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**MIDWAY**  
TM



## OPERATIONS MANUAL

ONE to FOUR PLAYERS



MIDWAY MANUFACTURING COMPANY



**TROG**

The Legend of .....



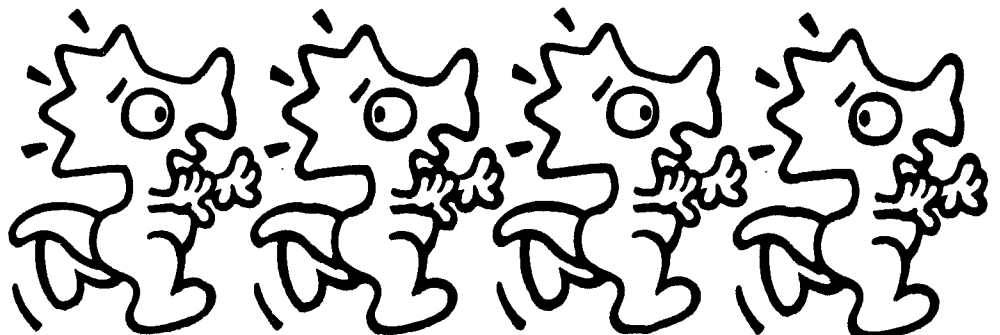
Long, long ago,  
In a land named OG-  
There lived a One-eyed Caveman  
by the name of TROG !

And in that land  
There lived four friends-  
REX and BLOOP,  
SPIKE and GWEN !

They need your help  
to get home you see-  
For if you don't lead them  
TROG'S DINNER they'll be !

TROG is always thinking,  
Inventing something new-  
The wheel and the club  
and the bouncing spring shoe !

When they've picked up all their  
eggs,  
You'll see them smile and shout-  
'Cause leading Dinos HOME  
Is what the game's about !



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# **RULES**

Up to four people can play simultaneously.

Each person chooses their own DINO, Rex, Bloop, Spike, or Gwen.

Use the joystick to move the DINO.

Press the PUNCH Button to make the DINO PUNCH.

Pick up a HOT CHILI PEPPER and press the PUNCH Button to make the DINO FIRE.

Pick up all of your DINOS EGGS to reveal HOME.

The first DINO HOME WINS.

Keep DINOS away from DANGEROUS areas, like the EDGE OF THE WATER and THE PITS.

Especially, keep DINOS away from TROG.

# TROG

## S E C T I O N one

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### Operation and Troubleshooting

# Safety Notices

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

## WARNINGS

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

**PROPERLY GROUND THE GAME.** To avoid electrical shocks, do not plug in the game until it has been inspected and properly grounded. Midway games should only be plugged into a grounded 3-wire outlet. Shocks will also result, if the control panel is not properly grounded! After servicing any parts on the panel, assure that the 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. When removing or repairing the monitor, extra precautions must be taken to avoid electrical shock because high voltages may exist within the monitor circuitry and cathode ray tube (crt) even after power has been disconnected. Do not touch internal parts of the display with your hands or metal objects! Always discharge the crt: attach one end of a large, well-insulated, 20-kV jumper to ground. Momentarily touch the free end of the grounded jumper to the anode by sliding it under the anode cap. Wait two minutes and discharge the anode again.

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

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

## CAUTION

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



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# Setup Procedure

## Installation and Inspection

1. Remove the game from its shipping carton, and inspect the exterior of the cabinet for any signs of damage. Remove the shipping cleats from the bottom of the cabinet.
2. Remove keys from the taped coin return slot (or attached to joystick). Unlock and open the coin and cash box doors. (Leg levellers and spare parts are stored in the cash box.)
3. Locate the four threaded holes on the bottom of the cabinet (one in each corner), and install one leg leveller (with its hex nut) in each hole.
4. Stand the cabinet upright and make certain that it is in a stable position. Level the cabinet.
5. Unscrew (or unlock) and remove the rear doors/panels of the cabinet. Inspect the interior for any signs of damage. Check all major assemblies to assure that they are mounted securely.
6. Refer to the game's cabinet wiring diagram (Section 3), and check to see that all cable connectors are correctly secured and firmly seated. DO NOT FORCE CONNECTORS. Watch for damaged connectors and avoid making reversed connections.
7. Line Voltage Selection. Your game is designed to work properly on the line voltage where you are located. Determine the value of your line voltage with a meter. Then, check the power input wires to the main power supply transformer on your game to be sure they are connected to taps which correspond to your local line voltage value. If necessary, reconnect the power input wires to the transformer in accordance with the Transformer Chart in Section 3.  
  
If the line voltage in your area falls outside the upper or lower limits of the range of voltage inputs covered by the main power supply transformer, DO NOT PLUG YOUR GAME IN until you have contacted your distributor or the Midway Service Department and obtained a solution to the problem. Otherwise, you could damage your game.
8. Lay the line cord (connected to the Power Chassis) in the slot along the bottom edge of the lower rear cabinet door/panel. Install the rear cabinet doors/panels and screw (lock) them securely. Close and lock the front coin and cash box doors.
9. Connect the line cord to a grounded (3-terminal) AC wall outlet.
10. Switch ON the game, using the ON/OFF switch located on the upper left rear of the cabinet, to verify proper operation.

## GAME LOCATION REQUIREMENTS

### Power

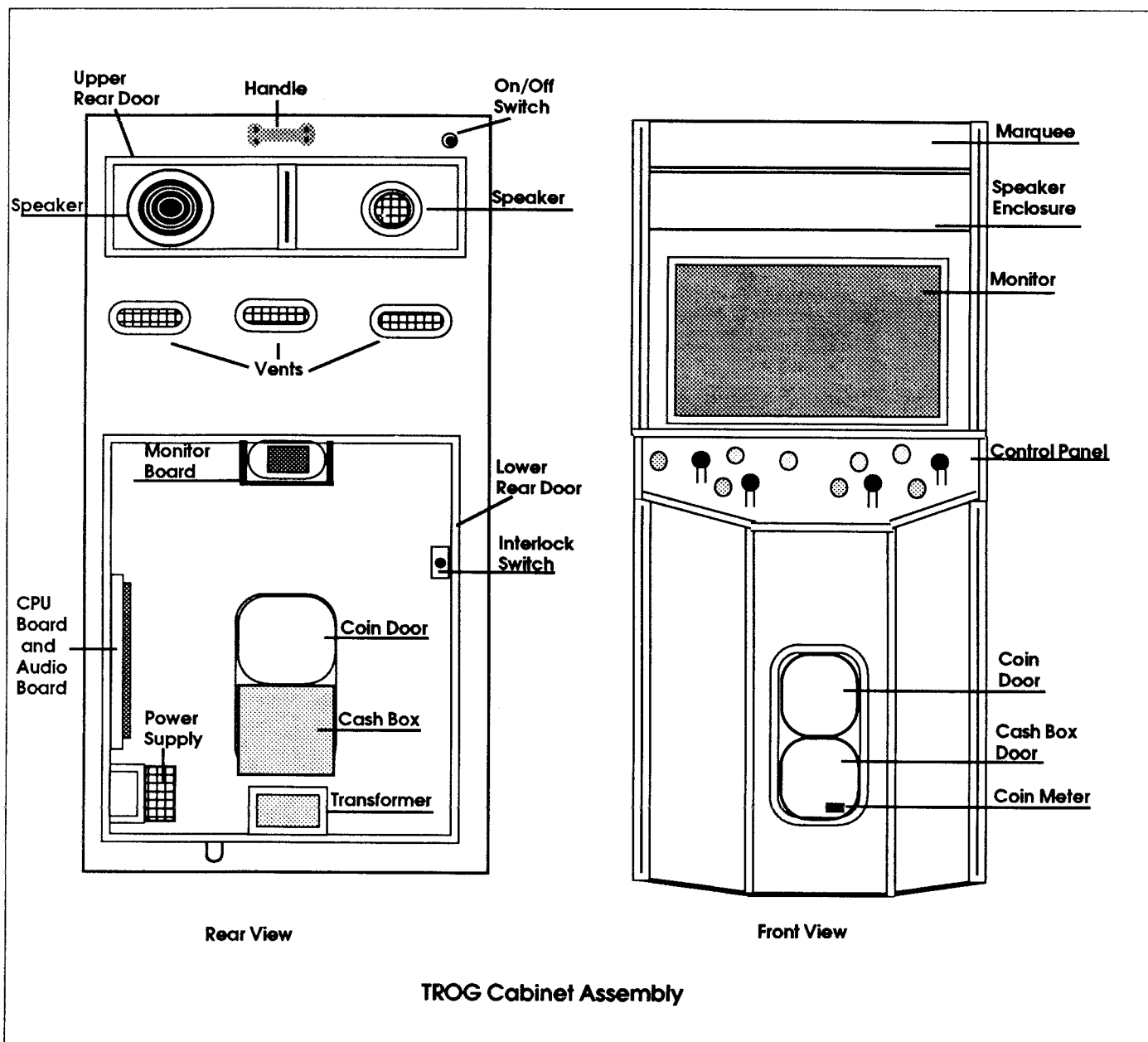
Domestic 115V @ 60 Hz  
Foreign 230V @ 50 Hz

### Temp.

32° F to 100° F  
(0° C to 38° C)

### Humidity

Not to exceed 95% relative.



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# Servicing

## ■ Servicing the Control Panel

Switch OFF power to the game. The control panel is held in place by four latches (located on the left and right sides of the cabinet) which provide constant pressure on the strikes. The latches can be reached through the coin door opening. To release the latches, lift the latch handle and unhook the wire fasteners. Carefully use the joysticks to lift the control panel. Rest the panel on its support bracket, while working on it. To reinstall the control panel, check for proper cable connections, including the ground strap, and use the joysticks to lower it into position, avoiding pinched wires. Reclamp the latches.

### NOTE

To remove the control panel for bench servicing, release the latches and lift the control panel, until it rests on its support bracket. Disconnect the cables and the ground strap. Lift the control panel out of the game cabinet.

### CAUTION

To preserve color purity of the monitor, when moving the game be sure the power is turned OFF.

## ■ Removal of Viewing Glass

Switch OFF power to the game, and open the control panel. Unscrew the four nuts at the bottom of the glass and remove the protective black plastic strip. Carefully lift the glass from its bottom groove and lift it clear of the cabinet.

### CAUTION

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

## ■ Removal of Monitor Bezel

Switch OFF power to the game, and remove the viewing glass. Remove the bezel securing screws to free the monitor bezel.

## ■ Monitor Replacement

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

Switch OFF power to the game. Open the upper rear door/panel. Remove the viewing glass and the monitor bezel. Completely disconnect the monitor from all of its cabling, including its chassis ground strap. Remove the four bolts securing the monitor's mounting flanges to its mounting panel. Pull the monitor carefully from the cabinet front.

### CAUTION

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

## WARNING

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

### ■ Removal of the Marquee Glass

Switch OFF power to the game. Remove the screws in the black plastic strip on top of the cabinet. Remove the strip and carefully lift the glass. Store the glass carefully to prevent damage.

The fluorescent tube is now accessible for replacement. Grasp the tube, give it a quarter turn, and remove it from its socket. Carefully place a new tube into the socket, and turn to reinstall.

### ■ Removal of the Fluorescent Light Assembly

Switch OFF power to the game. Remove the marquee glass. Disconnect the fluorescent light assembly from its power cable. Remove the screws fastening the assembly to the cabinet and lift out the assembly.

### ■ Removal of the Speakers

Switch OFF power to the game. Remove the upper rear cabinet door/panel, taking care to *not* damage the speaker enclosure seals. Disconnect the speakers from their cabling. Remove the nuts on the speaker mounting bolts. Remove the speakers. Because the speakers are mounted in an acoustical enclosure, carefully reinstall the seals upon completing any task in the speaker enclosure.

### ■ Volume Control, Test/Diagnostics Switch, and Service Credit Switch

Open the coin door to locate the game's volume control and Diagnostic switches on the small panel atop the cash box cover. The Volume Control is the white knob on left end of the panel. Turning the knob clockwise increases the volume. The upper right switch on the bracket is the Test/Diagnostics Switch that enables activating the game's test mode. The lower right switch is the Service Credit Switch, which allows adding credits to a game for service testing without affecting the game's bookkeeping total.

# 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 TROG REVISION LEVEL, CMOS TEST OK and the COIN SETTING. The game then moves to the attract mode. After the proper coinage has been inserted, the game exits the attract mode and enters the play mode.

**TROG is a one- to-four player game. Each player chooses his/her own DINO. Any combination of DINOS can be played simultaneously.**

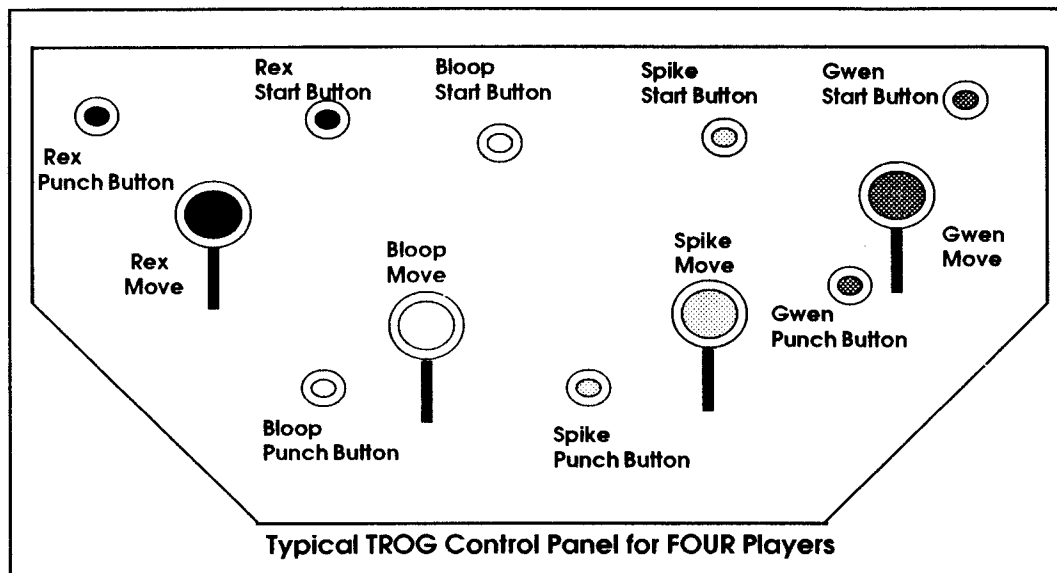
## Player Controls

- Each **START** button allows the player to choose a Dino. BLOOP (blue); GWEN (purple); SPIKE (yellow); and REX (red).
- Each **PUNCH** button allows the player to either Punch or Fire. Press Punch to make your Dino punch. Pick up a HOT CHILI PEPPER and press Punch to make your Dino Fire.
- Each **JOYSTICK** allows each player to move their Dino up, down, left, or right.

### NOTE

TROG will operate in the Test Mode, when the Test Switch (on the cash box cover) is closed or DIP Switch Bank #2 Switch #8 is closed.

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



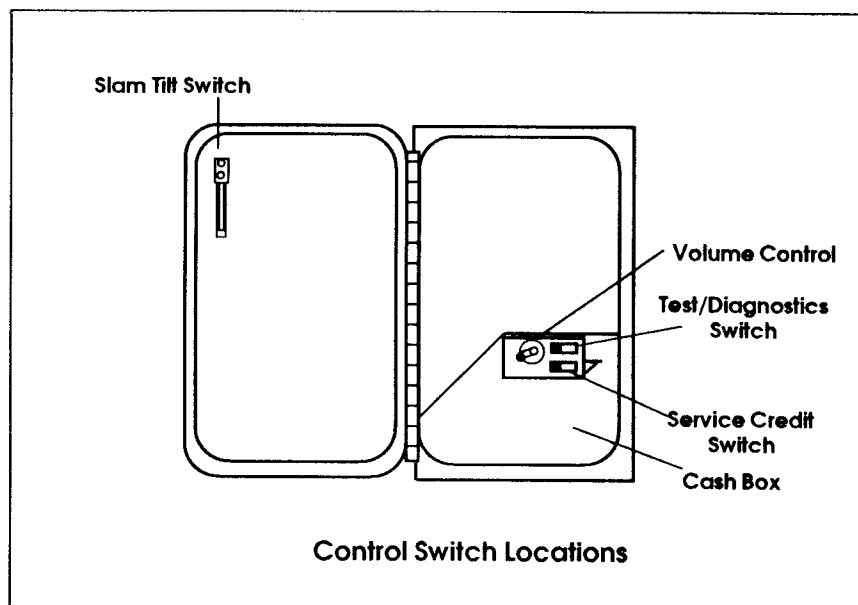
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## Game Operation

TROG is a one- to four-player video game with a color monitor. From the player's perspective, the game has two modes of operation: Ready-to-Play and Play. For the owner/operator, the game has an additional mode of operation called Game Audit, Adjustments and Diagnostics.

### Control Switches

- The **VOLUME CONTROL** allows increasing or decreasing the volume level of the game music and speech. For greater profits, set your game's volume level at its maximum.
- The **TEST/DIAGNOSTICS SWITCH** allows you to enter into the game's Diagnostic mode. Turn the Test Switch ON to enter the Diagnostics mode. To exit this mode, turn the Test Switch OFF. Game diagnostics can be reached via the DIP Switches also.
- The **SERVICE CREDIT SWITCH** is a special feature switch that allots credit without affecting the game's book-keeping total.
- The **COIN DOOR SLAM TILT SWITCH** detects any forceful vibrations against the Coin Door. This eliminates pounding for free games.
- The **POWER INTERLOCK SWITCH** is a safety switch that ensures power to the game is off during servicing. This switch is located inside the rear door/panel.



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# Game Audits, Adjustments & Diagnostics

## Operation

All TROG Game Audits, Adjustments, and Diagnostics are options of the Main Test Menu. Each option, in turn, has its own menu, listing several choices that you may act upon as desired.

