

MIDWAY

May 1994

16-40019-101

REVOLUTION-X

MUSIC IS THE WEAPON.

2-PLAYER OPERATIONS MANUAL

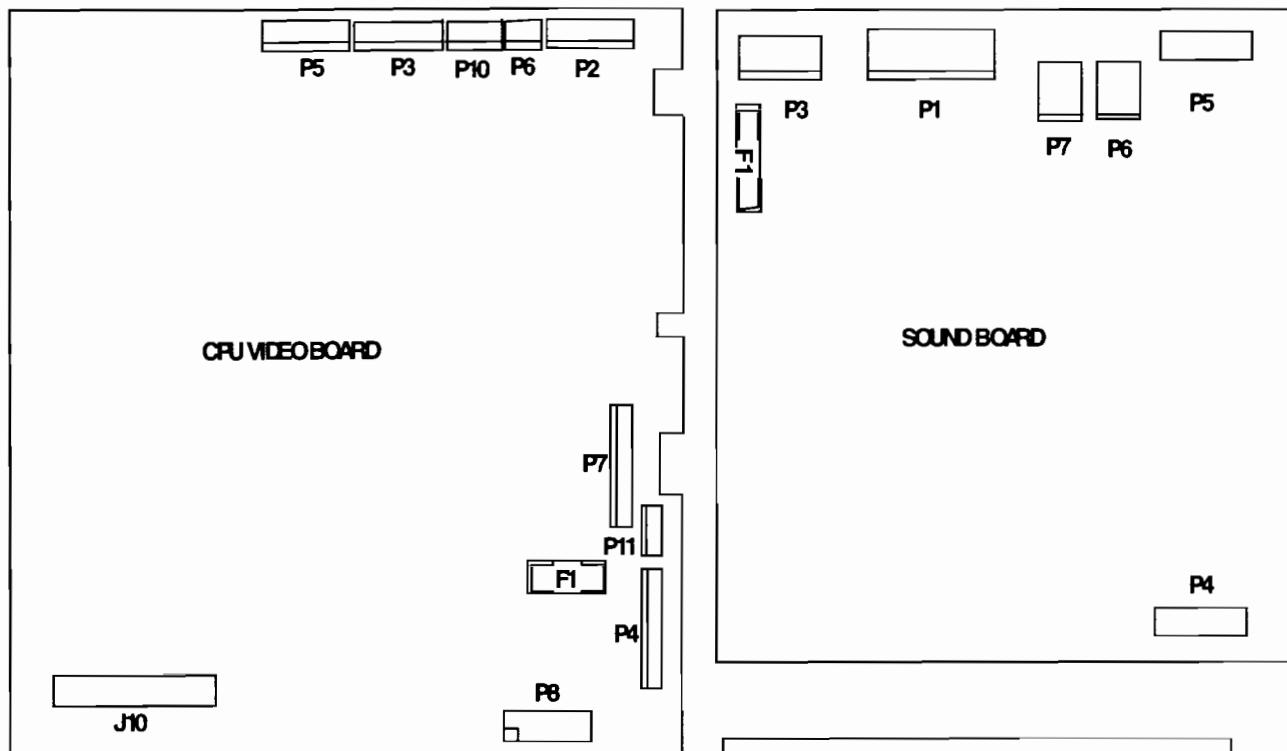
operation & adjustments
testing & problem diagnostic
parts information
wiring diagrams & schematics

REVOLUTION X

2 PLAYER

MIDWAY Manufacturing Company reserves the rights to make modifications and improvements to its products. The specifications and parts identified in this manual are subject to change without notice.

FUSE LIST



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

Line Fuse*
(Country Specific)

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

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

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

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

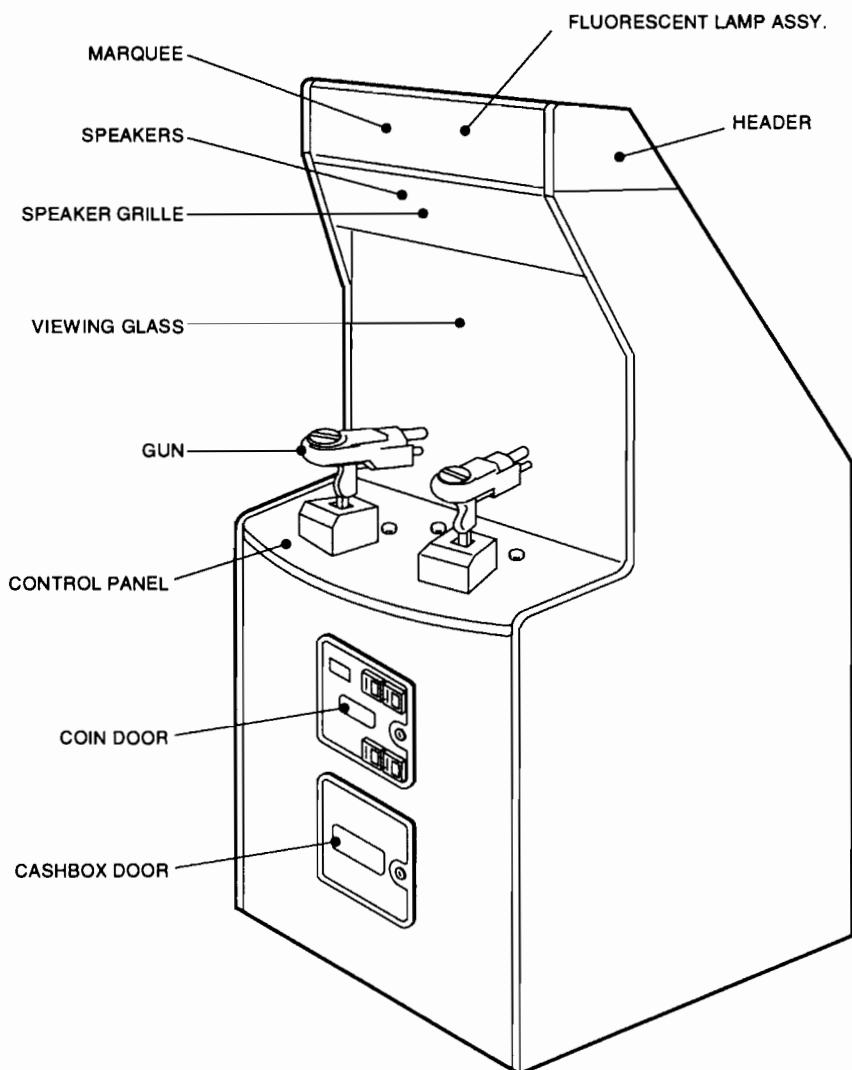
10. If the following message appears on the screen when the game is turned on, the guns must be calibrated.

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

NOTE

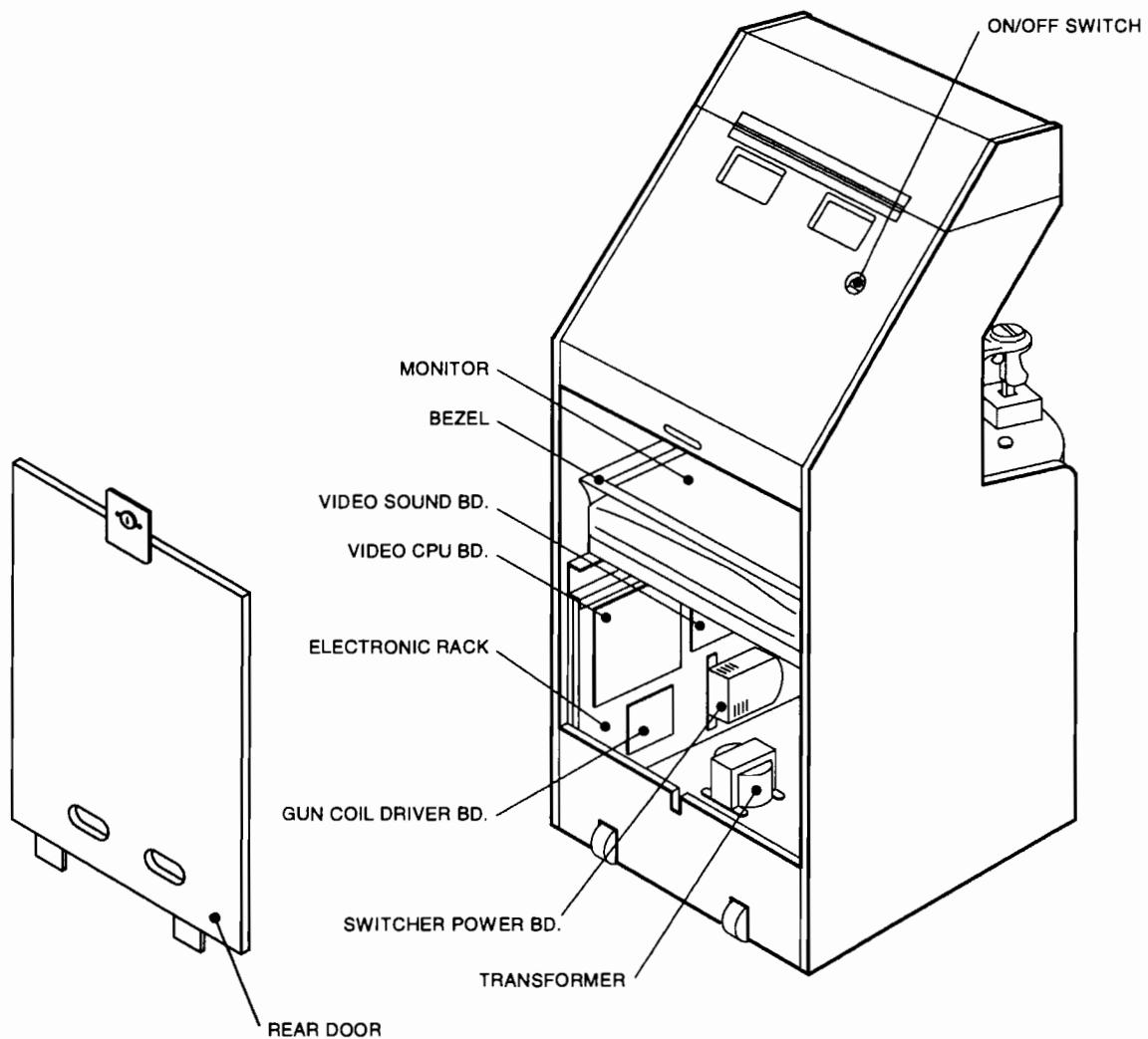
Check the gun calibration when you receive the game. Guns might of been jarred during shipping and be in need of calibration. The guns are calibrated from the factory. However, if you change PC boards or replace ROMs, RAMs, or the battery, they must be re-calibrated. Guns do not operate unless they are 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.

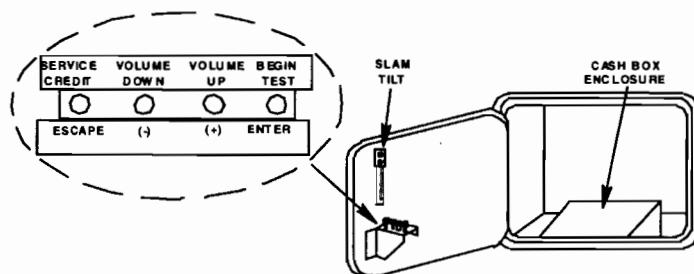
■ Removal of the Speakers

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

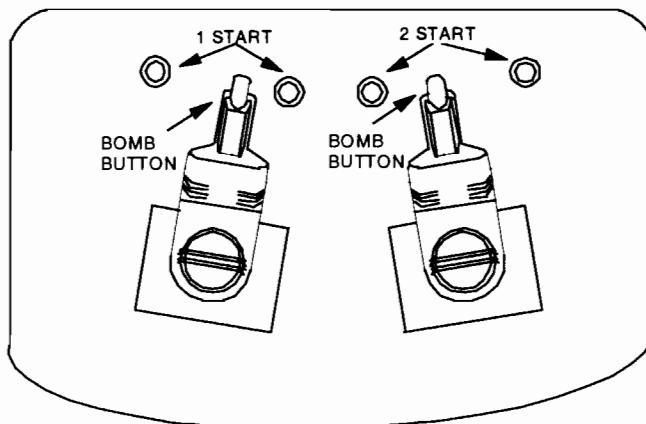
Each player has two red LEDs located on each side of their gun. The LEDs are illuminated during game play.

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.

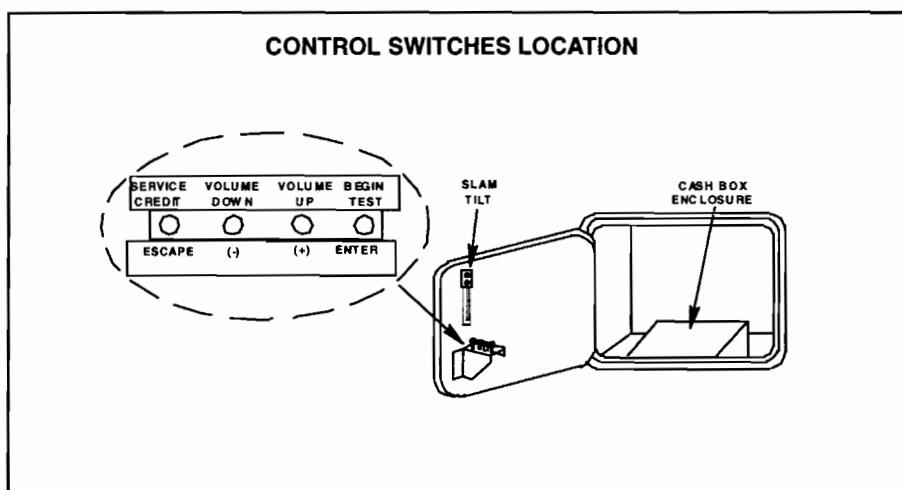
The **Enter** push-button switch moves into the next menu. This switch also locks in an adjustment setting value.

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.



MENU SYSTEM OPERATION

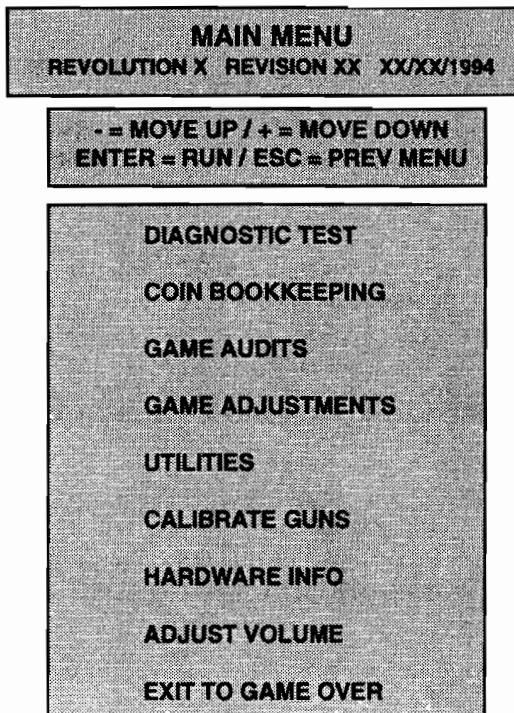
OPERATION

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.

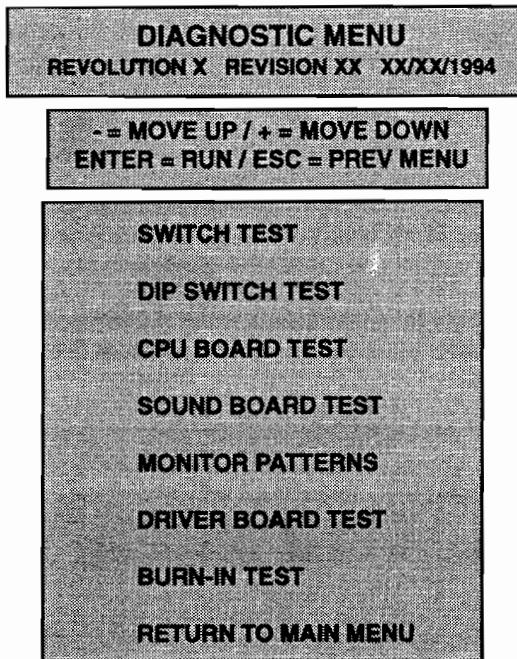
Press the (-) button, to move the cursor up the menu screen. Press the (+) button to move the cursor down the screen. Notice that the options are highlighted in sequence. Press the Enter button to open a highlighted option. *Only highlighted options can be opened.*

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.



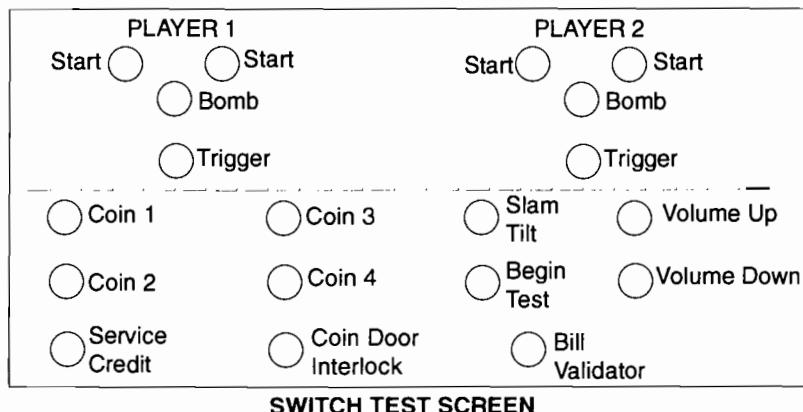
Switch Test

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.



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*							
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		
USA/ECA	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*		
Test Switch						On		
Game Mode								
Test Mode							Off*	

* 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.

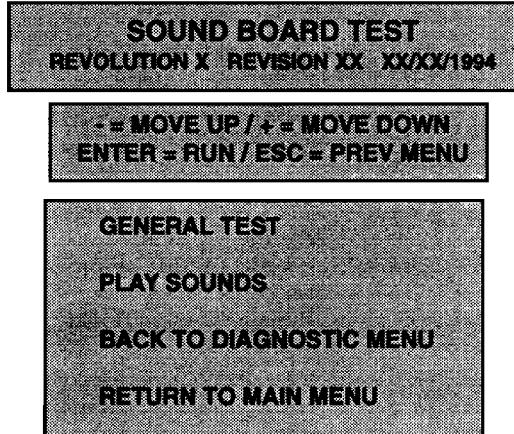
Select the CPU Board Test with the (-) or (+) button, then press the Enter button to start the automatic test of the CPU Board's RAMs and ROMs. When this test is activated, a "rug" pattern appears on the screen. The screen then changes to show the layout of the RAMs, and ROMs. During the test, ROMs or 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.

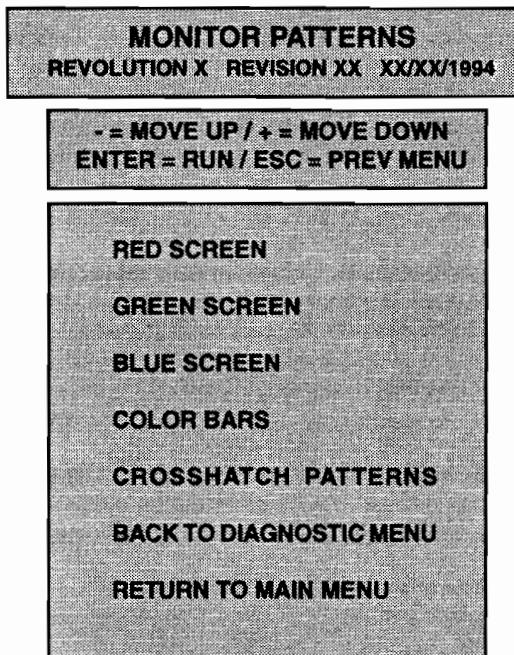
PLAY SOUNDS test synthesized and digitized sounds from the Sound Board. Advance to the next sound with the (-) or (+) button. Repeat a sound by pressing Enter button. Press the Escape button to end the test.

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 BARS** 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.

COIN BOOKKEEPING	
REVOLUTION X REVISION XX XX/XX/1994	
LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
SERVICE CREDITS	0
PAID CREDITS	0
TOTAL GAMES STARTED	0
PLAYER STARTS	0
PLAYER CONTINUES	0
TOTAL PLAYER STARTS & CONTINUES	0
PLAYS UNTIL HIGH SCORE RESET	5000
MORE DETAILED DATA RETURN TO MAIN MENU	

COIN BOOKKEEPING	
REVOLUTION X REVISION XX XX/XX/1994	
LEFT SLOT COINS	0
RIGHT SLOT COINS	0
THIRD SLOT COINS	0
FOURTH SLOT COINS	0
TOTAL	0
CLEAR COIN METERS RETURN TO MAIN MENU	

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.

GAME AUDITS	
REVOLUTION X REVISION XX XX/XX/1994	
TOTAL GAMES STARTED	0
TOTAL GAMES ENDED	0
TOTAL PLAY TIME	0
TOTAL GAME UPTIME	0
AVERAGE TIME/CREDIT	0
AVERAGE CREDITS SPENT/GAME	0
TIME 1 PLAYER ONLY	0
TIME 2 PLAYERS SIMULTANEOUS	0

NEXT AUDIT PAGE
RETURN TO MAIN MENU

PAGE ONE OF AUDIT TABLE

GAME AUDITS	
REVOLUTION X REVISION XX XX/XX/1994	
PLAYER STARTS	0
PLAYER CONTINUES	0
TOTAL PLAYER STARTS & CONTINUES	0
GAME CONTINUES OFFERED	0
GAME CONTINUES TAKEN	0
PERCENTAGE OF CONTINUES TAKEN	0
AVERAGE CREDITS SPENT PER PLAYER/GAME	0
COIN DOOR SLAMS	0
BURN-IN LOOPS SUCCESSFULLY COMPLETED	0
START FAILURES	0

NEXT AUDIT PAGE
PREVIOUS AUDIT PAGE
RETURN TO MAIN MENU

PAGE TWO OF AUDIT TABLE

Game Audits continued...

GAME AUDITS	
REVOLUTION X REVISION XX XX/XX/1994	
TOTAL GAMES STARTED	0
REACHED L.A. BTR	0
ENTERED CLUB X	0
REACHED AEROSMITH IN CLUB X	0
COMPLETED CLUB X	0
REACHED HELICOPTER BOSS	0
COMPLETED FLYING BOSS	0
SELECTED MIDDLE EAST	0
COMPLETED MIDDLE EAST	0

NEXT AUDIT PAGE
PREVIOUS AUDIT PAGE
RETURN TO MAIN MENU

PAGE THREE OF AUDIT TABLE

GAME AUDITS	
REVOLUTION X REVISION XX XX/XX/1994	
TOTAL GAMES STARTED	0
SELECTED JUNGLE	0
REACHED JUNGLE BTR	0
REACHED RECEPTIONIST	0
REACHED ELEVATOR	0
REACHED FINAL HALLWAY	0
STARTED BIG CHASE	0
COMPLETED JUNGLE	0

NEXT AUDIT PAGE
PREVIOUS AUDIT PAGE
RETURN TO MAIN MENU

PAGE FOUR OF AUDIT TABLE

Game Audits continued...

GAME AUDITS	
REVOLUTION X REVISION XX XX/XX/1994	
TOTAL GAMES STARTED	0
SELECTED PACIFIC RIM	0
REACHED WAREHOUSE	0
REACHED FACTORY	0
REACHED R & D AREA	0
REACHED MANAGER'S OFFICE	0
COMPLETED PACIFIC RIM	0
REACHED WEMBLEY STADIUM	0
GAMES PLAYED TO COMPLETION	0

NEXT AUDIT PAGE
PREVIOUS AUDIT PAGE
RETURN TO MAIN MENU

PAGE FIVE OF AUDIT TABLE

GAME AUDITS	
REVOLUTION X REVISION XX XX/XX/1994	
TOTAL GAMES STARTED	0
FOUND STEVE TYLER	0
FOUND JOE PERRY	0
FOUND TOM HAMILTON	0
FOUND BRAD WHITFORD	0
FOUND JOEY KRAMER	0
PARTYED BACKSTAGE	0

PREVIOUS AUDIT PAGE
RETURN TO MAIN MENU

PAGE SIX OF AUDIT TABLE

GAME ADJUSTMENTS

The Game Adjustments allow the operator to customize the game.

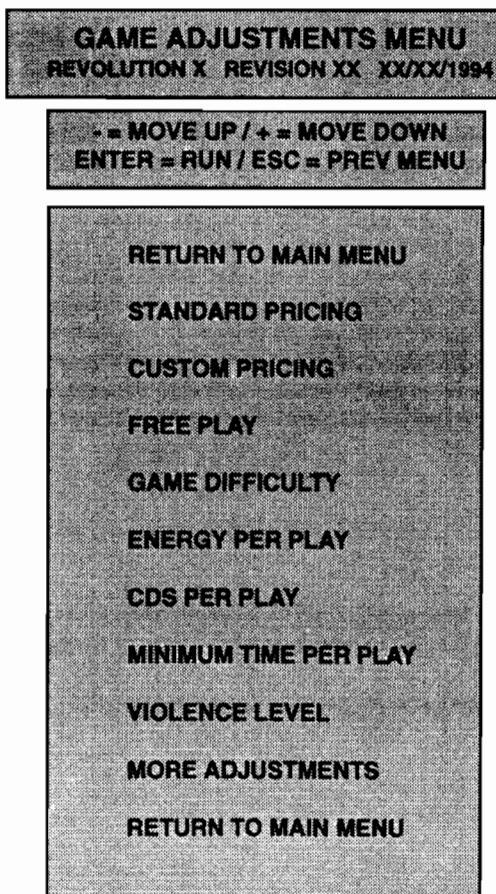
To select the Game Adjustments Menu press the (-) or (+) button, then press the Enter button to open the menu.

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

Game Adjustments continued...

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		50P	
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	
Antilles	1/25¢, 4/1 guilder	25¢		1 guilder	
Hungary	1/2 x 10 forint, 3/2 x 20 forint	10 forint		20 forint	

CUSTOM PRICING
REVOLUTION X REVISION XX XX/XX/1994

- = MOVE UP / + = MOVE DOWN
ENTER = RUN / ESC = PREV MENU

RETURN TO ADJ. MENU

(1) LEFT CHUTE UNITS

(1) RIGHT CHUTE UNITS

(1) THIRD CHUTE UNITS

(1) FOURTH CHUTE UNITS

(2) UNITS/CREDITS

(3) UNITS/BONUS

(4) MINIMUM UNITS REQUIRED

(5) CREDITS TO START

(6) CREDITS TO CONTINUE

(7) COINS PER DOLLAR

MAXIMUM CREDITS

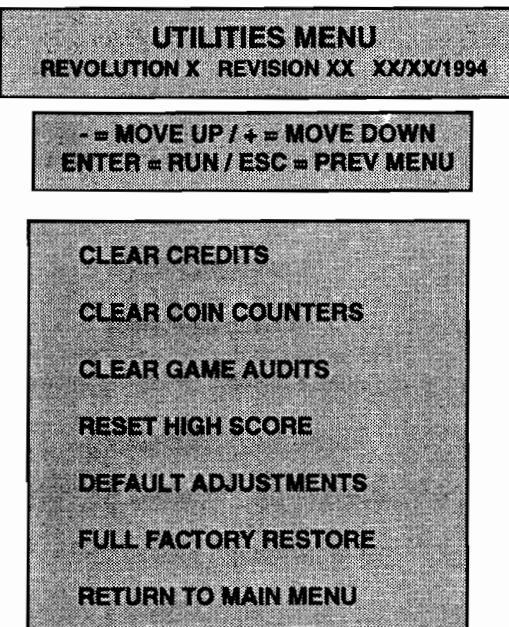
RETURN TO ADJ. MENU

- (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).

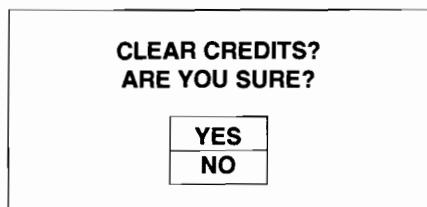
UTILITIES

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:

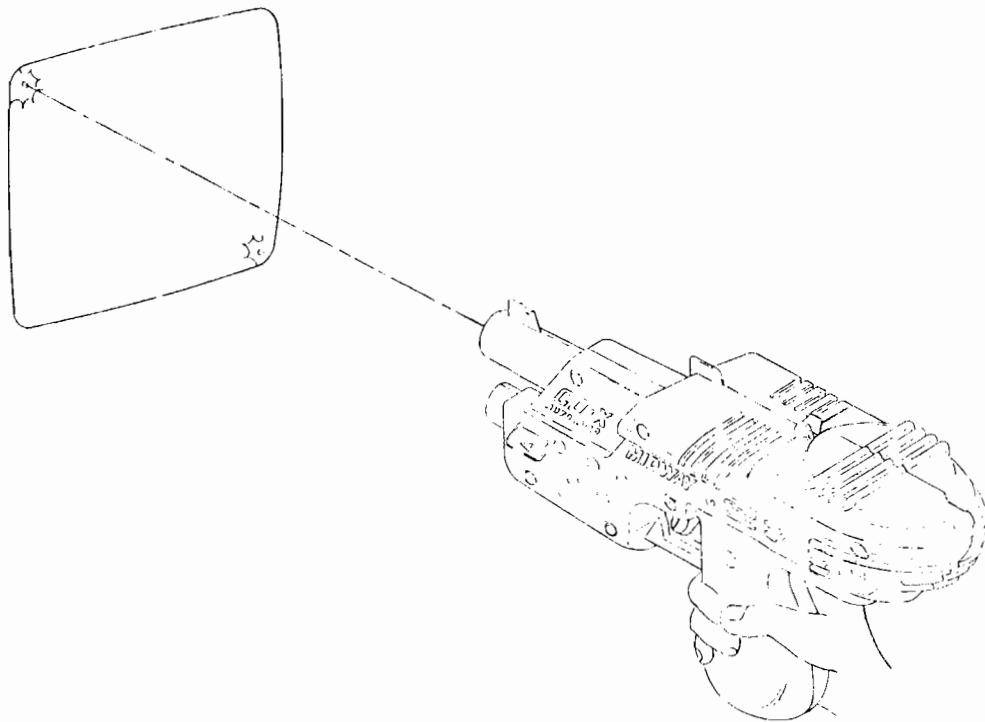
-**CMOS RAM ERROR**-

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.

