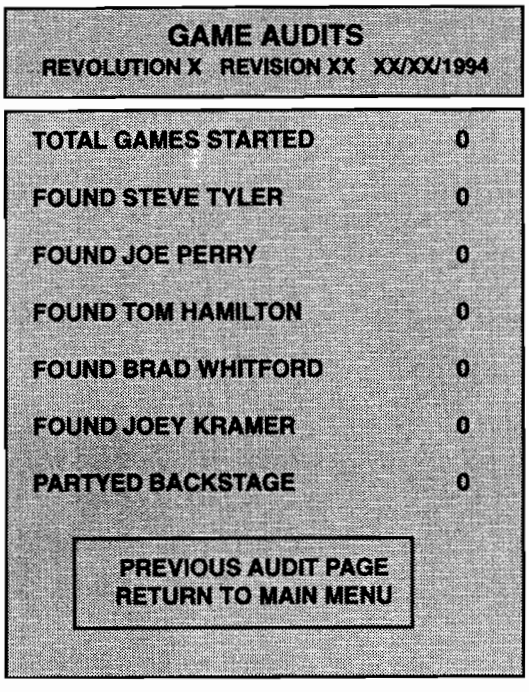
PAGE THREE OF AUDIT TABLE



PAGE FOUR OF AUDIT TABLE

Game Audits continued...

PAGE FIVE OF AUDIT TABLE



PAGE SIX OF AUDIT TABLE

GAME ADJUSTMENTS

The Game Adjustments allow the operator to customize the game.

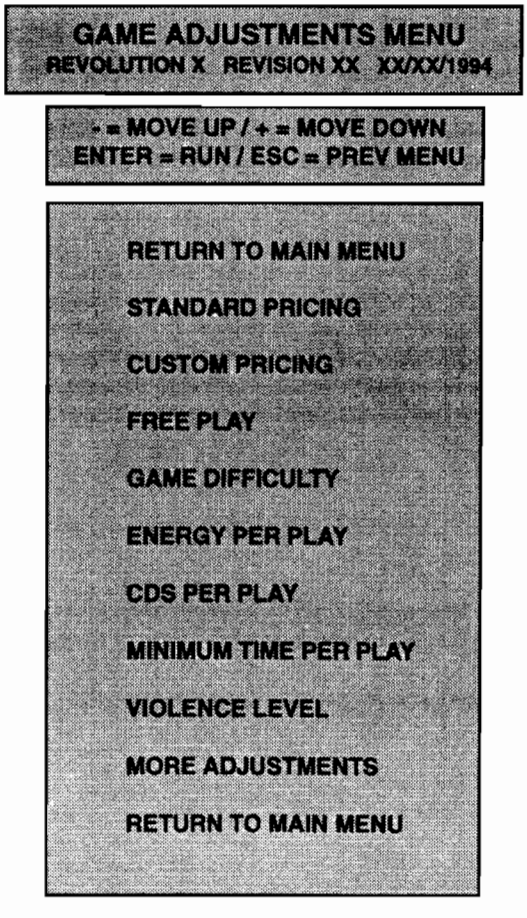
To select the Game Adjustments Menu press the (-) or (+) button, then press the Enter button to open the menu.

The Game Adjustments Menu offers several options. Each option has several choices. Press the (-) or (+) button to select an option, then press the Enter button to open the option. The next menu screen provides a setting choice. Press the (+) button to increase the setting value and press the (-) button to decrease the setting value. When the desired value is reached, press the Enter button to lock it in.

To exit the Adjustments Menu, use the (-) or (+) button to select RETURN TO MAIN MENU, then press the Escape button.

NOTE

Game adjustments are explained in more detail on the following page.
Adjustment values set by DIP SWITCH, override adjustment values set by the menu system.



Game Adjustments

Standard Pricing
Standard pricing allow the operator to choose any of the "standard" selections from the Standard Pricing Table. See page 1-23.

Modify the setting value with the (-) or (+) button. Press the Enter button to lock in the new value and return to the Adjustments Menu.

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 maximum amount of credits per game, the amount of credits required to start a game, and the amount of credits required to continue a game. This option is being adjusted from the DIP Switch settings. See page 1-24.

Modify the setting value with the (-) or (+) button. Press the Enter button to lock in a new value and return to the Adjustment Menu.

Free Play
This option selects free play. The setting choices for this adjustment are:
- No
- Yes
- Factory Setting: No

Game Difficulty
This option determines the difficulty level of the game play. The setting choices for this adjustment are:
- Easiest Setting: Easy
- Hardest Setting: Hard
- Factory Setting: Medium

Energy Per Play
The amount of energy a player receives each time he starts or continues a game. The setting range is:
- Maximum Setting: 200
- Minimum Setting: 5
- Factory Setting: 150

CDS Per Play
The number of CDS a player receives each time he starts or continues a game. The setting range is:
- Maximum Setting: 99
- Minimum Setting: 10
- Factory Setting: 25

Minimum Time Per Play
The minimum time, in seconds, the player is guaranteed to receive each play. The setting range is:
- Maximum Setting: 300
- Minimum Setting: 5
- Factory Setting: 75

Violence Level
This controls the level of graphic violence. The setting choices are:
- High = Blood is red.
- Medium = All blood is green.
- Low = No blood displayed.
- Factory Setting: High

MORE ADJUSTMENTS
This gains access to the following adjustments

Attract Mode Sounds
This determines whether the game has attract mode sounds. The setting choices are:
- Off
- On
- Factory Setting: On

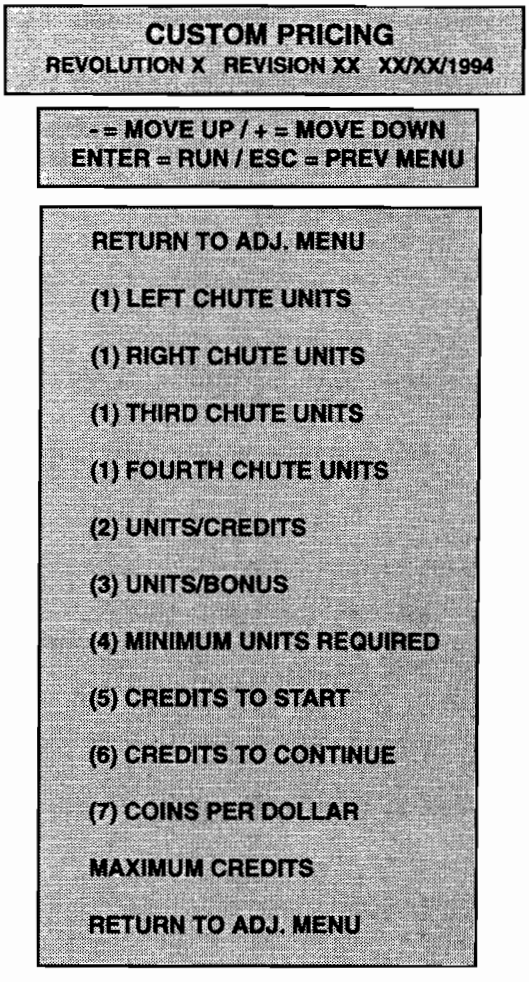
Auto High Score Reset
The All-time High Score Table will be reset to factory values each time this many plays occur. The setting range is:
- Off
- Maximum Setting: 25,000
- Minimum Setting: 250
- Factory Setting: 5000

High Score Entry
This determines whether the game will allow High Score Entry and Display Table. The setting choices are:
- No
- Yes
- Factory Setting: Yes

Set Minimum Volume
This determines the minimum level allowed when setting the volume of the Sound board. The setting range is:
- Maximum Setting: 128
- Minimum Setting: 0
- Factory Setting: 31

STANDARD PRICING TABLE

Name	Setting - Credit/Coin	Left Chute	Center Chute	Right Chute	Fourth Chute
USA 1	1/25¢ (2 to Start; 2 to Continue)	25¢	$1.00	25¢	
USA 2	1/25¢ (2 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 3	1/25¢ (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 4	1/50¢, 3/$1.00 (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 5	1/50¢, 4/$1.00 (2 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 6	1/50¢ (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 7	1/50¢, 3/$1.00 (1 to Start; 1 to Continue)	25¢	$1.00	25¢	
USA 8	1/50¢, 4/$1.00 (2 to Start; 2 to Continue)	25¢	$1.00	25¢	
USA ECA	1/25¢, 4/$1.00 (2 to Start; 2 to Continue)	$1.00	10¢	25¢	5¢
German 1	1/1DM, 6/5DM	1DM		5DM	
German 2	1/1DM, 7/5DM	1DM		5DM	
German 3	1/1DM, 8/5DM	1DM		5DM	
German 4	1/1DM, 5/5DM	1DM		5DM	
German 5	1/1DM, 6/5DM	1DM		5DM	
German ECA	1/1DM, 2/2DM, 6/5DM	5DM	1DM	2DM	
France 1	2/5F, 5/10F	5F		10F	
France 2	2/5F, 4/10F	5F		10F	
France 3	1/5F, 3/10F	5F		10F	
France 4	1/5F, 2/10F	5F		10F	
France 5	2/5F, 5/10F, 11/2 x 10F	5F		10F	
France 6	2/5F, 4/10F, 9/2 x 10F	5F		10F	
France 7	1/5F, 3/10F, 7/2 x 10F	5F		10F	
France 8	1/5F, 2/10F, 5/2 x 10F	5F		10F	
France 9	1/3 x 1F, 2/5F	1F		5F	
France 10	1/2 x 1F, 3/5F	1F		5F	
France 11	1/3 x 1F, 2/5F, 5/2 x 5F	1F		5F	
France 12	1/2 x 1F, 3/5F, 7/2 x 5F	1F		FF	
France ECA	1/3 x 1F, 2/5F, 5/2 x 5F	1F	10F	5F	
Canada	1/2 x 25¢, 3/$1.00	25¢		$1.00	
Swiss 1	1/1F, 6/5F	1F		5F	
Swiss 2	1/1F, 7/5F	1F		5F	
Swiss 3	1/1F, 8/5F	1F		5F	
Italy	1/500 lire	500 lire		500 lire	
UK 1	1/20P, 3/50P	20P		50P	
UK 2	2/20P, 5/50P	20P		50P	
UK ECA	1/20P, 3/50P, 7/£1.00	£1.00	20P	50P	10P
UK Elec w/CCU	1/30P, 2/50P, 4/£1.00	£1.00	20P	50P	10P
Spain 1	1/100 peseta, 6/500 peseta	100 peseta		500 peseta	
Spain 2	1/100 peseta, 5/500 peseta	100 peseta		500 peseta	
Australia 1	1/3 x 20¢, 2/$1.00	20¢		$1.00	
Australia 2	1/5 x 20¢, 1/$1.00	20¢		$1.00	
Japan 1	1/100 yen	100 yen		100 yen	
Japan 2	2/100 yen	100 yen		100 yen	
Austria 1	1/5 schilling, 2/10 schilling	5 schilling		10 schilling	
Austria 2	1/2 x 5 schilling, 3/2 x 10 schilling	5 schilling		10 schilling	
Belgium 1	1/20F	20F		20F	
Belgium 2	3/20F	20F		20F	
Belgium 3	2/20F	20F		20F	
Belgium ECA	1/20F	50F	5F	20F	
Sweden	1/3 x 1 krona, 2/5 krona	1 krona		5 krona	
New Zealand 1	1/3 x 20¢	20¢		20¢	
New Zealand 2	1/2 x 20¢	20¢		20¢	
Netherlands	1/1 HFI, 3/2.5 HFI	1 HFI		2.5 HFI	
Finland	1/1 markka	1 markka		1 markka	
Norway	1/2 x 1 krone, 3/5 x 1 krone	1 krone		1 krone	
Denmark	1/2 x 1 krone, 3/5 krone, 7/2 x 5 krone	1 krone		5 krone	
Antillies	1/25¢, 4/1 guilder	25¢		1 guilder	
Hungary	1/2 x 10 forint, 3/2 x 20 forint	10 forint		20 forint	



(1) Coins inserted accumulate units. This adjustment specifies the number of units given for each coin in the fourth chute (see "units/credit").

(2) This is the number of coin units required to buy one credit.

(3) There is one bonus credit awarded after this many coin units have accumulated.

(4) No credits will be awarded until this many coin units have accumulated.

(5) Each player needs this many credits to begin a game.

(6) Each player needs this many credits to continue a game.

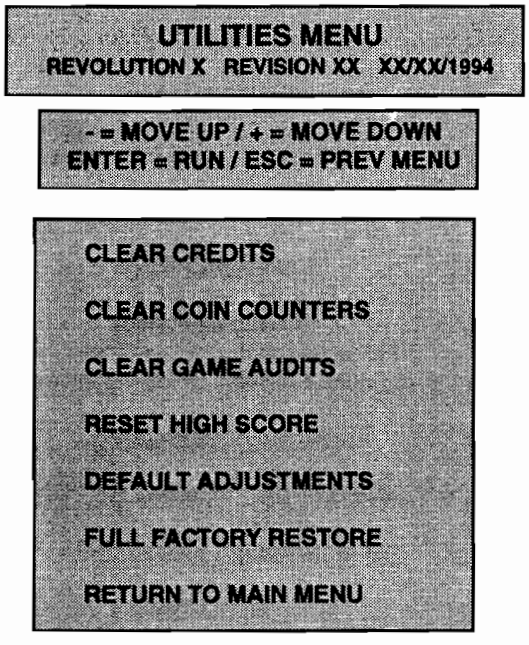
(7) The detailed bookkeeping screen shows total collections based on this many coins per dollar. (Set to zero to disable the display of money totals.)

(8) This is the limit for the credit counter. Additional coins inserted will be lost (factory setting: 30).

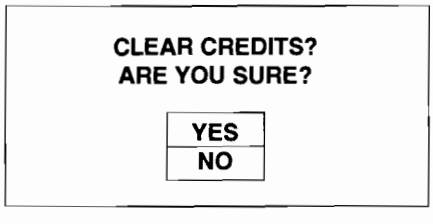
UTILITIES

The Utilities Menu allows the operator to clear the game's bookkeeping memory and to install a custom message.

To select the Utilities Menu press the (-) or (+) button, then press the Enter button.



Press the player (-) or (+) button to select a utility. Press the Enter button to activate the selection. A dialogue box appears and the operator can choose to reset the utility. For example:



Press the (-) or (+) button to choose a setting value. Press the Enter button to lock in the new setting value.

To exit the Utilities Menu press the (-) or (+) button to select RETURN TO MAIN MENU, then press the Escape button.

CALIBRATE GUNS

The calibrate Guns option allows the operator to align the guns.

NOTE

Check gun calibration when the game is received. The gun assemblies are calibrated from the factory. However, guns might of been jarred during shipping and may need to be re-calibrated.

If you change boards or replace ROMs, RAMs or the battery, you must re-calibrate the guns. Guns do not operate unless they are calibrated.

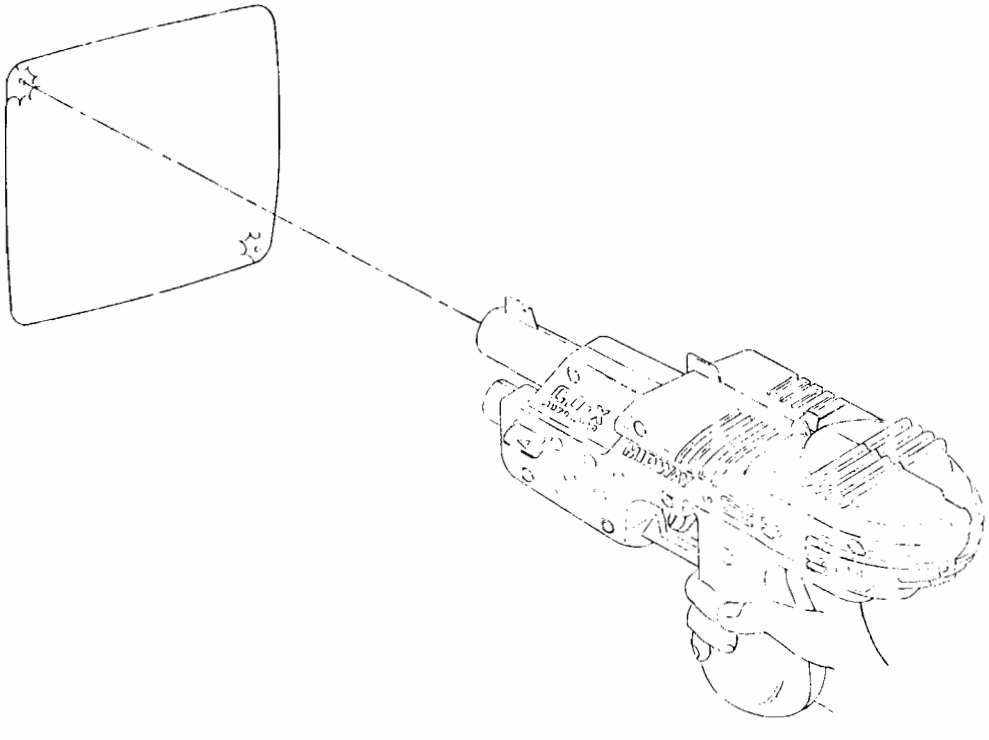
Press the (-) or (+) button to select Calibrate Guns. Press the Enter button to access the option. The screen shows the operator two targets to aim and shoot at. The targets are located at the top left and bottom right of the screen. Calibrate the left gun first, then the right gun.

When the guns are calibrated correctly the message, **-**Calibration Successful**-**, appears on the screen. The data is stored in the CMOS RAM and the game automatically returns to the Main Menu.

If the gun calibration is not successful, the following message appears on the screen:

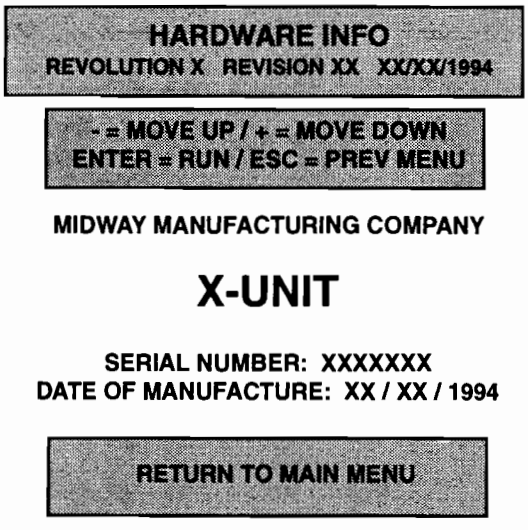
-CMOS RAM ERROR**-**
Unable to write calibration values.
Guns are not aligned.
Press any button to continue.

Begin again to calibrate the guns. If you make a mistake, press the Escape button to abort the procedure and start over. The screen returns to the Main Menu automatically.



HARDWARE INFO

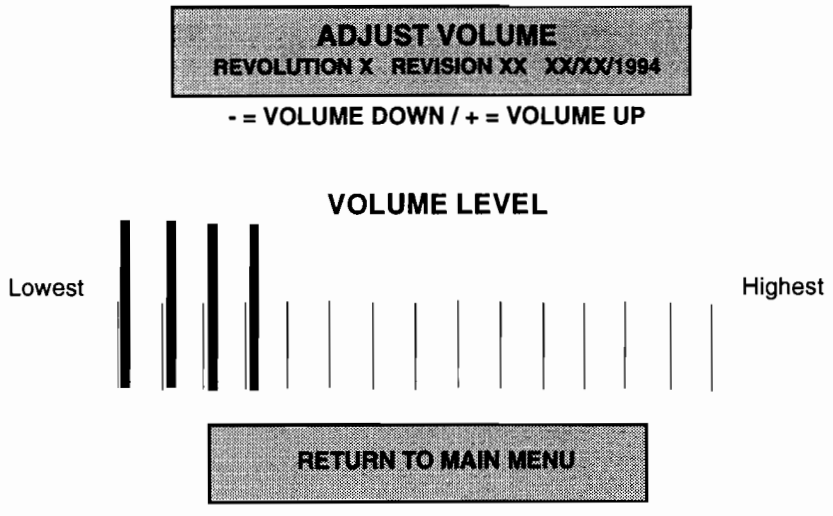
The Hardware Info option allows access to a screen that shows information specifically about the individual game.



ADJUST VOLUME

The Adjust Volume feature allows the operator to determine the sound and music level of the game.

Press the (+) button to raise the volume level of the game and the (-) to lower the volume level. The current volume level is shown with a red line. Press the Escape button to 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 and 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 the speaker connection to pin L and 10 on the JAMMA connector. Check volume control setting. Check for +12Vdc at pins F and 6 on the JAMMA connector. Check interboard wiring from CPU board to sound board. Also, check the fuse on the sound board.
No general illumination.	Check the 1A, S.B. fuse in the A.C. power pack assembly.
Press start button and nothing happens.	Check for open wires between the button and the CPU board. Check for contamination on CPU board pins or the Start button switch blade contacts. Check for proper ground.
No credit given for number of coins inserted.	Check DIP switch coin settings. Check for contamination on the 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 the game pricing settings. Check for a short between pins T & 16 on the JAMMA connector.
Game stay in test mode.	Check that the switch #8 of DIP switch bank #2 is set to off.

NOTES

REVOLUTION X

SECTION
two

Parts

Cabinet Hardware

Cabinet Assembly	A-16200
Lock Retainer Plate	01-7264
Upper Door Lock Cam	01-8989
Leg Leveler Plate	01-9155
Lock Plate	01-11285
Pad Lock Bracket	01-11286
Key Lock Bracket	01-11287
Door Bracket	01-11291
Shaft Caster	02-4404
20" Vent Hole Cover	03-7602
Leg Adjuster, 3.0"	08-7377
Door Cam Lock	20-6542-TB
Toggle Latch	20-9347
Caster Wheel	20-9627
Marquee Hinge	20-9939
Coin Door Assembly	09-50000-33
DBV Adapter Cable - USA	H-18136
Mars DBV Chute	01-11379
Coin Chute Assembly	01-12324
Video Cash Box Tub	03-8863
Vault Door - Blank with Lock	09-41000
Coin Meter with Diode	5580-13476-00
Tamper Proof Screw Tool, T-20	20-9620
#555 Bulb, 6.3V	24-8768
Silver Front Mirror*	31-1900
Screened Viewing Glass	31-1901
Marquee	31-1907-1
Marquee Retainer	03-8252-2
Marquee Glass	08-7786
Interlock Switch	5643-09268-00

**** The mirror is a large tempered VERY HEAVY glass. Servicing should not be needed.***

Manuals

Instruction Manual	16-40019-101
Tamper-proof Screws Sheet	16-9416
DBV Installation Instructions	16-9637
Rear Latch Instructions	16-9718

Control Panel

Control Panel Assembly	A-17033
Gun	A-18027
Control Panel Cable	H-17999
Security Latch Bracket	01-11955
Clear Overlay	03-9086
Red Push-button	20-9687-1
Blue Push-button	20-9687-3
Screened Overlay	31-1903

Electronic Rack

Electronic Rack	A-17876
Power Supply Switcher Assy	A-15202-1
X-unit CPU Board	A-16744-40019
Gun Coil Driver Board	A-17024.1
DCS Sound Board	A-17026-40019

Speakers

Cabinet Speaker Cable	H-17035
Speaker Grille	01-12421
Full Range Speaker	5555-13961-00

Transformer Assembly

Power Pack Assembly	A-17031 - (country)

Fluorescent Lamp Assembly

Fluorescent Housing & Bracket	A-15890
Lamp Lock	03-8327
18" Fluorescent Bulb, 15W	24-8809

Cables

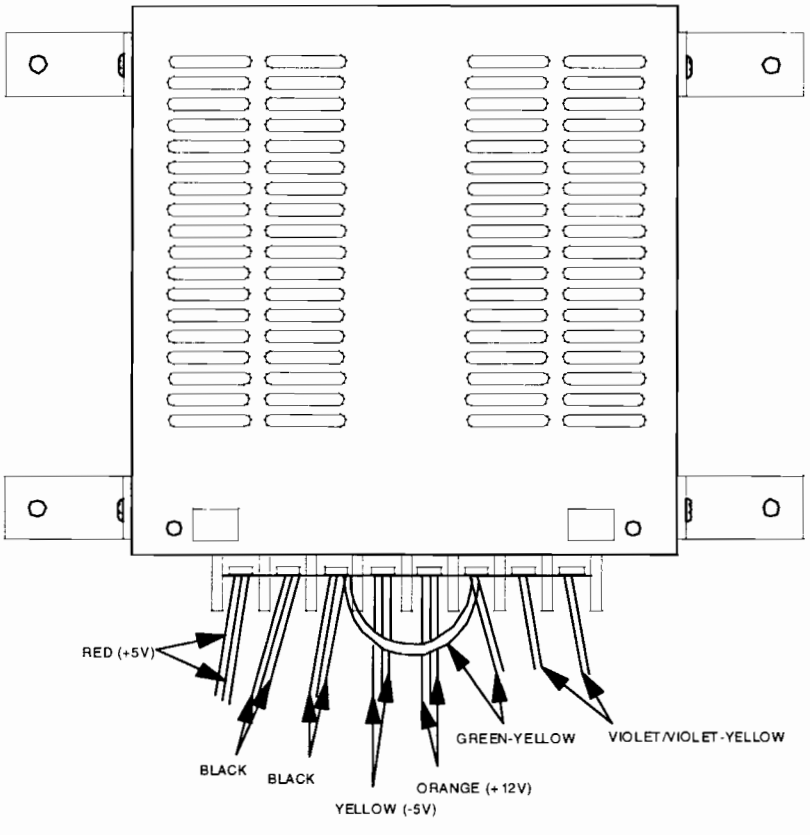
Line Voltage Cable Assembly	A-17877-2
Dixie-Mars Interconnect Cable	H-17019
Cabinet Speaker Cable	H-17035
Main Harness Cable	H-17715.1
Control Panel Cable	H-17999
DBV Adapter Cable - USA	H-18136
20-pin Ribbon Cable	5795-10937-18

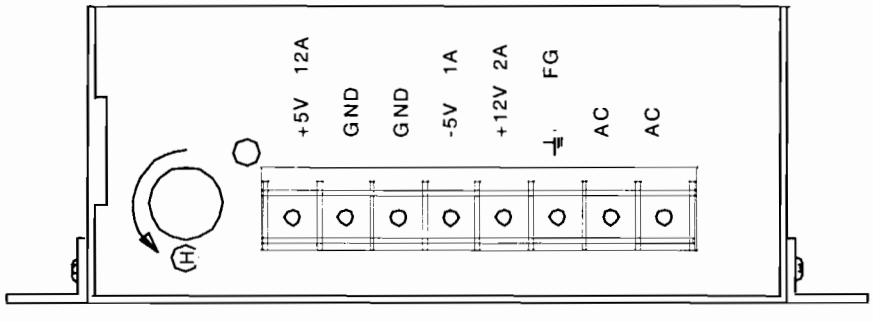
Monitor

Monitor Support Bracket, Left	A-14769
Monitor Support Bracket, Right	A-14770
Monitor Bezel	03-8497-2
25" Monitor	5675-12787-05

