



# GUARDIANS

OF THE 'HOOD

KIT

INSTALLATION

INSTRUCTIONS



## **For technical assistance:**

If reading through this manual does not lead to solving your game maintenance or repair problem, call TELE-HELP® at one of these Atari Games Customer Service offices:

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# GUARDIANS

OF THE 'HOOD



## Universal Kit Installation Instructions

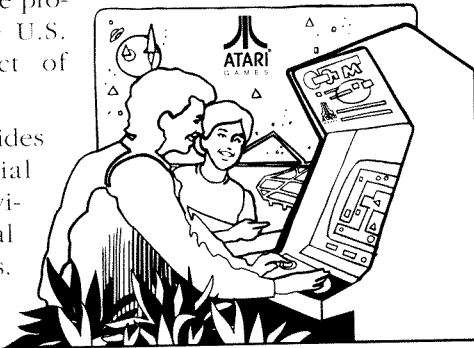
*Conversion kit for upright games*

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**NOTICE RE  
NON-ATARI  
PARTS**

**WARNING**

*Use of non-Atari parts or modifications of any Atari game circuitry may adversely affect the safety of your game, and may cause injury to you and your players.*

You may void the game warranty (printed on the inside back cover of this manual) if you do any of the following:

- Substitute non-Atari parts in the game.
- Modify or alter any circuits in the game by using kits or parts *not* supplied by Atari Games Corporation.

**NOTE**

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction 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 Federal Communications Commission (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 or modification to this equipment is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. If you suspect interference from an Atari game at your location, check the following:

- All ground wires in the game are properly connected as shown in the game wiring diagram.
- The power cord is properly plugged into a grounded three-wire outlet.
- On games provided with an Electromagnetic Interference (EMI) ground plane, be sure that the game printed-circuit boards (PCBs) are properly installed on the EMI ground plane and that the end board is securely installed with **all** screws in place and tightened.

If you are still unable to solve the interference problem, please contact Customer Service at Atari Games Corporation. See the inside front cover of this manual for service in your area.

## S A F E T Y   S U M M A R Y

The following safety precautions apply to all game operators and service personnel. Specific warnings and cautions will be found in this manual whenever they apply.

### WARNING

**Properly Ground the Game.** Players may receive an electrical shock if this game is not properly grounded! To avoid electrical shock, do not plug in the game until it has been inspected and properly grounded. This game should only be plugged into a grounded three-wire outlet. If you have only a two-wire outlet, we recommend you hire a licensed electrician to install a three-wire grounded outlet. If the control panel is not properly grounded, players may receive an electrical shock! After servicing any part on the control panel, check that the grounding wire is firmly secured to the inside of the control panel. After you have checked this, lock up the game.

**AC Power Connection.** Before you plug in the game, be sure that the game's power supply can accept the AC line voltage in your location. The line voltage requirements are listed in the first chapter of this manual.

**Disconnect Power During Repairs.** To avoid electrical shock, disconnect the game from the AC power before removing or repairing any part of the game. If you remove or repair the video display, be very careful to avoid electrical shock. High voltages continue to exist even after power is disconnected in the display circuitry and the cathode-ray tube (CRT). Do not touch the internal parts of the display with your hands or with metal objects! Always discharge the high voltage from the CRT before servicing it. Do this after you disconnect it from the power source. First, attach one end of a large, well-insulated, 18-gauge jumper wire to ground. Then momentarily touch the free end of the grounded jumper wire to the CRT anode by sliding the wire under the anode cap. Wait two minutes and do this again.

**Use Only Atari Parts.** To maintain the safety of your Atari game, use only Atari parts when you repair it.

Using non-Atari parts or modifying the game circuitry may be dangerous, and could injure you and your players.

**Handle the CRT With Care.** If you drop the CRT and it breaks, it may implode! Shattered glass from the implosion can fly six feet or more.

**Use the Proper Fuses.** To avoid electrical shock, use replacement fuses which are specified in the parts list for this game. Replacement fuses must match those replaced in fuse type, voltage rating, and current rating. In addition, the fuse cover must be in place during game operation.

### CAUTION

**Properly Attach All Connectors.** Make sure that the connectors on each printed circuit board (PCB) are properly plugged in. The connectors are keyed to fit only one way. If they do not slip on easily, do not force them. If you reverse a connector, it may damage your game and void your warranty.

**Ensure the Proper AC Line Frequency.** Video games manufactured for operation on 60 Hz line power (used in the United States) must not be operated in countries with 50 Hz line power (used in Europe). If a 60 Hz machine operates on 50 Hz line power, the fluorescent line ballast transformer will overheat and cause a potential fire hazard. Check the product identification label on your machine for the line frequency required.

### ABOUT NOTES, CAUTIONS, AND WARNINGS

In Atari publications, notes, cautions and warnings have the following meaning:

**NOTE** — A highlighted piece of information.

**CAUTION** — Equipment and/or parts can be damaged or destroyed if instructions are not followed. You will void the warranty on Atari printed-circuit boards, parts thereon, and video displays if equipment or parts are damaged or destroyed due to failure of following instructions.

**WARNING** — Players and/or technicians can be killed or injured if instructions are not followed.

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See the List of Illustrations that follows.

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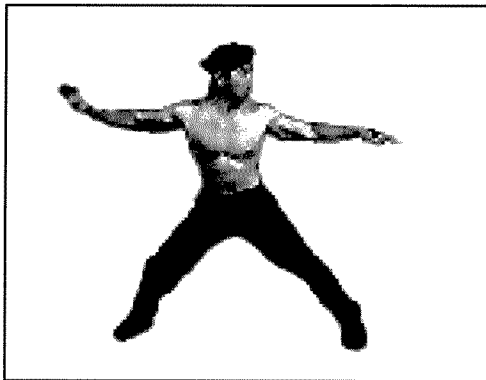
**N O T E S**



# Installation

## HOW TO USE THIS MANUAL

**T**HE GUARDIANS of the 'Hood™ conversion kit is a two-player game (expandable to a three-player game) for a standard upright cabinet. **▀** This manual provides information for installing, testing, and troubleshooting the Guardians of the 'Hood™ conversion kit. **▀** **Chapter 1** describes how to install the Guardians of the 'Hood kit in your cabinet. This chapter also describes game play. **▀** **Chapter 2** contains self-test procedures and additional diagnostic tests. The self-test is important in the



### NOTE

*The three-player option is intended primarily for a Pit-Fighter cabinet. However, you can install the three-player option if you have a game cabinet with a wide enough control panel to accommodate the additional joystick and pushbuttons.*

Guardians of the 'Hood game. You can troubleshoot the PC boards, main circuits, and controls using the screens in the self-test. You should regularly test the boards and controls with the self-test to keep your game in peak condition and at top earnings. **▀** **Chapter 3** contains troubleshooting and maintenance procedures for the controls. **▀** **Chapter 4** contains the kit parts list and parts illustrations. **▀** **Chapter 5** contains the schematics for the Guardians of the 'Hood printed-circuit boards.

**WARNING**

To avoid electrical shock, unplug the cabinet while installing the kit. After installation, plug the game only into a grounded 3-wire outlet.

**Cabinet Equipment Requirements**

Table 1-1 lists the equipment required in the cabinet into which you are installing the Guardians of the 'Hood kit.

**CAUTION**

Do not unplug or plug in the Guardians of the 'Hood game printed-circuit board (PCB) edge connector while the power is on. You could seriously damage the PCB.

**Tools Required**

- Drill with a 1/2-inch, 3/8-inch, 7/32-inch, and 3/16-inch drill bits
- Phillips screwdriver
- Flat-blade screwdriver
- Socket wrench set and ratchet

- 5/32" hex wrench
- Pencil
- Compass or circle template
- Wire cutters and strippers
- Straight edge
- Squeegee
- X-ACTO™ knife
- Insulated wire connectors (if you are installing a new JAMMA harness)
- Carbon paper
- Saber saw
- Band saw

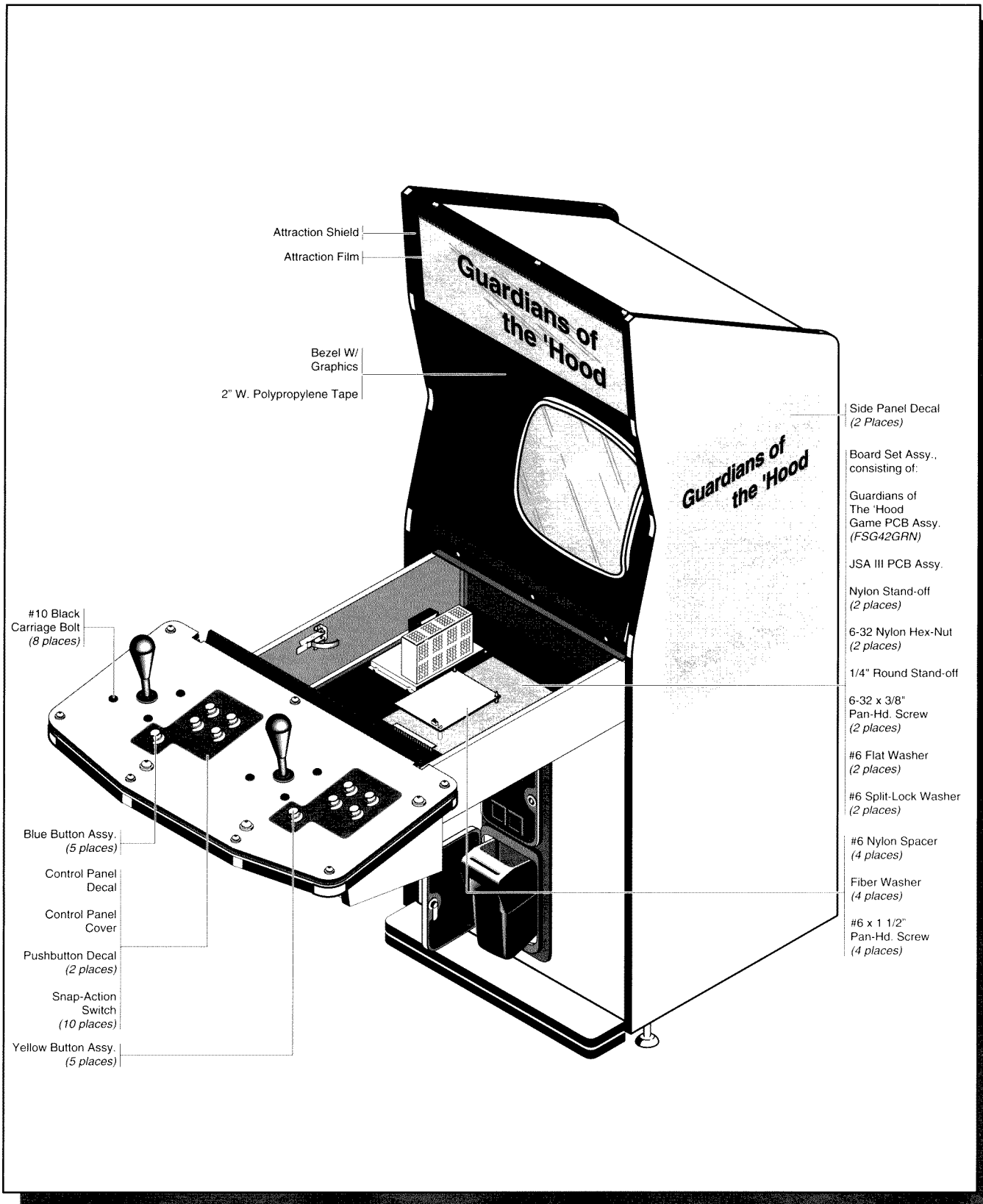
Equipment	Specification
Video Display	Color RGB monitor Separate positive horizontal and vertical sync or negative composite sync Horizontal mounting Horizontal frequency: 15.750 KHz Vertical frequency: 60 Hz Video input: 1V to 3V peak-to-peak positive polarity
Control Panel	Metal only
Speaker	8 Ω, 10 W
Coin Counter	+5 VDC or +12 VDC
Power Cord	Three-conductor with ground
Power Supply	+5 VDC ± 0.25V @ 3.0 amps +12 VDC @ 1.0 amp -5 VDC @ 1.0 amp (optional)

**Table 1-1 Equipment Requirements**

Part No.	Description
72-6624S	#6 x 1 1/2"-Long, Type AB, Pan-Head, Cross-Recessed Screws (4)
75-5112B	#10-24 x 3/4"-Long Black Carriage Bolts (8)
038158-01	Product I.D. Label
039450-01	FCC Compliance Label
047205-01	Attraction Shield
050227-01	Control Panel Cover
050149-01	Side Panel Decals (2)
050150-01	Attraction Panel Film
050151-01	Control Panel Decal
050152-01	Monitor Bezel with Graphics
050154-01	Pushbutton Decal (3)
141026-001	.50"-I.D. Ferrite Split Beads (2)
141026-003	.40"-I.D. Ferrite Split Beads (6)
160044-001	Snap-Action Switch (12)
171099-001	8-Position Black NO/NC Joystick Assembly with Gold-Plated Switch Contacts (2)
175004-706	.154" x .375" x .125" Thk Fiber Washers (4)
175014-1040	#10 Flat Washers (8)
177026-0040	#10-24 Zinc Nut/Washer Assemblies (8)
178020-812	Spacer, Rnd, #6, I.D.=.140, O.D.=.25, L=.812, Nylon (4)
178032-002	#10 Wire & Cable Ties (5)
178237-001	Red Pushbutton Assembly (2)
178237-002	Yellow Pushbutton Assembly (5)
178237-005	Blue Pushbutton Assembly (5)
TM-377	Guardians of the 'Hood Universal Kit Installation Instructions (with Control Panel Templates)
A049811-01	Three-Player Harness Assembly
A050194-01	Switch Jumper Harness Assembly (2)
A050756-03	Guardians of the 'Hood PC Board Set

Packaging materials are not listed. All parts are a quantity of 1, except as noted in parentheses.

**Table 1-2 Contents of Guardians of the 'Hood Kit**



**Figure 1-1 Installed Kit Parts (Two-Player Game)**



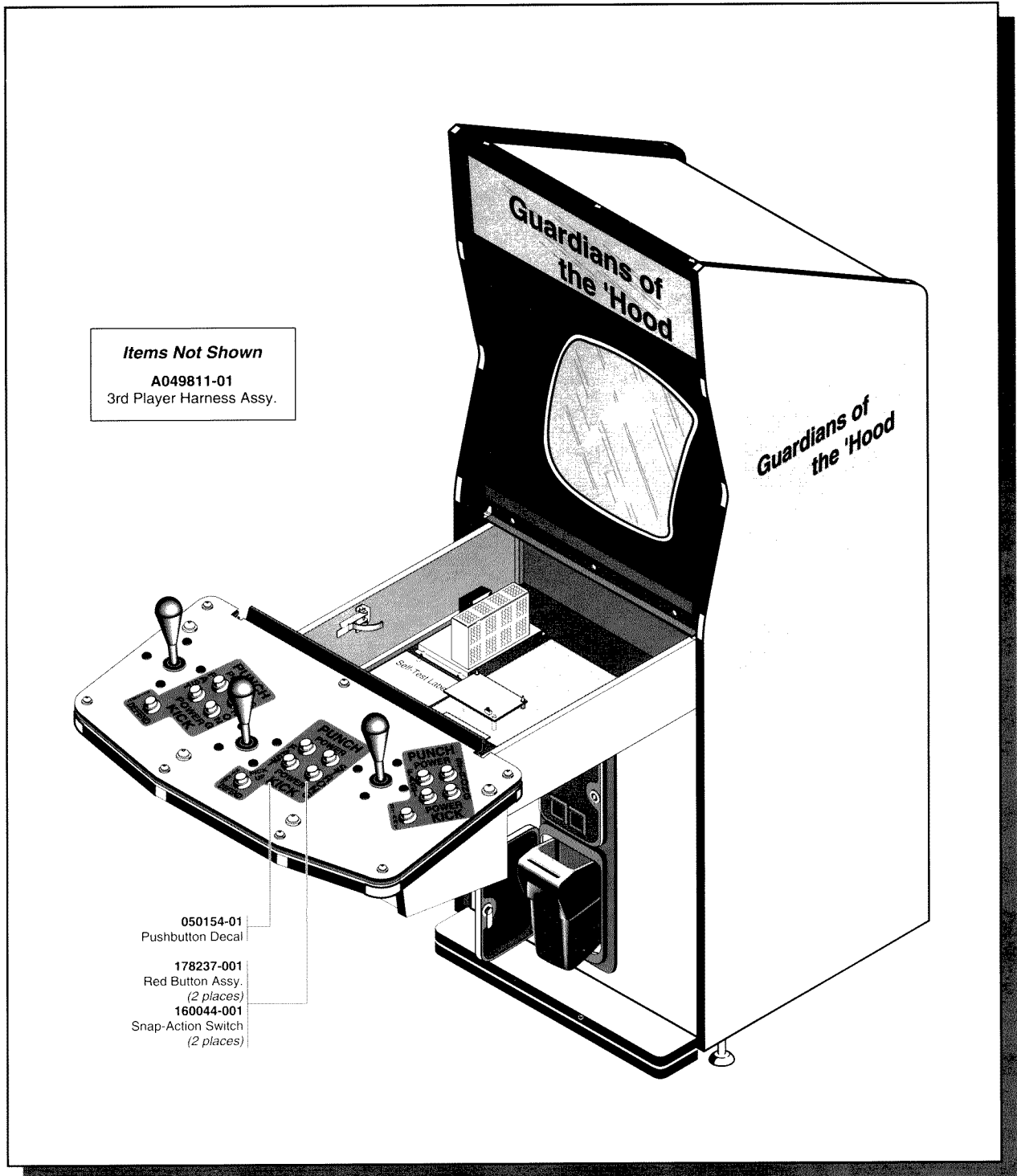


Figure 1-2 Installed Kit Parts (Three-Player Game)

## Inspecting the Kit

Check to see that you have all the parts listed in the kit parts list in Table 1-2. If any part is missing or damaged, contact your distributor with the Guardians of the Hood kit serial number, part number, and description of the missing or damaged parts, and date received.

## Preparing the Cabinet for the Kit Installation

### WARNING

*To avoid electrical shock, unplug the cabinet while installing the kit. After installation, plug the game only into a grounded 3-wire outlet.*

Figure 1-1 shows almost all kit parts installed in a typical cabinet. Use this illustration as a guide while you install the parts.

1. Turn off power to the game, and unplug the power cord.
2. Remove the following from the cabinet:
  - Existing PCBs
  - Game harness, if it is not Japan Amusement Machinery Manufacturers Association (JAMMA)–compatible. Table 1-3 assumes you have an available game cabinet with a JAMMA harness installed in it.
  - Control panel decals, labels, and controls
  - Side decals, graphics, and adhesive. If the cabinet sides are damaged, repair them before putting on the new decals.
  - Video display (monitor) shield, display bezel, attraction shield, and marquee.
3. Wipe down and vacuum the cabinet. Paint the cabinet, if required.