HARDWARE INFO
REVOLUTION X REVISION XX XX/XX/1994

- = MOVE UP / + = MOVE DOWN
ENTER = RUN / ESC = PREV MENU

MIDWAY MANUFACTURING COMPANY

X-UNIT

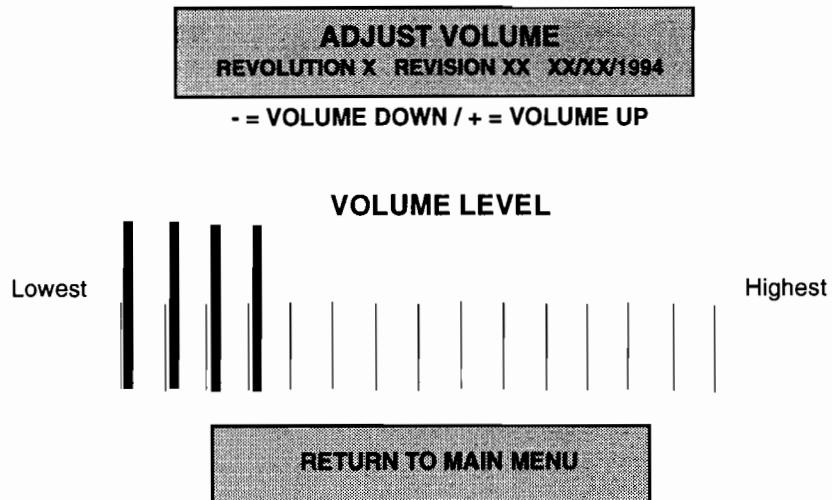
SERIAL NUMBER: XXXXXXX
DATE OF MANUFACTURE: XX / XX / 1994

RETURN TO MAIN MENU

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

No picture or distorted picture.

POSSIBLE SOLUTION

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)
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Fluorescent Lamp Assembly

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

Cables

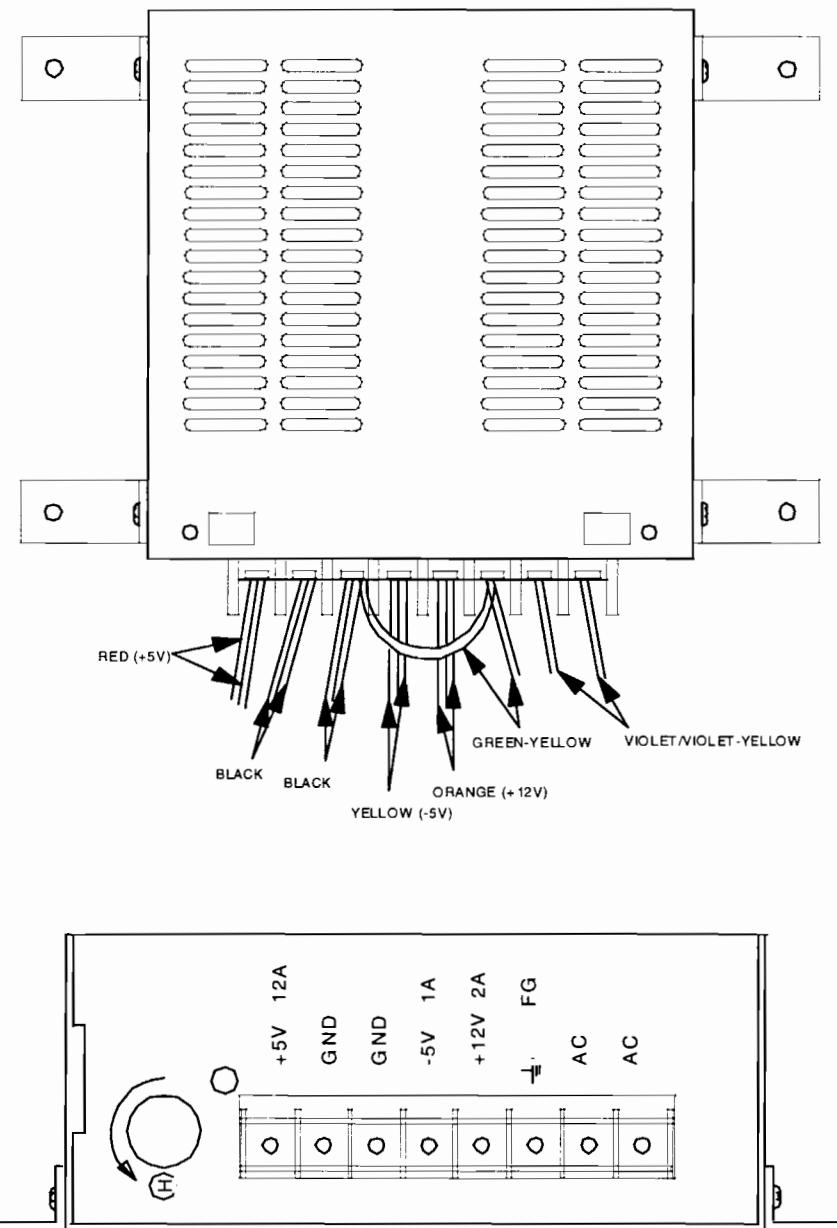
Line Voltage Cable Assembly	A-17877-2
Dixie-Mars Interconnect Cable	H-17019
Cabinet Speaker Cable	H-17035
Main Harness Cable	H-17715.1
Control Panel Cable	H-17999
DBV Adapter Cable - USA	H-18136
20-pin Ribbon Cable	5795-10937-18

Monitor

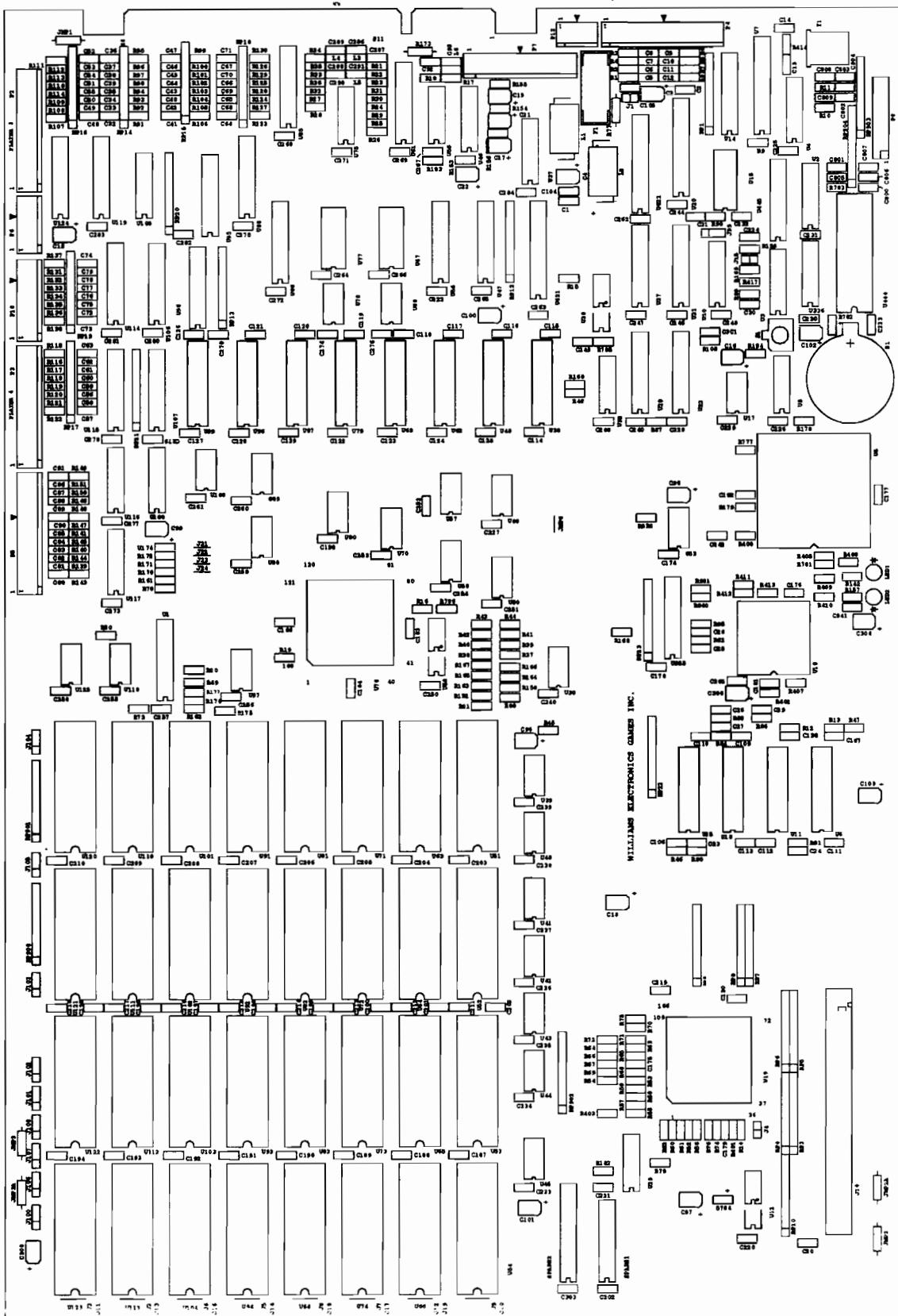
Monitor Support Bracket, Left	A-14769
Monitor Support Bracket, Right	A-14770
Monitor Bezel	03-8497-2
25" Monitor	5675-12787-05

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

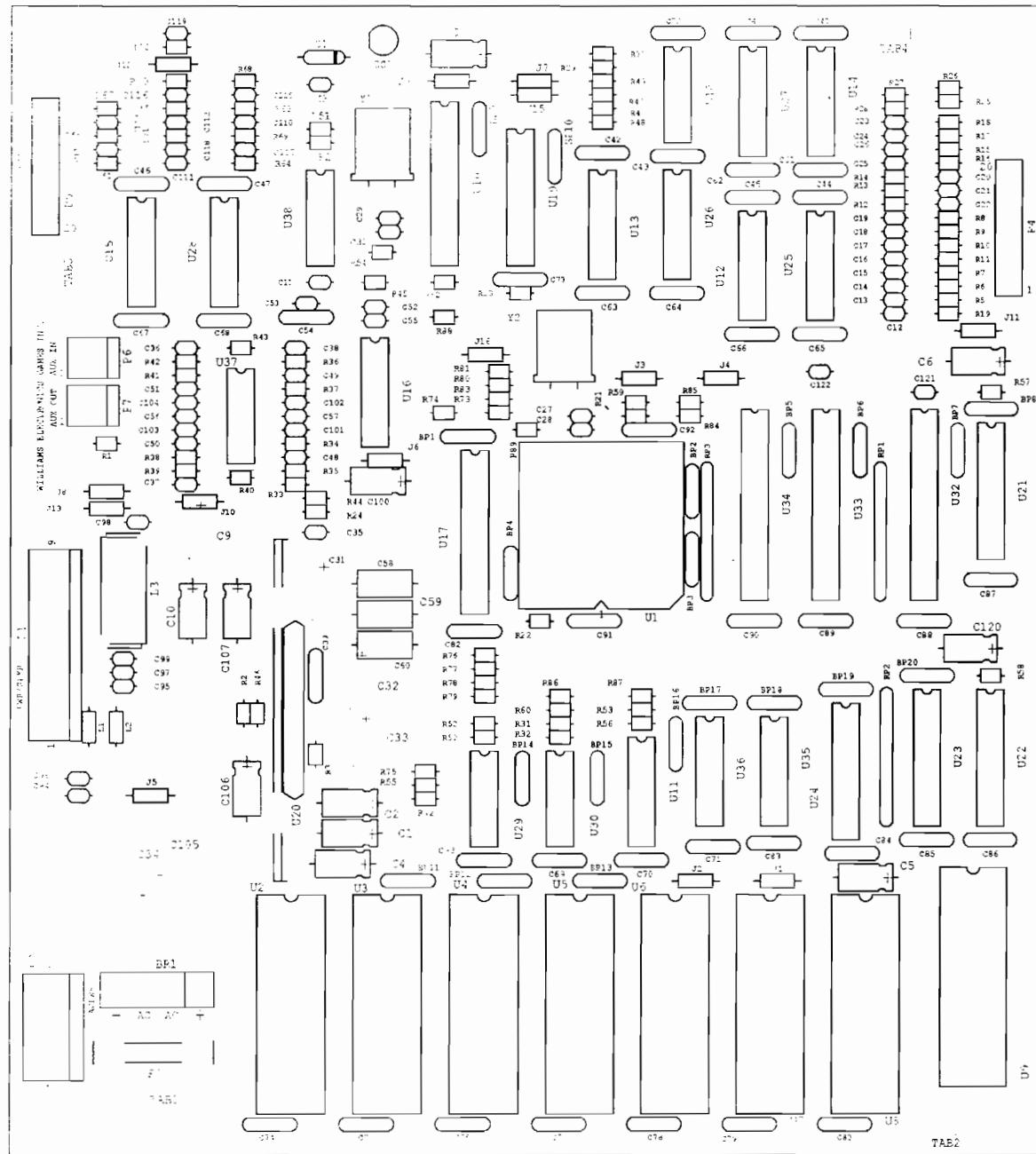


A-16744-40019

X-unit CPU Board Parts

Part Number	Part Designator	Description	Part Number	Part Designator	Description
5020-13637-00	R12, R13, R47 R139-R141, R143-R151, R777	Res., 33Ω, 1/8W, 5%	5372-13323-00	U20	IC., ADC0848, +/-1LSB
			5430-13692-00	U7	IC., UART 2691 D28-300
			5434-12255-00	U3	IC., Max691 MCS4.65V
5020-13668-00	R25, R31, R36	Res., 15Ω, 1/8W, 5%	5520-13093-00	Y1	Crystal 3.6864MHZ
5020-13669-00	R24, R30, R35	Res., 8.2KΩ, 1/8W, 5%	5521-13603-05	U12	Osc., CMOS 40MHZ
5020-13671-00	R1-R8, R48, R91-R138	Res., 470Ω, 1/8W, 5%	5521-13806-03	U30	Osc., TTL 8MHZ
5020-13672-00	R23, R29, R34	Res., 3.9KΩ, 1/8W, 5%	5521-13806-04	U59	Osc., TTL 25MHZ
5020-13673-00	R22, R28, R33	Res., 2KΩ, 1/8W, 5%	5551-09822-00	L1, L2	Inductor., 4.7μH, 3A
5020-13674-00	R80-R86, R142, R153-R157, R180, R401, R410	Res., 330Ω, 1/8W, 5%	5641-12551-00	S1	Sw., PB, PCB Mount
			5645-09025-00	U105, U108	Sw., DIP, 8 pos.
5020-13676-00	R10, R11, R18, R19, R26 R74, R75, R87, R169, R404, R930	Res., 100Ω, 1/8W, 5%	5700-09915-00	U1, U955	LED, Red
			5700-10176-00	U444	Socket, IC, 20-pin, .3"
			5700-12088-00	U51-U54, U63-U66, U71-U74, U81-U84, U91-U94, U101-U113, U120-U123	Socket, IC, 28-pin, .6"
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%	5700-12424-00	U5	Socket, 84-pin, PLCC
5020-13735-00	R9, R20, R46, R50, R89-R90, R159, R182-R184, R781-R786, R417, R900, R901	Res., 47KΩ, 1/8W, 5%	5700-13173-00	U10	Socket, 44-pin, PLCC
5022-13761-00	R21, R27, R32	Res., 1KΩ, 1/8W, 2%	5791-10862-09	P7	Header, 9-pin str sq, .156
5020-13678-00	L3-L6	Res., 0Ω, 1/8W, 5%	5791-12461-05	P12	Header, 5-pin str sq, .100
5019-09362-00	RP1, RP3-RP10, RP12-RP22, RP900-RP902	SIP, 4.7KΩ, 9R, 10, 5%	5791-12461-07	P6	Header, 7-pin str sq, .100
5019-13838-00	RP903, RP904	SIP, 47Ω, 5R, 10, 5%	5791-12461-10	P10	Header, 10-pin strsq, .100
5019-09669-00	RP23	SIP, 1KΩ, 9R, 10, 5%	5881-12315-00	P2-P5	Header, 15-pin strsq, .100
5050-13679-00	C3, C4, C15-C19, C21, C22, C96-C103, C300, C304, C306	Cap., 10μF, 16V, +80/-20	5880-11056-00	B1	Battery Holder, Btn, Sgnl
			5733-14113-00	B1	Battery, Lithium, 3V
			5735-13839-00	F1	Fuse Holder, 5x20mm
				F1	Fuse, 250mA, 250V, F.B.
5052-13633-00	C106-C129, C31	Cap., .33μF, 50V, z5u	5791-09437-00	P8	100 C 10 x 2
5052-13645-00	C20	Cap., .1μF, 50V, z5u	20-9915	JMP1-JMP3, JMP2A, JMP3A, JMP6, R77, R173	Wire Insulated Jumper
5052-13648-00	C13, C14, C23-C29, C92, C93, C286-C291, C301	Cap., 22pF, 50V, npo, 5%	5343-40019-01	U120	IC., EPROM
5052-13680-00	C1, C2, C80-C91, C174-C284, C302, C303, C305	Cap., .01μF, +80/-20	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
5052-13681-00	C104, C105	Cap., .001μF, 10%	5343-40019-08	U113	IC., EPROM
5052-13682-00	C30	Cap., 470pF, npo, 10%	5343-40019-09	U101	IC., EPROM
5052-13683-00	C5-C12, C32-C79, C800-C809	Cap., 100pF, npo, 10%	5343-40019-10	U102	IC., EPROM
5287-13689-00	U40, U42, U44, U57 U58, U68, U78	IC., 74ABT374	5343-40019-11	U103	IC., EPROM
5287-13690-00	U17, U39, U41, U43 U45, U49, U50, U70, U80, U89-U90, U100 U125	IC., 74ABT245	5343-40019-12	U104	IC., EPROM
5287-13691-00	U23, U36, U97, U118,	IC., 74ABT244	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
5340-13849-00	U38, U48, U62, U69, U79, U87, U96, U99	IC., V/RAM, 48121	5343-40019-18	U82	IC., EPROM
			5343-40019-19	U83	IC., EPROM
5349-13685-00	U15	IC., RAM, STAT-S, 8Kx8	5343-40019-20	U84	IC., EPROM
5349-13686-00	U6, U11, U18, U25	IC., RAM, DYN, 256Kx16	5343-40019-21	U71	IC., EPROM
5349-13687-00	U67, U77	IC., RAM, STAT-S, 32Kx8	5343-40019-22	U72	IC., EPROM
5400-13684-00	U19	IC., MPU-GSP, 34020	5343-40019-23	U73	IC., EPROM
5410-12862-00	U76	IC., Custom Video, DMA2	5343-40019-24	U74	IC., EPROM
5280-08974-00	U75	IC., 7406 Hex Inv Oc	5343-40019-25	U63	IC., EPROM
5281-09733-00	U37, U116, U117, U336	IC., 74LS174 Hex F/F	5343-40019-26	U64	IC., EPROM
			5343-40019-27	U65	IC., EPROM
5281-09737-00	U55	IC., 74LS6 Quad Xor	5343-40019-28	U66	IC., EPROM
5281-09851-00	U9	IC., 74LS14 Smt/Trg	5343-40019-29	U51	IC., EPROM
5283-10552-00	U29	IC., 74F04 Inverter	5343-40019-30	U52	IC., EPROM
5283-12489-00	U32	IC., 74F32 Quad Or	5343-40019-31	U53	IC., EPROM
5283-13737-00	U16	IC., 74F138 3/8 Dmx Dip	5343-40019-32	U54	IC., EPROM
5315-12031-00	U88, U95, U106, U107, U114, U115, U119, U124	IC., 74HCT244	A-17719	U5*	IC., EPROM
			A-17720	U10*	IC., PLD PLSI 1032 Assy
5317-12208-00	U14, U47, U98	IC., 74ALS245 Xovr	A-17721	U955*	IC., PLD MACH 110 Assy
5317-13736-00	U22, U28, U56, U86	IC., 74ALS374 Dip 20	A-17722	U1*	IC., PLD 16V8 Assy
5317-13738-00	U21, U27, U61, U85, U445	IC., 74ALS244 Dip 20	5400-13823-00	U444*	IC., PLD 16L8 Assy
					PIC1657
5340-12958-00	U2	IC., 26LS31 Bal Drvr			
5340-12959-00	U4	IC., 26LS32			
5370-12602-00	U46	IC., ULN 2064B			

A-17026-40019
Sound Board Assembly

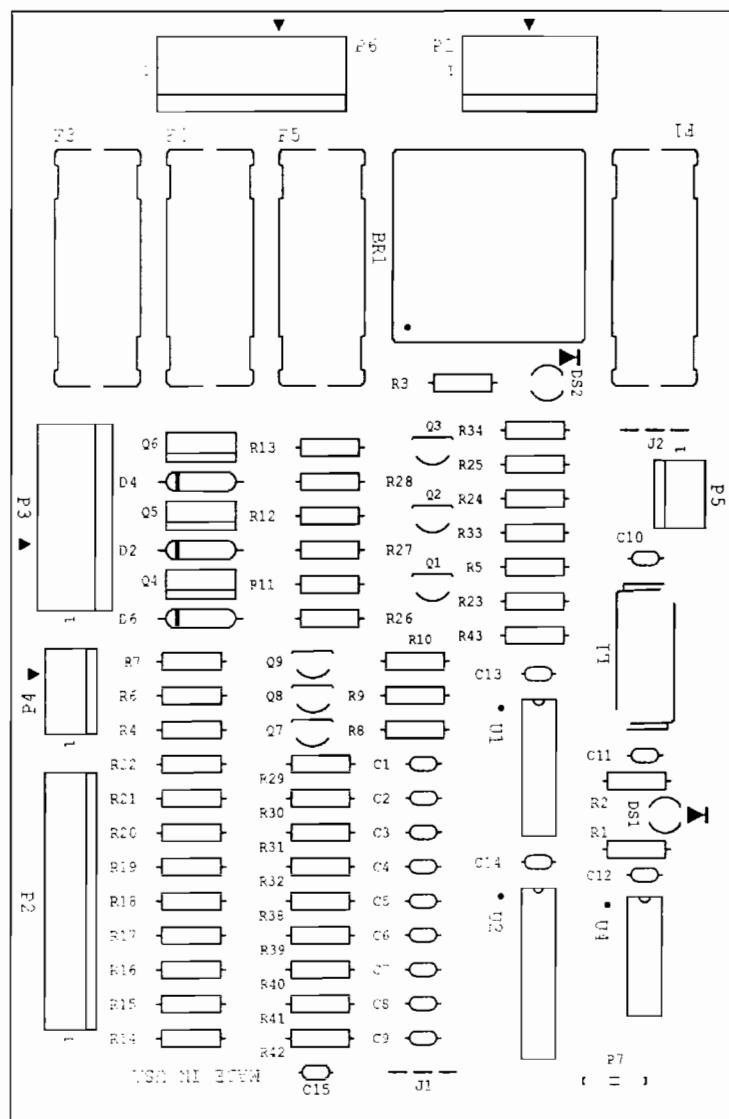


A-17026-40019

Sound Board Parts

Part Number	Part Designator	Description	Part Number	Part Designator	Description
20-9915	J1, J4, J6, J8, J9, J10, J13, J16	Jumper Wire, Insulated	A-17481 5400-13298-00	U17 U1	IC., PLD 20V8 Assy IC., MPU 2105KP-40
5010-13361-00	R1	Res., 1kΩ, 1/8W, 2%	5735-13853-00	F1	Fuse, 250V, 2A, S.B.
5010-13363-00	R45, R51, R57-R62	Res., 100Ω, 1/8W, 5%	A-5343-40019-33	U2	IC., EPROM
5010-13365-00	R21-R23, R31, R32, R50, R53, R55, R56, R73-R75, R88	Res., 4.7kΩ, 1/8W, 5%	A-5343-40019-34	U3	IC., EPROM
5010-13371-00	R52	Res., 330Ω, 1/8W, 5%	A-5343-40019-35	U4	IC., EPROM
5010-13472-00	R63-R72, R76-R87, R89	Res., 47Ω, 1/8W, 5%	A-5343-40019-36	U5	IC., EPROM
5010-13844-00	R3, R20, R54	Res., 100kΩ, 1W, 5%	A-5343-40019-37	U6	IC., EPROM
5010-13858-00	R2	Res., 820Ω, 1/8W, 5%	A-5343-40019-38	U7	IC., EPROM
5010-13962-00	R46	Res., 12kΩ, 1/8W, 5%	A-5343-40019-39	U8	IC., EPROM
5013-13842-00	R33-R44	Res., 6.19kΩ, 1/8W, 1%	A-5343-40019-40	U9	IC., EPROM
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			

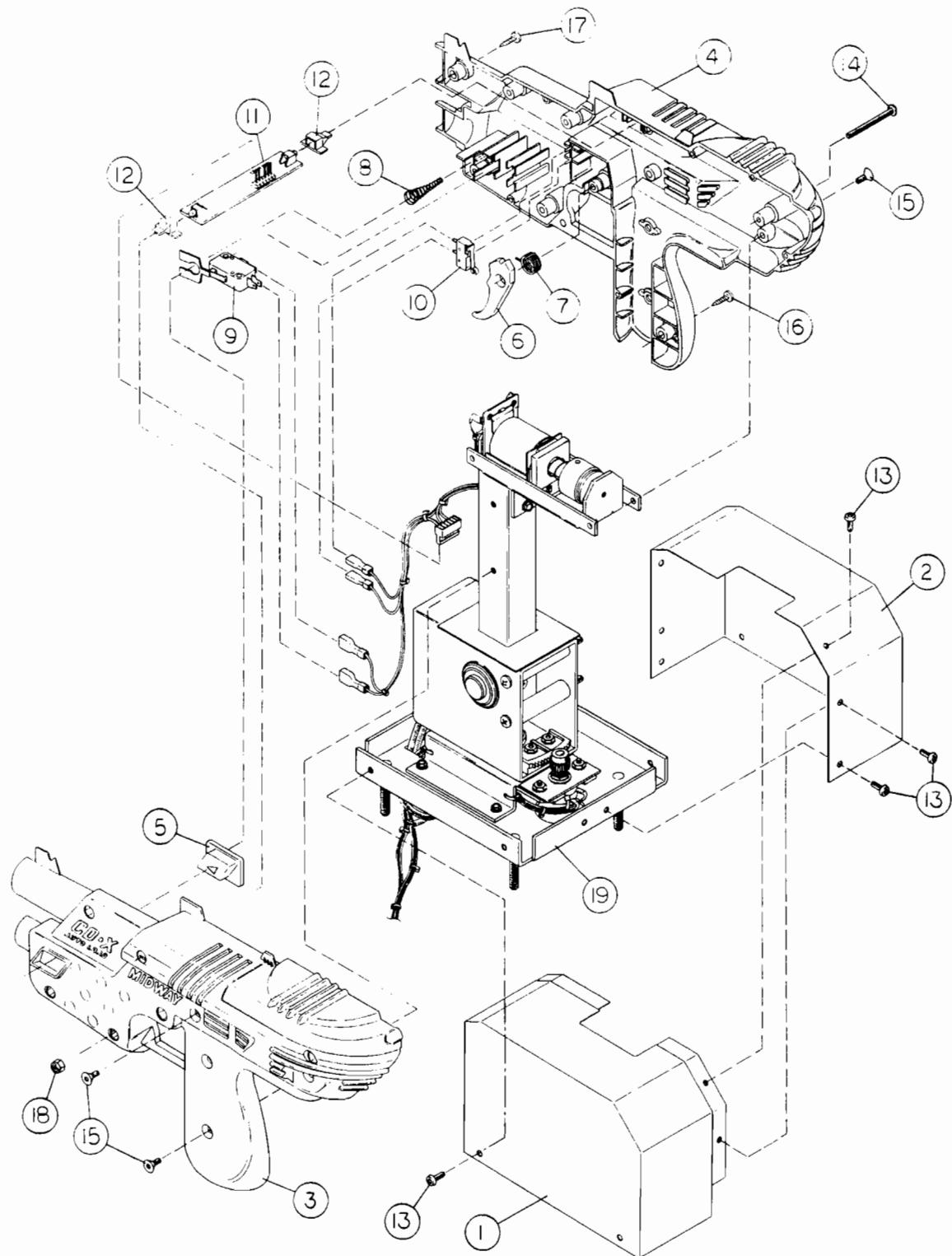
A-17024.1
Gun Coil Driver Board Assembly