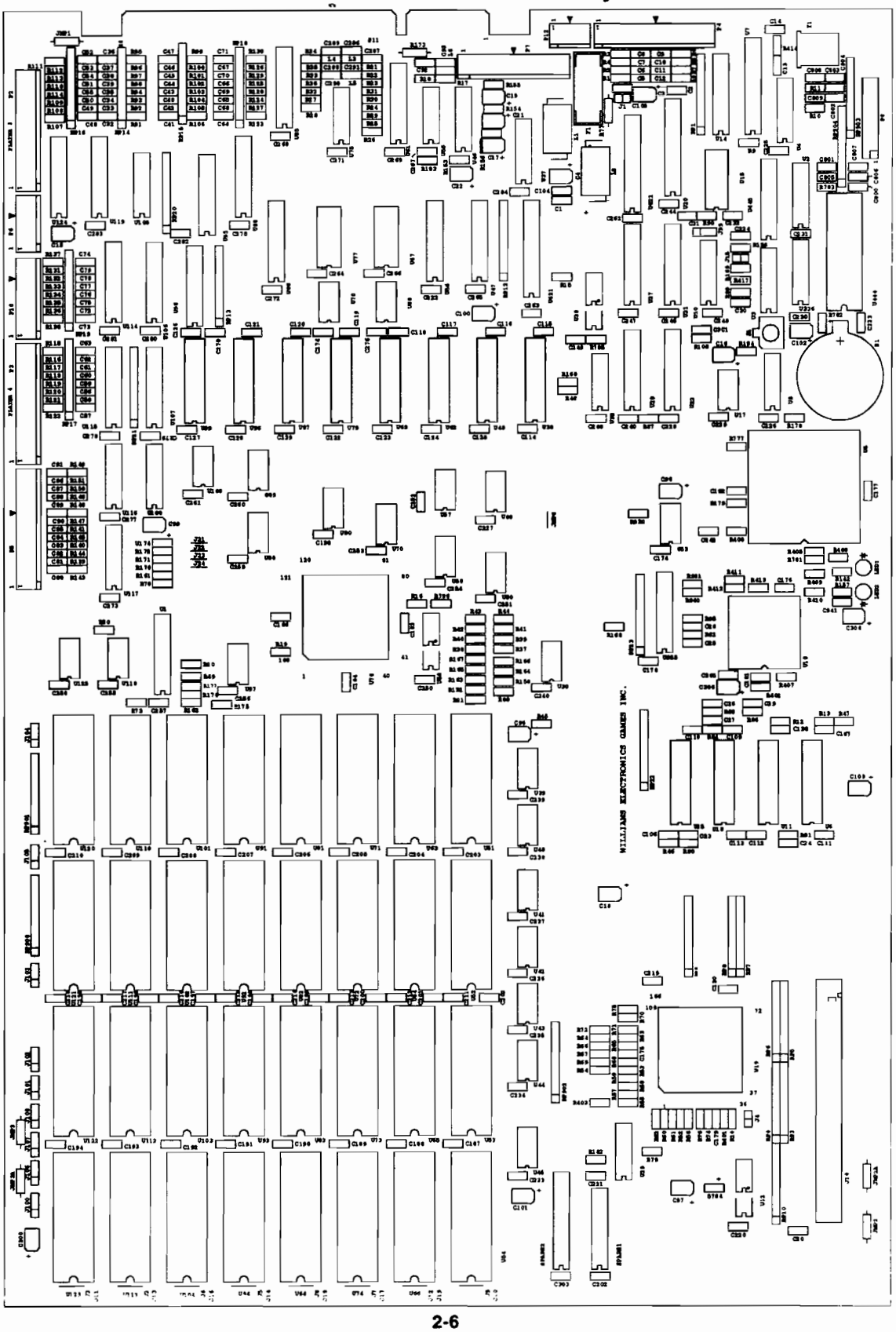
A-15202-1
Power Supply Switcher Assembly

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





A-16744-40019
X-unit CPU Board Assembly

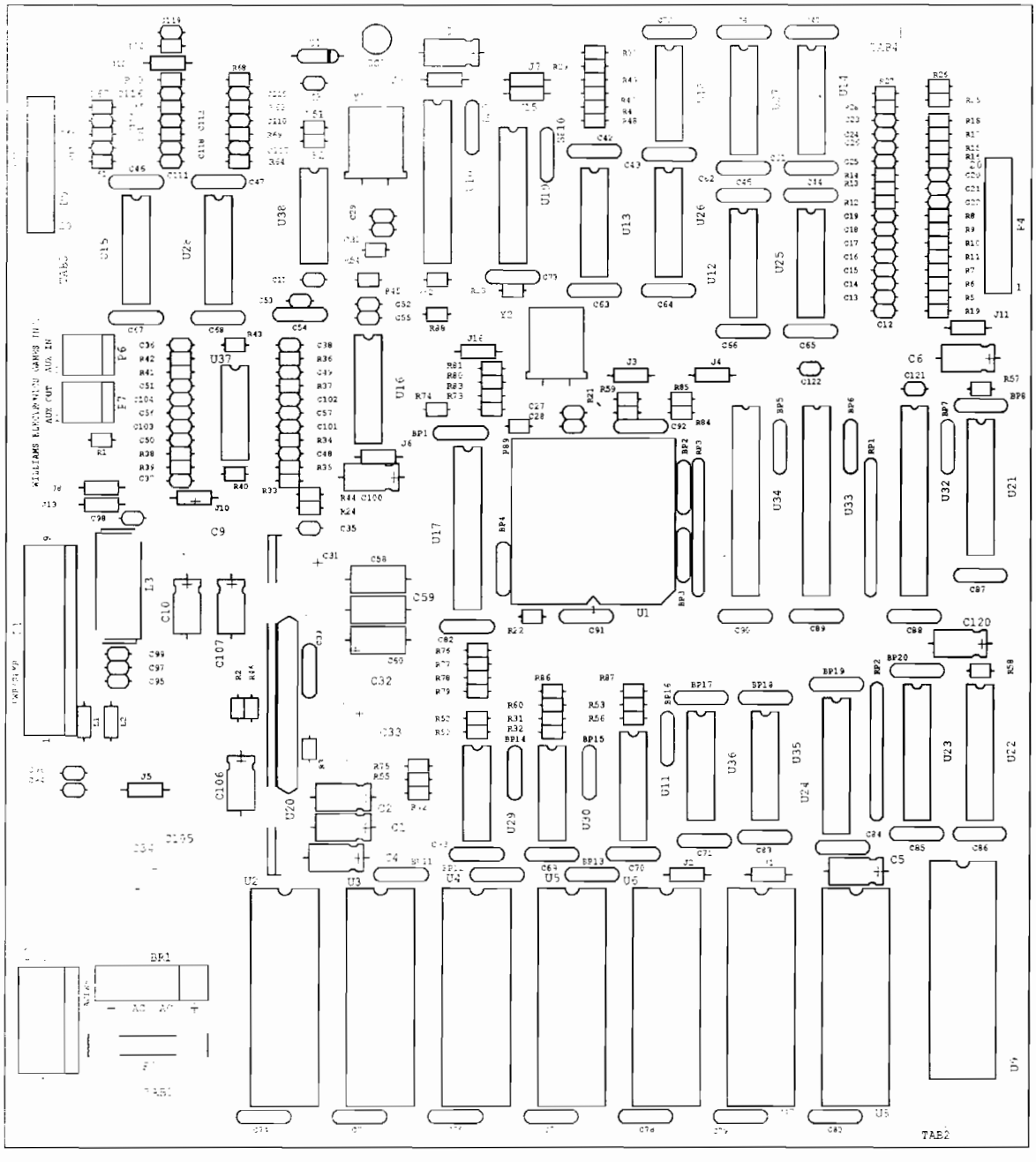


A-16744-40019
X-unit CPU Board Parts

Part Number	Part Designator	Description
5020-13637-00	R12, R13, R47 R139-R141, R143-R151, R777	Res., 33Ω, 1/8W, 5%
5020-13668-00	R25, R31, R36	Res., 15Ω, 1/8W, 5%
5020-13669-00	R24, R30, R35	Res., 8.2KΩ, 1/8W, 5%
5020-13671-00	R1-R8, R48, R91-R138	Res., 470Ω, 1/8W, 5%
5020-13672-00	R23, R29, R34	Res., 3.9KΩ, 1/8W, 5%
5020-13673-00	R22, R28, R33	Res., 2KΩ, 1/8W, 5%
5020-13674-00	R80-R86, R142, R153-R157, R180, R401, R410	Res., 330Ω, 1/8W, 5%
5020-13676-00	R10, R11, R18, R19, R26 R74, R75, R87, R169, R404, R930	Res., 100Ω, 1/8W, 5%
5020-13677-00	R14-R16, R37-R45 R51-R72, R76, R79, R88, R152, R158, R160, R163-R167, R402, R403, R405-R409, R411-R413	Res., 47Ω, 1/8W, 5%
5020-13735-00	R9, R20, R46, R50, R89-R90, R159, R182-R184, R781-R786, R417, R900, R901	Res., 47KΩ, 1/8W, 5%
5022-13761-00	R21, R27, R32	Res., 1KΩ, 1/8W, 2%
5020-13678-00	L3-L6	Res., 0Ω, 1/8W, 5%
5019-09362-00	RP1, RP3-RP10, RP12-RP22, RP900-RP902	SIP, 4.7KΩ, 9R,10, 5%
5019-13838-00	RP903, RP904	SIP, 47Ω, 5R,10, 5%
5019-09669-00	RP23	SIP, 1KΩ, 9R, 10, 5%
5050-13679-00	C3, C4, C15-C19, C21, C22, C96-C103, C300, C304, C306	Cap., 10µF, 16V, +80/-20
5052-13633-00	C106-C129, C31	Cap., .33µF, 50V, z5u
5052-13645-00	C20	Cap., .1µF, 50V, z5u
5052-13648-00	C13, C14, C23-C29, C92, C93, C286-C291, C301	Cap., 22pF, 50V, npo, 5%
5052-13680-00	C1, C2, C80-C91, C174-C284, C302, C303, C305	Cap., .01µF, +80/-20
5052-13681-00	C104, C105	Cap., .001µF, 10%
5052-13682-00	C30	Cap., 470pF, npo, 10%
5052-13683-00	C5-C12, C32-C79, C800-C809	Cap., 100pF, npo, 10%
5287-13689-00	U40, U42, U44, U57 U58, U68, U78	IC., 74ABT374
5287-13690-00	U17, U39, U41, U43 U45, U49, U50, U70, U80, U89-U90, U100	IC., 74ABT245
5287-13691-00	U23, U36, U97, U118, U125	IC., 74ABT244
5340-13849-00	U38, U48, U62, U69, U79, U87, U96, U99	IC., V/RAM, 48121
5349-13685-00	U15	IC., RAM, STAT-S, 8Kx8
5349-13686-00	U6, U11, U18, U25	IC., RAM, DYN, 256Kx16
5349-13687-00	U67, U77	IC., RAM, STAT-S, 32Kx8
5400-13684-00	U19	IC., MPU-GSP, 34020
5410-12862-00	U76	IC., Custom Video, DMA2
5280-08974-00	U75	IC., 7406 Hex Inv Oc
5281-09733-00	U37, U116, U117, U336	IC., 74LS174 Hex F/F
5281-09737-00	U55	IC., 74LS86 Quad Xor
5281-09851-00	U9	IC., 74LS14 Smt/Trg
5283-10552-00	U29	IC., 74F04 Inverter
5283-12489-00	U32	IC., 74F32 Quad Or
5283-13737-00	U16	IC., 74F138 3/8 Dmx Dip
5315-12031-00	U88, U95, U106, U107, U114, U115, U119, U124	IC., 74HCT244
5317-12208-00	U14, U47, U98	IC., 74ALS245 Xovr
5317-13736-00	U22, U28, U56, U86	IC., 74ALS374 Dip 20
5317-13738-00	U21, U27, U61, U85, U445	IC., 74ALS244 Dip 20
5340-12958-00	U2	IC., 26LS31 Bal Drvr
5340-12959-00	U4	IC., 26LS32
5370-12602-00	U46	IC., ULN 2064B
5372-13323-00	U20	IC., ADC0848, +/-1LSB
5430-13692-00	U7	IC., UART 2691 D28-300
5434-12255-00	U3	IC., Max691 MCS4.65V
5520-13093-00	Y1	Crystal 3.6864MHZ
5521-13603-05	U12	Osc., CMOS 40MHZ
5521-13806-03	U30	Osc., TTL 8MHZ
5521-13806-04	U59	Osc., TTL 25MHZ
5551-09822-00	L1, L2	Inductor., 4.7µH, 3A
5641-12551-00	S1	Sw., PB, PCB Mount
5645-09025-00	U105, U108	Sw., DIP, 8 pos.
5671-13732-00	LED1, l ED2	LED, Red
5700-09915-00	U1, U955	Socket, IC, 20-pin, .3"
5700-10176-00	U444	Socket, IC, 28-pin, .6
5700-12088-00	U51-U54, U63-U66, U71-U74, U81-U84, U91-U94, U101-U113, U120-U123	Socket, DIP 32-pin, .6"
5700-12424-00	U5	Socket, 84-pin, PLCC
5700-13173-00	U10	Socket, 44-pin, PLCC
5791-10862-09	P7	Header, 9-pin str sq, .156
5791-12461-05	P12	Header, 5-pin str sq, .100
5791-12461-07	P6	Header, 7-pin str sq, .100
5791-12461-10	P10	Header, 10-pin strsq,.100
5791-12461-15	P2-P5	Header, 15-pin strsq,.100
5881-12315-00	B1	Battery Holder, Btn, Sgnl
5880-11056-00	B1	Battery, Lithium, 3V
5733-14113-00	F1	Fuse Holder, 5x20mm
5735-13839-00	F1	Fuse, 250mA, 250V, F.B.
5791-09437-00	P8	100 C 10 x 2
20-9915	JMP1-JMP3, JMP2A, JMP3A, JMP6, R77, R173	Wire Insulated Jumper
5343-40019-01	U120	IC., EPROM
5343-40019-02	U121	IC., EPROM
5343-40019-03	U122	IC., EPROM
5343-40019-04	U123	IC., EPROM
5343-40019-05	U110	IC., EPROM
5343-40019-06	U111	IC., EPROM
5343-40019-07	U112	IC., EPROM
5343-40019-08	U113	IC., EPROM
5343-40019-09	U101	IC., EPROM
5343-40019-10	U102	IC., EPROM
5343-40019-11	U103	IC., EPROM
5343-40019-12	U104	IC., EPROM
5343-40019-13	U91	IC., EPROM
5343-40019-14	U92	IC., EPROM
5343-40019-15	U93	IC., EPROM
5343-40019-16	U94	IC., EPROM
5343-40019-17	U81	IC., EPROM
5343-40019-18	U82	IC., EPROM
5343-40019-19	U83	IC., EPROM
5343-40019-20	U84	IC., EPROM
5343-40019-21	U71	IC., EPROM
5343-40019-22	U72	IC., EPROM
5343-40019-23	U73	IC., EPROM
5343-40019-24	U74	IC., EPROM
5343-40019-25	U63	IC., EPROM
5343-40019-26	U64	IC., EPROM
5343-40019-27	U65	IC., EPROM
5343-40019-28	U66	IC., EPROM
5343-40019-29	U51	IC., EPROM
5343-40019-30	U52	IC., EPROM
5343-40019-31	U53	IC., EPROM
5343-40019-32	U54	IC., EPROM
A-17719	U5*	IC., PLD PLSI 1032 Assy
A-17720	U10*	IC., PLD MACH 110 Assy
A-17721	U955*	IC., PLD 16V8 Assy
A-17722	U1*	IC., PLD 16L8 Assy
5400-13823-00	U444*	PIC1657

***NONUSER SERVICEABLE/REPLACEABLE PARTS**

A-17026-40019
Sound Board Assembly

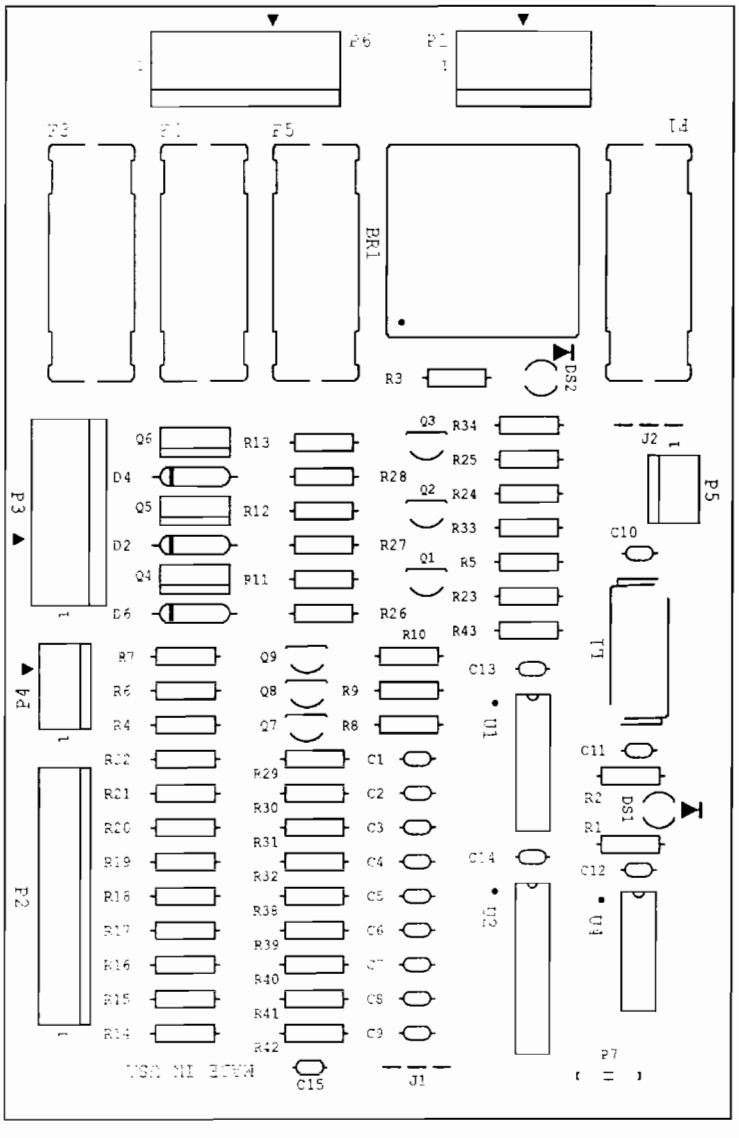


A-17026-40019
Sound Board Parts

Part Number	Part Designator	Description
20-9915	J1, J4, J6, J8, J9, J10, J13, J16	Jumper Wire, Insulated
5010-13361-00	R1	Res., 1KΩ, 1/8W, 2%
5010-13363-00	R45, R51, R57-R62	Res., 100Ω, 1/8W, 5%
5010-13365-00	R21-R23, R31, R32, R50, R53, R55, R56, R73-R75, R88	Res., 4.7KΩ, 1/8W, 5%
5010-13371-00	R52	Res., 330Ω, 1/8W, 5%
5010-13472-00	R63-R72, R76-R87, R89	Res., 47Ω, 1/8W, 5%
5010-13844-00	R3, R20, R54	Res., 100KΩ, 1W, 5%
5010-13858-00	R2	Res., 820Ω, 1/8W, 5%
5010-13962-00	R46	Res., 12KΩ, 1/8W, 5%
5013-13842-00	R33-R44	Res., 6.19KΩ, 1/8W, 1%
5010-13841-00	R24	Res., 47KΩ, 1/8W, 5%
5019-10661-00	RP1-RP3	SIP, 10KΩ, 9R, 5%
5040-09343-00	C1, C2, C4-C7, C10, C100, C106, C107, C120	Cap., 10µF, 20V, +/-20%
5043-08996-00	BP1-BP9, BP11-BP20, C3, C39, C40, C46, C47, C52-C57, C65, C67-C71, C73-C80 C82-C99, C121, C122	Cap., .1µF, 50V, +/-20%
5045-12926-00	C58-C60	Cap., .1µF, 100V, 10%
5048-11028-00	C27-C30	Cap., 22pF, 50V
5048-13375-00	C11, C110-C119	Cap., 100pF, 50V, 10%
5048-13608-00	C51	Cap., 6800pF, 50V, 5%
5048-13609-00	C48-C50	Cap., 3900pF, 50V, 5%
5048-13610-00	C35-C38	Cap., 1000pF, 50V, 5%
5048-13611-00	C101-C104	Cap., 680pF, 50V, 5%
5040-09421-00	C9, C31, C32	Cap., 100µF, 25V,+50/-10
5040-09506-00	C33	Cap., 220µF, 16V,+50/-10
5040-13417-00	C105	Cap., 10,000µF, 35V
5070-08919-00	D1	Diode, 1N4148
5556-12513-00	L1, L2	Ferrite Bead, t & reel
5551-09822-00	L3	Inductor, 4.7µH, 3A
01-10516	HSNK1	Heatsink
20-9690-18		Standoff, Spacer PCB
4006-01003-06		MS, 6-32x3/8 P-PH-S
4406-01128-00		Nut, 6-32 KEPS
5100-13945-02	BR1	Bridge Diode SIP, 200V
5280-08974-00	U29	IC., 7406
5283-10551-00	U30	IC., 74F00
5311-10948-00	U11	IC., 74HC138
5311-12043-00	U35, U36	IC., 74HC174
5311-12287-00	U21-U23	IC., 74HC541
5311-12538-00	U38	IC., 74HC14
5287-13966-00	U24	IC., 74ABT245
5340-12958-00	U28	IC., 26LS31
5340-12959-00	U15	IC., 74LS32
5340-13304-00	U32-U34	IC., RAM, STATIC 2Kx8
5370-12730-00	U37	IC., TL084, op-amp
5370-13308-00	U20	IC., Audio Amp MB, 3731
5371-13299-00	U16	IC., AD-1851,16 bit mono
5430-13692-00	U10	IC., UART/DUAL 2691
5700-12047-00	U17	Socket, IC., 24-pin, .300
5700-12088-00	U2-U9	Socket, IC., 32-pin, .600
5700-12533-00	U1	Socket, IC., 68-pin,PLCC
5520-13093-00	Y1	Crystal, 3.6864MHZ
5520-13301-00	Y2	Crystal, 10MHZ
5671-13732-00	DS1	LED, Red
5791-09437-00	P5	Conn., 20HCN, 2x10 st.
5791-10862-05	P3	Conn., 5H, str sq pin,.156
5791-10862-09	P1	Conn., 9H, str sq pin,.156
5733-13826-00	F1	Fuse Holder, 5x20mm

Part Number	Part Designator	Description
A-17481	U17	IC., PLD 20V8 Assy
5400-13298-00	U1	IC., MPU 2105KP-40
5735-13853-00	F1	Fuse, 250V, 2A, S.B.
A-5343-40019-33	U2	IC., EPROM
A-5343-40019-34	U3	IC., EPROM
A-5343-40019-35	U4	IC., EPROM
A-5343-40019-36	U5	IC., EPROM
A-5343-40019-37	U6	IC., EPROM
A-5343-40019-38	U7	IC., EPROM
A-5343-40019-39	U8	IC., EPROM
A-5343-40019-40	U9	IC., EPROM

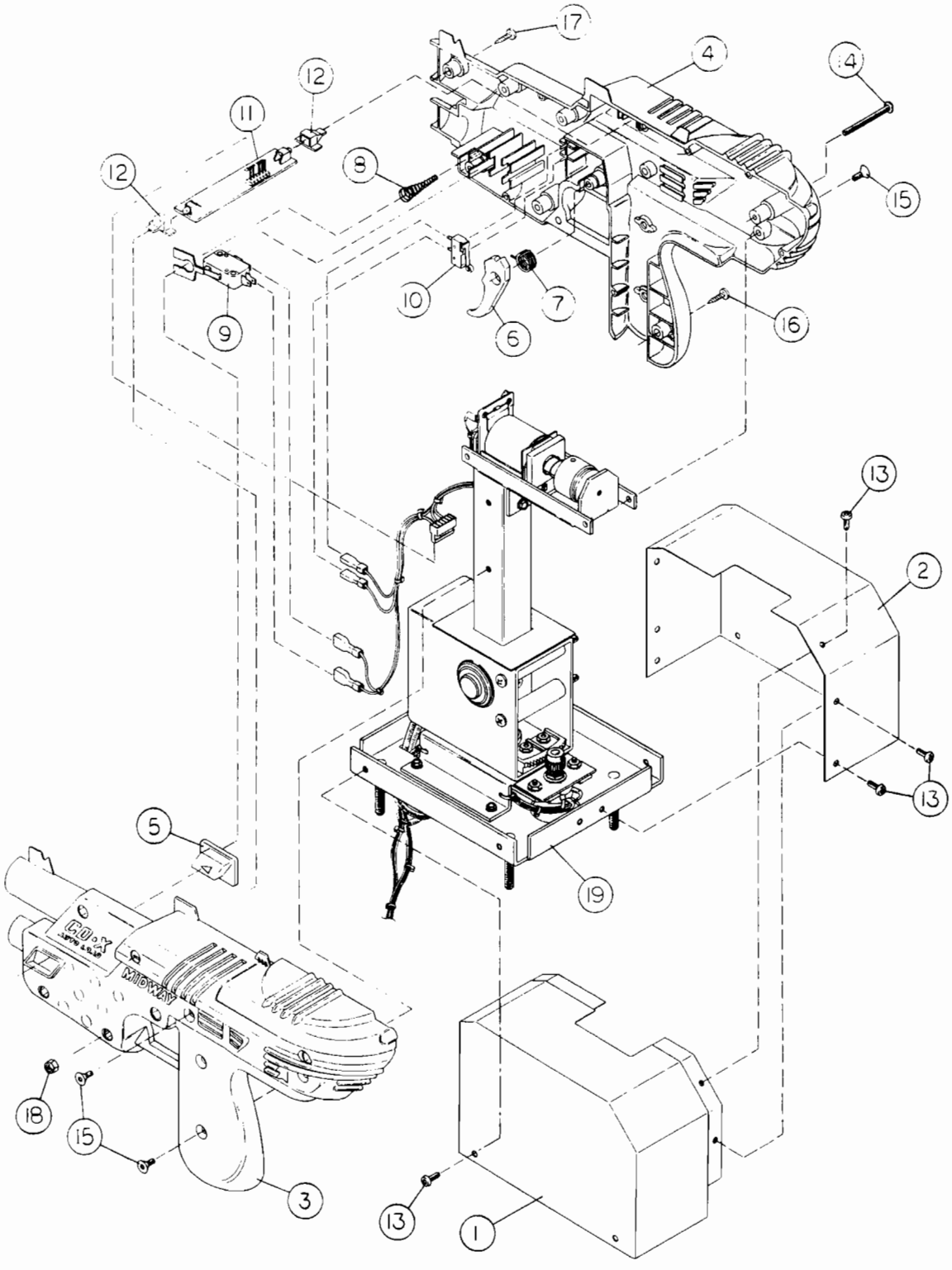
A-17024.1
Gun Coil Driver Board Assembly