## Assembling the Two-Player Control Panel

### Parts Needed from This Kit

To assemble the control panel, you need the two-player control panel hole-cutting template printed in Figure 1-7 or 1-8. Cut out the appropriate template sheet from

this manual. You will also need the following parts from the kit:

### For a Two-Player Game

- Clear cover for the control panel
- Control-panel decal
- Five blue pushbutton assemblies
- Five yellow pushbutton assemblies
- Two Punch/Kick/Defend pushbutton decals
- Two joystick assemblies
- Twelve #10-24 x 3/4" long black carriage bolts, flat washers, and nut/washer assemblies — four for the corners of the control-panel cover and eight for the joysticks.

### Installing the Parts for a Two-Player Game

1. Using carbon paper, transfer the control mounting pattern from the template to the control panel. Save the template. Also refer to Figure 1-3 or 1-4 for the exact locations of all control panel holes.
2. Using a saber saw, carefully cut out the large hole for the joystick controls and the smaller holes for the pushbuttons. Deburr the sharp edges with a file.
3. Lay the plastic cover over the top of the control panel and mark the outside shape of the panel on the plastic. Also mark the button holes as close as possible to the locations shown on the template.
 

Lastly, mark the positions of the four holes that will be used for securing the cover to the control panel. These four holes can be placed anywhere near the corners — wherever space permits.
4. Using a bandsaw, cut the control panel cover to its correct outside shape.

### WARNING

*Wear safety glasses when drilling the plastic control panel cover. Use care to avoid shattering or chipping the plastic.*

5. Tape or glue the template to the plastic cover. To start the saber saw cut, drill a 1/2" hole inside the joystick holes and the pushbutton holes.
6. Saw out the large joystick holes and the pushbutton holes.

**Solder Side**

**Component Side**

Color <sup>1</sup>	Signal Pin	Pin Signal	Color <sup>1</sup>
Brown	POWER GND <b>A</b>	<b>1</b> POWER GND	Brown
Brown <sup>2</sup>	POWER GND <b>B</b>	<b>2</b> POWER GND	Brown
Red	+5V DC <b>C</b>	<b>3</b> +5V DC	Red
Red	+5V DC <b>D</b>	<b>4</b> +5V DC	Red <sup>3</sup>
Orange <sup>4</sup>	-5V <b>E</b>	<b>5</b> -5V	Orange
Yellow <sup>5</sup>	+12V DC <b>F</b>	<b>6</b> +12V DC	Yellow
—	<b>Key H</b>	<b>7 Key</b>	—
Violet/White <sup>6</sup>	COIN CTR 2 <b>J</b>	<b>8</b> COIN CTR 1	Blue/White <sup>7</sup>
—	Not Used <b>K</b>	<b>9</b> Not Used	—
White	SPKR - <b>L</b>	<b>10</b> SPKR +	Brown
—	Not Used <b>M</b>	<b>11</b> Not Used	—
Green	VIDEO GREEN <b>N</b>	<b>12</b> VIDEO RED	Red
Brown	VIDEO NEG. SYNC <b>P</b>	<b>13</b> VIDEO BLUE	Blue
—	Not Used <b>R</b>	<b>14</b> VIDEO GND	Black
—	Not Used <b>S</b>	<b>15</b> SELF-TEST	White <sup>8</sup>
Orange	RT COIN <b>T</b>	<b>16</b> LT COIN	Yellow
Yellow/Black	Not Used <b>U</b>	<b>17</b> Not Used	White/Black
Yellow/Brown <sup>9</sup>	RT PLYR UP J.S. <b>V</b>	<b>18</b> LT PLYR UP J.S.	White/Brown <sup>9</sup>
Yellow/Red <sup>9</sup>	RT PLYR DOWN J.S. <b>W</b>	<b>19</b> LT PLYR DOWN J.S.	White/Red <sup>9</sup>
Yellow/Orange <sup>9</sup>	RT PLYR LEFT J.S. <b>X</b>	<b>20</b> LT PLYR LEFT J.S.	White/Orange <sup>9</sup>
Yellow/White <sup>9</sup>	RT PLYR RIGHT J.S. <b>Y</b>	<b>21</b> LT PLYR RIGHT J.S.	White/Yellow <sup>9</sup>
Yellow/Green <sup>9</sup>	RT PLYR (Switch 3) STRONG/KICK <b>Z</b>	<b>22</b> LT PLYR (Switch 3) STRONG/KICK	White/Green <sup>9</sup>
Yellow/Blue <sup>9</sup>	RT PLYR (Switch 4) FAST/PUNCH <b>a</b>	<b>23</b> LT PLYR (Switch 4) FAST/PUNCH	White/Blue <sup>9</sup>
Yellow/Violet <sup>9</sup>	RT PLYR (Switch 5) STRONG/PUNCH <b>b</b>	<b>24</b> LT PLYR (Switch 5) STRONG/PUNCH	White/Violet <sup>9</sup>
Yellow/Gray <sup>9</sup>	RT PLYR (Switch 2) FAST/KICK <b>c</b>	<b>25</b> LT PLYR (Switch 2) FAST/KICK	White/Gray <sup>9</sup>
Gray/White <sup>9</sup>	RT PLYR (Switch 1) START/DEFEND <b>d</b>	<b>26</b> LT PLYR (Switch 1) START/DEFEND	Violet <sup>9</sup>
Black/White	SWITCH GND <b>e</b>	<b>27</b> SWITCH GND	Black/White
Black/White	SWITCH GND <b>f</b>	<b>28</b> SWITCH GND	Black/White

**Footnotes**

<sup>1</sup>The colors listed are for reference only. They are the colors used on the JAMMA harness available from Atari.

<sup>2</sup>Connect to the 5V GND (RTN) terminal on the power supply. However, if you have 12V GND, connect *one* of the wires at pin 1, 2, A, or B to the 12V GND terminal.

<sup>3</sup>Connect to the +5V terminal on the power supply. However, if your power supply has a + Sense terminal, connect to the + Sense.

<sup>4</sup>Connect to the -5V terminal of the power supply. If -5V is not available, connect to the 12V GND or the 5V GND. *NOTE: If you do not have or*

*use -5V, the maximum power to the speaker will be reduced by half.*

<sup>5</sup>Connect to the +12V terminal of the power supply. If your coin counter(s) require 12V, also connect to the + side of the coin counter(s).

<sup>6</sup>If you want to install a second coin counter, connect this wire to one side of the right 12V coin counter. Then clip R26 on the game PCB. *Note: Do not use 24V counters.* Connect the + side to +5V or +12V on the power supply, as appropriate.

<sup>7</sup>Connect this wire to one side of the left 12V coin counter. *Note: Do not use 24V counters.* Connect the + side

to +5V or +12V on the power supply, as appropriate.

<sup>8</sup>Use this wire if you want an external self-test switch. However, the kit already has a self-test switch on the game PCB. (If you connect an external self-test switch, turn off the switch on the PCB. Connect the wire to the N.O. terminal on the external self-test switch. Connect the common terminal of the switch to a GND wire.)

<sup>9</sup>Connect these wires to the N.O. terminal of the control switches. Connect the common terminal of the switch to a GND wire. Refer to Figure 1-6 for proper switch connections.

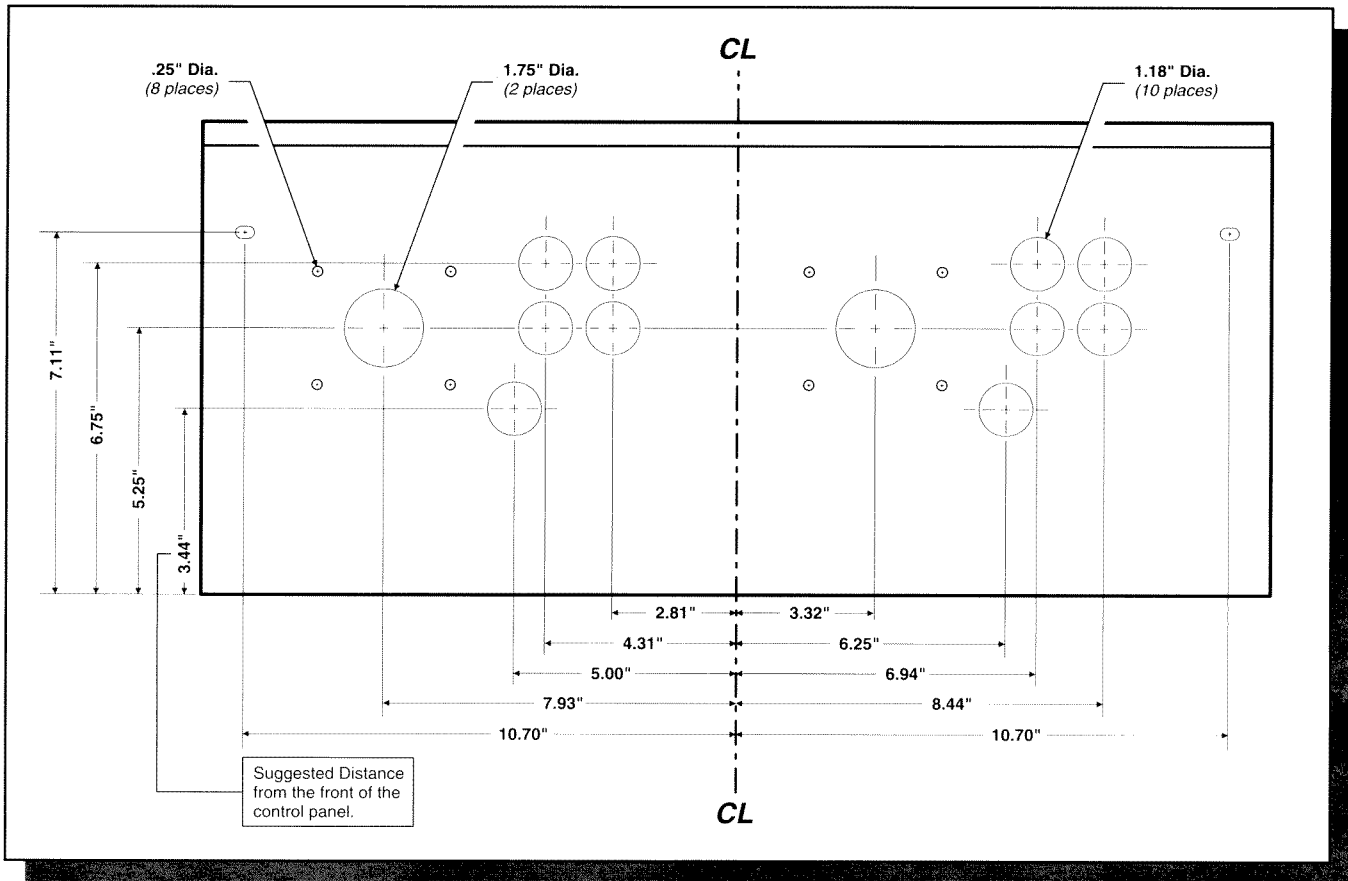
**Table 1-3 JAMMA Pin and Wire Connections**



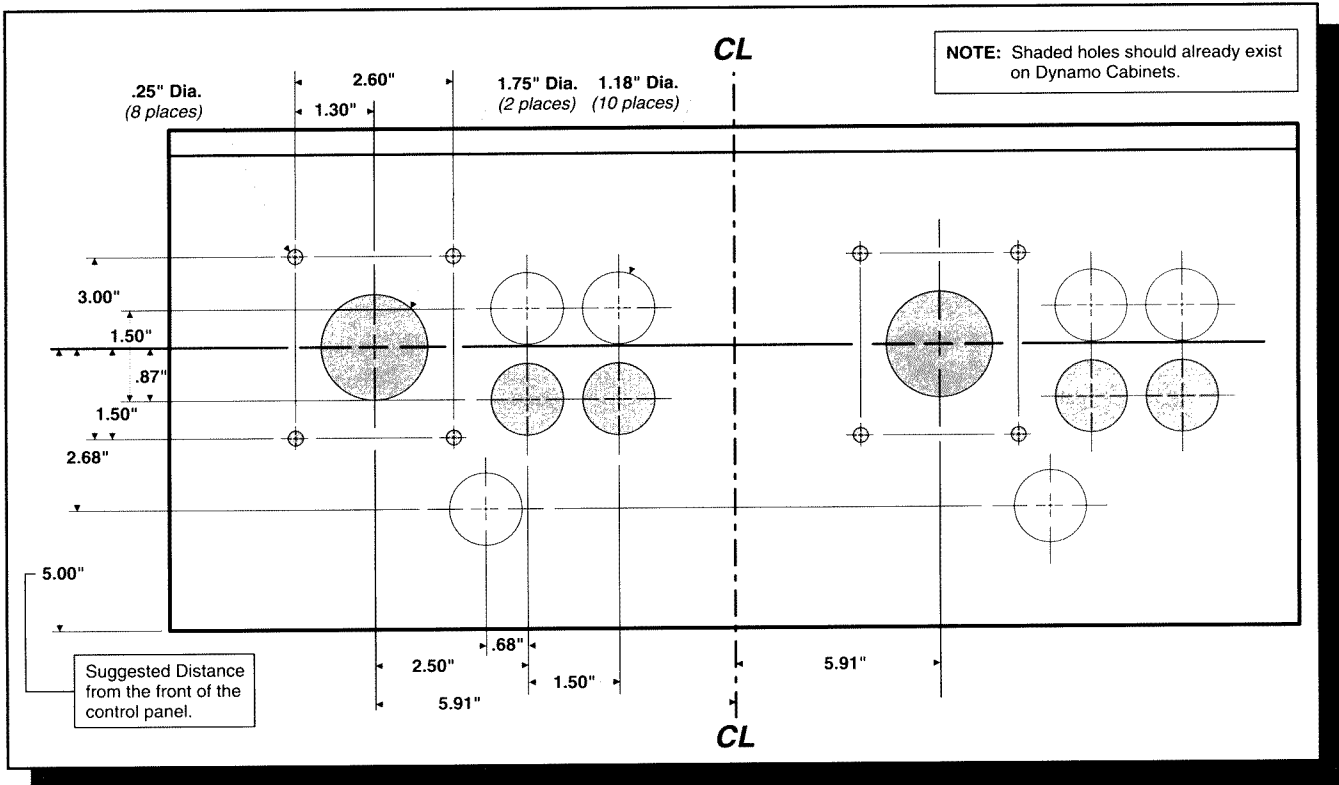
Pin #	Wire Code	Signal	Instructions
1	BK	GND	Connect to common terminal of player 3 control switches.
2	R/W	—	Not used
3	W/BU	—	Not used
4	W/GY	—	Not used
5	W/Y	—	Not used
6	W	—	Not used
7	BN	Player 3 Up	Connect to N.O. Terminal of the joystick UP switch.
8	R	Player 3 Down	Connect to N.O. Terminal of the joystick DN switch.
9	OR	Player 3 Left	Connect to N.O. Terminal of the joystick LEFT switch.
10	Y	Player 3 Right	Connect to N.O. Terminal of the joystick RIGHT switch.
11	GN	(Switch 5) STRONG/PUNCH	Refer to Fig. 1-6. Route to N.O. terminal of appropriate switch.
12	BU	(Switch 4) FAST/PUNCH	
13	V	(Switch 3) STRONG/KICK	
14	GY	(Switch 2) FAST/KICK	
15	W/BN	(Switch 1) START/DEFEND	

**NOTE:** The center player is the “third player”.

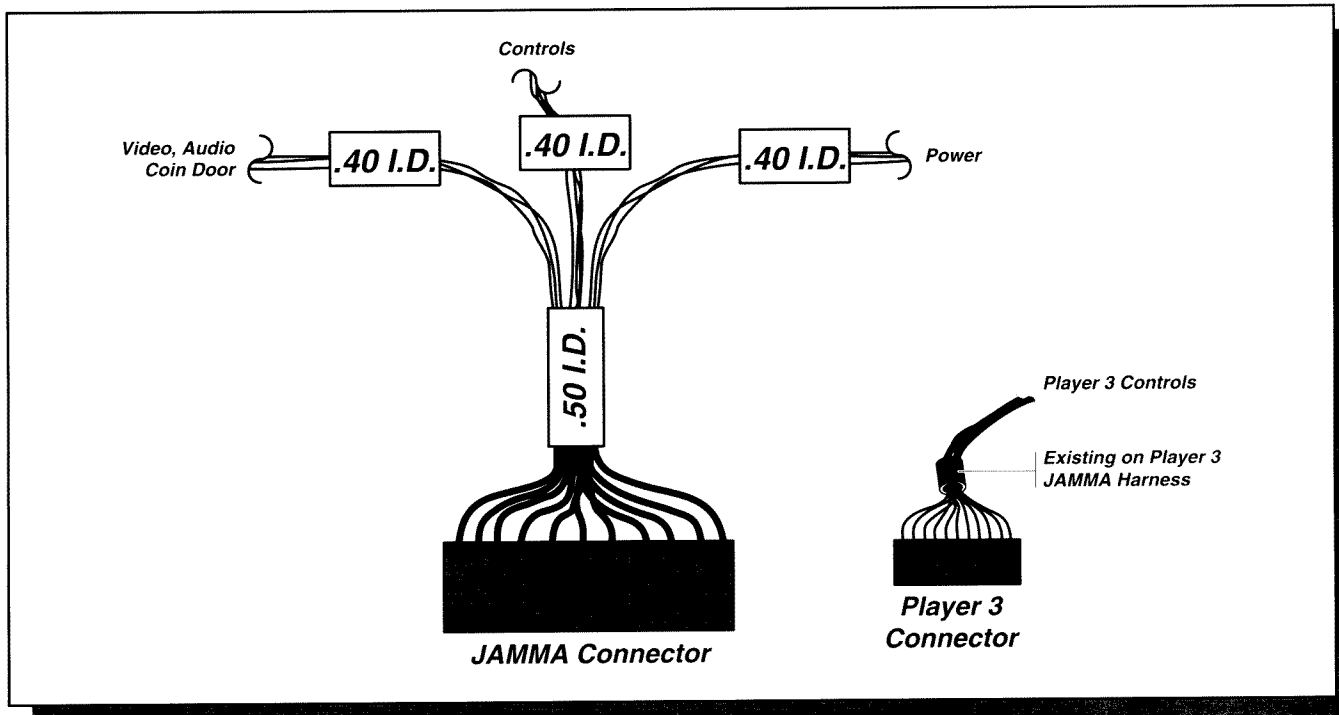
**Table 1-4 Third-Player Pin and Wire Connections**



**Figure 1-3 Locations of Control Panel Holes to Be Drilled (Two-Player Atari Cabinet)**



**Figure 1-4** Locations of Control Panel Holes to Be Drilled (Two-Player Dynamo Cabinet)



**Figure 1-5** Correct Placement of Split Beads

7. Drill the four 1/4" holes that will be used to mount the cover to the control panel and the holes to mount the joystick controls and pushbuttons.
  8. To prevent injury, carefully deburr all the edges of the plastic cover.
  9. Install the control panel decal on the control panel. Use a sharp X-ACTO knife to trim the outside edge and to cut out the holes for the controls.
  10. Mount the Punch/Kick/Defend decals on the control panel around the pushbutton holes.
  11. Install the cover on the control panel with the four 3/4"-long carriage bolts, washers, and locknuts.
  12. Install the joystick controls using the 3/4"-long carriage bolts and #10-24 nut/washer assemblies.
  13. Install the pushbutton assemblies in Figure 1-1.
- For maintenance and servicing information on the joystick control, refer to Chapter 3 of this manual.

