




TM-369
1st printing

ROAD RIOT 4WD™

Operator's Manual



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:

UNITED STATES

Atari Games Corporation
California Customer Service Office
737 Sycamore Drive
Milpitas, CA 95036-1110
Fax (408) 434-3945
Telex 5101007850
☎ (408) 434-3950

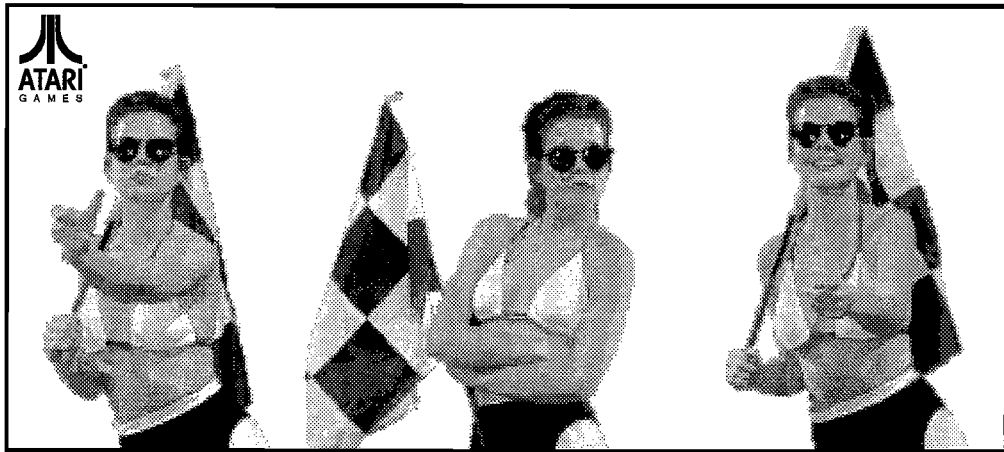
(Monday–Friday, 7:30 a.m.–4:00 p.m. Pacific time)

EUROPE

Atari Games Ireland Limited
European Customer Service Office
Tipperary Town, Ireland
Fax 062-51702
Telex 70665
☎ 062-52155

(Monday–Friday, 9:00 a.m.–5:30 p.m. GMT)

ROAD AND RIDE 4WD™



Operator's Manual

Copyright © 1991 by Atari Games Corporation. All rights reserved.

No part of this publication may be reproduced by any mechanical, photographic or electronic process, or in the form of a phonographic recording, nor may it be stored in a retrieval system, transmitted, or otherwise copied for public or private use, without permission from the publisher.

The game play, all graphic designs, this technical manual, its accompanying schematic diagrams, and the display manual are protected by the U.S. Copyright Act of 1976.

This Act provides for substantial penalties for violating federal copyright laws. Courts can impound infringing articles while legal action is pending. If infringers are convicted, courts can order destruction of the infringing articles.

In addition, the Act provides for payment of statutory damages of up to \$50,000 per infringing transaction in certain cases. Infringers may also have to pay costs and attorneys' fees and face an imprisonment of up to five years as well as fines of up to \$250,000 in the case of individuals and up to \$500,000 in the case of corporations.

Atari Games Corporation will aggressively enforce its copyrights against infringers. We will use all legal means to immediately halt any manufacture, distribution, or operation of a copy of video games made by us. Anyone who purchases such copies risks forfeiting such a game.

Published by:
Atari Games Corporation
675 Sycamore Drive
P.O. Box 361110
Milpitas, California 95036-1110

Printed in the U.S.A. 5/91

Produced by the Atari Games Technical Publications Department.

Writing and Editing: Andrea Dencker

Illustration and Design: Mary Ohanessian Sumner

**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:

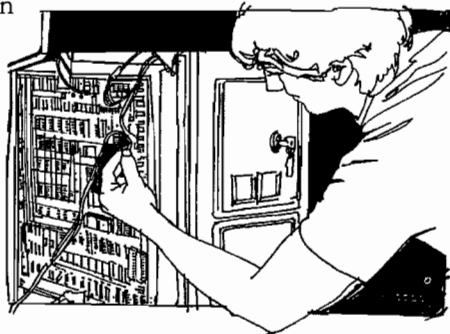
- Substitute non-Atari parts in the game.
- Modify or alter any circuits in the game by using kits or parts *not* supplied by Atari Games Corporation.

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.



CONTENTS

1 Set-Up

How to Use This Manual	1-1
Inspecting the Game	1-2
Control and Switch Locations	1-2
Installing the Seat Assembly.....	1-2
Installing the Roll Bars	1-3
Final Inspection	1-3
Setting the Coin and Game Options.....	1-3
Game Play.....	1-3

2 Self-Test

Introduction.....	2-1
Entering and Exiting the Self-Test.....	2-2
Self-Test Menu	2-2
Adjust Volume.....	2-2
Game Statistics.....	2-2
Histograms.....	2-3
Coin Options.....	2-3
Game Options.....	2-3
Alpha Test	2-3
Motion Object Test	2-4
Playfield Test.....	2-4
Switch Test.....	2-4
Color Test.....	2-6
Convergence Test.....	2-7
Sound Test.....	2-7
ASIC65 Test.....	2-7
Comm (Common) RAM Test.....	2-7
Complete RAM/ROM Test.....	2-8

3 Troubleshooting and Maintenance

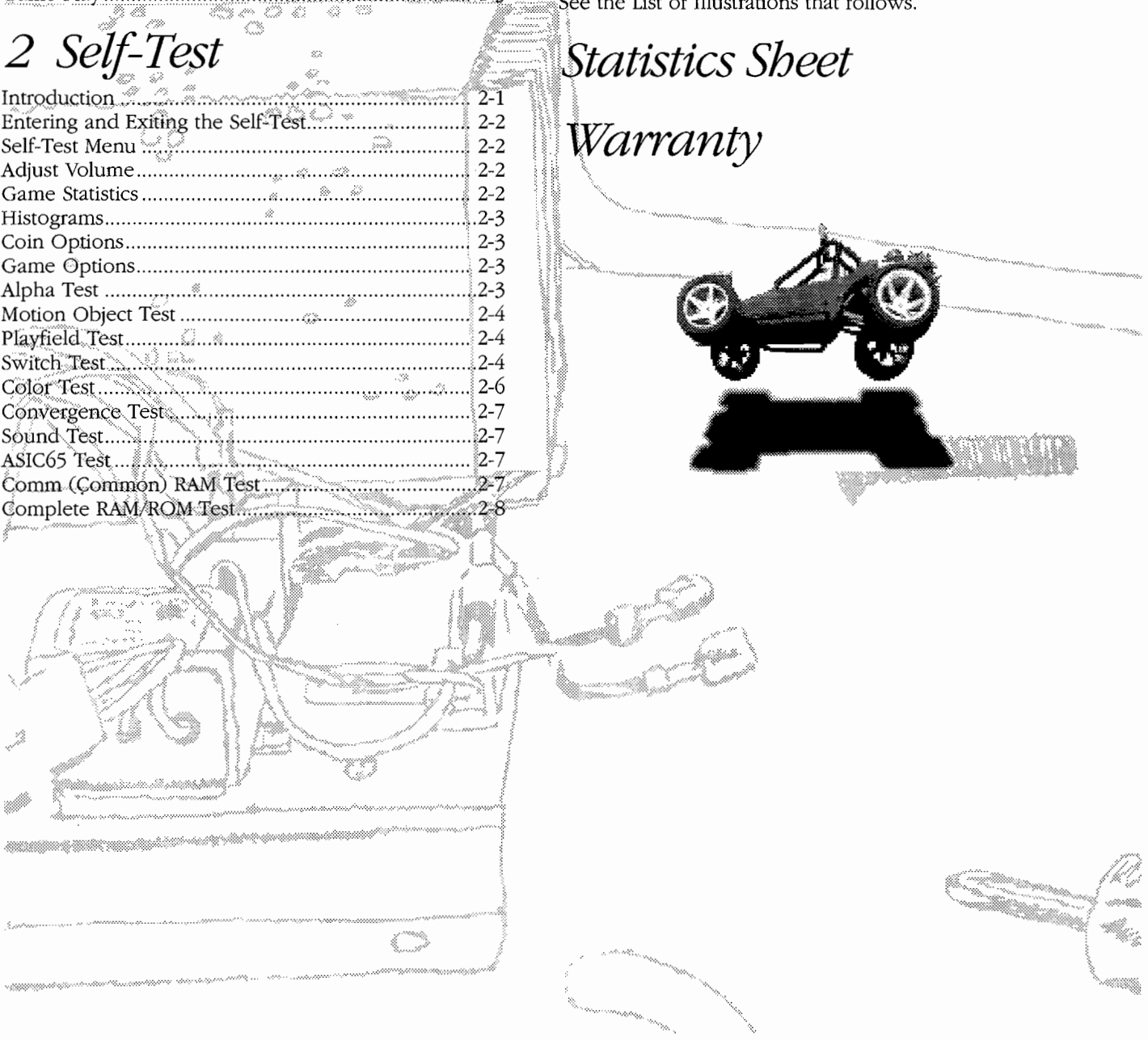
Maintaining the Coin Mechanism	3-3
Repairing the Video Display.....	3-3
Steering Control.....	3-4
Steering Motor	3-5
Foot Pedal Assembly	3-5
ROMs and RAMs	3-5

4 Parts Illustrations

See the List of Illustrations that follows.