To enter the Main Menu, turn ON the Test Switch (on the cash box cover), or turn ON DIP Switch #8 in switch bank 2. The Main Test Menu (shown below) then appears. Game adjustments, bookkeeping, and diagnostics are all accessible from this menu.

Move any joystick up or down to cycle through the menu options. Notice that the options are highlighted in sequence. Selecting a desired option requires it to be highlighted. To activate the selected option, press any control panel button.

To exit, use any joystick to highlight Exit To Game Over and turn OFF either the Test Switch or DIP Switch #8 in switch bank 2.

The Main Test Menu lists six options.

**SELECT WITH UP/DOWN STICK  
ACTIVATE WITH ANY BUTTON**

**DIAGNOSTIC TESTS  
COIN BOOKKEEPING  
GAME AUDITS  
GAME ADJUSTMENTS  
UTILITIES  
EXIT TO GAME OVER**

**Main Test Menu**

## DIAGNOSTIC TESTS

To enter the Diagnostic Tests from the Main Test Menu, move any joystick to select (highlight) the Diagnostic Tests option, and press any control panel button to activate the option.

The Diagnostic Tests Menu lists seven options.

**SELECT WITH UP/DOWN STICK  
ACTIVATE WITH ANY BUTTON.**

**SWITCH TEST**

**DIP SWITCH TEST**

**CPU BOARD TEST**

**SOUND BOARD TEST**

**MONITOR PATTERNS**

**BURN-IN TEST**

**RETURN TO MAIN MENU**

**Diagnostic Test Menu**

## Switch Test

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

Select the Switch Test by using any joystick to highlight the Switch Test option; then, press any control panel button to activate it. The screen shows the control panel and coin door switches. Pressing a switch causes the corresponding switch location on the screen to light. Release the switch and the screen returns to normal.

Press both Player 1 Punch and Player 1 Start Buttons to return to the Diagnostic Menu.



## DIP Switch Test

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

Select the DIP Switch Test by moving any joystick to highlight the DIP Switch Test option; then, press any control panel button to activate the test. The screen displays a layout of the DIP switches and their current settings.

To change the setting of either DIP switch, press the switch position (SW1 - SW8) to the desired setting (ON from OFF, or vice versa). Check the screen to verify that the switch now shows the setting desired.

Press any control panel button to return to the Diagnostic Test Menu.

**DIP Switch 1 Settings Table**

|                                       | SW 1        | SW 2        | SW 3  | SW 4  | SW 5  | SW 6  | SW 7  | SW 8  |
|---------------------------------------|-------------|-------------|-------|-------|-------|-------|-------|-------|
| Upright<br>Midway Cocktail            | Off *<br>On |             |       |       |       |       |       |       |
| CMOS Coinage<br>DIP Switch<br>Coinage |             | On<br>Off * |       |       |       |       |       |       |
| <b>Coin Settings</b>                  |             |             |       |       |       |       |       |       |
| USA 1                                 | Ger 1       | Fr 1        | Off * | Off * | Off * |       |       |       |
| USA 2                                 | Ger 2       | Fr 2        | On    | Off   | Off   |       |       |       |
| USA 3                                 | Ger 3       | Fr 3        | Off   | On    | Off   |       |       |       |
| USA 4                                 | Ger 4       | Fr 4        | On    | On    | Off   |       |       |       |
| USA ECA                               | Ger ECA     | Fr ECA      | Off   | Off   | On    |       |       |       |
| N/U                                   | 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    |       |       |       |
| Not Used                              |             |             |       |       |       | Off * | Off * | Off * |

**DIP Switch 2 Settings Table**

|   | SW1   | SW2   | SW3   | SW4         | SW5                      | SW6                      | SW7         | SW8         |
|---|-------|-------|-------|-------------|--------------------------|--------------------------|-------------|-------------|
| USA   | Off * | Off * |       |             |                          |                          |             |             |
| German  | On    | Off   |       |             |                          |                          |             |             |
| French  | Off   | On    |       |             |                          |                          |             |             |
| Not Used  | On    | On    |       |             |                          |                          |             |             |
| Not Used  |       |       | Off * |             |                          |                          |             |             |
| One Counter<br>Two Counters                         |       |       |       | Off *<br>On |                          |                          |             |             |
| 4 Players<br>3 Players<br>2 Players<br>1 Player     |       |       |       |             | Off *<br>On<br>Off<br>On | Off *<br>Off<br>On<br>On |             |             |
| Video Freeze<br>(activates when<br>change detected) |       |       |       |             |                          |                          | Off *<br>On |             |
| Test Switch<br>Game Mode<br>Test Mode               |       |       |       |             |                          |                          |             | Off *<br>On |

\* Indicates Factory Setting

## NOTE

As soon as a faulty chip is detected, the CPU Test stops. The remaining chips are not tested.

## CPU Board Test

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

Move any joystick to select the CPU Board Test; then, press any control panel button to activate 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 on the CPU. Any chip that is shown as black with a white outline is part of the CPU and should turn either red or green during the CPU Test. Any chip that is shown as gray with a white outline is not installed in the game. During the test, chips are good, if they turn green; they are faulty, if they turn red.

If no errors are detected, the screen automatically returns to the Diagnostic Menu.

## Sound Board Test

The Sound Test allows listening to some of the sounds that TROG is capable of producing. This test also emits a tone for each fault that is detected.

Move any joystick to select the Sound Board Test; then, press any control panel button to activate the test. The screen displays two test options:

**GENERAL TEST** analyzes the sound circuitry. 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.

**PLAY SOUNDS** tests synthesized sounds from the Sound Board. Press any Punch Button to advance to the next sound.

To exit this test, use any joystick to select Back to Diagnostic Menu, or Return to Main Menu; then press any control panel button.

**GENERAL TEST**

**PLAY SOUNDS**

**BACK TO DIAGNOSTIC MENU**

**RETURN TO MAIN MENU**

**Sound Test Menu**

## Monitor Patterns

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

Move any joystick to select a test; press any control panel button to activate the test.

**SELECT WITH UP/DOWN STICK  
ACTIVATE WITH ANY BUTTON.**

**RED SCREEN**

**GREEN SCREEN**

**BLUE SCREEN**

**COLOR BARS**

**CROSSHATCH PATTERNS**

**BACK TO DIAGNOSTIC MENU**

**RETURN TO MAIN MENU**

### Monitor Pattern Menu

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 gradated 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 appear round.

Exit this test by pressing any control panel button to return to the Monitor Patterns Menu. Use any joystick to select Back to Diagnostic Menu, or Return to Main Menu; then press any control panel button.

### NOTE

TROG provides front-mounted Monitor Board controls. These controls are accessible within the control panel opening beneath the monitor.

## Burn-in Test

The Burn-in Test continually repeats the CPU Board Test. Move any joystick to select the Burn-In Test; then, press any button to activate the test. When the Burn-In Test detects an error, the test stops and displays an error message on the screen. The third page of the Audit Table specifies the number of Burn-in cycles successfully completed. Use this test to find intermittent CPU problems.

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

## COIN BOOKKEEPING

To enter the Coin Bookkeeping from the Main Test Menu, move any joystick to select the Coin Bookkeeping option; then, press any control panel button to activate it.

The Coin Bookkeeping Table records the coinbox totals and game play counters. The left side of the table names the bookkeeping item; the right side shows the number of coins, credits, or plays for each item.

|                              |      |
|------------------------------|------|
| LEFT SLOT COIN               | 0    |
| RIGHT SLOT COIN              | 0    |
| THIRD SLOT COIN              | 0    |
| FOURTH SLOT COIN             | 0    |
| SERVICE CREDITS              | 0    |
| PAID CREDITS                 | 0    |
| GAMES STARTED                | 0    |
| GAMES CONTINUED              | 0    |
| TOTAL PLAYS                  | 0    |
| PLAYS UNTIL HIGH SCORE RESET | 5000 |
| MORE DETAILED INFORMATION    |      |
| RETURN TO MAIN MENU          |      |

**Coin Bookkeeping Table**

To exit Coin Bookkeeping, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate it.

## GAME AUDITS

To enter Game Audits from the Main Test Menu, move any joystick to select the Game Audits option; then, press any button to activate it. To advance to the next (or return to the previous) page of the Game Audit Table, move any joystick to select either "Next Audit Page", or "Previous Audit Page"; then, press any control panel button to change the page.

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

|                             |   |
|-----------------------------|---|
| TOTAL PLAYS                 | 0 |
| TOTAL PLAY TIME             | 0 |
| TOTAL GAME UP TIME          | 0 |
| AVERAGE TIME/LIFE           | 0 |
| AVERAGE TIME/CREDIT         | 0 |
| TIME 1 PLAYER ONLY          | 0 |
| TIME 2 PLAYERS SIMULTANEOUS | 0 |
| TIME 3 PLAYERS SIMULTANEOUS | 0 |
| TIME 4 PLAYERS SIMULTANEOUS | 0 |
| <b>NEXT AUDIT PAGE</b>      |   |
| <b>RETURN TO MAIN MENU</b>  |   |

PAGE 1 OF AUDIT TABLE

|                            |   |
|----------------------------|---|
| TOTAL PLAYS                | 0 |
| AVERAGE CREDITS/GAME       | 0 |
| BEGINNER STARTS            | 0 |
| ADVANCED STARTS            | 0 |
| EXPERT STARTS              | 0 |
| AVERAGE WAVE REACHED       | 0 |
| GAMES PLAYED TO COMPLETION | 0 |
| MAXIMUM WAVE COMPLETED     | 0 |
| <b>NEXT AUDIT PAGE</b>     |   |
| <b>PREVIOUS AUDIT PAGE</b> |   |
| <b>RETURN TO MAIN MENU</b> |   |

PAGE 2 OF AUDIT TABLE

|                                      |   |
|--------------------------------------|---|
| TOTAL EXTRA DINOS EARNED             | 0 |
| GAME CONTINUES OFFERED               | 0 |
| GAME CONTINUES TAKEN                 | 0 |
| PERCENTAGE OF CONTINUES TAKEN        | 0 |
| COIN DOOR SLAMS                      | 0 |
| BURN-IN LOOPS SUCCESSFULLY COMPLETED | 0 |
| <b>PREVIOUS AUDIT PAGE</b>           |   |
| <b>RETURN TO MAIN MENU</b>           |   |

PAGE 3 OF AUDIT TABLE

To exit the Game Audit Table , move any Joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate it.

## **GAME ADJUSTMENTS**

Move any joystick to select the Game Adjustment option on the Main Test Menu; then, press any control panel button to activate it.

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

The Game Adjustment Menu offers 12 choices. Several of these choices have their own menu. Move any joystick to select your choice from the Game Adjustments Menu; then, press any control panel button to activate that choice. On the next menu, either move any joystick to select the item you wish to modify; then, press any control panel button to activate that item, or If the item only provides a setting choice, move any joystick to change the current setting to the desired value; then, press any control panel button to lock in the desired value. Moving the joystick up increases the setting value shown on the screen. Moving the joystick down causes the value shown on the screen to decrease.

**SELECT WITH UP/DOWN STICK  
PRESS ANY BUTTON TO MODIFY**

**RETURN TO MAIN MENU**

**STANDARD PRICING**

**CUSTOM PRICING**

**GAME DIFFICULTY**

**LIVES PER PLAY**

**EXTRA MAN EVERY**

**NUMBER OF EXTRA MEN**

**AUTO HIGH SCORE RESET**

**FREE PLAY**

**HIGH SCORE ENTRY**

**ALLOW GAME CONTINUE**

**RETURN TO MAIN MENU**

**Game Adjustment Menu**

## Standard Pricing

Standard Pricing allows the operator to choose any of the "Standard" selections for the Standard Pricing Table. Standard Pricing *cannot* be installed when either Custom or DIP Switch Pricing is in effect.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

### NOTE

The TROG Standard Pricing Table is on page 1-19.

## 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. Custom Pricing *cannot* be installed when DIP Switch Pricing is in effect.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

## Game Difficulty

Game Difficulty allows the operator to select the difficulty level of the game. The range of this setting is Easiest (1) to Hardest (10).

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

## Lives per Play

Lives per Play allows the operator to select the number of lives a player receives each time a game is started or continued.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

## Extra Man Every

Extra Man Every allows the operator determine how many points the player must earn before receiving an extra life.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

## Number of Extra Men

Number of Extra Men allows the operator to determine how many men the player can earn per credit.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

## **Auto High Score Reset**

Auto High Score Reset allows the operator to determine how many plays must occur before the all time high scores are automatically reset to factory settings.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

## **Free Play**

Free Play allows the operator to determine whether game play can occur without any coins being dropped into the coin chutes. Free Play *cannot* be installed when DIP Switch Pricing is in effect.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

## **High Score Entry**

Allows the operator to determine whether the game has a High Score Entry Table and Display.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

## **Allow Game Continue**

Allow Game Continue allows the operator to determine whether a player can continue to play even though all other players are dead.

Press any control panel button to lock in the selected setting and return to the Game Adjustments Menu.

To return to the Main Test Menu, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate the return.



### TROG Standard Pricing Table

| NAME       | SETTING<br>Credit/Coin      | LEFT<br>CHUTE | CENTER<br>CHUTE | RIGHT<br>CHUTE | FOURTH<br>CHUTE |
|------------|-----------------------------|---------------|-----------------|----------------|-----------------|
| USA 1      | 1/25¢                       | 25¢           |                 | 25¢            |                 |
| USA 2      | 1/50¢                       | 25¢           |                 | 25¢            |                 |
| USA 3      | 1/50¢, 3/\$1.00             | 25¢           |                 | 25¢            |                 |
| USA 4      | 1/50¢, 4/\$1.00             | 25¢           |                 | 25¢            |                 |
| USA ECA    | 1/25¢, 4/\$1.00             | \$ 1.00       | 10¢             | 25¢            | 5¢              |
| German 1   | 1/1 DM, 6/5 DM              | 1 DM          |                 | 5 DM           |                 |
| German 2   | 1/1 DM, 7/5 DM              | 1 DM          |                 | 5 DM           |                 |
| German 3   | 1/1 DM, 8/5 DM              | 1 DM          |                 | 5 DM           |                 |
| German 4   | 1/1 DM, 5/5 DM              | 1 DM          |                 | 5 DM           |                 |
| German ECA | 1/1 DM, 2/2 DM, 6/5 DM      | 5DM           | 1DM             | 2DM            |                 |
| France 1   | 2/5 F, 5/10 F               | 5 F           |                 | 10 F           |                 |
| France 2   | 2/5 F, 4/10 F               | 5 F           |                 | 10 F           |                 |
| France 3   | 1/5 F, 3/10 F               | 5 F           |                 | 10 F           |                 |
| France 4   | 1/5 F, 2/10 F               | 5 F           |                 | 10 F           |                 |
| France ECA | 1/3 X 1 F, 2/5 F, 5/2 X 5 F | 1F            | 10F             | 5F             |                 |
| Swiss      | 1/1 F, 6/5 F                | 1 F           |                 | 5 F            |                 |
| Italy      | 1/500 Lire                  | 500 Lire      |                 | 500 Lire       |                 |
| UK 1       | 1/20 P, 3/50 P              | 20 P          |                 | 50 P           |                 |
| UK ECA     | 1/30 P, 2/50 P, 4/£1.00     | £1.00         | 20P             | 50 P           | 10 P            |
| Spain 1    | 1/25 Peseta, 5/100 Peseta   | 25 Peseta     |                 | 100 Peseta     |                 |
| Japan 1    | 1/100 Yen                   | 100 Yen       |                 | 100 Yen        |                 |

If option desired is not shown above, use custom pricing .

## UTILITIES

On the MainTest Menu, move any joystick to select the Utilities option; then, press any control panel button to activate it.

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

**SELECT WITH UP/DOWN STICK  
ACTIVATE WITH ANY BUTTON**

### OPERATOR MESSAGE

**CLEAR CREDITS**

**CLEAR COIN COUNTERS**

**CLEAR GAME AUDITS**

**RESET HIGH SCORE**

**DEFAULT ADJUSTMENTS**

**FULL FACTORY RESTORE**

**RETURN TO MAIN MENU**

**Utilities Menu**

Move any joystick to select an item from the Utilities Menu; then, press any control panel button to activate that item. After an item has been activated, you are given the option of resetting the item or not. For example;

**CLEAR CREDITS  
ARE YOU SURE ?**

**YES  
NO**

Move any joystick to choose YES or NO; then, press any control panel button to lock in your choice and to return to the Utilities Menu.

To exit Utilities, move any joystick to select RETURN TO MAIN MENU; then, press any control panel button to activate it.