## Connecting the JAMMA Harness

1. If your game cabinet does not already have a JAMMA harness, install a JAMMA harness in the cabinet (optional, Atari part no. A046501-01).
2. Install one pair of 0.50" split beads on the JAMMA harness (See Figure 1-5).
3. Install one pair of 0.40" split beads on the following harnesses (See Figure 1-5):
  - The harness that runs to the power supply
  - The harness that runs to the display speakers and coin door
  - The harness that runs to the control panel.

In all cases, make sure you move the split beads as close to the PCB edge connector as possible. Hold the beads on the harnesses with the tie wraps included in the kit.

---

### CAUTION

*You must install the split beads on the JAMMA harness to meet FCC requirements.*

---

4. Using Table 1-3 for wiring information, connect the JAMMA harness to existing component harnesses. Use crimp splices or butt soldering.

---

### WARNING

*Do not simply tie the wires together. If you do, you could cause intermittent problems, loose connections, oxidation, or a fire.*

---

## Connecting Power Wires

1. Connect the wires on the JAMMA harness to the wires for the power supply, as shown in Table 1-3. The Guardians of the 'Hood kit requires +5V and +12V. If -5V is available, it should be used, too.
2. Tie off any other voltage wires on the power supply besides +5V, -5V, and +12V.
3. There is more than one wire for each voltage in the JAMMA harness. Use more than one wire for each voltage (connecting them as described in Table 1-3) so that the power wiring does not overload and burn.

## Connecting Video Display Wires

---

### NOTE

*The JAMMA harness provides only negative composite sync. If your video display requires separate positive sync, see Chapter 3 for alternative wiring.*

---

Connect the wires designated for the red, green and blue video guns along with the sync and ground wires, according to Table 1-3.

## Connecting Coin Door Wires

1. Connect the wires on the JAMMA harness to the coin switches and meter according to Table 1-3.
2. Connect one terminal of the door lamps to one of the GND wires. Connect the other terminal of the door lamps to the R wire supplying +5V.



**NOTE**

*Do not use -5V for the coin door lamps. The -5V is required for audio.*

Some games have separate power supply outputs for the coin door lamps. If you choose to use these outputs, make sure you connect both terminals of each lamp to the terminals on the power supply.

**Connecting the Control Wires**

Connect the joysticks and switches to the JAMMA harness using crimp splices or butt soldering. Follow the wiring instructions in Table 1-3 and refer to Figure 1-6 for switch numbers.

**Grounding the Cabinet**

Find the ground lead (green) of the 115V input power line. Connect this lead in daisy-chain fashion to a bare metal part of the coin door, the control panel, the video display, and the power supply. This AC ground must be of #18 AWG wire or larger.

**WARNING**

*For the safety of players, you must connect the green ground wire as indicated above.*

**Checking the JAMMA Connections**

Before plugging in the game PCB, turn on the power to the game, and check for +5V on pins 3, 4, C, and D of the JAMMA connector; +12V on pins F and 6; and -5V on pins E and 5.

Check that the video display and the attraction lamp have power. Now turn off the power to the game.

**Installing the Guardians of the 'Hood Board Set**

After you have checked the power on the JAMMA connector (above), install the Guardians of the 'Hood board set in the cabinet. Follow these steps and referring to Figure 4-4:

1. Use the nylon standoffs, fiber washers, and four #6 x 1½" long screws in the kit.
2. Connect the JAMMA connector to the game PCB.
3. Secure the JAMMA harness away from the PCB with cable ties.

4. Turn on the power to the game. Check that the game PCBs function. If a video picture is not present, see Chapter 3.

**Installing the Bezel, Decals, Labels, and Attraction Assembly****Installing the Product ID and FCC Label**

Place the product ID label (part no. 038158-01) and FCC compliance label (part no. 039450-01) on the back of the cabinet.

**Installing the Side Panel Decals**

Find the side panel decals in the kit. Wet the left and right side panels of the cabinet with slightly soapy water. Then position the decals as shown in Figure 1-1. Remove any wrinkles in the artwork using a squeegee. Allow the sides to dry.

**Installing the Attraction Assembly**

Find the Guardians of the 'Hood attraction shield and the attraction panel film in the kit. Using the existing shield as a template, cut the shield and film to size, if necessary. Install them on the cabinet as shown in Figure 1-1.

**Assembling the Three-Player Control Panel (Pit-Fighter)****NOTE**

*To install the third player in any cabinet other than Pit-Fighter, you must first purchase an additional joystick and five red button assemblies from Atari Customer Service; then follow the installation instructions by using Table 1-4 as a reference.*

**Parts Needed from This Kit**

To assemble the three-player control panel, you need the optional three-player control panel hole-cutting template. (The three-player template is a foldout included with this manual.) You will also need the following parts from the kit:

**For a Three-Player Game**

- Third-player harness assembly
- Two red pushbutton assemblies
- Punch/Kick/Defend pushbutton decal
- Two jumper harnesses

**Disassembling the Pit-Fighter Control Panel Assembly**

1. Remove all the controls from the Pit-Fighter control panel assembly. Save these parts.
2. Separate the metal control panel from the wood backup board by removing the seven screws around the perimeter. Mark the top surface of the backup board to avoid improper assembly later in the conversion process.

**Modifying the Pit-Fighter Control Panel Assembly**

1. Remove the old decal from the Pit-Fighter control panel.
2. Align the large template provided over the Pit-Fighter panel and tape it in position. Center-punch the 12 hole centers for the new button locations. Using a compass or circle template, draw the twelve 13/16" circles in pencil. Save the template since you will need it to make the plastic overlay.
3. Using a saber saw, carefully cut out the 12 button holes. If necessary, first drill a 1/2" hole within the button hole outline to start the saber saw cut.
4. Install the new control panel decal on the modified control panel. Use a sharp X-ACTO knife to trim the outside edge and to cut out the holes.
5. Apply the three Punch/Kick/Defend decals on top of the control panel decal. Position the decals so that the holes in the label align with the new button holes in the metal panel.

**Making the Plastic Overlay**

1. Tape the template onto the 32 1/2" x 14" polycarbonate panel provided. Center-punch the 41 holes required. Using a compass or circle template, draw the appropriate size circle in pencil. Also trace the outside outline. Take your time and check your work carefully before proceeding further. Save the template since you will need it to modify the wood backup board.
2. Drill out the smaller holes using a power drill and appropriate size drill bit. For the larger holes drill a

1/2" hole within each, and then cut out with a saber saw.

3. Using a bandsaw, cut the control panel cover to its correct outside shape.
4. To prevent injury, carefully deburr all the edges of the plastic overlay.

**Modifying the Pit-Fighter Wood Backup Board**

1. Align the template on the *top* of the wood backup board and tape it in position. Using a sharp pencil or other pointed object, poke through the template and mark each corner (21 places) of the new cutout. Then remove the template and "connect the dots." Compare your outline with the template before proceeding further.
2. Using a saber saw, cut out the center of the backup board following the outline transferred from the template.

**Assembling the Guardians of the Hood Control Panel Assembly**

1. Remount the metal control panel on top of the wood backup board. Position the plastic overlay over the metal panel, and check to see that all the holes are properly aligned. Then reinstall the seven screws around the perimeter to hold the assembly together.
2. Mount the controls onto the panel using the parts and hardware provided in the kit as well as one joystick and three red buttons from Pit-Fighter. Install the blue buttons in the left-player position, the yellow buttons on the right, and the red buttons in the center.
3. Reinstall the Pit-Fighter control panel harness.
4. Install the two kit switch jumper harnesses (Atari part no. A050194-01) and plug them into the two block-style connectors.
  - Plug the gray wire into pin 9
  - Plug the white wire into pin 10
5. Route the one-player wires (white with colored stripes) into the one-player switch.
6. Route the two-player wires (yellow with colored stripes) into the two-player switch.
7. Leave the existing ground (green wire) attached.
8. Splice the switch ground wires from the nearby switch (COM).

9. Rearrange the original three switches to their correct placements, following Table 1-3 and Figure 1-6.
10. Be sure to install the split beads included in the kit. See Figure 1-5 for the correct placement of the split beads.

### Connecting the Three-Player Harness

When you install the three-player harness in your game cabinet, you must:

- Remove the existing harness from the three-player switches.
- Add the three-player kit harness
- Rearrange the switches

Follow these steps (See Figure 1-6):

1. Clip some of the tie wraps attached to the existing three-player harness and remove this harness.
2. Install the kit three-player harness (Atari part no. A049811-01) and route it to the appropriate switches by referring to Table 1-4 and Figure 1-6.

### Setting the Coin and Game Options

Set the coin and game options in the self-test. See Chapter 2 for information about the option settings.

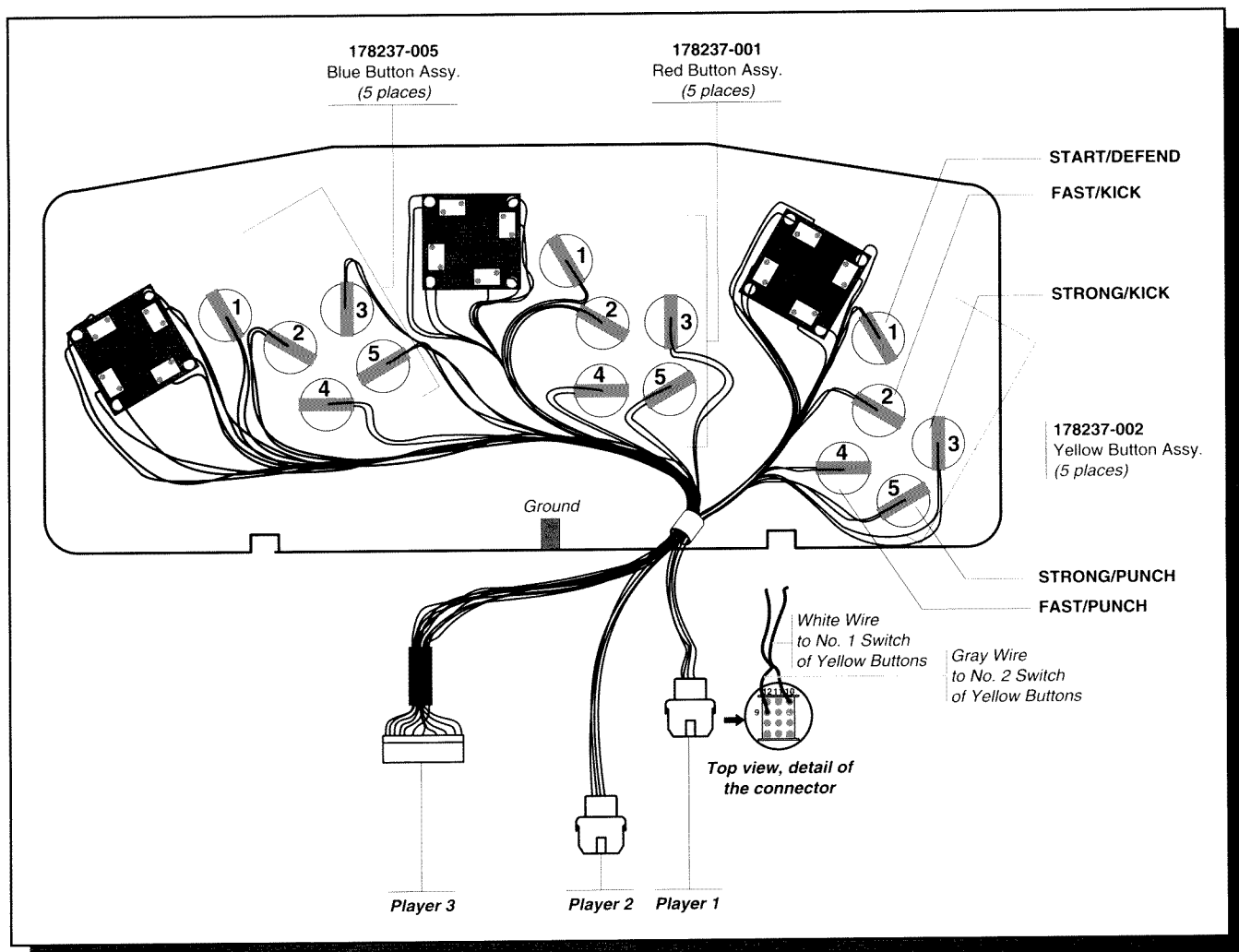


Figure 1-6 Connections for Optional Three-Player Harness

## Maximizing Earnings

For maximum earnings, regularly maintain your Guardians of the Hood game following the instructions shown in Table 3-1, in Chapter 3.

When you set up the game and when you collect money, perform the automated self-test and check the controls with the Controls Test in the self-test.

You should read Chapter 2, Self-Test, for information on the game options, statistics, and coin options so you can effectively use the available options. Evaluate the game data by using the statistics and histograms screens, and make adjustments on the game options screen.

The key to maximizing earnings is striking a midpoint on game times. Game times must be short enough so that the player turnover is high. Conversely, game times must be long enough to give players a good value and ensure repeat play. Repeat play is *crucial* to longevity. The Guardians of the Hood software gives the operator the flexibility to tune game difficulty and enough statistics to intelligently make adjustments.

If collections seem low or are dropping off, check all player controls and coin mechanisms for proper operation.

If earnings seem low, the game is technically sound, and the average game time per quarter is under 150 seconds, try changing the game difficulty option to an easier setting. The change will give players more game time for their money.

If the average game time per quarter is over 270 seconds, first try changing the game difficulty to a harder setting. If the average game time per quarter is still over 270 seconds after a few weeks, try an even harder setting.

After changing the game difficulty settings, you should reset the game statistics and the histograms. The game statistics and histograms can be cleared in the self-test by holding the start button and pressing any left button.

## Game Play

This section describes the features and play of the Guardians of the Hood™ game.

### Introduction

The place is Center City. An escalating crime rate has converted a once-peaceful town into a seedy hangout for gangs and hoodlums.

Three gangs have taken over the town — the Dreads, the Shavers, and the Dragons. Each gang has an evil boss that rules over them. The plan for the Guardians of the Hood is to break up the gangs and convert the bosses to their side. Only this way can they turn the tide and regain the city. In the end, the secretive “Mr. Big” unveils his true identity that will surely surprise every player.

The local gym has become a meeting spot for a band of young citizens called the Guardians of the Hood. Here they work out and train with each other to keep their fighting skills razor sharp and instincts cat-like keen. Each could be registered as a lethal weapon, and united their fires burn hotter than boiling lava and pump up to the strength of one hundred men.

## Game Characters

The characters in Guardians of the Hood are:

- **CONNER** — An all-around good fighter. Trained in both boxing and Karate, he possesses amazing quickness for his size. Graduating with honors from Center City University in medicine, he is considered the most eligible bachelor of the town.
- **CHIEF** — Tough as a truck and the size of three men. After losing his family in a battle between two rival gangs, he pledged to bring back peace to the city. He is so devoted to the cause, that he passed up a multi-million-dollar football offer.
- **TANYA** — She is the tall statuesque cat. When not securing the peace in Center City, she can be found adorning the covers of major fashion magazines. Her father's duty in Special Forces influenced her interest in the martial arts. She possesses black belts in Tai-Chi, Tae Kwon Do, and Kung Fu.
- **JAVIER** — He is a gold-medal winner in kickboxing. His natural speed and agility aided his ability to be a multi-sport athlete. After the Guardians of the Hood clean up the city, he plans to return to his shortstop position on the Center City Bashers.

## Game Play Description

Guardians of the Hood is a two-player game (expandable to a three-player game) full of hard-hitting action. Players wage the war against crime with four powerful fighters. As players punish rival gang bosses and convert them to their side, the selection of player characters increases. There's seven in all! From closed-in Gym Waves to wide-open street scenes, Guardians of the Hood gives players the best of both worlds ... head-to-head and side-scrolling game play. Meet head-

on with gangs who make bad streets, back alleys, and subway stations their domain to prey on the weak!

Players can even pick up and use street junk like garbage cans, parking meters, newspaper stands, and even car fenders!