A-17024.1
Gun Coil Driver Board Parts

Part Number	Part Designator	Description
5100-09690-00	BR1	Bridge, 35A, 100V
5791-10862-05	P1	Conn., 5-pin, .156
5791-12461-15	P2	Conn., 15-pin, .100
5791-12461-04	P5	Conn., 4-pin, .100
5791-10862-07	P3, P6	Conn., 7-pin, .156
5791-12461-00	P4	Conn., 5-pin, .100
5048-13375-00	C1-C11	Cap., 100pF, 50V, +/-20%
5043-08980-00	C12-C15	Cap., .01μF, 50V, +80/-20%
5070-09054-00	D2, D4, D6	Diode, 1N4004, 1.0A
5733-12060-01	F1, F3, F4, F5	Fuse Holder
5731-09651-00	F1	Fuse, 5A, 250V, S.B.
5731-14144-00	F3, F4, F5	Fuse, 1.8A, 250V, S.B.
5551-09822-00	L1	Inductor, 4.7μH, 3.0A
5671-13732-00	DS1, DS2	LED, Red
5434-12255-00	U1	IC., MAX691
5311-12688-00	U2	IC., 74HCT273
5311-12669-00	U4	IC., 74HCT14
5162-12635-00	Q4, Q5, Q6	Trans., TIP 102, 100V, 8A
5190-09016-00	Q7, Q8, Q9	Trans, 2N4403
5160-10269-00	Q1, Q2, Q3	Trans., 2N3904
5010-09187-00	R4, R6, R7	Res., 150Ω, 5%
5010-09085-00	R8, R9, R10	Res., 1.5KΩ, 5%
5010-08998-00	R3	Res., 2.2KΩ, 5%
5010-08997-00	R26, R27, R28	Res., 2.7KΩ, 5%
5010-09001-00	R2	Res., 330Ω, 5%
5010-09416-00	R14-R25	Res., 470Ω, 5%
5010-08991-00	R1, R5, R29-R34, R38-R43	Res., 4.7KΩ, 5%
5010-12480-00	R11, R12, R13	Res., 68Ω, 5%

A-18027
Gun Assembly



A-18027
Gun Parts

Item	Part Number	Description
1	01-13026	Base Housing, Left
2	01-13027	Base Housing, Right
3	03-8986	Gun Housing, Molded Left
4	03-8987	Gun Housing, Molded Right
5	03-8989	Bomb Button
6	03-8988	Trigger
7	10-465	Spring, Trigger
8	10-466	Spring, Bomb Button
9	A-18603	Switch, Bomb Button
10	5647-12693-06	Switch, Trigger
11	A-18834	LED Board Assembly
12	03-9230-9	LED Extension
13	4008-01090-06B	TS, 8-32 x 3/8 PH-Trx-TP Typ23 Blk (10)
14	4008-01093-22B	MS, 8-32 x 1-3/8 TPR Black (6)
15	4010-01148-06B	MS, 10-32 x 3/8 FH Torx TP Black (6)
16	4010-01148-10B	MS, 10-32 x 5/8 FH Torx TP Black (4)
17	4108-01092-10B	SMS, #8 x 5/8 #1 Riser PH-T-20 TP Blk (2)
18	4408-01119-00B	Nut, 8-32 ESNA Black (6)
19	Gun Mechanism Parts	
a)	AE-23-800-08	Coil Assembly
b)	03-7067-5	Tubing, Plastic
c)	23-6735	Bumper, Plunger Rev X Gun
d)	01-13028	Solenoid Bracket
e)	23-6736	Bumper, Recoil Pad Rev X Gun
f)	10-482	Spring, Compression
g)	02-5059	Plunger
h)	20-10105	Bumper, 3/4" Diameter
i)	5014-12909-00	Potentiometer (2)
j)	03-8528-1	Gear, Segment, 32DP
k)	20-10107	Gear, Segment, Hubless
m)	20-10106	Gear, Spur
n)	03-9202	Spacer
p)	20-10108	Bumper
q)	03-9203	Disk, Plastic Washer
r)	20-10109	Bearing, .625 Bore (4)

NOTES

REVOLUTION X

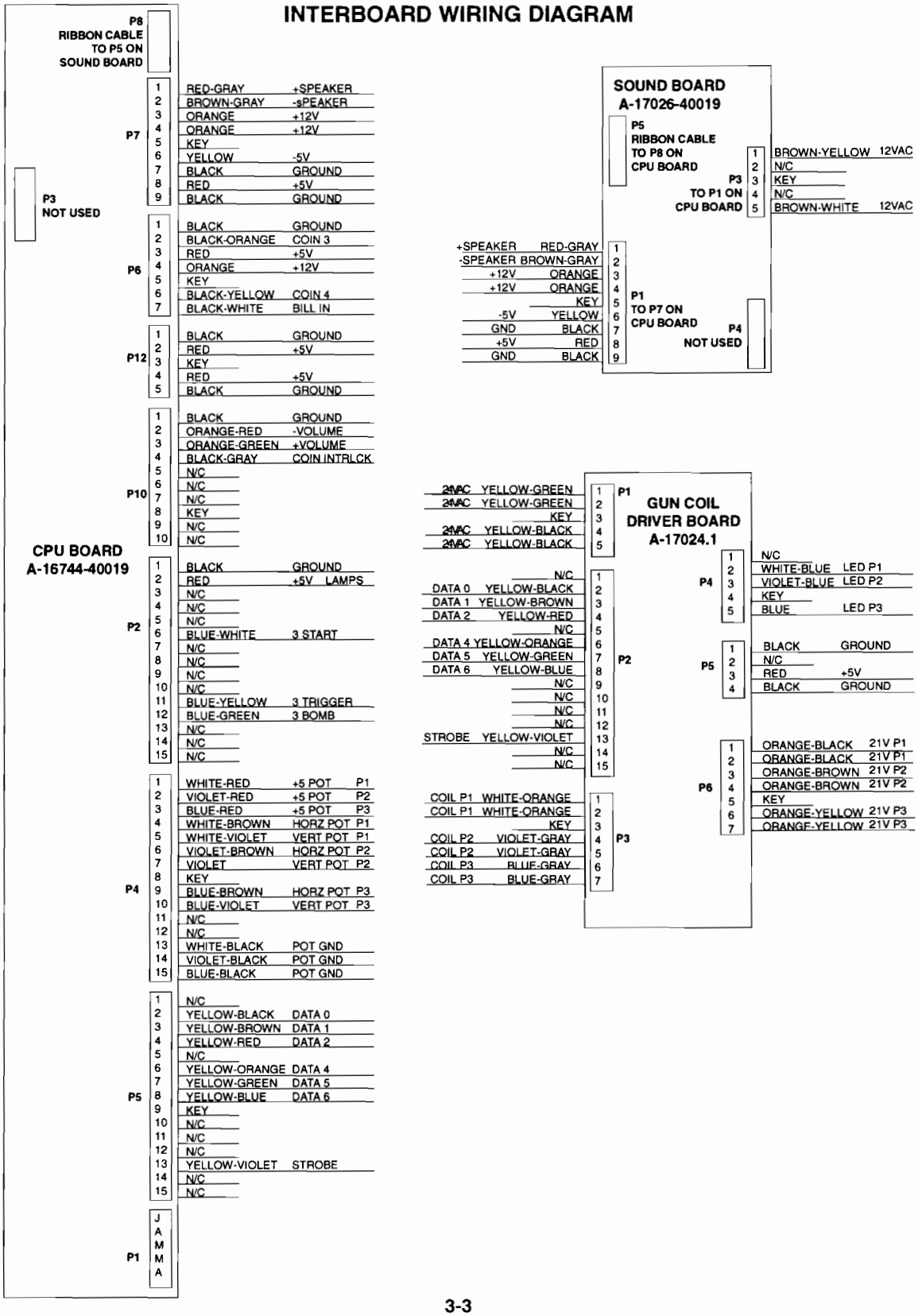
SECTION
three

Wiring Diagrams and Schematics

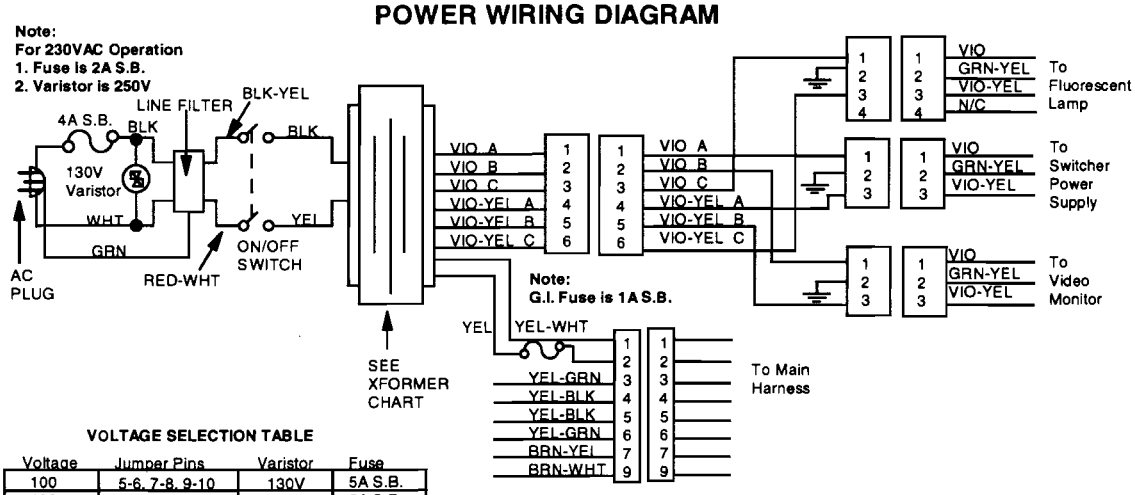
JAMMA CHART

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	
Meter 1	Brown	8	J	Brown-Red	Meter 2
	N/C	9	K	N/C	
Speaker (+)	Red-Gray	10	L	Brown-Gray	Speaker (-)
	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 Switch
Test Switch	Black-Blue	15	S	Black-Green	Tilt Switch
Coin 1	Black-Brown	16	T	Black-Red	Coin 2
Start 1	White	17	U	Violet-White	Start 2
	N/C	18	V	N/C	
	N/C	19	W	N/C	
	N/C	20	X	N/C	
	N/C	21	Y	N/C	
1 Push 1	White-Yellow	22	Z	Violet-Yellow	2 Push 1
1 Push 2	White-Green	23	a	Violet-Green	2 Push 2
	N/C	24	b	N/C	
	N/C	25	c	N/C	
	N/C	26	d	N/C	
Ground	Black	27	e	Black	Ground
Ground	Black	28	f	Black	Ground

INTERBOARD WIRING DIAGRAM



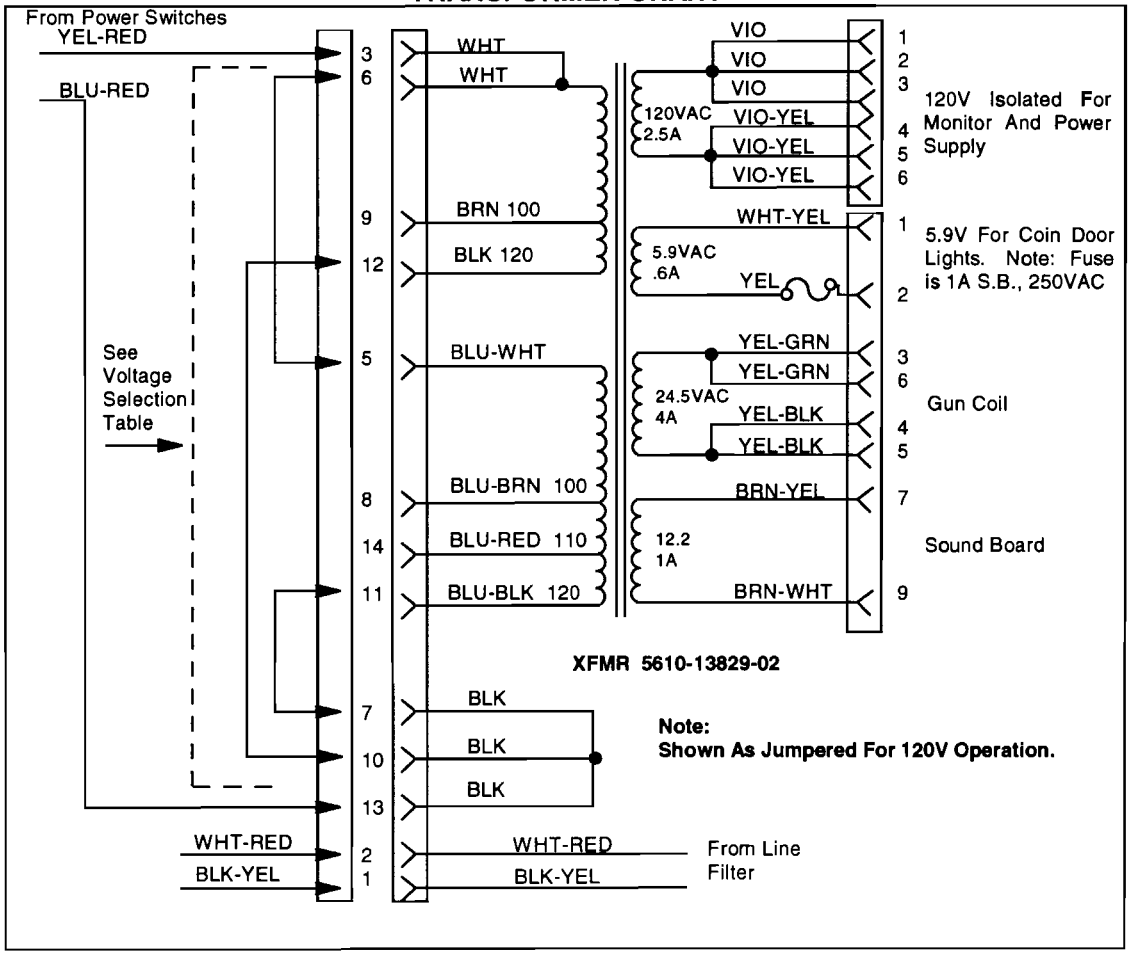
POWER WIRING DIAGRAM



VOLTAGE SELECTION TABLE

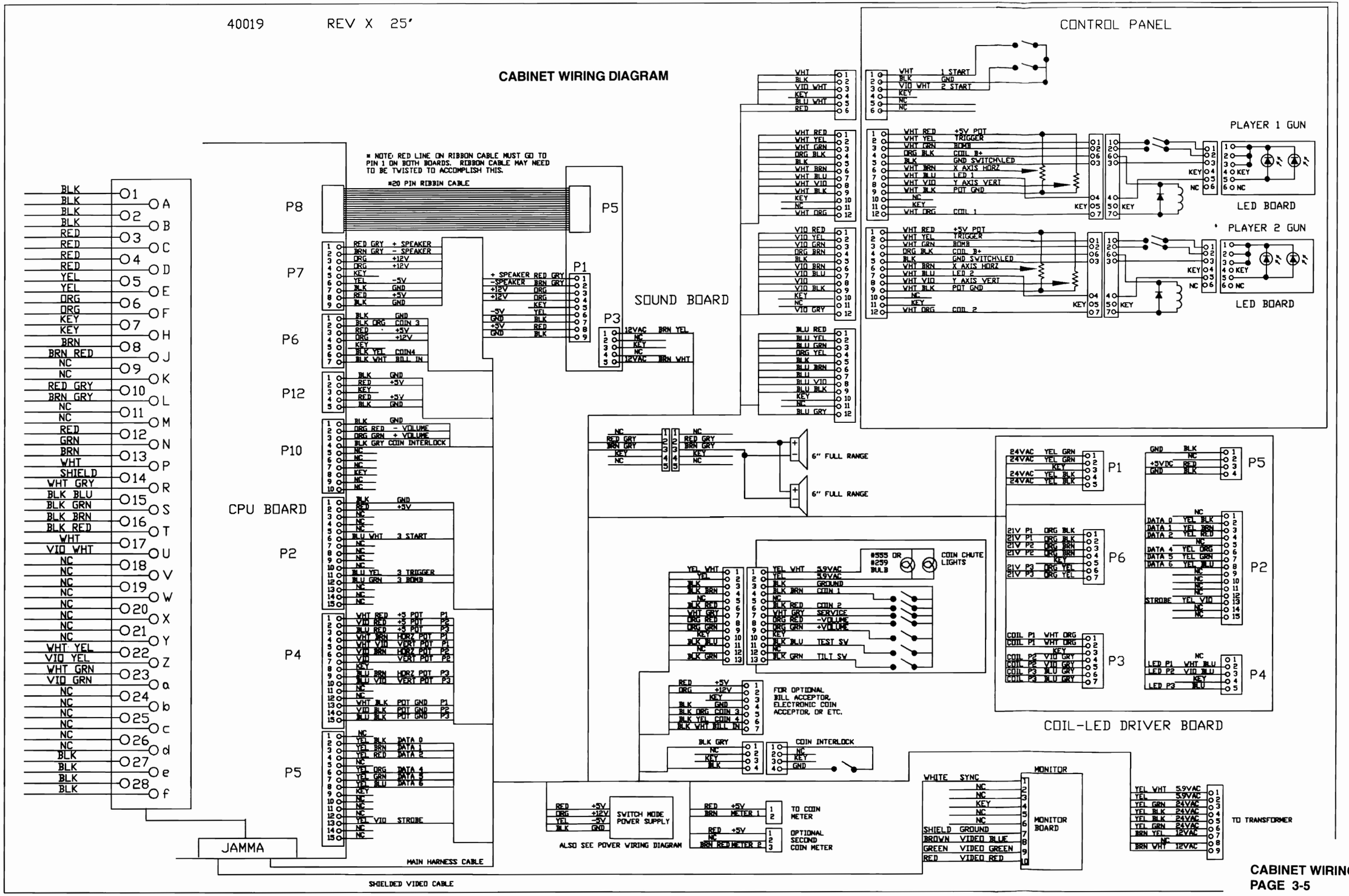
Voltage	Jumper Pins	Varistor	Fuse
100	5-6, 7-8, 9-10	130V	5A S.B.
120	5-6, 7-11, 10-12	130V	5A S.B.
200	5-9, 10-8	275V	3A S.B
210	5-9, 10-14	275V	3A S.B.
220	5-9, 10-11	275V	3A S.B.
230	5-12, 10-14	275V	3A S.B.
240	5-12, 10-11	275V	3A S.B.

TRANSFORMER CHART



40019 REV X 25'

CABINET WIRING DIAGRAM



GUN COIL DRIVER BOARD
PAGE 3-6

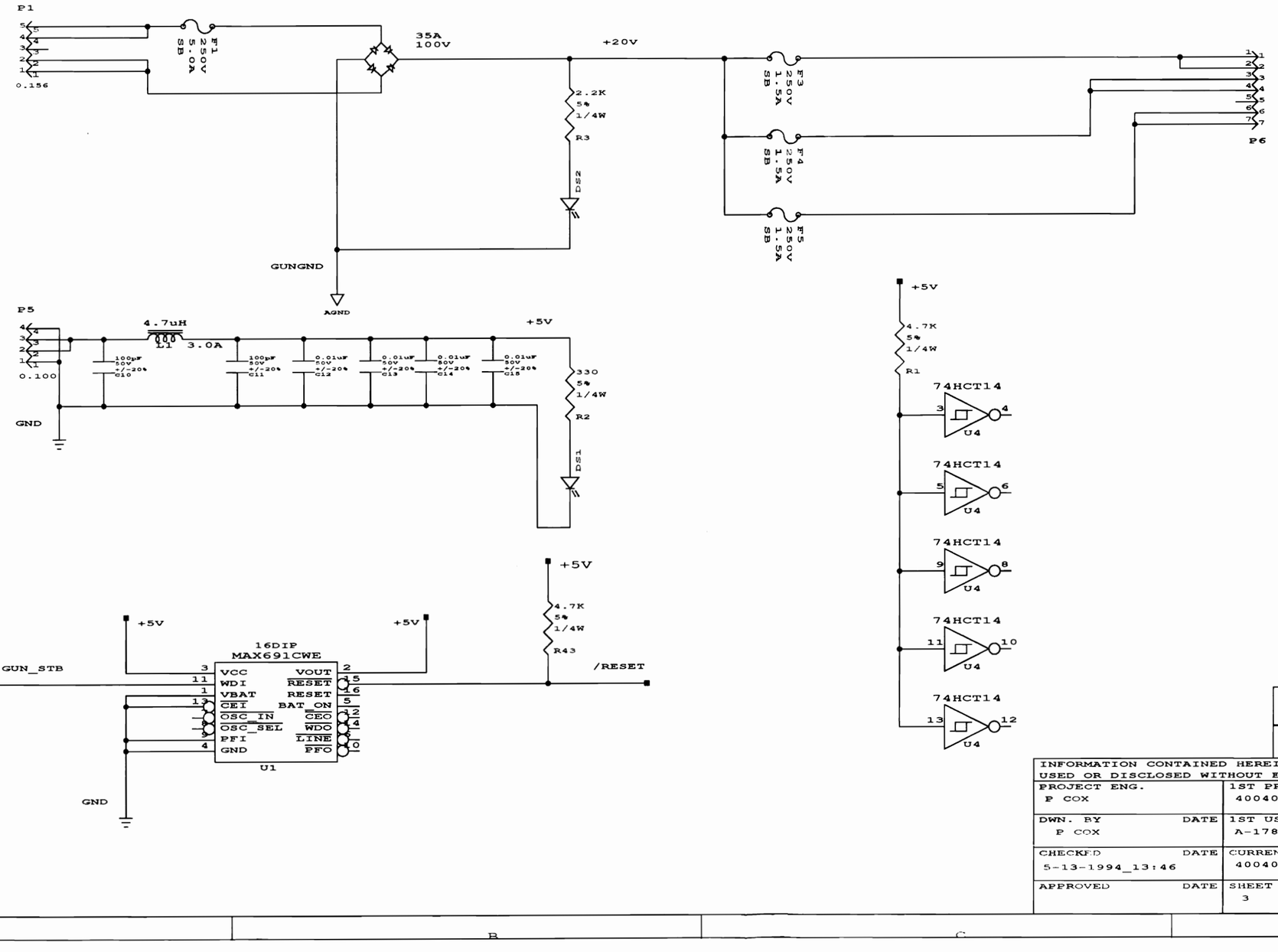
	UPDATE REF. DES. SEE SHEETS 2 AND 3
ECN 36074	CHANGE NPR — DATE 2-23-94

PROJECT ENG. P COX	1ST PROJ. NO. — DATE 40040	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY — DATE P COX	1ST USEAGE — DATE A-17876	TITLE GUNDRVR
CHECKED — DATE 5-13-1994 13:45	CURRENT PROJ. — DATE 40040	
APPROVED — DATE	SHEET 1 OF 3	PART NO. 16-9554 — REV. 1

GUN COIL DRIVER BOARD
PAGE 3-7

	UPDATE REF. DES. FOR R33, R34, R5
ECN 36074	CHANGE NPR — DATE 2-23-94

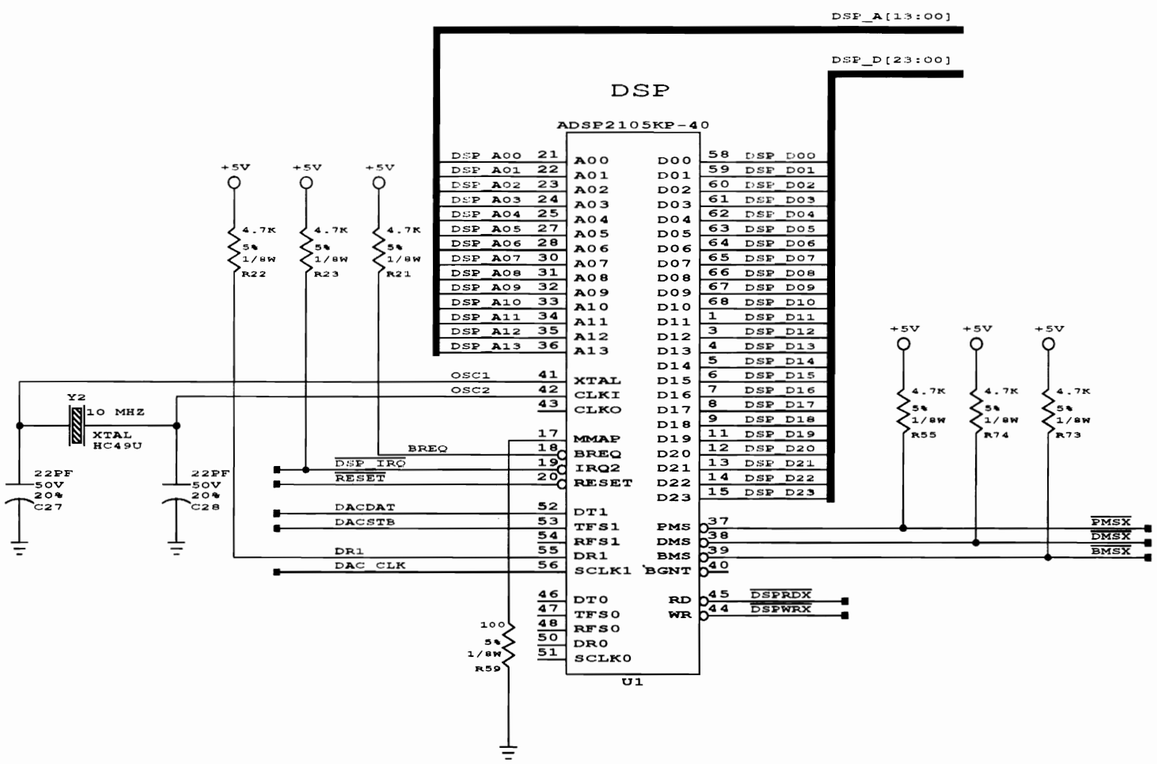
PROJECT ENG. P COX	1ST PROJ. NO. — DATE 40040	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY — DATE P COX	1ST USEAGE — DATE A-17876	TITLE GUNDRVR
CHECKED — DATE 5-13-1994_13:45	CURRENT PROJ. — DATE 40040	
APPROVED — DATE	SHEET 2 OF 3	PART NO. 16-9554 — REV. 1