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

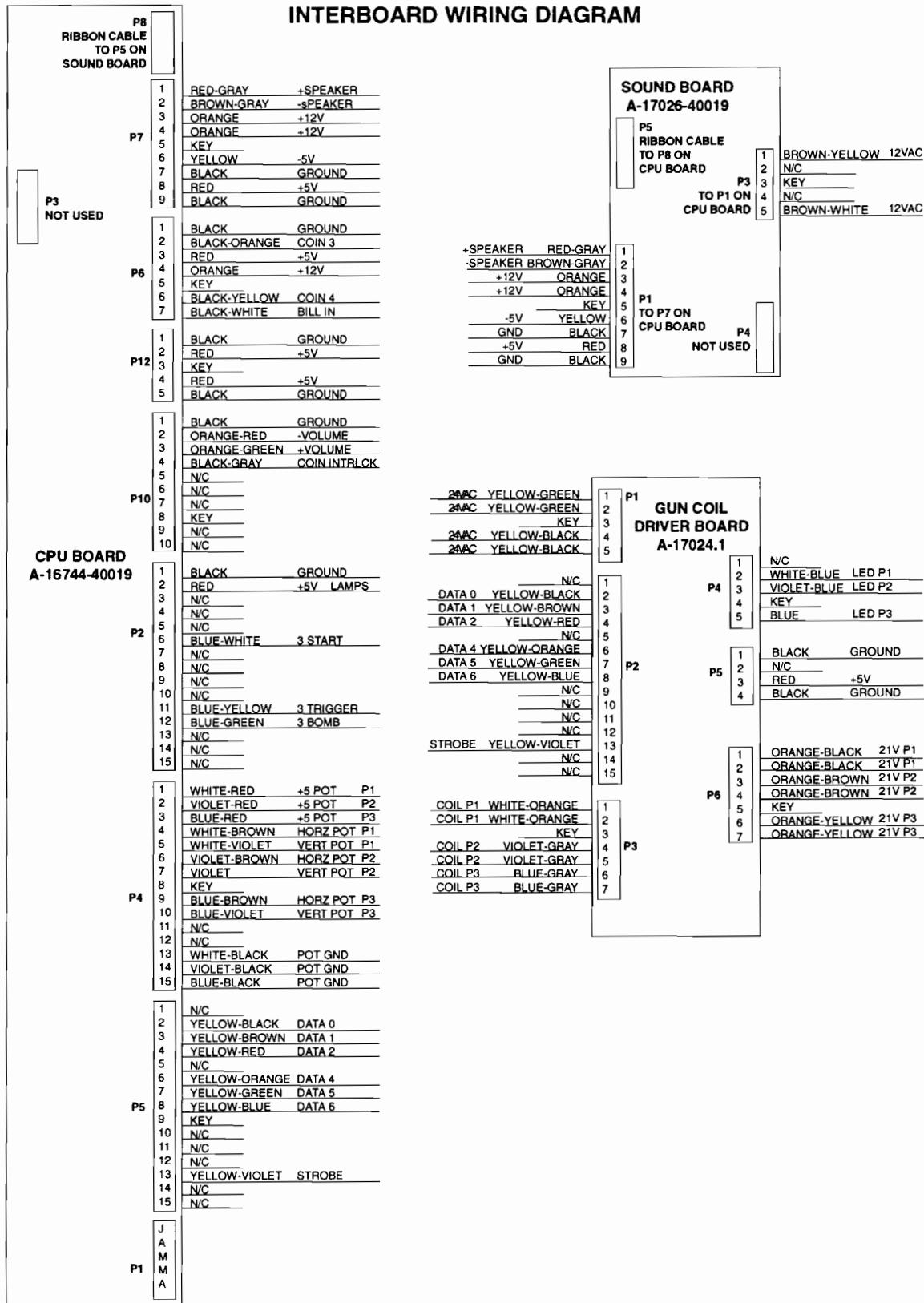
SECTION
three

Wiring Diagrams and Schematics

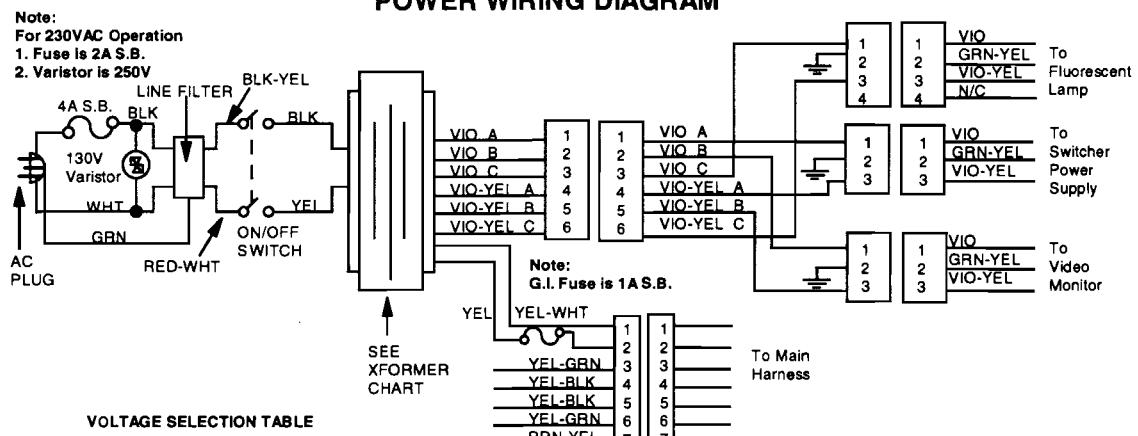
JAMMA CHART

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



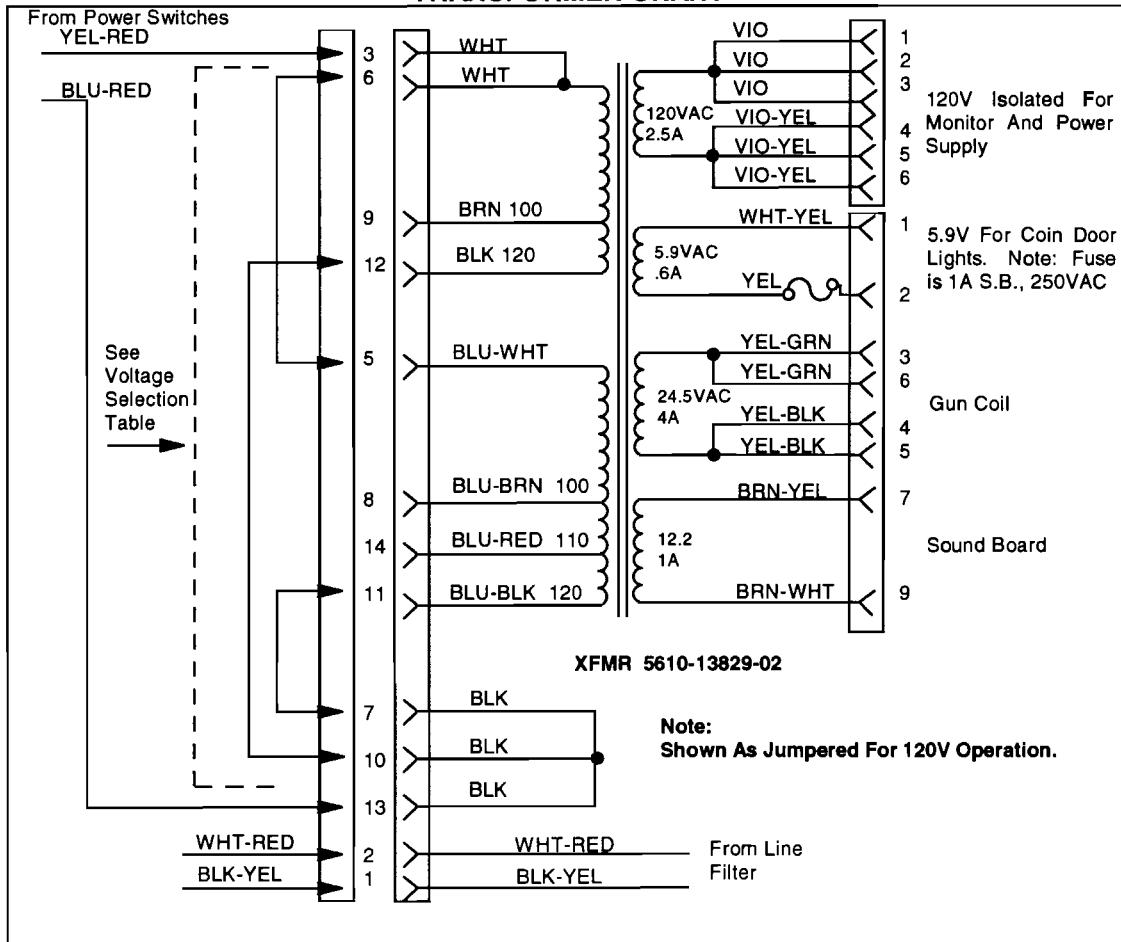
POWER WIRING DIAGRAM

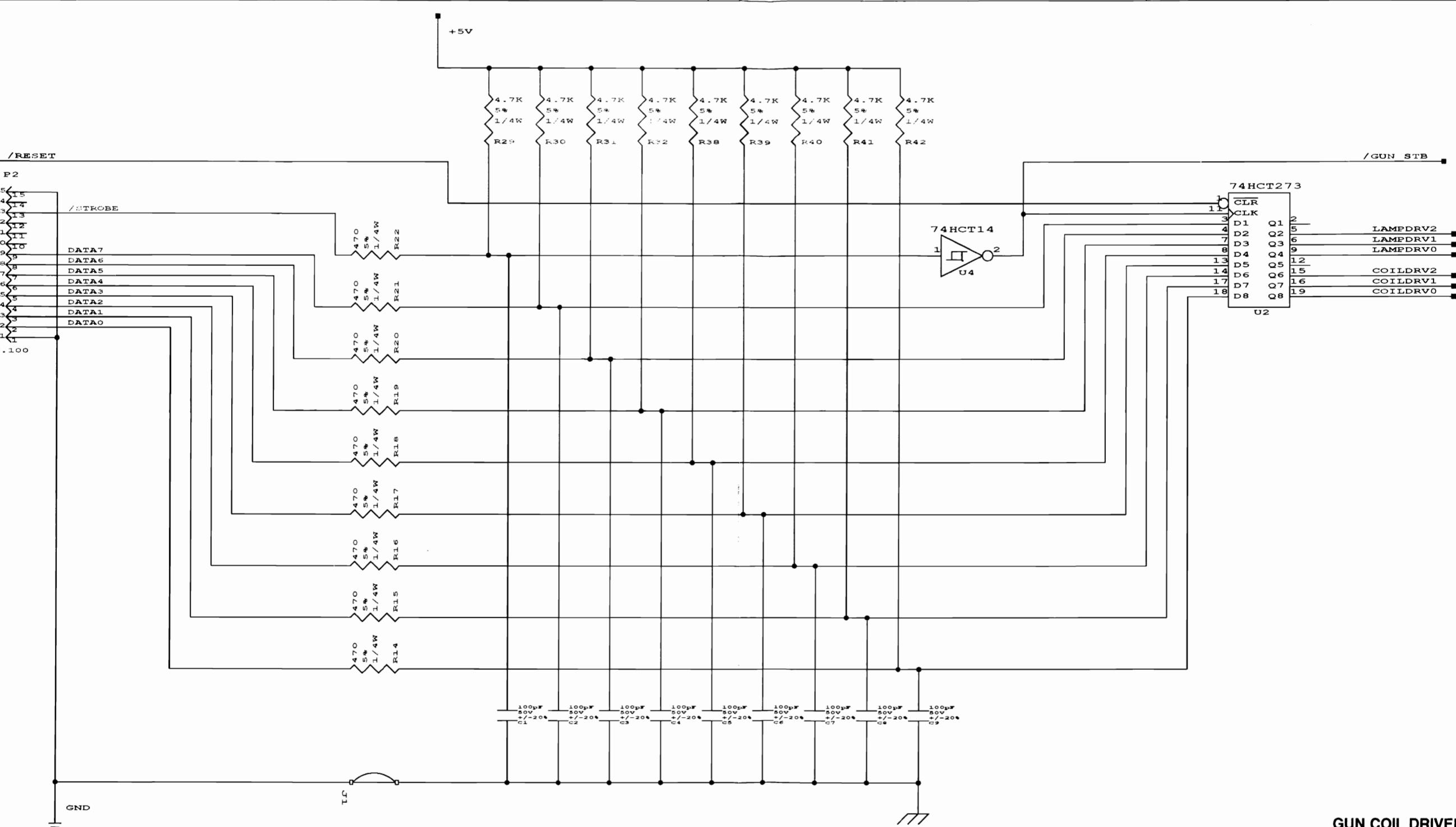


VOLTAGE SELECTION TABLE

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

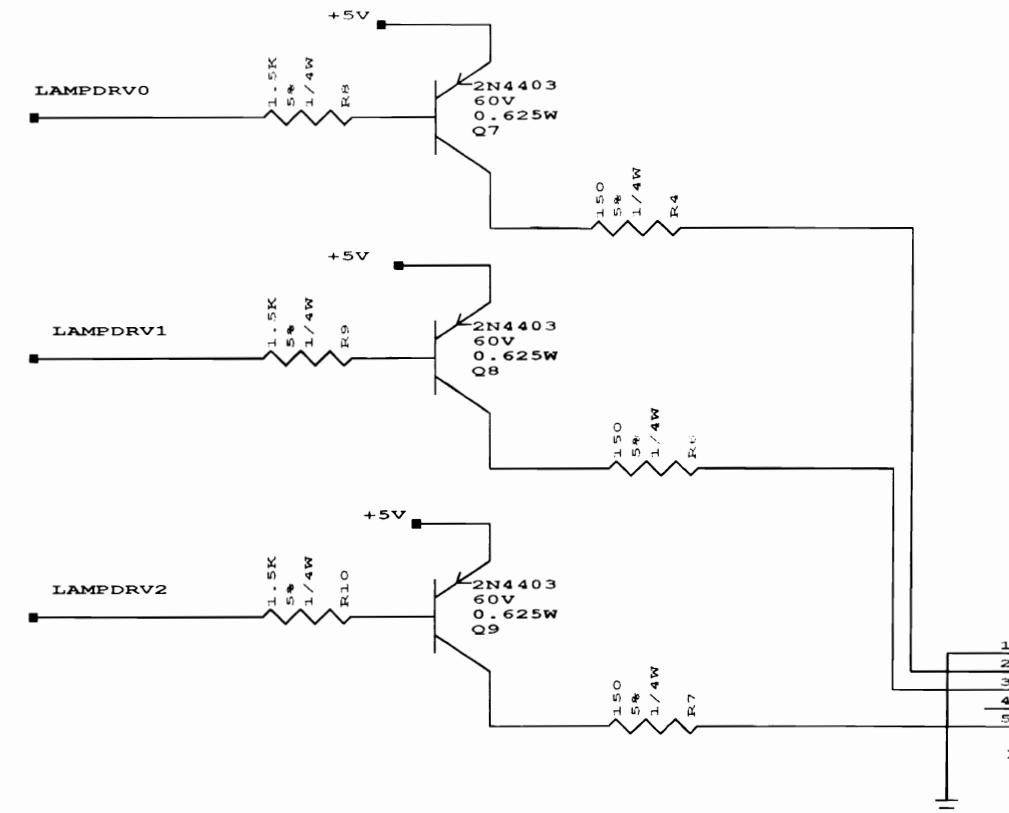
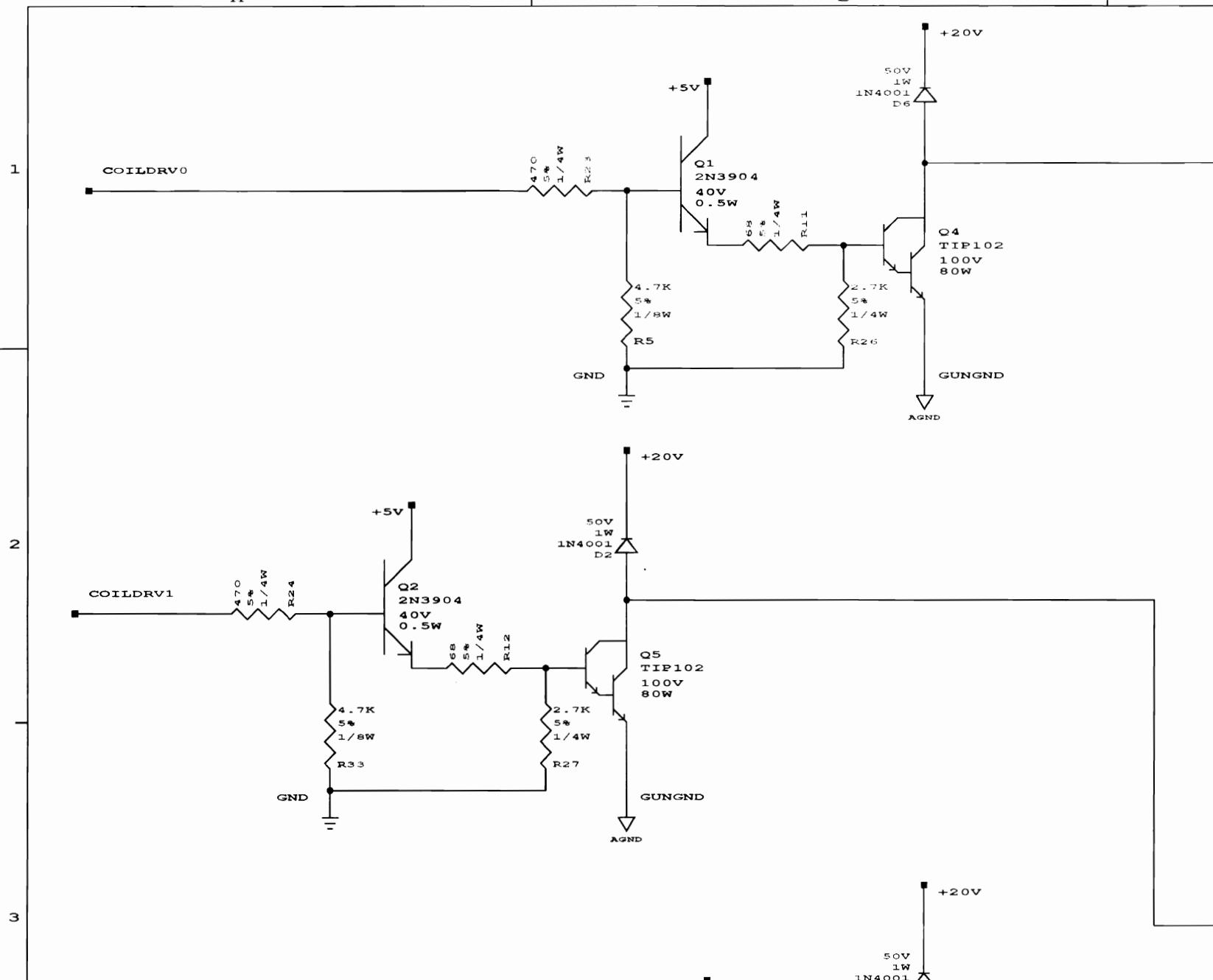




GUN COIL DRIVER BOARD
PAGE 3-6

		UPDATE REF. DES. SEE SHEETS 2 AND 3	
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DWN. BY P COX	1ST USEAGE A-17876	DATE	TITLE
CHECKED 5-13-1994 13:45	CURRENT PROJ. 40040	DATE	GUNDRVR
APPROVED	DATE	SHEET 1	OF 3
		PART NO. 16-9554	REV. 1

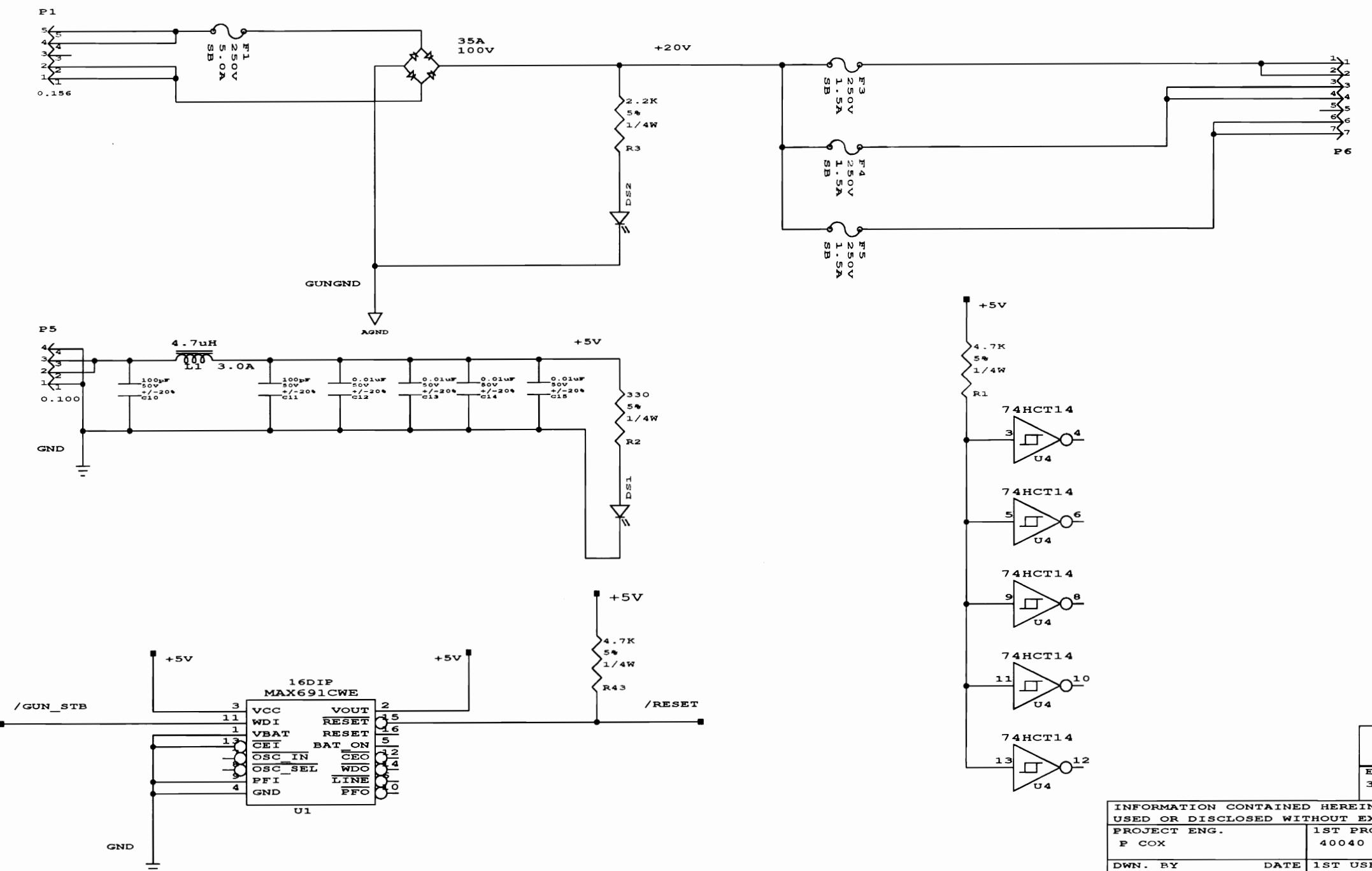
A B C D



**GUN COIL DRIVER BOARD
PAGE 3-7**

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DWN. BY	1ST USAGE	DATE
P COX	A-17876	
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	40040	
APPROVED	SHEET	OF
	2	3
	PART NO.	REV.
	16-9554	1

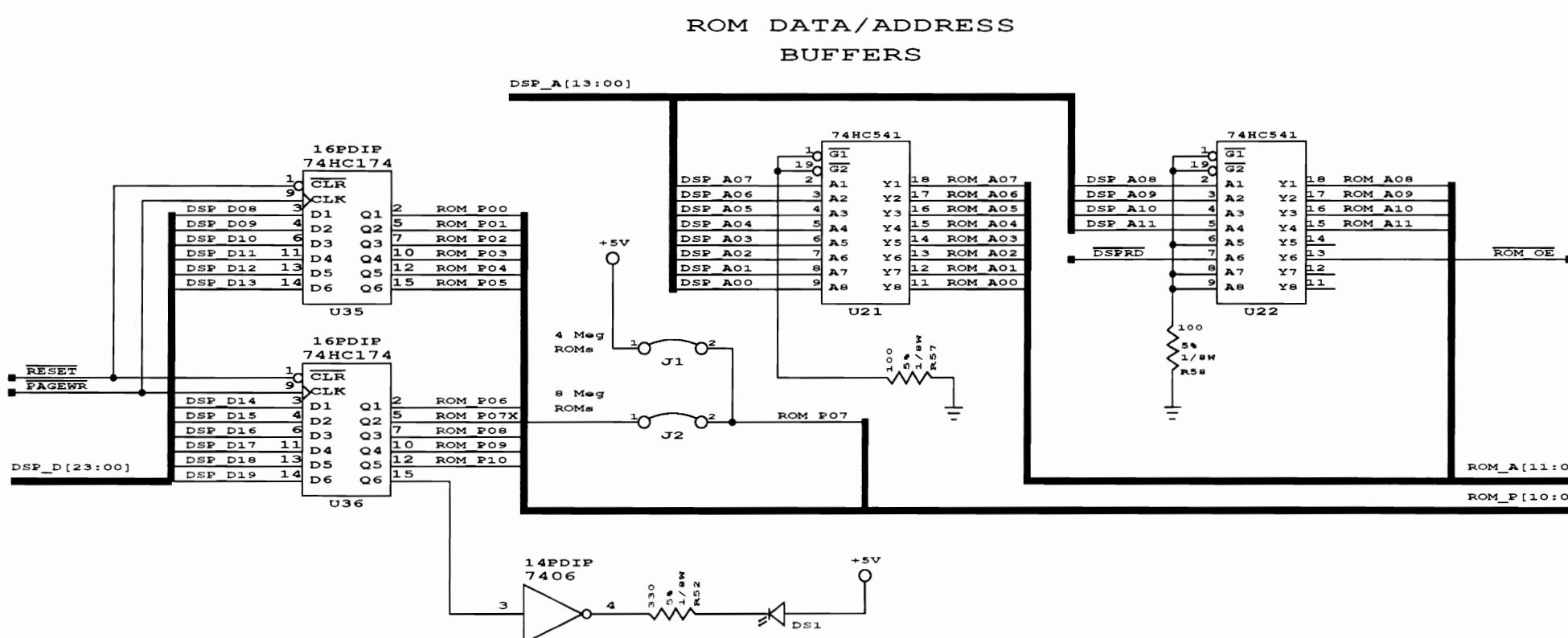
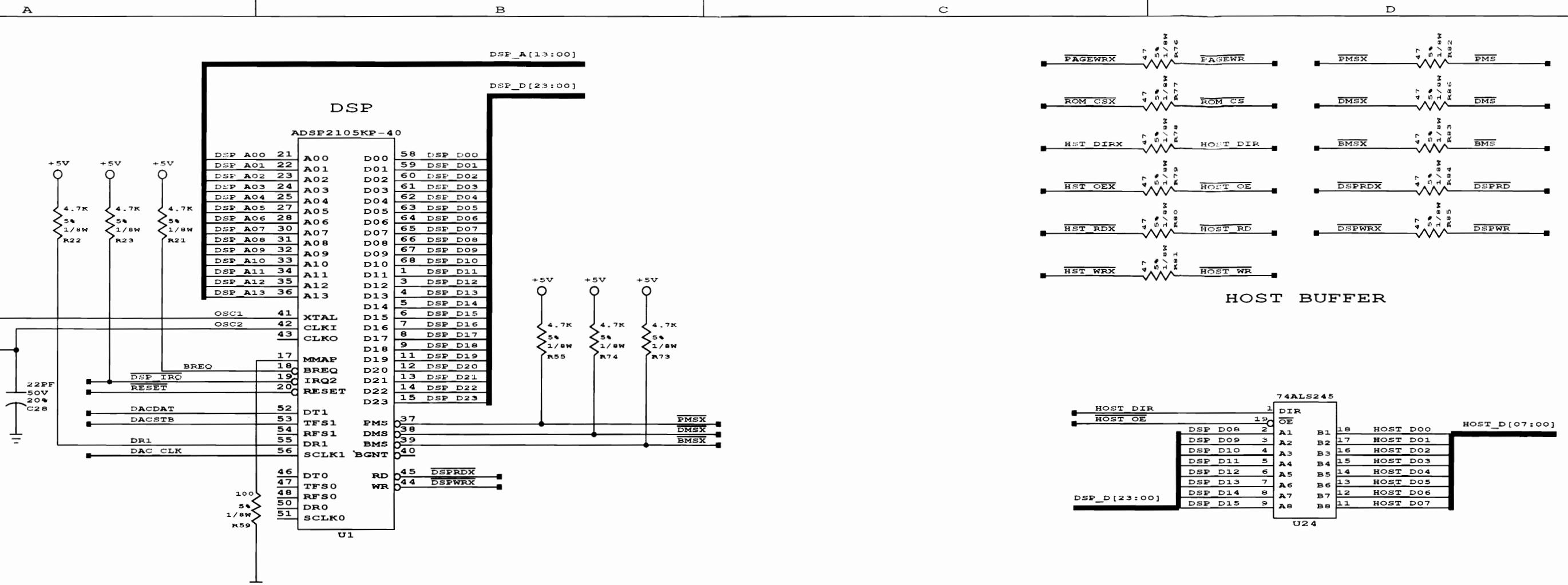
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**GUN COIL DRIVER BOARD
PAGE 3-8**

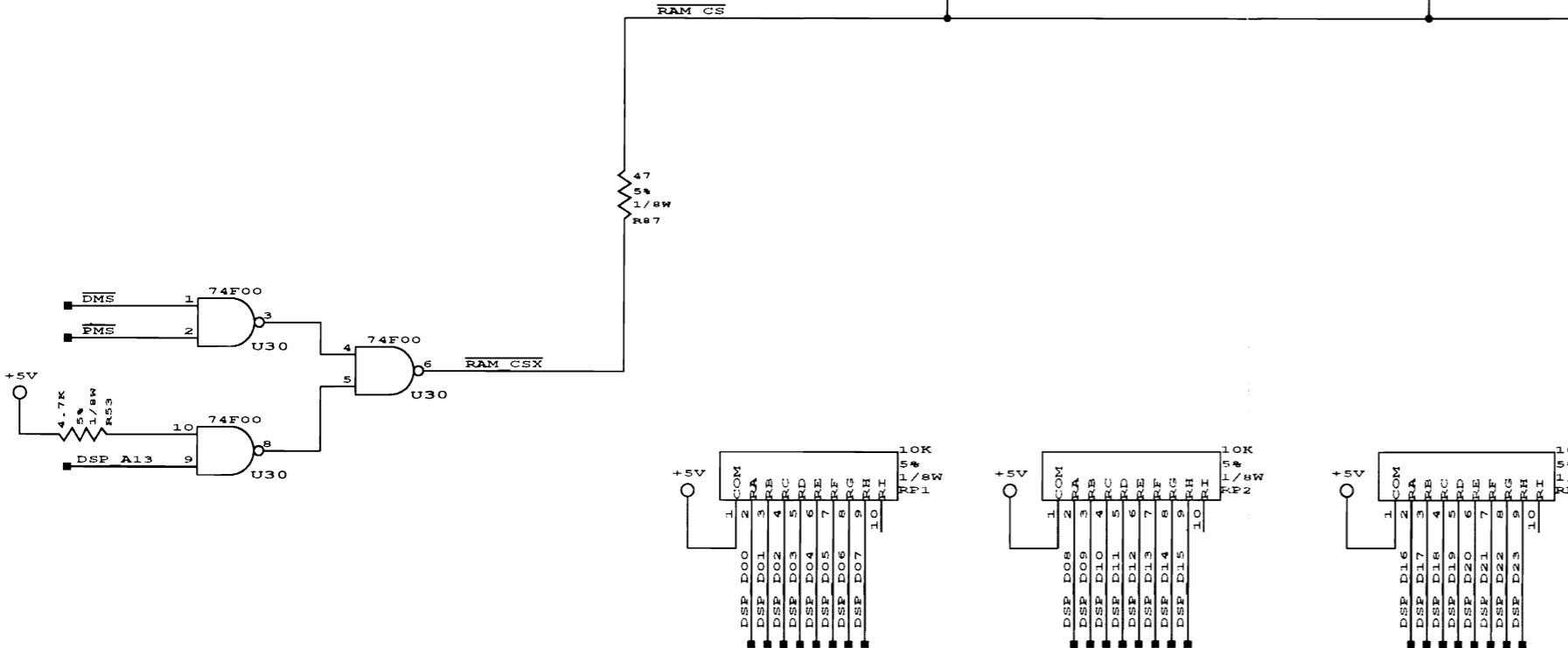
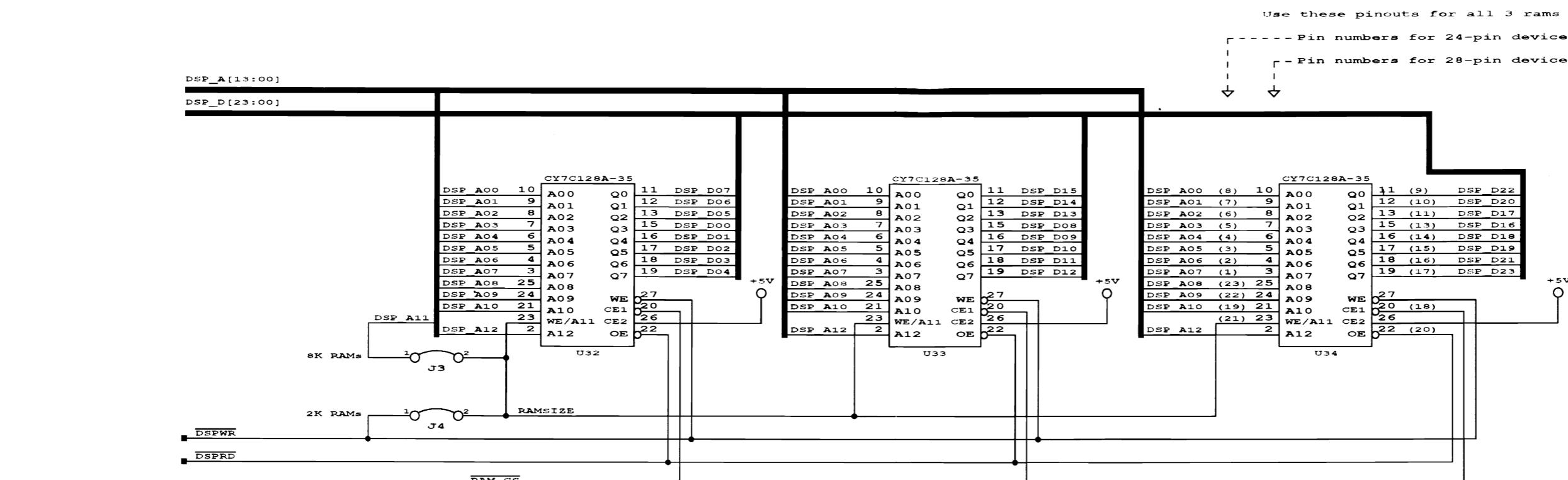
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GUNDVR