Four pushbuttons in combination with the Defend button (a total of five) arm each fighter with over 35 different moves. A devastating Power Move is executed

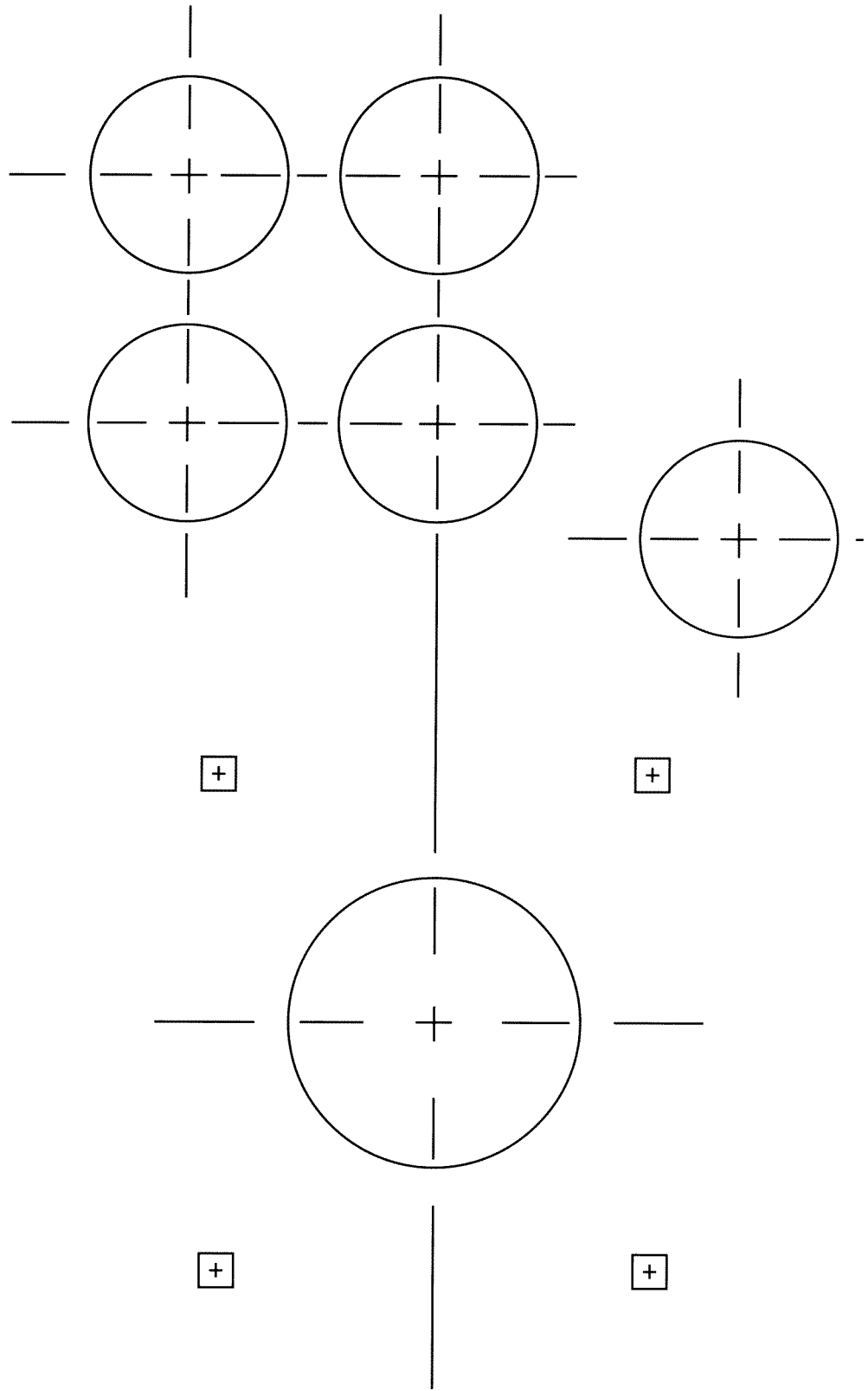
when all pushbuttons are pressed. There are lots of hidden moves for players to discover!

The new power-perfect 3-D digitized graphics make the action almost too close for comfort! But you be the judge of that!

Don't turn your back on those that need you ... help save the city! Who knows, hero, you may see yourself on the front page!

Top

Figure 1-7 Two-Player Hole-Cutting Template for Guardians of the 'Hood™ Kit Control Panel (Atari Cabinets)



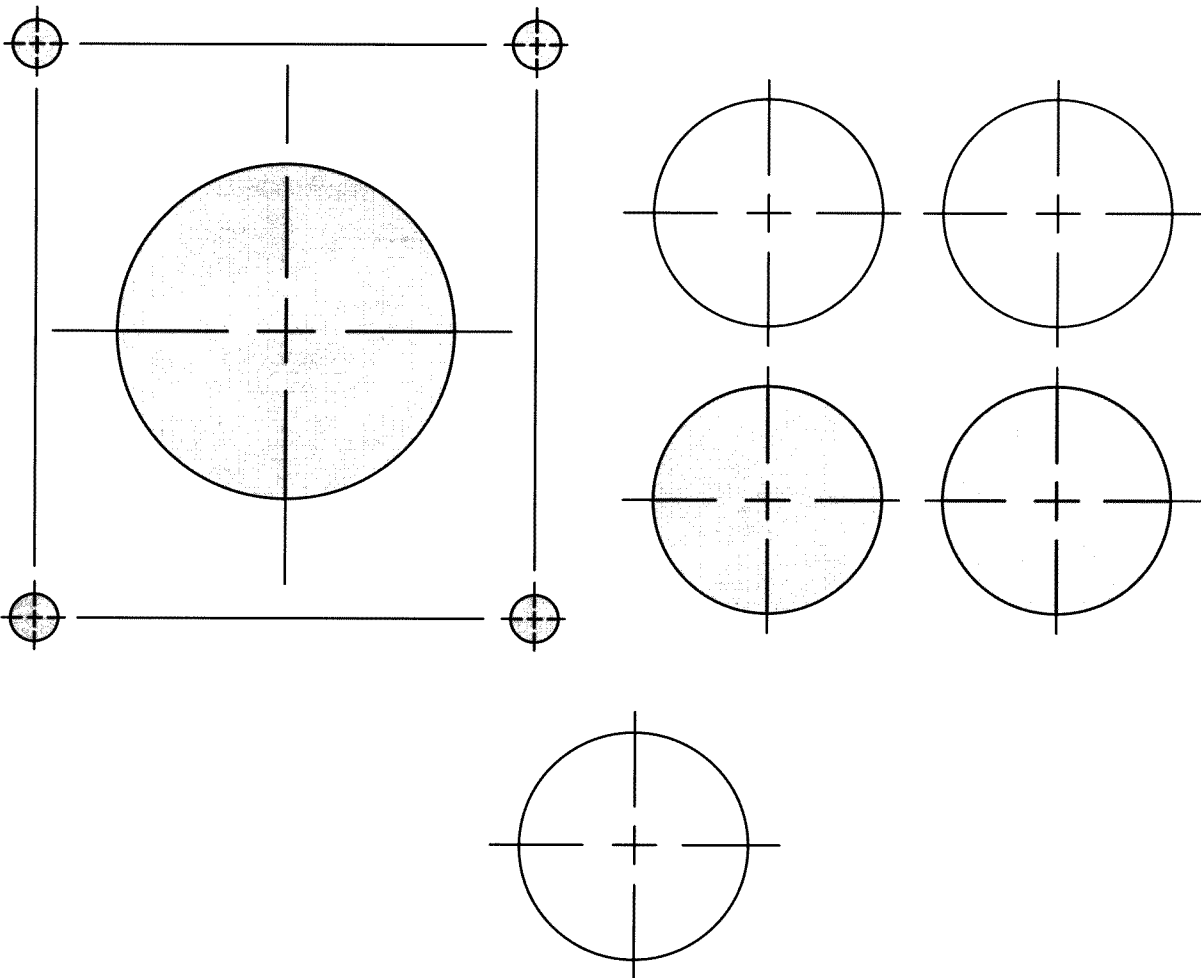






**Figure 1-8 Two-Player Hole-Cutting Template for Guardians of the 'Hood™ Kit Control Panel (Dynamo Cabinets)**

Top



**NOTE:** Shaded circles represent existing holes in the Dynamo control panel.



# Self-Test

## Introduction

**U**SE THE Guardians of the 'Hood self-test to check the condition of the game circuitry and controls. You will see the self-test information on the video display and hear the sound test information through the speakers. You do not need any additional equipment to perform the self-test. **F** Perform the self-test



when you first set up the game, each time you collect the money, or when you suspect game problems. This

chapter shows the screens in the self-test and explains each of the tests. The screens and explanations are arranged in the order they appear in the self-test. Table 2-1 lists all the self-test screens.

# Entering and Exiting the Self-Test

This game has two self-test switches. The primary one is conveniently located inside the upper coin door (inside the left edge of the opening). The secondary self-test switch is located on the JSA Audio III PCB, in the drawer behind the control panel.

To enter the self-test, turn on the self-test switch inside the upper coin door. Doing so displays the Select Test menu (entitled "Self Test"); see Figure 2-1. Exit the self-test by turning off the self-test switch at any time.

## RAM and ROM Test

When you turn on the power, the game automatically runs through the random-access memory (RAM) and read-only memory (ROM) test. This test is not part of the self-test procedure. Regardless of whether or not the game has a problem, it will always advance to the attract mode. The game will stop only if you power it

Self Test (Select Test Menu)
Switch Test
Volume Adjust
Sound Test
Coin Options
Game Options
Game Statistics
Alpha(numeric) Test
Motion Object Test
Playfield Test
Color Test
First Color Test
Second Color Test
Red Color Purity
Green Color Purity
Blue Color Purity
White Color Purity
Grey Color Purity
Convergence Test
White Convergence
Violet Convergence
Blue Convergence
Yellow Convergence

**Table 2-1 Summary of All Self-Test Screens**

up and the self-test switch has been previously turned on.

### Game RAM Test

No message appears while the test is checking the RAMs. If more than 30 seconds elapse and the self-test menu doesn't appear, the game has a problem. See Table 2-2 for the locations of bad RAMs. If the test finds no RAM errors, no message appears and the program goes to the ROM test after 15–20 seconds.

### Game ROM Test

If the test finds no ROM errors, no message appears and the program goes to the title screen in the attract mode. If a ROM fails, a message is displayed. Furthermore, if the failed ROM is a program ROM, then the error number with checksums is shown in the center of the screen. The ROM error test takes a few seconds. See Table 2-3 for the location of bad ROMs.

If you think you have a ROM error, but the screen shows no messages, see Table 3-3 for information about the locations of various ROM functions.

Depending on how bad the ROM error is, you may not be able to enter the self-test.

## Select Test Menu

Choose which test or screen you want to see from this menu, shown in Figure 2-1. Move up and down the menu using any joystick. Start the selected test by pressing any Defend button.

Error Address	RAM Location	
	High	Low
FE8000 (Color RAM)	3C	2C
FF0000 (Video RAM)	17N	15N

**Table 2-2 Bad RAM Location by Error Address**

Error Address	ROM Location	
	High	Low
000000	8D	8C
020000	9D	9C

**Table 2-3 Bad ROM Location by Error Address**



Figure 2-1 Select Test Menu Screen

# Volume Adjust

Adjust the volume of the game using this screen, shown in Figure 2-3. Follow the instructions at the bottom of the screen to change the volume, to restore the old volume level, and to save the new volume and return to the select test menu.

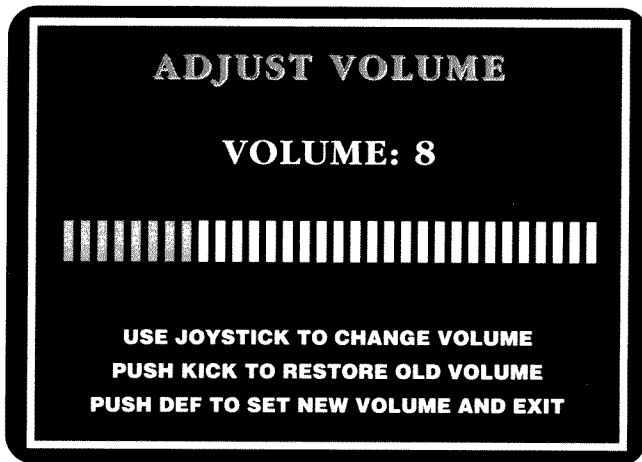


Figure 2-3 Volume Adjust Screen

# Switch Test

The switch test screen for a two-player game is shown in Figure 2-2. Test the joysticks and pushbutton switches. As you use each control, the pink Xs for the pushbuttons change to Os, or the joystick switch markers (small yellow dots) are highlighted. If the changes do not appear on the screen, check the switch wiring and the switches.

## NOTE

*The coin mechanisms are checked in the Sound test. See the section that follows.*

Press the Punch and Kick buttons simultaneously to return to the select test menu.

# Sound Test

The sound test indicates the condition of the sound effects circuit on the game PCB. The sound test screen appears in Figure 2-4.

Use one of the joysticks to select from the sounds; press one of the Punch buttons to listen to it. (You can have numerous sounds playing simultaneously, or you

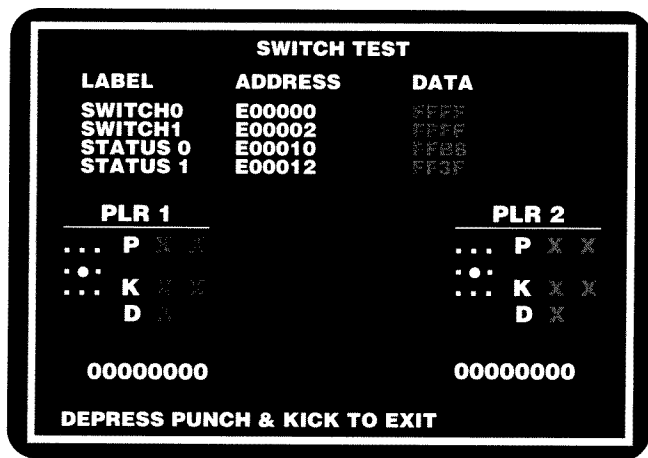


Figure 2-2 Switch Test Screen

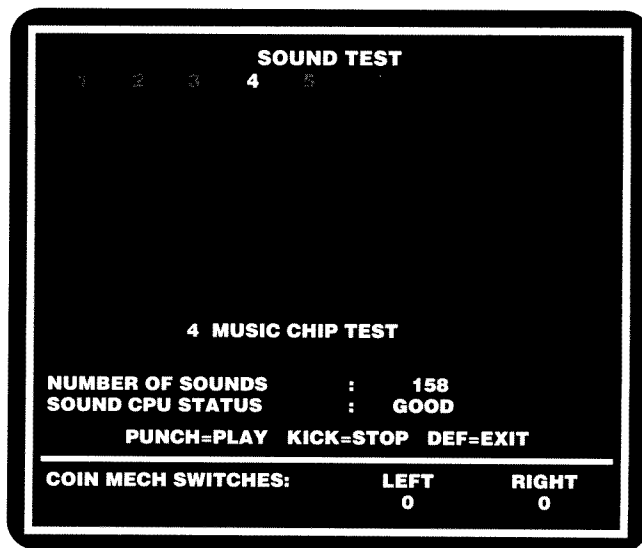


Figure 2-4 Sound Test Screen



Option	Available Settings	Explanation
<b>Free Play</b>	No ♦ Yes	Lets you choose free play to demonstrate the game.
<b>Discount to Continue</b>	No ♦ Yes	If set to Yes, this option reduces by 50% the player's cost to continue a game (always rounded up to the next full coin).
<b>Game Cost</b>	1 coin 1 credit ♦ 2 coins 1 credit ... 8 coins 1 credit	The number of coins required for one credit.
<b>Bonus for Quantity Buy-in</b>	None ♦ 2 coins give 1 3 coins give 1 3 coins give 2 4 coins give 1 ... 9 coins give 2 9 coins give 3	Lets you choose from various kinds of bonuses or no bonus.
<b>Right Mech Value</b>	1 coin counts as 1 coin ♦ 1 coin counts as 2 coins ... 1 coin counts as 7 coins 1 coin counts as 8 coins	The number of coins each coin counts as in the right coin mechanism.
<b>Left Mech Value</b>	1 coin counts as 1 coin ♦ 1 coin counts as 2 coins ... 1 coin counts as 7 coins 1 coin counts as 8 coins	The number of coins each coin counts as in the left coin mechanism.

♦ *Manufacturer's recommended settings*

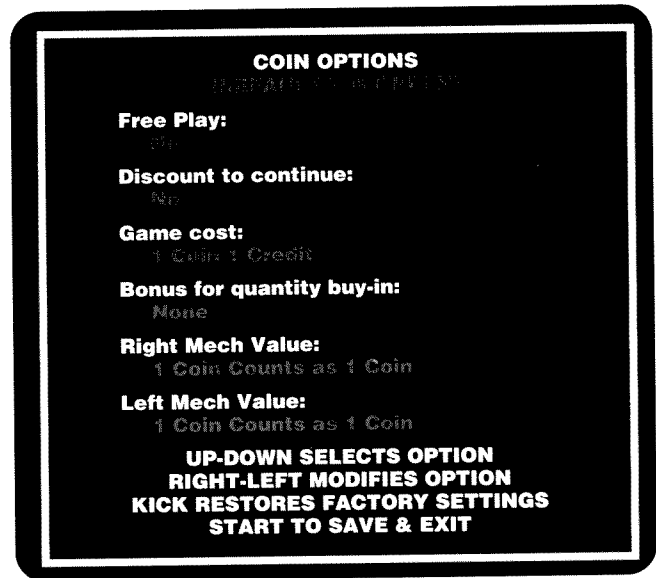
**Table 2-4 Coin Option Settings**

can have silence, depending on which ones you select.) Pressing any Defend button returns you to the select test menu.

## Coin Options

Check and select the coin options on this screen, shown in Figure 2-5. The screen shows the factory default settings in green.

To move through the options, to change or save the settings, or to return to the select test menu, follow the instructions shown at the bottom of the screen. The coin option settings, with defaults, are shown and explained in Table 2-4.



**Figure 2-5 Coin Options Screen**

Option	Available Settings	Explanation
<b>Difficulty Level</b>	Scale of 1 to 8 (where 1 = Easy and 8 = Hard) 5 ♦	Sets the game difficulty.
<b>Music in Attract (Mode)</b>	Yes ♦      No	Lets you turn the sound on or off in the attract mode.
<b>Cabinet Configuration</b>	Two-Player ♦      Three-Player	Sets the number of players who can use the game.
<b>Auto Clear High Scores</b>	Yes ♦      No	Automatically clears the high score table periodically.
<b>Clear High Scores Now</b>	Yes      No ♦	Immediately clears the high score table in the self-test.
<b>Display EPA Screen</b>	Yes ♦      No	Periodically displays the U.S. Environmental Protection Agency (EPA) emblem and the message "Recycle, Don't Trash It!" in the attract mode. If this game is used outside of the U.S., we recommend you set this option to "No."

♦ Manufacturer's recommended settings

**Table 2-5 Game Option Settings**

## Game Options

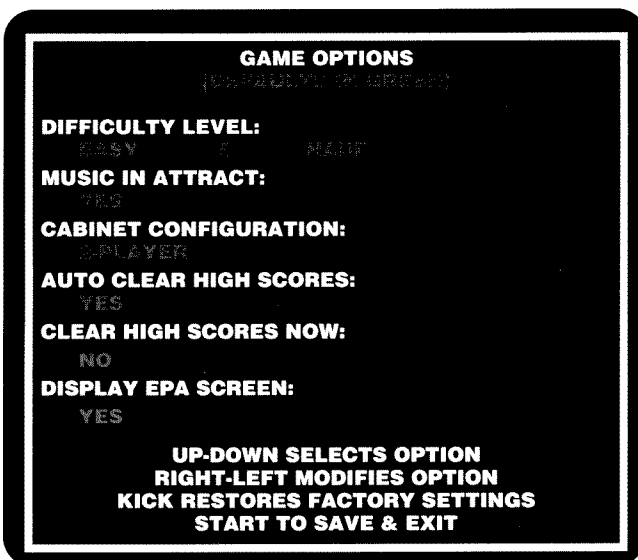
Check and select the game options on this screen, shown in Figure 2-6. The screen shows the factory default settings in green.