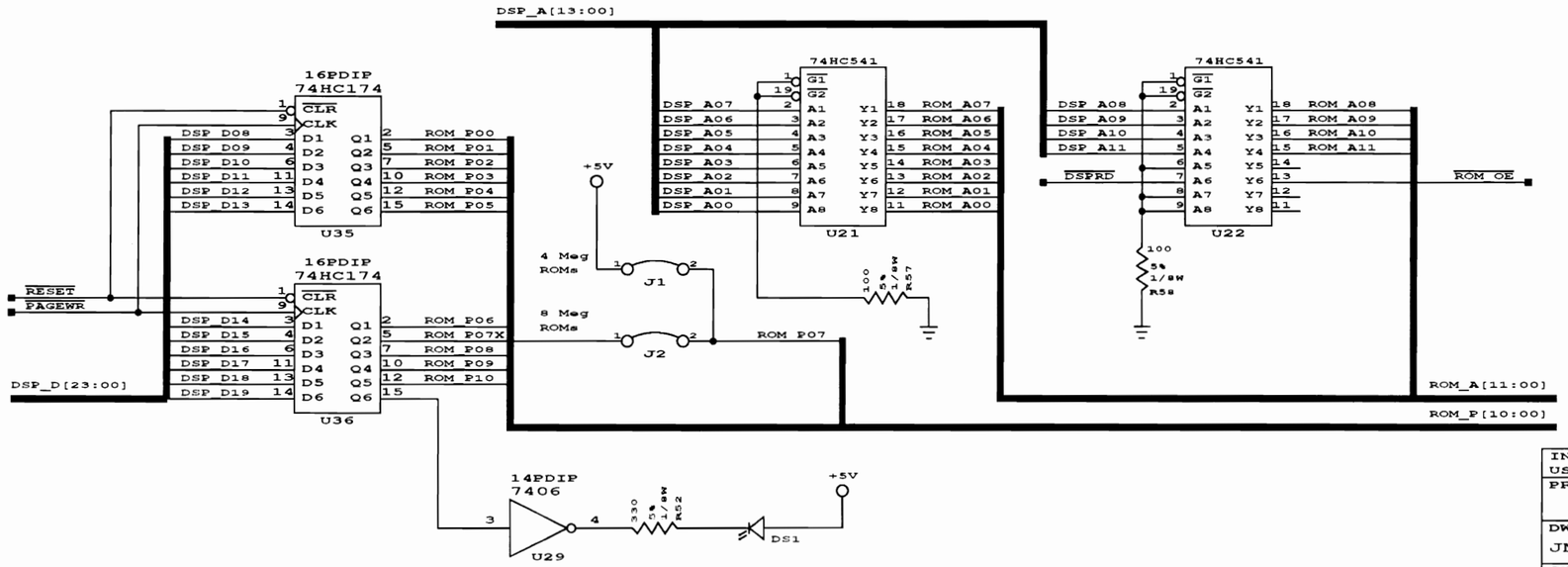
GUN COIL DRIVER BOARD
PAGE 3-8

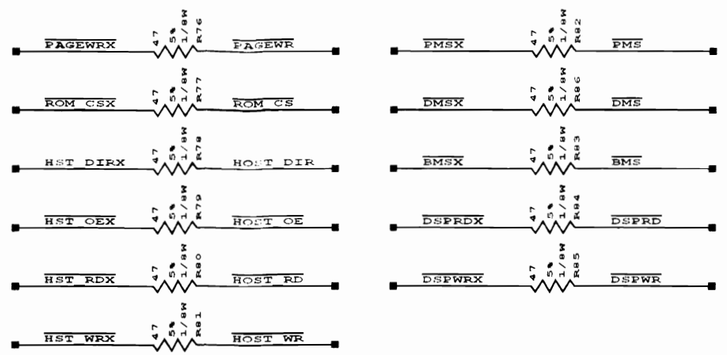
	ADD REF. DES. FOR F1
ECN 36074	CHANGE NPR — DATE 2-23-94

PROJECT ENG. P COX	1ST PROJ. NO. 40040 — DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY P COX — DATE	1ST USEAGE A-17876 — DATE	TITLE
CHECKED 5-13-1994_13:46 — DATE	CURRENT PROJ. 40040 — DATE	GUNDRVR
APPROVED — DATE	SHEET 3 — OF 3	PART NO. 16-9554 — REV 1

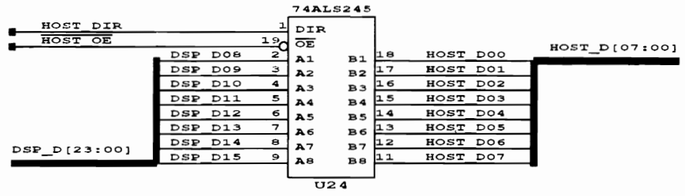


ROM DATA/ADDRESS BUFFERS

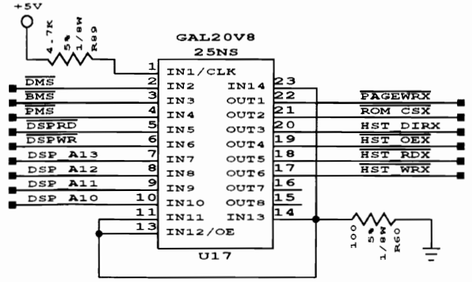




HOST BUFFER



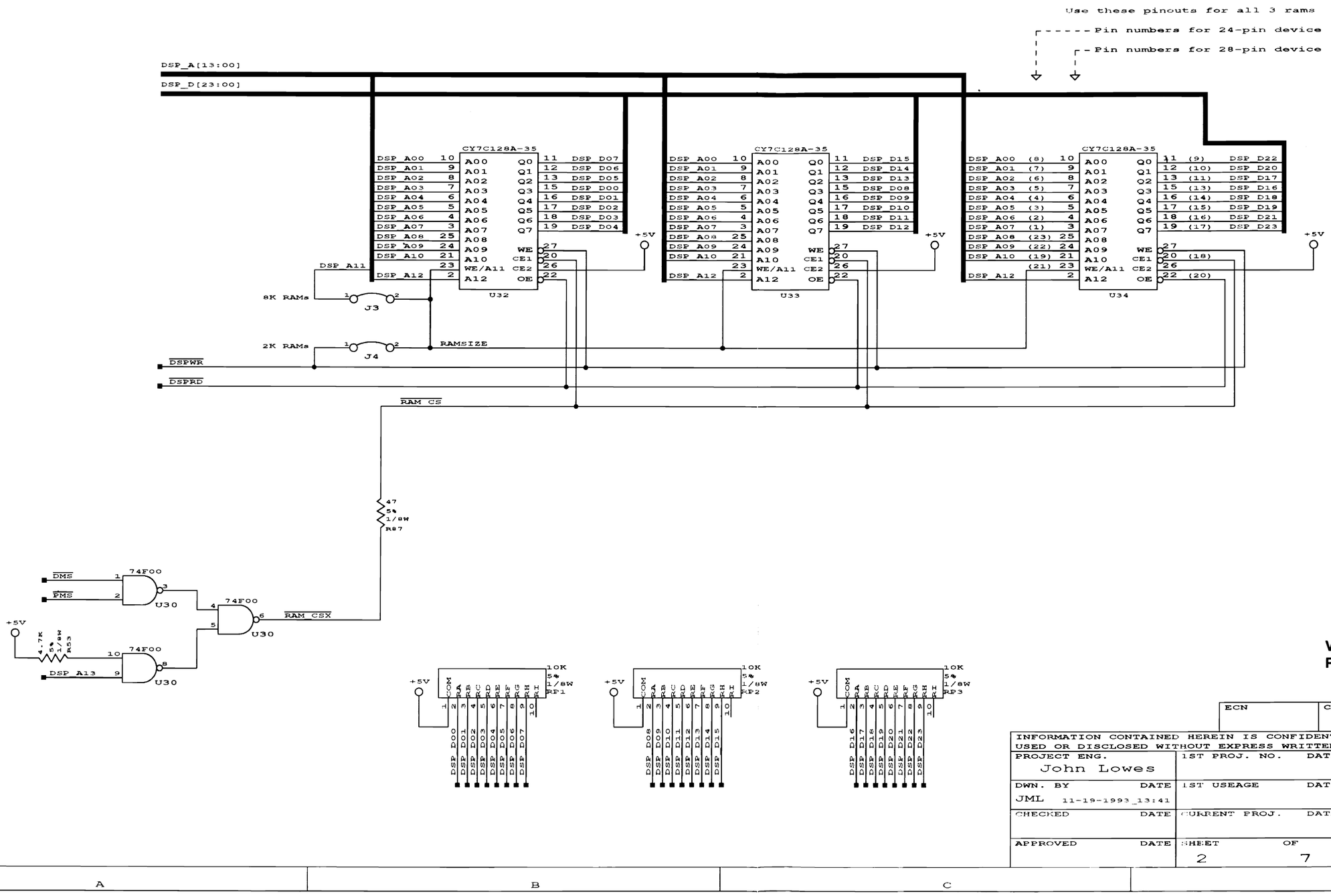
CONTROL PAL



VIDEO SOUND BOARD
PAGE 3-9

ECN	CHANGE	DATE

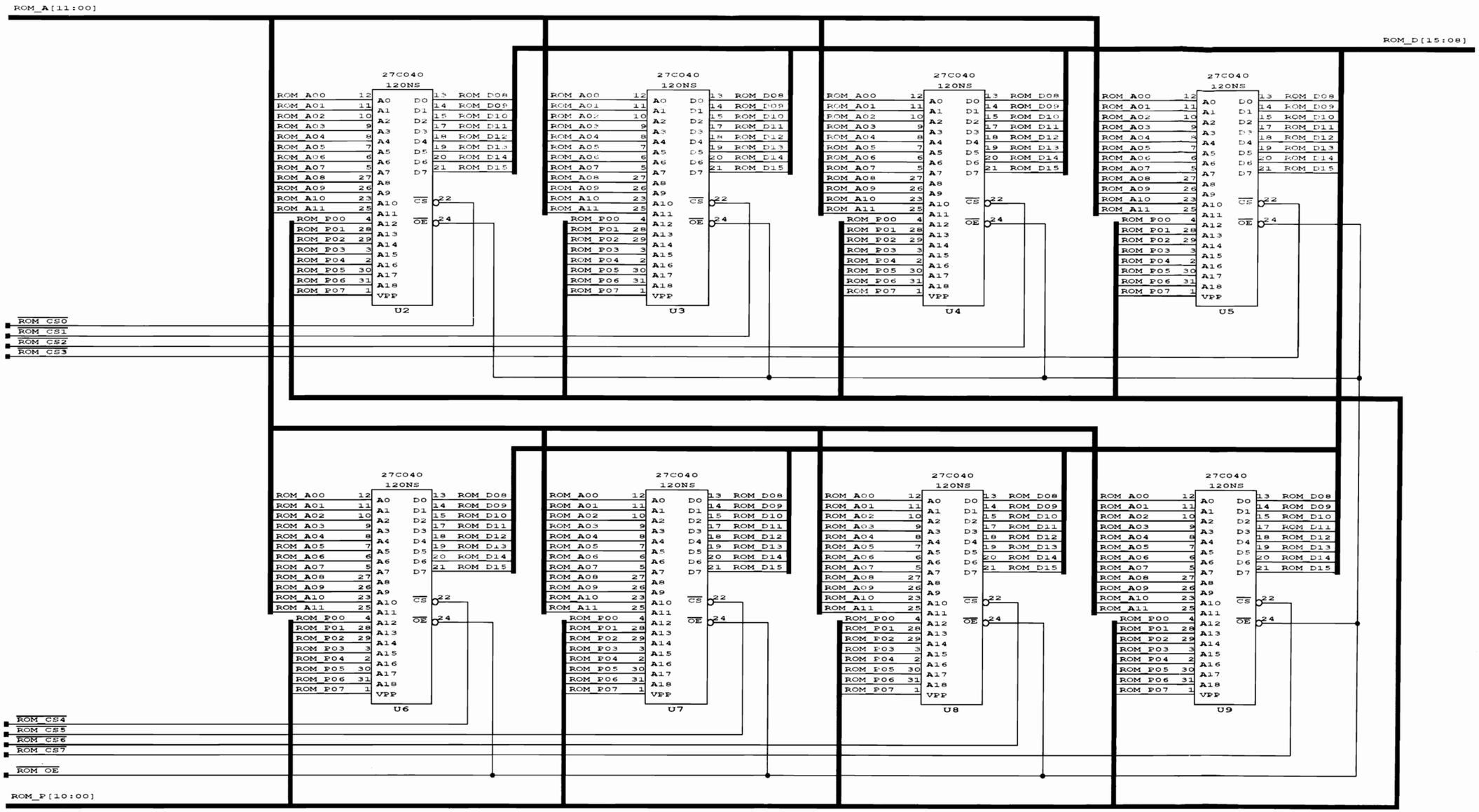
PROJECT ENG. John Lowes	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 11-19-1993_16:38	1ST USEAGE DATE	TITLE DCS Video Sound Board DSP/BUS Interface
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 1 OF 7	PART NO. 16-9615 REV. -

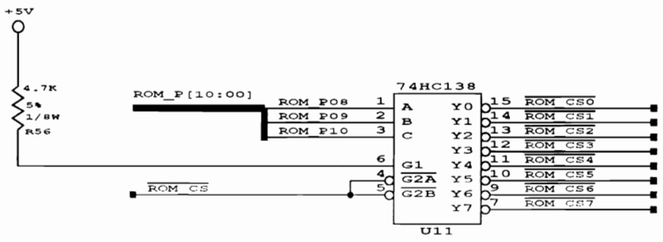


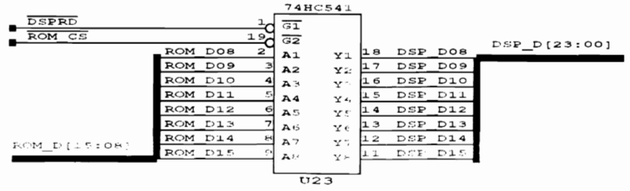
VIDEO SOUND BOARD
PAGE 3-10

ECN	CHANGE	DATE

PROJECT ENG. John Lowes	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 11-19-1993 13:41	1ST USEAGE DATE	TITLE DCS Video Sound Board System RAMs
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 2 OF 7	PART NO. 16-9615 REV. -







VIDEO SOUND BOARD
PAGE 3-11

ECN	CHANGE	DATE

PROJECT ENG. John Lowes	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 11-19-1993_14:03	1ST USEAGE DATE	TITLE DCS Video Sound Board Program/Data Roms
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 3 OF 7	PART NO. 16-9615 REV. -

Aux In
74HC14
U38
DACSTB
100
5%
1/8W
R45
100PF
50V
20%
C11
+5V
AD1851
U16
-VA
DGND
+VD
NC
CLK
LTCH
DATA
-VD
+VA
TRIM
MSBA
AGND
IOUT
SJ
RFB
VOUT
-5A
+5A
0.1UF
50V
20%
C55
DAC_CLK
DACDAT
DACOUT
0.1UF
50V
20%
C52
C53
C54
AGND
J6
F6
DACSIG
10UF
25V
20%
C100
6.19K
1%
1/8W
R44
R35
R36
R37
R34
R33
47K
5%
1/8W
R24
3900PF
50V
5%
C48
C49
1000PF
50V
20%
C35
C38
680PF
50V
20%
C101
C102
TL084
U37
Install J5 if 12V is used
as power amp (U20) supply.
From Aux
Power supply
V_AUD
0.01UF
50V
+80/-20%
C39
MB3731
U20
IN
NC
BYPASS
FB
MUTE
GND_IN
VCC
BS-M
OUT-M
OUT-I
BS-I
GND_OUT
100UF
25V
20%
C31
C32
+SPKR
-SPKR
FILM
0.1UF
100V
10%
C58
C59
C60
To P1
Page 6
100K
5%
1/8W
R3
10UF
25V
20%
C106
220UF
16V
20%
C33
C1
C2
12K
5%
1/8W
R46
820
5%
1/8W
R2
1K
5%
1/8W
R1
F7
Line Out
VIDEO SOUND BOARD
PAGE 3-12
ECN
CHANGE
DATE
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.
PROJECT ENG.
John Lowes
1ST PROJ. NO.
DATE
WILLIAMS ELECTRONICS GAMES
MIDWAY MANUFACTURING CO.
3401 N. CALIFORNIA AVENUE
CHICAGO ILLINOIS USA
DWN. BY
DATE
JML
5-12-1994_12:22
1ST USEAGE
DATE
TITLE
DCS Video Sound Board
Anti-Aliasing Filter
CHECKED
DATE
CURRENT PROJ.
DATE
APPROVED
DATE
SHEET
4
OF
7
PART NO.
16-9615
REV.
-

Add 0.1uF and 0.01uF caps
for every 26lsXX part.

HOST_D[07:00]
HOST_D00
HOST_D01
HOST_D02
HOST_D03
HOST_D04
HOST_D05
HOST_D06
HOST_D07

74LS374 U19
26LS31 U25
26LS32A U12
26LS31 U26
26LS32A U13
26LS31 U27
26LS32A U14
74LS74 U18
74LS74 U18

100 5% 1/8W R45
+5V
470 5% 1/8W R4
220 5% 1/8W R47
Biased at 1.6V

47 5% 1/8W R19 SND_D00
47 5% 1/8W R5 SND_D01
47 5% 1/8W R6 SND_D02
47 5% 1/8W R7 SND_D03
47 5% 1/8W R11 SND_D04
47 5% 1/8W R10 SND_D05
47 5% 1/8W R9 SND_D06
47 5% 1/8W R8 SND_D07

100PF 50V 20% C12
100PF 50V 20% C13
100PF 50V 20% C14
100PF 50V 20% C15
100PF 50V 20% C16
100PF 50V 20% C17
100PF 50V 20% C18
100PF 50V 20% C19
EGND

J11
0.100"
P4

47 5% 1/8W R14 SND_DAV
47 5% 1/8W R13 B_SND_RD
47 5% 1/8W R12 SND_RDY
47 5% 1/8W R15 SNDVIDRD
47 5% 1/8W R16 B_VIDDAV
47 5% 1/8W R17 SND_SRES
47 5% 1/8W R18 B_VIDRES

100PF 50V 20% C20
100PF 50V 20% C21
100PF 50V 20% C22
EGND

4.7K 5% 1/8W R29
4.7K 5% 1/8W R30
100 5% 1/8W R48
Stuff jumper for parallel interface

HOST_RD J7
HOST_WR
DSP_IRQ J15
WR_ACK
WR_EN
RDY_CLK
SOFT_RES
HARD_RES

4.7K 5% 1/8W R25
4.7K 5% 1/8W R26
4.7K 5% 1/8W R27
4.7K 5% 1/8W R28

100PF 50V 20% C26
100PF 50V 20% C25
100PF 50V 20% C24
EGND

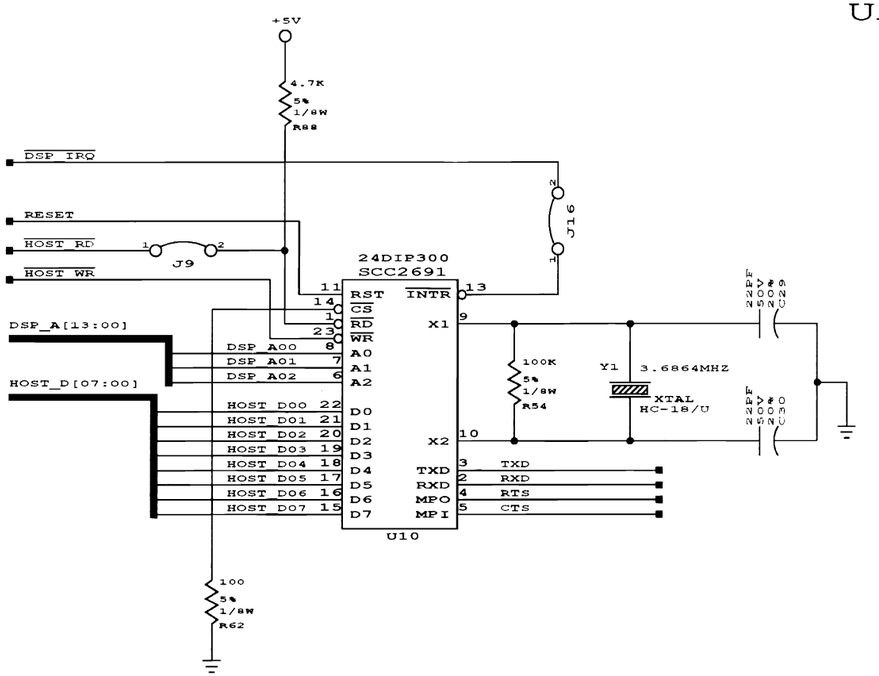
VIDEO SOUND BOARD
PAGE 3-13

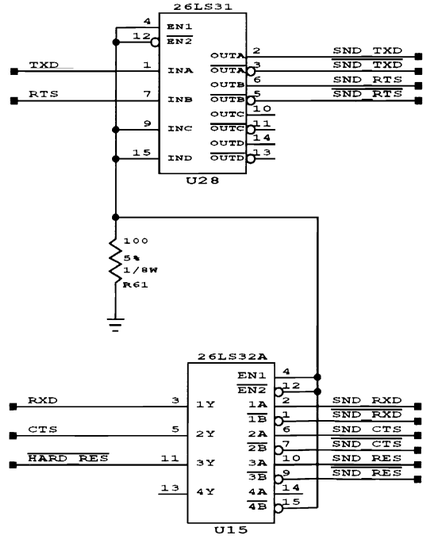
ECN	CHANGE	DATE

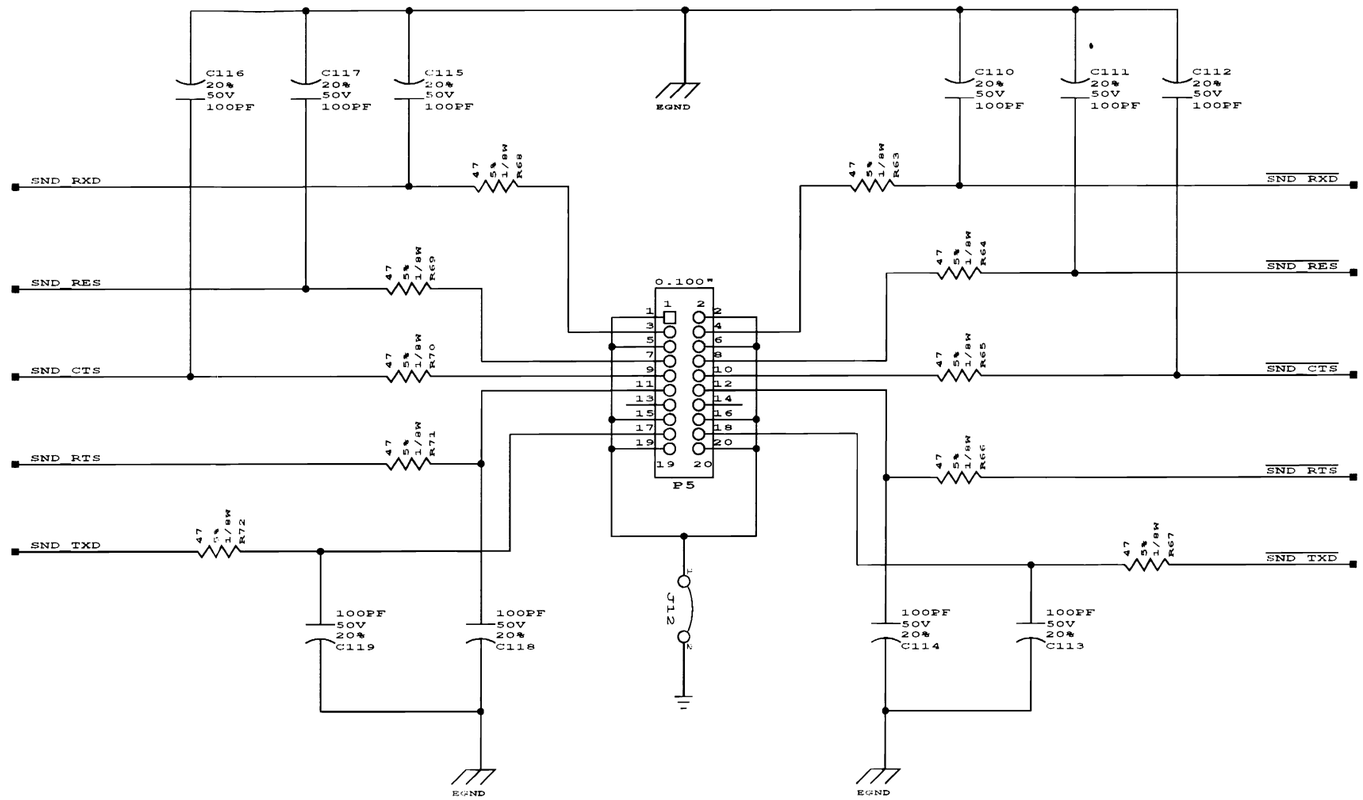
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.