Statistics Sheet

Warranty



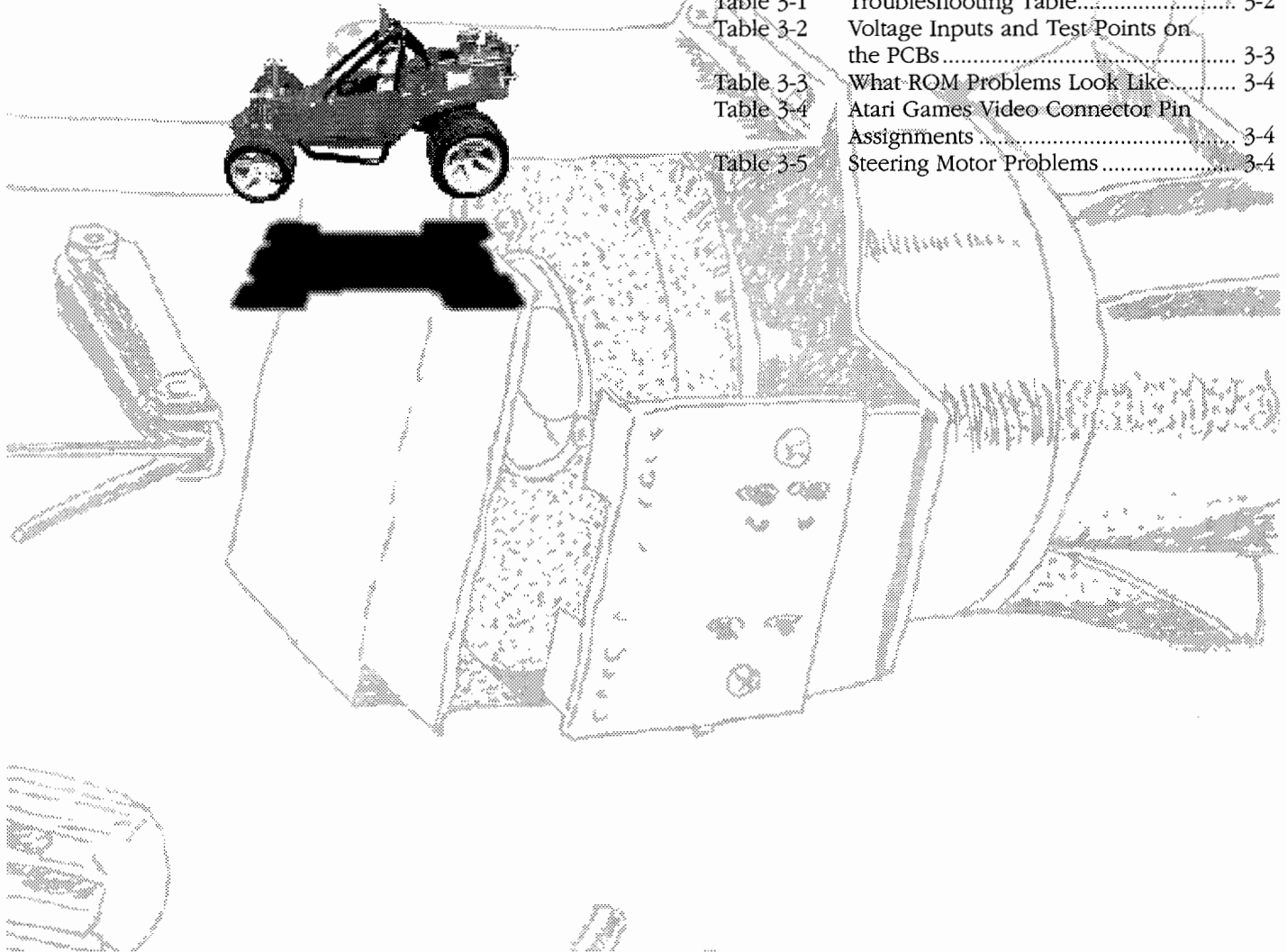
ILLUSTRATIONS

Figure 2-1	Self-Test Menu Screen	2-2
Figure 2-2	Adjust Volume Screen.....	2-2
Figure 2-3	Game Statistics Screen.....	2-3
Figure 2-4	Coin Options Screen	2-4
Figure 2-5	Game Options Screen	2-4
Figure 2-6	Alpha Test Screen.....	2-5
Figure 2-7	Motion Object Test Screen.....	2-5
Figure 2-8	Playfield Test Screen	2-6
Figure 2-9	Switch Test Screen.....	2-6
Figure 2-10	Color Test Screen.....	2-6
Figure 2-11	Convergence Test Screen.....	2-7
Figure 2-12	Sound Test Screen	2-7
Figure 2-13	ASIC65 Test Screen.....	2-7
Figure 2-14	RAM Test Screen.....	2-8

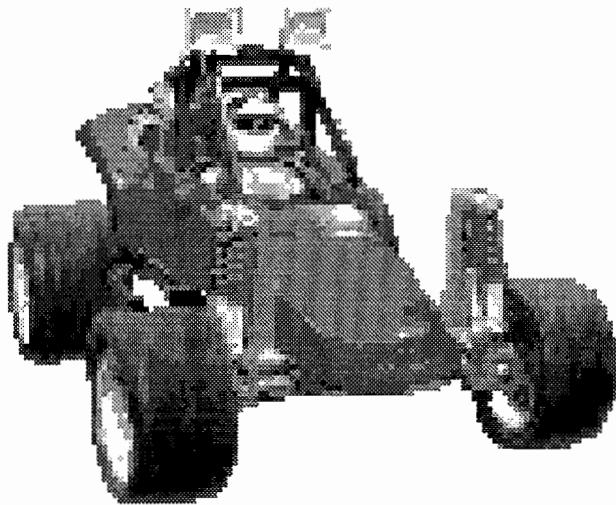
Figure 4-1	Cabinet-Mounted Assemblies.....	4-2
Figure 4-2	Shaker Steering Control Assembly.....	4-5
Figure 4-3	Foot Pedal Assembly	4-7
Figure 4-4	Four-Entry Coin Door Assembly.....	4-8
Figure 4-5	Power Supply Assembly.....	4-11
Figure 4-6	Road Riot 4WD Game PCB Assembly	4-12
Figure 4-7	JSA III PCB Assembly	4-17
Figure 4-8	Comm-RAM PCB Assembly	4-20
Figure 4-9	Solenoid/Motor PCB Assembly.....	4-22

TABLES

Table 1-1	Game Specifications	1-2
Table 2-1	Summary of All Self-Test Screens	2-2
Table 2-2	Game Option Settings	2-4
Table 2-3	Coin Option Settings	2-5
Table 3-1	Troubleshooting Table.....	3-2
Table 3-2	Voltage Inputs and Test Points on the PCBs.....	3-3
Table 3-3	What ROM Problems Look Like.....	3-4
Table 3-4	Atari Games Video Connector Pin Assignments	3-4
Table 3-5	Steering Motor Problems	3-4



N O T E S



Set-Up

How to Use This Manual



This manual is written for operators and service personnel. It provides information for setting up, playing, testing, and maintaining your Road Riot 4WD™ two-player game. The manual is divided into the following chapters: 🕒 Chapter 1 contains set-up and game playing information. 🕒 Chapter 2 describes the self-test and how to use the self-test screens. 🕒 Chapter 3 contains maintenance, repair, and trouble-

shooting procedures. Be sure to perform the preventive maintenance tasks to keep the game in good condition. 🕒 Chapter 4 contains the parts illustrations. 🕒 The accompanying *Road Riot 4WD*

Schematic Package (SP-369) contains the schematics for the Road Riot 4WD game printed-circuit board (PCB), JSA III PCB, Comm-RAM (common RAM) PCB, and the wiring diagrams.

Inspecting the Game

WARNING

To avoid electrically shocking yourself and damaging the game electronics, do not plug in the game until it has been inspected and set up for your line voltage.

This cabinet should be connected to a grounded three-wire outlet only. If you have only two-wire outlets, we recommend that you hire a licensed electrician to install grounded outlets. Players can receive an electrical shock if the cabinet is not properly grounded.

Inspect your Road Riot 4WD game carefully to ensure that the game is complete and was delivered to you in good condition.

Inspect the cabinet as follows:

1. Examine the exterior of the cabinet for dents, chips, or broken parts.
2. Open the service door. Unlock and open the coin doors. Inspect the interior of the cabinet as follows:
 - a. Check that all plug-in connectors on the cabinet harnesses are firmly plugged in. Do not force connectors together. The connectors are keyed so they fit only in the proper orientation. A reversed connector can damage a printed-circuit board (PCB). This will void your warranty.
 - b. Ensure that all plug-in integrated circuits on each PCB are firmly plugged into their sockets.
 - c. Inspect the power cord for any cuts or dents in the insulation.
 - d. Inspect the power supply. Make sure that the correct fuses are installed. Check that the harness is plugged in correctly and that the fuse block cover is mounted in place. Check that the green ground wires are connected.

Table 1-1 Game Specifications

Characteristic	Specification
Power Consumption	273 W maximum
Line Fuse Rating	4 Amps
Line Voltage	102 to 132 VAC
Temperature	5° to 38° C (37° to 100° F)
Humidity	Not to exceed 95% relative
Weight	650 lbs. (1430 kg)
<i>Dimensions (after assembly):</i>	
Width	49.25 inches (125 cm)
Depth	61.5 inches (156.2 cm)
Height	66 inches (167.6 cm)

- e. Inspect other sub-assemblies, such as the video display, controls, printed-circuit boards (PCBs), and speakers. Make sure that they are mounted securely and that the ground wires are connected.

Control and Switch Locations

Most of the controls are located inside the coin door. The only exception is the power on/off switch.

Power On/Off Switch

The power on/off switch is located at the bottom rear of the cabinet.

Volume Control

There is no longer a volume adjustment knob on the game PCBs. Volume is now adjusted in the self-test. Refer to Chapter 2 of this manual for more information.

Self-Test Switches

This game has two self-test switches — one for each game PCB or each monitor. The switches are located on a metal bracket inside the coin door.

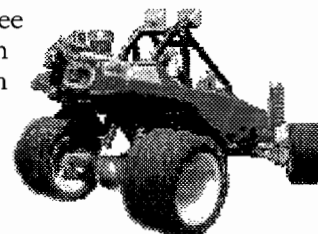
Coin Counters

The coin counters are also located inside the coin door, on the same metal bracket.