To move through the options, to change or save the settings, or to return to the select test menu, follow the instructions shown at the bottom of the screen. The game options, with defaults, are shown and explained in Table 2-5.

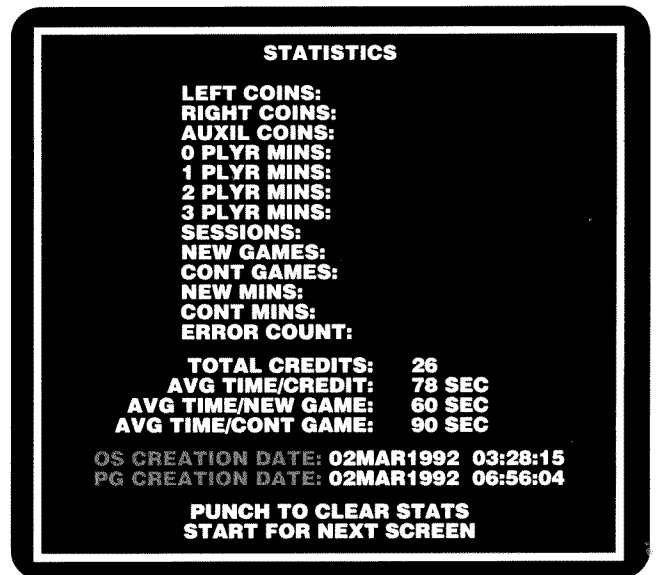
## Game Statistics

Use the information shown in the four statistics and histogram (bar graph) screens to keep track of your game use and maximize your profits. Record the information on the Guardians of the Hood statistics page in the back of this manual. The first of the screens is shown in Figure 2-7.

The game statistics are collected from the last time the statistics were cleared. You can clear the statistics by pressing the Punch button. Press any Defend button to advance to the next statistics or histogram screen, or to go back to the select test menu.



**Figure 2-6 Game Options Screen**

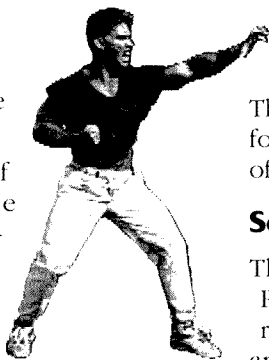


**Figure 2-7 Statistics Screen**

## First Statistics Screen

The first statistics screen lists the following information:

- Left Coins shows the number of coins counted in the left coin mechanism.
- Right Coins shows the number of coins counted in the right coin mechanism.
- Auxiliary Coins shows the number of coins counted on the auxiliary service coin inputs.
- 0 Plyr Mins shows the number of minutes that the game was idle.
- 1 Plyr Mins shows the number of minutes that the game was played by one person only.
- 2 Plyr Mins shows the number of minutes that the game was played by two people.
- 3 Plyr Mins shows the number of minutes that the game was played by three people.
- Session is measured from when the first player starts a game until the *Game Over* message appears.
- New Games shows the number of unique games played. A unique game is counted every time a player starts a new game (not a continued game).
- Cont Games shows the number of games that players continued.
- New Mins shows the number of minutes that the game was played as new games.
- Cont Mins shows the number of minutes that the game was played as continued games.
- Error Count shows the number of errors counted in the erasable memory. If you have an error count, the statistics may be wrong. If you consistently have errors counted for several weeks, replace the EEROM at 30E on the Guardians of the Hood game PCB.
- Total Credits is the number of credits accumulated by the game.
- Average Time per Credit is displayed in seconds. This item is tabulated for all games played since the statistics were cleared. If there are no credits, this line will not be displayed.
- Average Time per New Game is also displayed in seconds.
- Average Time per Continued Game is also displayed in seconds.



## Statistics 2 Screen

The next statistics screen (titled “Round Counts and Average Times”) lists the locale of each round. After the 13 locales, the screen shows how many players achieved those rounds and their average times playing those rounds.

## New Game Time Screen

The next statistics screen (titled “New Game Time in Seconds”) lists the length of time for all new games, grouped in 20-second increments (except for the shortest games lasting 0–39 seconds).

## Continuation Game Time Screen

The next statistics screen (titled “Continuation Game Time in Seconds”) lists the same information as the previous screen, except for continued games.

## Session Time Screen

The next statistics screen (titled “Session Time in Minutes”) lists how long each session lasted.

The bottom of the screen displays the median point for all session times. The median point represents half of all players above this point and half below.

## Segment Screen

The next statistics screen (titled “Segment at Which Player Quit”) lists which game segments players reached. The bottom of the screen displays the median point for all attained game segments.

## Wave 1–4 Screens

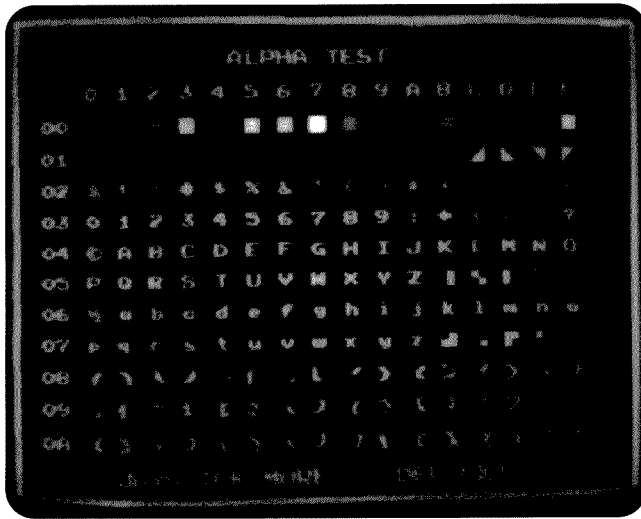
The remaining four statistics screens (titled “Who’s the most popular — Wave 1–4”) lists which characters were most often chosen by players at the start of each wave.

# Alphanumeric Test

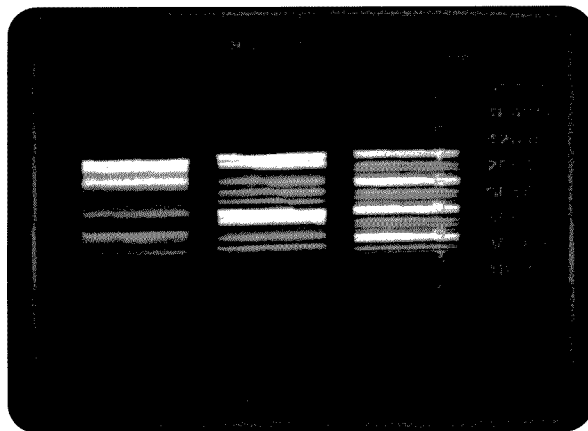
The alphanumeric test, shown in Figure 2-8, checks the condition of the alphanumerics in the game. If you see an error on the screen, check the EPROM at 15L. Moving any of the joysticks up or down scrolls the screen up and down. Press any Defend button to go to the select test menu.

# Motion Object Test

The motion object test screen, shown in Figure 2-9, tests the movement and color of various game objects. The most important part of this screen is the ROM sta-



**Figure 2-8 Alphanumeric Test Screen**

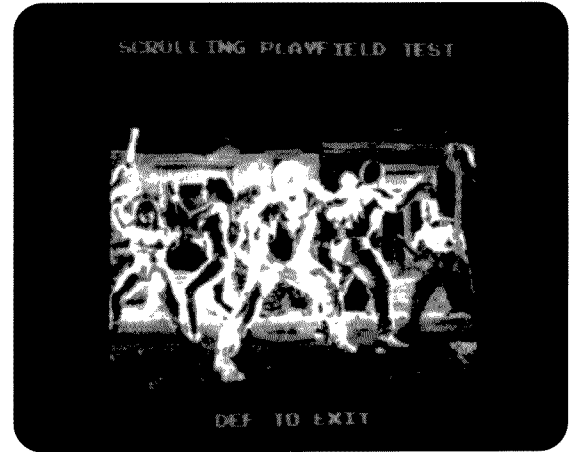


**Figure 2-9 Motion Object Test Screen**

tus squares on the right side. The squares should all be green (indicating good motion object ROMs); red squares indicate bad ROMs. The squares are displayed the same way as the ROMs are installed on the game PCB — columns S and P and rows 9 to 2.

Choose an object and move it or change it as follows:

<b>Control:</b>	<b>This action results:</b>
Left joystick	Left/right and up/down moves the object around on the screen.
Right joystick	Up/down enlarges/shrinks the object.
Left Punch, Kick	Selects one of the three motion objects (called 0, 1, and 2).
Right Punch, Kick	Selects a picture that will be displayed and manipulated as the motion object.



**Figure 2-10 Playfield Test Screen**

Press any Defend button to go to the select test menu.

## Playfield Test

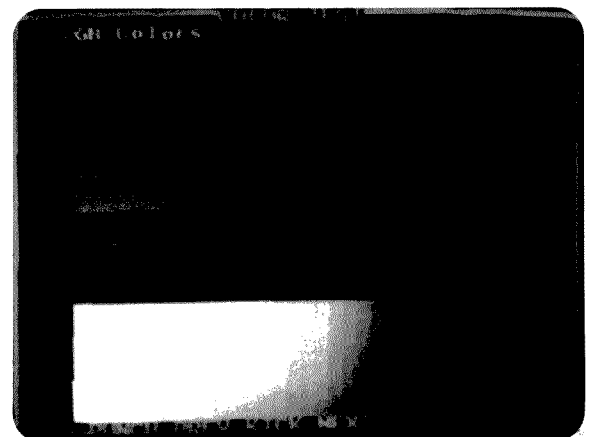
The playfield test screen, shown in Figure 2-10, tests the movement of the playfield.

Move the left joystick up, down, left, and right to check whether the whole picture moves accordingly. Press any Defend button to go to the select test menu.

## Color Test

This test has seven screens, the first of which is shown in Figure 2-11. Advance to each screen by pressing the Kick button.

- The first color test (labeled "0-RGB") indicates the dynamic range of the video display color circuit.



**Figure 2-11 Color Test Screen**

The screen should show four bands (red, green, blue, and white, from top to bottom), ranging from bright to dark, left to right. The red, green, and blue bands are produced by only one color gun being turned on in each band. At the bottom is a white band, in which all three color guns are turned on.

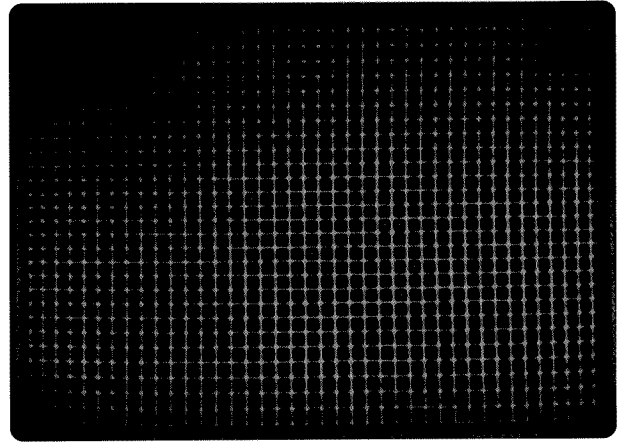
- The second color test (labeled “1–YCP”) shows the same as the first color test, but with two color guns being turned on in three bands — a yellow band (red and green guns), cyan band (blue and green guns), and purple band (blue and red guns). At the bottom is a white band.
- The remaining screen numbers 2 through 6 are color purity tests. The rectangles of color shown are red, green, blue, white (“GREY Purity 1”), and grey (“GREY Purity 2”).

Each screen should display a straight rectangle of color, with no curving at the corners, no unevenness of color, and no lines in the display.

If any of these screens are not correct, adjust the video display as described in the video display manual. Return to the select test menu by pressing any Jab button.

## Convergence Test

The convergence test has four screens — white, violet, blue, and yellow grid lines. The white screen is shown in Figure 2-12. To see the remaining screens, press any Kick or Jump button. Press any Jab button to go to the select test menu.

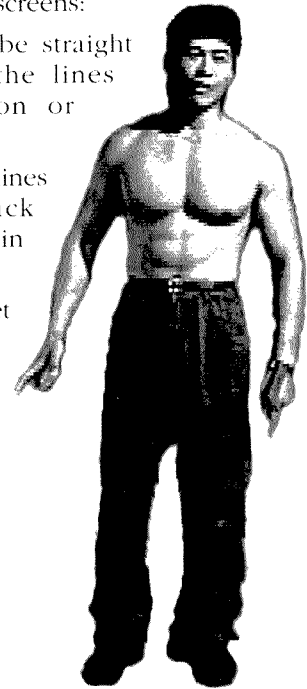


**Figure 2-12 Convergence Test Screen**

Check the following on the screens:

- The grid lines should be straight within 3.0 mm and the lines should not pincushion or barrel.
- The convergence of the lines on the violet and black screens should be within 2.0 mm.

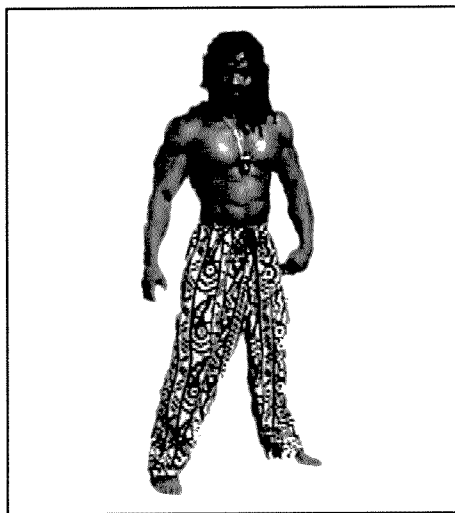
If these screens do not meet these criteria, adjust the video display as described in the video display manual.



# Troubleshooting and Maintenance

## INTRODUCTION

**T**HIS CHAPTER contains troubleshooting tables and re-



pair procedures for your Guardians of the 'Hood™ game. The chapter has two parts. The first part contains three troubleshooting tables. The tables contain general troubleshooting information, the voltage levels and test

points on the printed-circuit boards, and a list of ROM-caused problems, with specif-

ic ROMs to check and replace. ■ The last part of the chapter has information about connecting the video display (if it requires separate positive sync) and repair information for the joystick controls.



<b>Problem</b>	<b>Suggested Action</b>
<b>Coin Mechanism Problem</b>	<ol style="list-style-type: none"> <li>1. Check the wiring to the coin mechanism.</li> <li>2. Check the voltage to the + side of the mechanism.</li> <li>3. Test the coin mechanisms with the controls test screen in the self-test.</li> </ol>
<b>Game Play Problem</b>	<ol style="list-style-type: none"> <li>1. Check the harness and connectors.</li> <li>2. Perform the self-test.</li> <li>3. Check the voltage levels on the PCB. See Table 3-2, <i>Voltage Inputs and Test Points</i>.</li> <li>4. Check <i>What ROM Problems Look Like</i>, Table 3-3, for specific ROM problems.</li> </ol>
<b>Control Problems</b>	<ol style="list-style-type: none"> <li>1. Check the harnesses and connectors.</li> <li>2. Check the switches on the control.</li> <li>3. If you took the control apart, have you reassembled it correctly?</li> <li>4. Make sure all the parts on the control are in good repair. Repair or replace parts.</li> <li>5. Is the "Cabinet Configuration" option in the self-test game options set correctly?</li> </ol> <p>NOTE: The joysticks and three-button switches do <i>not</i> require lubrication.</p>
<b>Sound Problem</b>	<ol style="list-style-type: none"> <li>1. Is the speaker volume turned up? (Volume is adjusted digitally in the self-test.)</li> <li>2. Check the voltage on the JAMMA connector.</li> <li>3. Check the wiring from the PCB to the speaker.</li> <li>4. Check the voltage level to the PCB. See Table 3-2, <i>Voltage Inputs and Test Points</i>.</li> <li>5. Replace the speaker.</li> </ol>
<b>Video Display Problem</b> Screen is dark.	<ol style="list-style-type: none"> <li>1. Is the game plugged in?</li> <li>2. Is the game turned on?</li> <li>3. Are the connections good?</li> <li>4. Is the line fuse good?</li> <li>5. Is the display brightness turned up?</li> <li>6. Are the solder connections on the line filter and transformer good?</li> <li>7. Is the JAMMA connector on the PCB tightly connected?</li> <li>8. Check all of the items below. If you answer <i>no</i> to any question, you have a problem with the video display, not with the game circuitry. See your video display service manual. <ol style="list-style-type: none"> <li>a. Do you have power to the video display?</li> <li>b. Are the video display's filaments lit?</li> <li>c. Do you have high voltage to the video display?</li> </ol> </li> <li>9. Are the voltage levels to the video display PCB correct? (Power voltage is 100 VAC or 110 VAC, depending on the type of video display. Video signal voltage is 0.5 to 3.5 Volts.)</li> <li>10. If the level is not correct, check the connectors and the harness.</li> </ol>
Only a colored screen appears.	You probably have a serious RAM problem.
Display area wavers or is too small.	<ol style="list-style-type: none"> <li>1. Do you have correct power voltage to the video display PCB?</li> <li>2. Do you have correct high voltage to the video display?</li> </ol>
Picture is wavy.	<ol style="list-style-type: none"> <li>1. Is the monitor ground connected to the monitor?</li> <li>2. Are the sync inputs connected properly?</li> </ol>
Picture is upside down.	When you serviced the display, you connected the wires incorrectly. Switch the horizontal or vertical yoke wires on the display.
Convergence, purity or color problems.	Use the screens in the self-test to adjust the video display. Use the adjustment procedures in your video display manual.
Picture is not centered.	Use the centering procedures in your video display manual.

**Table 3-1 Troubleshooting Table**

Voltage	Test Point or LED	Source and Purpose
+5 ± 0.25 VDC	+5V1	Logic power from the switching power supply.
	CR5 LED (Game PCB)	Lights when 5 V is applied to the PCB and the reset (RST) jumper is open.
	CR4 (Audio PCB)	Lights when the +12 V supply is good.
	CR3 (Audio PCB)	Lights when the -5 V supply is good.

**Table 3-2 Voltage Inputs and Test Points on the PCBs**

Problem	ROM Causing the Problem	Check the ROM at:
Program works, but motion objects or playfield is wrong.	Graphics ROMs	14S, 18S (Game PCB) 4D, 8D, 10D (Audio PCB)
Garbage on screen; program doesn't work.	Processor	13F (Game PCB)
Game program is erratic.	Program ROMs	17E, 17J, 19E, 19J (Game PCB)
No sound or erratic sound.	ADPCM ROMs	9B, 10B, 12B (Audio PCB)

**Table 3-3 What ROM Problems Look Like**

## Video Display Sync Problems

This game board provides separate positive horizontal and vertical sync on a separate connector, for monitors that will not work with the composite negative sync signal provided at the JAMMA edge connector.