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

A B C D



VIDEO SOUND BOARD PAGE 3-10

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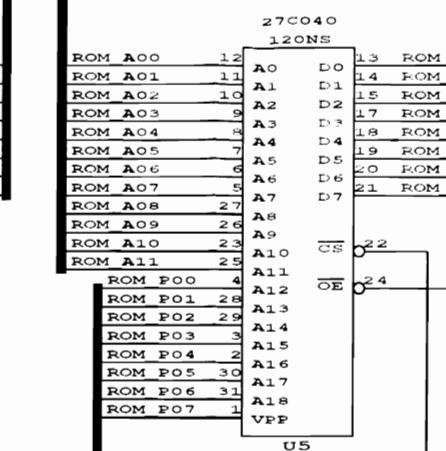
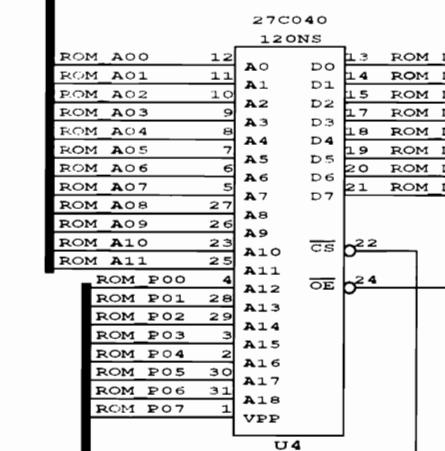
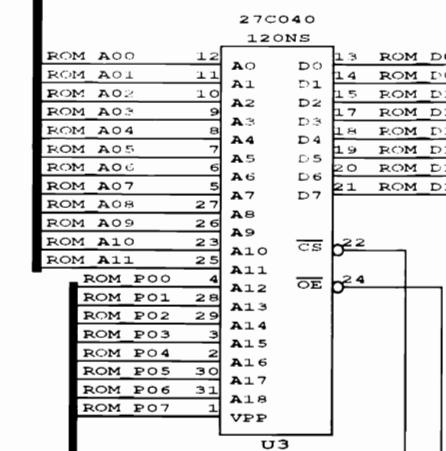
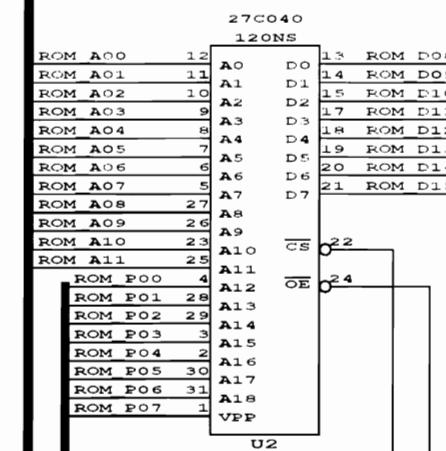
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C

D

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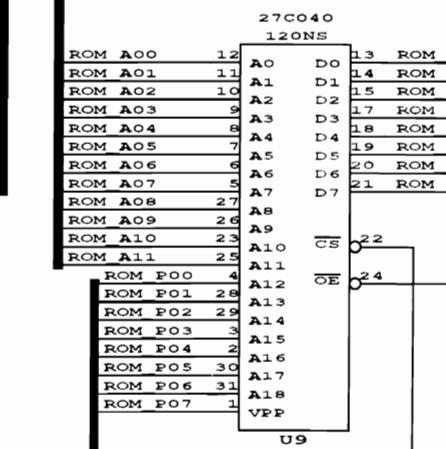
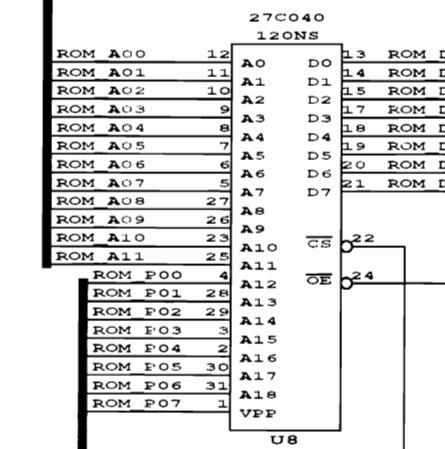
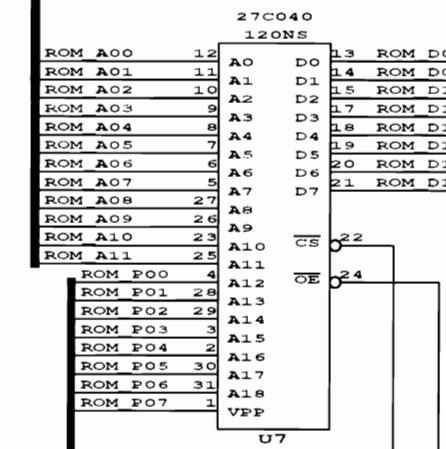
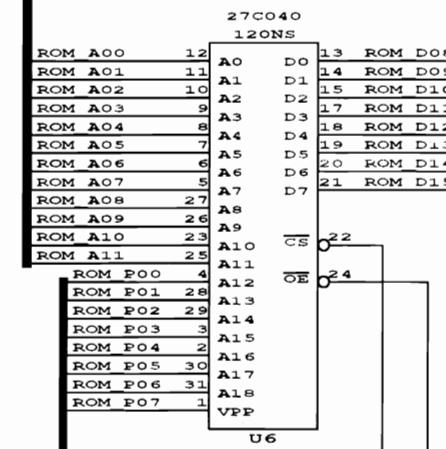
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■ ROM CS0
■ ROM CS1
■ ROM CS2
■ ROM CS3

ROM_OE

ROM_P[10:00]



■ ROM CS4
■ ROM CS5
■ ROM CS6
■ ROM CS7

+5V
4.7K
5*
1/BW
R56
ROM_P[10:00]
ROM_CS
ROM_D[15:08]

74HC138
DSPRD
ROM_CS
ROM_D[15:08]

U11

74HC541
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ROM_D08 2 A1 Y1 18 DSP_D08
ROM_D09 3 A2 Y2 17 DSP_D09
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ROM_D11 5 A4 Y4 15 DSP_D11
ROM_D12 6 A5 Y5 14 DSP_D12
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U23

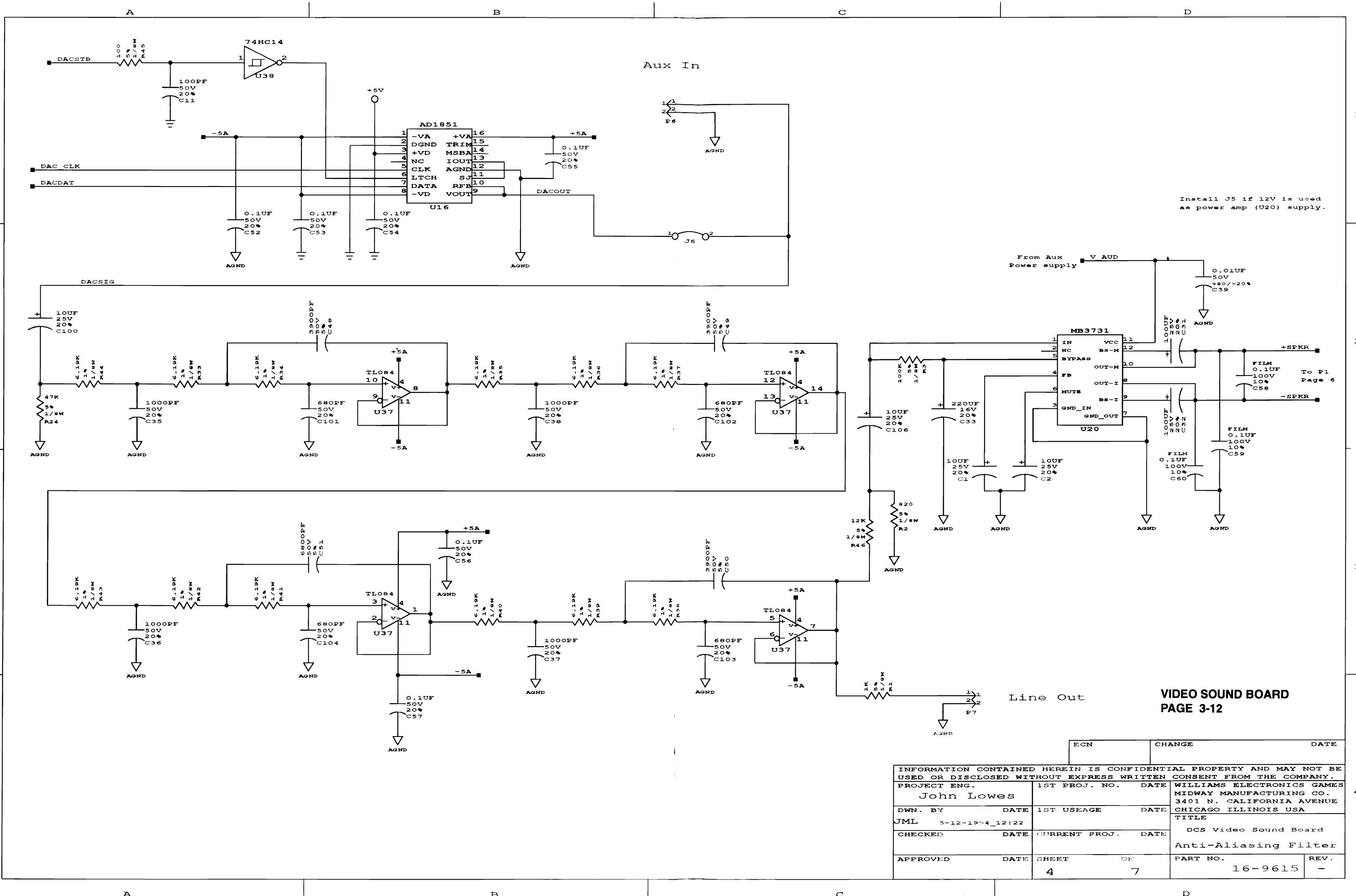
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 ECN CHANGE DATE
 DCS Video Sound Board
 Program/Data Roms
 PART NO. 16-9615 REV. -

A

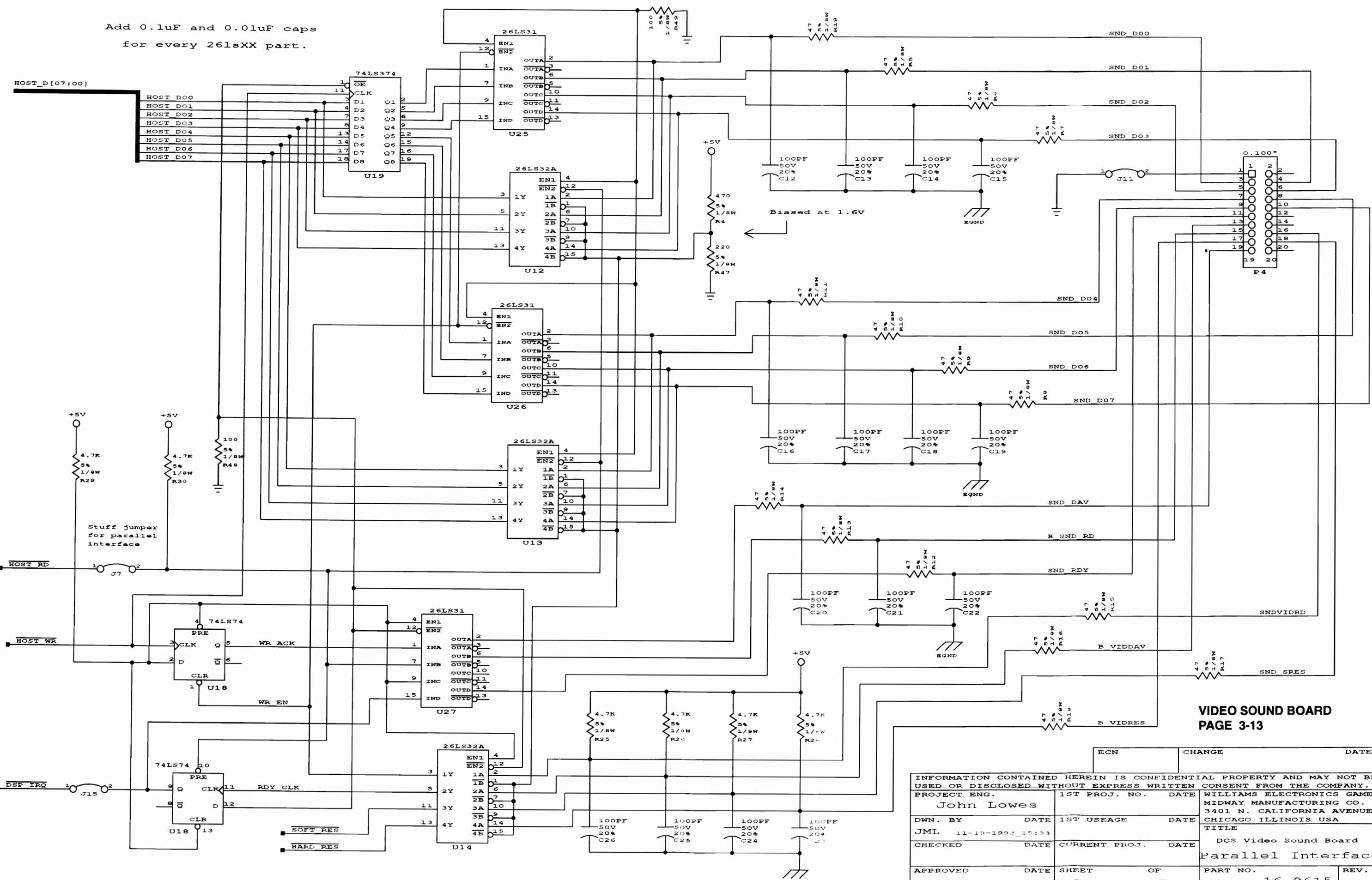
B

C

D



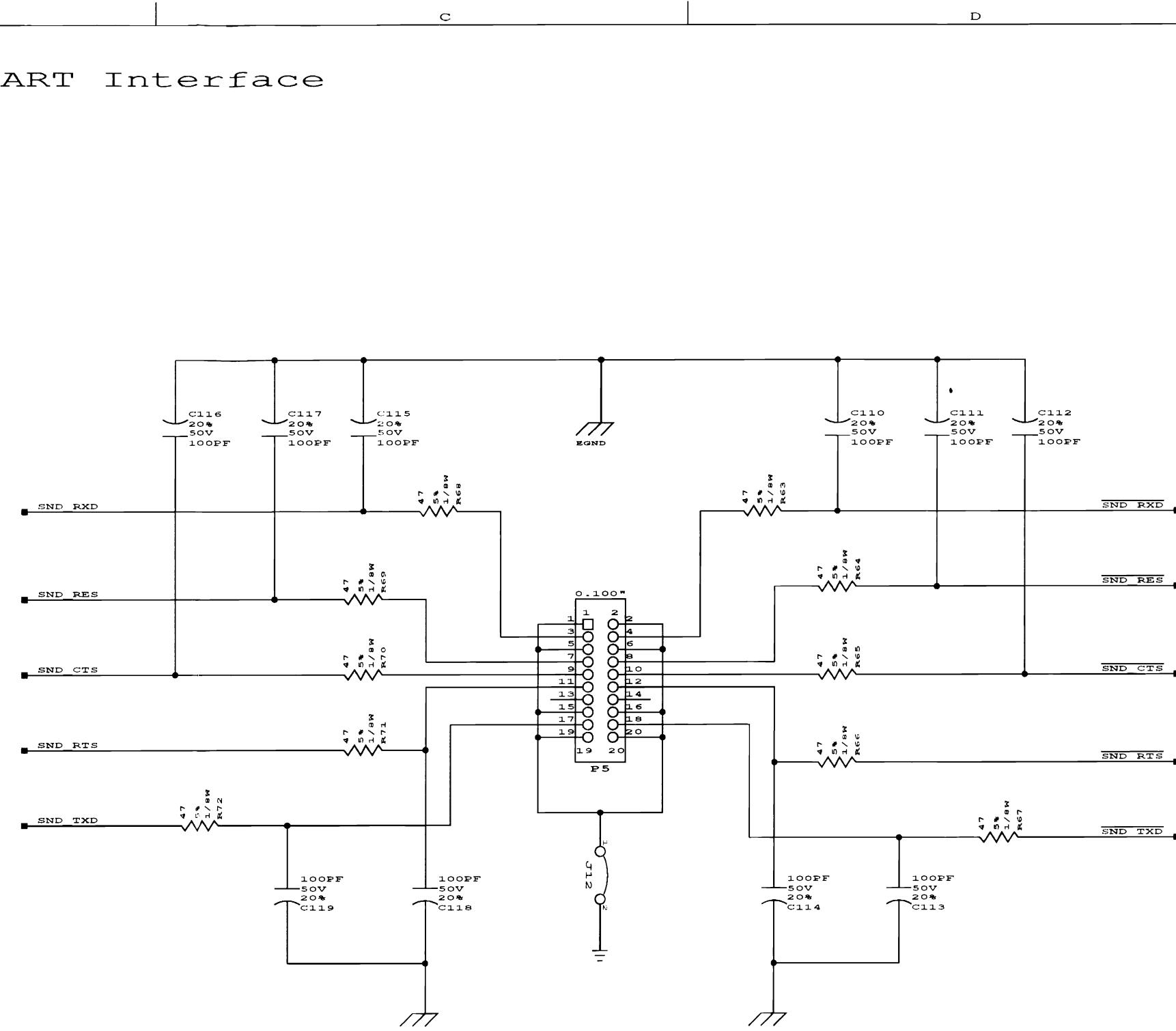
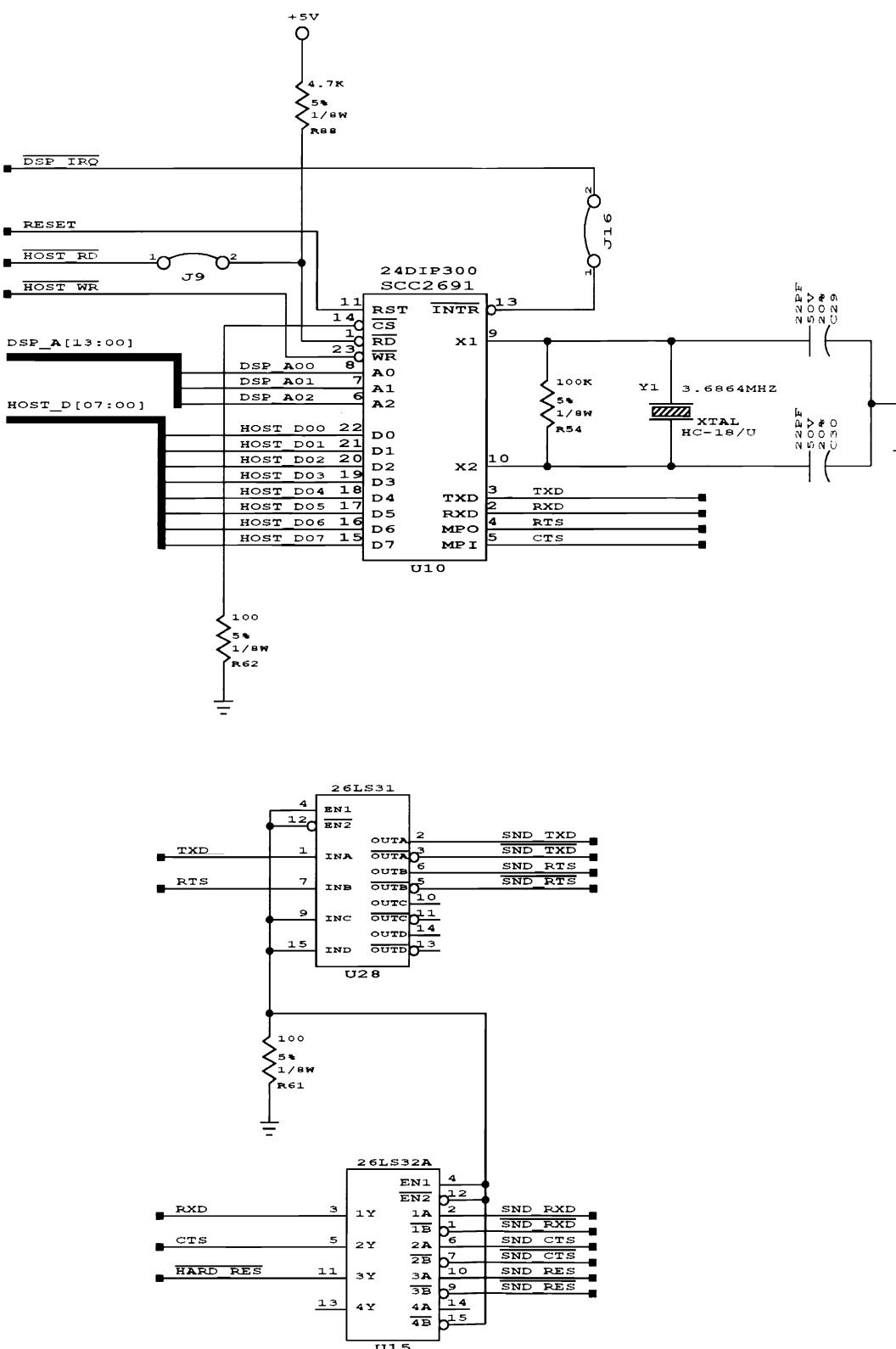
Add 0.1uF and 0.01uF caps
for every 26lsXX part.



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.	1ST PROJ. NO.	DATE
John Lowes		
DWN. BY	1ST USAGE	DATE
JML 11-19-1993 10:33		
CHECKED	CURRENT PROJ.	DATE
APPROVED	DATE	SHEET OF
		5 7
PART NO.		REV.
16-9615		-

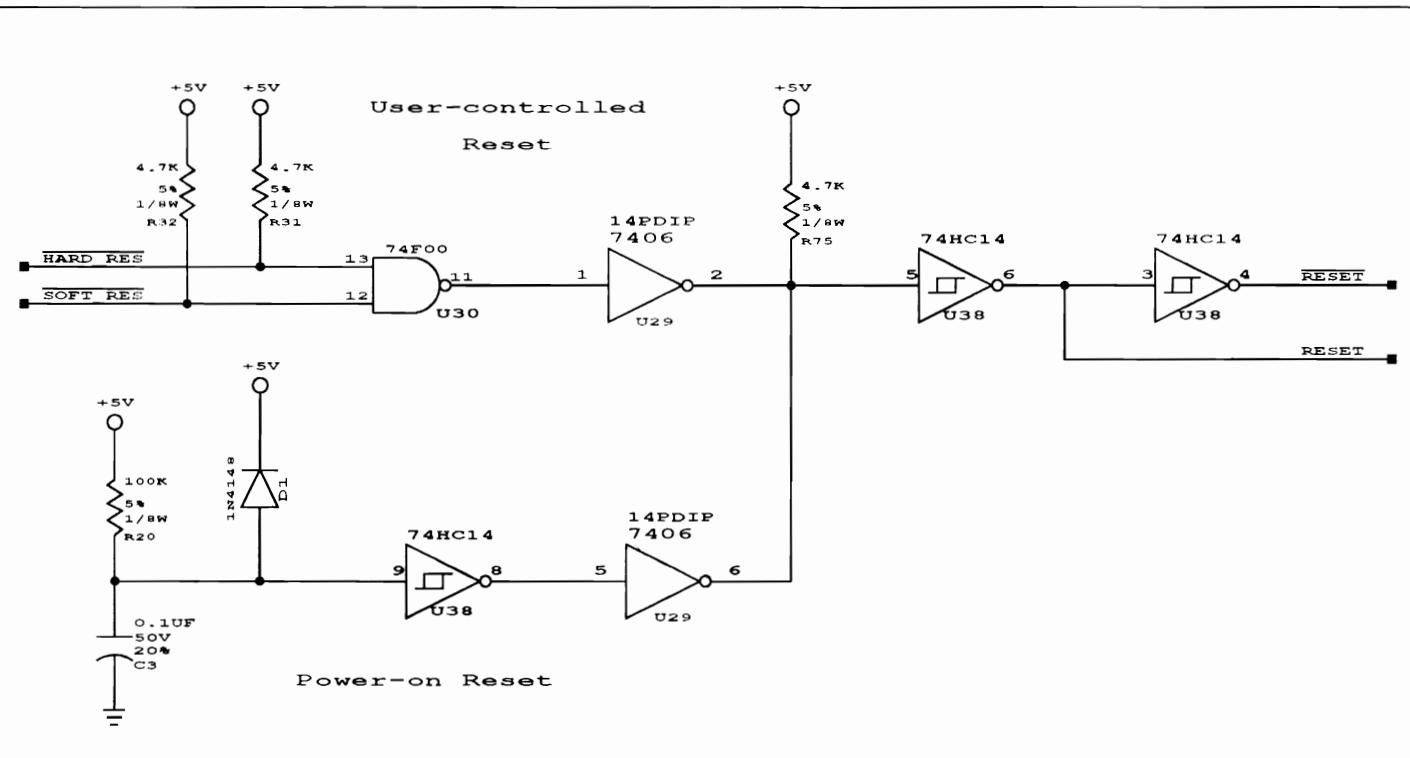
UART Interface



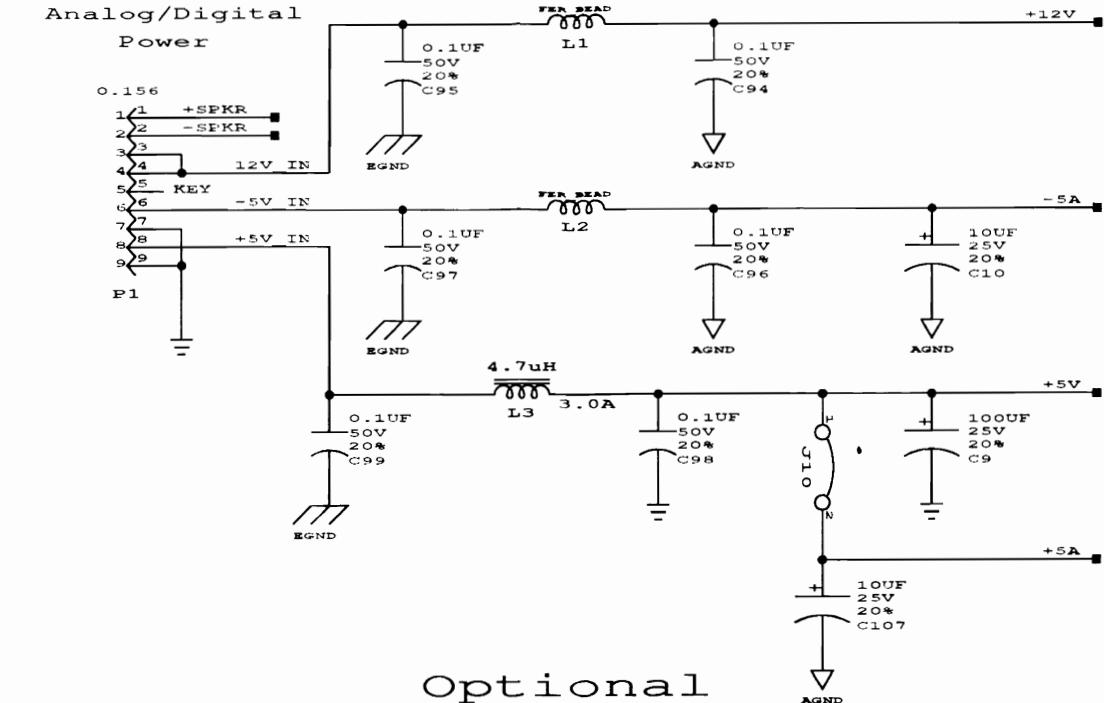
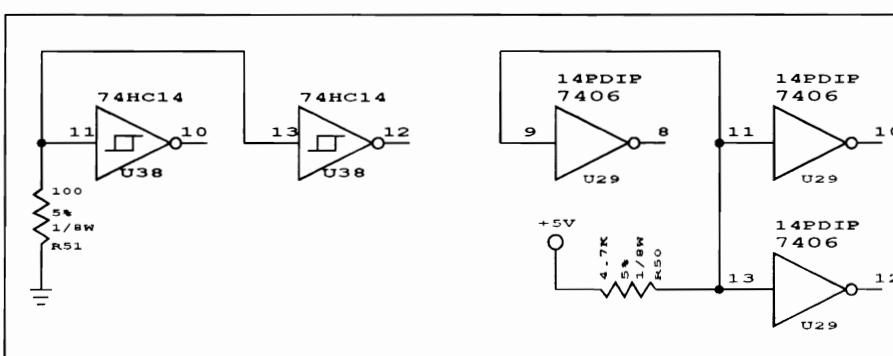
**VIDEO SOUND BOARD
PAGE 3-14**

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.	1ST PROJ. NO.	DATE
John Lowes		
DWN. BY	1ST USAGE	DATE
JML	11-19-1993_15:53	
CHECKED	CURRENT PROJ.	DATE
APPROVED	DATE	SHEET OF
		6 7
		PART NO. REV.
		16-9615 -

Reset Circuit

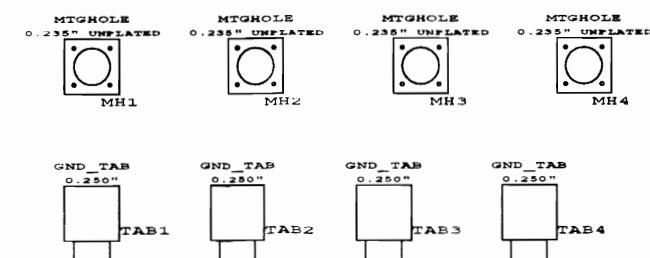
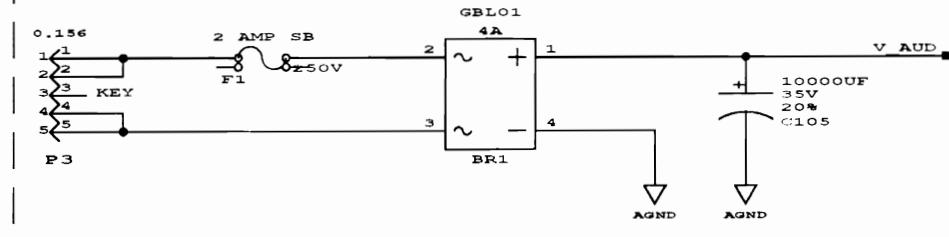


Spare Gates

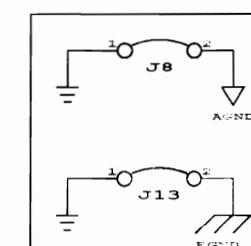


Aux Power: If used, then do NOT stuff C34, C94, C95, L1, and J5.
This circuit replaces +12V as the power amp (U20) supply.