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# Troubleshooting

| <b>Problem</b>   | <b>Possible Solution</b>   |
|--|--|
| NO PICTURE<br>OR DISTORTED<br>PICTURE.                                 | Check for faulty video board or monitor. Check for disconnected video signal cable.  |
| TURN GAME ON &<br>NOTHING HAPPENS                                      | Check line fuse. Check for +5V dc at pins C, D, 3, and 4 of the JAMMA Connector.   |
| NO SOUND   | Check the speaker and speaker connection to pins L and 10 on JAMMA Connector. Check volume control setting. Check for +12V dc at pins F and 6 on the JAMMA Connector. Check interboard wiring from CPU Board to Sound Board. |
| NO GENERAL<br>ILLUMINATION   | Check the 1A., S-B fuse on the cabinet wall above the coin box.  |
| MOVE JOYSTICK,<br>BUT DINO DOES<br>NOT MOVE                            | Check for open wires between Joystick and CPU Board. Check for contamination on joystick switch contacts and CPU Board pins. Check for proper ground.  |
| PRESS <b>START</b> or<br><b>PUNCH BUTTON</b><br>AND NOTHING<br>HAPPENS | Check for open wires between button and CPU Board. Check for contamination on CPU Board pins or button switch blade contacts. Check for proper ground.   |
| NO CREDIT GIVEN<br>WHEN COINS ARE<br>INSERTED                          | Check DIP switch coin setting. Check for contamination on coin switch contacts. Check for an open wire between Coin Switch 1 and pin 16 on JAMMA Connector or Coin Switch 2 and pin T of JAMMA Connector.                    |
| TOO MANY CREDITS<br>FOR NUMBER OF<br>COINS INSERTED                    | Check Game Pricing setting. Check for a short between pins T & 16 on JAMMA Connector.  |
| GAME STAYS IN THE<br>TEST MODE.  | Check that the Test Switch (on the cash box cover) and the Test Switch (Position 8) on DIP Switch 2 are set to OFF.  |

## Notes

# TROG

S E C T I O N

two

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Parts Information

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## Cabinet Hardware

|                             |                |
|-----------------------------|----------------|
| Cabinet Assembly            | A-11-933-4005  |
| Caster Wheel Assembly       | B-13086        |
| Leg Leveler Plate           | 01-9155        |
| Leg Adjuster                | 08-7377        |
| Back Door Assembly          | B-13574        |
| Lock Retainer               | 01-7264        |
| Upper Door Lock Cam         | 01-8989        |
| Rear Wood Door              | 11-934         |
| Door Cam Lock               | 20-6542-TB     |
| Line Voltage Cable Assembly | C-12773-4      |
| Mtg Plt Toggle Assembly     | A-9958         |
| Interlock Spring Brkt. Assy | B-12907        |
| Line Voltage Cable          | H-13555        |
| Protective Cap              | 17-1038-2      |
| Toggle Switch               | 5640-10932-00  |
| Interlock Cheat Switch      | 5643-09556-00  |
| Over/Under Coin Door        | D-13250        |
| Test Switch                 | A-13115        |
| Coin Door Cable             | H-13215        |
| Coin Door USA               | 09-20000-V-1   |
| 12 pin "Z" Header           | 5791-12235-12  |
| Glass Retainer Bracket      | 01-9607        |
| 20" Vent Hole Cover         | 03-7602        |
| Vent Hole Cover             | 03-7839        |
| Marquee Retainer            | 03-8252-2      |
| Lock Lamp                   | 03-8327        |
| Glass Edge Channel          | 03-8358        |
| 25" CRT Bezel               | 03-8387        |
| Vent Hole Cover             | 03-8413        |
| Speaker Wood Door           | 11-935         |
| Toggle Latch                | 20-9347        |
| TROG Marquee                | 31-1543-4005-U |
| Glass CRT Cover             | 31-1544-4005-U |
| Speaker Grille              | 31-1553-4005-U |

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## Speakers

|                              |               |
|------------------------------|---------------|
| Piezo Speaker Assembly       | B-13587       |
| 6" Round Speaker, 4 ohm, 10W | 5555-12015-00 |

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## Fluorescent Lamp

|                               |         |
|-------------------------------|---------|
| Fluorescent Housing & Bracket | C-12679 |
| Housing Mounting Brkt         | 01-9146 |
| Light Fixture                 | 20-9590 |
| 18" Fluorescent Bulb, 15 W    | 24-8809 |

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## PC Boards

|                            |               |
|----------------------------|---------------|
| Y-Unit CPU Assembly        | C-13234-40003 |
| Power Supply Assembly      | C-13253-1     |
| Audio Sound Board Assembly | D-11581-40003 |

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## Transformer Assembly

|                          |               |
|--------------------------|---------------|
| Power Pack Assembly      | D-13252       |
| Line Cord Assembly       | A-13340       |
| Power Transformer        | 5610-12559    |
| Power Pack Chassi Assy   | C-13251       |
| Power Pack Jumper Cable  | H-13265       |
| Line Filter Jumper Cable | H-13344       |
| Transformer Jumper Cable | H-13378       |
| Varistor, 130V, 10J      | 5017-09044-00 |
| Line Filter, 5Amp        | 5102-08895-00 |

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## Control Panel

|                              |            |
|------------------------------|------------|
| Control Panel Assembly       | A-14174    |
| Control Panel Plate Assembly | C-13473    |
| Blue Button Assembly         | C-9214-1   |
| Purple Button Assembly       | C-9214-22  |
| Red Button Assembly          | C-9214-4   |
| Yellow Button Assembly       | C-9214-23  |
| Control Panel Cable          | H-13556    |
| Latch Bracket                | 01-6994    |
| Latch Bracket                | 01-9605    |
| Universal Switch Molding     | 03-7614    |
| Wood Control Panel           | 11-942     |
| 5/8 Palnut                   | 20-9222    |
| Red Joystick                 | 20-9662    |
| Yellow Joystick              | 20-9662-4  |
| Purple Joystick              | 20-9662-6  |
| Blue Joystick                | 20-9662-8  |
| Screened Overlay             | 31-5-40003 |

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## Monitor

|             |               |
|-------------|---------------|
| Monitor 25" | 5675-12621-00 |
|-------------|---------------|

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## Cables

|                           |               |
|---------------------------|---------------|
| Video Sound/Power Cable   | H-10217-4     |
| Speaker Cable             | H-13213       |
| Coin Door Cable           | H-13215       |
| Sound/Power Speaker Cable | H-13257       |
| Volume Control Cable      | H-13258-2     |
| Power Pack Jumper Cable   | H-13265       |
| Line Filter Jumper Cable  | H-13344       |
| Transformer Jumper Cable  | H-13378       |
| Main Harness Cable        | H-13554       |
| Line Voltage Cable        | H-13555       |
| Control Panel Cable       | H-13556       |
| Piezo Speaker Cable       | H-13557       |
| Ground Jumper Cable       | H-13953       |
| 20 pin Ribbon Cable       | 5795-10937-18 |

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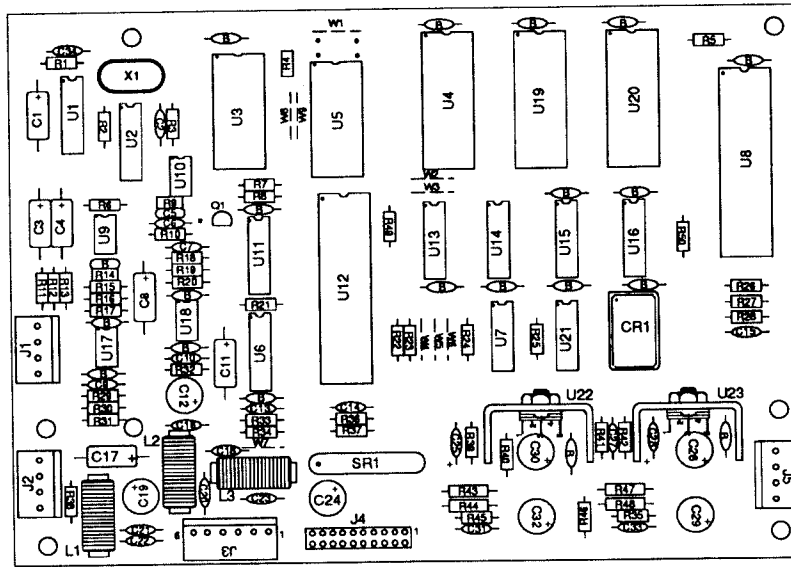
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## Manuals

|                    |               |
|--------------------|---------------|
| Monitor Manual     | 16-3000-103   |
| Instruction Manual | 16-40003A-101 |



# D-11581-40003 Audio Board Assembly

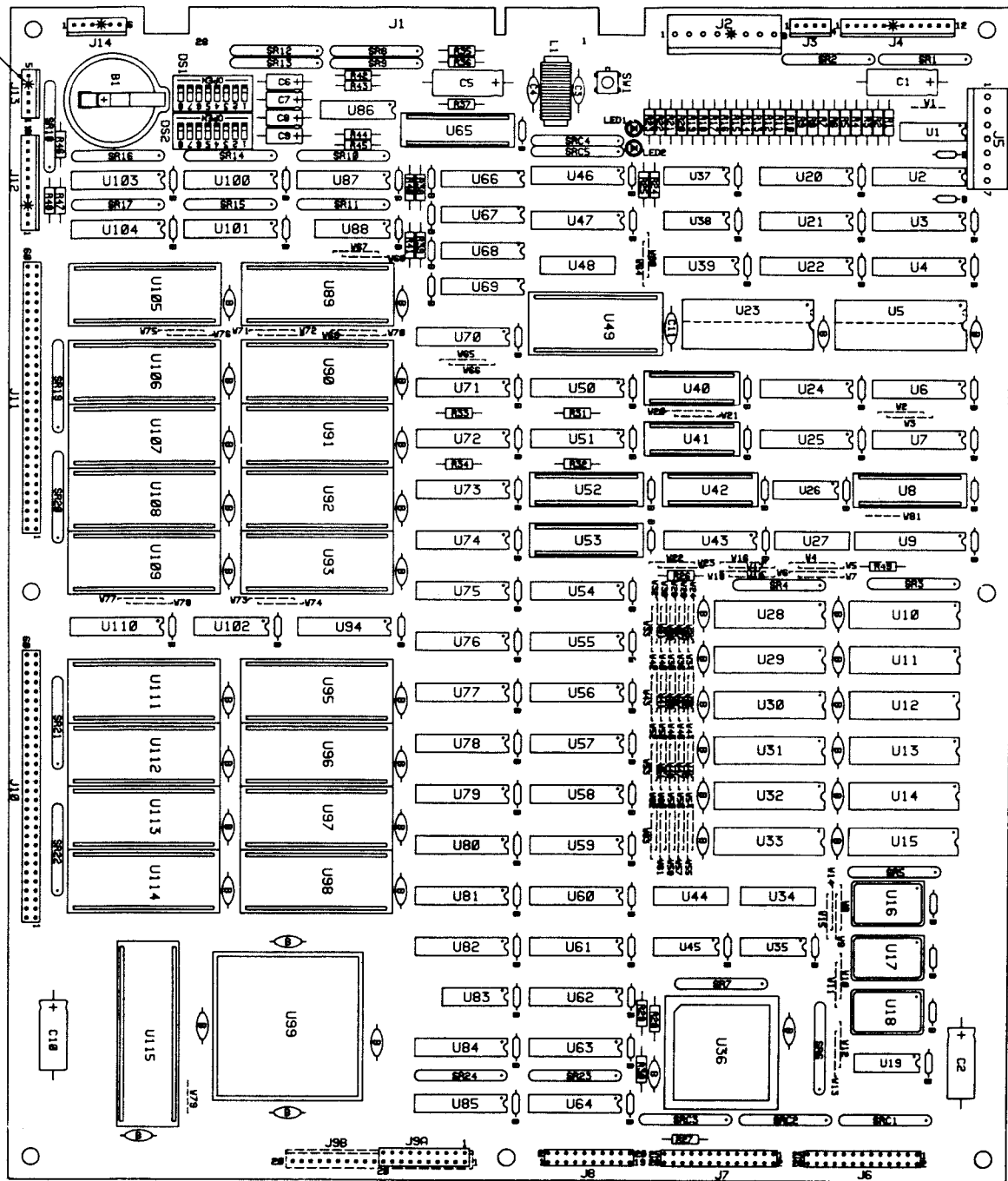


| Part No.         | Ckt Designator                                      | Description                       | Part No.      | Ckt Designator           | Description                              |
|------------------|---|-----------------------------------|---------------|--------------------------|--|
| 5766-12130-00    |   | Bare P. C. Board                  | 5010-10985-00 | R14, R15                 | Resistor, 20K, 1/4w, 5%                  |
| 5371-11087-00    | U1  | IC, D/A Conv, YM3012              | 5010-09034-00 | R22-R24, R17, R34        | Resistor, 10K, 1/4w, 5%                  |
| a) 5700-09006-00 |   | Socket, IC, 16-pin (U1)           | 5010-09324-00 | R6, R19, R20, R21        | Resistor, 27K, 1/4w, 5%                  |
| 5370-11086-00    | U3  | IC, Sound Processor, YM2151       | 5010-09162-00 | R39                      | Resistor, 100K, 1/4w, 5%                 |
| a) 5700-09004-00 |   | Socket, IC, 24-pin (U3)           | 5010-09331-00 | R16                      | Resistor, 13K, 1/4W, 5%                  |
| 5400-10320-00    | U8  | IC, $\mu$ Processor, MC68B09E     | 5010-08772-00 | R18                      | Resistor, 15K $\Omega$ , 1/4W, 5%        |
| a) 5700-08985-00 |   | Socket, IC, 40-pin (U8)           | 5010-08824-00 | R32                      | Resistor, 43K $\Omega$ , 1/4W, 5%        |
| A-5343-40003-19  | U4  | IC, Audio ROM 1                   | 5010-08846-00 | R31                      | Resistor, 220K $\Omega$ , 1/4W, 5%       |
| A-5343-40003-20  | U19   | IC, Audio ROM 2                   | 5010-08981-00 | R12                      | Resistor, 4.7K $\Omega$ , 1/4W, 5%       |
| A-5343-40003-21  | U20   | IC, Audio ROM 3                   | 5010-09219-00 | R38                      | Resistor, 8.2K, 1/4W, 5%                 |
| a) 5700-10176-00 |   | Socket, IC, 28-pin (U4, U19)      | 5010-10258-00 | R40                      | Resistor, 1M, 1/4w, 5%                   |
| 5371-09152-00    | U11   | IC, D/A Convtr, MC1408            | 5010-09179-00 | R10                      | Resistor, 3.3M, 1/4w, 5%                 |
| 5430-10322-00    | U12   | IC, PIA, MC68B21                  | 5010-09333-00 | R29                      | Resistor, 180K $\Omega$ , 1/4W, 5%       |
| 5340-10139-00    | U5  | IC, RAM/S 5516-2 2Kx8             | 5010-09342-00 | R30                      | Resistor, 36K $\Omega$ , 1/4W, 5%        |
| 5281-09487-00    | U16   | IC, Dual D Flipflop, 74LS74       | 5010-09534-00 | W9                       | Resistor, 0 $\Omega$ , 1/4w, 5%          |
| 5281-10043-00    | U13   | IC, 74LS175                       | 5040-09343-00 | C1, C3, C4, C8           | Capacitor, 10 $\mu$ fd, 20v, $\pm 20\%$  |
| 5281-09235-00    | U21   | IC, Triple NAND, 74LS10           | 5040-10974-00 | C12, C19, C24            | Capacitor, 100 $\mu$ fd, 35v             |
| 5370-09321-00    | U9, U10, U17, U18                                   | IC, Op Amp, MC1458                | 5040-09776-00 | C26, C30                 | Capacitor, 470 $\mu$ fd, 16v; +50, -10%  |
| 5281-09215-00    | U2  | IC, Hex Inv, 74LS04               | 5040-12006-00 | C29, C32                 | Capacitor, 1000 $\mu$ fd, 16v, 20%       |
| 5281-09246-00    | U14   | IC, 2-4 Dec, 74LS139              | 5041-09243-00 | C25, C28                 | Capacitor, 10 $\mu$ fd, 10v, $\pm 10\%$  |
| 5281-09745-00    | U15   | IC, Dual Mux, 74LS138             | 5043-08980-00 | C5, B (17)*              | Capacitor, 0.01 $\mu$ fd, 50v, +80, -20% |
| 5370-09156-00    | U22, U23  | IC, Audio Amp, TDA2002            | 5043-08996-00 | C31, C33                 | Capacitor, 0.1 $\mu$ fd, 50v, $\pm 20\%$ |
| a) 5705-09199-00 |   | Heatsink, #6030B                  | 5043-09065-00 | C13 - C15                | Capacitor, 470 pfd, 50v, $\pm 20\%$      |
| b) 4006-01003-06 |   | Mach. Screw, 6-32 x 3/8           | 5043-09492-00 | C2, C34                  | Capacitor, 100 pfd, 50v, $\pm 10\%$      |
| c) 4406-01117-00 |   | Nut, 6-32 Hex.                    | 5043-09844-00 | C6                       | Capacitor, 47 pfd, 50v, $\pm 20\%$       |
| d) 4703-00007-00 |   | Lockwasher, #6 Ext.               | 5043-09845-00 | C16, C18, C20 - C23, C27 | Capacitor, 1000 pfd, 50v, $\pm 20\%$     |
| 5160-10269-00    | Q1  | Transistor, 2N3904, NPN           | 5520-09020-00 | X1                       | Crystal, 3.58 MHz                        |
| 5060-10396-00    | SP1   | SIP 4.7K & 470pfd, 8R8C           | 5521-10931-00 | CR1                      | Oscillator, 8 MHz                        |
| 5010-09181-00    | R44, R48  | Resistor, 1.0 $\Omega$ , 1/2w, 5% | 5551-09822-00 | L1 - L3                  | Inductor, 4.7 $\mu$ H, 3A                |
| 5010-09161-00    | R35, R45  | Resistor, 2.2 $\Omega$ , 1/4w, 5% | 5791-09437-00 | J4                       | Connector, 20 pin, (Hdr), Rib. Cbl       |
| 5010-09361-00    | R43, R46, R47                                       | Resistor, 220 $\Omega$ , 1/2w, 5% | 5791-10862-04 | J1, J2, J5               | Connector, 4 pin (Hdr)                   |
| 5010-09358-00    | R41, R42  | Resistor, 1K, 1/4w, 5%            | 5791-10862-06 | J3                       | Connector, 6 pin (Hdr)                   |
| 5010-08998-00    | R2, R3,   | Resistor, 2.2K, 1/4w, 5%          | 16-8850-250   |                          | P.C.B. I.D. Label                        |
| 5010-08983-00    | R7-R9   | Resistor, 3.3K, 1/4w, 5%          | 20-9229       |                          | Thermal Compound                         |
| 5010-08981-00    | R1, R4, R5, R11, R25 - R28, R33, R36, R37, R49, R50 | Resistor, 4.7K, 1/4w, 5%          |               |                          |  |

## NOTES:

- \* 17 capacitors (shown on diagram with "B" symbol) provide +5VDC filtering for ICs.
- All capacitors are ceramic, 50v, axial, unless otherwise noted.
- All resistors are 5%, 1/4w, Carbon Film, unless otherwise noted.