This connector (labeled "Sync") is located near the edge connector. Pin 1 is horizontal sync, Pin 2 is vertical sync, and Pin 3 is ground.

## Troubleshooting

The tables in this chapter (3-1, 3-2, and 3-3) can help you troubleshoot problems in your game. The troubleshooting table lists possible sources of problems in various parts of the game. The voltage inputs and test points can help you troubleshoot PCB problems. The ROM problems table can help determine exactly which ROM might be causing game play problems.

## Removing and Replacing the Joystick Control

The joystick control is shown in Figure 4-2. If you have trouble with the joystick, make sure you have assembled it properly. Refer to the instructions included with the joystick or see Figure 4-2.

If you need to repair the joystick, first remove it from the control panel. Disassemble it by removing the retaining ring at the bottom of the shaft. To replace any of the four switches, remove the two screws that secure each switch.

## ROMs and RAMs

If you have think you have bad ROMs or RAMs, perform the ROM or RAM test in the self-test procedure. If you have a ROM problem, see Table 3-3. For the location of all the ROMs and RAMs on the game PCB, see Figure 4-4.

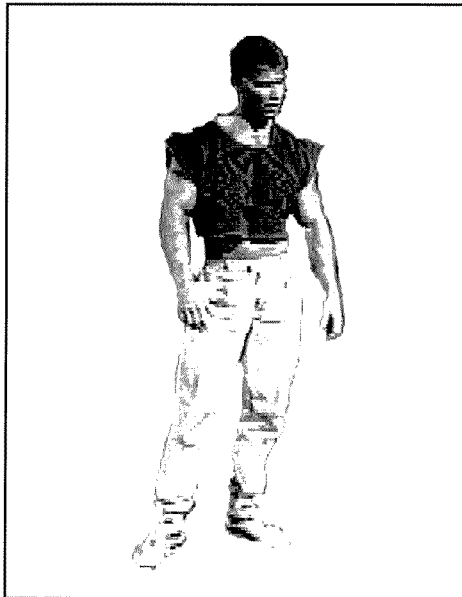
**N O T E S**

# Parts Illustrations

## INTRODUCTION

**T**HIS CHAPTER provides information you need to order replacement parts for your kit. Common hardware parts, such as screws, nuts, washers, and so on, are included in these parts illustrations.

When you order parts, give the part number, part name, the number of this manual,



and the serial number of your game. With this information, we can fill your order rapidly and correctly. We hope this will create less downtime and more profit from your games. Atari Games Customer Service phone numbers are listed on the inside front cover of this manual.

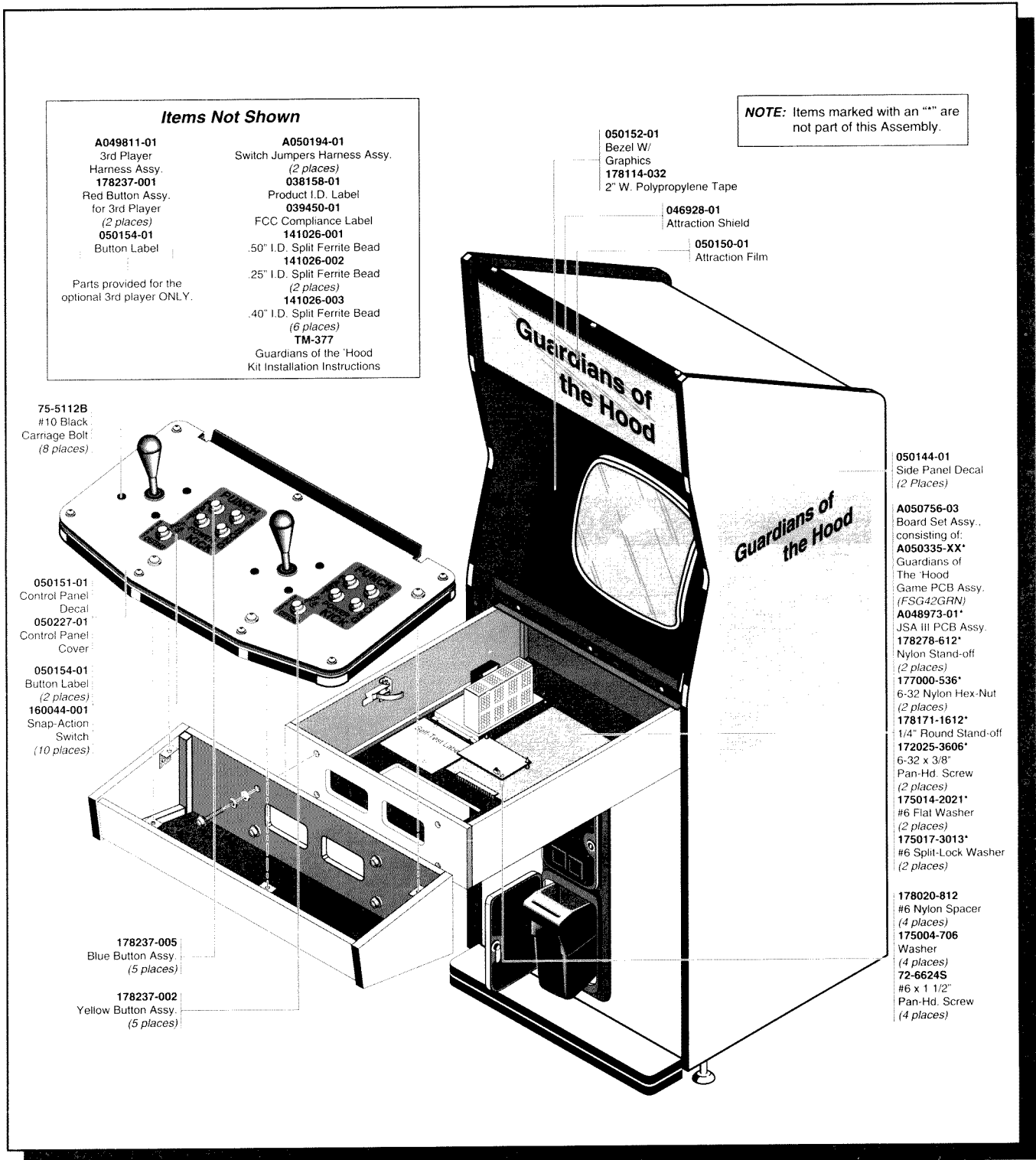
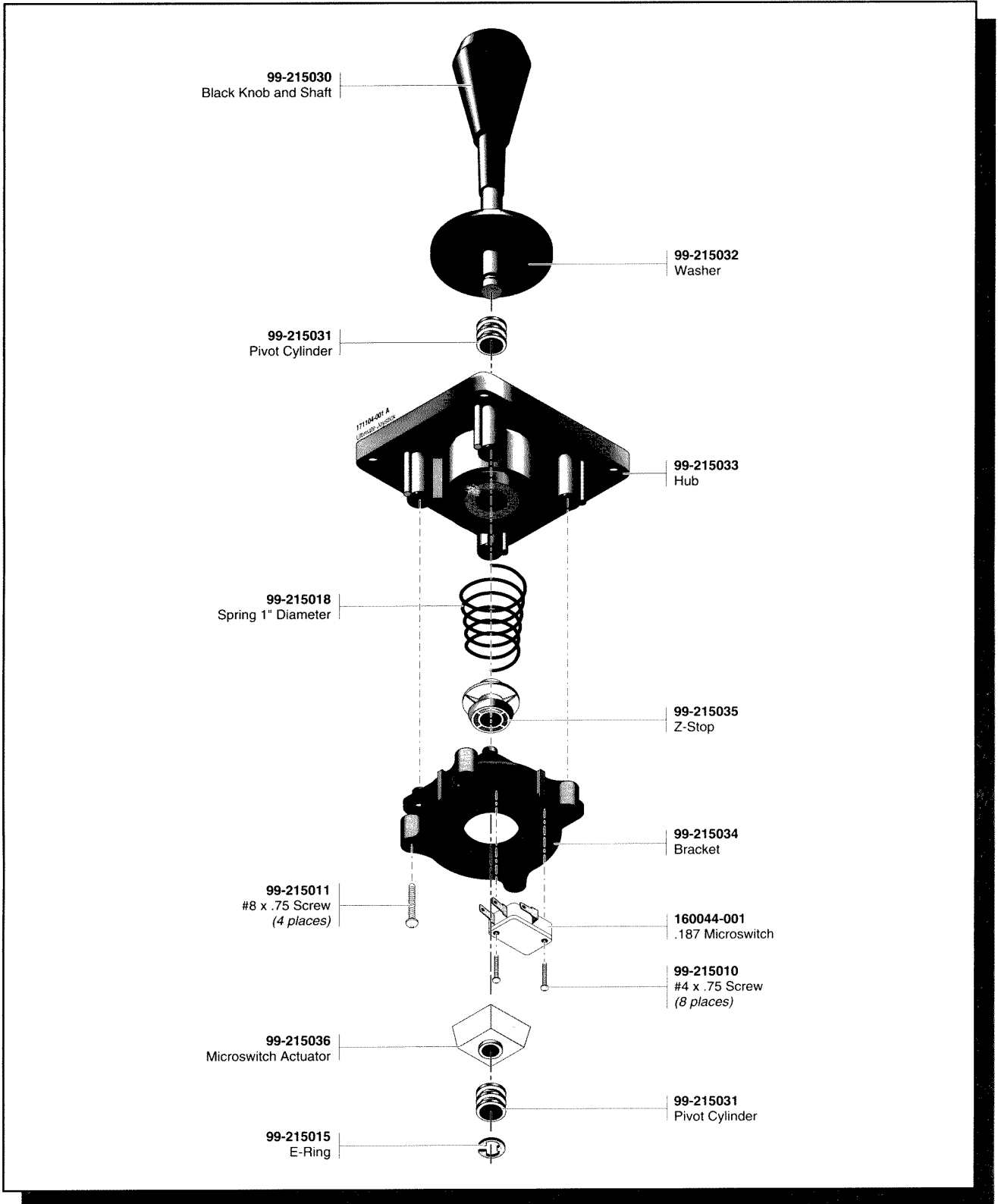


Figure 4-1 Parts of Guardians of the 'Hood Universal Kit (Two-Player Shown)

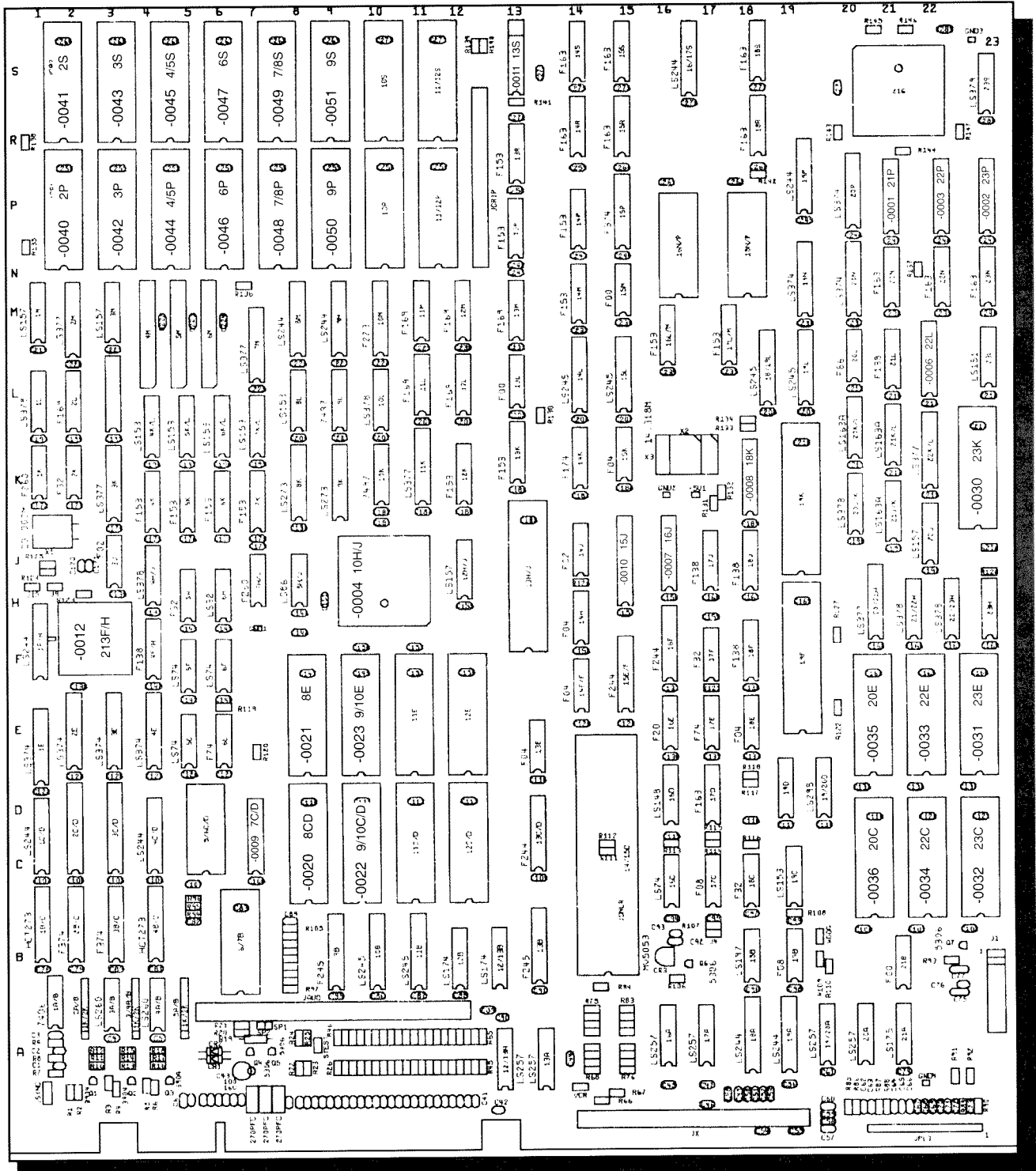
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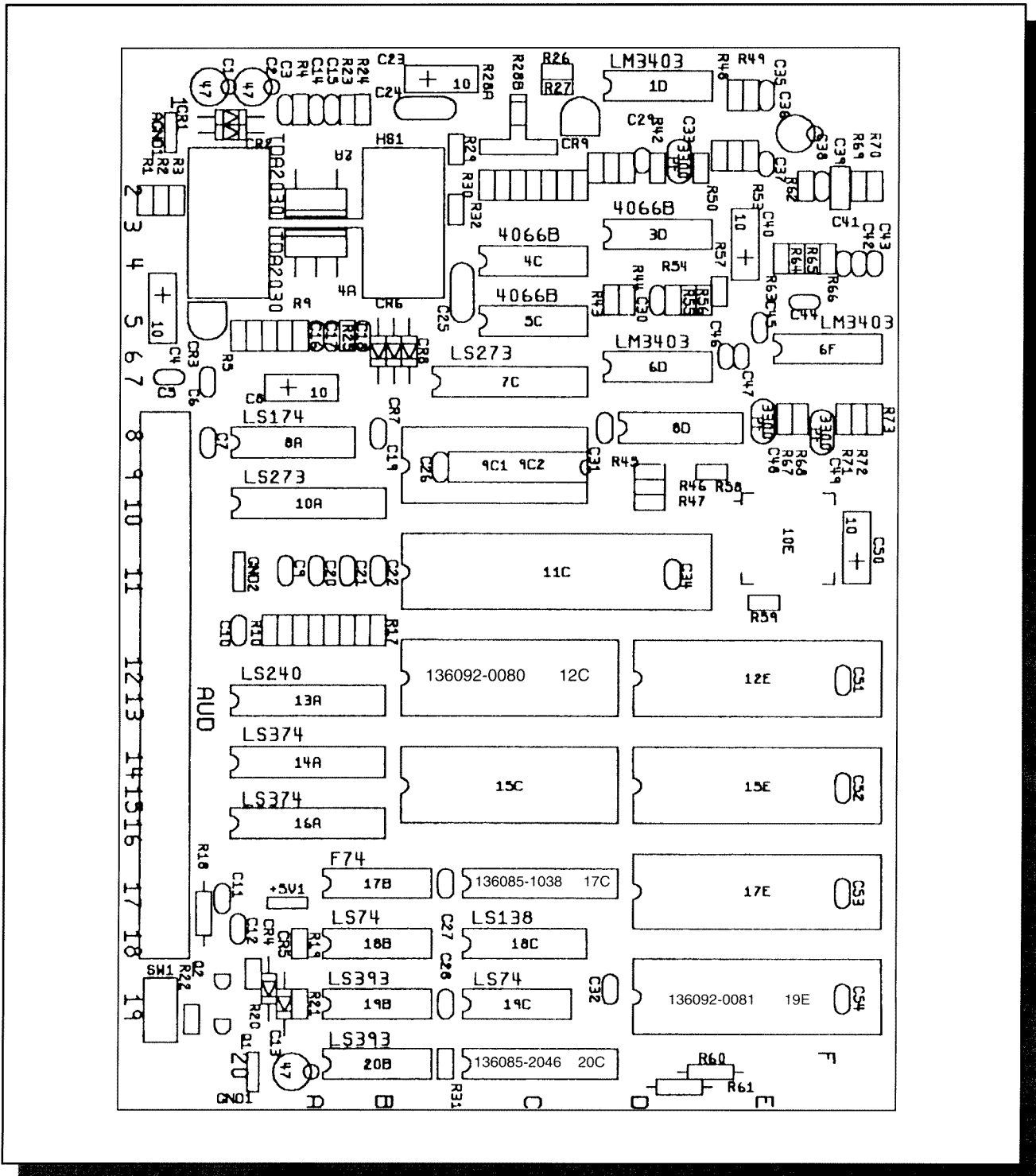
**Figure 4-2 8-Position, Gold-Contact Joystick Assembly**  
171099-001



**NOTE:** The first six digits of each program chip in this drawing are all the same number — 136092. The remaining four digits following the hyphen are marked in this drawing. For example, the part number for the chip in location 2S is 136092-0041.