16VAC

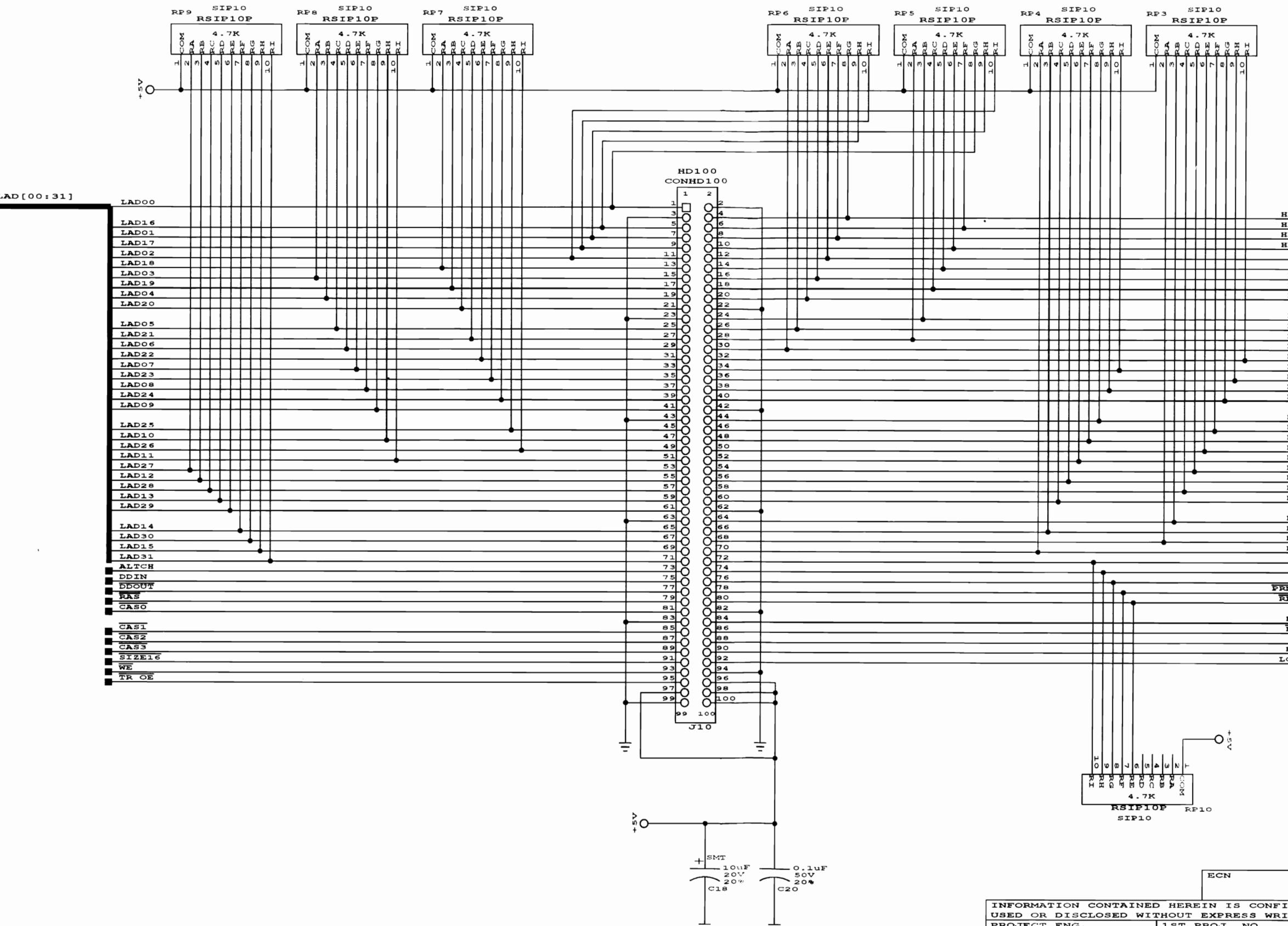


GROUND ISOLATION



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
DWN. BY JML 12-28-1993 10:14	1ST USAGE	DATE
checked	CURRENT PROJ.	DATE
APPROVED	DATE	SHEET OF 7 7
		PART NO. 16-9615 REV. -

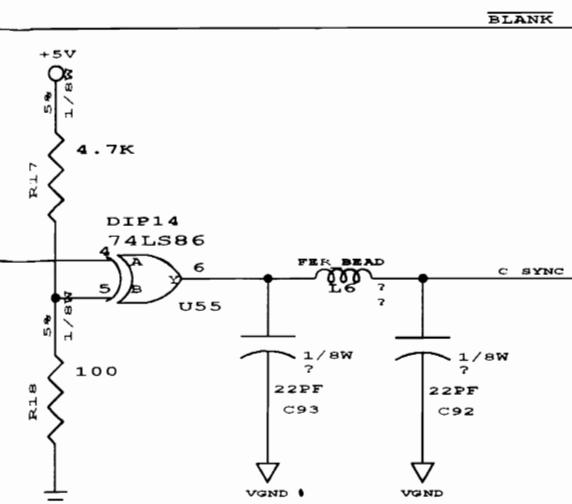
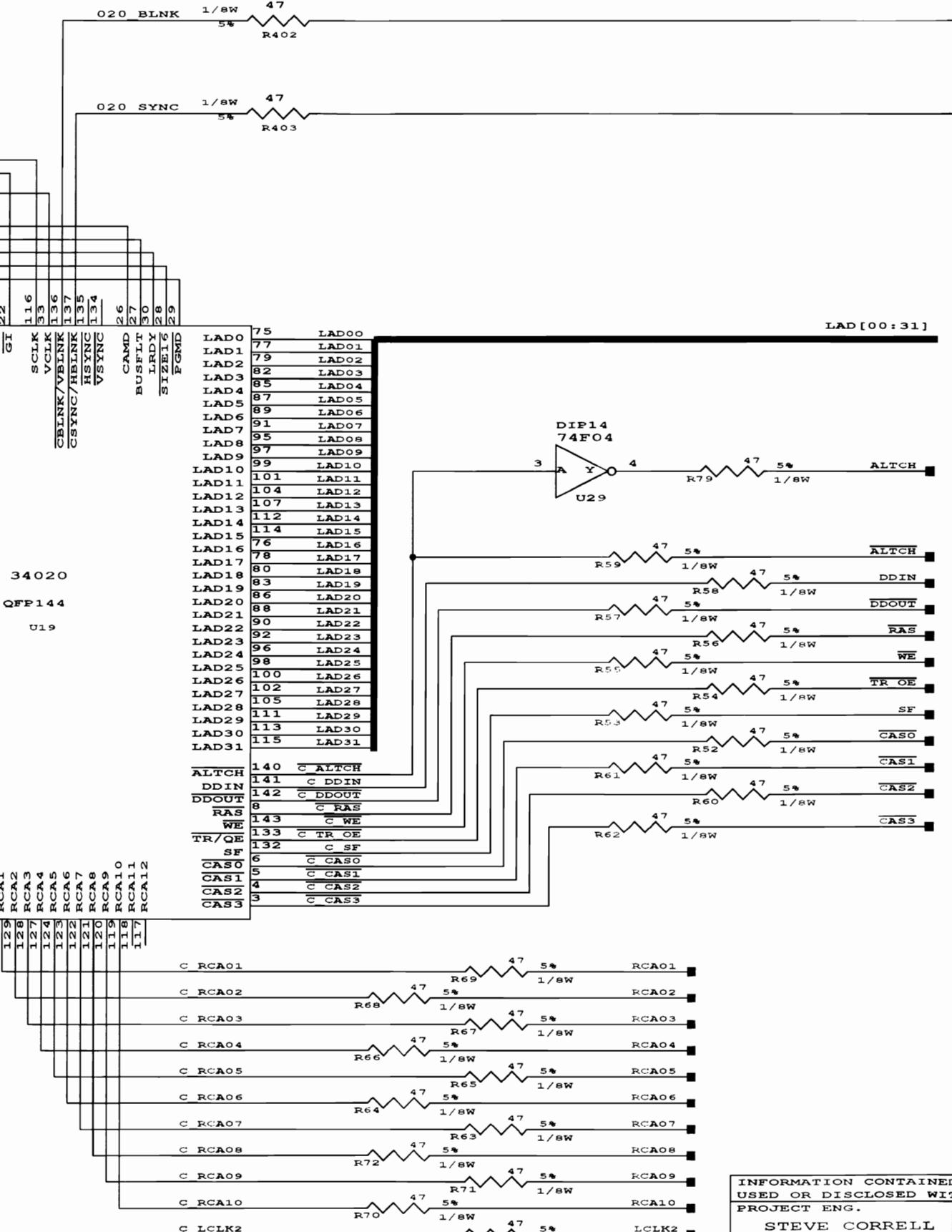
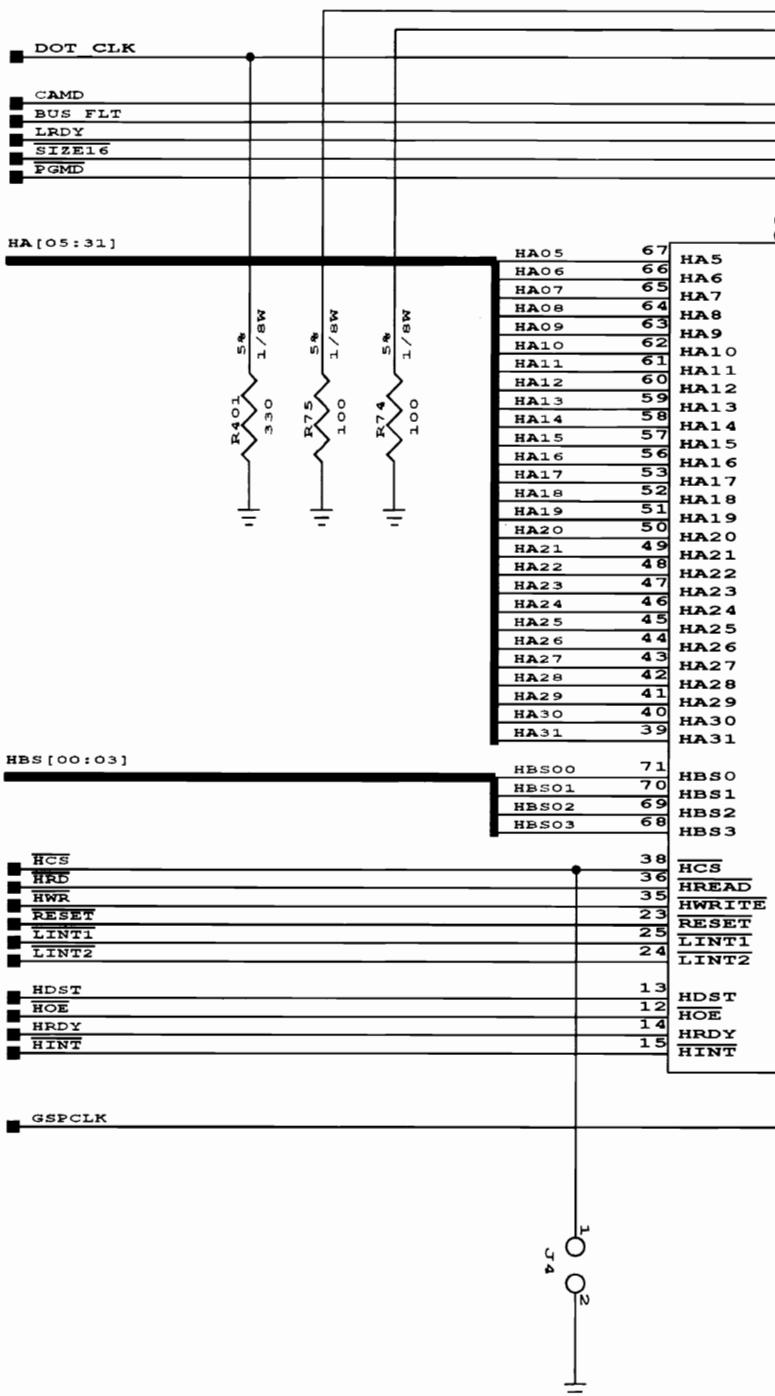
A B C D



VIDEO CPU BOARD
PAGE 3-16

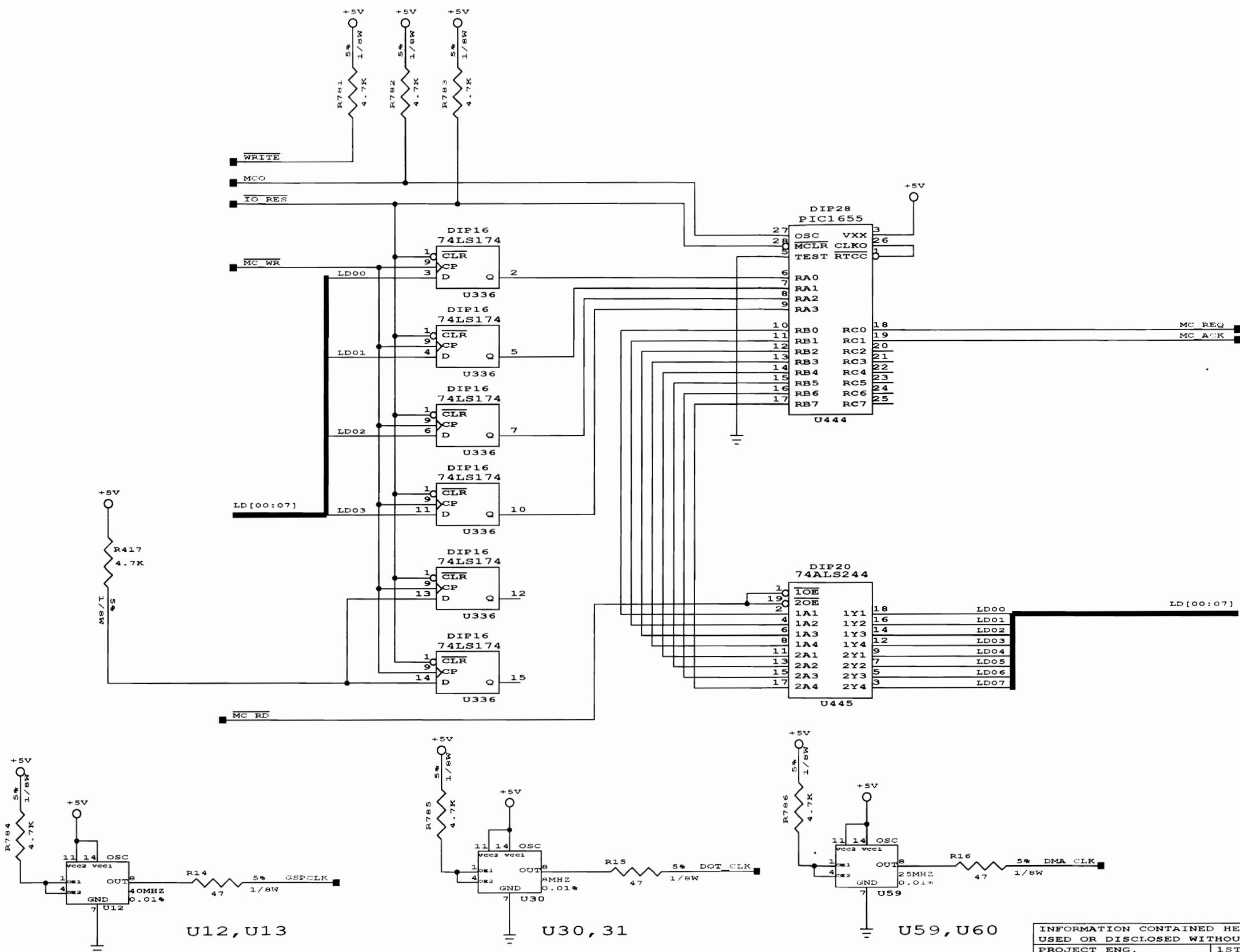
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INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.		
PROJECT ENG.	1ST PROJ. NO.	DATE
STEVE CORRELL		
DWN. BY	DATE	1ST USAGE DATE
RSC 5-12-1994 12:04		
CHECKED	DATE	CURRENT PROJ. DATE
APPROVED	DATE	SHEET OF
		1 26
		PART NO. 16-9518 REV. 4

A B C D



VIDEO CPU BOARD
PAGE 3-17

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. STEVE CORRELL	1ST PROJ. NO.	DATE
DWN. BY RSC 5-12-1994 12:05	1ST USAGE	DATE
CHECKED	CURRENT PROJ.	DATE
APPROVED	DATE	SHEET OF 2 26
PART NO. 16-9518 REV. 4		



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

REFDES USED IS DEPENDANT UPON PACKAGE USED.

VIDEO CPU BOARD
PAGE 3-18

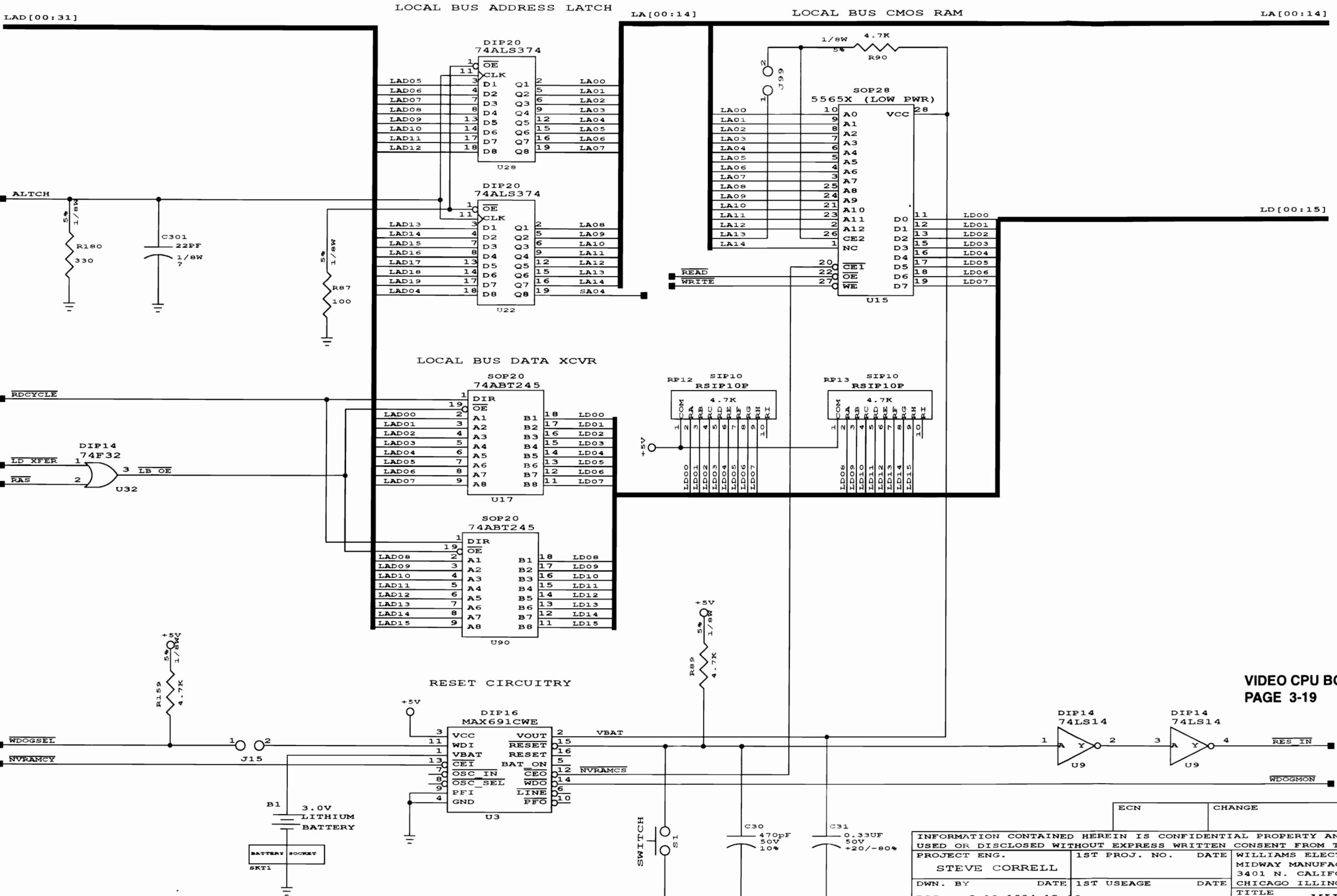
INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.						
PROJECT ENG. STEVE CORRELL	1ST PROJ. NO. DATE			WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA		
DWN. BY RSC 5-12-1994 12:06	1ST USEAGE DATE			TITLE XUNIT		
CHECKED	CURRENT PROJ. DATE			CAN BUS AND CLOCK GENERATION CIRCUITRY		
APPROVED	DATE	SHEET 3	OF 26	PART NO. 16-9518	REV. 4	

A

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C

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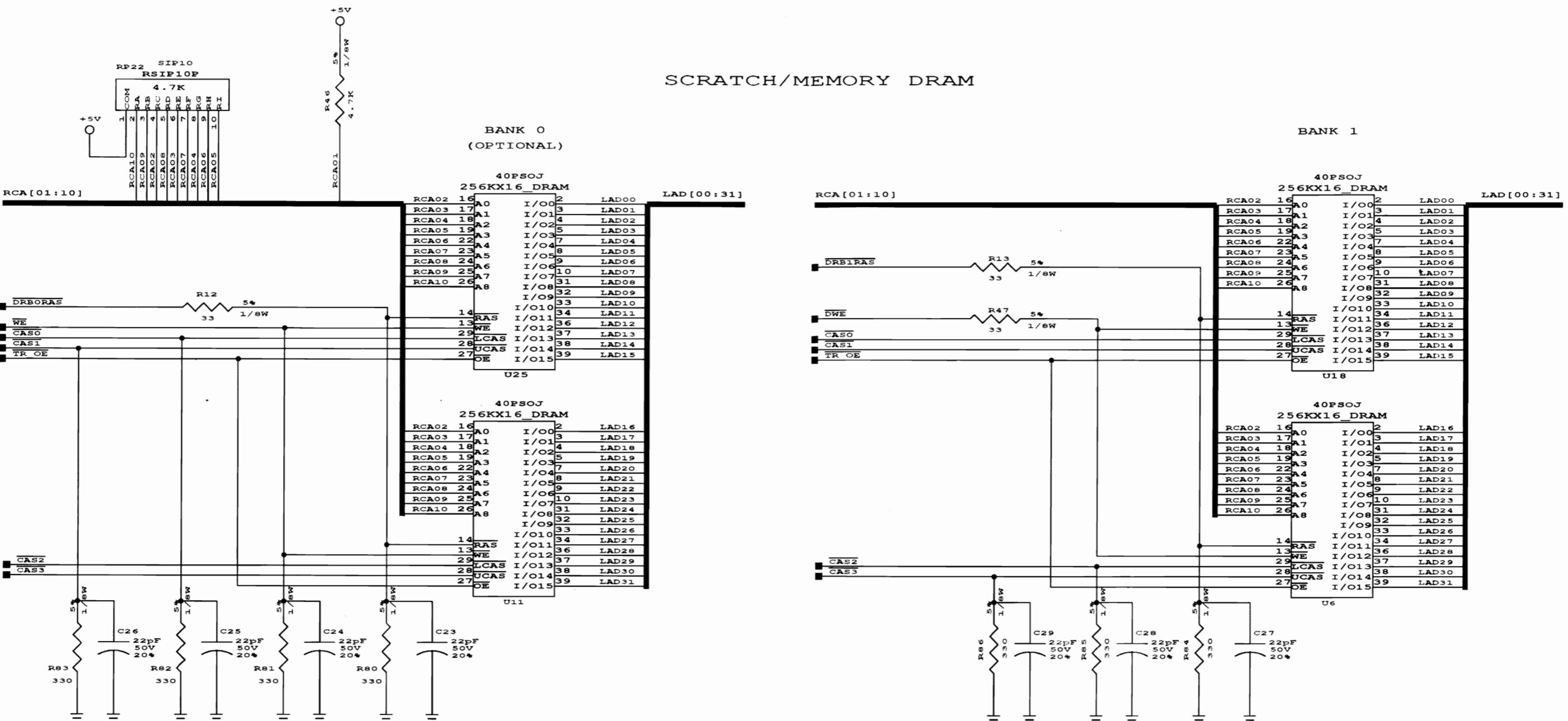


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D



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

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

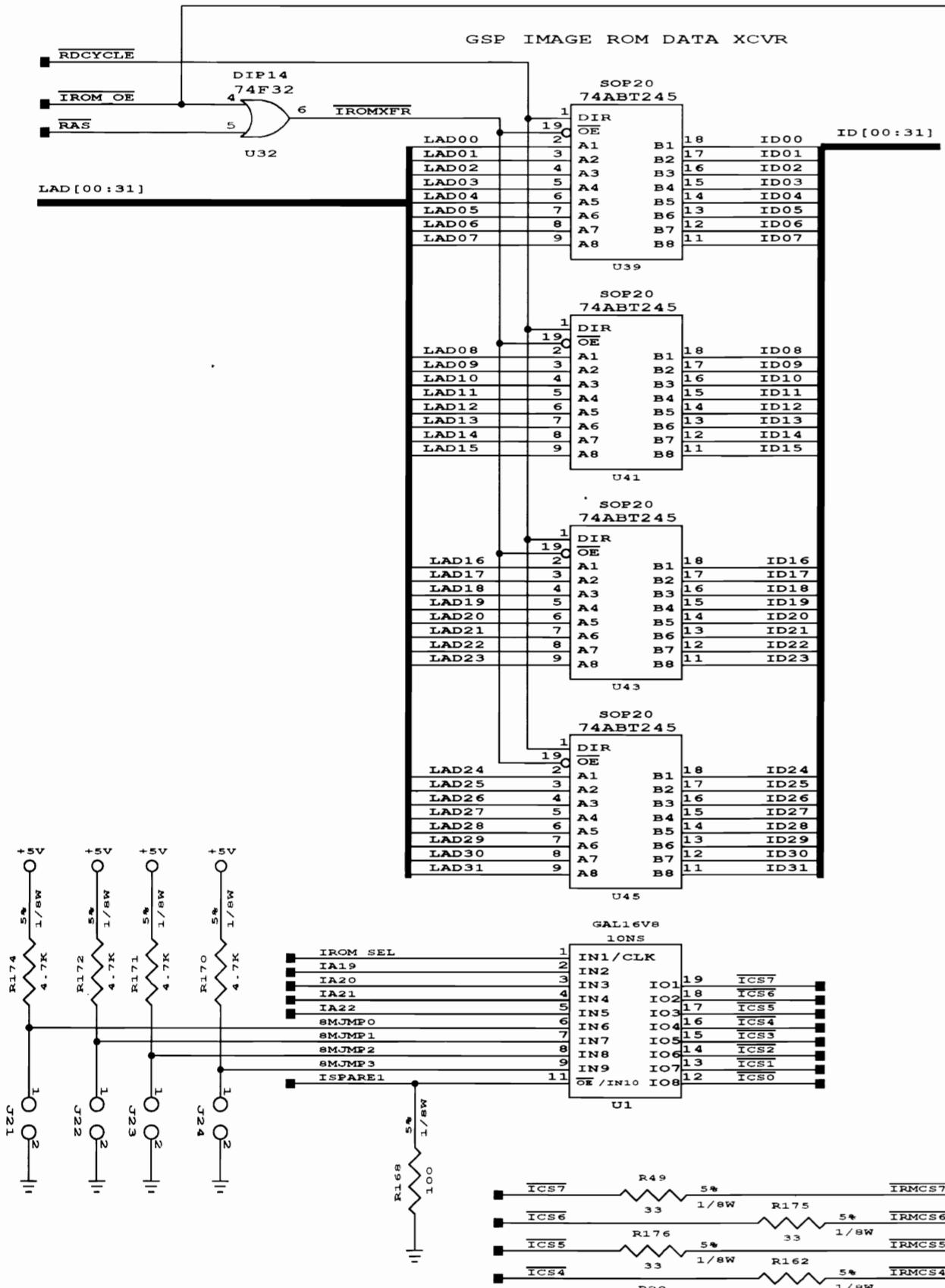
**VIDEO CPU BOARD
PAGE 3-20**

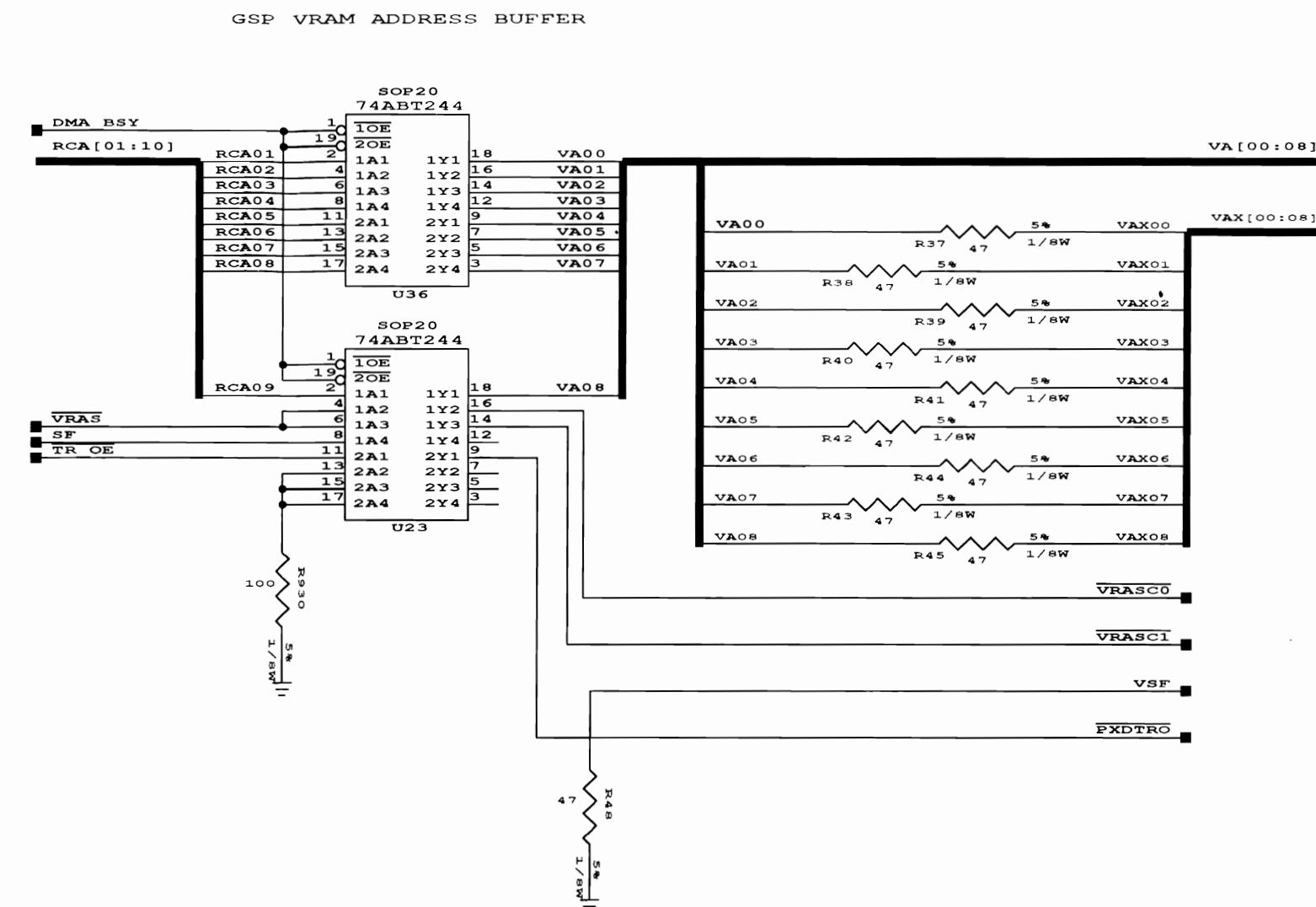
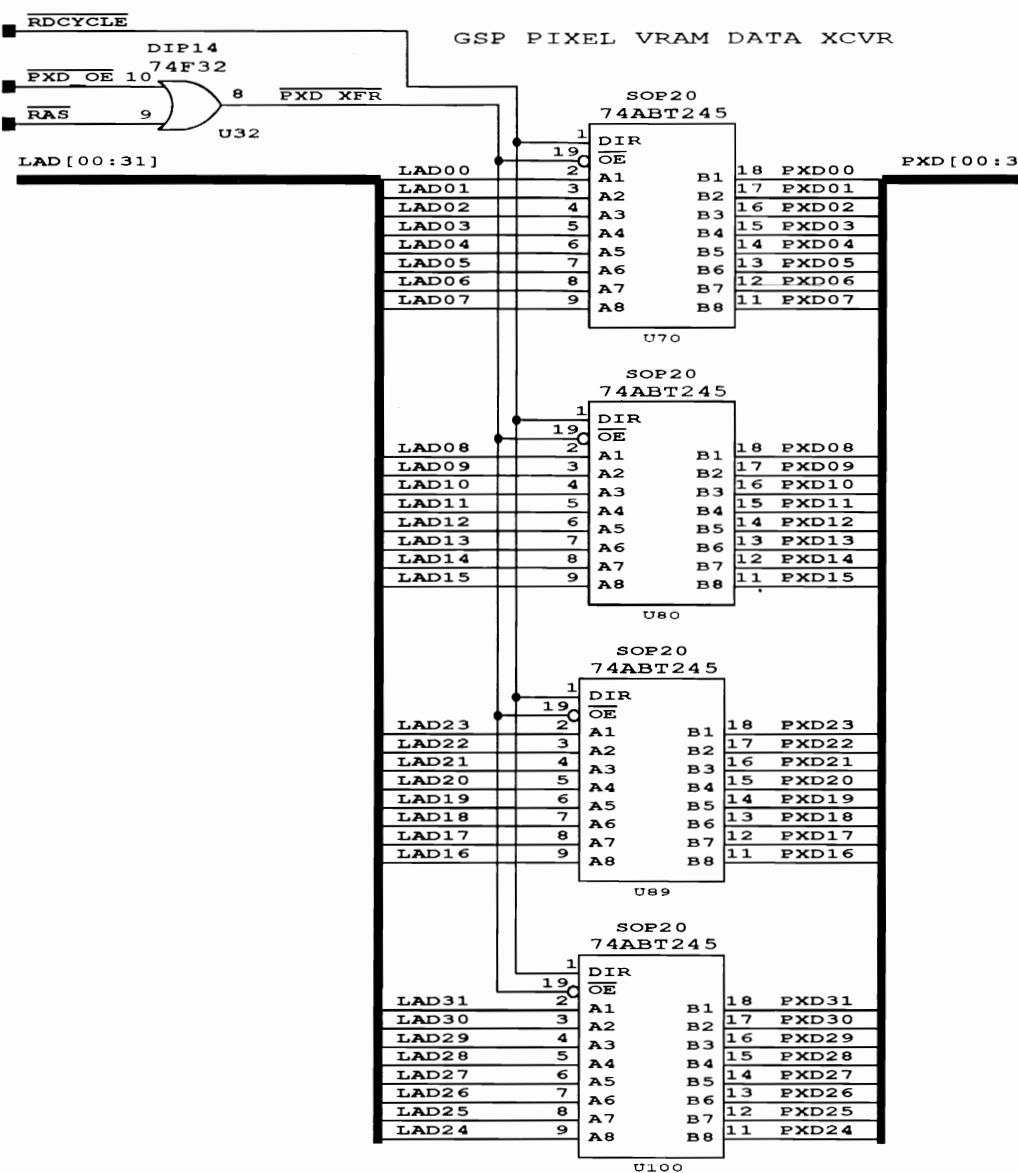
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B