INDICATES  
KEYING PIN

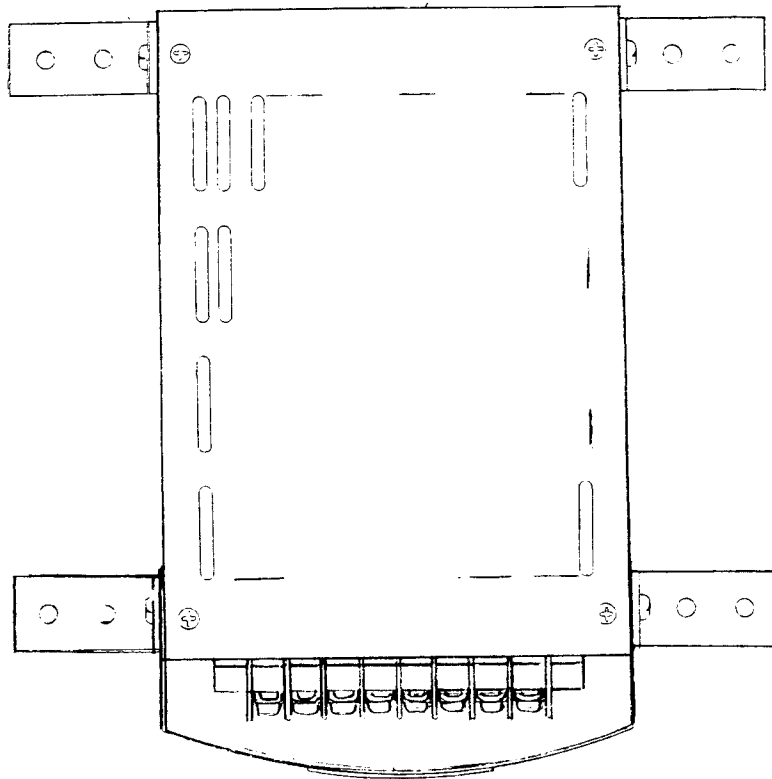


## C-13234-40003      Y-unit CPU Board Assembly

| Part No.       | Ckt.Designator               | Description        | Part No.        | Ckt.Designator  | Description               |
|----------------|------------------------------|--------------------|-----------------|-----------------|---------------------------|
| 5770-12555-00  |                              | Bare PC Brd.       | 5043-08980-00   | B               | Cap. .01 µfd 10V          |
| 5281-09737-00  | U1                           | IC, 74LS 86        | 5040-08986-00   | C1, C2, C5, C10 | Cap. 100µfd 10V           |
| 5317-12211-00  | U2, U20, U24, U43            |                    | 5043-09845-00   | C3, C4          | Cap. .001µfd 10V          |
|                | U61, U62, U70                | IC, 74ALS541       | 5041-09243-00   | C6-C9           | Cap. 10µfd 10V            |
| 5317-12212-00  | U3, U6, U7, U21, U25         | 74ALS574           | 5043-8996-00    | C11             | Cap. .1µfd                |
|                | U50, U58, U63, U64           |                    | 5019-12611-00   | SR1, SR2, SR8   | SIP, 470Ω 5 Res.          |
|                | U71, U72, U74, U79, U84, U85 |                    |                 | SR9, SR12, SR13 |                           |
| 5317-12208-00  | U4, U22, U54-U57             | 74ALS245           |                 | SR18            |                           |
|                | U59, U60, U75-U78            |                    | 5019-09362-00   | SR3, SR4, SR6   | SIP, 4.7KΩ                |
|                | U80, U81, U94, U110          |                    |                 | SR7, SR11, SR15 |                           |
| 5340-12242-00  | U5, U23                      | IC, 8K x 8 S RAM   |                 | SR17, SR19-SR24 |                           |
| 5700-12047-00  | U8, U52, U53, U65            | 24 pin Socket      |                 | SRC1-SRC3       |                           |
| 5340-12213-00  | U10, U11, U28-U33            | IC, 4461 VRAM      | 5019-10143-00   | SR5             | SIP, 470Ω 9 Res.          |
| 5521-12604-00  | U16                          | 40 MHZ Xtal        | 5060-10396-00   | SRC4, SRC5      | SIP. 4.7KΩ 470pf          |
| 5521-10318-00  | U17                          | 24 MHZ Xtal        |                 | SRC10, SRC14    |                           |
| 5283-10468-00  | U19, U45                     | IC, 74F74          |                 | SRC16           |                           |
| 5019-10849-00  | U27, U34, U44, U48           | 100Ω DIP Res.      | 5671-09019-00   | LED1, LED 2     | LED, Red                  |
| 5317-12305-00  | U35                          | IC, 74ALS00        | 5551-09822-00   | L1              | Inductor, 4.7UH           |
| 5700-12253-00  | U36                          | 68 pin Socket      | 5645-09025-00   | DS1, DS2        | DIP. Sw. 16 pin           |
| 5280-09309-00  | U37                          | IC, 7407           | 5641-12551-00   | SW1             | Pushbutton Sw.            |
| 5281-09487-00  | U38                          | IC, 74LS74         | 5881-12315-00   | B1              | Battery Holder            |
| 5434-12255-00  | U39                          | IC, MAX691         | 5791-10862-08   | J2              | 8 pin Connector           |
| 5700-09915-00  | U40-U42                      | 20 pin Socket      | 5791-12461-12   | J4              | 12 pin Connector          |
| 5311-12287-00  | U47, U46, U87, U100          | IC, 74HC541        | 5791-10850-00   | J6, J7          | 26 pin Ribbon Connector   |
|                | U101, U103, U104             |                    |                 |                 |                           |
| 5700-10176-00  | U49                          | 28 pin Socket      | 5791-09437-00   | J8              | 20 pin Ribbon Connector   |
| 5311-12285-00  | U51, U73, U82                | IC, 74HC573        |                 |                 |                           |
| 5340-12014-00  | U66-U69                      | IC, 4464 DRAM      | 5791-124-10     | J12             | 10 pin Connector          |
| 5283-10552-00  | U83                          | IC, 74F04          | C-13235-2       |                 | CPU Sub-assembly          |
| 5370-12602-00  | U86                          | IC, ULN2064B       | A-5346-40003-1  | U8              | IC, PLD Color RAM Control |
| 5317-12023-00  | U88                          | IC, 74ALS138       | 5400-12220-00   | U36             | IC, TMS 30410             |
| 5700-12088-00  | U89-U93, U95-U98             | 32 pin Socket      | A-5346-40003-2  | U40             | IC, PLD Address Decoder   |
|                | U105-U109, U111-U114         |                    | A-5346-40003-3  | U41             | IC, PLD Video RAM Control |
| 5700-12254-00  | U99                          | 144 pin Socket     | A-5346-40003-4  | U42             | IC, 8K x 8 Static RAM     |
| 5700-08985-00  | U115                         | 40 pin Socket      | A-5346-40003-5  | U52             | IC, PLD Video RAM Sequen. |
| 5010--08991-00 | R1,R24, R27                  | Res. 4.7KΩ 5% 1/4W | A-5346-40003-6  | U53             | IC, PLD Image ROM Control |
| 5010-10204-00  | R2, R7, R12                  | Res. 1KΩ 2% 1/4W   | A-5346-40003-7  | U65             | IC, PLD Misc. Control     |
| 5010-10205-00  | R3, R8, R13                  | Res. 2KΩ 2% 1/4W   | A-5343-40003-1  | U89             | IC, Game EPROM            |
| 5010-10000-00  | R4, R9, R14                  | Res. 3.9KΩ 5% 1/4W | A-5343-40003-2  | U90             | IC, Game EPROM            |
| 5010-09219-00  | R5, R10, R15                 | Res. 8.2KΩ 5% 1/4W | A-5343-40003-3  | U91             | IC, Game EPROM            |
| 5010-08772-00  | R6, R11, R16                 | Res. 15KΩ 5% 1/4W  | A-5343-40003-4  | U92             | IC, Game EPROM            |
| 5010-09001-00  | R23, R25                     | Res. 330Ω 5% 1/4W  | A-5343-40003-5  | U93             | IC, Game EPROM            |
| 5010-09036-00  | R26, R29-R34                 | Res. 100Ω 5% 1/4W  | A-5343-40003-6  | U95             | IC, Game EPROM            |
| 5010-09416-00  | R35-R37, R46-R48             | Res. 470Ω 5% 1/4W  | A-5343-40003-7  | U96             | IC, Game EPROM            |
| 5010-08997-00  | R38-R45                      | Res. 2.7Ω 5% 1/4W  | A-5343-40003-8  | U97             | IC, Game EPROM            |
| 5010-09534-00  | W2, W8, W11, W12             | Res. 0Ω            | A-5343-40003-9  | U98             | IC, Game EPROM            |
|                | W14, W20, W22, W24           |                    | 5410-12239-00   | U99             | IC, Custom ASIC           |
|                | W27, W28, W31, W32,          |                    | A-5343-40003-10 | U105            | IC, Game EPROM            |
|                | W35, W39, W41, W43           |                    | A-5343-40003-11 | U106            | IC, Game EPROM            |
|                | W44, W46, W48, W50,          |                    | A-5343-40003-12 | U107            | IC, Game EPROM            |
|                | W52, W54, W56, W58           |                    | A-5343-40003-13 | U108            | IC, Game EPROM            |
|                | W60, W62, W66, W68,          |                    | A-5343-40003-14 | U109            | IC, Game EPROM            |
|                | W69, W72, W74, W76           |                    | A-5343-40003-15 | U111            | IC, Game EPROM            |
|                | W78, W80                     |                    | A-5343-40003-16 | U112            | IC, Game EPROM            |
|                |                              |                    | A-5343-40003-17 | U113            | IC, Game EPROM            |
|                |                              |                    | A-5343-40003-18 | U114            | IC, Game EPROM            |
|                |                              |                    | A-5343-40003-8  | U115            | IC, Game EPROM            |
|                |                              |                    | 5880-11056-00   | B1              | Battery, Lithum 3V        |
|                |                              |                    | 03-8338-1       |                 | 1/4 Inch Spacer           |

## C-13253-1 Power Supply

| Part Number | Description           |
|-------------|-----------------------|
| 20-9633     | Switcher Power Supply |
| 01-9254     | Shield                |



# TROG

## S E C T I O N three

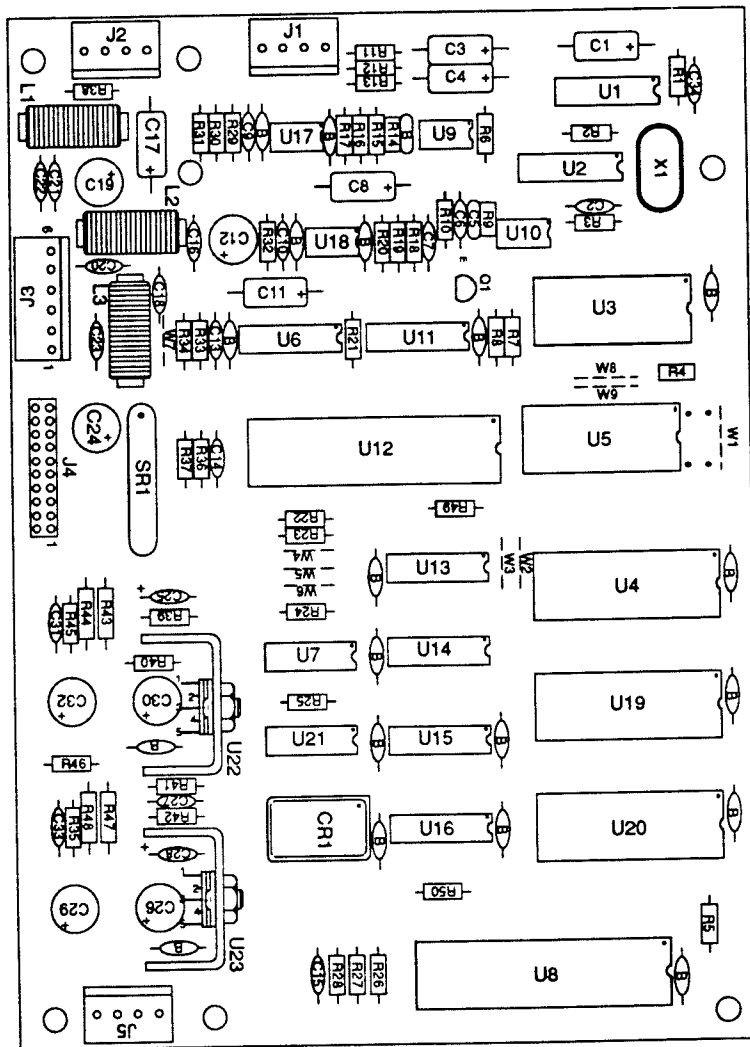
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### Diagrams & Schematics

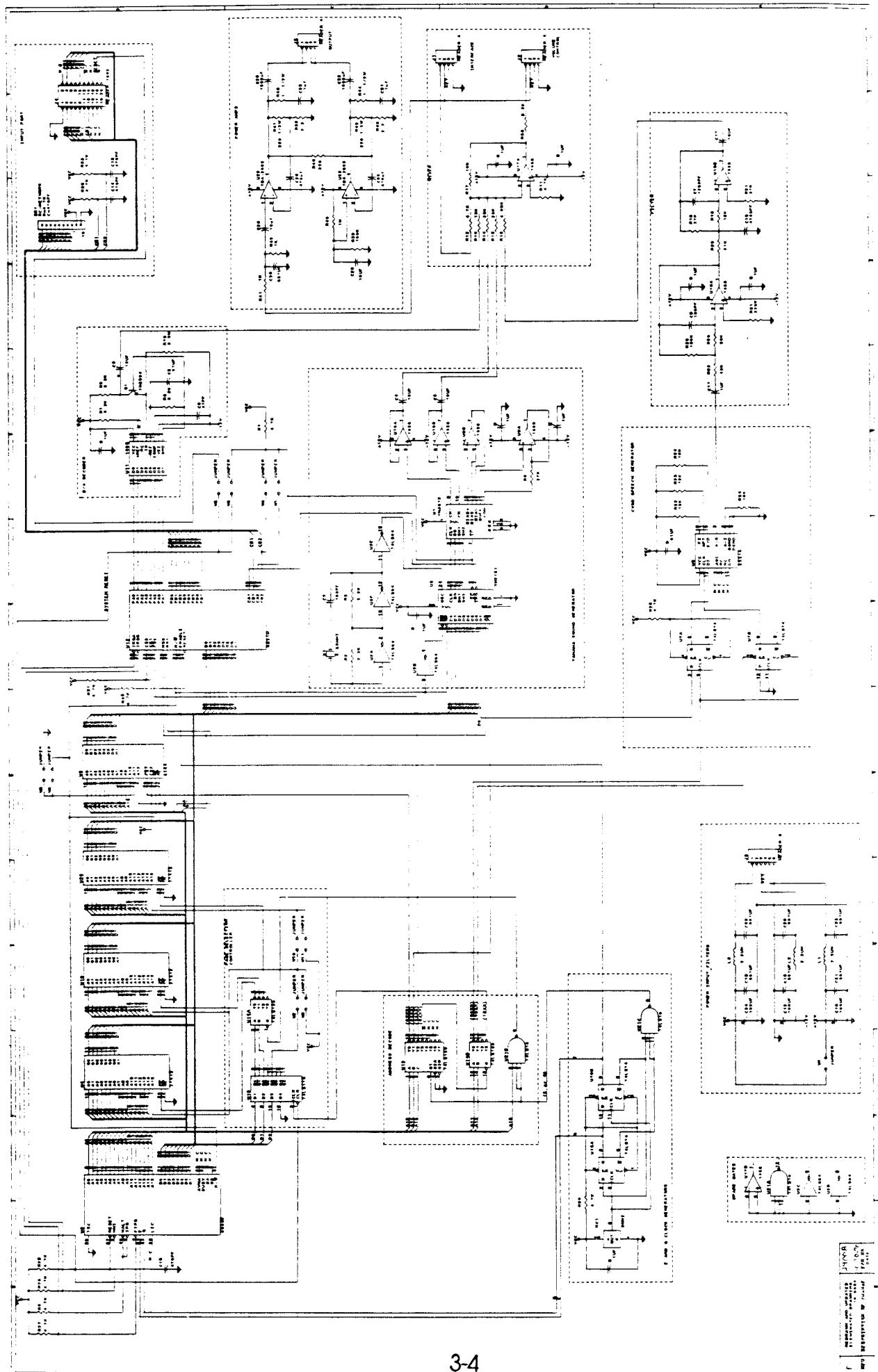
# **TROG JAMMA Chart**

| FUNCTION     | WIRE COLOR | PIN | PIN | WIRE COLOR | FUNCTION       |
|--------------|------------|-----|-----|------------|----------------|
| Ground       | Blk        | 1   | A   | Blk        | Ground         |
| Ground       | Grn-Brn    | 2   | B   | Blk        | Ground         |
| +5 Volts DC  | Gry        | 3   | C   | Gry        | +5 Volts DC    |
| +5 Volts DC  | Gry        | 4   | D   | Gry        | +5 Volts DC    |
| -5 Volts DC  | Gry-Grn    | 5   | E   | Gry-Grn    | -5 Volts DC    |
| +12 Volts DC | Gry-Yel    | 6   | F   | Gry-Yel    | +12 Volts DC   |
|              | Key        | 7   | H   | Key        |                |
| Counter 1    | Wht-Orn    | 8   | J   | Wht-Grn    | Counter 2      |
|              | NC         | 9   | K   | NC         |                |
| Speaker (+)  | Red-Vio    | 10  | L   | Grn-Vio    | Speaker (-)    |
|              | NC         | 11  | M   | NC         |                |
| Video Red    | Red        | 12  | N   | Grn        | Video Grn      |
| Video Blue   | Brn        | 13  | P   | Wht        | Video Sync     |
| Video Grd    | Shield     | 14  | R   | Wht-Red    | Service Credit |
| Test         | Grn        | 15  | S   | Wht-Vio    | Slam Tilt      |
| 1 Coin       | Wht-Blu    | 16  | T   | Yel-Wht    | 2 Coin         |
| 1 Start      | Yel-Grn    | 17  | U   | Yel-Blu    | 2 Start        |
| 1 Up         | Org-Blk    | 18  | V   | Yel-Blk    | 2 Up           |
| 1 Down       | Org-Brn    | 19  | W   | Yel-Brn    | 2 Down         |
| 1 Left       | Org-Red    | 20  | X   | Yel-Red    | 2 Left         |
| 1 Right      | Org        | 21  | Y   | Yel-Org    | 2 Right        |
| 1 Punch      | Org-Yel    | 22  | Z   | Yel-Vio    | 2Punch         |
| NC           | Org-Grn    | 23  | a   | Yel-Gry    | NC             |
| NC           | Org-Blu    | 24  | b   | Vio-Blk    | NC             |
| NC           | Org-Vio    | 25  | c   | Vio-Brn    | NC             |
| NC           | Org-Gry    | 26  | d   | Vio-Red    | NC             |
| Ground       | NC         | 27  | e   | NC         | Ground         |
| Ground       | Blk        | 28  | f   | Blk        | Ground         |