PROJECT ENG. John Lowes	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 11-19-1993 15:33	1ST USEAGE DATE	TITLE DCS Video Sound Board Parallel Interface
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 5 OF 7	PART NO. 16-9615 REV. -

UART Interface





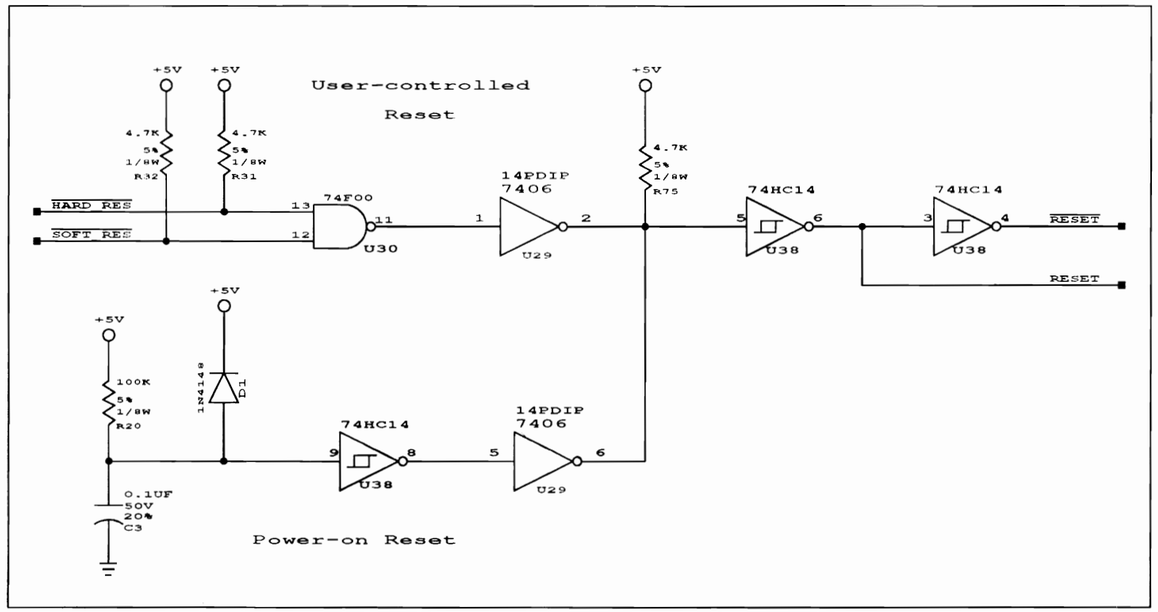


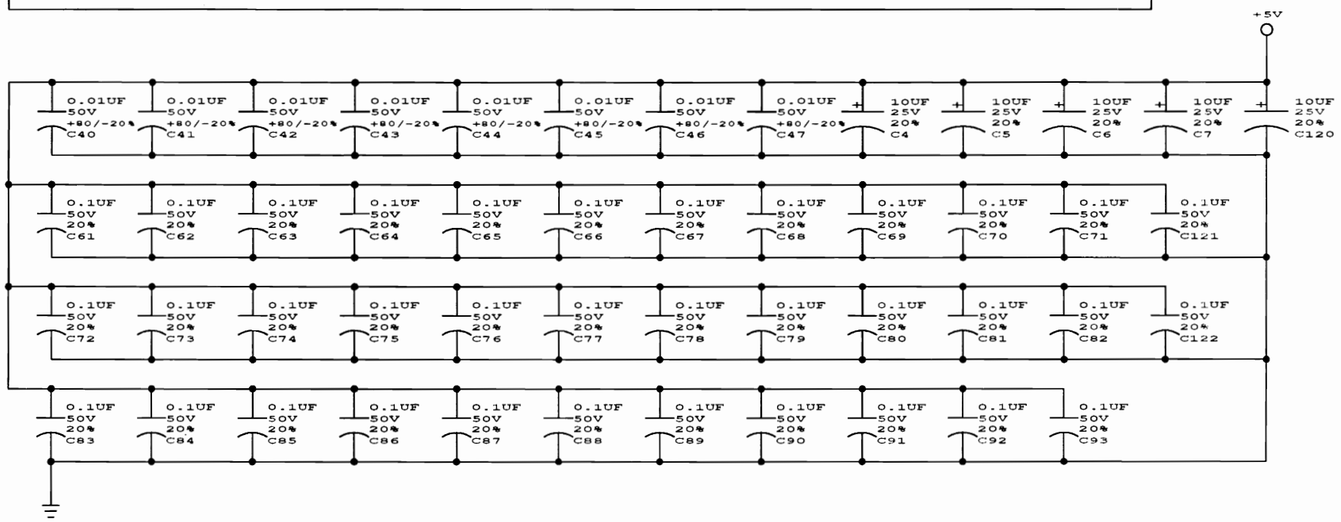
VIDEO SOUND BOARD
PAGE 3-14

ECN	CHANGE	DATE

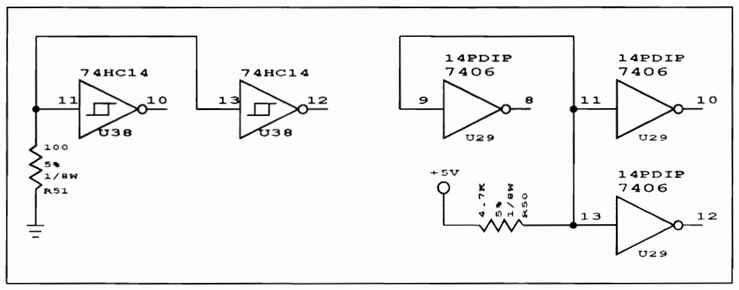
PROJECT ENG. John Lowes	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 11-19-1993_15:53	1ST USEAGE DATE	TITLE DCS Video Sound Board UART Serial Interface
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 6 OF 7	PART NO. 16-9615 REV. -

Reset Circuit

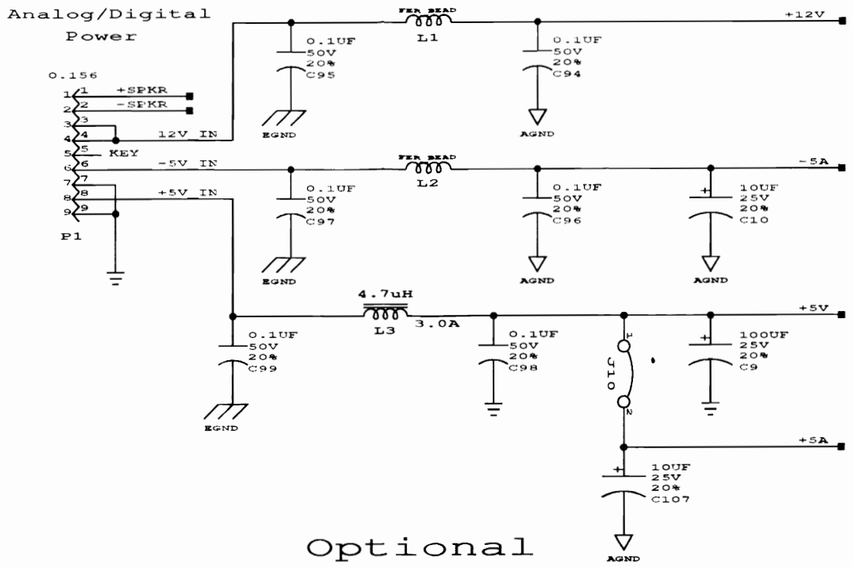




Spare Gates



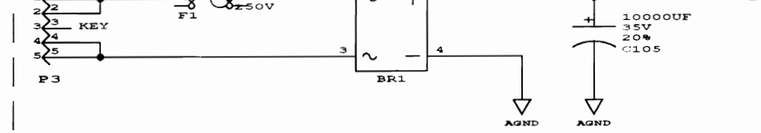
Analog/Digital Power

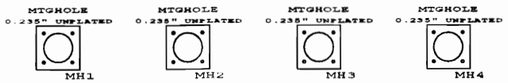


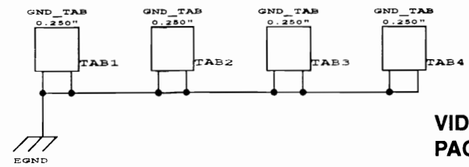
Optional

Aux Power: If used, then do NOT stuff C34, C94, C95, L1, and J5.
This circuit replaces +12V as the power amp (U20) supply.

16VAC

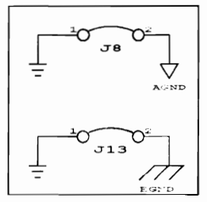






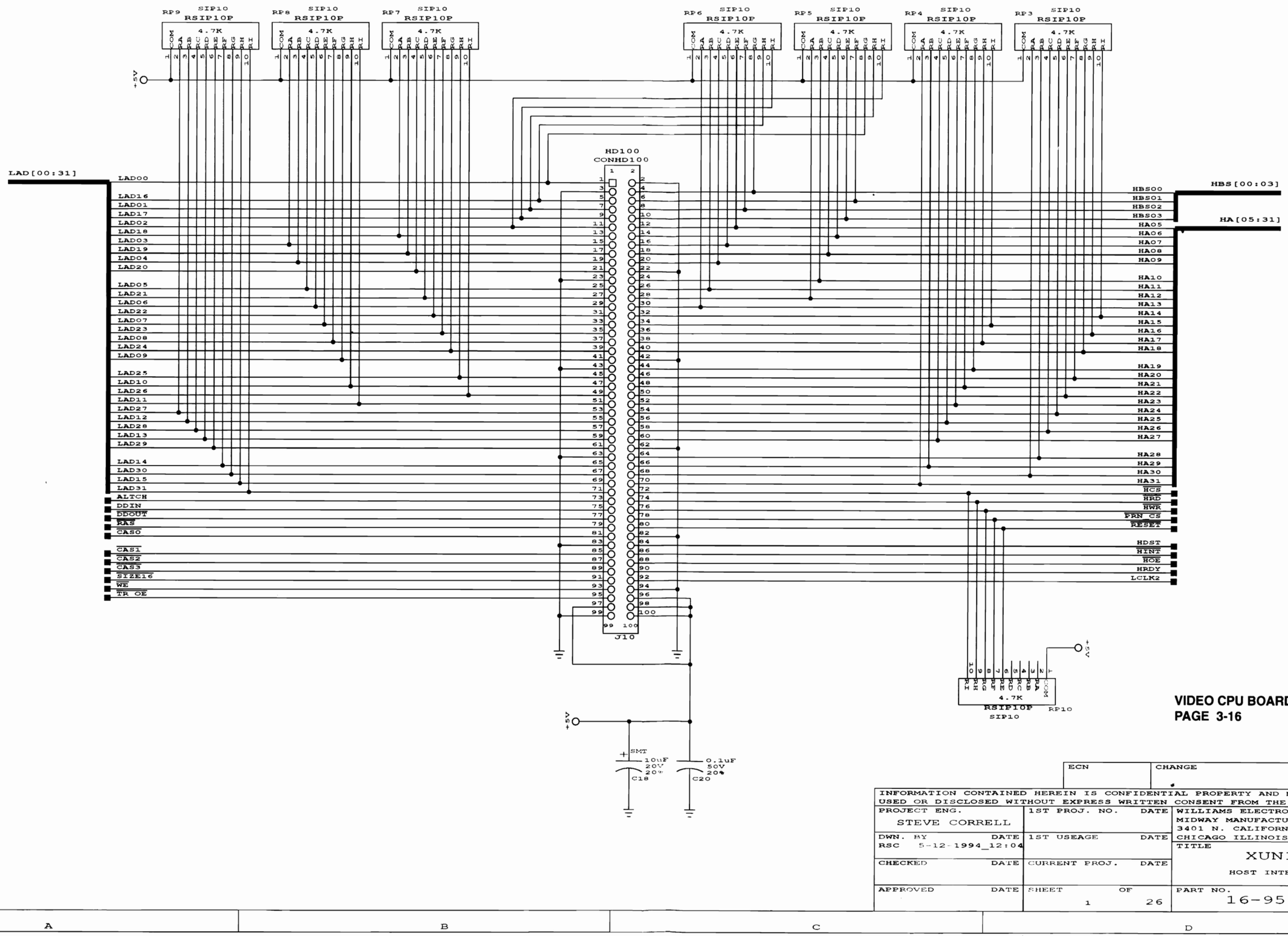
VIDEO SOUND BOARD
PAGE 3-15

GROUND ISOLATION



ECN	CHANGE	DATE

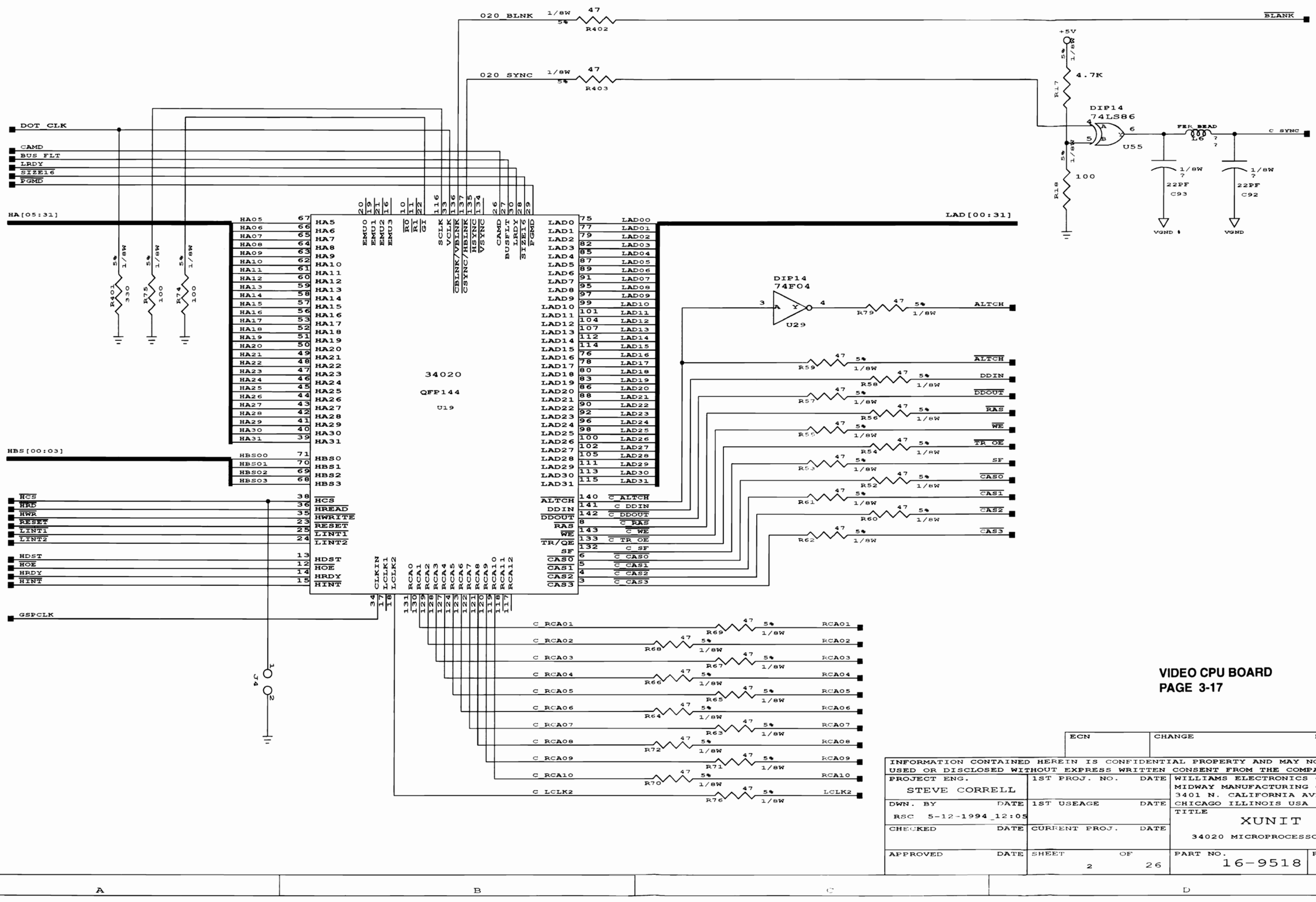
PROJECT ENG. John Lowes	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 12-28-1993 19:14	1ST USEAGE DATE	TITLE DCS Video Sound Board Reset and Power
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 7 OF 7	PART NO. 16-9615 REV. -



VIDEO CPU BOARD
PAGE 3-16

ECN	CHANGE	DATE

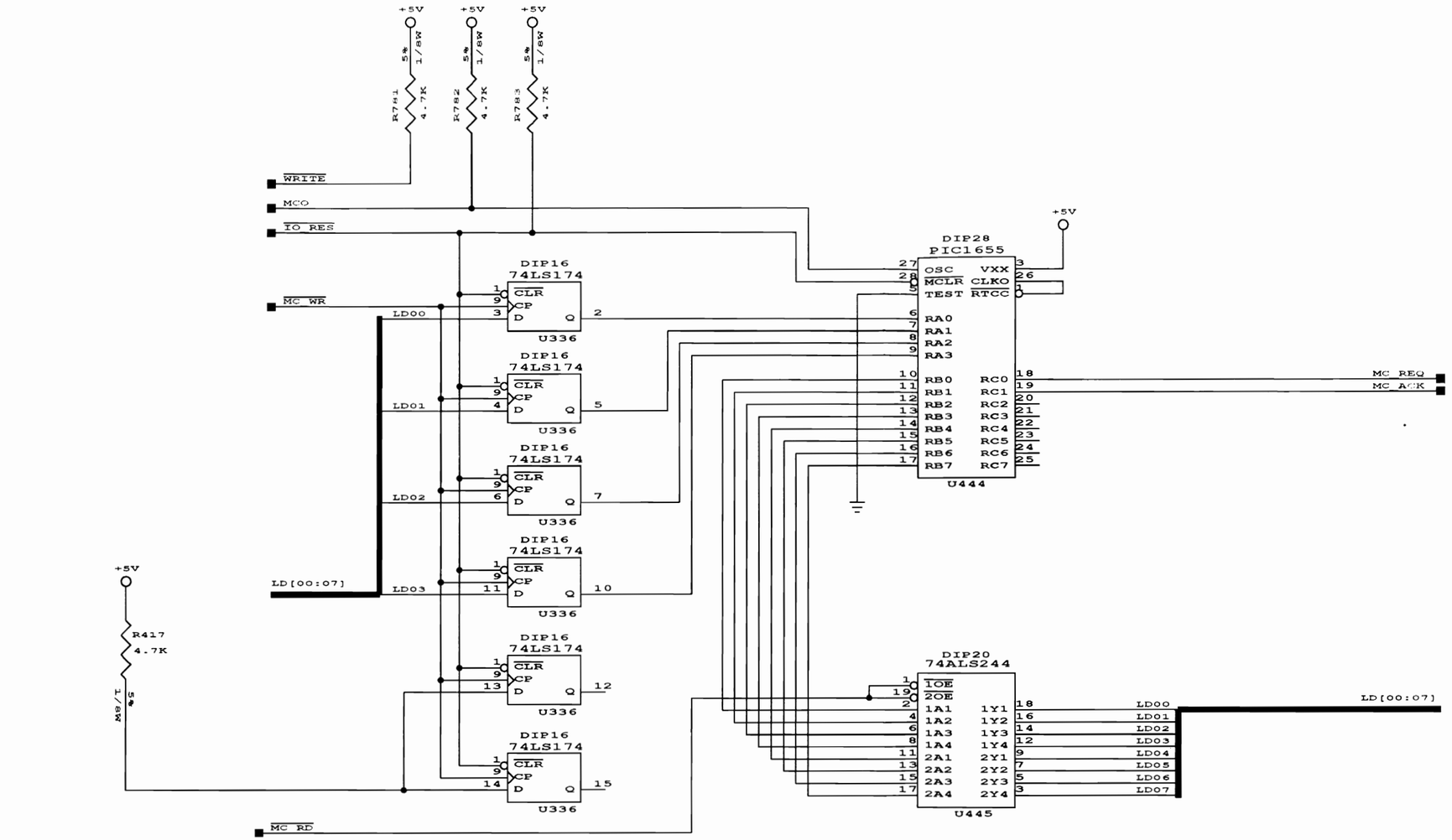
PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:04	1ST USEAGE DATE	TITLE XUNIT HOST INTERFACE
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET OF 1 26	PART NO. 16-9518 REV. 4

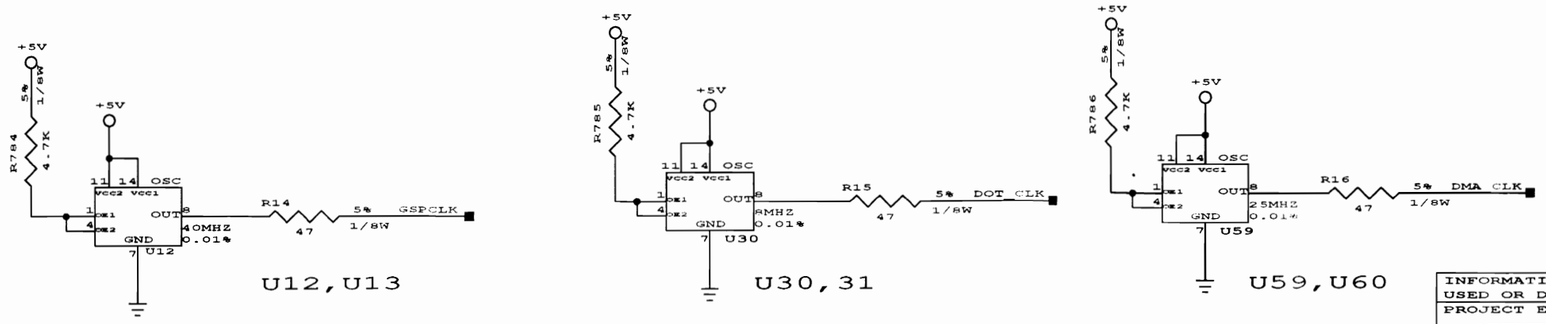


VIDEO CPU BOARD
PAGE 3-17

ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994 12:05	1ST USEAGE DATE	TITLE XUNIT 34020 MICROPROCESSOR
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 2 OF 26	PART NO. 16-9518 REV. 4





U12,U13 U30,31 U59,U60

NOTE : OSCILLATORS HAVE DUAL FOOTPRINTS
WITH TWO REFDES ATTRIBUTES.
REFDES USED IS DEPENDANT UPON PACKAGE USED.

VIDEO CPU BOARD
PAGE 3-18

ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:06	1ST USEAGE DATE	TITLE XUNIT CAN BUS AND CLOCK GENERATION CIRCUITRY
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 3 OF 26	PART NO. 16-9518 REV. 4

LOCAL BUS ADDRESS LATCH

LAD[00:31]

LA[00:14]

DIP20
74ALS374
U28

LAD05	3	Q1	2 LA00
LAD06	4	Q2	5 LA01
LAD07	7	Q3	6 LA02
LAD08	8	Q4	9 LA03
LAD09	13	Q5	12 LA04
LAD10	14	Q6	15 LA05
LAD11	17	Q7	16 LA06
LAD12	18	Q8	19 LA07

DIP20
74ALS374
U22

LAD13	3	Q1	2 LA08
LAD14	4	Q2	5 LA09
LAD15	7	Q3	6 LA10
LAD16	8	Q4	9 LA11
LAD17	13	Q5	12 LA12
LAD18	14	Q6	15 LA13
LAD19	17	Q7	16 LA14
LAD04	18	Q8	19 SA04

ALTCH

R180 330 5% 1/8W

C301 22PF 1/8W ?

R87 100 5% 1/8W

LOCAL BUS CMOS RAM

LA[00:14]

R90 4.7K 5% 1/8W

J99

SOP28
5565X (LOW PWR)
U15

LA00	10	A0	VCC 28
LA01	9	A1	
LA02	8	A2	
LA03	7	A3	
LA04	6	A4	
LA05	5	A5	
LA06	4	A6	
LA07	3	A7	
LA08	25	A8	
LA09	24	A9	
LA10	21	A10	
LA11	23	A11	D0 11 LD00
LA12	2	A12	D1 12 LD01
LA13	26	CE2	D2 13 LD02
LA14	1	NC	D3 15 LD03
			D4 16 LD04
READ	20	CE1	D5 17 LD05
	22	OE	D6 18 LD06
WRITE	27	WE	D7 19 LD07

LD[00:15]

LOCAL BUS DATA XCVR

RDCYCLE

DIP14
74F32
U32

LD XFER 1
RAS 2
3 LB OE

SOP20
74ABT245
U17

	1	DIR	
	19	OE	
LAD00	2	A1	B1 18 LD00
LAD01	3	A2	B2 17 LD01
LAD02	4	A3	B3 16 LD02
LAD03	5	A4	B4 15 LD03
LAD04	6	A5	B5 14 LD04
LAD05	7	A6	B6 13 LD05
LAD06	8	A7	B7 12 LD06
LAD07	9	A8	B8 11 LD07

SOP20
74ABT245
U90

	1	DIR	
	19	OE	
LAD08	2	A1	B1 18 LD08
LAD09	3	A2	B2 17 LD09
LAD10	4	A3	B3 16 LD10
LAD11	5	A4	B4 15 LD11
LAD12	6	A5	B5 14 LD12
LAD13	7	A6	B6 13 LD13
LAD14	8	A7	B7 12 LD14
LAD15	9	A8	B8 11 LD15

RP12 SIP10
RSIP10P
4.7K

1 COM	2 RA	3 RB	4 RC	5 RD	6 RE	7 RF	8 RG	9 RH	10 RI	
+5V	LD00	LD01	LD02	LD03	LD04	LD05	LD06	LD07		

RP13 SIP10
RSIP10P
4.7K

1 COM	2 RA	3 RB	4 RC	5 RD	6 RE	7 RF	8 RG	9 RH	10 RI	
	LD08	LD09	LD10	LD11	LD12	LD13	LD14	LD15		

RESET CIRCUITRY

R159 4.7K 5% 1/8W +5V

R89 4.7K 5% 1/8W +5V

WDOGSEL

NVRAMCY

J15

DIP16
MAX691CWE
U3

3	VCC	VOUT	2 VBAT
11	WDI	RESET	15
1	VBAT	RESET	16
13	CEI	BAT_ON	5
7	OSC_IN	CEO	12 NVRAMCS
8	OSC_SEL	WDO	14
9	PFI	LINE	6
4	GND	PFO	10