C

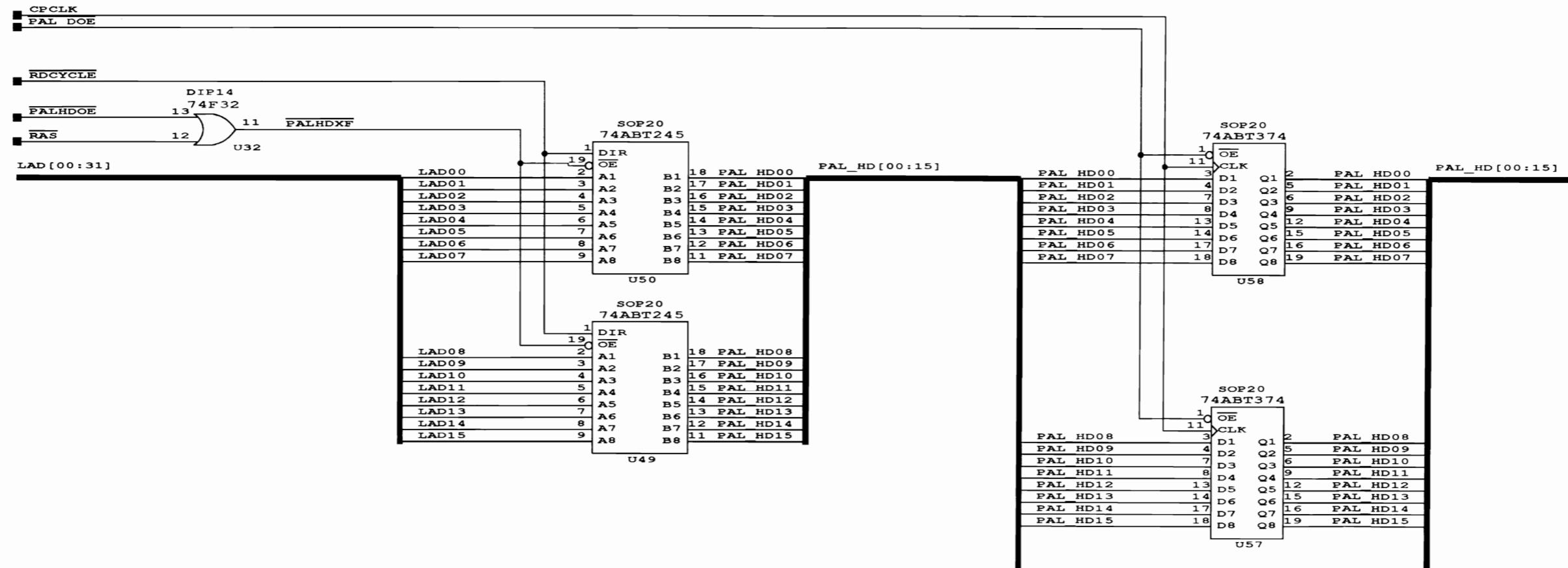
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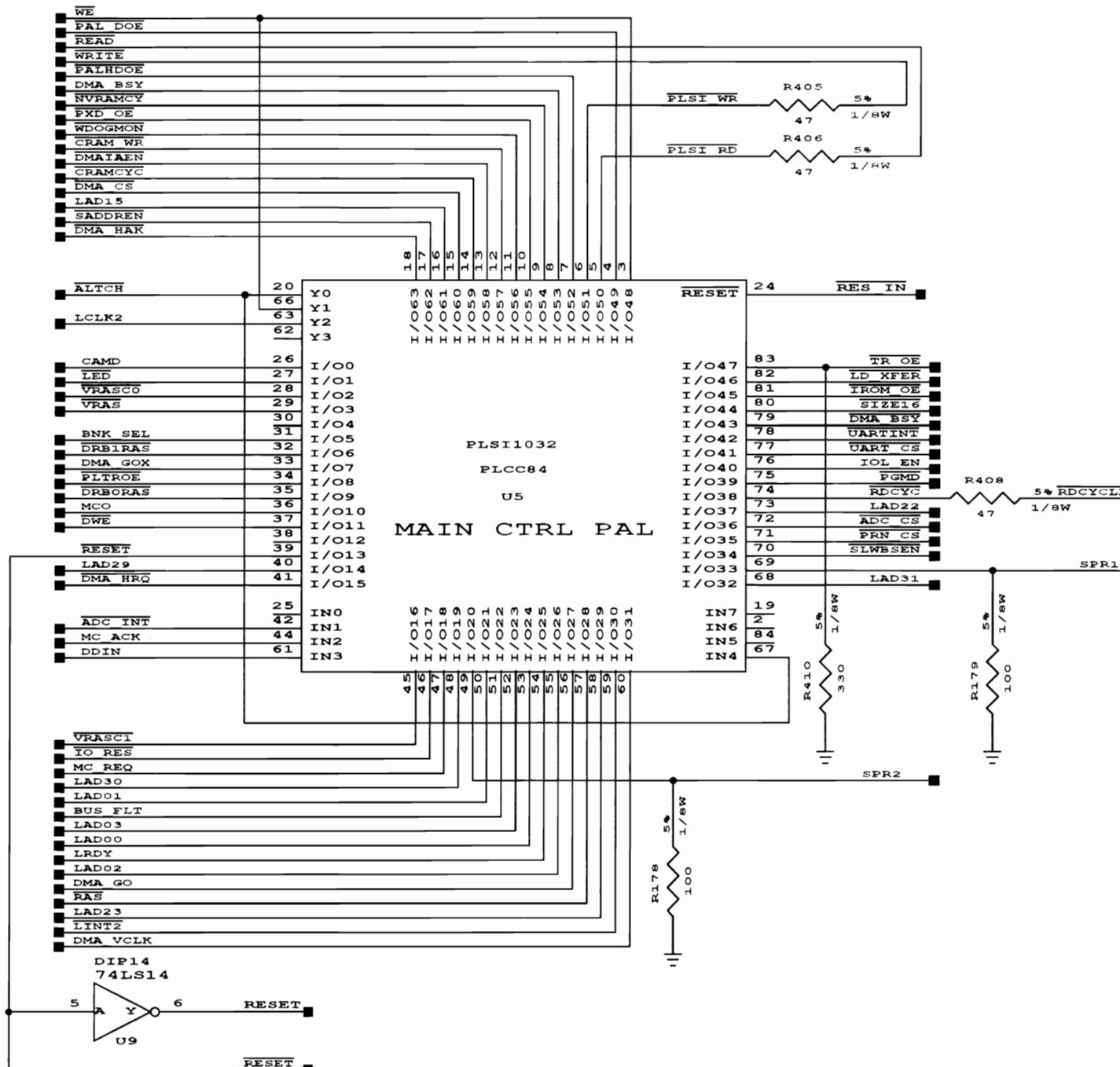
**VIDEO CPU BOARD
PAGE 3-22**

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.	1ST PROJ. NO.	DATE
STEVE CORRELL		
DWN. BY	DATE	1ST USAGE DATE
RSC 5-12-1994_12:07		
CHECKED	DATE	CURRENT PROJ. DATE
APPROVED	DATE	SHEET OF
		7 26
PART NO.		16-9518 REV. 4



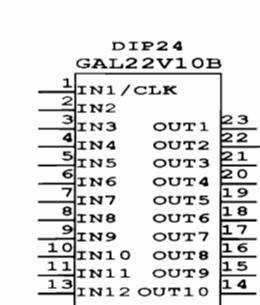
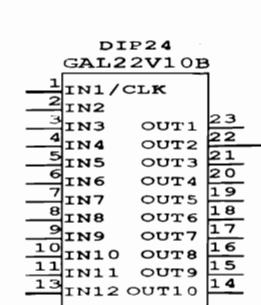
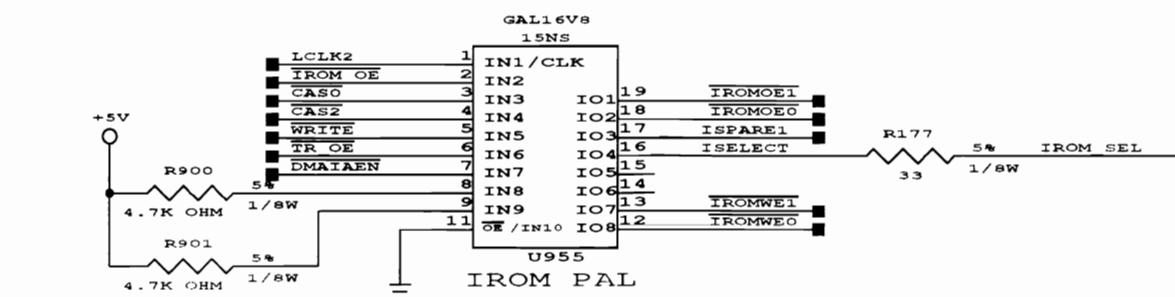
VIDEO CPU BOARD
PAGE 3-23

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



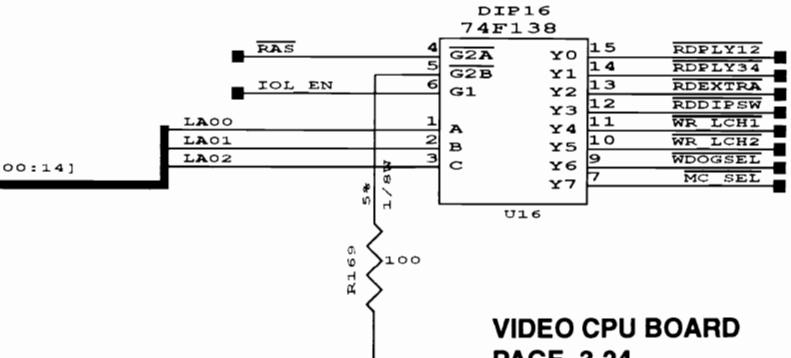
MAIN CTRL PAL

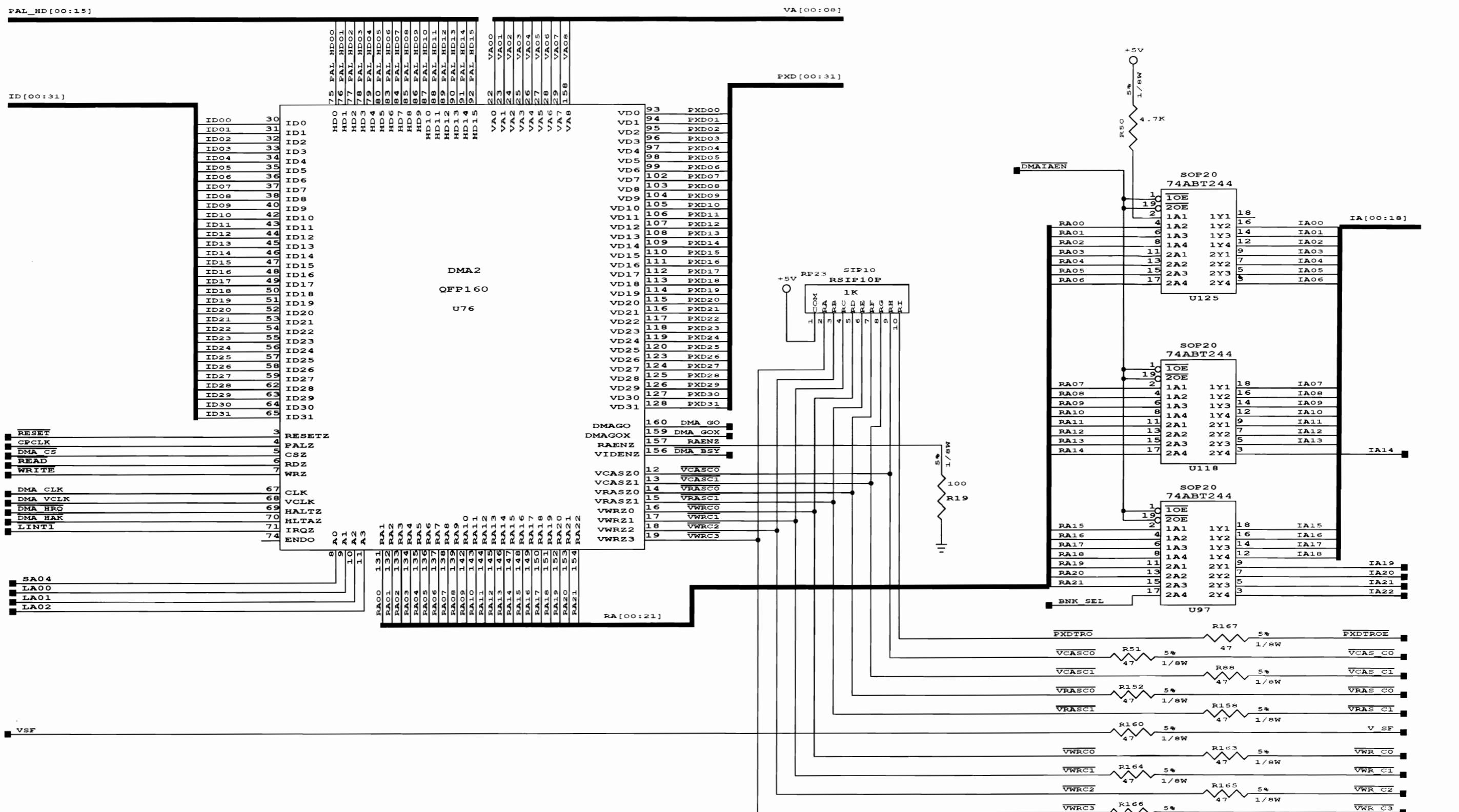
VRAM/BLANK PAL



INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.			
PROJECT ENG.	1ST PROJ. NO.	DATE	WILLIAMS ELECTRONICS GAMES
STEVE CORRELL	JML 5-12-1994	12:10	MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY	DATE	1ST USAGE	DATE
CHECKED	DATE	CURRENT PROJ.	DATE
APPROVED	DATE	SHEET	OF
		9	26
PART NO. 16-9518 REV. 4			

VIDEO CPU BOARD
PAGE 3-24





VIDEO CPU BOARD
PAGE 3-25

INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.					
PROJECT ENG. STEVE CORRELL	1ST PROJ. NO.		DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3401 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA	
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CHECKED	DATE	CURRENT PROJ.	DATE		
APPROVED	DATE	SHEET 10	OF 26	PART NO. 16-9518	REV. 4

A

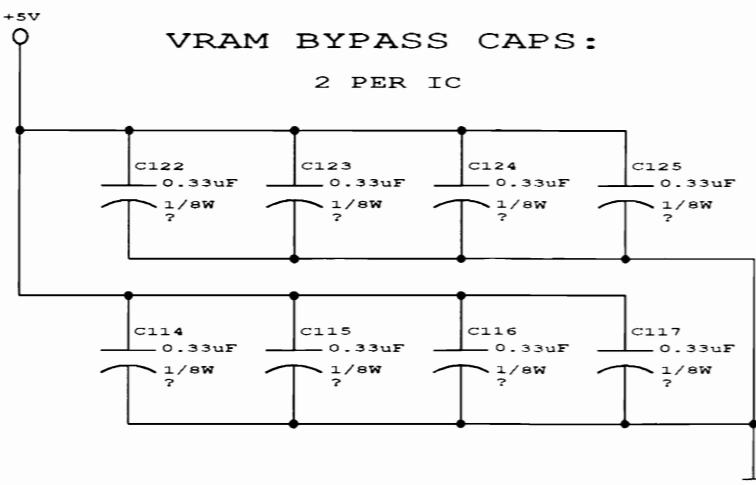
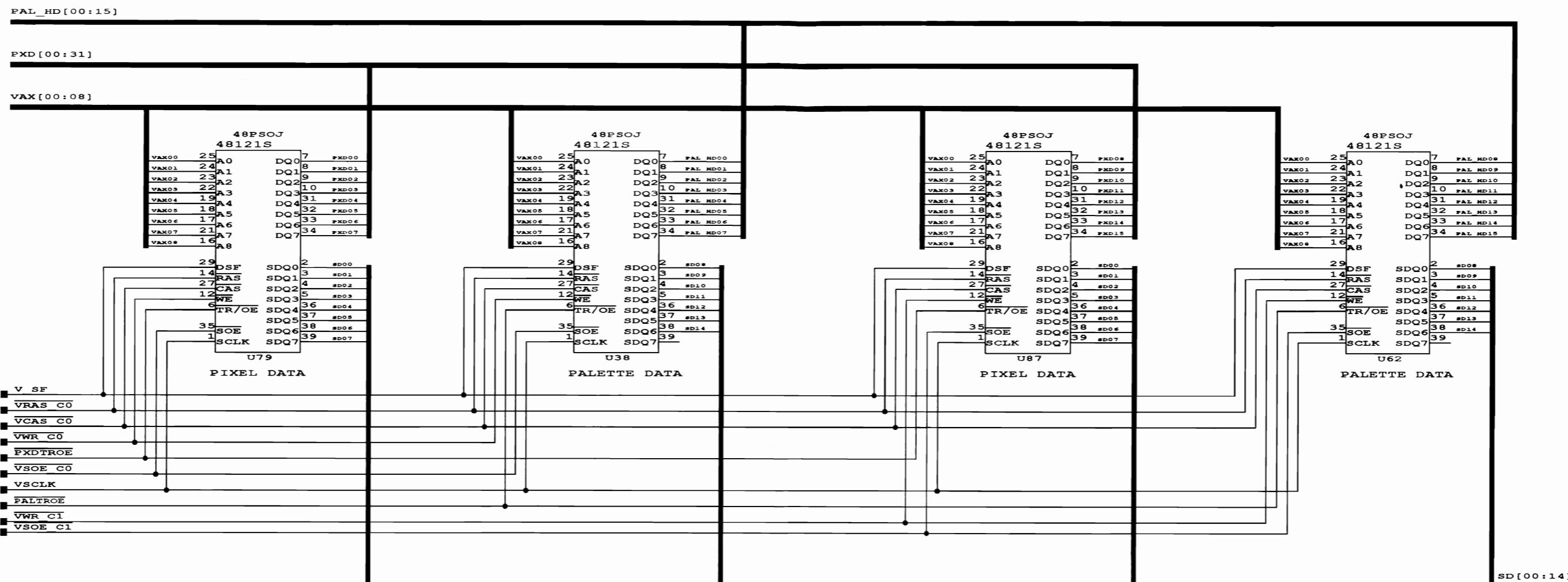
B

C

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VIDEO RAM - BANK 0

VIDEO RAM - BANK 1

VIDEO CPU BOARD
PAGE 3-26

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. STEVE CORRELL	1ST PROJ. NO.	DATE
DWN. BY JML 5-12-1994_12:11	1ST USAGE	DATE
CHECKED	CURRENT PROJ.	DATE
APPROVED	SHEET OF	PART NO. REV.
	11 26	16-9518 4

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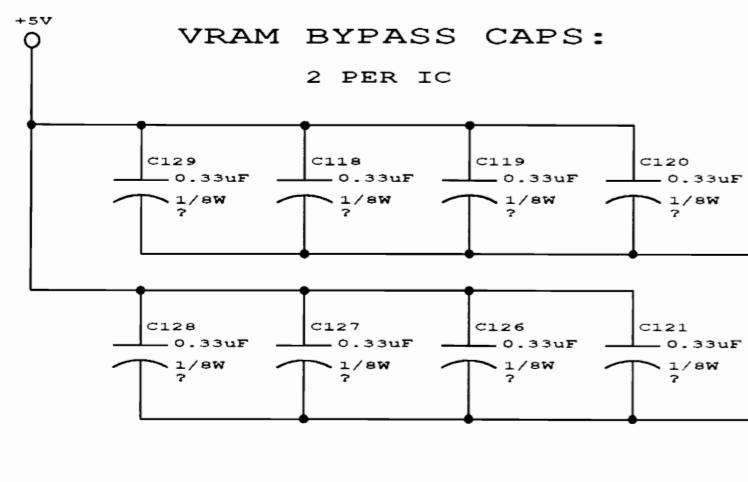
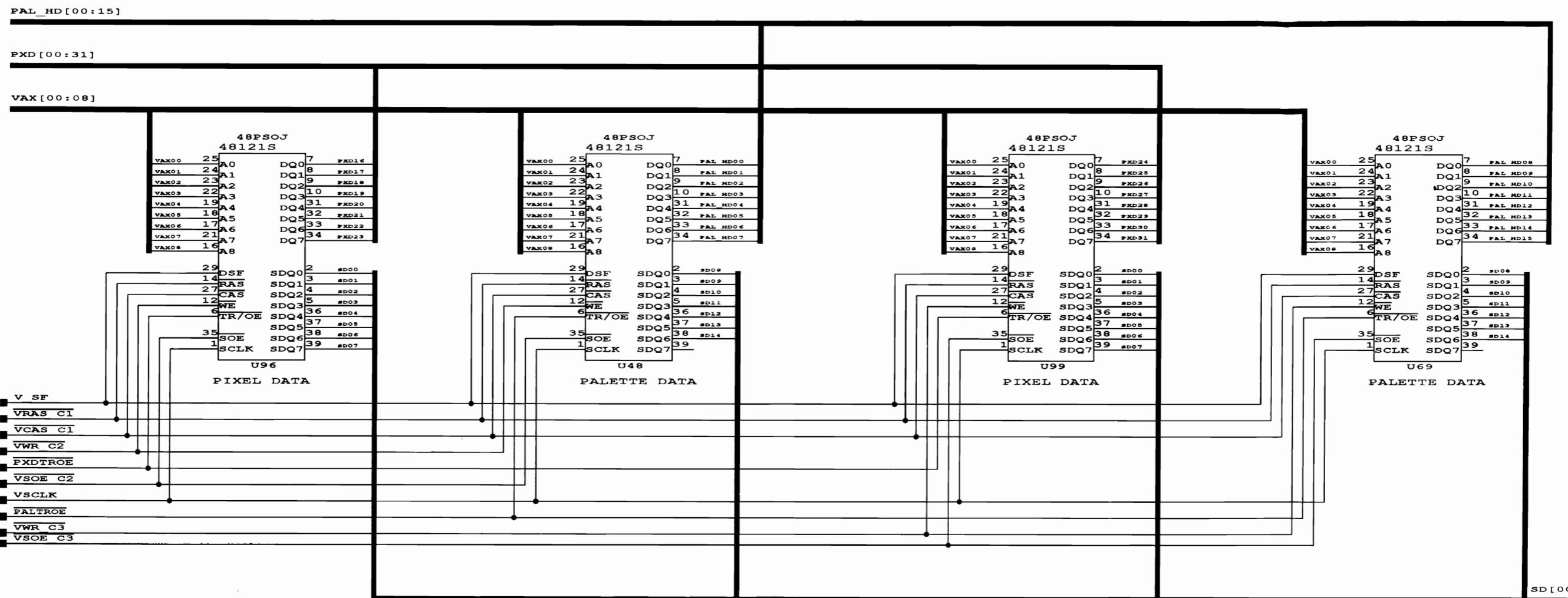
C

D

A B C D

VIDEO RAM - BANK 2

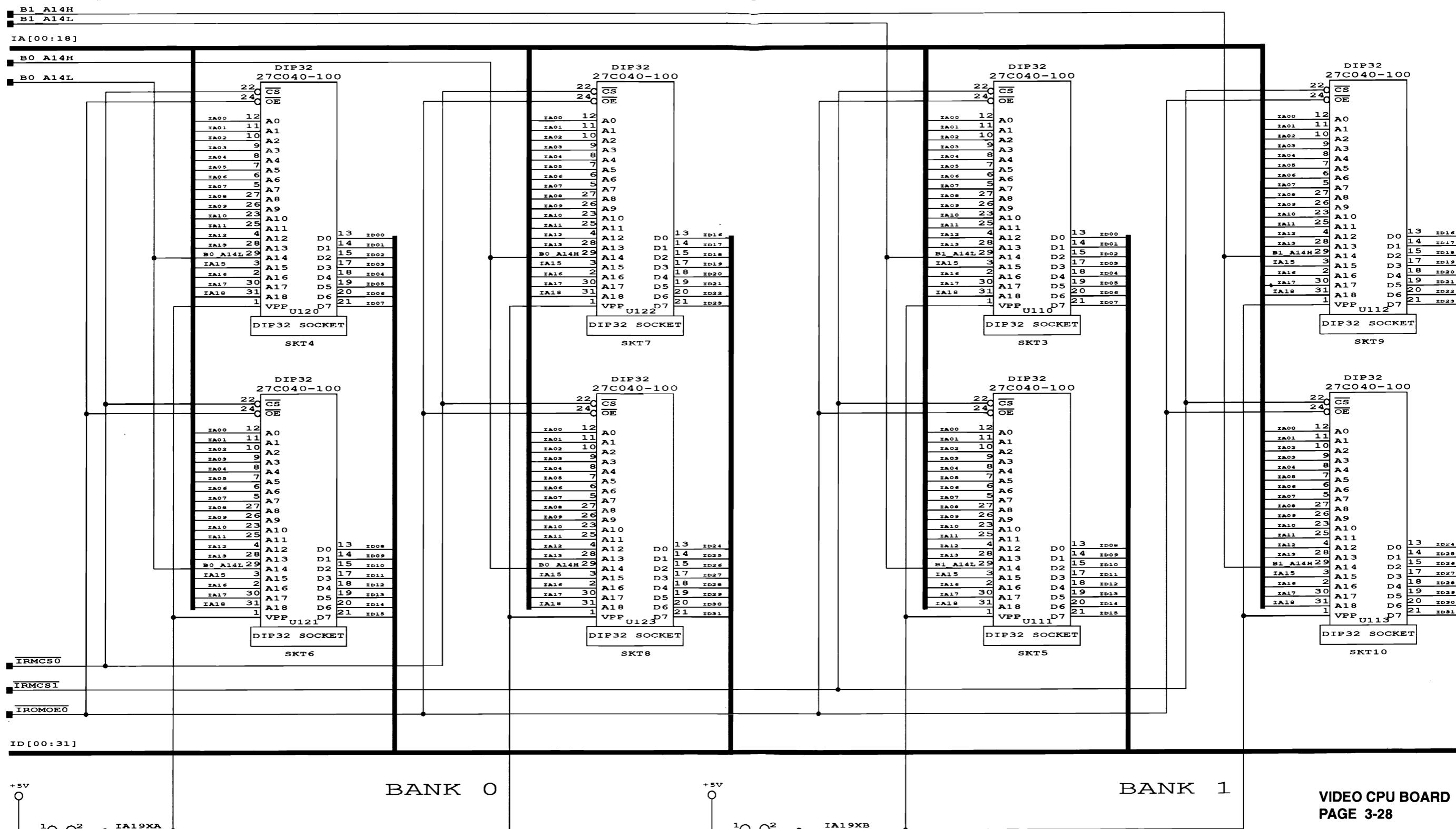
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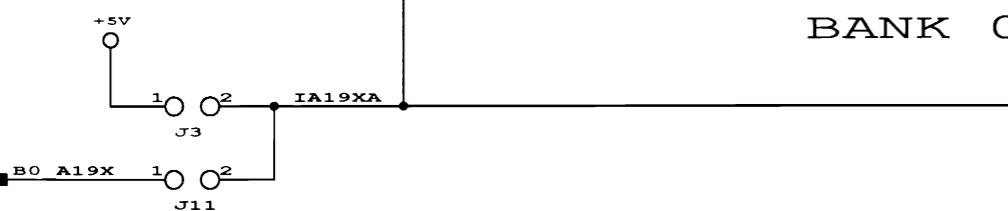
VIDEO CPU BOARD
PAGE 3-27