## D-11581-40003 Audio Board Assembly

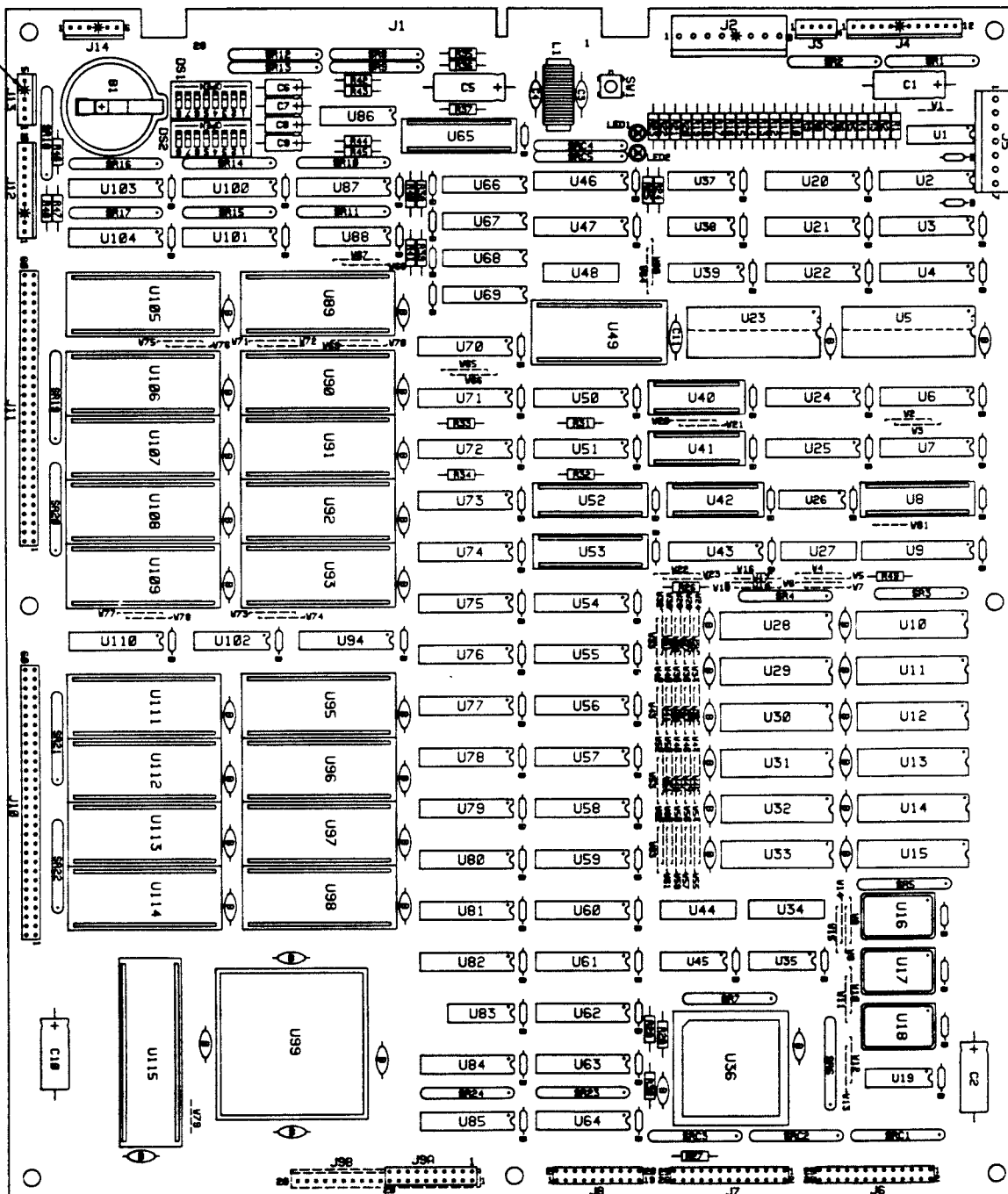


# AUDIO BOARD SCHEMATIC

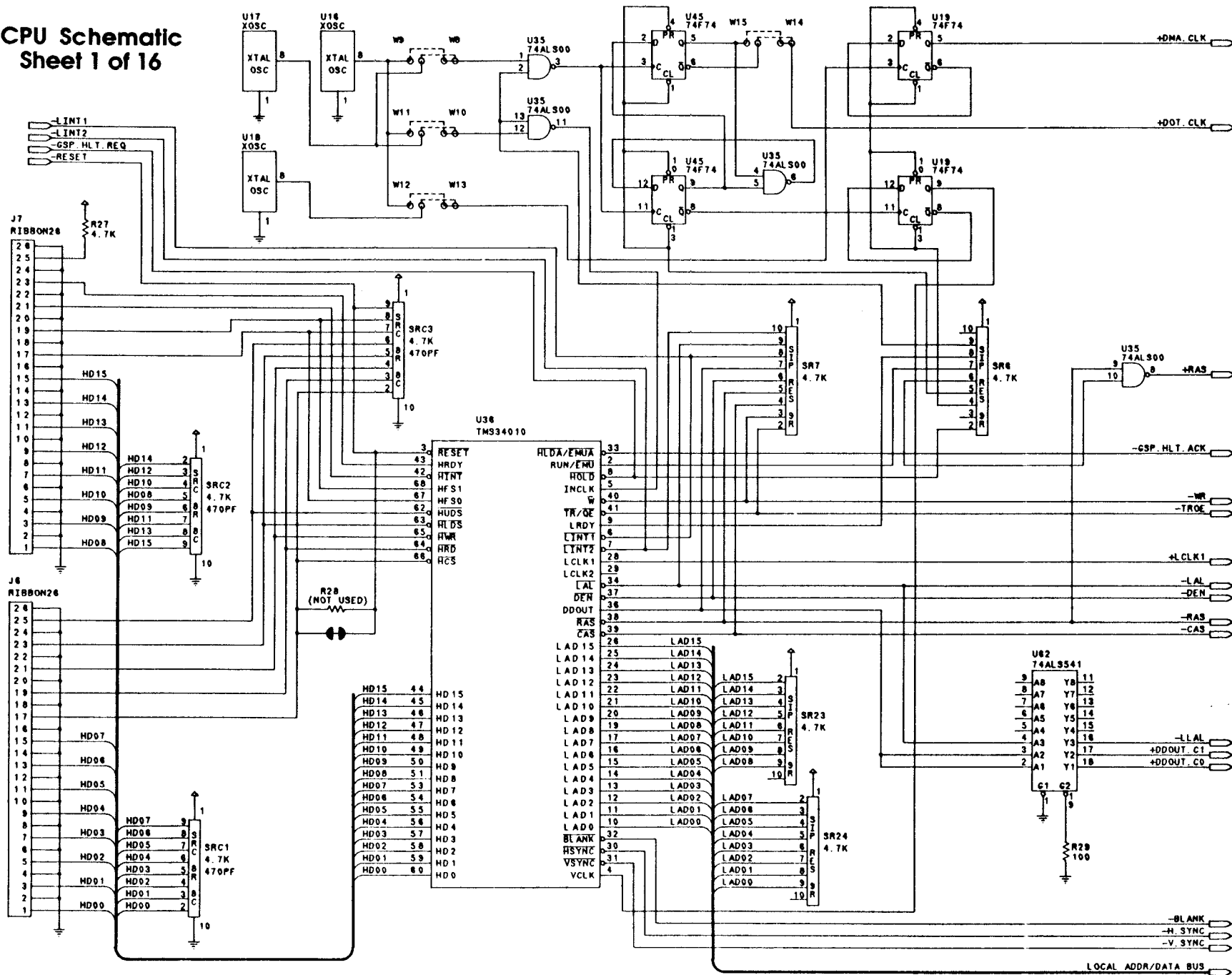




INDICATES  
KEYING PIN

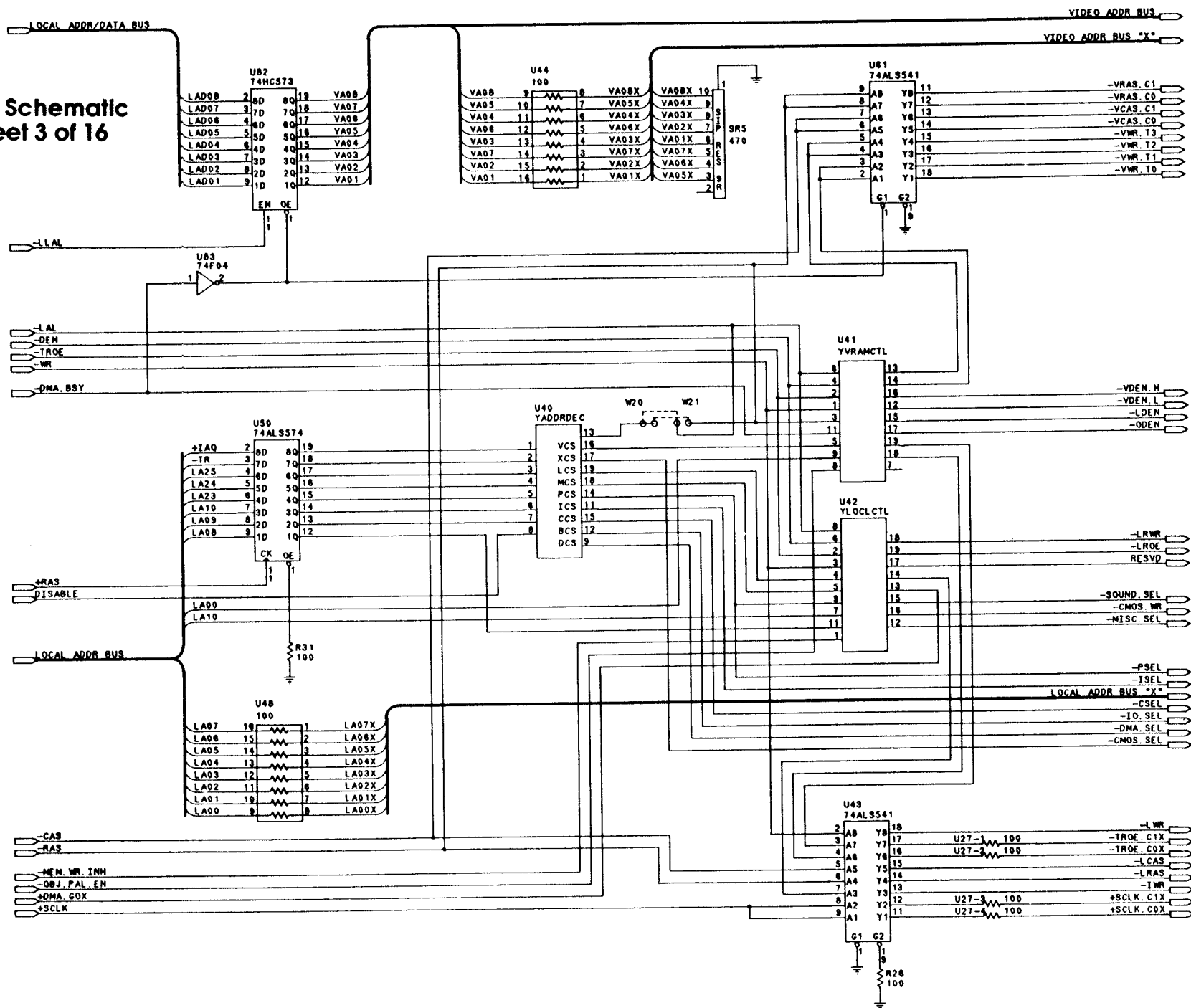


# CPU Schematic Sheet 1 of 16



[illegible]