Installing the Seat Assembly

Make sure the game power is turned off. To install the separately packaged seat assembly, you need a hex driver or wrench. Follow these steps to attach the seat assembly onto the game:

1. Reach in through the rectangular front opening at the bottom center of the game. (See Figure 4-1.) Pull out both power cords.
2. Move the seat assembly up to the front of the game cabinet. Plug the power cord labeled *LEFT* into the left socket on the seat assembly, and plug the other one into the right socket.
3. Move the seat assembly up flush to the game, being careful not to pinch any excess power cord. Match the seat platform height with the cabinet height by adjusting the leg levelers.
4. Loosely place one black side bracket on each side of the cabinet. Install four flat washers and tamper-proof screws into the four holes provided on each side (see Figure 4-1). As you tighten the screws, press each bracket firmly against the sides of the seat assembly and cabinet.



Installing the Roll Bars

1. Unwrap the protective covering on the roll bars. Lift each roll bar into place, so that the large plate end slides down behind the seat but in front of the rear wood panel on the seat assembly.
2. Attach the large plate to the seat assembly by inserting a black 1.25" tamperproof screw and flat washer into each hole on the outside of the wood panel. Behind the seat attach a large fender washer and acorn nut. Tighten the hardware.
3. Secure the top of the roll bar by inserting black 1.25" tamperproof screws with flat washers into the slots on the small roll-bar plate and then into the cabinet holes. Tighten the hardware.

Final Inspection

1. Turn on the game power. Check that the video display and the attraction lamp have power.
2. Observe the screen: you should see the attract mode displayed. If the screen remains a solid color, you have a video or CPU RAM failure. If you see a black-and-white screen, you have a color RAM failure.

Setting Coin and Game Options

The Road Riot 4WD coin and game options are set in the self-test. Refer to Chapter 2 for the recommended settings and the procedure for setting the options.

Game Play

This section describes the features and driving of the Road Riot 4WD™ game.

Introduction

Road Riot 4WD presents off-road racing competition combined with combative shooting action. Players can compete head-to-head, driving high-performance off-road vehicles armed with a stun gun. The unique cabinet design is complete with roll bars to attract Road Riot 4WD racers of all ages.

Game Play

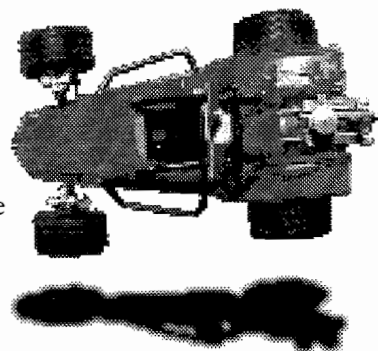
Road Riot 4WD is a one- or two-player off-road racing game where players can compete for an overall season championship. The side-by-side, two-monitor configu-

ration encourages two-player linked competition; however, players can also choose to play individually.

Controls include a gas pedal and a feedback steering control with trigger buttons. When the car drives off the race course, the game gives a realistic off-road feel to the player through a unique motor-driven steering control. Road Riot 4WD also includes the innovative "rump-thump" feature; the trigger buttons on one player's control activate a solenoid in the seat of the other player, resulting in a unique sound and feel.

The player is challenged by the lifelike skidding and bouncing action of his four wheel drive vehicle on the track. The car can also crash in several different ways, depending upon how an object is hit. The car can roll on its side, fly end-over-end, or even explode on impact.

Twelve different tracks offer special terrain and competitor challenges. Each track has a different background, ranging from desert to mountains, corn fields to ice fields. Terrain and track obstacles vary for each setting.

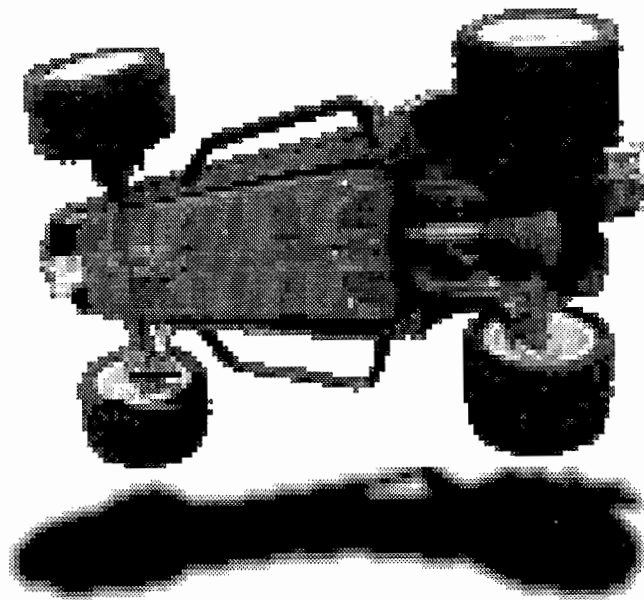


There are several incentives for two-player simultaneous play. Two players can compete head-to-head against each other for the season championship of 11 different race courses. The road riot will continue as long as the player defeats the hosting opponent's team yellow cars. If two players are playing a linked game, there is one less computer-controlled car to beat. Two players can cooperate to beat the opponent cars.

The competition between two players in a linked game is also heightened with Atari's innovative "rump-thump" feature. When one player hits the other with the stun gun, a solenoid located within the seat gives an audible kick as the player is "shot."

Video graphics are digitized pictures of real-life objects. The Road Riot 4WD racing vehicles, people, and obstacles on and around the track are realistically depicted. The life-like detail and humorous interaction with the video graphics enhances player appeal.

NOTES



Self-Test

INTRODUCTION

Use the Road Riot 4WD™ 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. 🎮 You should perform the self-test when you first



set up the game, each time you collect the money, or when you suspect game failure. 🎮 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 of the self-test screens and their purposes.

Entering and Exiting the Self-Test

To enter the self-test, turn on the two self-test switches on the bracket located behind the left side of the coin door. Exit the self-test by switching off the two self-test switches. They can be turned on or off individually.

Self-Test Menu

Choose which test or screen you want to see from this menu, shown in Figure 2-1. Move up and down the list by pressing the left and right triggers; the corresponding test is highlighted in blue. Choose the screen by pressing the START button.

Adjust Volume

Adjust the volume of the game using this screen, shown in Figure 2-2. Control the volume by pressing the left and right triggers; the volume number increases or decreases. To restore old volume level, push pedal. Save the new volume and return to the self-test menu by pressing the START button.

Game Statistics

Use the information shown on the statistics screen, in Figure 2-3, and on the histogram screens to keep track of your game use and maximize your profits. Record the information on the Road Riot 4WD statistics page in the back of this manual. The statistics are collected

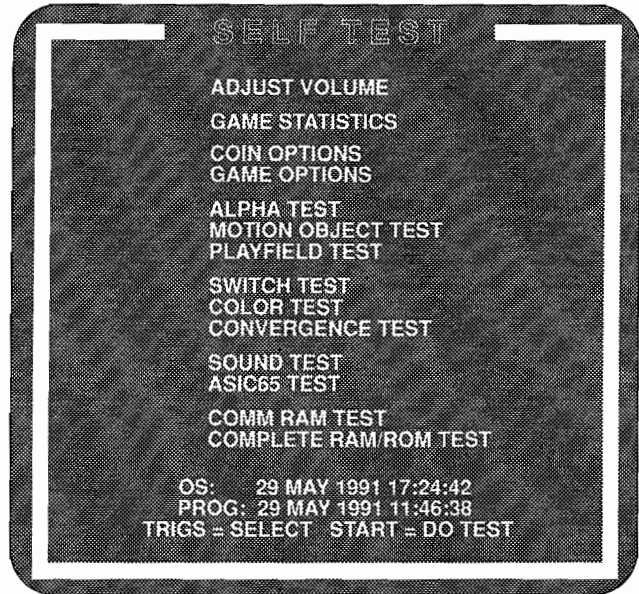


Figure 2-1 Self-Test Menu Screen

from the last time the statistics were cleared. You can clear the statistics by pressing both triggers at the same time. Press the START button to leave this screen and go to the histograms.

- *Left Coins* show the number of coins counted in the left coin mechanism.
- *Right Coins* show the number of coins counted in the right coin mechanism.

Table 2-1 Summary of All Self-Test Screens

Screen	Use or Purpose
Adjust Volume	Adjusts the volume.
Game Statistics Screen	Displays the game statistics.
Coin Options Screen	Use to set and check the coin options settings.
Game Options Screen	Use to set and check the game options settings.
Alpha Test Screen	Use to test for clarity of characters.
Motion Object Test Screen	Use to test the movement and color of game objects.
Playfield Test Screen	Use to check the playfield displays.
Switch Test Screen	Use to display the functioning of the game switches and controls.
Color Test Screen	Use to check the video display color circuits.
Convergence Test Screen	A series of screens to check and adjust display convergence.
White Convergence Screen	Use to check and adjust video display convergence of red, blue, and green.
Violet Convergence Screen	Use to check and adjust video display convergence of red to blue.
Green Convergence Screen	Use to check and adjust video display convergence of red and blue to green.
Sound Test Screen	Use to check the audio circuits.
ASIC65 Test Screen	Use to test comm port, checksum, and internal RAM.
Common RAM Test Screen	Use to check common RAMs.
Complete RAM/ROM Test Screen	Use to check the all RAMs and program ROMs.

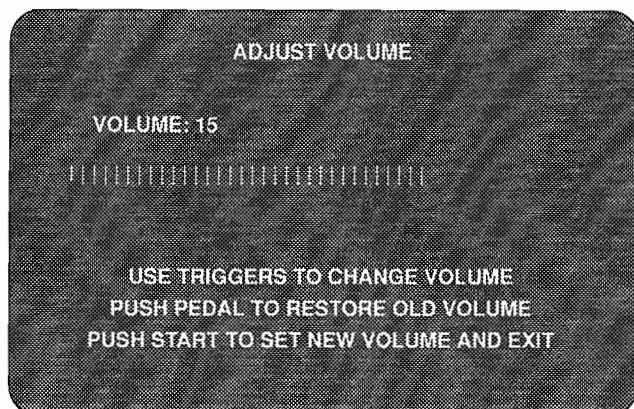


Figure 2-2 Adjust Volume Screen

- *Aux Coins* shows the number of coins counted on the auxiliary coin input.
- *New Games* is the number of new games played.
- *Continuation* is the number of continued games played.
- *Free Games* is the number of free games played if *Coin Options* is set to free games.
- *Idle Time* shows the number of minutes the game was not being played.
- *Active Time* is the number of minutes the game was being played in any mode.
- *Solo Time* is the number of minutes a race was being held in single-player mode.
- *Linked Time* is the number of minutes a race was being held in two-player mode.
- *Shaker Time* is the number of minutes the shaker motor inside the steering control was running.