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. STEVE CORRELL	1ST PROJ. NO.	DATE
DWN. BY JML 5-12-1994_12:11	1ST USAGE	DATE
CHECKED	CURRENT PROJ.	DATE
APPROVED	SHEET 12	OF 26
	PART NO. 16-9518	REV. 4

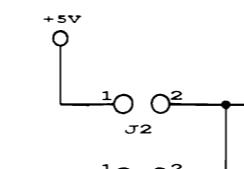
A B C D



BANK 0



BANK 1



VIDEO CPU BOARD
PAGE 3-28

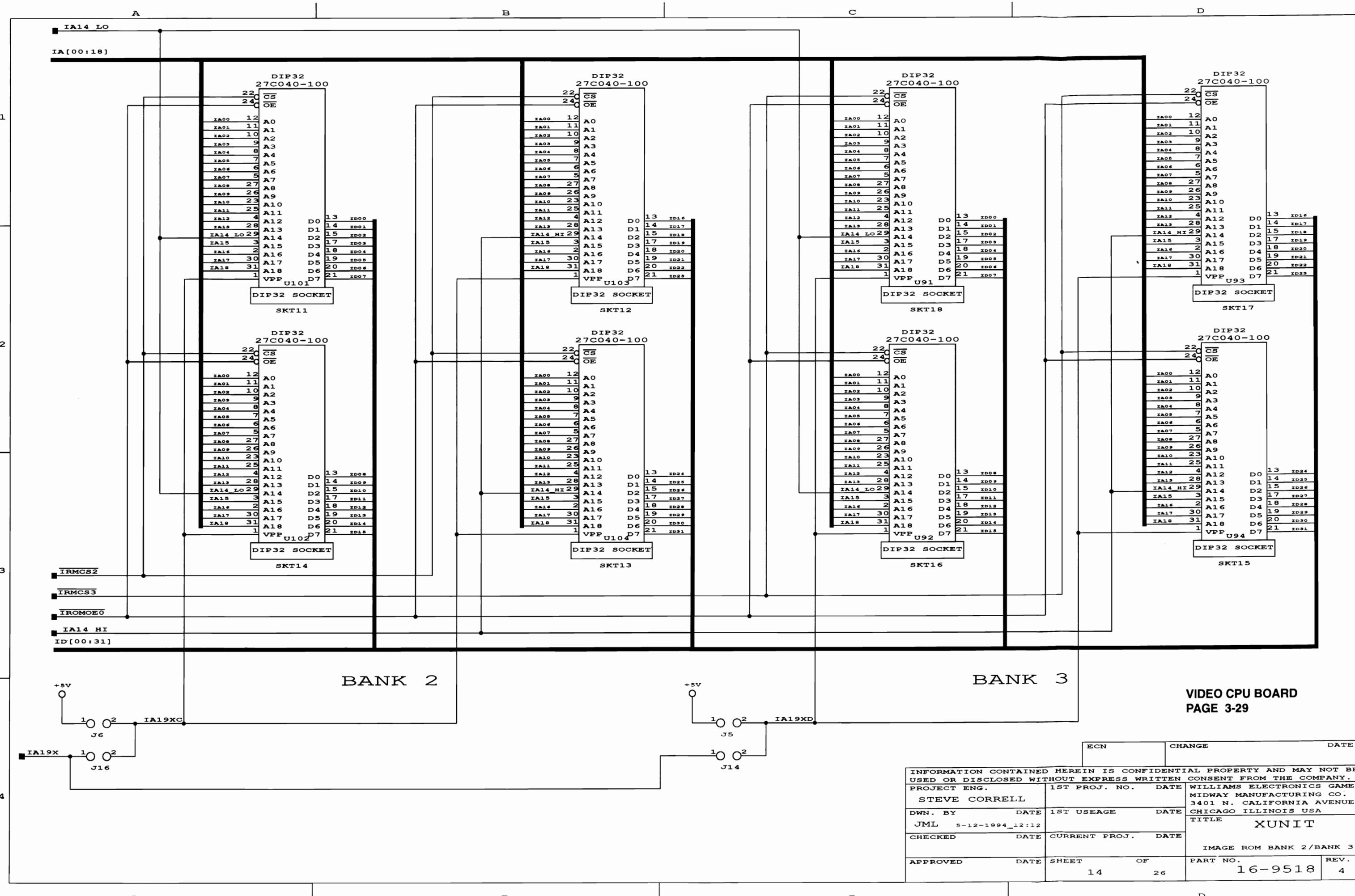
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INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.		
PROJECT ENG.	1ST PROJ. NO.	DATE
STEVE CORRELL		
DWN. BY	DATE	DATE
JML	5-12-1994 12:12	
CHECKED	DATE	CURRENT PROJ. DATE
APPROVED	DATE	SHEET OF 13 26
PART NO.	REV.	16-9518 4

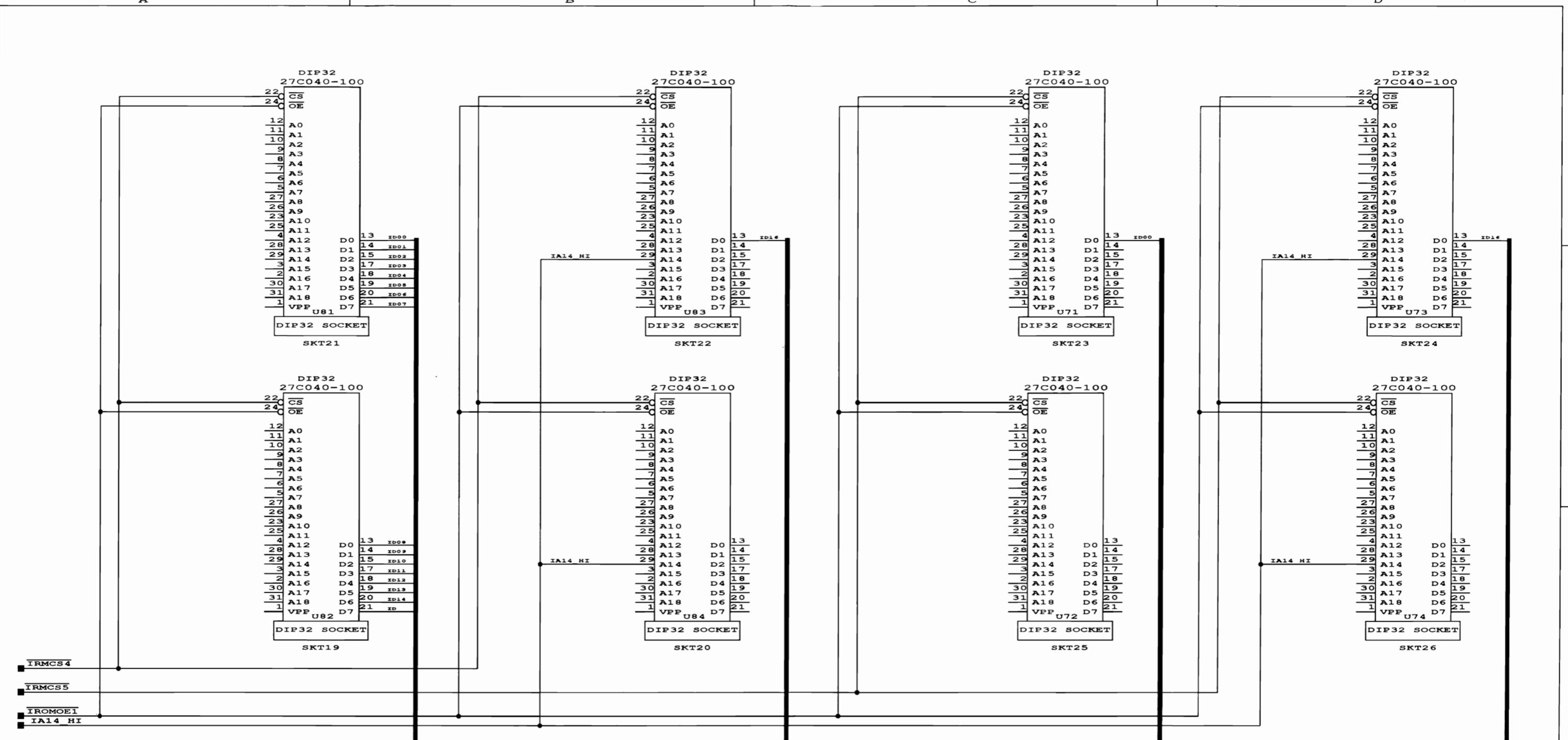
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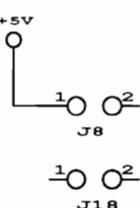
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D

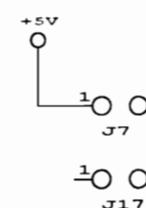




BANK 4

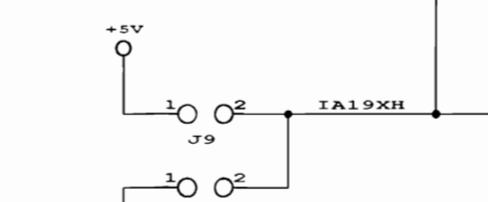
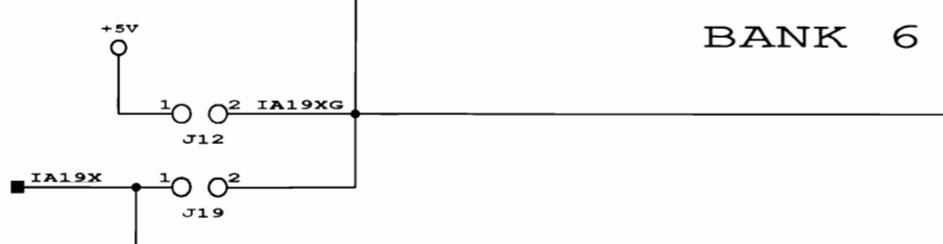
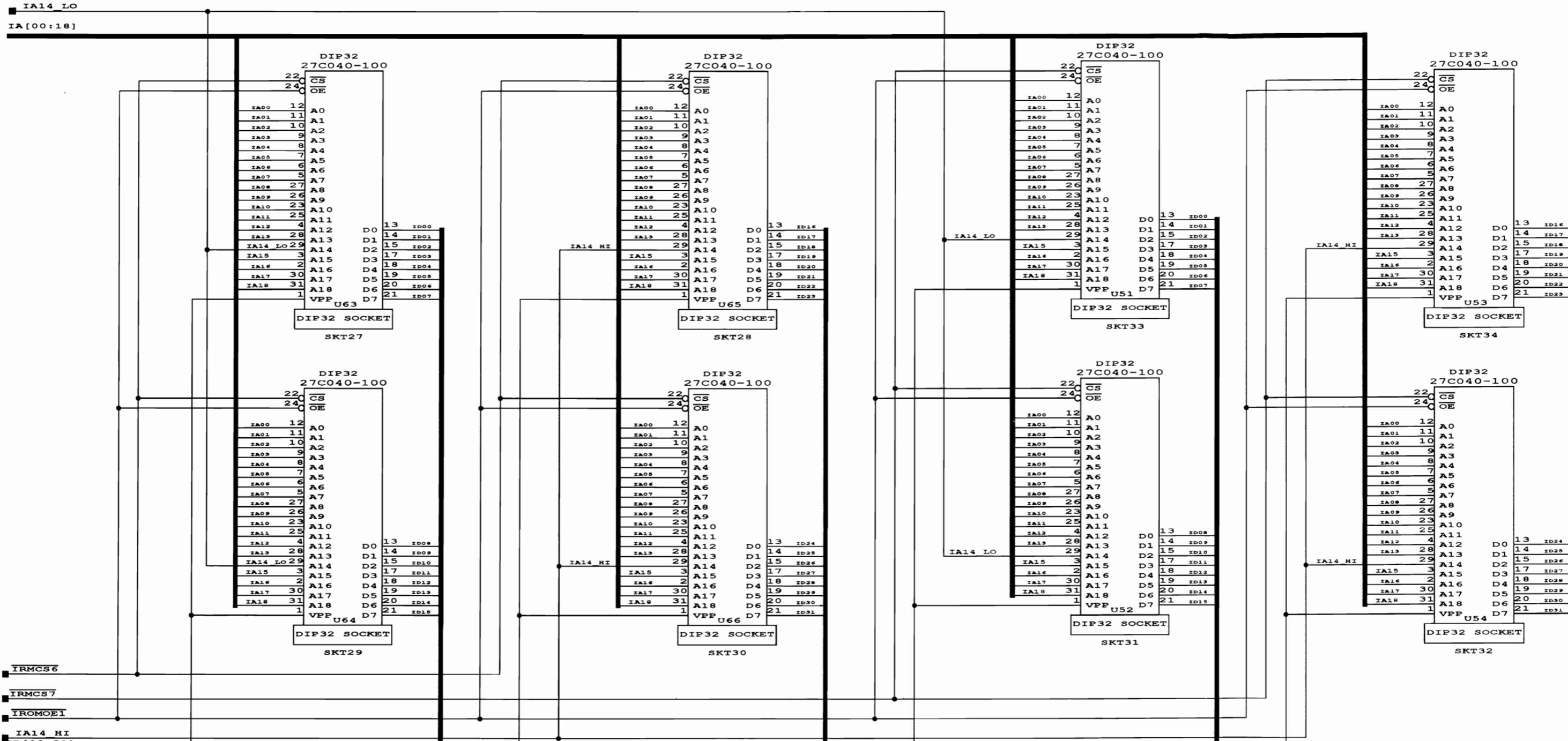


BANK 5



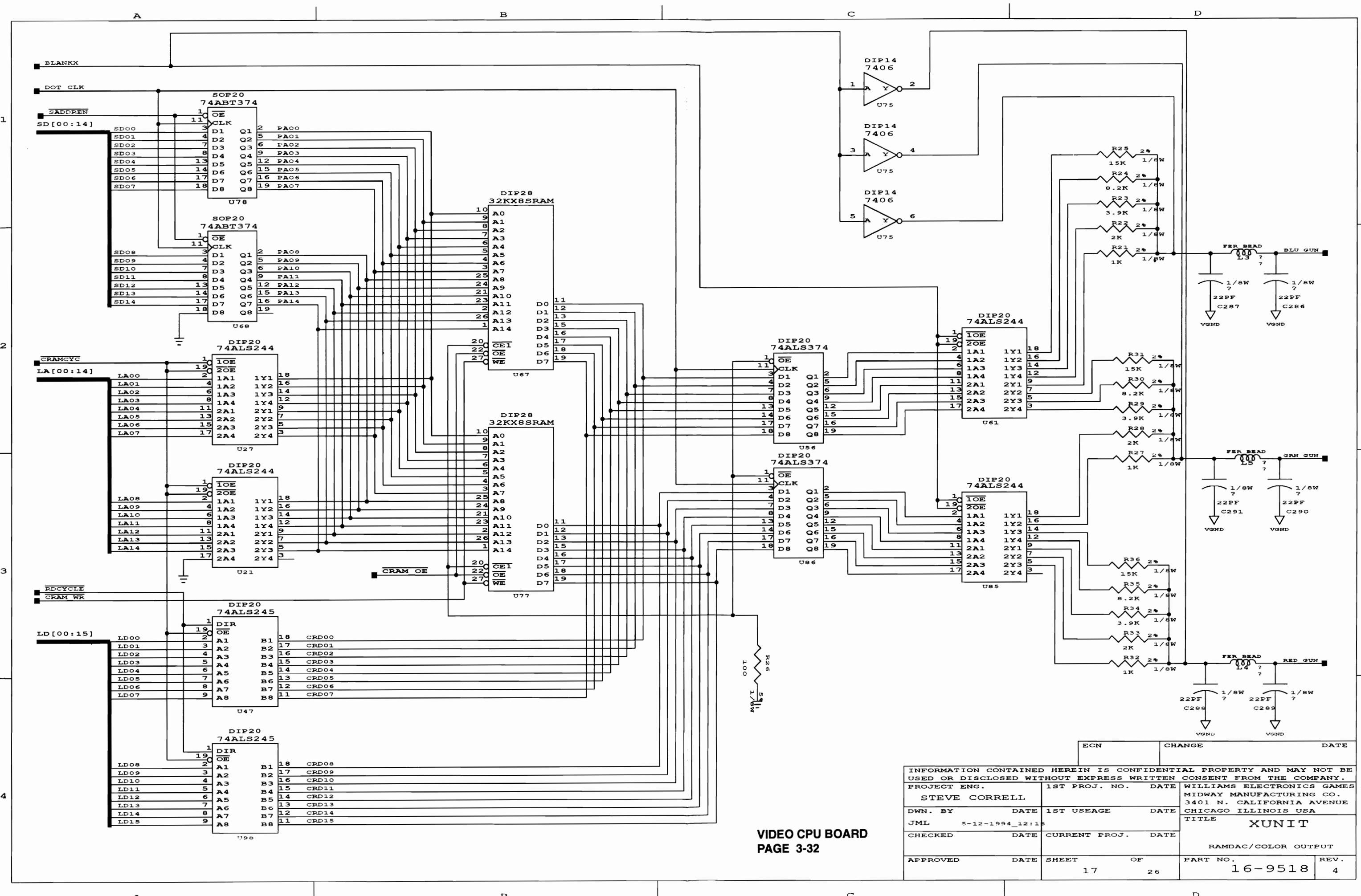
VIDEO CPU BOARD
PAGE 3-30

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. STEVE CORRELL	1ST PROJ. NO. DATE	WILLIAMS ELECTRONICS GAMES MIDWAY MANUFACTURING CO. 3440 N. CALIFORNIA AVENUE CHICAGO ILLINOIS USA
DWN. BY JML 5-12-1994 12:12	1ST USEAGE DATE	TITLE
CHECKED	CURRENT PROJ. DATE	IMAGE ROM BANK 4/BANK 5
APPROVED	SHEET OF 15 26	PART NO. REV.

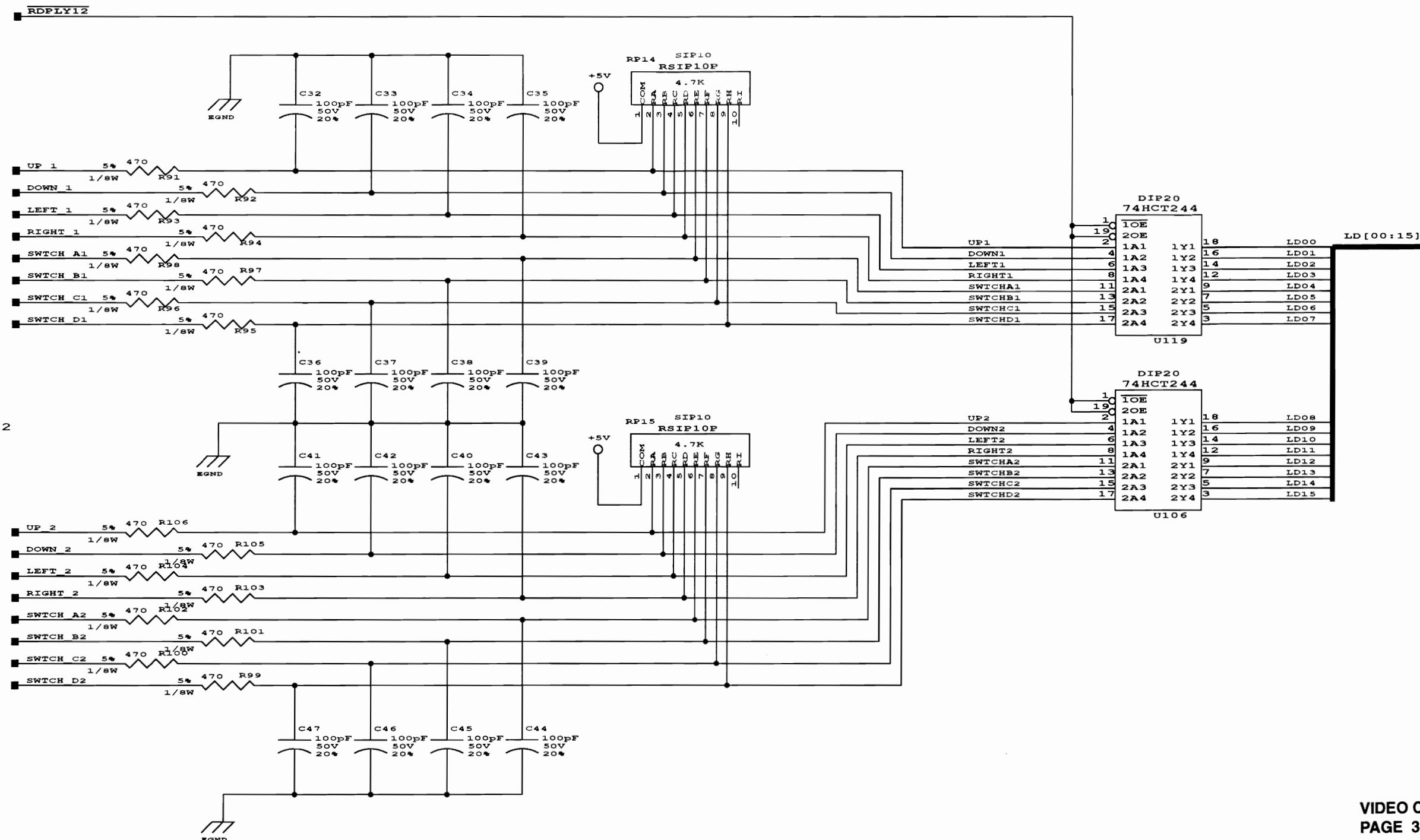


ECN	CHANGE	DATE
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PROJECT ENG.	1ST PROJ. NO.	DATE
STEVE CORRELL		
DWN. BY	DATE	1ST USAGE DATE
JML 5-12-1994 12:16		
CHECKED	DATE	CURRENT PROJ. DATE
APPROVED	DATE	SHEET OF 16 26
		PART NO. 16-9518 REV. 4

**VIDEO CPU BOARD
PAGE 3-31**

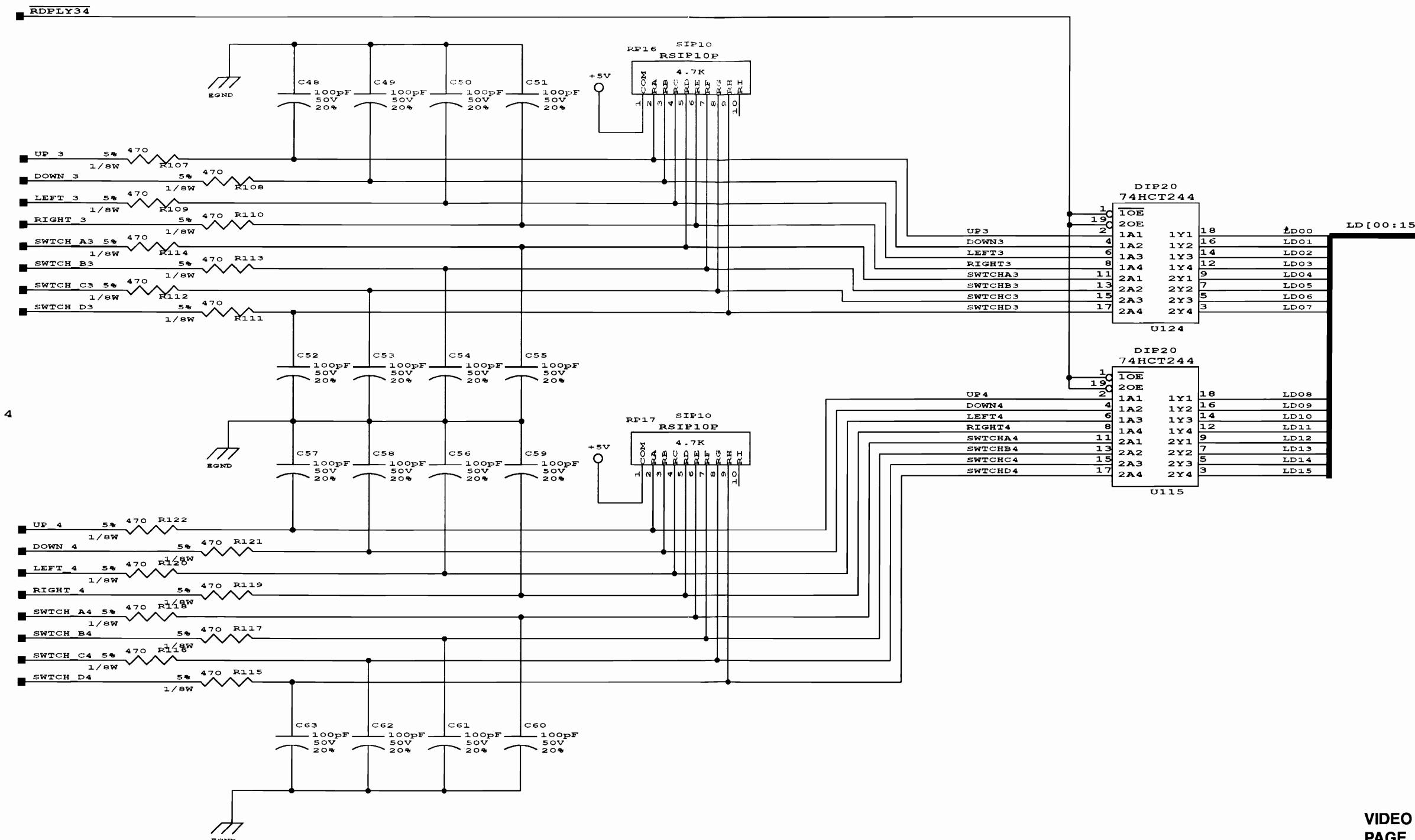


A B C D



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. STEVE CORRELL	1ST PROJ. NO.	DATE
DWN. BY RSC 5-12-1994_12:16	1ST USEAGE	DATE
CHECKED	CURRENT PROJ.	DATE
APPROVED	DATE	SHEET OF 18 26
		PART NO. 16-9518 REV. 4

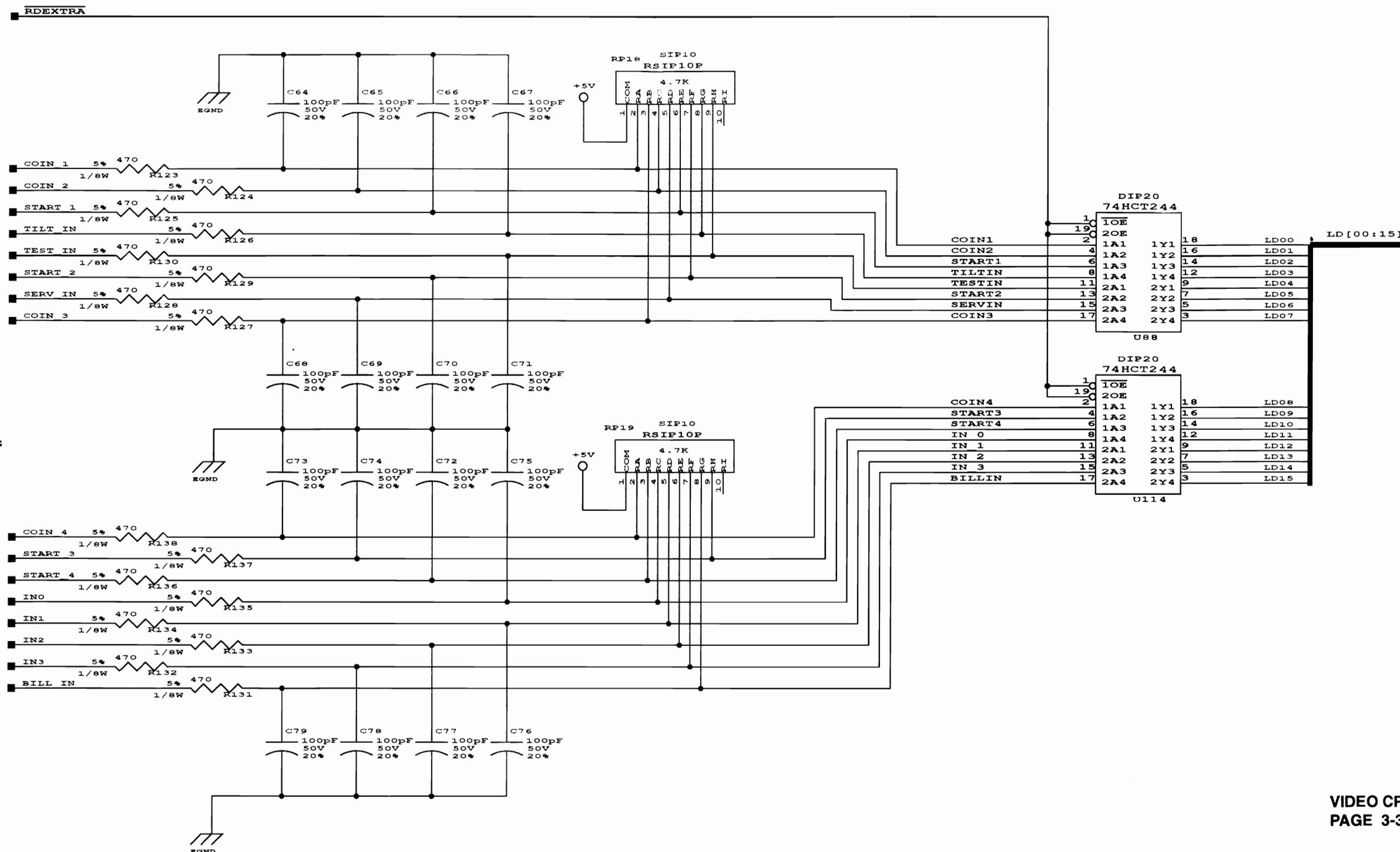
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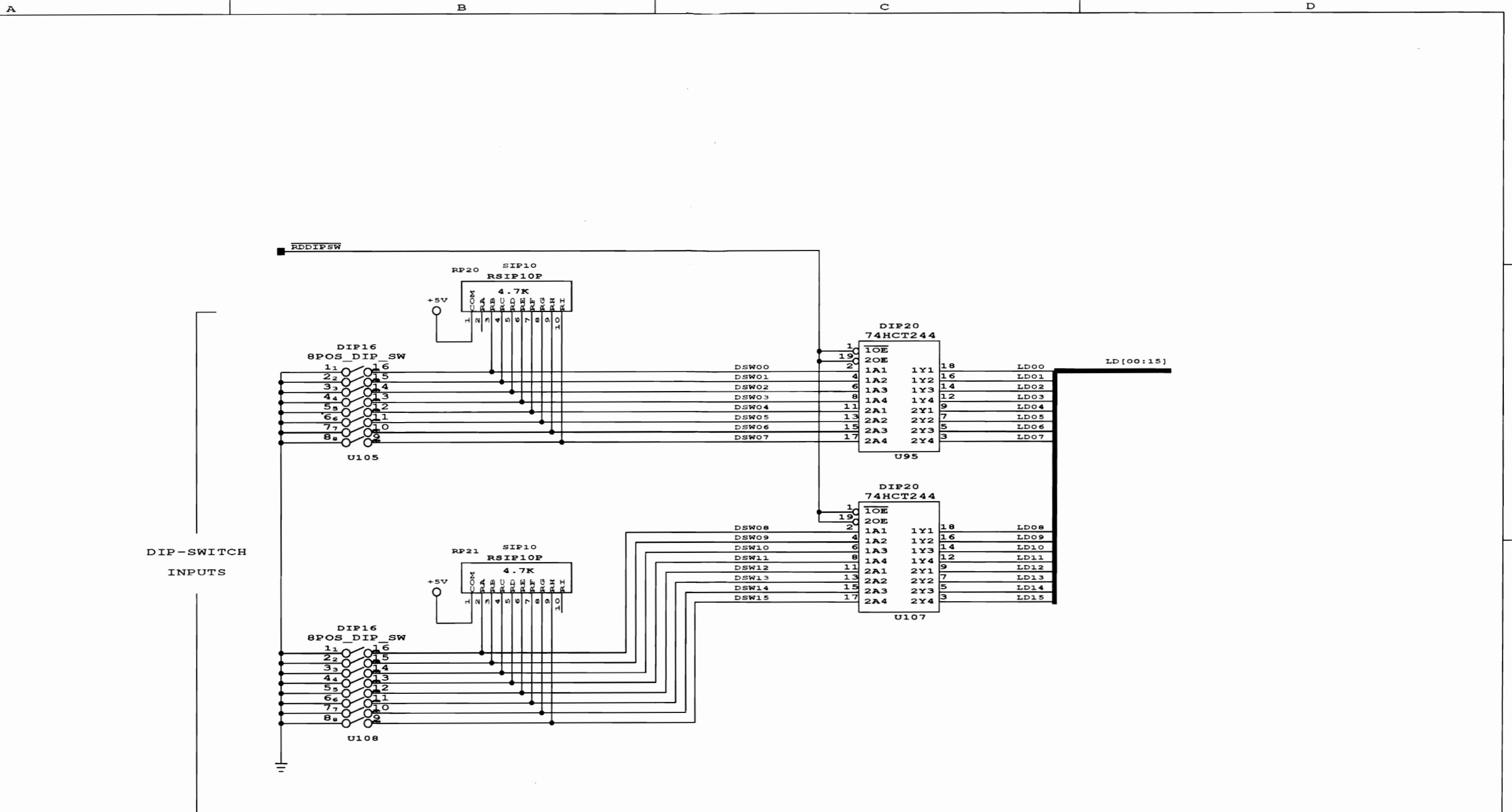
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INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.		
PROJECT ENG.	1ST PROJ. NO.	DATE
STEVE CORRELL		
DWN. BY	DATE	1ST USAGE DATE
RSC 5-12-1994 12:16		
CHECKED	DATE	CURRENT PROJ. DATE
APPROVED	DATE	SHEET OF
		19 26
		PART NO. 16-9518 REV. 4