+5V

B1 3.0V LITHIUM BATTERY

BATTERY SOCKET
SKT1

SWITCH ST

C30 470pF 50V 10%

C31 0.33UF 50V +20/-80%

DIP14
74LS14
U9

1 A Y 2 — 3 A Y 4

RES_IN

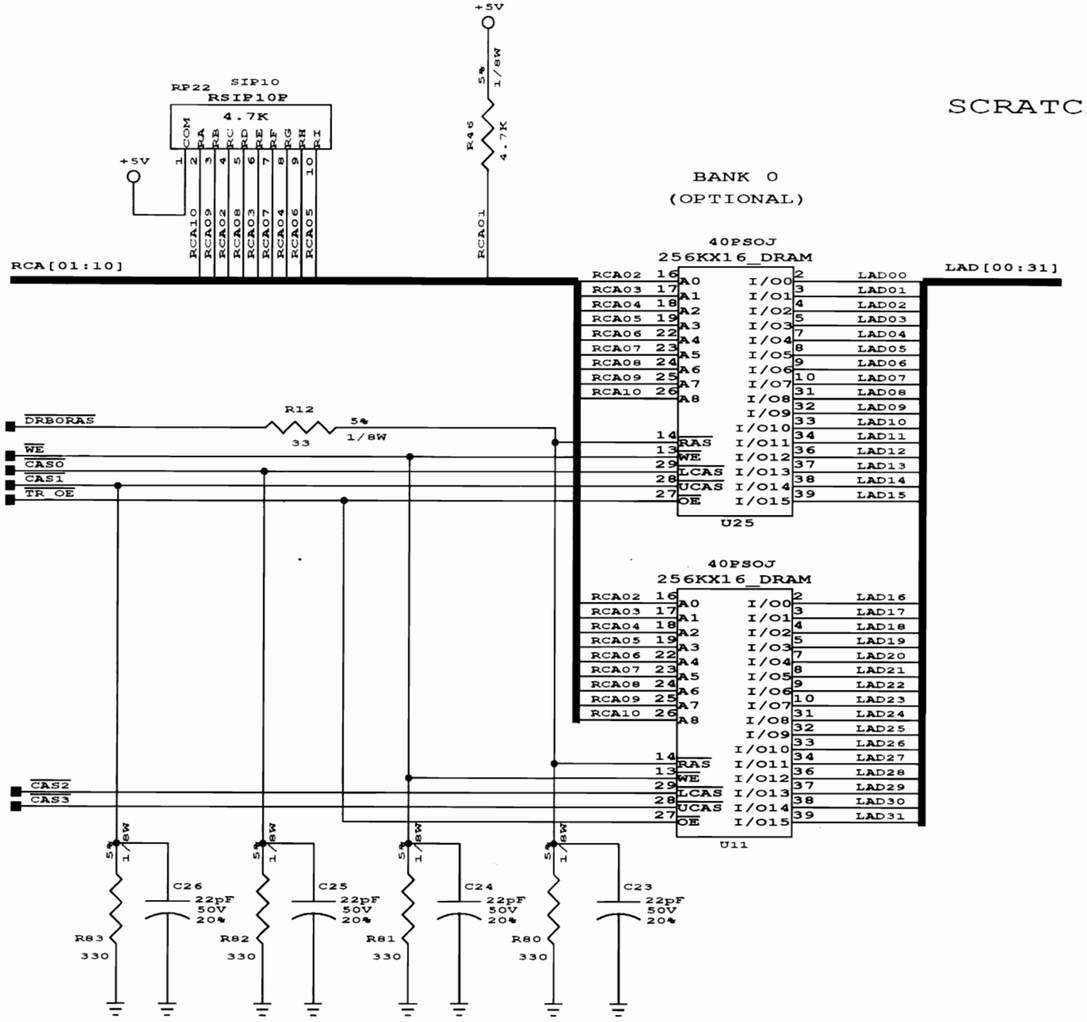
WDOGMON

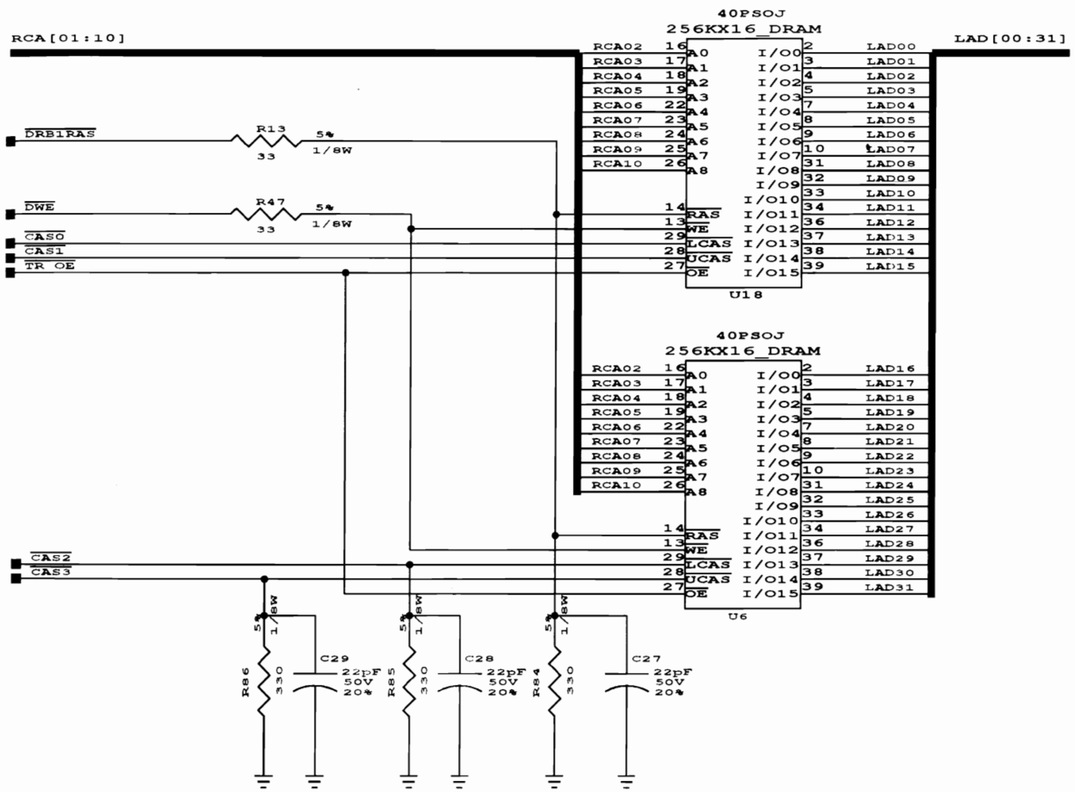
VIDEO CPU BOARD
PAGE 3-19

ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:06	1ST USEAGE DATE	TITLE XUNIT LOCAL BUS INTERFACE AND CMOS RAM
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 4 OF 26	PART NO. 16-9518 REV. 4

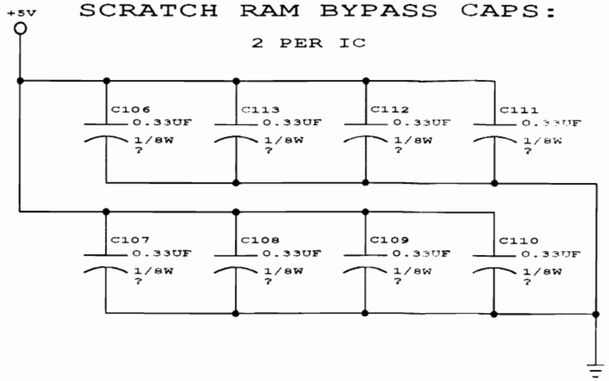
SCRATCH/MEMORY DRAM





SCRATCH RAM BYPASS CAPS:

2 PER IC

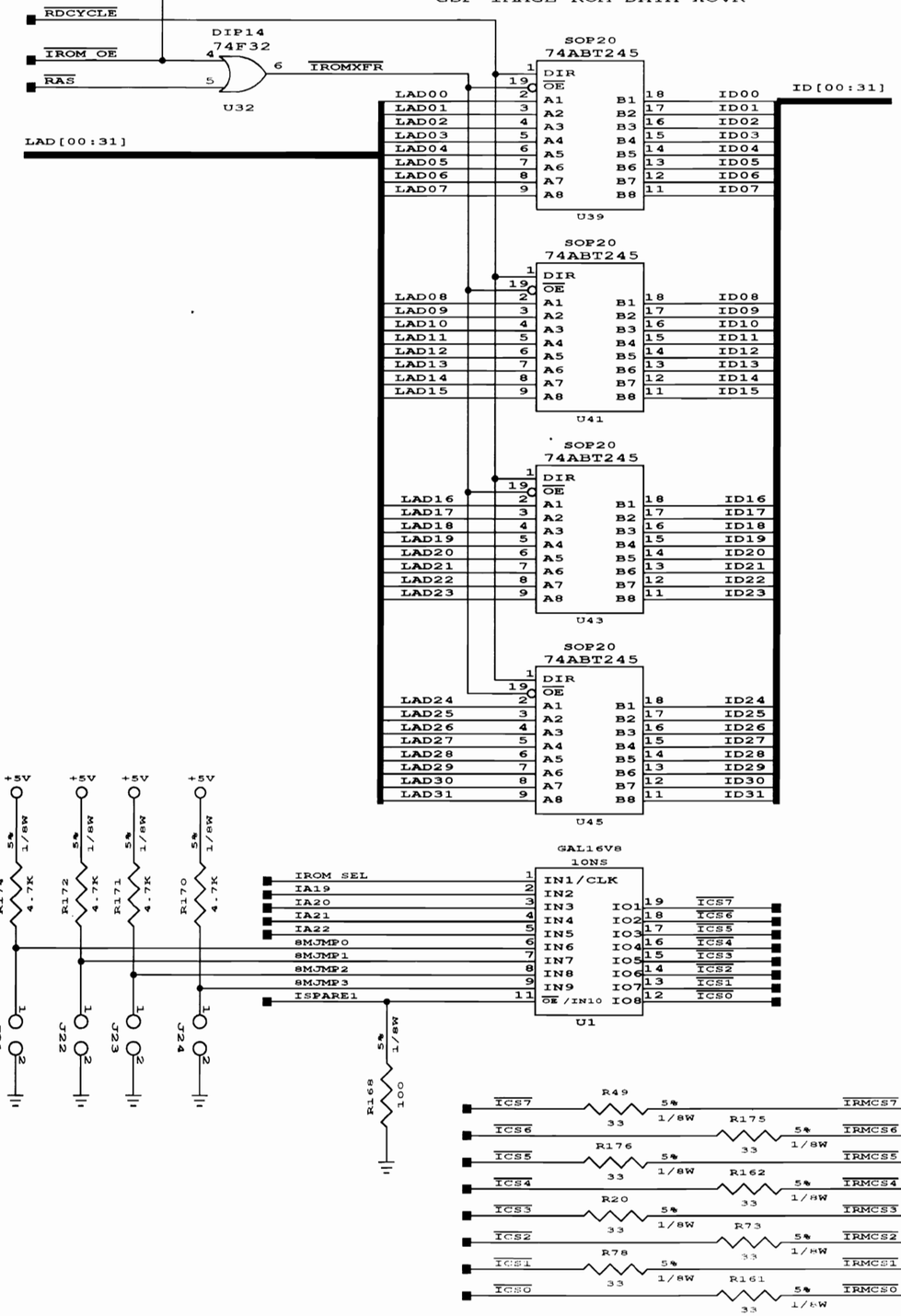


VIDEO CPU BOARD
PAGE 3-20

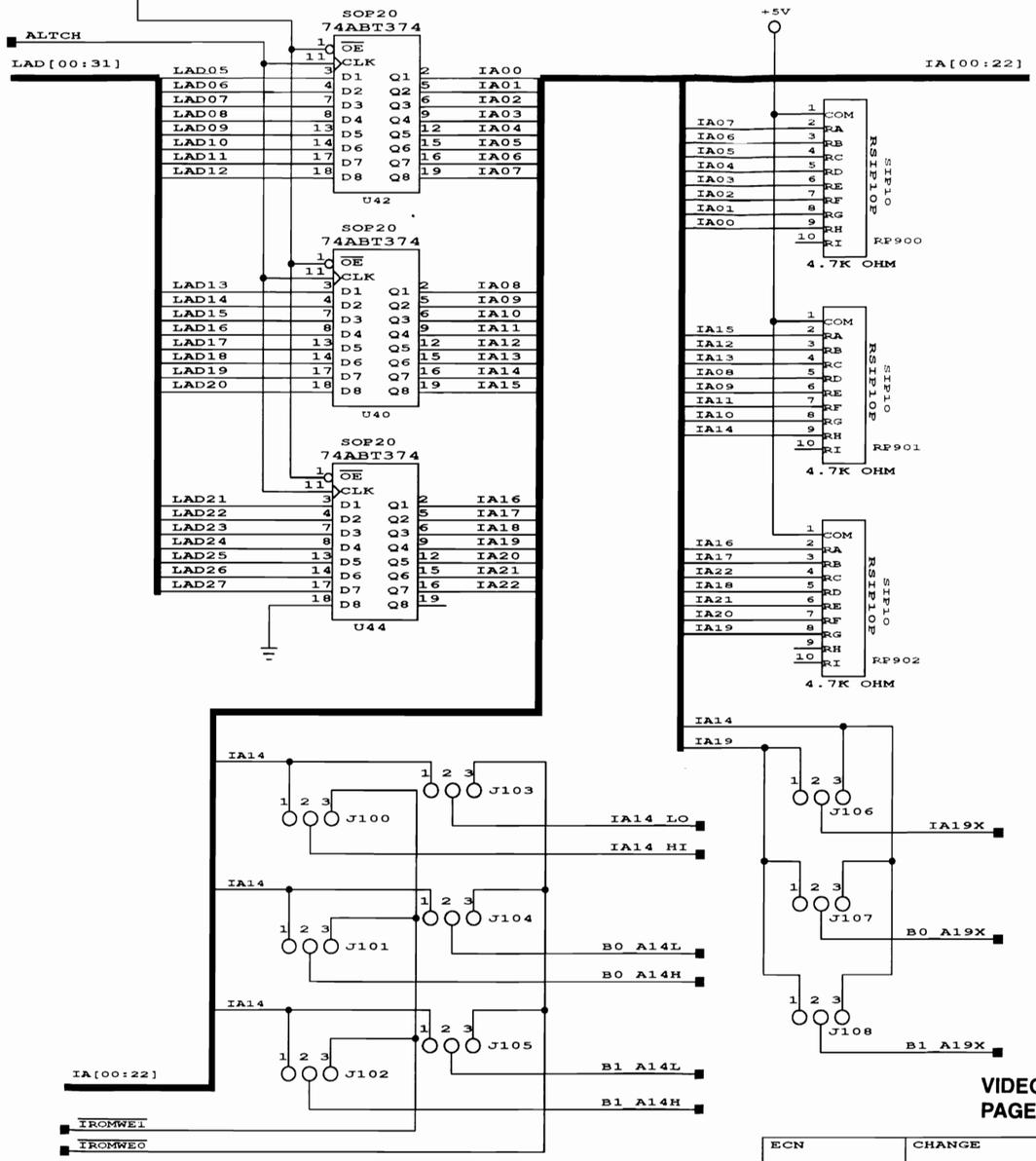
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994 12:06	1ST USEAGE DATE	TITLE XUNIT EXECUTION/SCRATCH RAM
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 5 OF 26	PART NO. 16-9518 REV. 4

GSP IMAGE ROM DATA XCVR



GSP IMAGE ROM ADDRESS LATCH

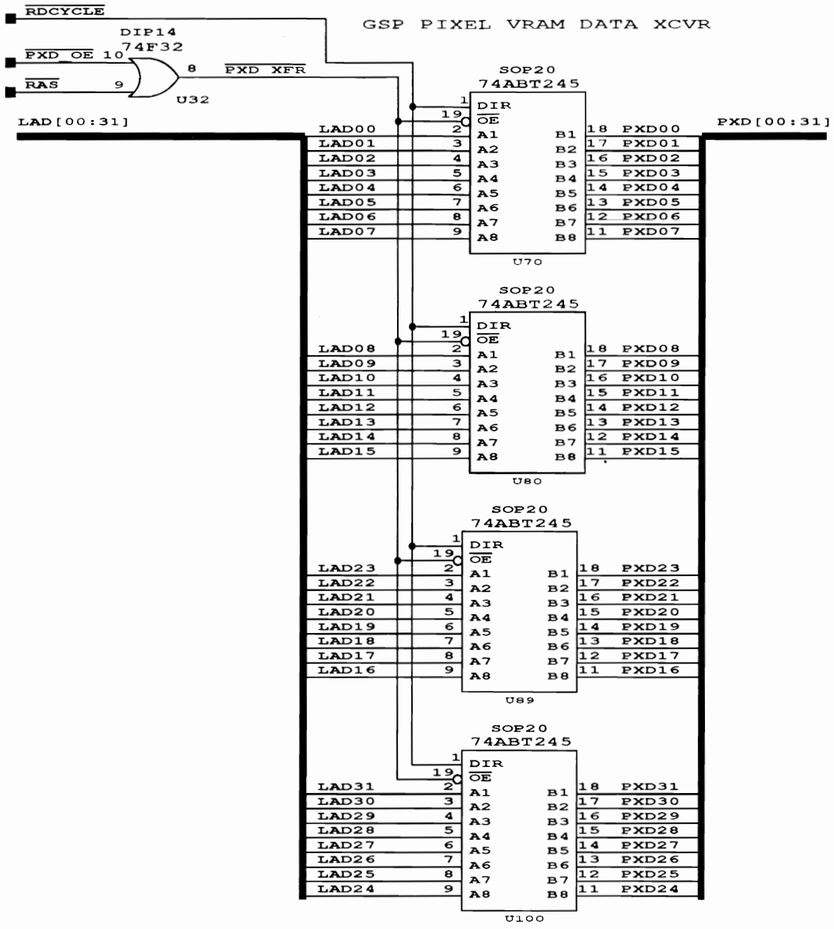


VIDEO CPU BOARD
PAGE 3-21

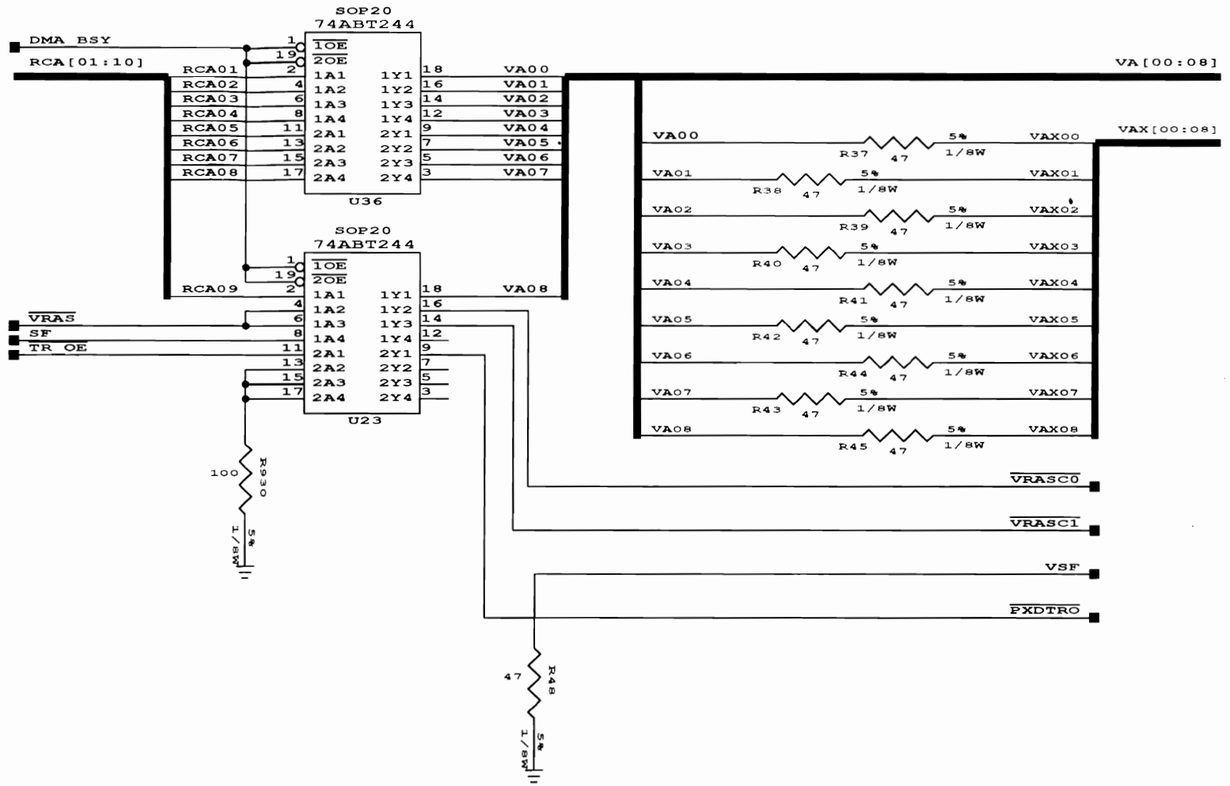
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:07	1ST USEAGE DATE	TITLE XUNIT GSP TO IMAGE ROM INTERFACE CIRCUITRY
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 6 OF 26	PART NO. 16-9518 REV. 4

GSP PIXEL VRAM DATA XCVR



GSP VRAM ADDRESS BUFFER



VIDEO CPU BOARD
PAGE 3-22

ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994 12:07	1ST USEAGE DATE	TITLE XUNIT GSP TO VRAM INTERFACE CIRCUITRY
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 7 OF 26	PART NO. 16-9518 REV. 4

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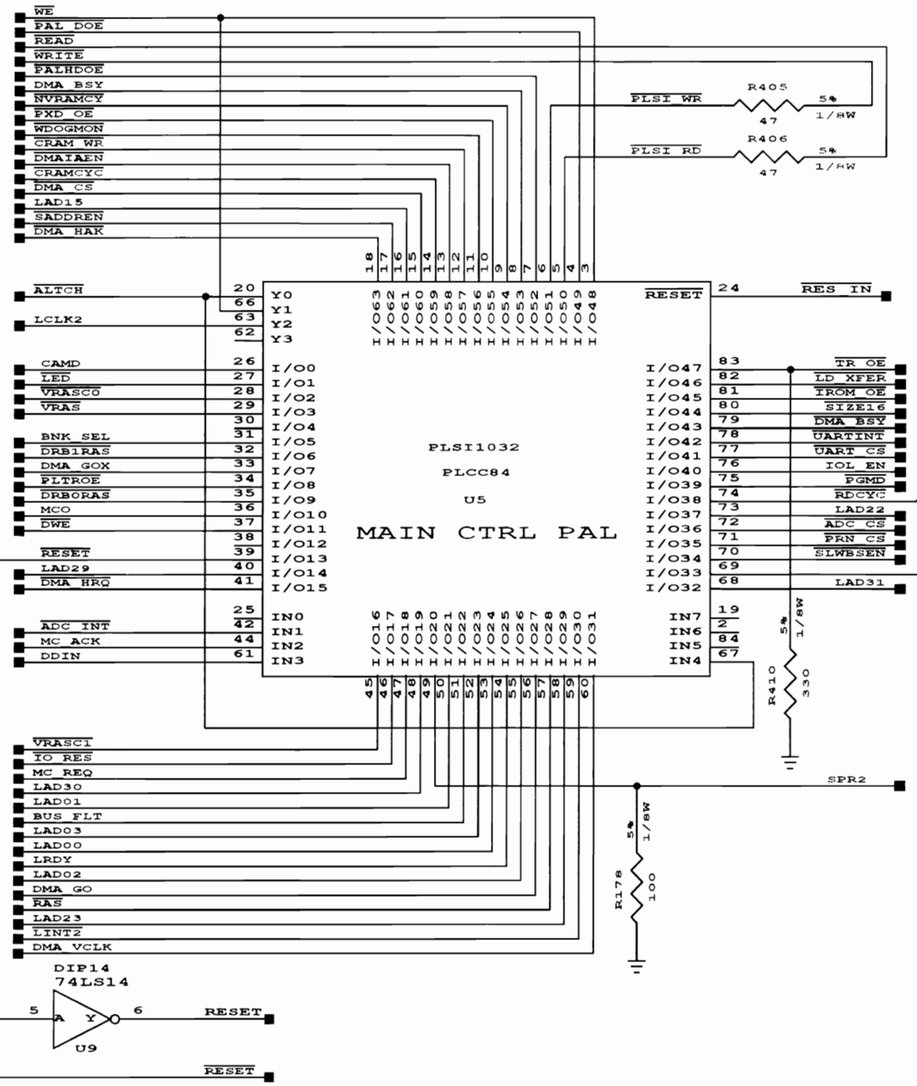
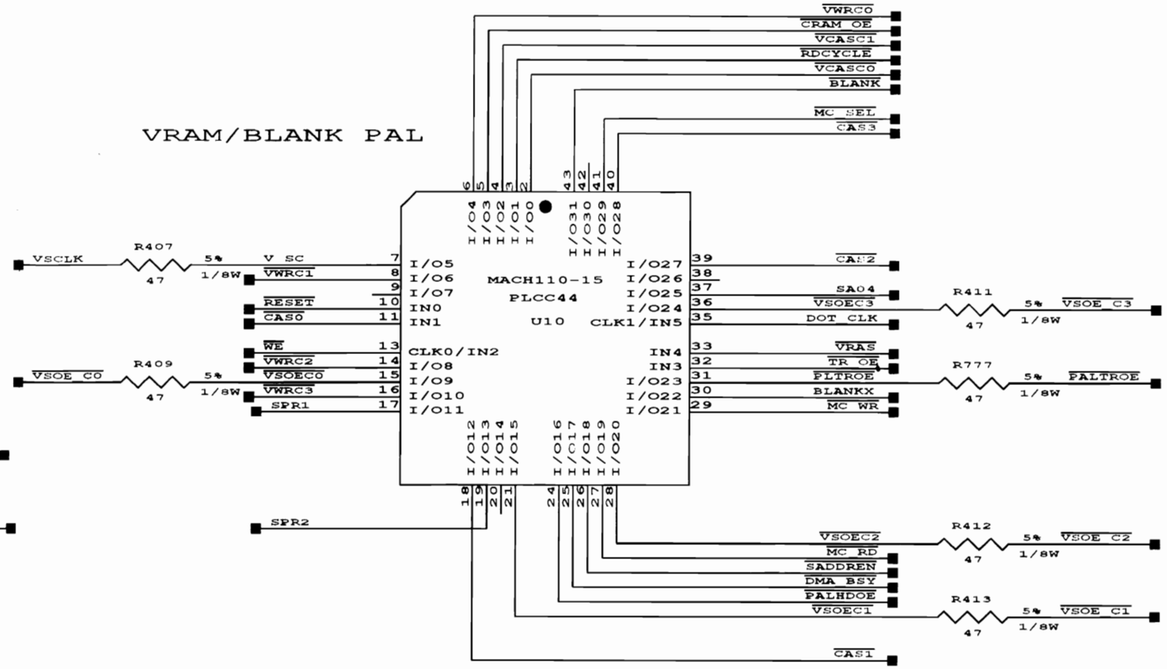
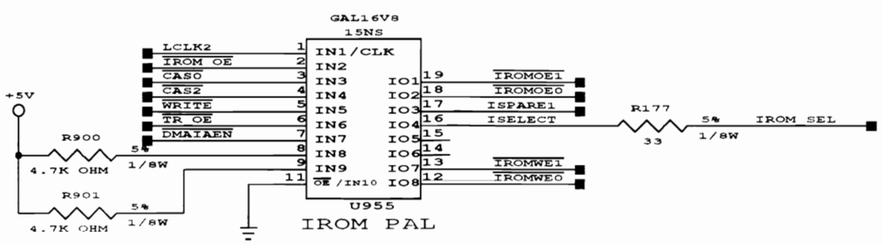
PAGE 3-23

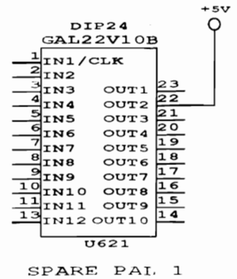
ECN	CHANGE	DATE

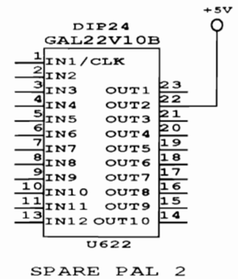
PROJECT ENG.: STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE: RSC 5-12-1994_12:09	1ST USEAGE DATE	TITLE: XUNIT FIFO CIRCUITRY/ PALETTE AND DMA COMMAND BUS
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 8 OF 26	PART NO. 16-9518 REV. 4