**Figure 4-3 Guardians of the Hood Game PCB Assembly (FSG42GRN)**  
A050335-XX B



**Figure 4-4 JSA III Audio PCB Assembly**

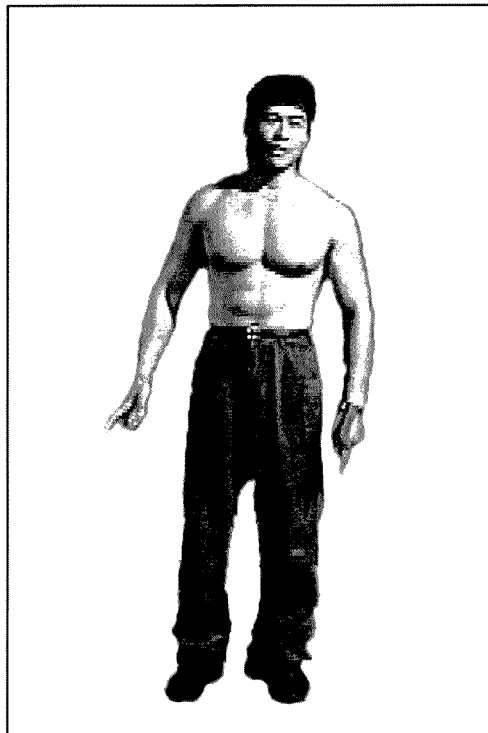
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**N O T E S**

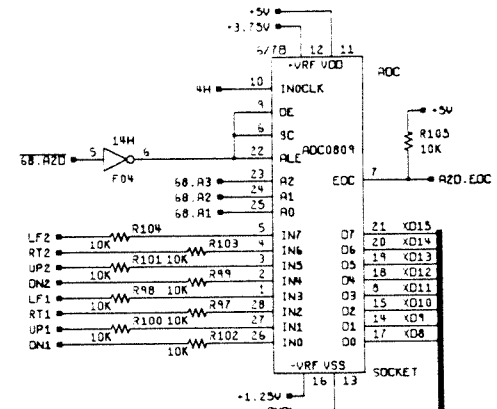
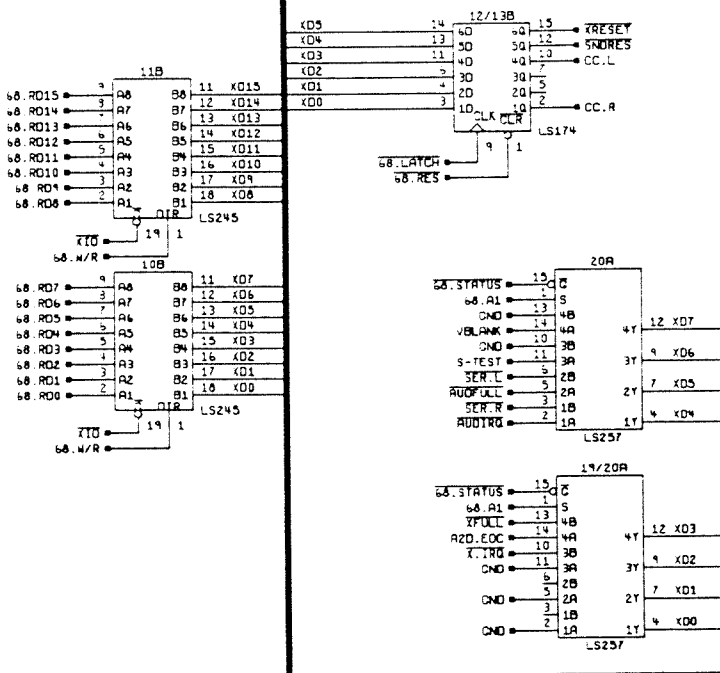
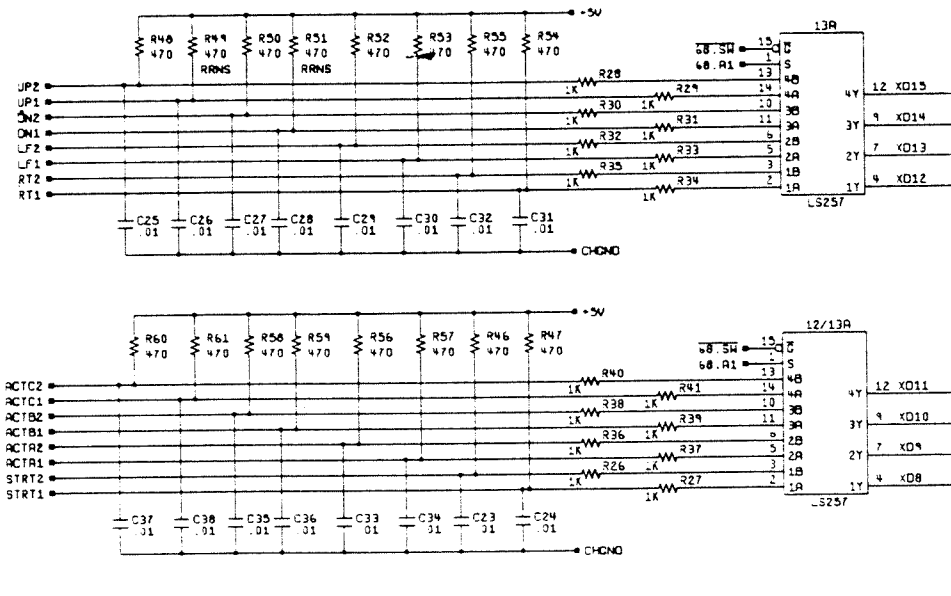
# Schematic Diagrams

## INTRODUCTION

**T**HIS CHAPTER contains partial schematic diagrams for the Guardians of the Hood™ game PCB and



the Audio PCB. The game PCB and Audio PCB *assembly drawings* are illustrated in Chapter 4, Parts Illustrations.



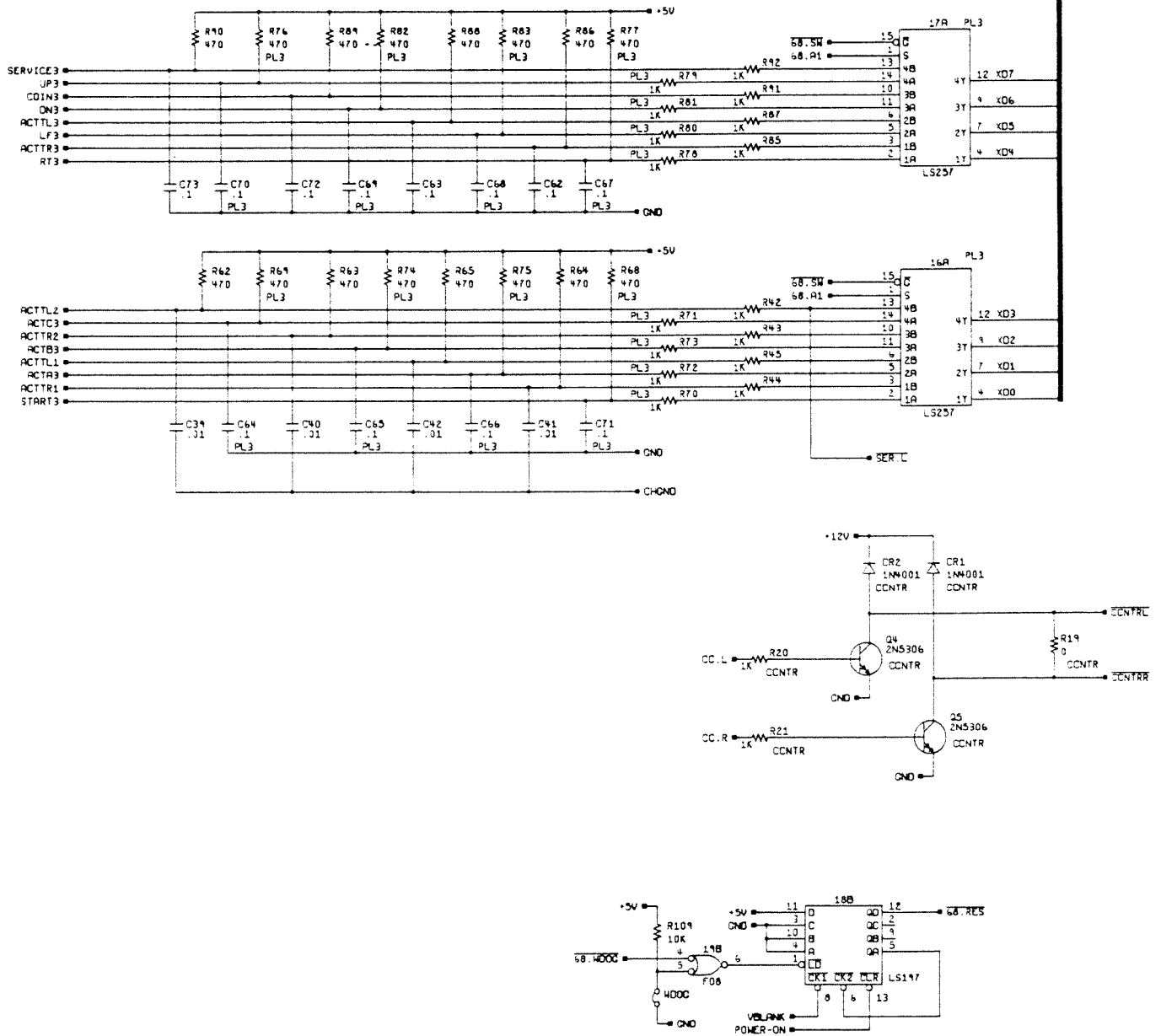


Figure 5-1 Guardians of the Hood Game PCB Assembly Schematic Diagram (FSG42GRN)

050335-XX B

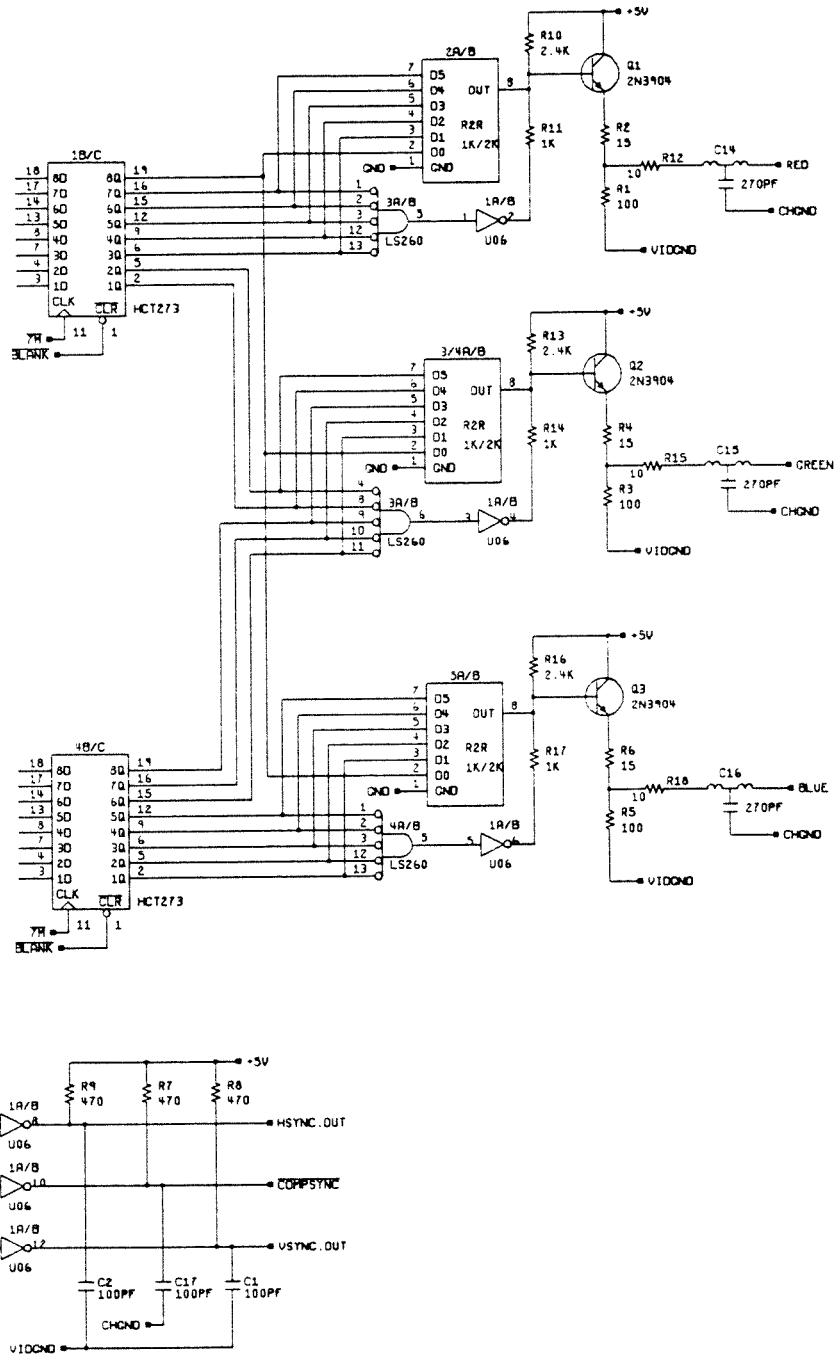


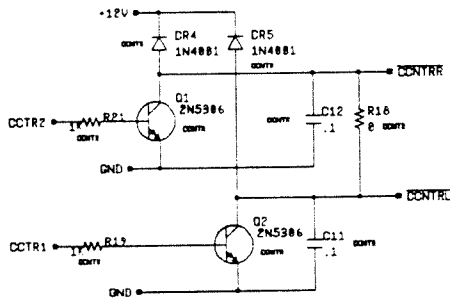
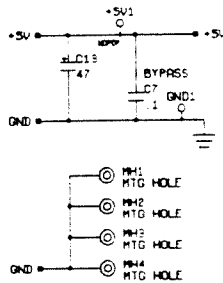
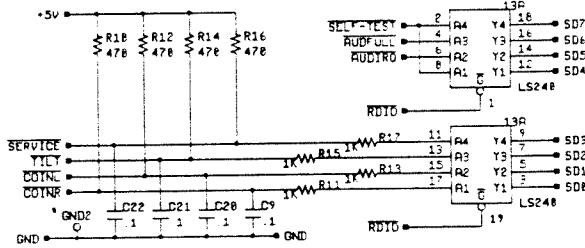
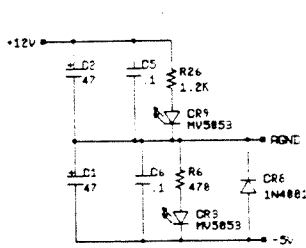
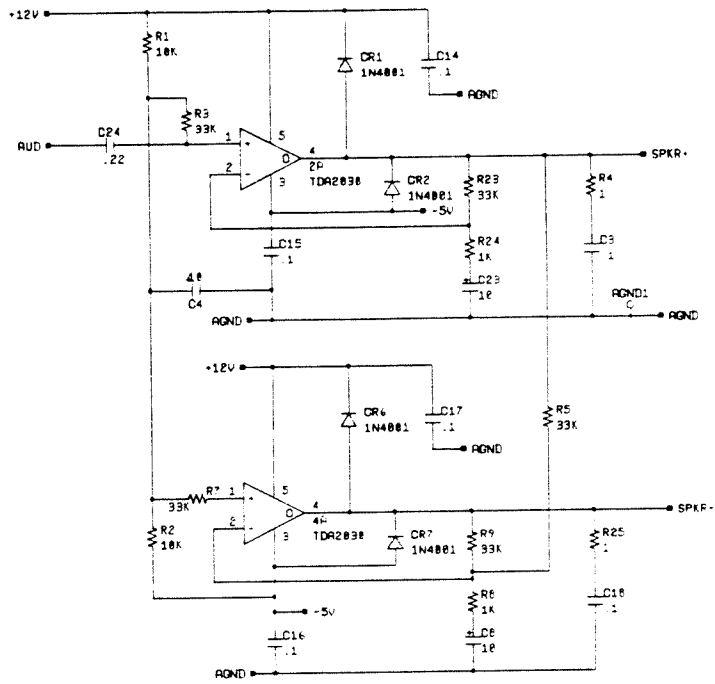
Figure 5-1 Guardians of the 'Hood Game PCB Assembly Schematic Diagram (FSG42GRN)