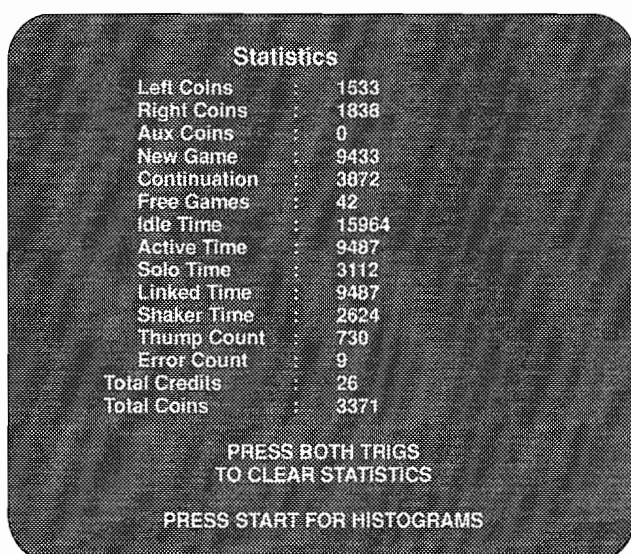


Figure 2-3 Game Statistics Screen

- *Thump Count* is the number of thumps received per seat.
- *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 38F.

Histograms

The histograms are two screens that contain information about the game. Press the START button to move to the next histogram. To clear all histograms, press both triggers while displaying the last histogram screen. Press START to exit from the last screen.

The first histogram shows new game times, and the second has continued game times.

Coin Options

Check and select the coin options on this screen, shown in Figure 2-4.

To move through the options, use the right trigger. Change the option in yellow type. The factory default settings are shown in green. To change a setting, use the left trigger. To save the new settings, press the START button. This returns you to the select test screen. If you want to keep the original setting, although you have changed it, press the pedal. This brings back the original factory setting. Use the START button to exit.

The coin option settings and factory defaults are explained in Table 2-3.

Game Options

Check and select the game options on this screen, shown in Figure 2-5.

To move through the options, use the right trigger. Change the option in yellow type. The factory default settings are shown in green. To change a setting, press the left trigger. To save the new settings, press the START button. This returns you to the select test screen. If you want to keep the original setting, although you have changed it, press the pedal. This brings back the original setting. Use the START button to exit.

The game option settings with factory defaults are shown in Table 2-2.

Alpha Test

The alpha test consists of a series of screens that you use to test the clarity of characters. Figure 2-6 shows the first of the alpha test screens.

Table 2-2 Game Option Settings

Option	Settings	Explanation
Difficulty Level*	Medium ✓ Easy Easier Easiest Hardest Harder Hard Medium Hard	Establishes degree of game difficulty.
Music in Attract	Yes ✓ No	Lets you choose whether or not to play music in the attract mode.
Seat Thumper	On ✓ Off	Lets you turn the seat thumper on/off.
Clear High Score Table	Yes No ✓	Lets you clear the high score table.
Steering Shaker Motor	On ✓ Off	Lets you turn the steering shaker motor on/off.
Auto High Score Reset	Enable ✓ Disable	Automatically resets the high scores to the factory defaults after 2000 games, unless a player has entered his initials within the previous 200 games.

You **must set both players to the same difficulty setting or the game will not function properly after turning on the power. If the settings don't agree, you can change them both to medium by pressing both START buttons at power-up. You can also use the Game Options screen in the self-test to change the setting.*

✓ Manufacturer's recommended settings. These settings are shown in green on the screen.

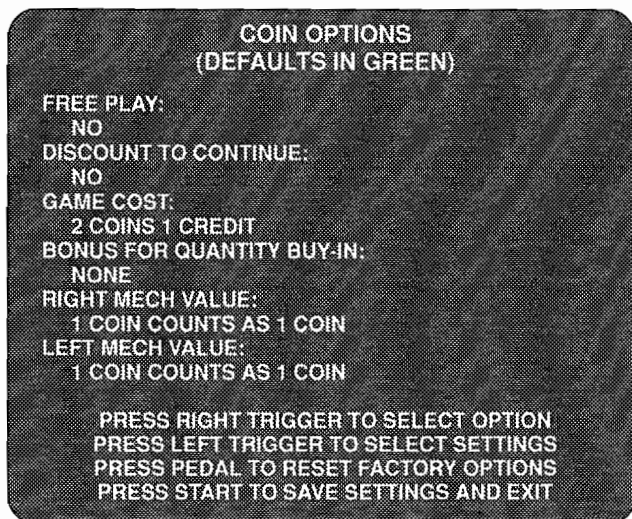


Figure 2-4 Coin Options Screen

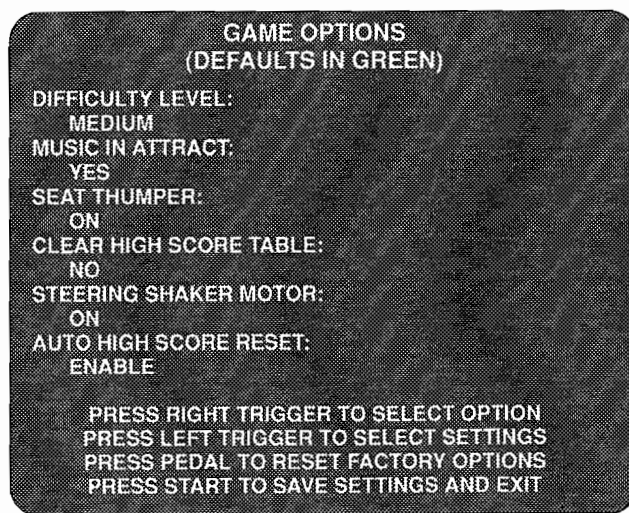


Figure 2-5 Game Options Screen

The screens display all of the alphanumeric character sets. If the screens are not clear, you have a problem. To move through the screens, press either the left or right trigger. Use the START button to exit.

Motion Object Test

The motion object test screen, shown in Figure 2-7, tests the movement and color of various game objects.

Select the test function with the START button. Use the pedal or steering control to move objects, change pictures, and change object size. Press the START button to move to the next test or exit.

Playfield Test

This test, shown in Figure 2-8, checks the condition of the scrolling playfield. Move the steering control left/right to see horizontal movement on the screen. Hold the right trigger button while moving the control left/right to see vertical movement. Press the START button to exit the test.

Switch Test

The switch test allows you to display the status of the game switches and controls. The switch test screen appears in Figure 2-9. The items tested are:

Table 2-3 Coin Option Settings

Option	Settings	Explanation
Free Play	No <input checked="" type="checkbox"/> Yes	Set this to "Yes" for demonstrating the game.
Discount to Continue	No <input checked="" type="checkbox"/> Yes	Lets you offer a reduced price per credit when players want to continue a game.
Game Cost	2 coins 1 credit <input checked="" type="checkbox"/> ... 8 coins 1 credit	Sets the number of coins required for one credit.
Bonus for Quantity Buy-in	None <input checked="" type="checkbox"/> 2 coins give 1 (extra coin) 3 coins give 1 3 coins give 2 4 coins give 1 4 coins give 2 4 coins give 3 5 coins give 1 5 coins give 2 5 coins give 3 6 coins give 1 6 coins give 2 6 coins give 3 7 coins give 1 7 coins give 2 7 coins give 3 8 coins give 1 8 coins give 2 8 coins give 3 9 coins give 1 9 coins give 2 9 coins give 3	Lets you choose various levels of bonus coins or no bonus.
Right Mech Value	1 coin counts as 1 coin <input checked="" type="checkbox"/> ... 1 coin count as 8 coins	Is the number of coins each coin counts as in the right coin mechanism.
Left Mech Value	1 coin counts as 1 coin <input checked="" type="checkbox"/> ... 1 coin count as 8 coins	Is the number of coins each coin counts as in the left coin mechanism.

Manufacturer's recommended settings. These settings are shown in green on the screen.