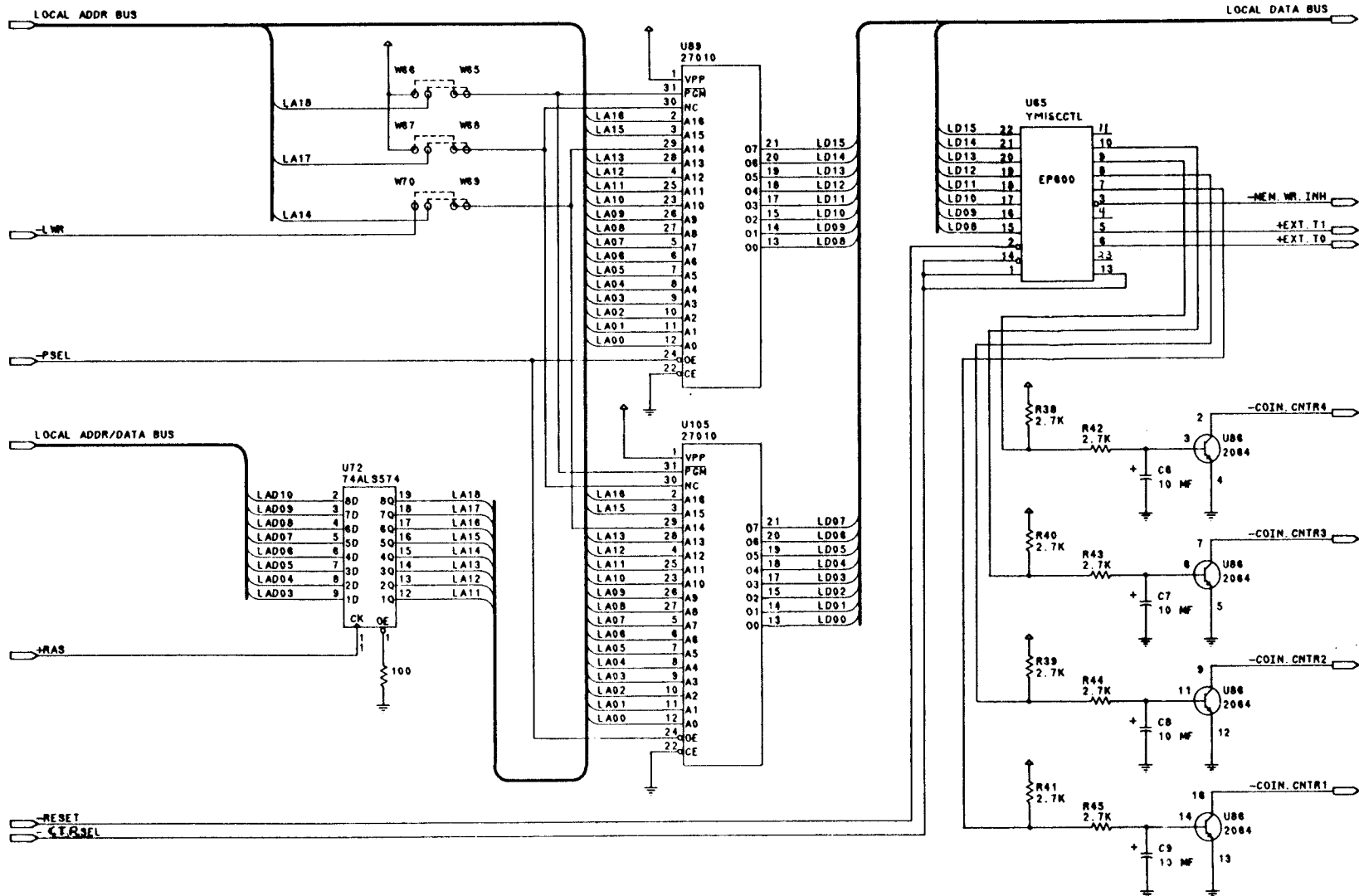
# CPU Schematic Sheet 3 of 16





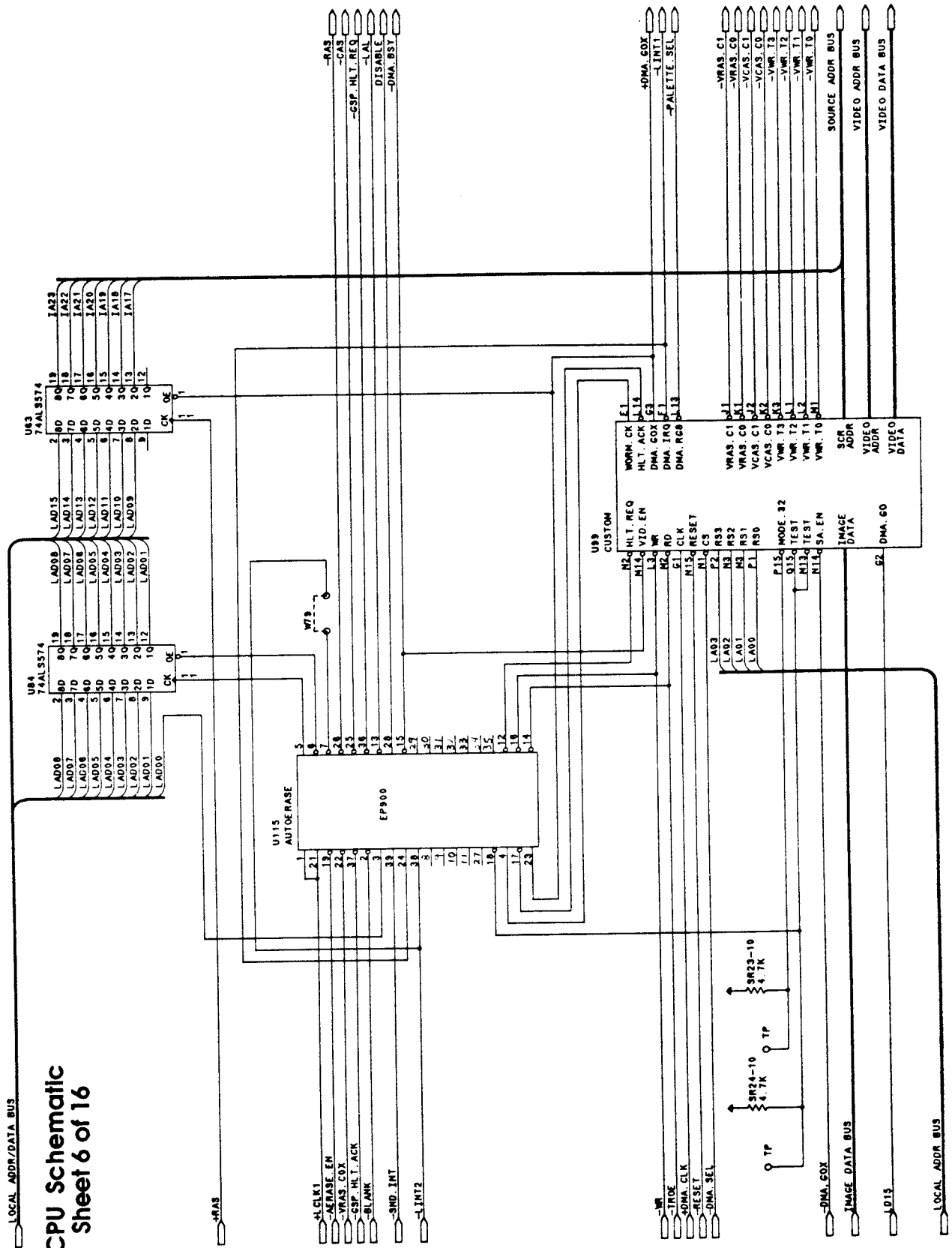
# CPU Schematic Sheet 5 of 16

PROGRAM MEMORY

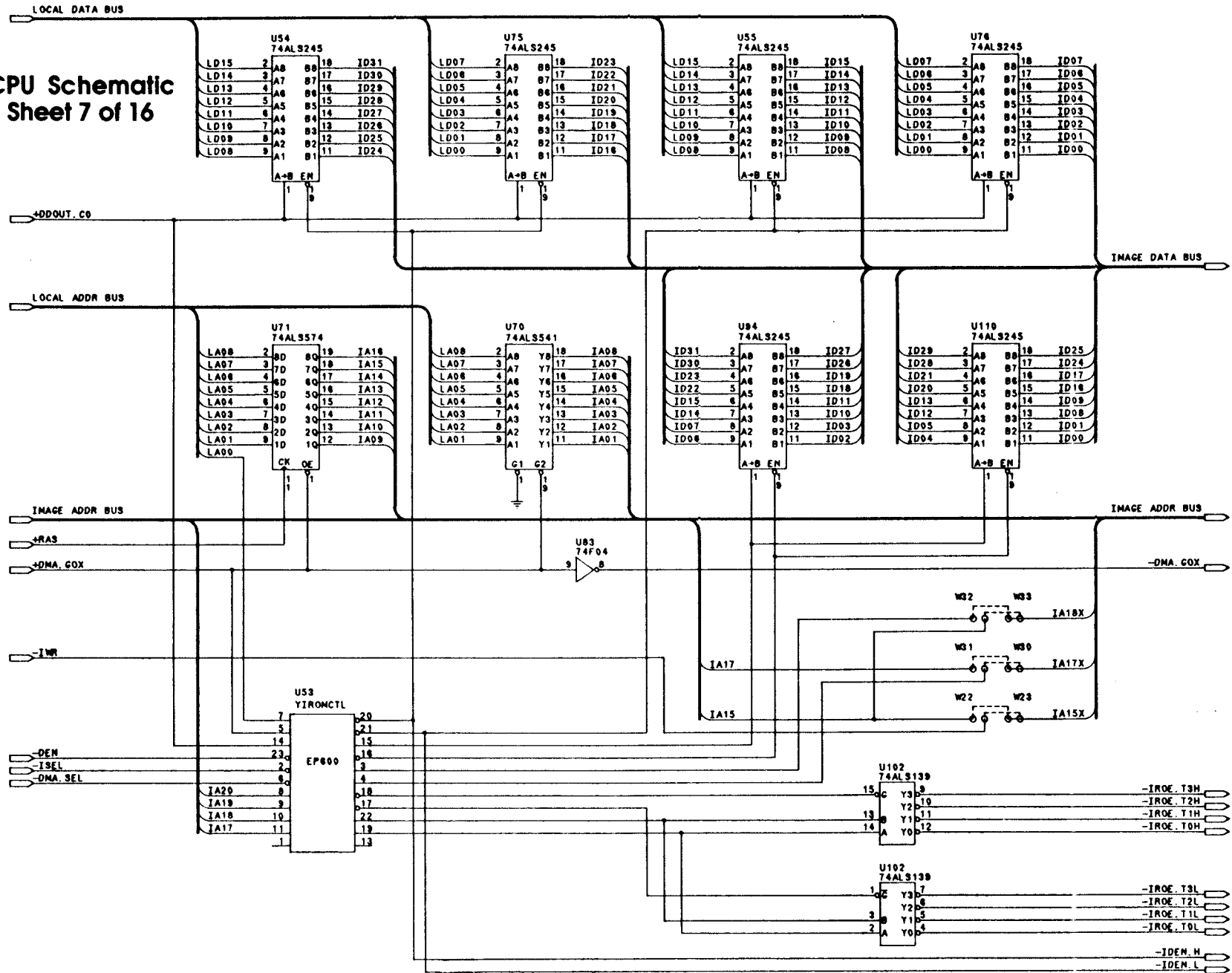


LOCAL ADDR/DATA BUS

# CPU Schematic Sheet 6 of 16



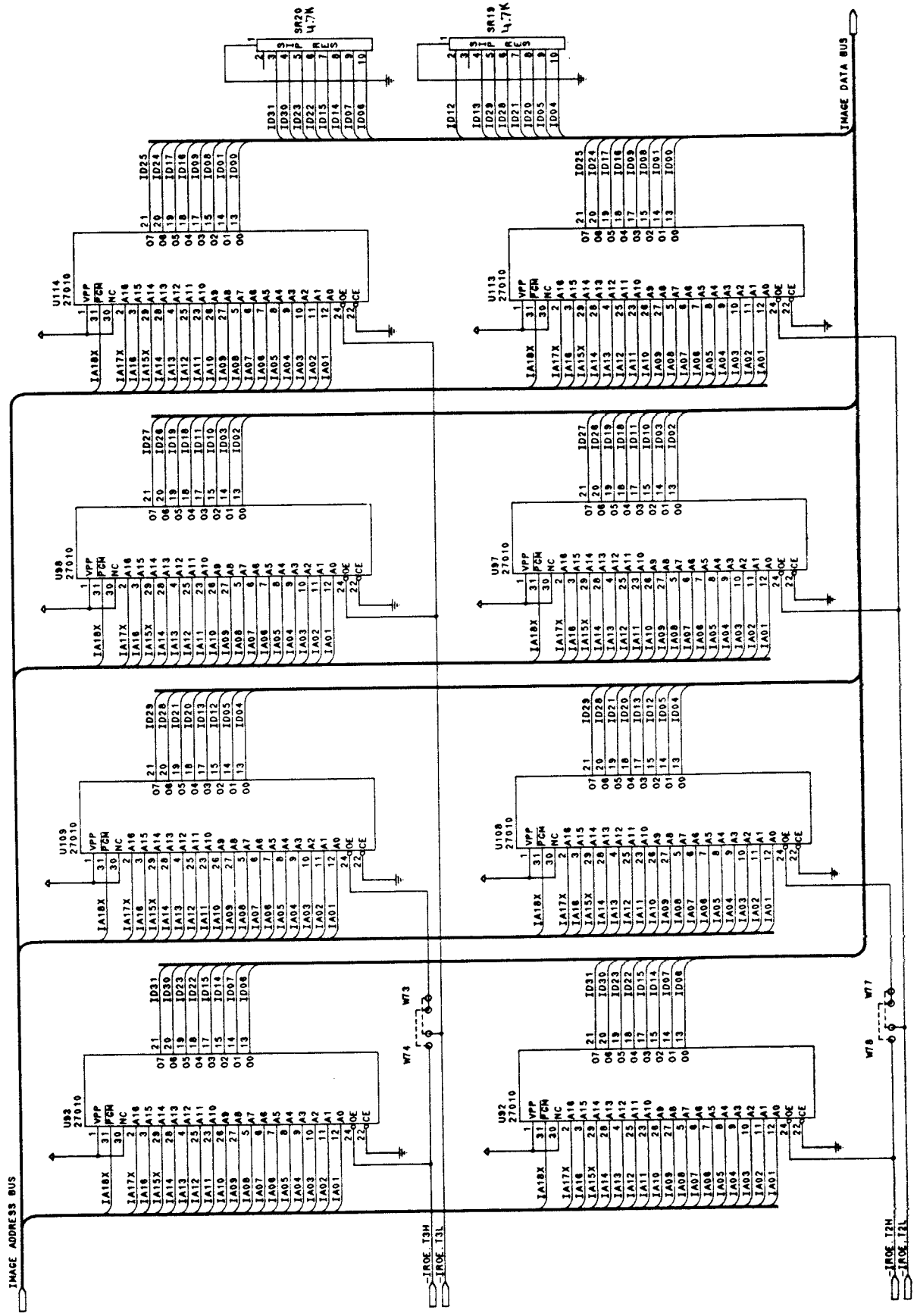
# CPU Schematic Sheet 7 of 16





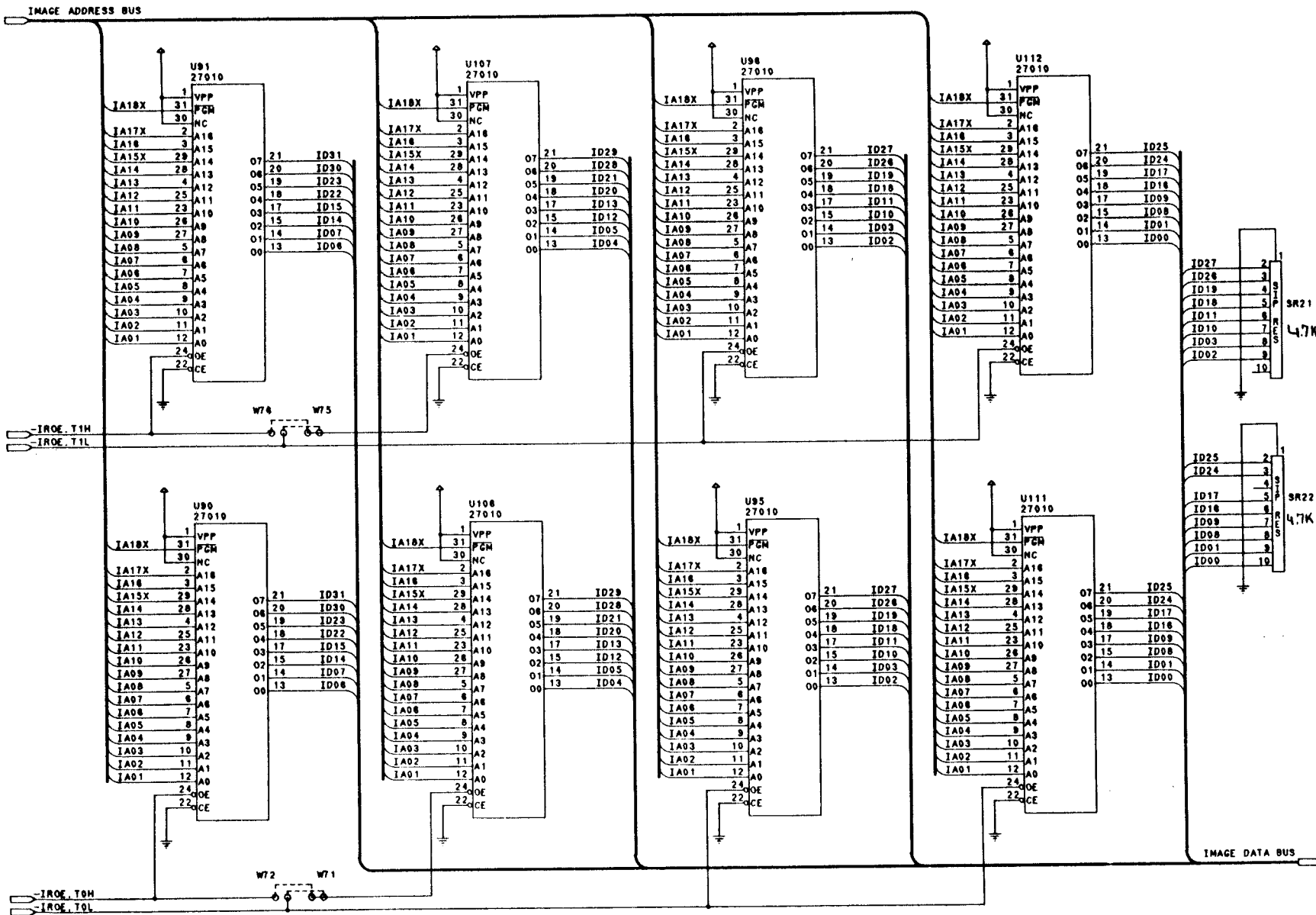
# CPU Schematic Sheet 8 of 16

IMAGE MEMORY



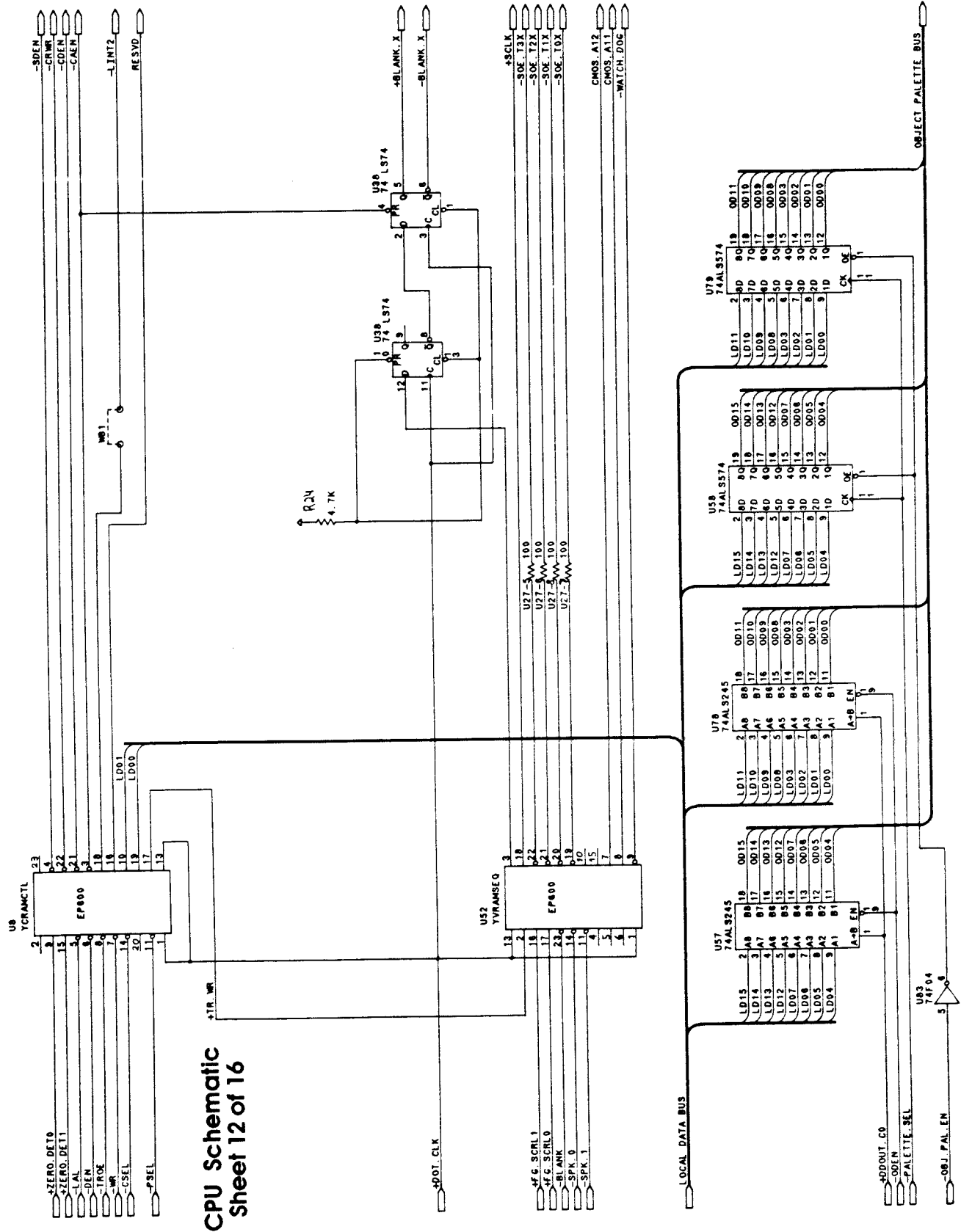
# CPU Schematic Sheet 9 of 16

IMAGE MEMORY



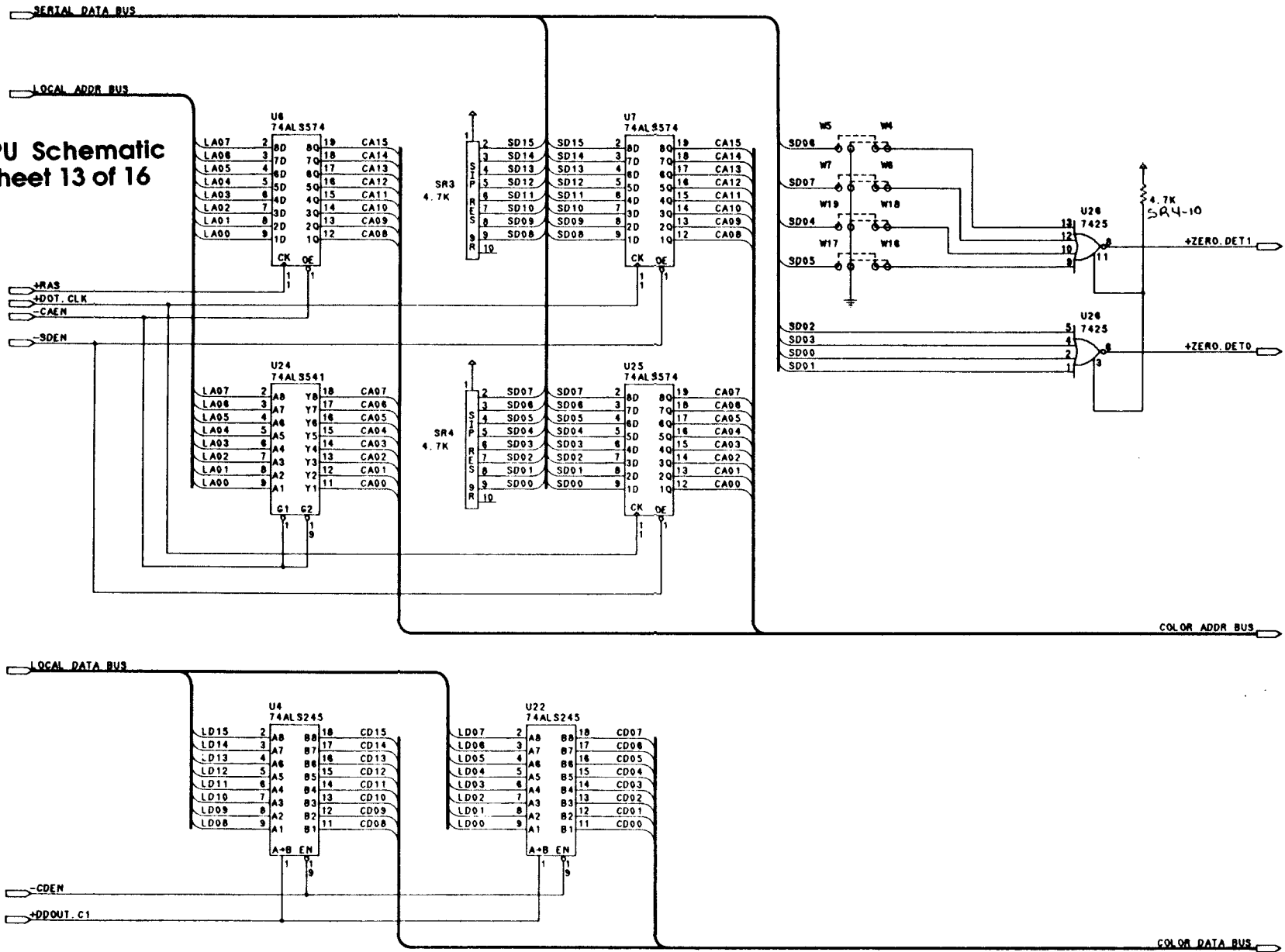
The diagram illustrates the timing and signal connections for a Video Address Bus (2") system. It features several control signals at the bottom: SCLK, C1X, VCAS, VRAS, and various data buses (Serial, RGB, Video). The system includes multiple chips, each with its own address, data, and control signal lines. The chips are labeled U12, U13, U14, U22, U23, U30, U31, U32, and U33. Each chip has a set of address lines (A0-A7), data lines (D0-D7), and control lines (R/W, CS, OE, SCL). The diagram shows the timing relationships between these signals, with specific timing points marked for each chip's operation.