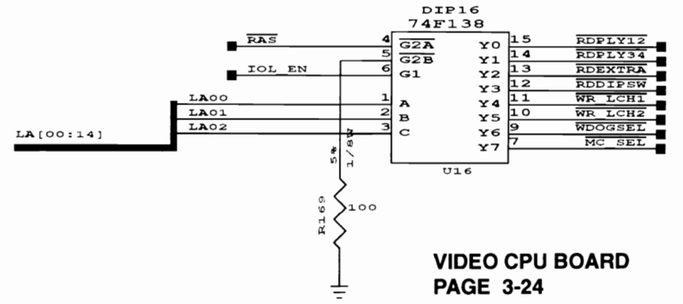








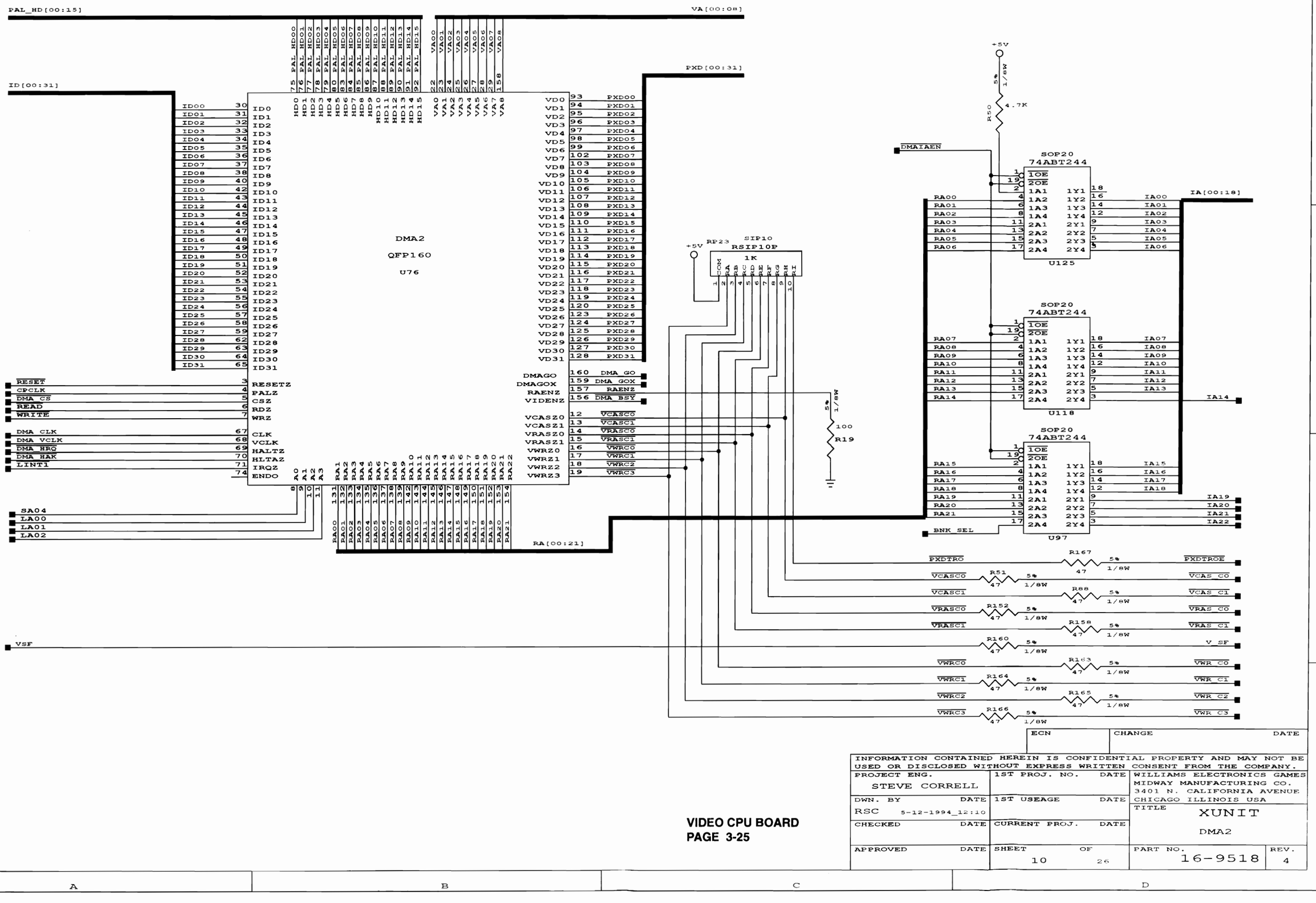




VIDEO CPU BOARD
PAGE 3-24

ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:10	1ST USEAGE DATE	TITLE XUNIT PLD/CONTROL
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 9 OF 26	PART NO. 16-9518 REV. 4



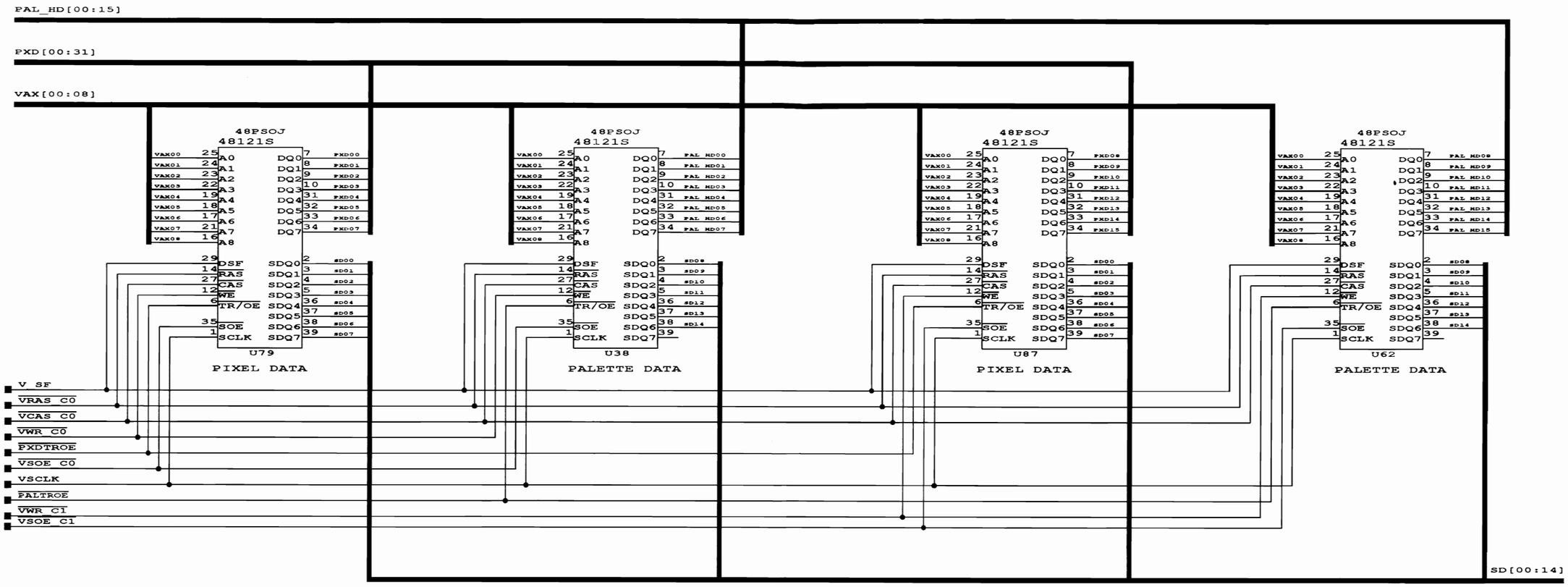
VIDEO CPU BOARD
PAGE 3-25

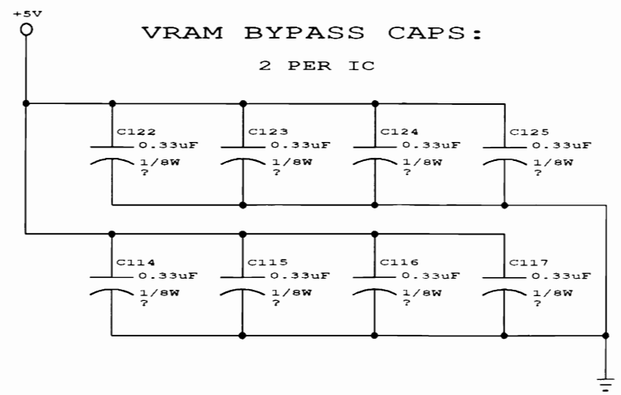
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:10	1ST USEAGE DATE	TITLE XUNIT DMA2
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 10 OF 26	PART NO. 16-9518 REV. 4

VIDEO RAM - BANK 0

VIDEO RAM - BANK 1





VIDEO CPU BOARD
PAGE 3-26

ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:11	1ST USEAGE DATE	TITLE XUNIT
CHECKED DATE	CURRENT PROJ. DATE	VIDEO RAM BANK 0/BANK 1
APPROVED DATE	SHEET 11 OF 26	PART NO. 16-9518 REV. 4

VIDEO RAM - BANK 2

VIDEO RAM - BANK 3

PAL_HD[00:15]

PXD[00:31]

VAX[00:08]

48PSOJ
48121S

U96
PIXEL DATA

U48
PALETTE DATA

U99
PIXEL DATA

U69
PALETTE DATA

V_SF
VRAS_C1
VCAS_C1
VWR_C2
PXDTROE
VSOE_C2
VSCLK
PALTROE
VWR_C3
VSOE_C3

SD[00:14]

+5V

VRAM BYPASS CAPS:

2 PER IC

C129 0.33uF 1/8W ?
C118 0.33uF 1/8W ?
C119 0.33uF 1/8W ?
C120 0.33uF 1/8W ?
C128 0.33uF 1/8W ?
C127 0.33uF 1/8W ?
C126 0.33uF 1/8W ?
C121 0.33uF 1/8W ?

VIDEO CPU BOARD
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ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:11	1ST USEAGE DATE	TITLE XUNIT VIDEO RAM BANK 2/BANK 3
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 12 OF 26	PART NO. 16-9518 REV. 4

B1_A14H
B1_A14L
IA[00:18]
B0_A14H
B0_A14L

DIP32 27C040-100 — DIP32 SOCKET — SKT4 — U120
DIP32 27C040-100 — DIP32 SOCKET — SKT7 — U122
DIP32 27C040-100 — DIP32 SOCKET — SKT3 — U110
DIP32 27C040-100 — DIP32 SOCKET — SKT9 — U112
DIP32 27C040-100 — DIP32 SOCKET — SKT6 — U121
DIP32 27C040-100 — DIP32 SOCKET — SKT8 — U123
DIP32 27C040-100 — DIP32 SOCKET — SKT5 — U111
DIP32 27C040-100 — DIP32 SOCKET — SKT10 — U113

IRMCS0
IRMCS1
IROMOE0
ID[00:31]

+5V — J3 — IA19XA
B0_A19X — J11
+5V — J2 — IA19XB
J13
B1_A19X

BANK 0
BANK 1

VIDEO CPU BOARD
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ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994 12:12	1ST USEAGE DATE	TITLE XUNIT IMAGE ROM BANK 0/BANK 1
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 13 OF 26	PART NO. 16-9518 REV. 4

IA14 LO

IA[00:18]

DIP32 27C040-100 — U101 — DIP32 SOCKET — SKT11
DIP32 27C040-100 — U103 — DIP32 SOCKET — SKT12
DIP32 27C040-100 — U91 — DIP32 SOCKET — SKT18
DIP32 27C040-100 — U93 — DIP32 SOCKET — SKT17
DIP32 27C040-100 — U102 — DIP32 SOCKET — SKT14
DIP32 27C040-100 — U104 — DIP32 SOCKET — SKT13
DIP32 27C040-100 — U92 — DIP32 SOCKET — SKT16
DIP32 27C040-100 — U94 — DIP32 SOCKET — SKT15

IRMCS2

IRMCS3

IROMOE0

IA14 HI

ID[00:31]

BANK 2

BANK 3

+5V — J6 — IA19XC

IA19X — J16

+5V — J5 — IA19XD

J14

VIDEO CPU BOARD
PAGE 3-29

ECN	CHANGE	DATE

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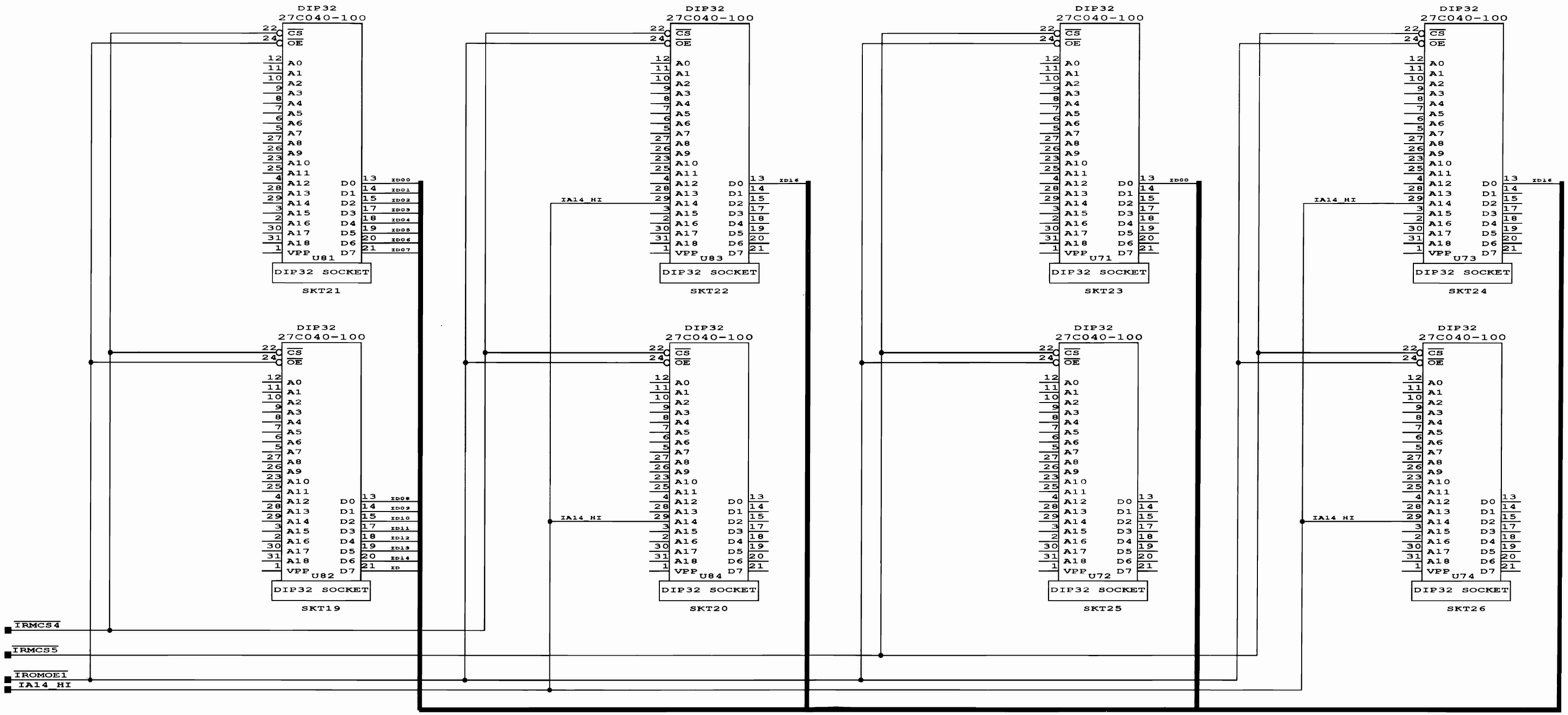
PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:12	1ST USEAGE DATE	TITLE XUNIT IMAGE ROM BANK 2/BANK 3
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 14 OF 26	PART NO. 16-9518 REV. 4



VIDEO CPU BOARD
PAGE 3-30

ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:12	1ST USEAGE DATE	TITLE IMAGE ROM BANK 4/BANK 5
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 15 OF 26	PART NO. / REV.

IA14_LO

IA[00:18]

DIP32 27C040-100 — U63 — DIP32 SOCKET — SKT27
DIP32 27C040-100 — U65 — DIP32 SOCKET — SKT28
DIP32 27C040-100 — U51 — DIP32 SOCKET — SKT33
DIP32 27C040-100 — U53 — DIP32 SOCKET — SKT34
DIP32 27C040-100 — U64 — DIP32 SOCKET — SKT29
DIP32 27C040-100 — U66 — DIP32 SOCKET — SKT30
DIP32 27C040-100 — U52 — DIP32 SOCKET — SKT31
DIP32 27C040-100 — U54 — DIP32 SOCKET — SKT32

IRMCS6

IRMCS7

IROMOE1

IA14_HI

ID[00:31]

BANK 6

BANK 7

+5V

J12 — IA19XG

IA19X — J19

+5V

J9 — IA19XH

J20

VIDEO CPU BOARD
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ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:16	1ST USEAGE DATE	TITLE XUNIT IMAGE ROM BANK 6/BANK 7
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 16 OF 26	PART NO. 16-9518 REV. 4

BLANKX

DOT CLK

SADDREN

SD[00:14]

SOP20
74ABT374
U78

SOP20
74ABT374
U68

DIP28
32KX8SRAM
U67

DIP28
32KX8SRAM
U77

DIP14
7406
U75

DIP14
7406
U75

DIP14
7406
U75

DIP20
74ALS374
U56

DIP20
74ALS374
U86

DIP20
74ALS244
U61

DIP20
74ALS244
U85

CRAMCYC

LA[00:14]

DIP20
74ALS244
U27

DIP20
74ALS244
U21

CRAM OE

RDCYCLE

CRAM WR

LD[00:15]

DIP20
74ALS245
U47

DIP20
74ALS245
U98

R26
100
1/8W 5%

R25 15K 2% 1/8W
R24 8.2K 2% 1/8W
R23 3.9K 2% 1/8W
R22 2K 2% 1/8W
R21 1K 2% 1/8W

FER BEAD L3 BLU GUN
1/8W ? 22PF C287 VGND
1/8W ? 22PF C286 VGND

R31 15K 2% 1/8W
R30 8.2K 2% 1/8W
R29 3.9K 2% 1/8W
R28 2K 2% 1/8W
R27 1K 2% 1/8W

FER BEAD L5 GRN GUN
1/8W ? 22PF C291 VGND
1/8W ? 22PF C290 VGND

R36 15K 2% 1/8W
R35 8.2K 2% 1/8W
R34 3.9K 2% 1/8W
R33 2K 2% 1/8W
R32 1K 2% 1/8W

FER BEAD L4 RED GUN
1/8W ? 22PF C288 VGND
1/8W ? 22PF C289 VGND

VIDEO CPU BOARD
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ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:18	1ST USEAGE DATE	TITLE XUNIT RAMDAC/COLOR OUTPUT
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 17 OF 26	PART NO. 16-9518 REV. 4

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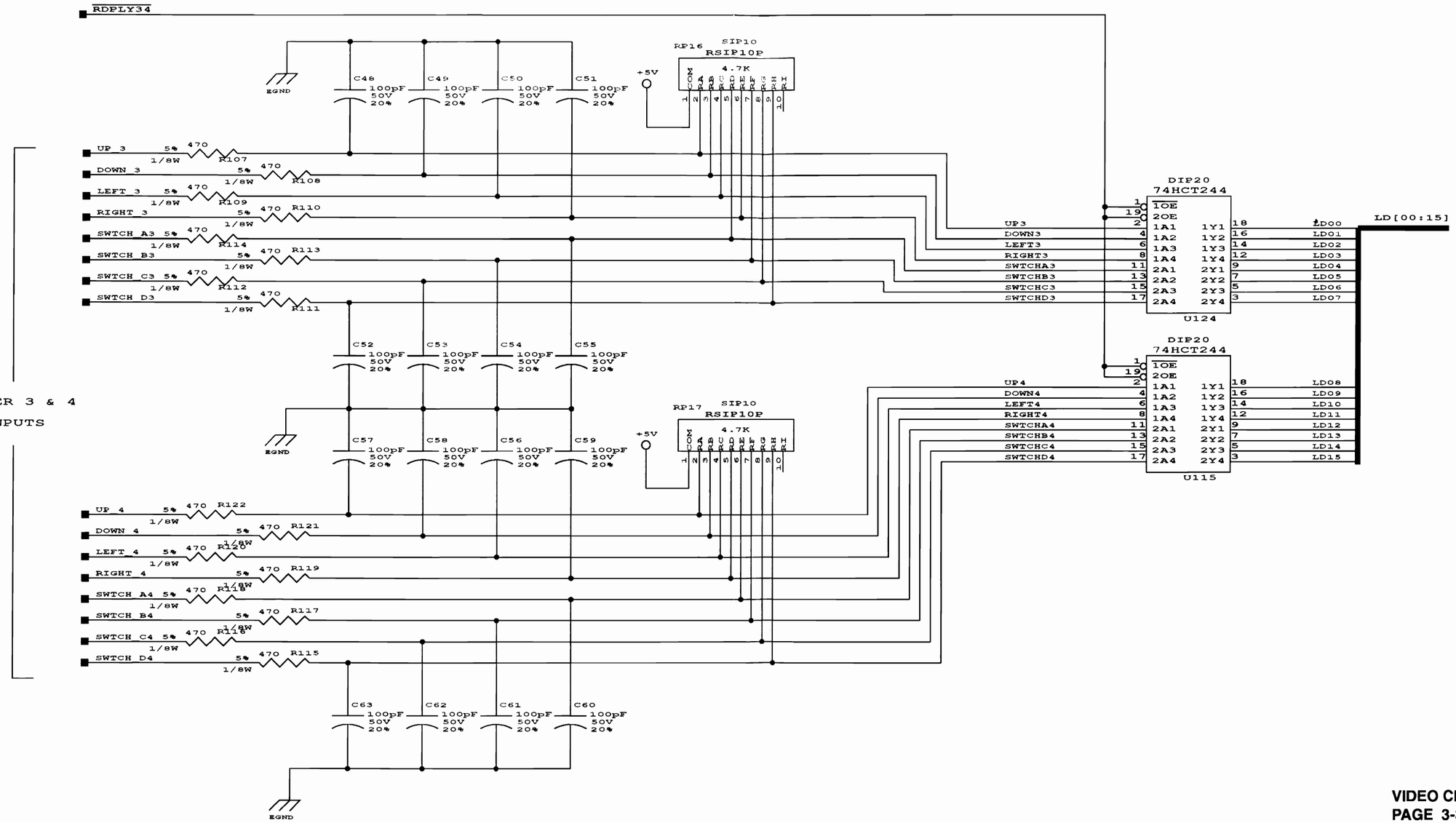
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:16	1ST USEAGE DATE	TITLE XUNIT PLAYER 1 AND 2 INPUTS
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 18 OF 26	PART NO. 16-9518 REV. 4



PLAYER 3 & 4
INPUTS

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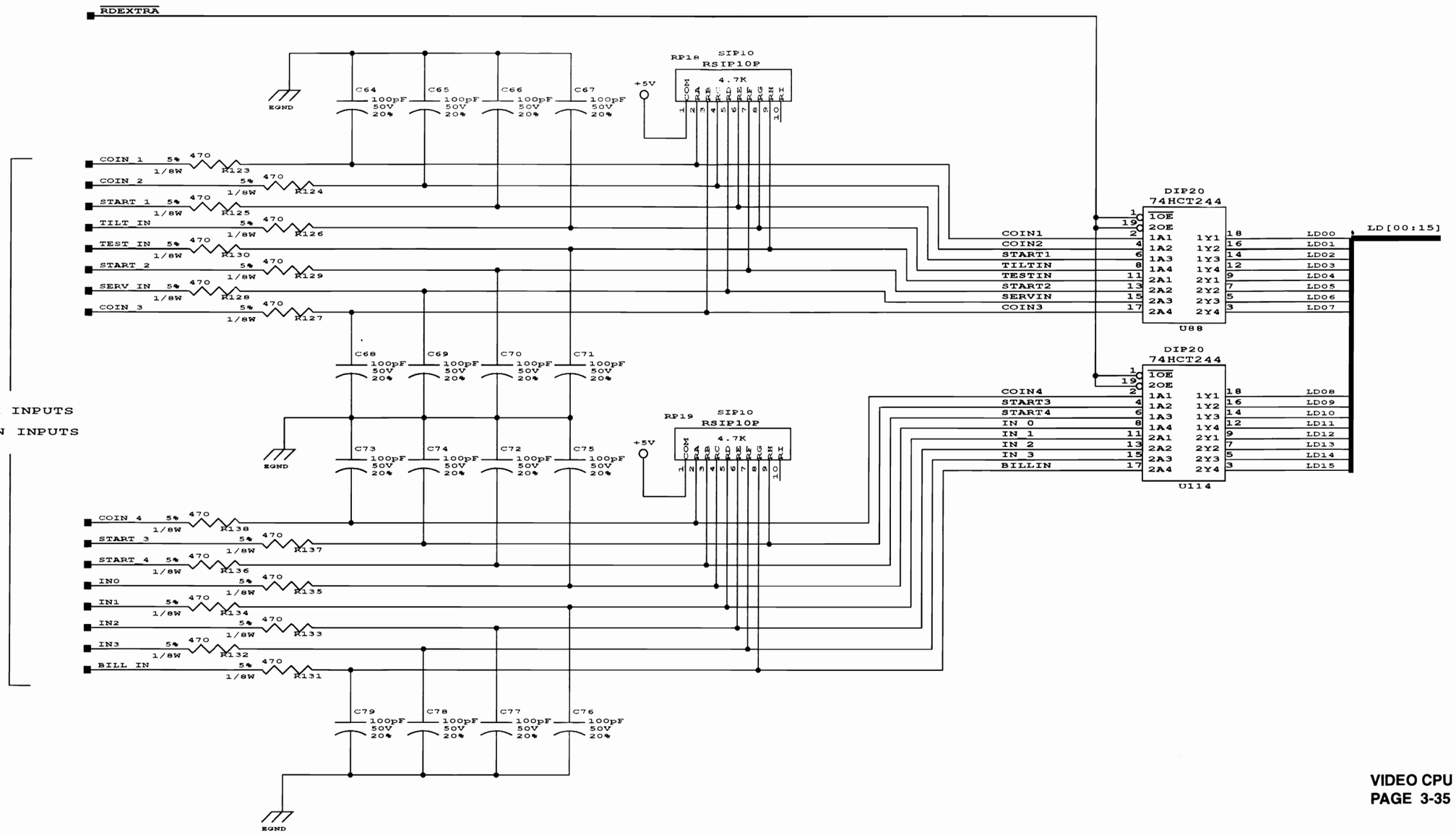
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:16	1ST USEAGE DATE	TITLE XUNIT PLAYER 3 AND 4 INPUTS
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 19 OF 26	PART NO. 16-9518 REV. 4