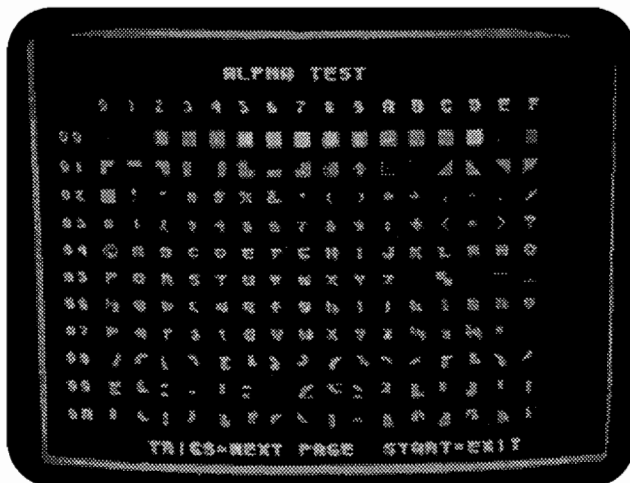


Figure 2-6 Alpha Test Screen

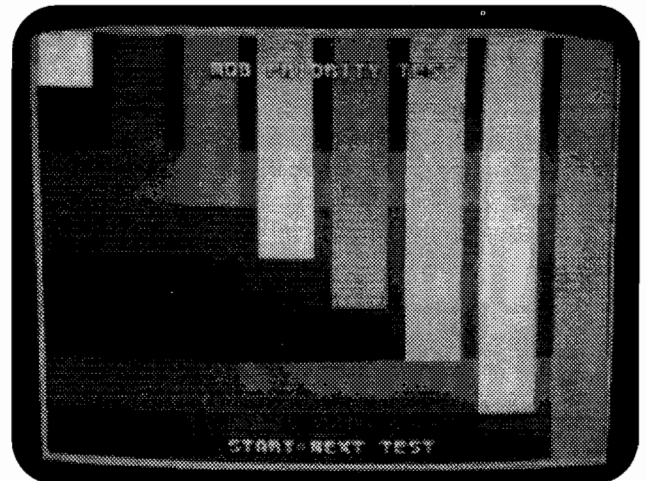


Figure 2-7 Motion Object Test Screen

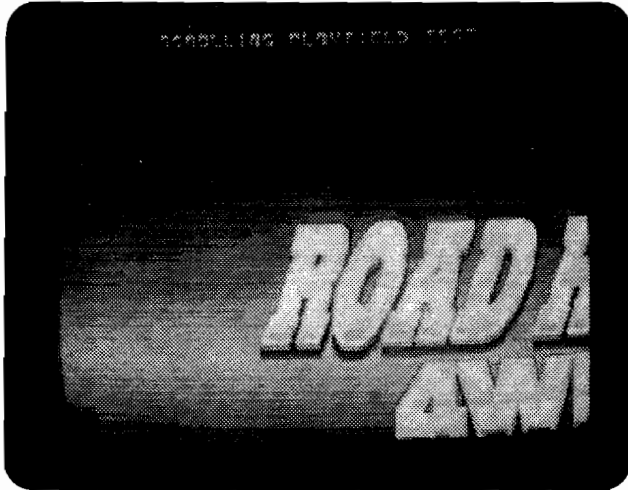
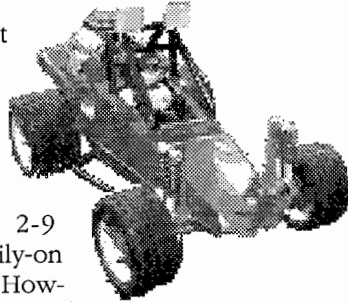


Figure 2-8 Playfield Test Screen

- Steering wheel left/right movement
- Foot pedal potentiometer
- Left trigger and steering shaker motor
- Right trigger and thumper solenoid
- Start switch and start lamp

As you activate each switch or control, make sure the correct words are highlighted in blue on the screen. Figure 2-9 shows all three momentarily-on controls in outline type. However, all three phrases would normally not be displayed simultaneously, because you would have to press the left and right triggers and start button at the same time.



If players complain of cars driving erratically, or whenever the control harness is unplugged, you must recalibrate the controls. Follow this procedure to do the calibration:

1. Press the right trigger and start button simultaneously. The numbers after *WHEEL* and *PEDAL* on the screen will change.
2. Turn the steering control to its right limit, and hold it there for 4 seconds. Then turn it to its left limit and hold it there for 4 seconds.
3. Press and hold the foot pedal for 4 seconds.
4. Simultaneously press both triggers to save the calibration and exit from the switch test. **Do not simply turn the self-test switch off** to exit from this test: doing so will not save the calibration.

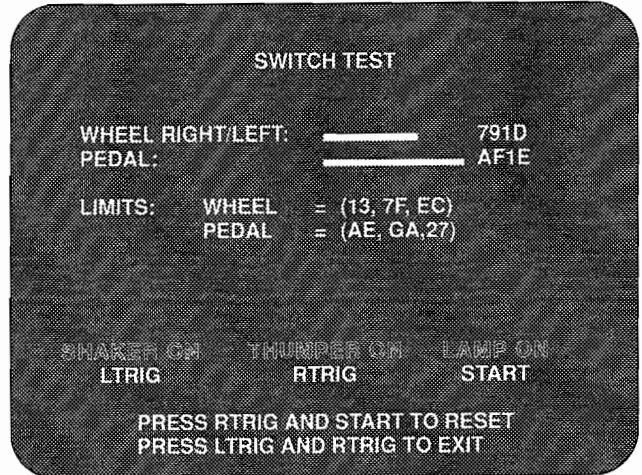


Figure 2-9 Switch Test Screen

Color Test

This test indicates the dynamic range of the video display color circuit in a series of seven screens. The first color test screen is shown in Figure 2-10. Advance to each screen by pressing the right trigger (the software cycles through all seven screens and then starts over again). The screens are as follows:

1. Red at the top, followed by green, blue, and white
2. Yellow at the top, followed by light blue, purple, and white
3. Solid red
4. Solid green
5. Solid blue
6. Solid white
7. Solid gray

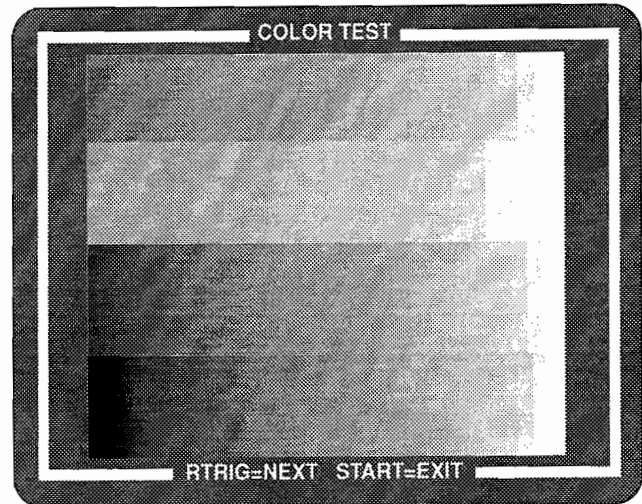


Figure 2-10 Color Test Screen

If the screens do not match this description, adjust the video display as described in the video display manual. Press the START button to exit.

Convergence Test

The convergence test has three screens: first white, then violet, and finally green. The white screen is shown in Figure 2-11. To see the violet and green screens, press the right trigger. Press the START button to go to the test select screen.

Check the following on the screens:

- The grid lines should be straight within 3 mm, and the lines should not pincushion or barrel.
- The convergence of the lines on the violet and white screens should be within 2 mm.

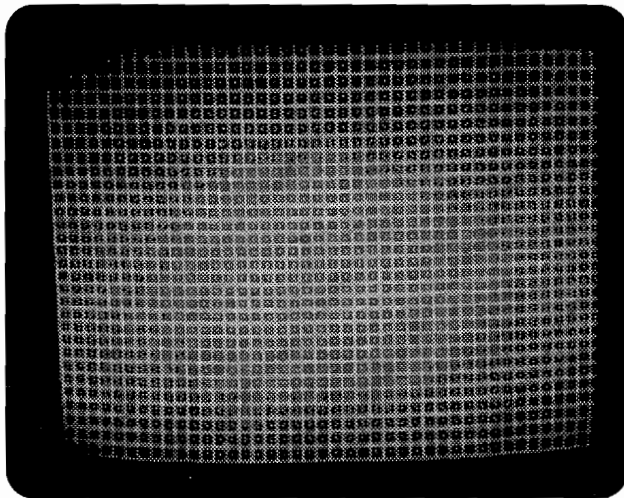


Figure 2-11 Convergence Test Screen

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

Sound Test

The sound test indicates the condition of the sound effects circuit on the game PCB. The sound test screen appears in Figure 2-12.

Use the steering wheel control to select the sound, and press the right trigger to listen to it. Pressing the left trigger stops the sound from playing. Press the START button to return to the select test menu.

ASIC65 Test

Use the ASIC65 test screen to test the comm port, checksum, and internal RAM. The first screen is shown in Figure 2-13. You can select one of the three options

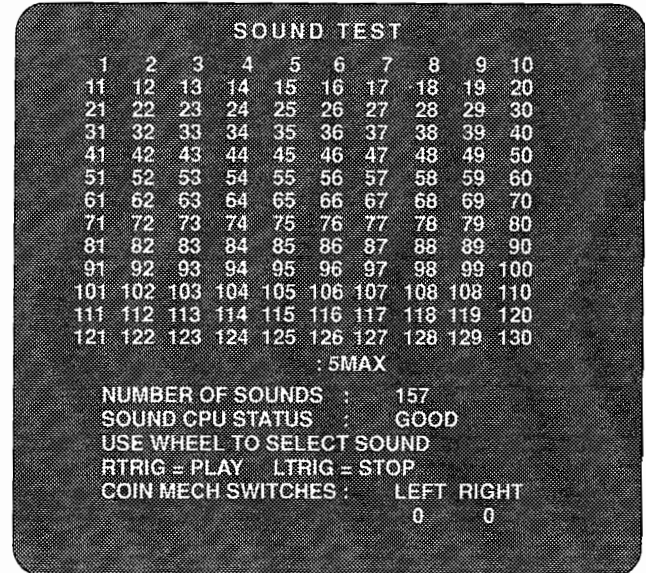


Figure 2-12 Sound Test Screen

shown. Use the left trigger to move to the next option. Use the right trigger to select an option.

If you test the comm port, a message indicates whether or not it's OK. The checksum option displays the checksum. The internal RAM test indicates whether or not the RAM is OK. Press the START button to exit.

Comm (Common) RAM Test

Use this selection screen, shown in Figure 2-14, to see if the common RAM is OK. This test is automatically run when you switch to game mode.

When the test runs successfully, you see the message *COMMON RAM OK!* If the RAM is bad, the message *COMMON RAM ERROR* is displayed and you must replace the Common RAM board.

Press the START button to exit.