[illegible]

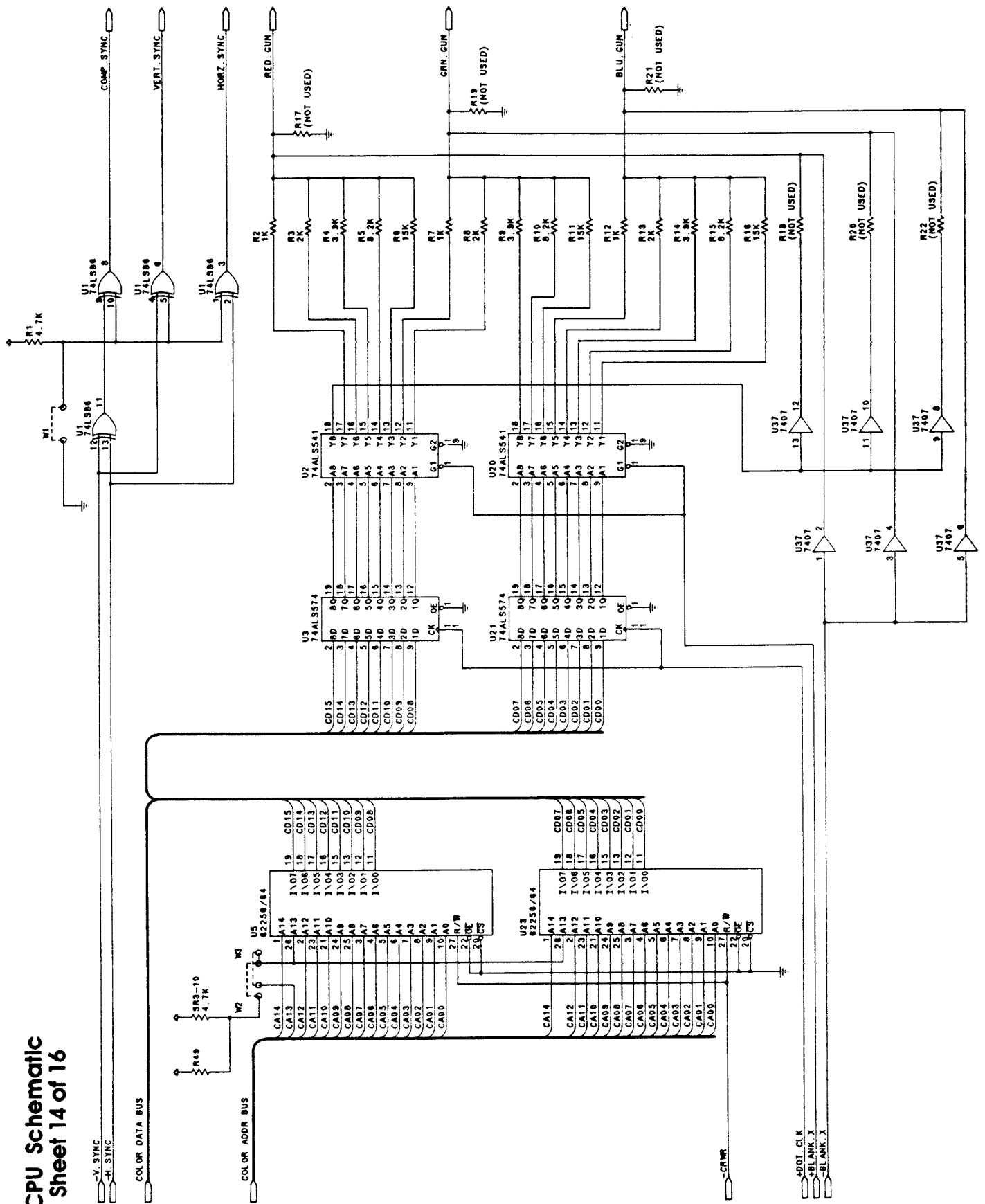


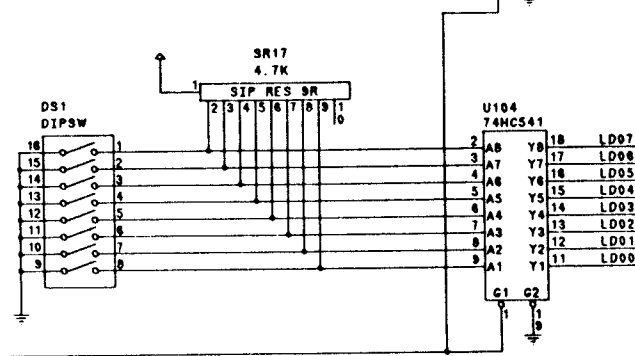
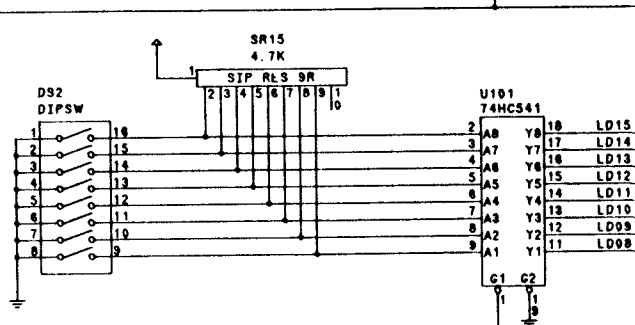
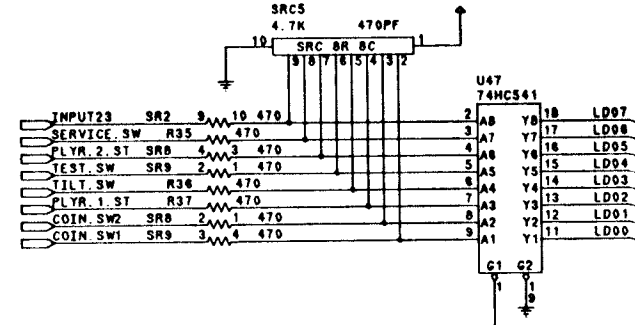
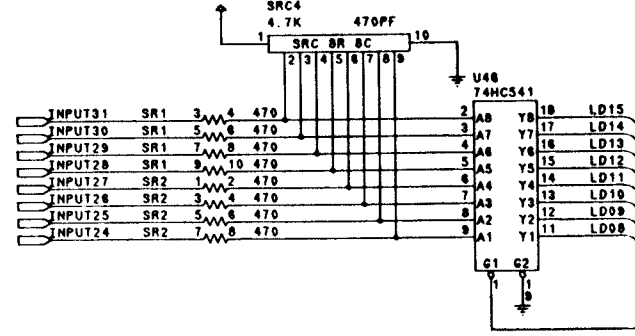
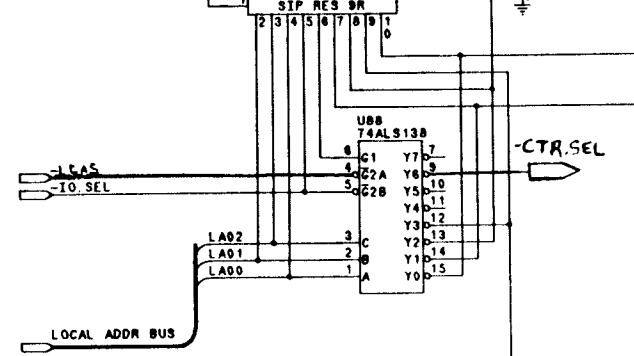
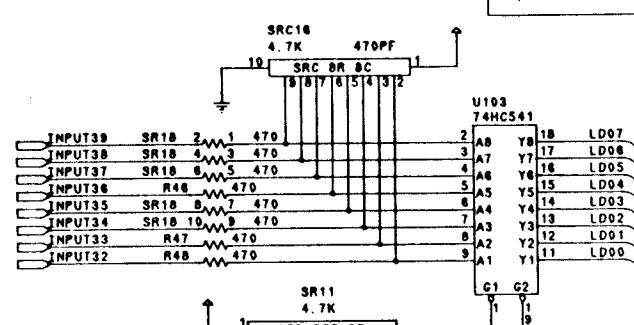
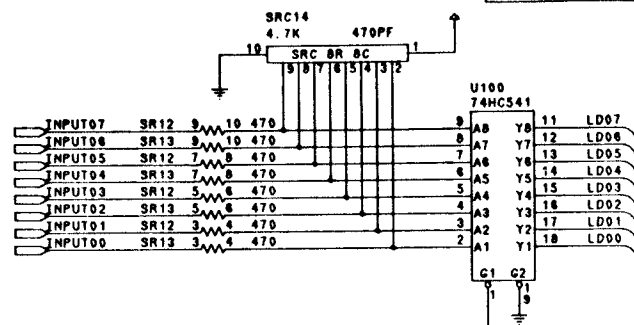
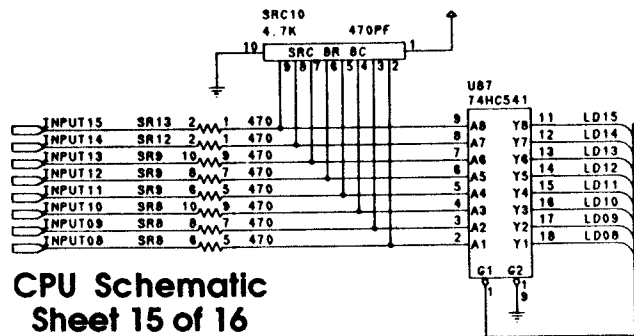
CPU Schematic  
Sheet 12 of 16

# CPU Schematic Sheet 13 of 16



# CPU Schematic Sheet 14 of 16





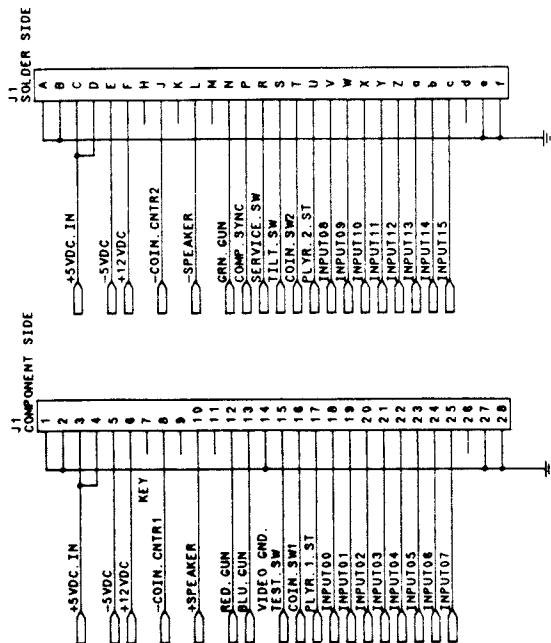
LOCAL DATA BUS

3-20

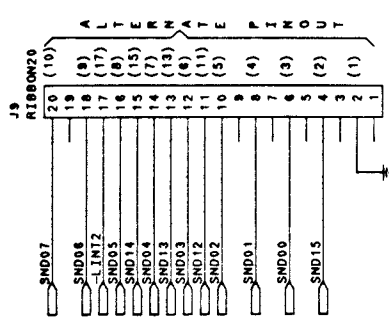


# CPU Schematic Sheet 16 of 16

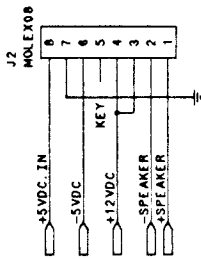
## JAMMA INTERFACE



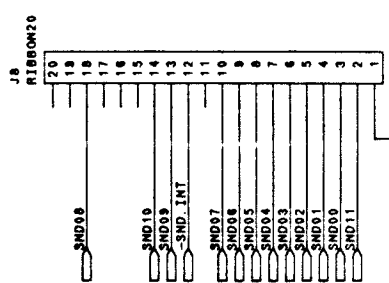
## INTERUPT INTERFACE



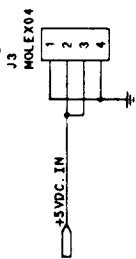
## SOUND POWER/SPEAKER



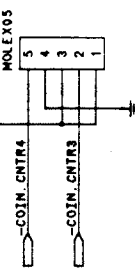
## SOUND BOARD INTERFACE



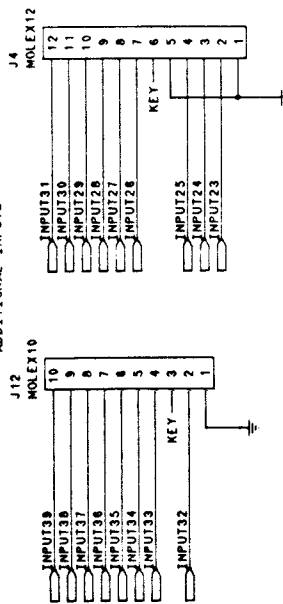
## AUX. POWER OUTPUT



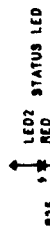
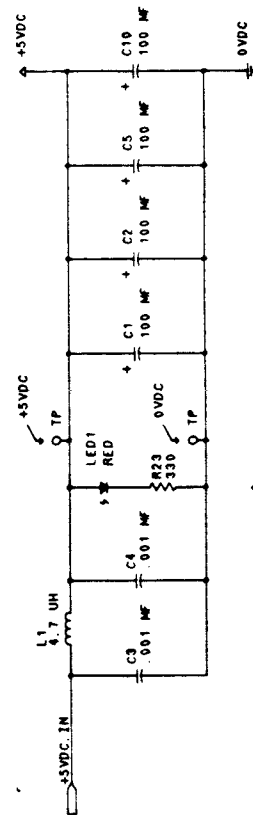
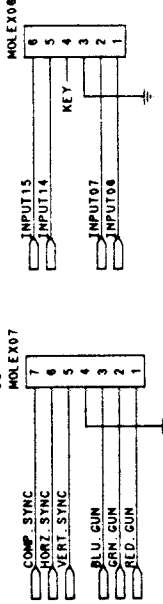
## J13 MOLEX05