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A B C D

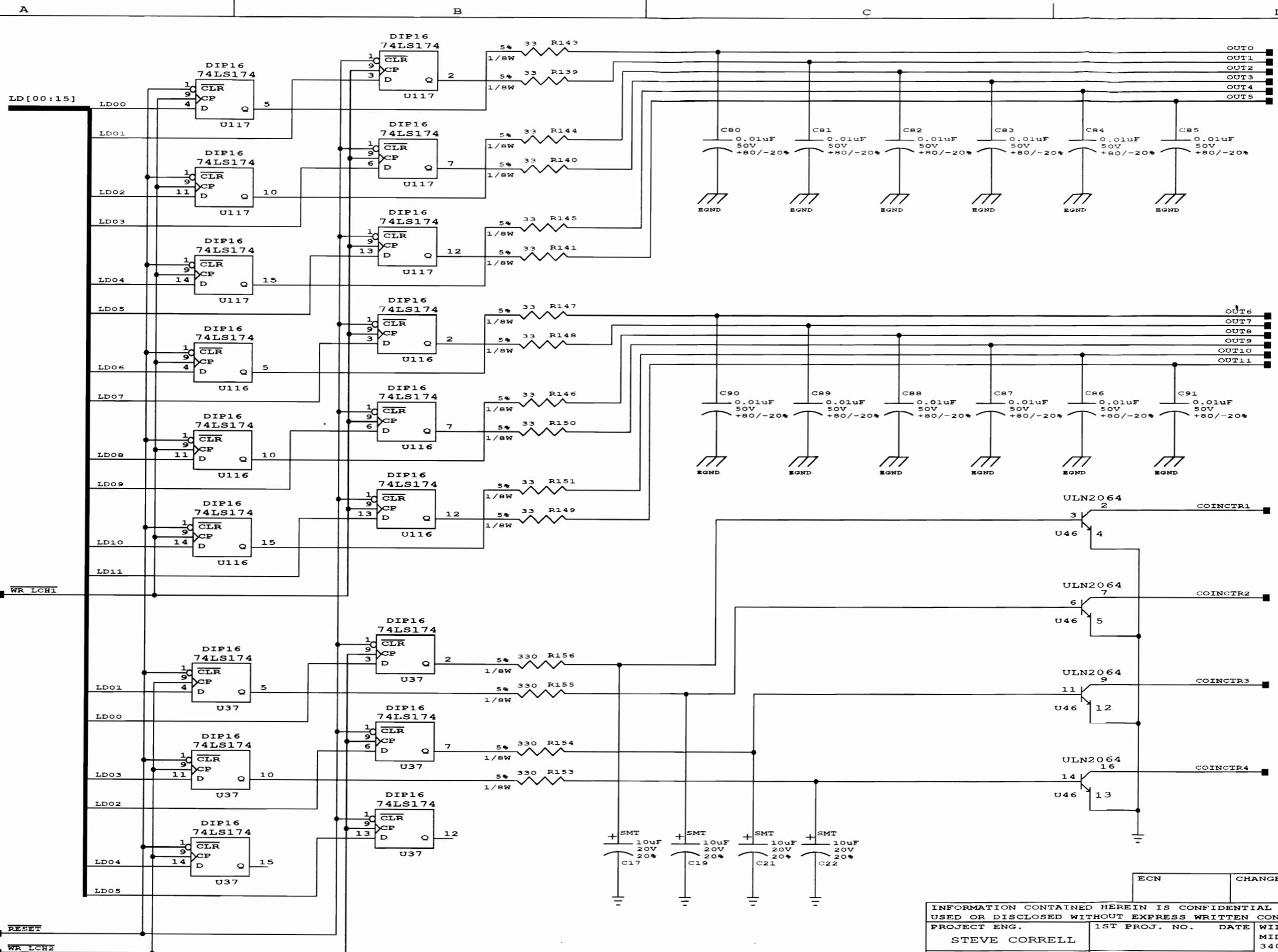


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INFORMATION CONTAINED HEREIN IS CONFIDENTIAL PROPERTY AND MAY NOT BE USED OR DISCLOSED WITHOUT EXPRESS WRITTEN CONSENT FROM THE COMPANY.		
PROJECT ENG.	1ST PROJ. NO.	DATE
STEVE CORRELL		
DWN. BY	DATE	1ST USAGE DATE
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CHECKED	DATE	CURRENT PROJ. DATE
APPROVED	DATE	SHEET OF 20 26
		PART NO. 16-9518 REV. 4



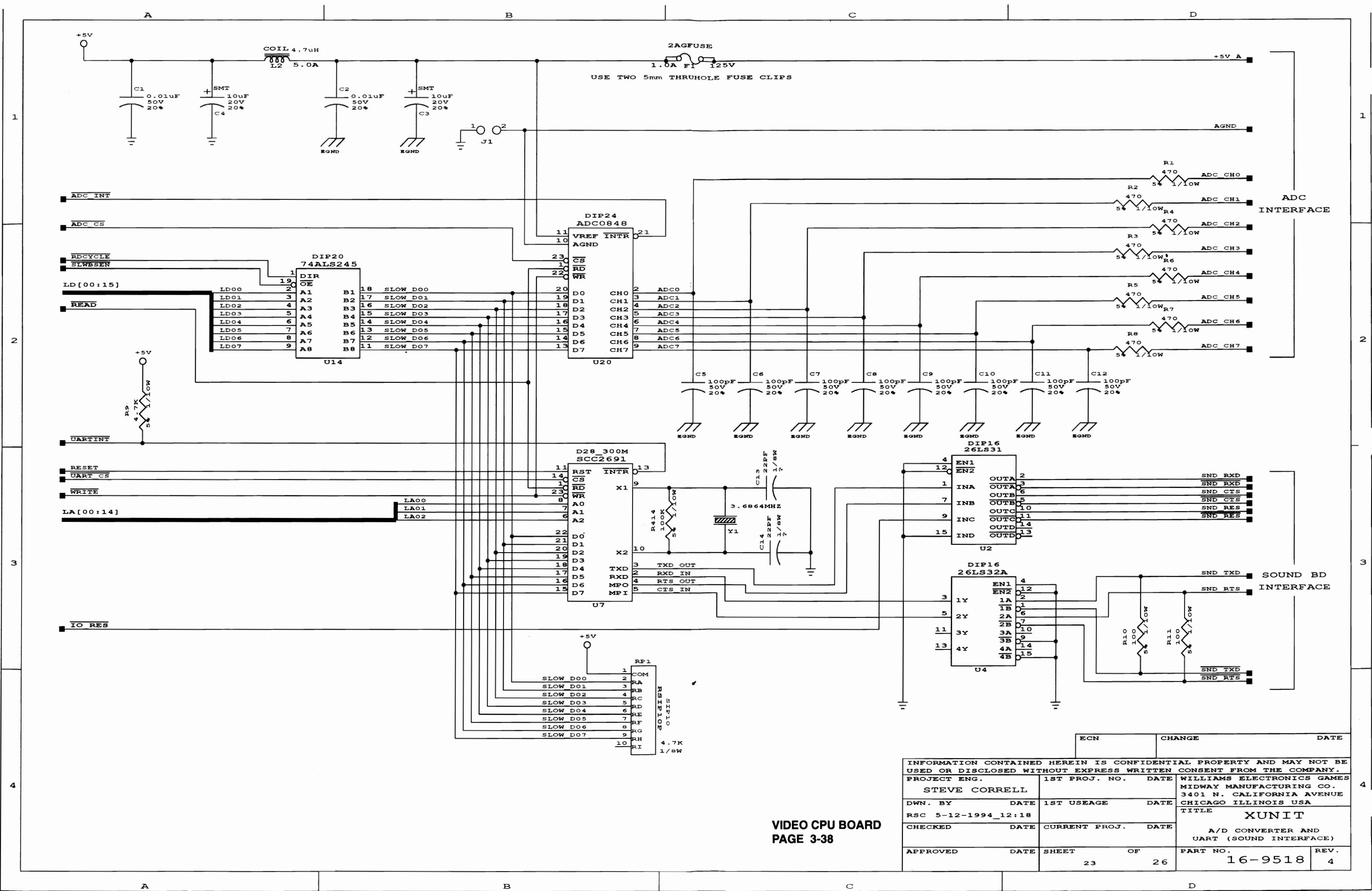
**VIDEO CPU BOARD
PAGE 3-36**

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. STEVE CORRELL	1ST PROJ. NO.	DATE
DWN. BY RSC 5-12-1994_12:17	1ST USEAGE	DATE
CHECKED	CURRENT PROJ.	DATE
APPROVED	DATE	SHEET OF 21 26
		PART NO. 16-9518 REV. 4



**VIDEO CPU BOARD
PAGE 3-37**

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.	1ST PROJ. NO.	DATE
STEVE CORRELL		
DWN. BY	DATE	1ST USAGE DATE
RSC 5-12-1994_12:18		
CHECKED	DATE	CURRENT FROJ. DATE
APPROVED	DATE	SHEET OF 22 26
		PART NO. 16-9518 REV. 4



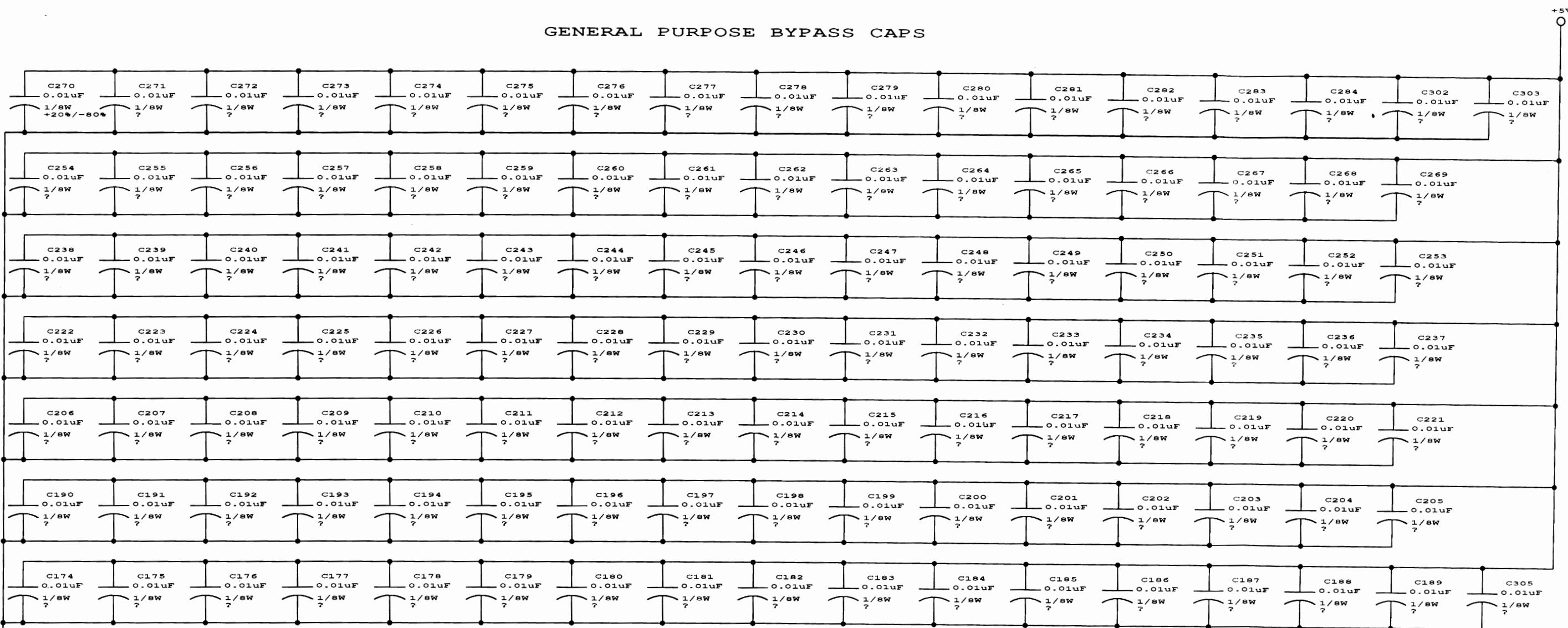
A

B

C

D

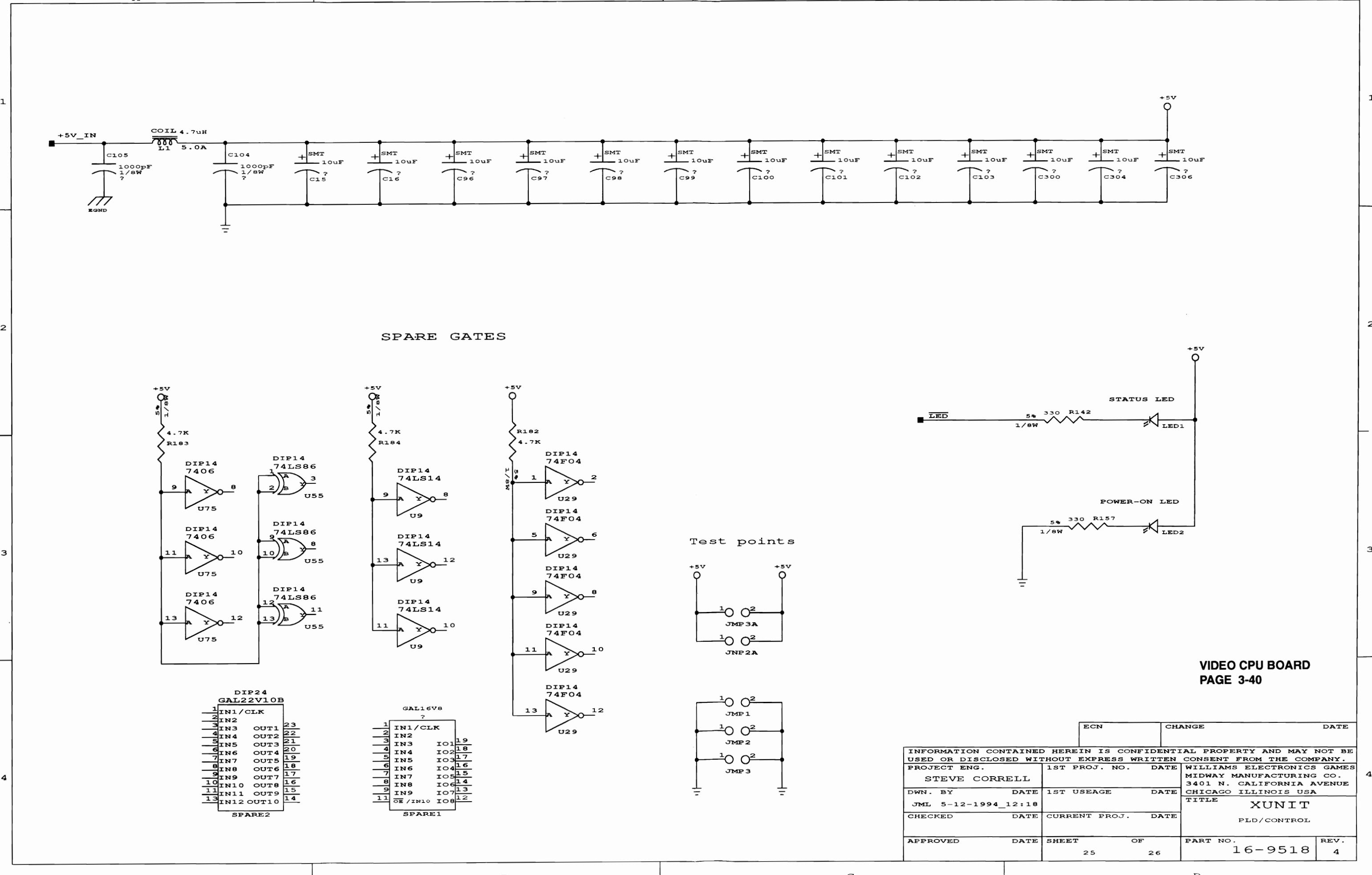
GENERAL PURPOSE BYPASS CAPS



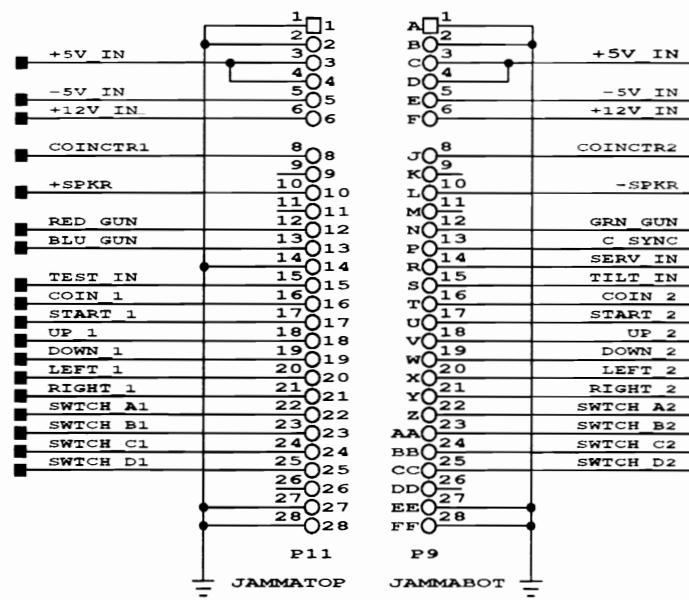
VIDEO CPU BOARD
PAGE 3-39

ECN	CHANGE	DATE
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PROJECT ENG.	1ST PROJ. NO.	DATE
STEVE CORRELL		
DWN. BY	1ST USAGE	DATE
JML 5-12-1994_12:18		
CHECKED	CURRENT PROJ.	DATE
APPROVED	DATE	SHEET OF
		24 26
		PART NO. 16-9518 REV. 4

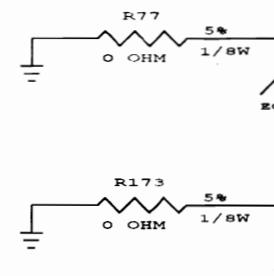
A B C D



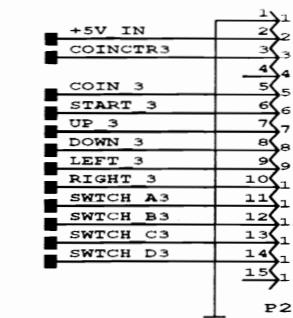
**JAMMA INTERFACE
EDGE CONNECTOR**



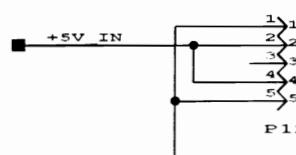
ISOLATED GROUNDS



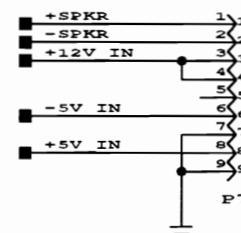
**PLAYER 3
I/O CONNECTOR**



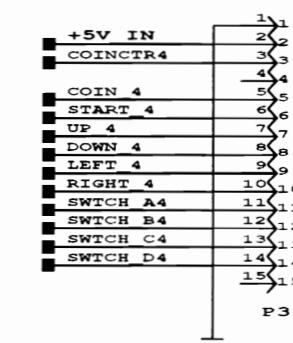
AUX. POWER OUT



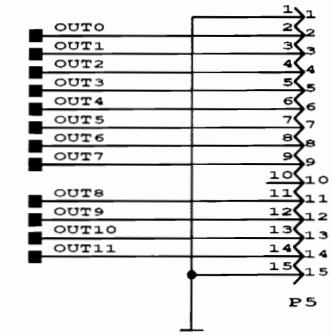
**SOUND
POWER/SPEAKER
INTERFACE**



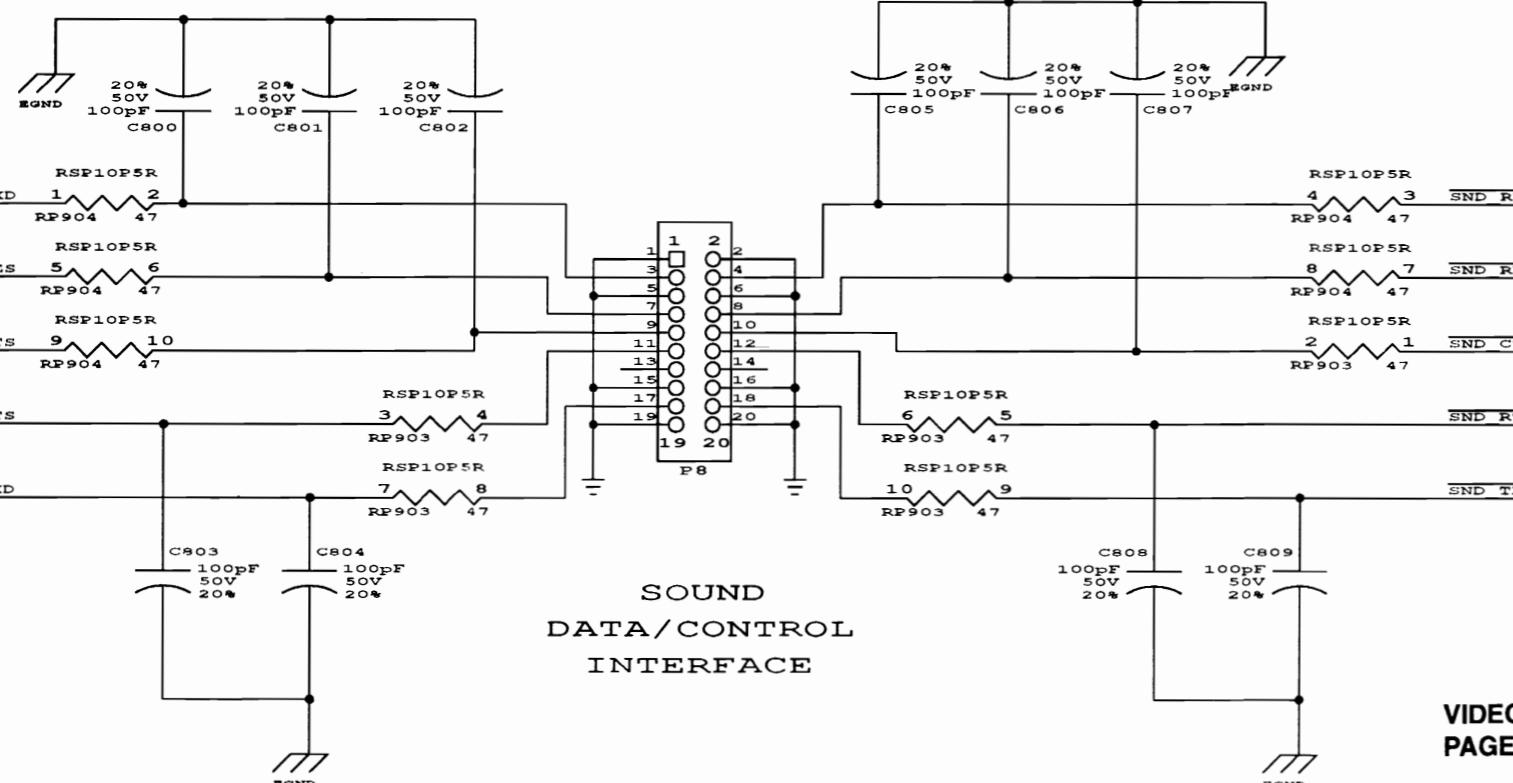
**PLAYER 4
I/O CONNECTOR**



**AUX. LATCHED
OUTPUTS**

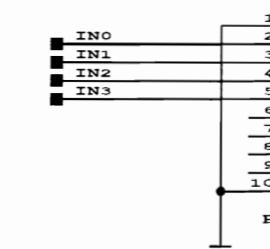


**SOUND
DATA/CONTROL
INTERFACE**

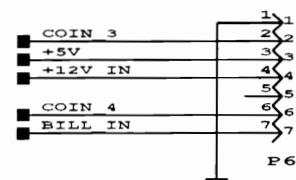


**VIDEO CPU BOARD
PAGE 3-41**

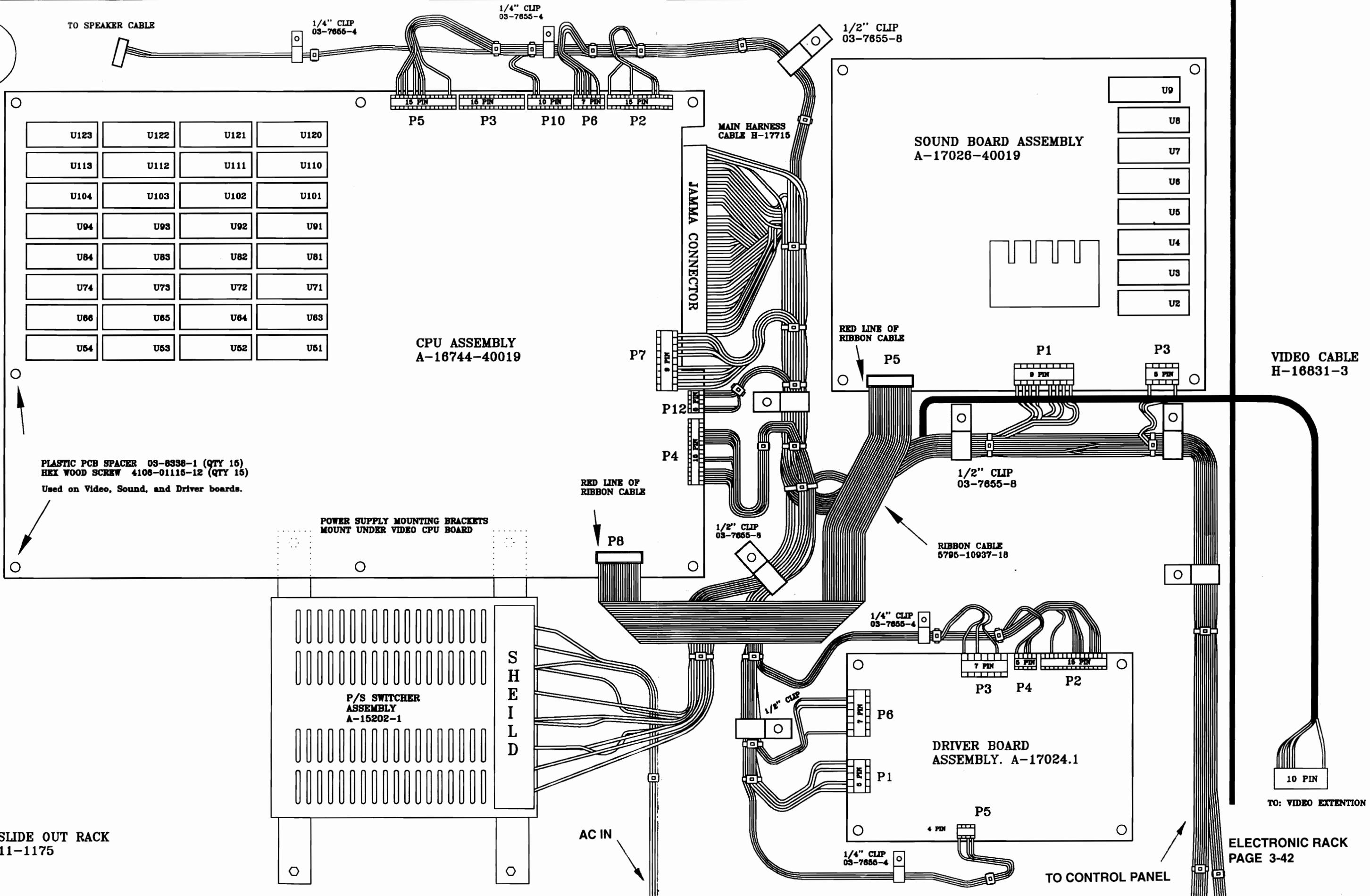
EXTRA INPUTS



COIN 3 & 4 INPUTS



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PART NO. 16-9518		REV. 4



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