050335-XX B

**N O T E S**



- 1 RESTY
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- 5 AUDWR
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- 7 D6
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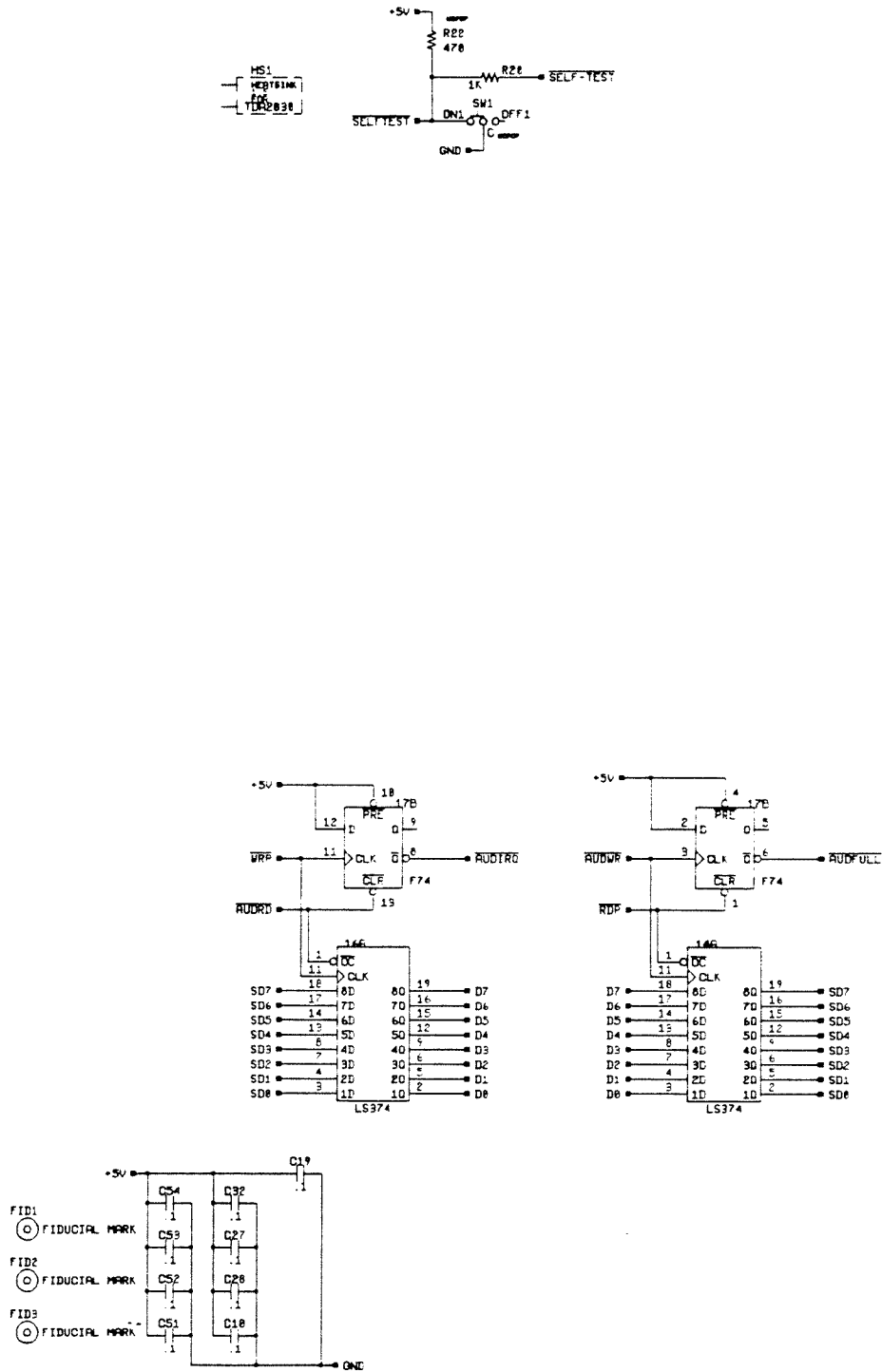
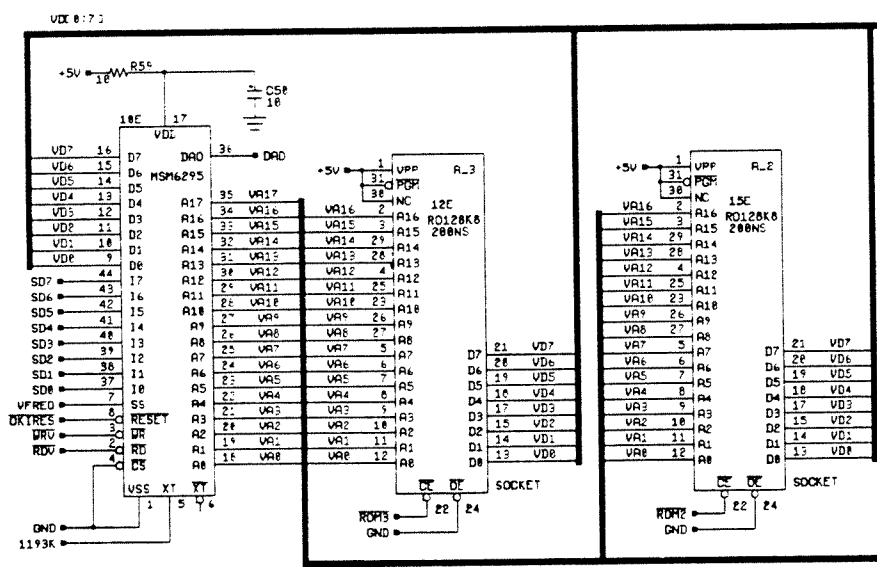
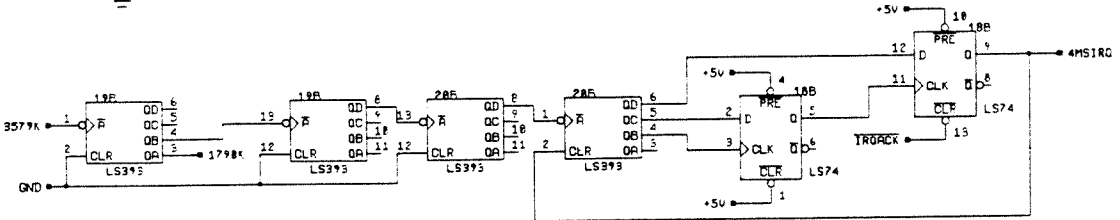
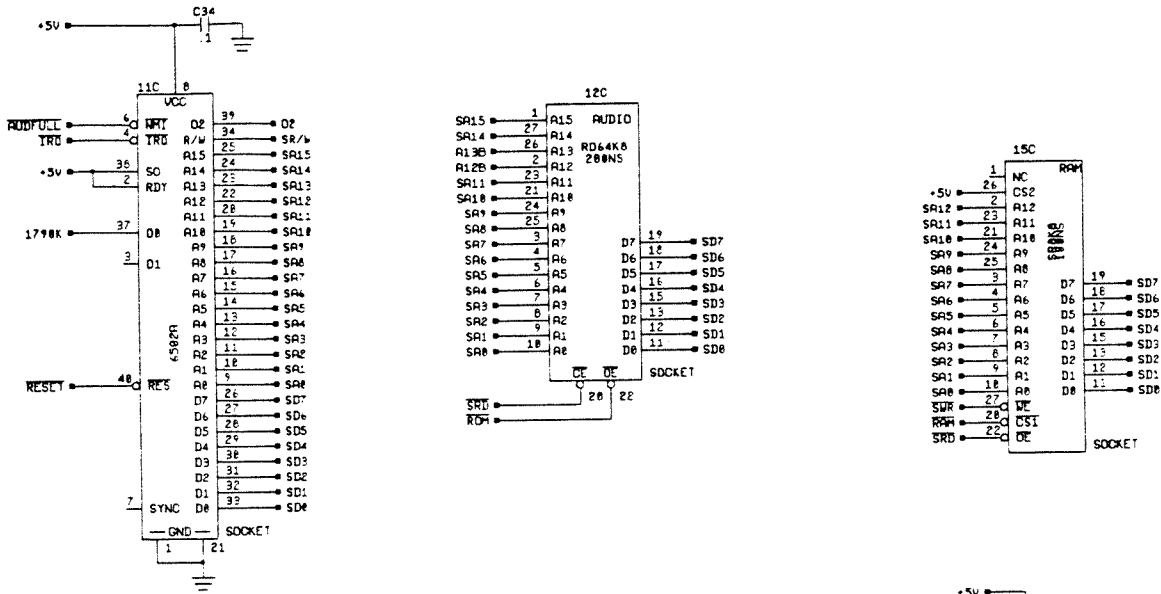


Figure 5-2 JSA Audio III PCB Assembly Schematic Diagram

048973-01 C



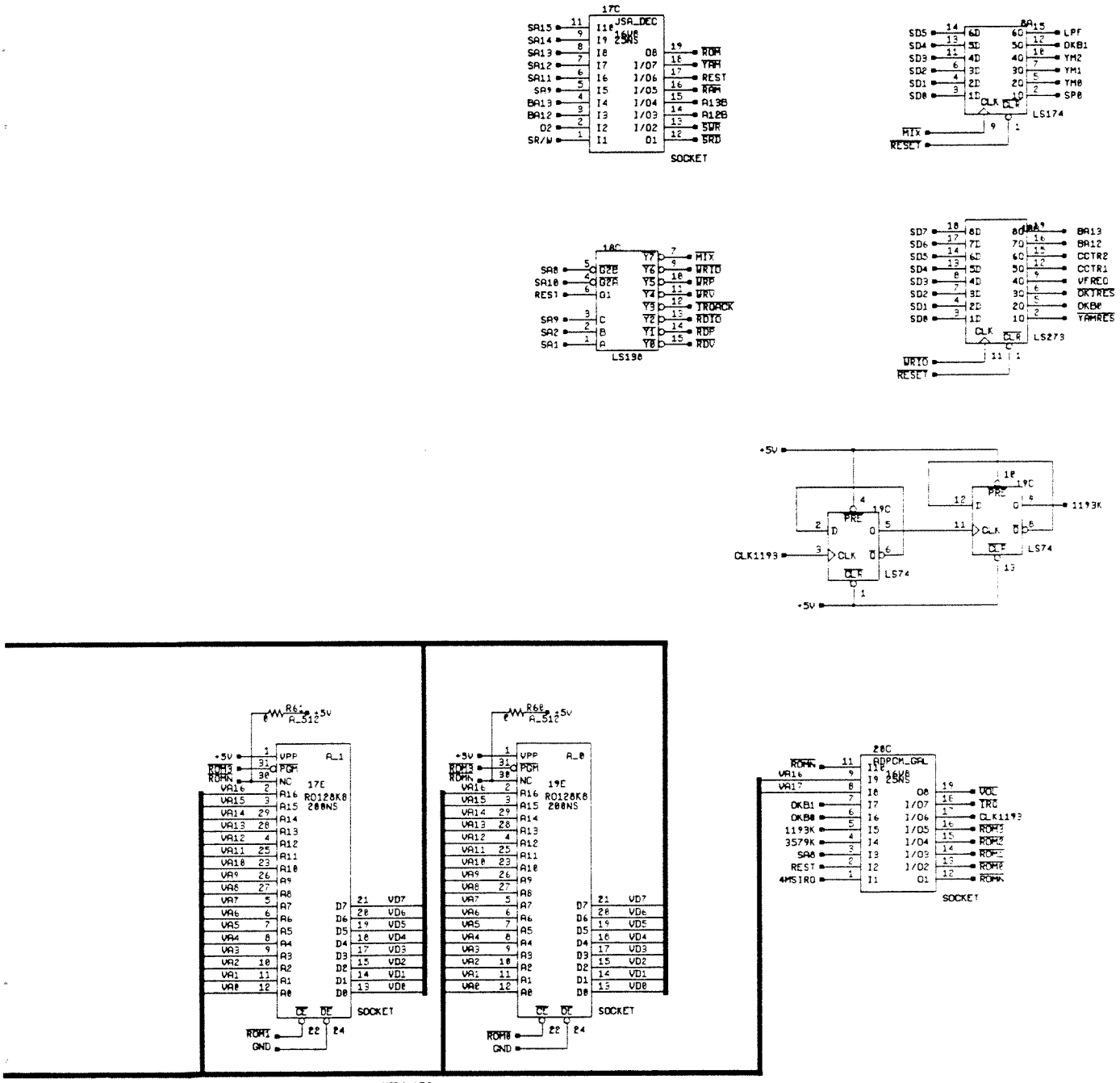
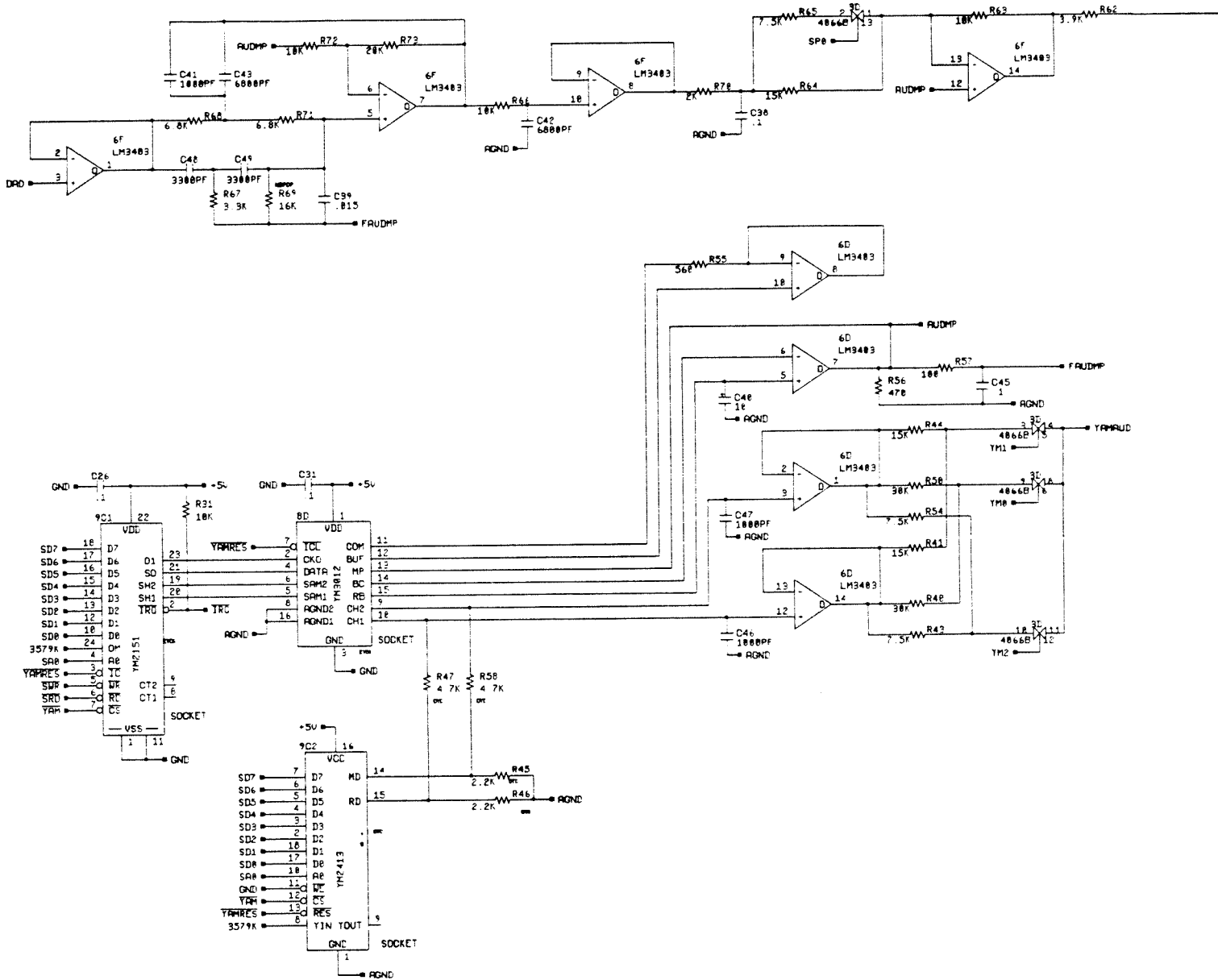


Figure 5-2 JSA Audio III PCB Assembly Schematic Diagram

048973-01 C



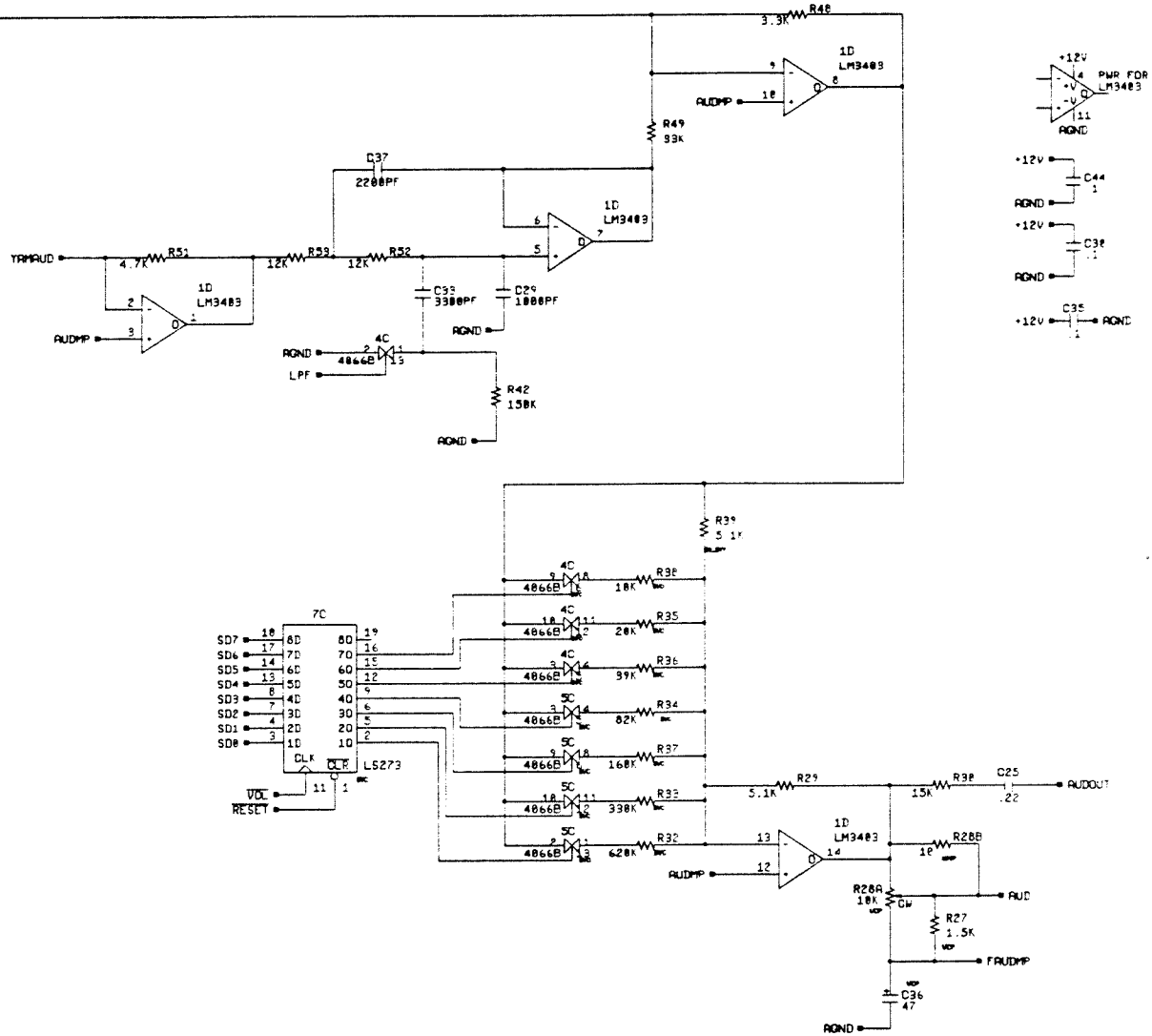


Figure 5-2 JSA Audio III PCB Assembly Schematic Diagram

048973-01 C

**N O T E S**

# Warranty

Seller warrants that its printed-circuit boards and parts thereon are free from defects in material and workmanship under normal use and service for a period of ninety (90) days from date of shipment. Seller warrants that its video displays and laser-video disc players (in games supplied with displays and video-disc players) are free from defects in material and workmanship under normal use and service for a period of thirty (30) days from date of shipment. None of the Seller's other products or parts thereof are warranted.

If the products described in this manual fail to conform to this warranty, Seller's sole liability shall be, at its option, to repair, replace, or credit Buyer's account for such products which are returned to Seller during said warranty period, provided:

- (a) Seller is promptly notified in writing upon discovery by Buyer that said products are defective;
- (b) Such products are returned prepaid to Seller's plant; and
- (c) Seller's examination of said products discloses to Seller's satisfaction that such alleged defects existed and were not caused by accident, misuse, neglect, alteration, improper repair, installation, or improper testing.

In no event shall Seller be liable for loss of profits, loss of use, incidental or consequential damages.

*Except for any express warranty set forth in a written contract between Seller and Buyer which contract supersedes the terms herein, this warranty is expressed in lieu of all other warranties expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose, and of all other obligations or liabilities on the Seller's part, and it neither assumes nor authorizes any other person to assume for the Seller any other liabilities in connection with the sale of products by Seller.*

The use of any non-Atari parts may void your warranty, according to the terms of the warranty. The use of any non-Atari parts may also adversely affect the safety of your game and cause injury to you and others. Be very cautious in using non-Atari-supplied components with our games, in order to ensure your safety.

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