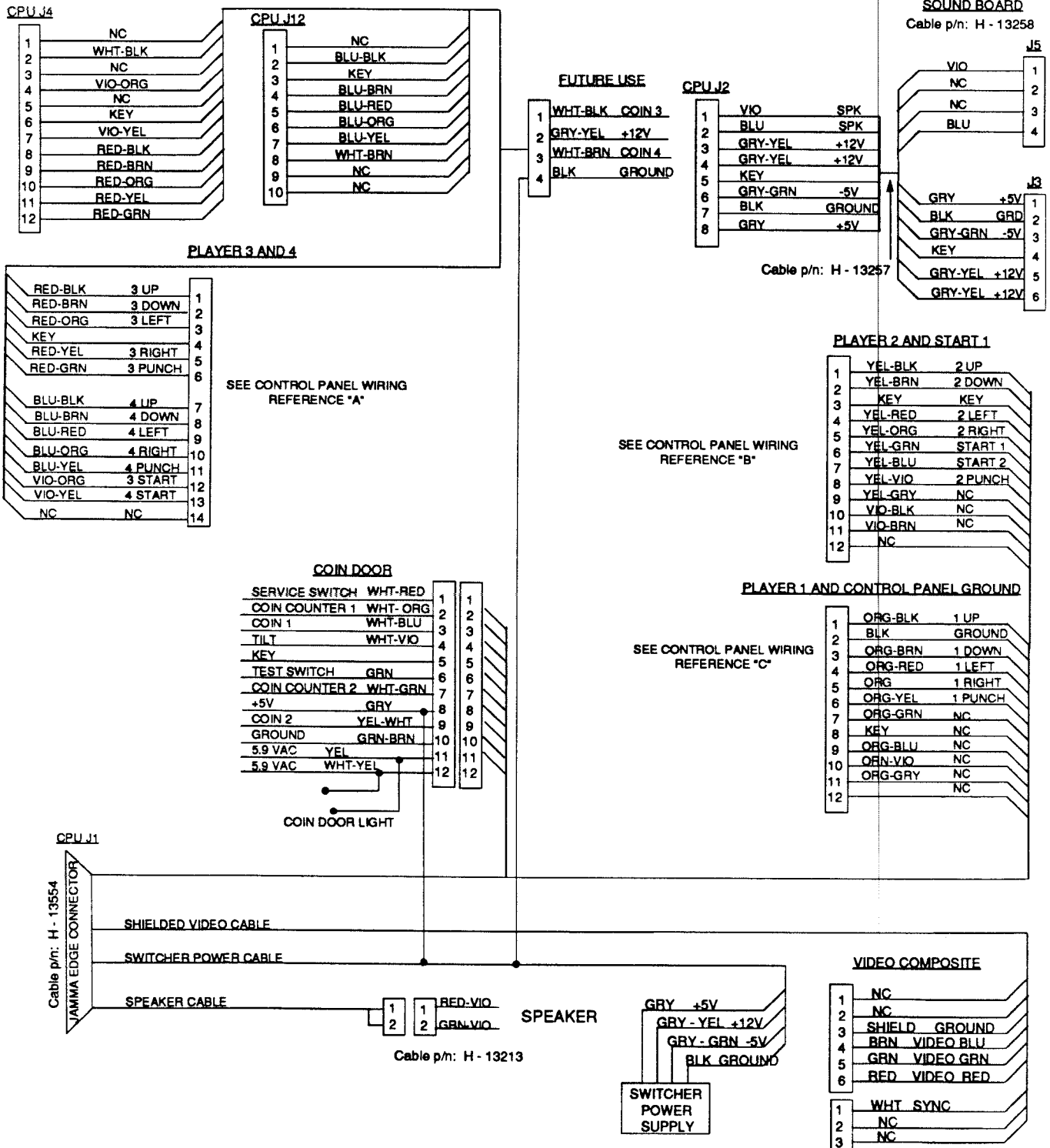
## ADDITIONAL INPUTS



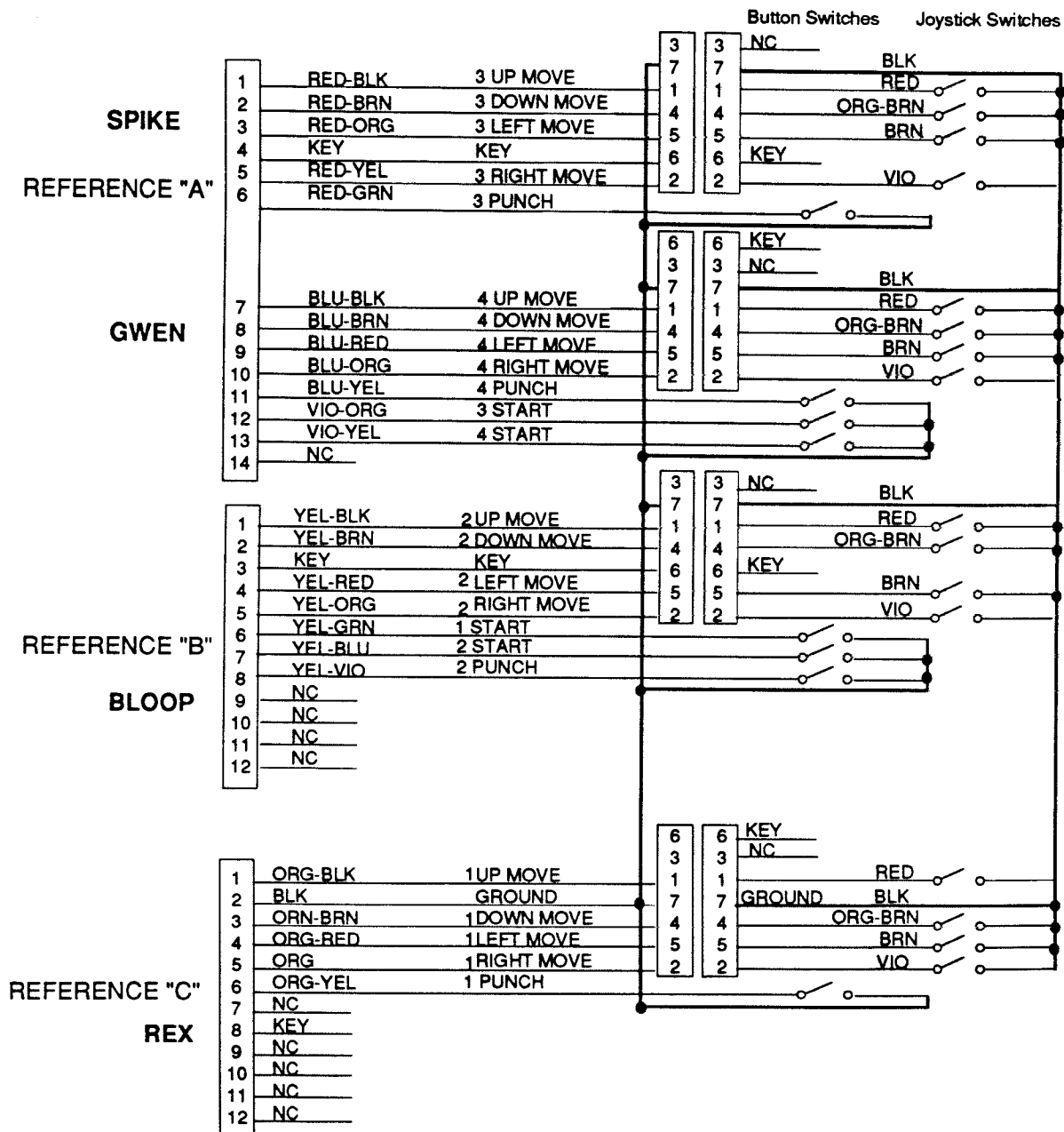
## J15 MOLEX07



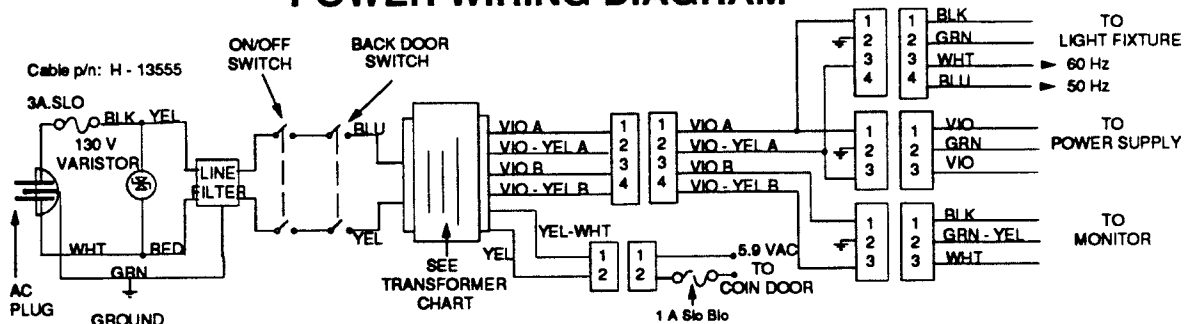
# TROG CABINET WIRING



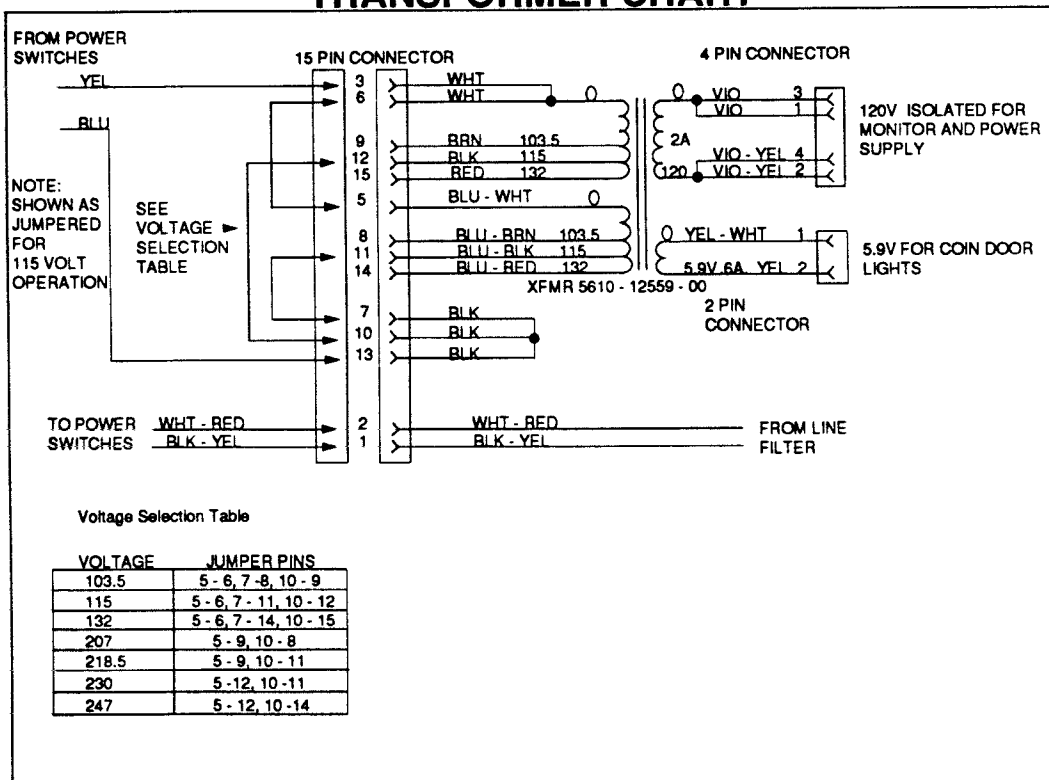
# TROG CONTROL PANEL WIRING



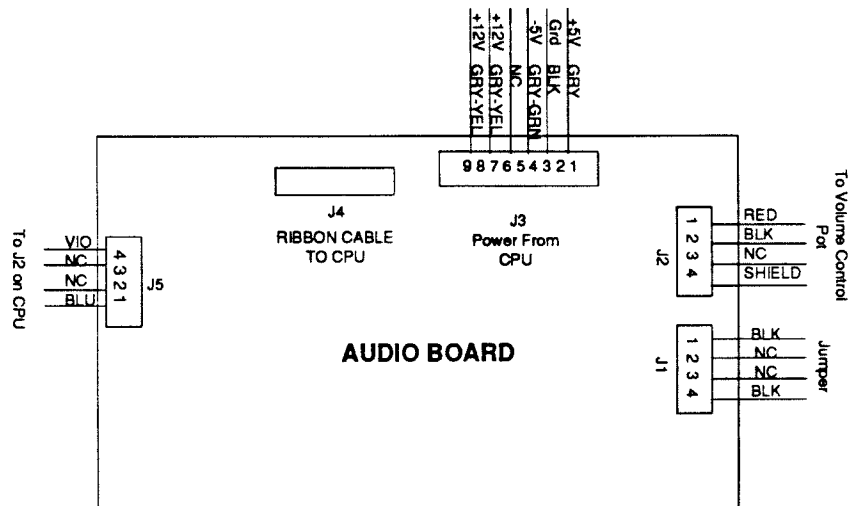
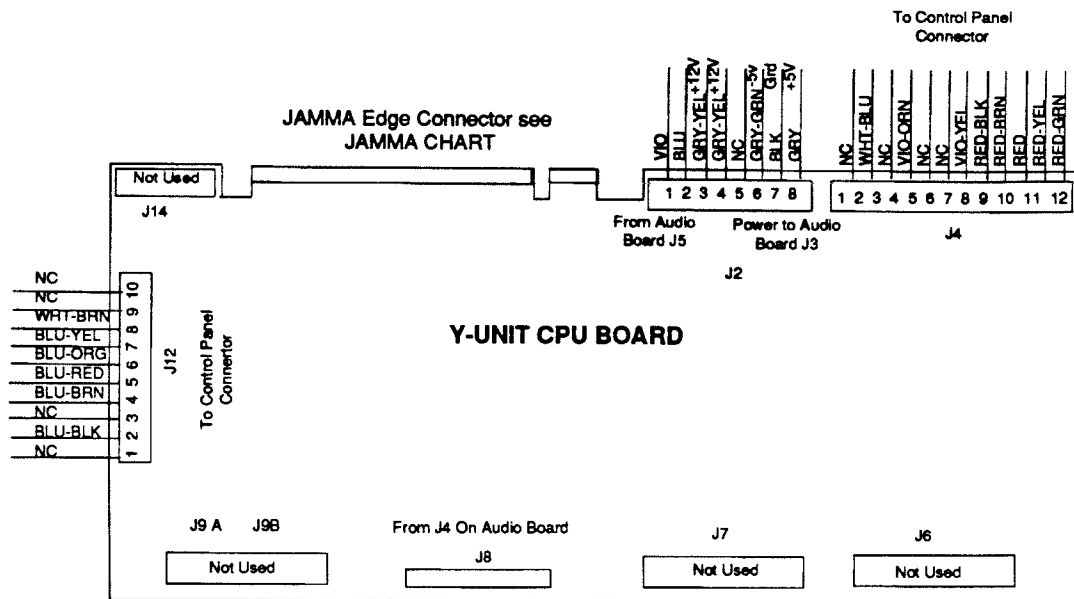
## POWER WIRING DIAGRAM



## TRANSFORMER CHART



# TROG INTERBOARD WIRING



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## Control Panel Wire Colors

### Rex

|              |               |
|--------------|---------------|
| Up           | Orange-Black  |
| Down         | Orange-Brown  |
| Left         | Orange-Red    |
| Right        | Orange        |
| Start Button | Yellow-Green  |
| Punch Button | Orange-Yellow |
| Ground       | Black         |

### Bloop

|              |               |
|--------------|---------------|
| Up           | Yellow-Black  |
| Down         | Yellow-Brown  |
| Left         | Yellow-Red    |
| Right        | Yellow-Orange |
| Start Button | Yellow-Blue   |
| Punch Button | Yellow-Violet |
| Ground       | Black         |

### Spike

|              |               |
|--------------|---------------|
| Up           | Red-Black     |
| Down         | Red-Brown     |
| Left         | Red-Orange    |
| Right        | Red-Yellow    |
| Start Button | Violet-Orange |
| Punch Button | Red-Green     |
| Ground       | Black         |

### Gwen

|              |               |
|--------------|---------------|
| Up           | Blue-Black    |
| Down         | Blue-Brown    |
| Left         | Blue-Red      |
| Right        | Blue-Orange   |
| Start Button | Violet-Yellow |
| Punch Button | Blue-Yellow   |
| Ground       | Black         |



## WARNINGS & NOTICES

### Warning

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

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

### Warning

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

### Warning

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

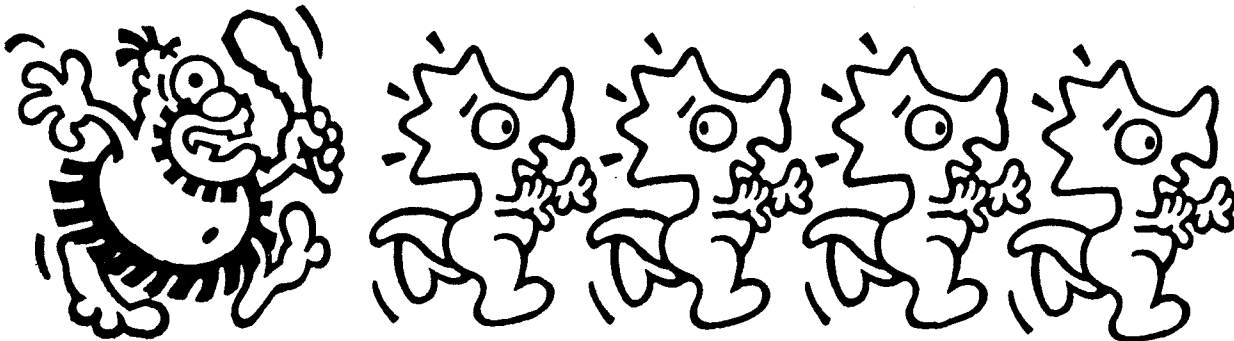
### Warning

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

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3401 N. CALIFORNIA AVE.  
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