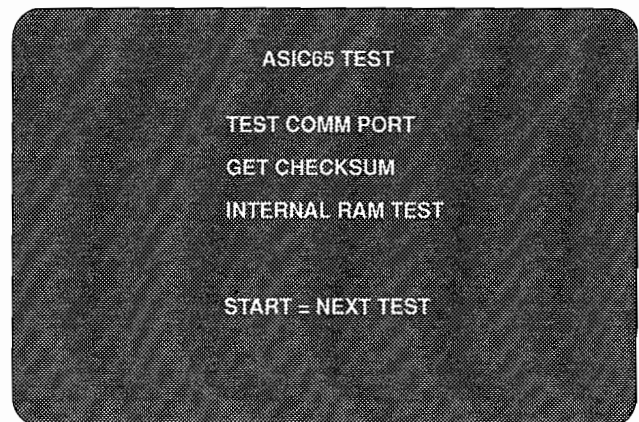


Figure 2-13 ASIC65 Test Screen

Complete RAM/ROM Test

The RAM/ROM test tests both RAM and ROM. When you run this test, you see a sequence of color screens. If the screens turn to black and white or gray or if no message appears, the RAM is bad. You need to replace it. If the ROM is bad, the checksum of the bad ROM is displayed. You need to replace that ROM.

Press the START button to exit.

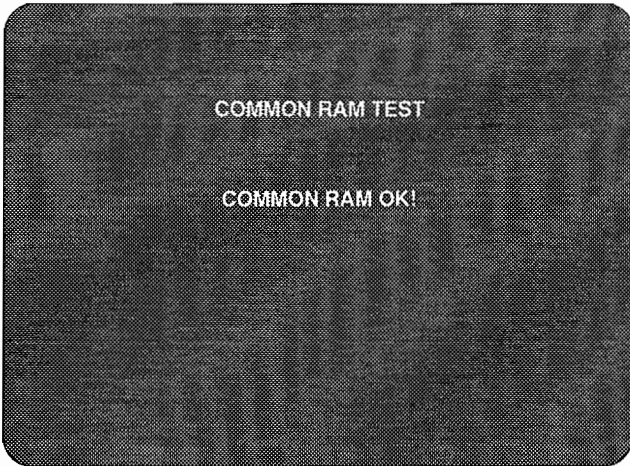
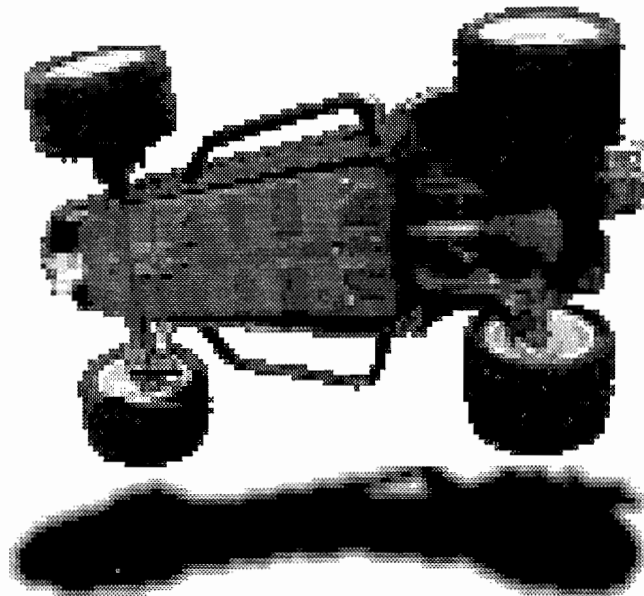


Figure 2-14 RAM Test Screen



Troubleshooting and Maintenance

This chapter contains troubleshooting tables and repair procedures for your Road Riot 4WD™ game. The chapter includes several troubleshooting tables. The tables contain general troubleshooting information, the voltage levels and test points on the game printed-circuit board, a list of ROM-caused problems with specific ROMs to check and



replace, and a description of steering motor problems. The chapter also includes information about connecting the video display if it requires separate positive sync and repair information for the steering control and foot pedal assembly, and locations of the RAMs and ROMs on the game PCB.

Table 3-1 Troubleshooting Table

Problem	Suggested Action
Coin Mechanism Problem	<ol style="list-style-type: none"> 1. Check the wiring to the coin mechanism. 2. Check the voltage to the + side of the mechanism. 3. Test the coin mechanisms with the sound test screen in the self-test.
Game Play Problem	<ol style="list-style-type: none"> 1. Check the harness and connectors. 2. Perform the self-test. 3. Check the voltage levels on the PCB. See Table 3-2, <i>Voltage Inputs and Test Points</i>. 4. Check <i>What ROM Problems Look Like</i>, Table 3-3, for specific ROM problems.
Steering Control Problem, Foot Pedal Problem	<ol style="list-style-type: none"> 1. Have the controls been lubricated with the correct type of lubricant? If not, lubricate them as shown in Figure 4-2 and 4-3. 2. Check the harnesses and connectors. 3. Check the switches on the control. 4. If you took the control apart, have you reassembled it correctly? 5. Make sure all the parts on the control are in good repair. Repair or replace parts. 6. Reset the limits on the steering control and the foot pedal.
Sound Problem	<ol style="list-style-type: none"> 1. Is the speaker volume turned up? (Volume is adjustable in self-test only.) 2. Check the voltage on the JAMMA connector. 3. Check the wiring from the PCB to the speaker. 4. Check the voltage level to the PCB. See Table 3-2, <i>Voltage Inputs and Test Points</i>. 5. Replace the speaker.
Video Display Problem	<ol style="list-style-type: none"> 1. Is the game plugged in? 2. Is the game turned on? 3. Are the connections good? 4. Is the line fuse good? 5. Is the display brightness turned up? 6. Are the solder connections on the line filter and transformer good? 7. Is the JAMMA connector on the PCB tightly connected? 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"> a. Do you have power to the video display? b. Are the video display's filaments lit? c. Do you have high voltage to the video display? 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.) 10. If the level is not correct, check the connectors and the harness.
Screen is dark.	
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"> 1. Do you have correct power voltage to the video display PCB? 2. Do you have correct high voltage to the video display?
Picture is wavy.	<ol style="list-style-type: none"> 1. Is the monitor ground connected to the monitor? 2. Are the sync inputs connected properly?
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.
Seat Thumper Problem	<p>Only qualified technicians having experience with high-power devices should troubleshoot this system. The solenoids and the solenoid/motor PCB run on live voltage and can cause serious injury. For further information, contact your Atari field service representative at (408) 434-3950.</p>

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

Voltage	Test Point or LED	Source and Purpose
+5 ± 0.25 VDC	+5V1	Logic power from the switching power supply.
	CR3 LED (Main PCB)	Lights when 5 V is applied to the PCB and the reset (RST) jumper is open.
	CR9 LED (JSA III PCB)	Lights when the +12 V supply is good.
	CR3 LED (JSA III PCB)	Lights when the -5 V supply is good.
+12V	+V0P (pin 4 of LM324)	+12 V from the switching power supply. Positive supply for the analog circuitry.
-5V	-V0P (pin 11 of LM324)	-5V from the switching power supply (if connected). Negative supply for the analog circuitry.

Maintaining the Coin Mechanism

The coin mechanism should be cleaned every three months. For detailed parts information on the coin door, see Figure 4-3. To maintain the coin mechanism:

1. Turn power off to the game. Open the upper coin door.
2. Open the gate on the door covering the magnet. Use the blade of a screwdriver to scrape away any metal filings collected on the magnet.
3. For a thorough cleaning, wash the coin mechanism in hot soapy water. Use a toothbrush to remove any stubborn build-up of residue in the coin path.
4. Dry the coin mechanism with compressed air.
5. If you do not want to use water, brush the loose dust off with a soft brush and scrub the residue in the coin path with a toothbrush. Blow out all the loose dust and dirt with compressed air.

NOTE

Never lubricate the coin mechanism with oil or grease.

Repairing the Video Display

The video display frame in this game is designed to be used with 25-inch horizontal-mounting displays.

Removing the Video Display

If you have a problem with the video display, first run the self-test procedure to narrow down the cause. To make adjustments to the video display, unlock the service door on the rear of the cabinet.

If you want to repair the video display, remove it from the game by following this procedure:

1. Turn the game power off and wait two minutes. Unplug the power cord for safety.

2. While you wait, unlock the service door on the rear of the cabinet.
3. Remove the four screws that attach the display shield retainer. Remove the retainer and shield. Then remove the cardboard bezel in front of the display.

WARNING

High Voltage

The video display contains lethal high voltages. To avoid injury, do not service this display until you observe all precautions necessary for working on high-voltage equipment.

X-Radiation

This video display is designed to minimize X-radiation. However, to avoid possible exposure to soft X-radiation, never modify the high-voltage circuitry.

Implosion Hazard

The cathode-ray tube (CRT) may implode if struck or dropped. The shattered glass from the tube may cause injury up to six feet away. Use care when handling the display and when removing it from the game cabinet. Also, wear gloves to protect your hands from the sheet-metal edges.

4. Remove the four nuts and washers that secure the video display.
5. Discharge the high voltage from the cathode-ray tube (CRT). The display assembly contains a circuit for discharging the high voltage to ground when power is removed. However, to make certain, always discharge the display as follows:
 - a. Attach one end of a solid 18-gauge wire to a well-insulated screwdriver or wooden handle.
 - b. Attach the other end of the wire to an earth ground.
 - c. Quickly touch the blade end of the screwdriver to the CRT anode by sliding it under the anode cap.
 - d. Wait two minutes and repeat part c.

Table 3-3 What ROM Problems Look Like

Problem	ROM Causing the Problem	Check the ROM at:
Program works, but the motion objects or playfield are wrong.	Graphics	Playfield: 20C–22C, 20D–22D. Motion Object High: 2S–9S. Motion Object Low: 2P–9P. Alphanumerics: 22J
Garbage on screen; program doesn't work.	Processor Program ROM 0	14B/C 8C, 8D
Game program is erratic.	Program ROM 1	9C, 9D
No sound or erratic sound.	Audio ROM: Audio Program Audio ADPCM	12C 12E, 15E, 17E, 19E

6. Disconnect the harness connectors from the video display.
7. Pull the video display assembly out of the cabinet. Be extremely careful.

Replacing the Video Display

Perform the following procedure to replace the video display in the cabinet.