VIDEO CPU BOARD
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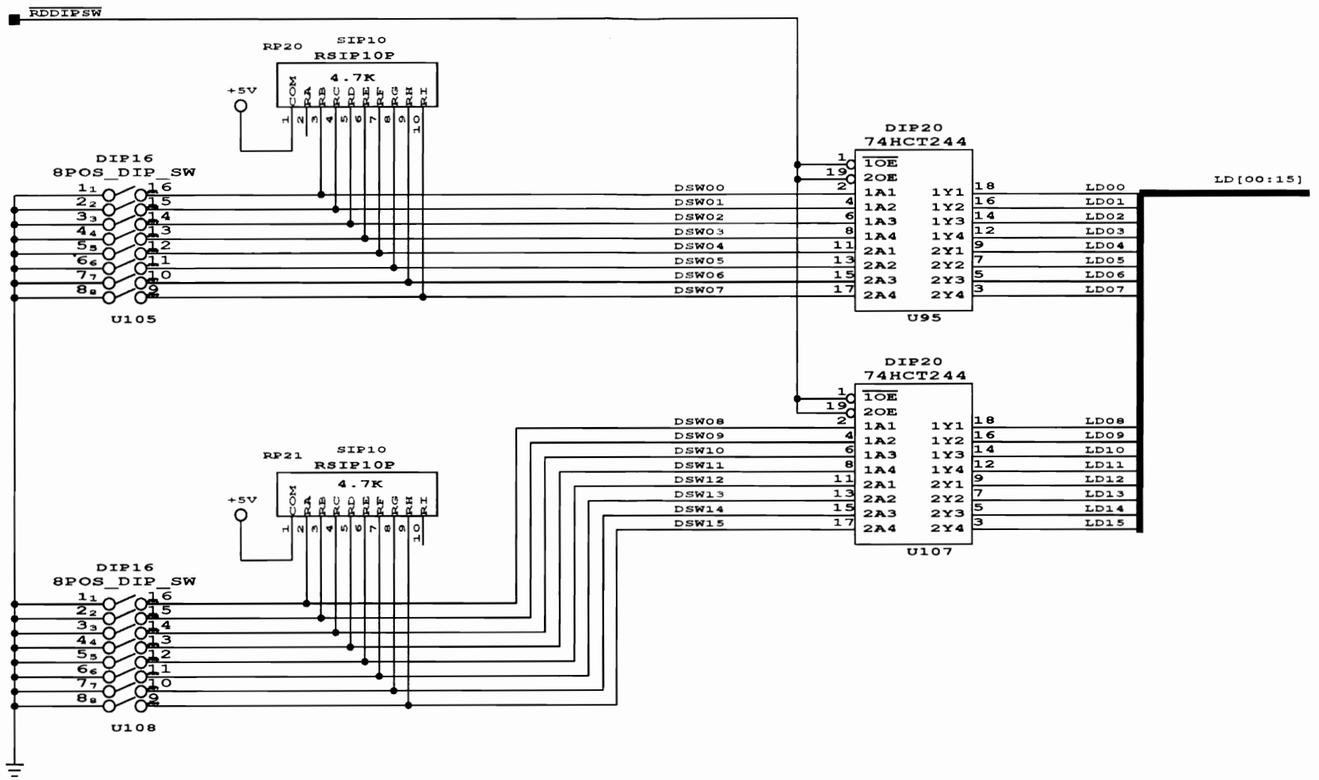
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:17	1ST USEAGE DATE	TITLE XUNIT EXTRA INPUTS, COIN/START
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 20 OF 26	PART NO. 16-9518 REV. 4

DIP-SWITCH INPUTS



VIDEO CPU BOARD
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ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:17	1ST USEAGE DATE	TITLE XUNIT DIP-SWITCH INPUTS
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 21 OF 26	PART NO. 16-9518 REV. 4

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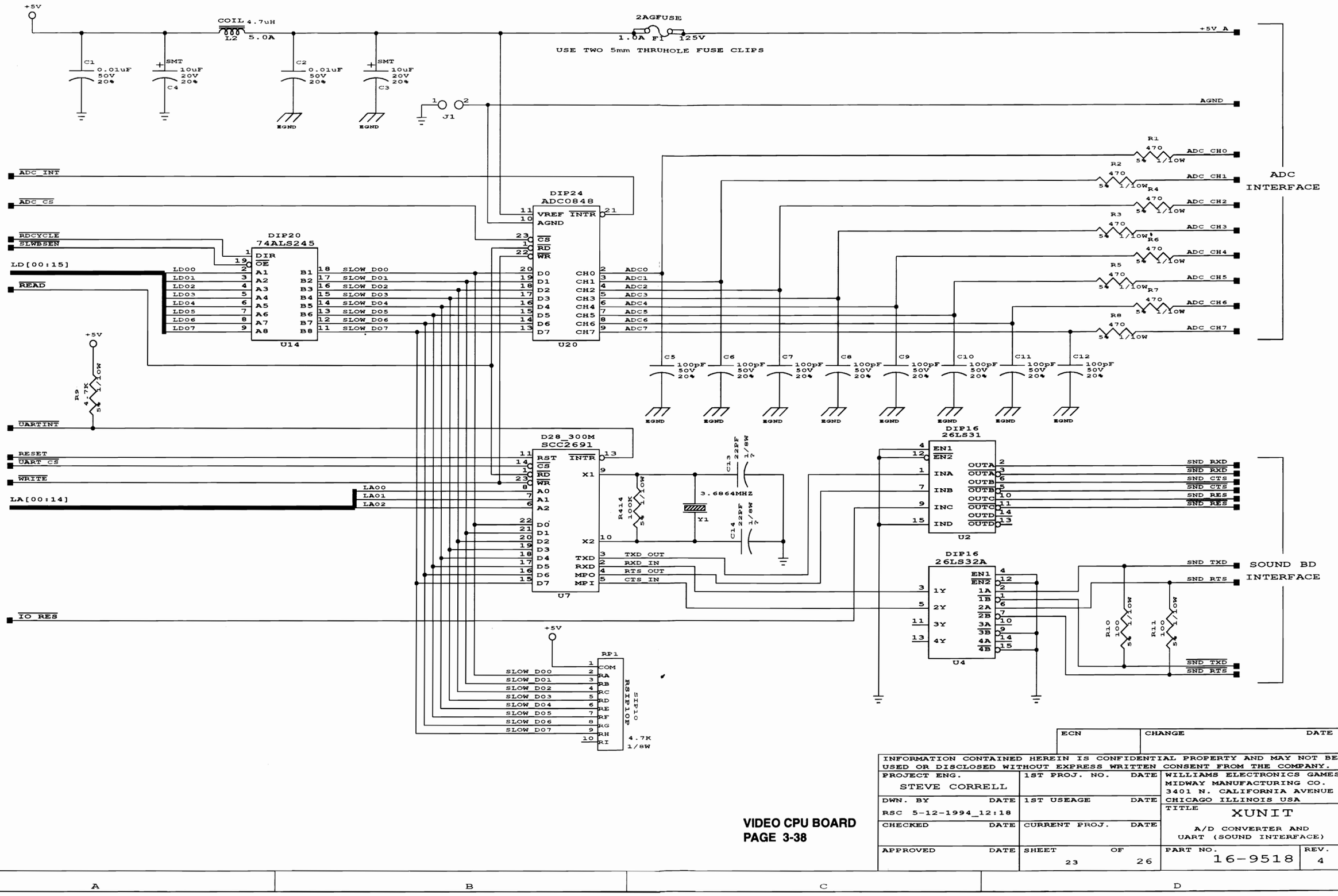
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:18	1ST USEAGE DATE	TITLE XUNIT OUTPUTS
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 22 OF 26	PART NO. 16-9518 REV. 4



VIDEO CPU BOARD
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ECN	CHANGE	DATE

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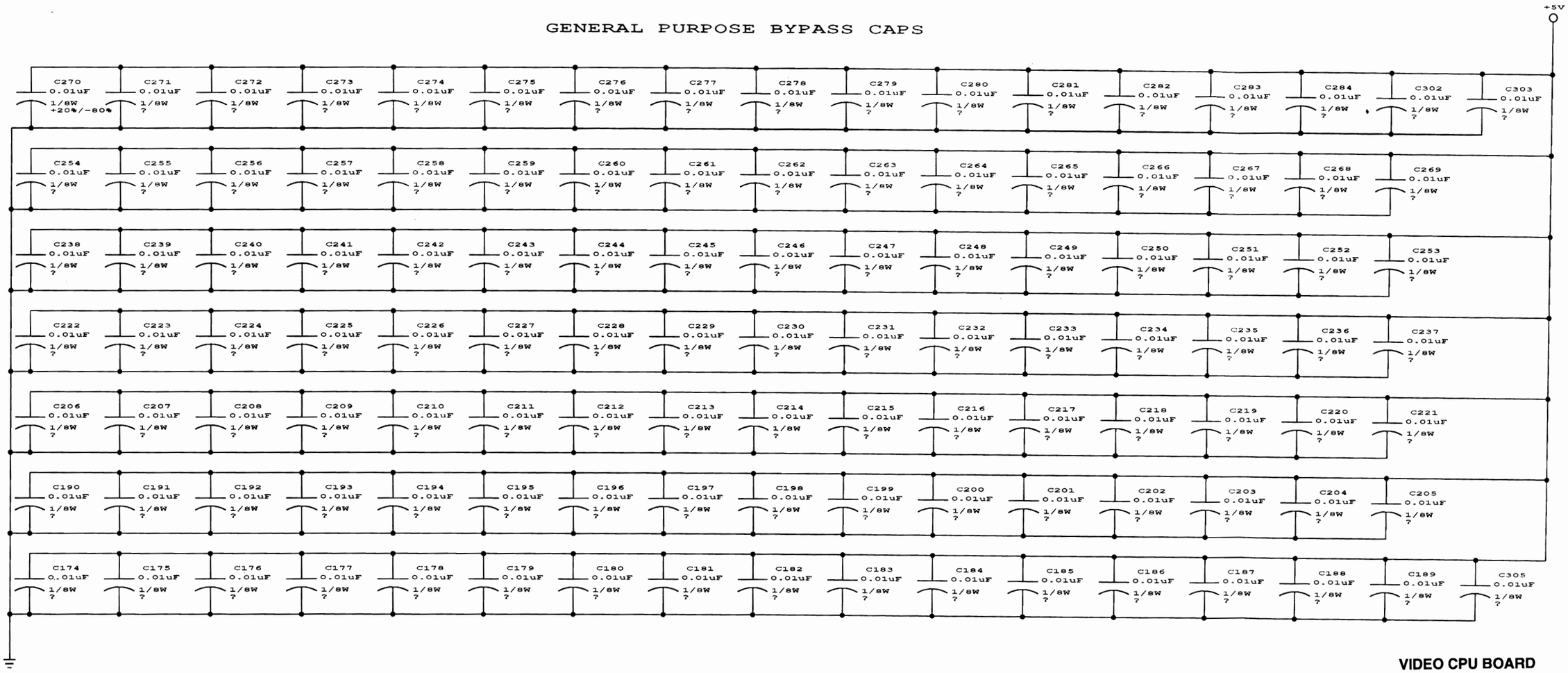
PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE RSC 5-12-1994_12:18	1ST USEAGE DATE	TITLE XUNIT A/D CONVERTER AND UART (SOUND INTERFACE)
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 23 OF 26	PART NO. 16-9518 REV. 4

GENERAL PURPOSE BYPASS CAPS



VIDEO CPU BOARD
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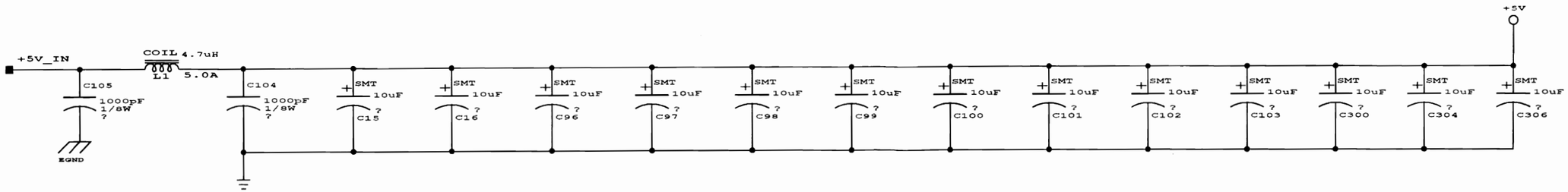
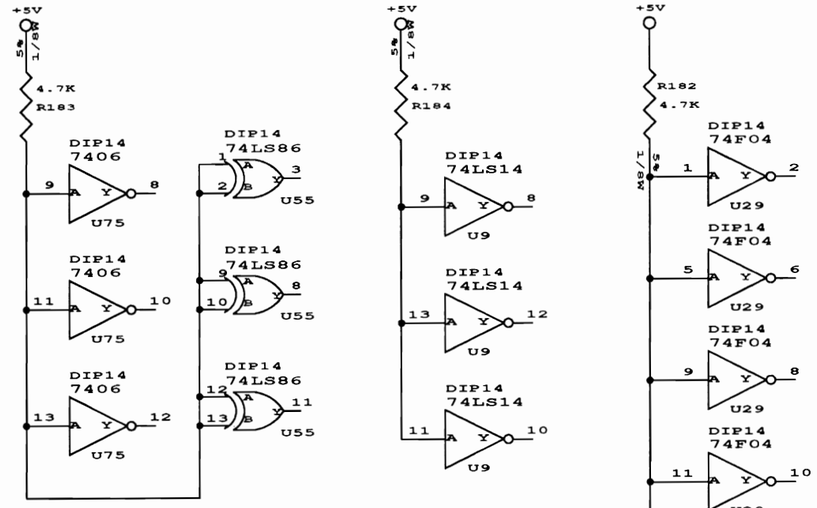
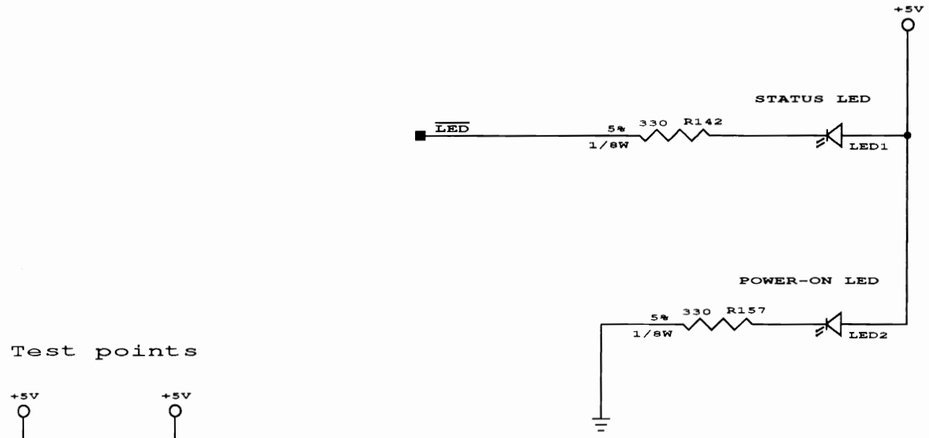
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:18	1ST USEAGE DATE	TITLE XUNIT BYPASS CAPS
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET OF 24 26	PART NO. 16-9518 REV. 4



SPARE GATES





VIDEO CPU BOARD
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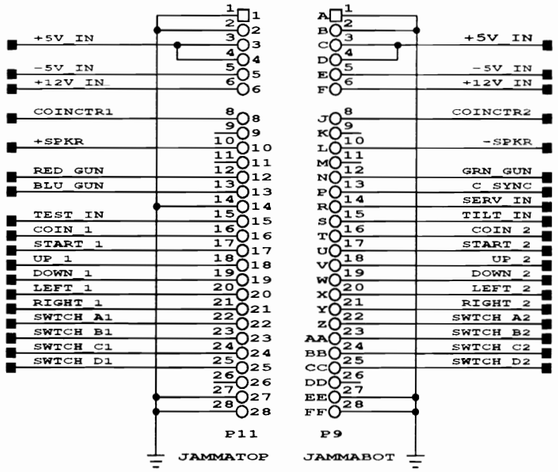
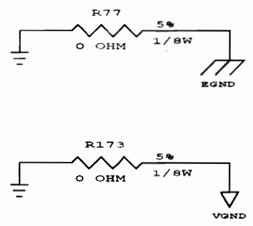
ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:18	1ST USEAGE DATE	TITLE XUNIT PLD/CONTROL
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 25 OF 26	PART NO. 16-9518 REV. 4

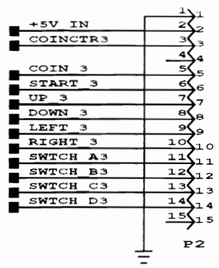
JAMMA INTERFACE EDGE CONNECTOR



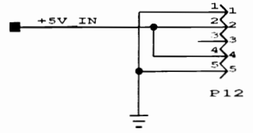
ISOLATED GROUNDS



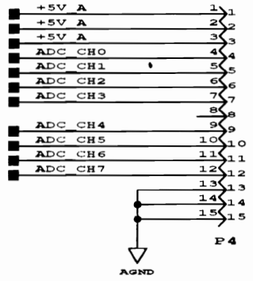
PLAYER 3 I/O CONNECTOR



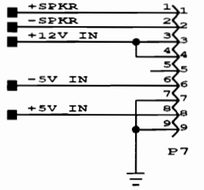
AUX. POWER OUT



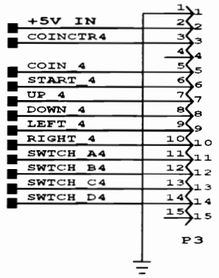
8 CHANNEL A/D



SOUND POWER/SPEAKER INTERFACE

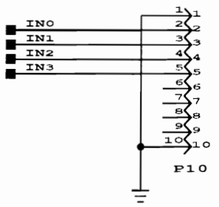


PLAYER 4 I/O CONNECTOR

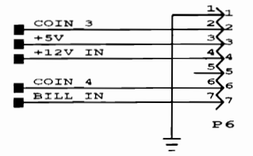


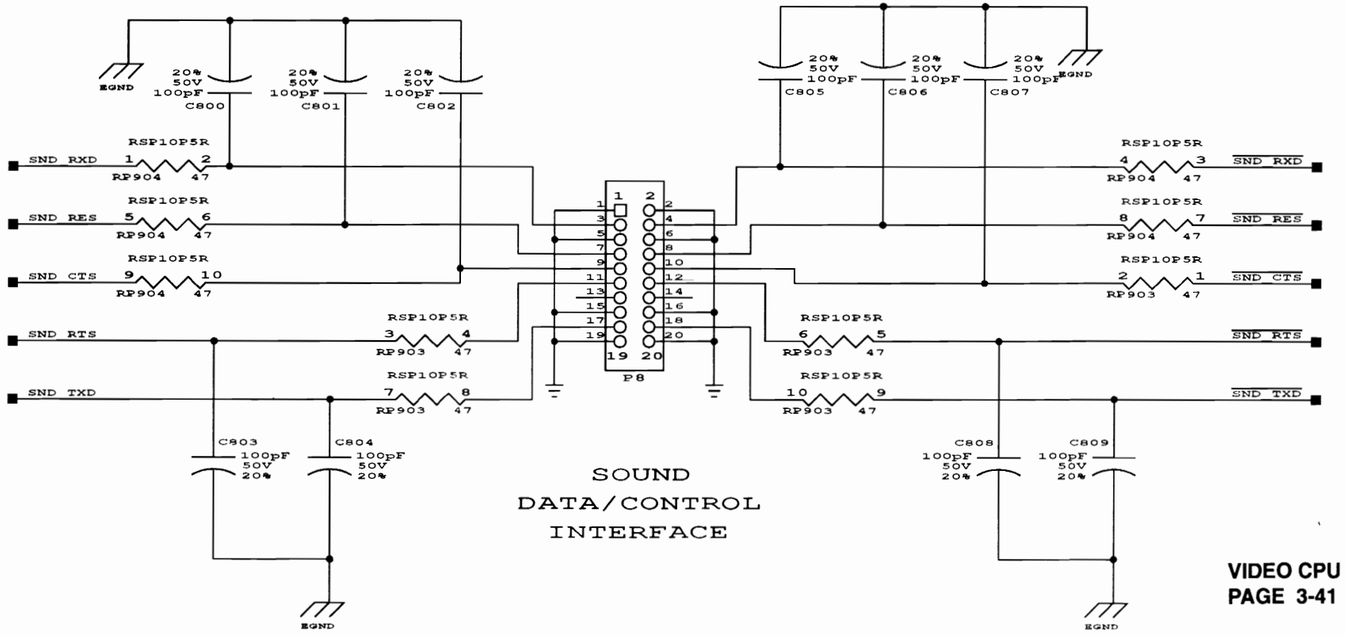
AUX. LATCHED OUTPUTS

EXTRA INPUTS



COIN 3 & 4 INPUTS



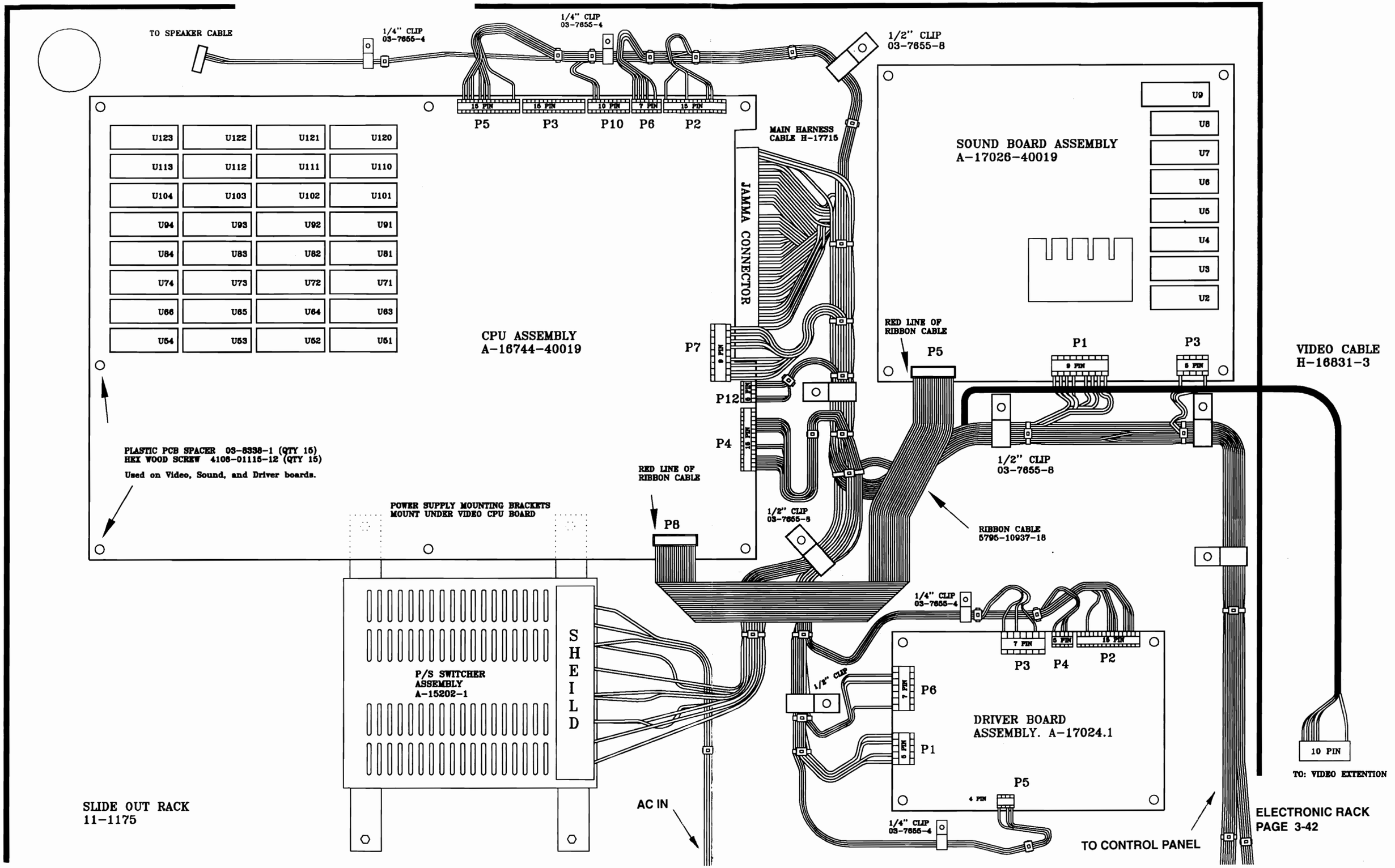


SOUND DATA/CONTROL INTERFACE

VIDEO CPU BOARD
PAGE 3-41

ECN	CHANGE	DATE

PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY DATE JML 5-12-1994_12:18	1ST USEAGE DATE	TITLE XUNIT connectors
CHECKED DATE	CURRENT PROJ. DATE	
APPROVED DATE	SHEET 26 OF 26	PART NO. 16-9518 REV. 4


TO SPEAKER CABLE
1/4" CLIP
03-7655-4
1/4" CLIP
03-7655-4
1/2" CLIP
03-7655-8
15 PIN
16 PIN
10 PIN
7 PIN
15 PIN
P5
P3
P10
P6
P2
MAIN HARNESS
CABLE H-17715
JAMMA CONNECTOR
SOUND BOARD ASSEMBLY
A-17026-40019
U9
U8
U7
U6
U5
U4
U3
U2
U123
U122
U121
U120
U113
U112
U111
U110
U104
U103
U102
U101
U94
U93
U92
U91
U84
U83
U82
U81
U74
U73
U72
U71
U66
U65
U64
U63
U54
U53
U52
U51
CPU ASSEMBLY
A-16744-40019
P7
P12
P4
RED LINE OF
RIBBON CABLE
P5
P1
P3
9 PIN
5 PIN
VIDEO CABLE
H-16831-3
1/2" CLIP
03-7655-8
RIBBON CABLE
5795-10937-18
PLASTIC PCB SPACER 03-6336-1 (QTY 15)
HEX WOOD SCREW 4106-01115-12 (QTY 15)
Used on Video, Sound, and Driver boards.
POWER SUPPLY MOUNTING BRACKETS
MOUNT UNDER VIDEO CPU BOARD
RED LINE OF
RIBBON CABLE
P8
1/2" CLIP
03-7655-8
1/4" CLIP
03-7655-4
7 PIN
5 PIN
15 PIN
P3
P4
P2
1/2" CLIP
P6
7 PIN
DRIVER BOARD
ASSEMBLY. A-17024.1
5 PIN
P1
P5
4 PIN
1/4" CLIP
03-7655-4
10 PIN
TO: VIDEO EXTENTION
P/S SWITCHER
ASSEMBLY
A-15202-1
SHIELD
AC IN
SLIDE OUT RACK
11-1175
TO CONTROL PANEL
ELECTRONIC RACK
PAGE 3-42