1. Carefully lift the video display into the cabinet.
2. Install the nuts that hold the video display assembly.
3. Connect the power and signal harnesses to the video display.
If you replace the CRT and yoke together, adjust the brightness, size, and centering as described in the video display service manual. Check the purity and convergence according to that manual, but adjust both only if required.

4. Install the video display shield, bezel, and cleats.
5. Lock the rear service door on the cabinet.

Steering Control

The steering control is shown in Figure 4-2. If you want to repair the steering control, disassemble it by removing it from the pod on the control panel. The hardware that secures the pod and steering control is shown in Figure 4-1.

Table 3-4 Atari Games Video Connector Pin Assignments

Pin	Signal	Pin	Signal
1	Red	7	GND
2	GND	8	GND
3	Key	9	Negative composite sync
4	Green	10	Positive V sync
5	GND	11	Positive H sync
6	Blue		

Table 3-5 Steering Motor Problems

Problem	Suggested Action
No motor action or erratic, weak	Check for a broken harness under the steering control cover.
Video distortion only when the motor goes on	Check for a broken harness under the steering control cover.
Electrical problems	Check for +12V across chassis ground/DC GND and either one of the terminals on the steering motor. There should be virtually 0 V on these terminals when the motor is running.
One terminal (red) is hot, no voltage on the other (black)	Check for a broken solder connection or open motor windings.
No voltage on either terminal	Check for an open fuse or blown solenoid/motor PCB.
Voltage present, but the motor doesn't run when the left trigger is pressed (while in Switch Test)	Check the solenoid/motor PCB, open transistor, or faulty connection to the Common RAM PCB.

Steering Motor

The steering motor is shown in Figure 4-2. If you want to test the steering motor, select the switch test (in the self-test) and press the left trigger. This turns the motor on for a few seconds at a time.

If you have a problem with the steering motor, refer to Table 3-5.

Foot Pedal Assembly

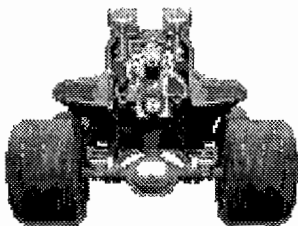
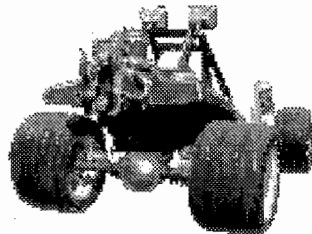
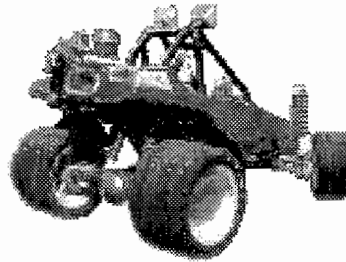
The foot pedal assembly is shown in Figure 4-3. If you want to repair the foot pedal, disassemble it by removing

it from the front of the game cabinet. The hardware that secures the foot pedal is shown in Figure 4-1.

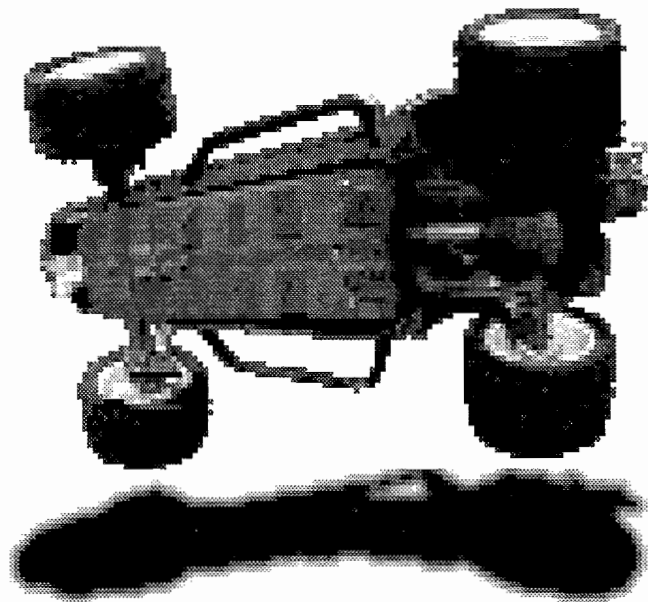
ROMs and RAMs

If you think you have bad ROMs or RAMs, perform the ROM or RAM test in the self-test. If you have a ROM problem, see Table 3-3. If you see only a colored screen and cannot enter the self-test, see Table 3-4.

For the location of all the ROMs and RAMs on the game PCB, see Figure 4-6.



NOTES



Parts Illustrations

This chapter provides information you need to order replacement parts for your Road Riot 4WD™ game. 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.

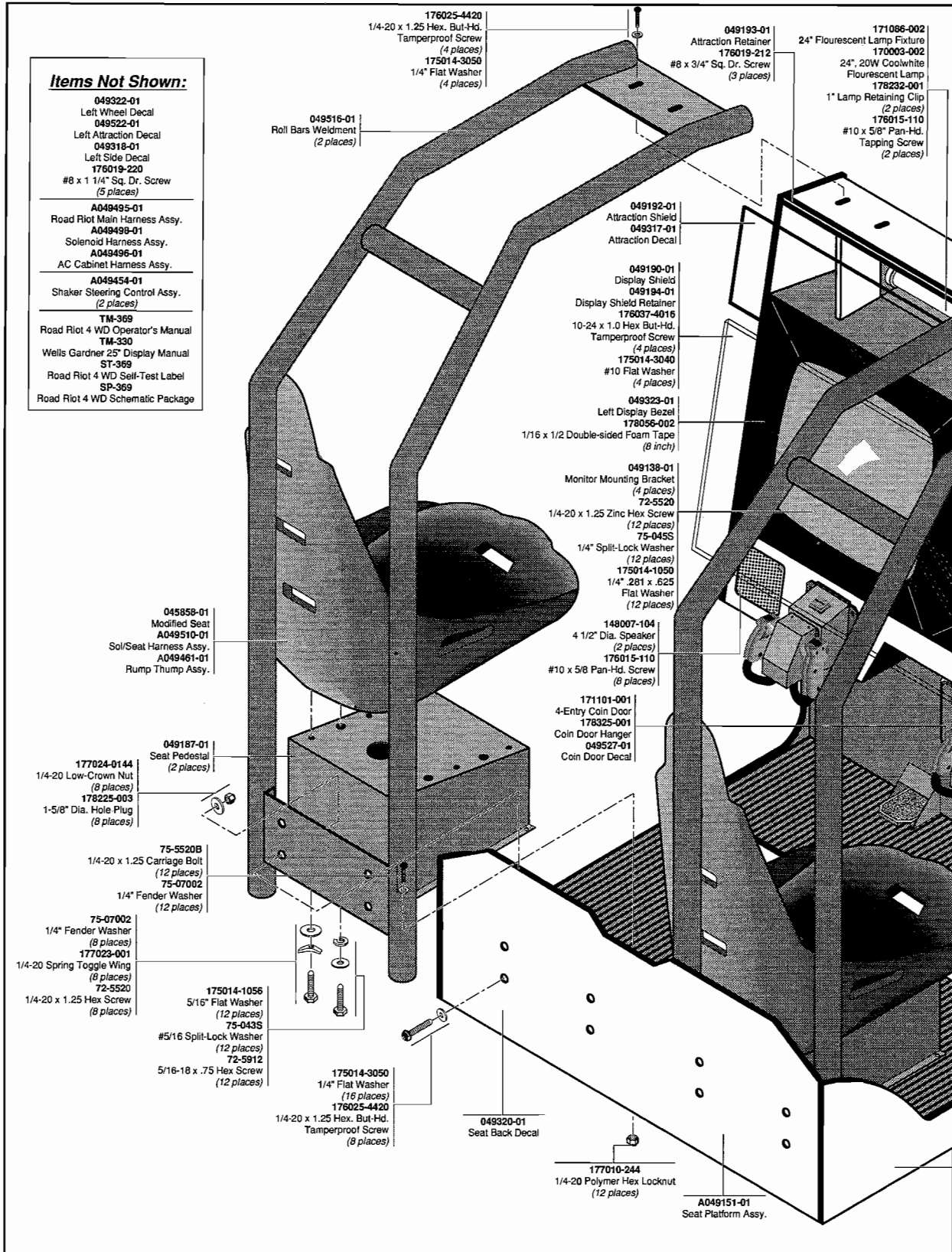


Figure 4-1 Cabinet-Mounted Assemblies, Front View
A049150-01 C

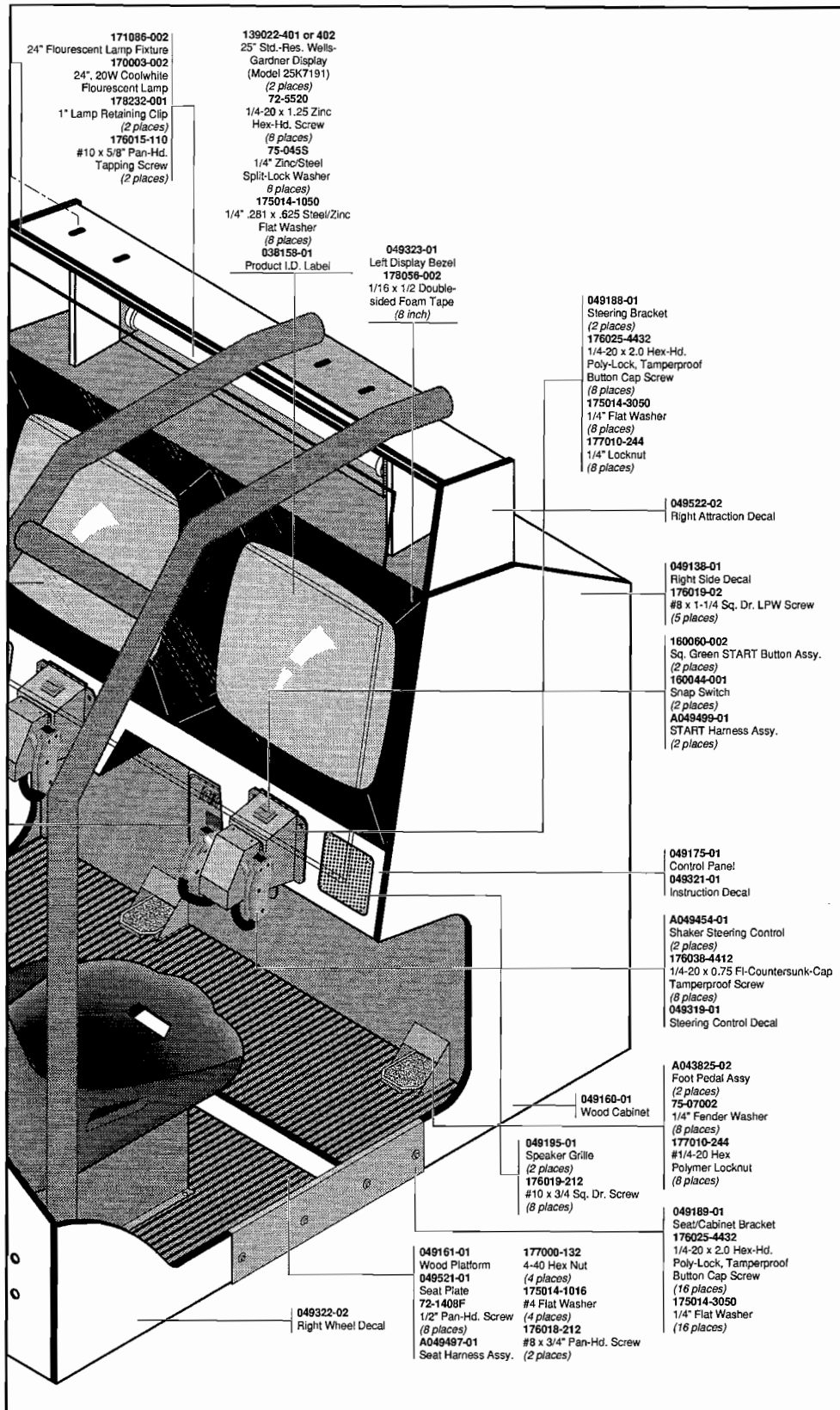


Figure 4-1 Cabinet-Mounted Assemblies, Front View
A049150-01 C

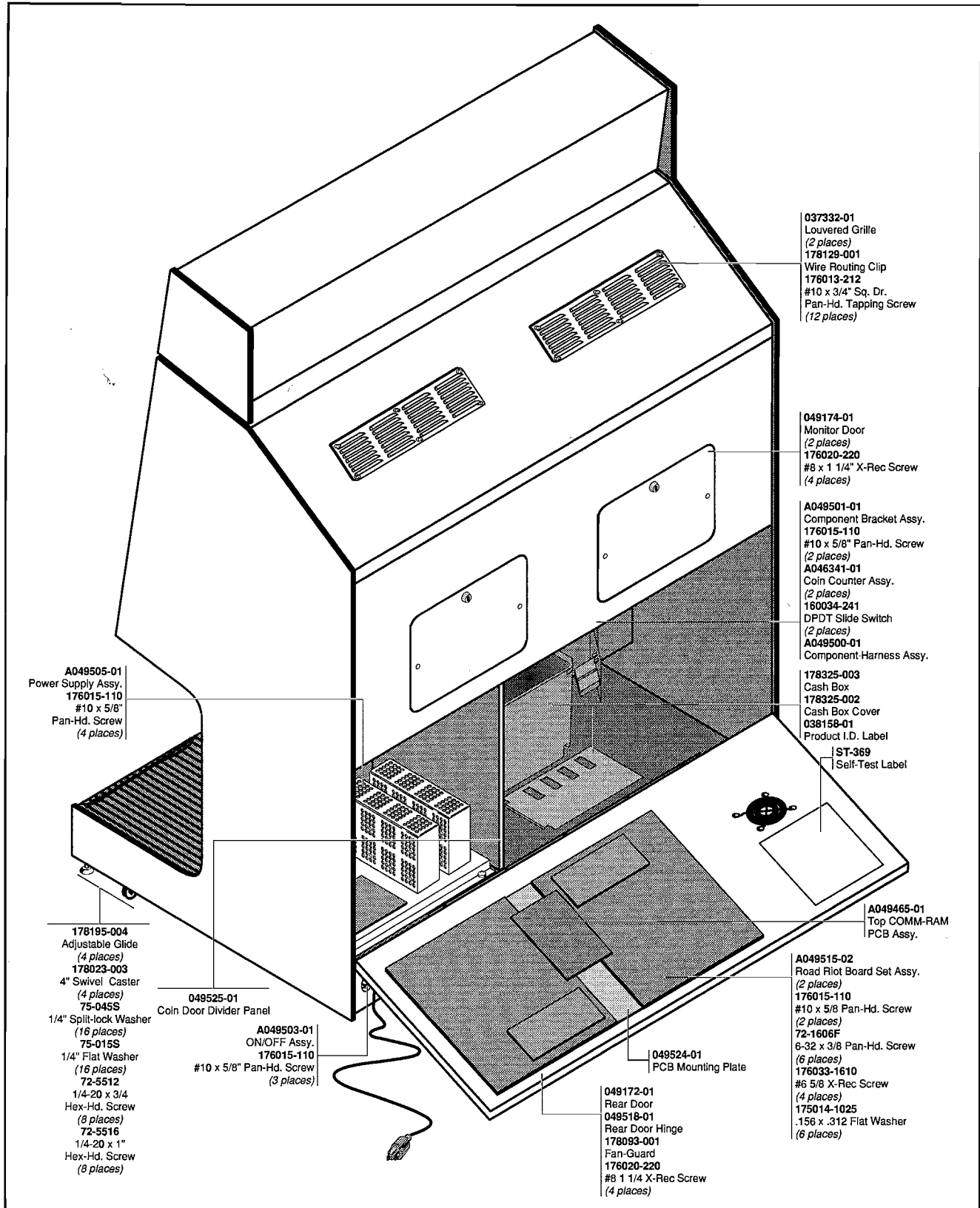


Figure 4-1 Cabinet-Mounted Assemblies, Rear View
A049150-01 C

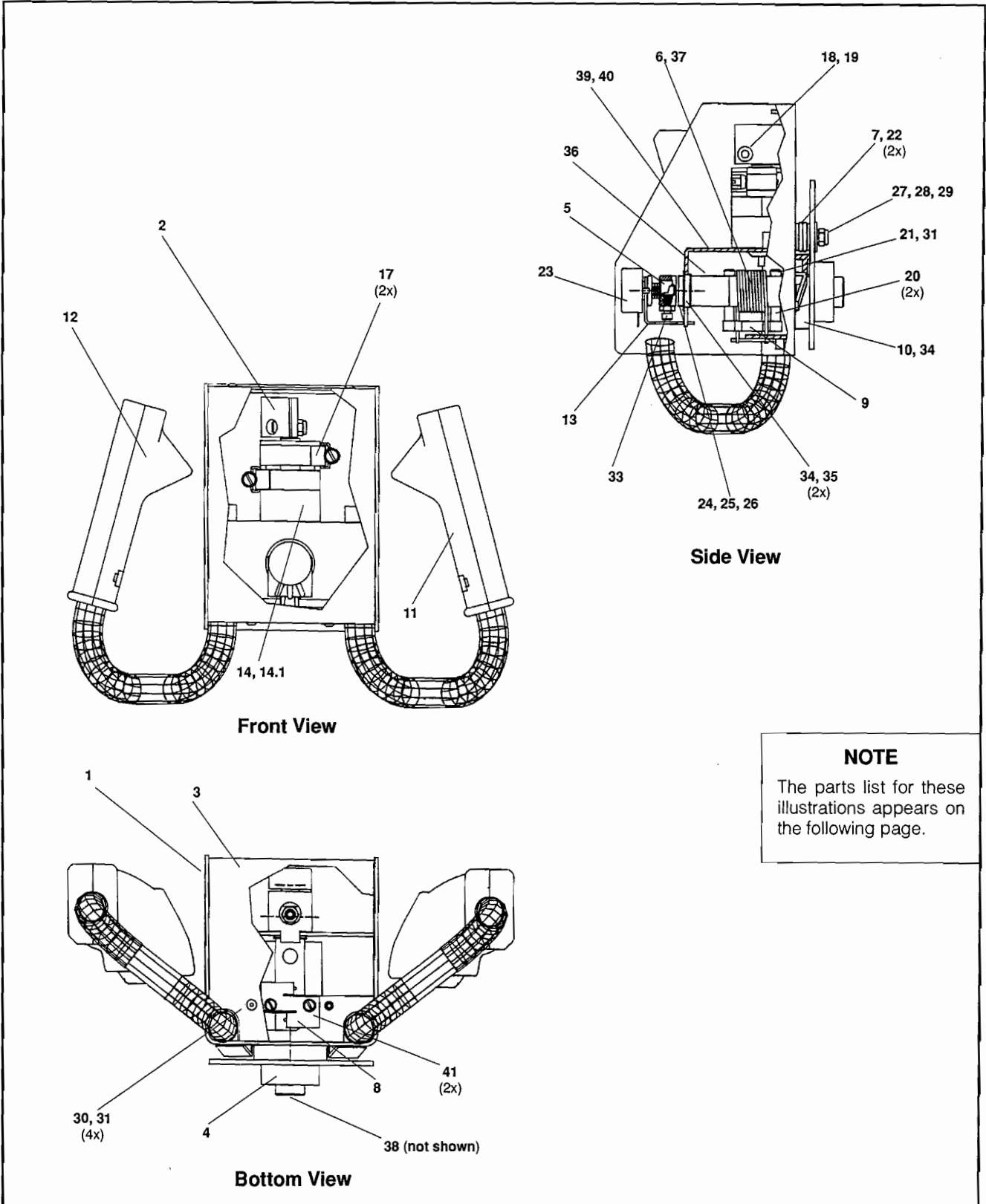
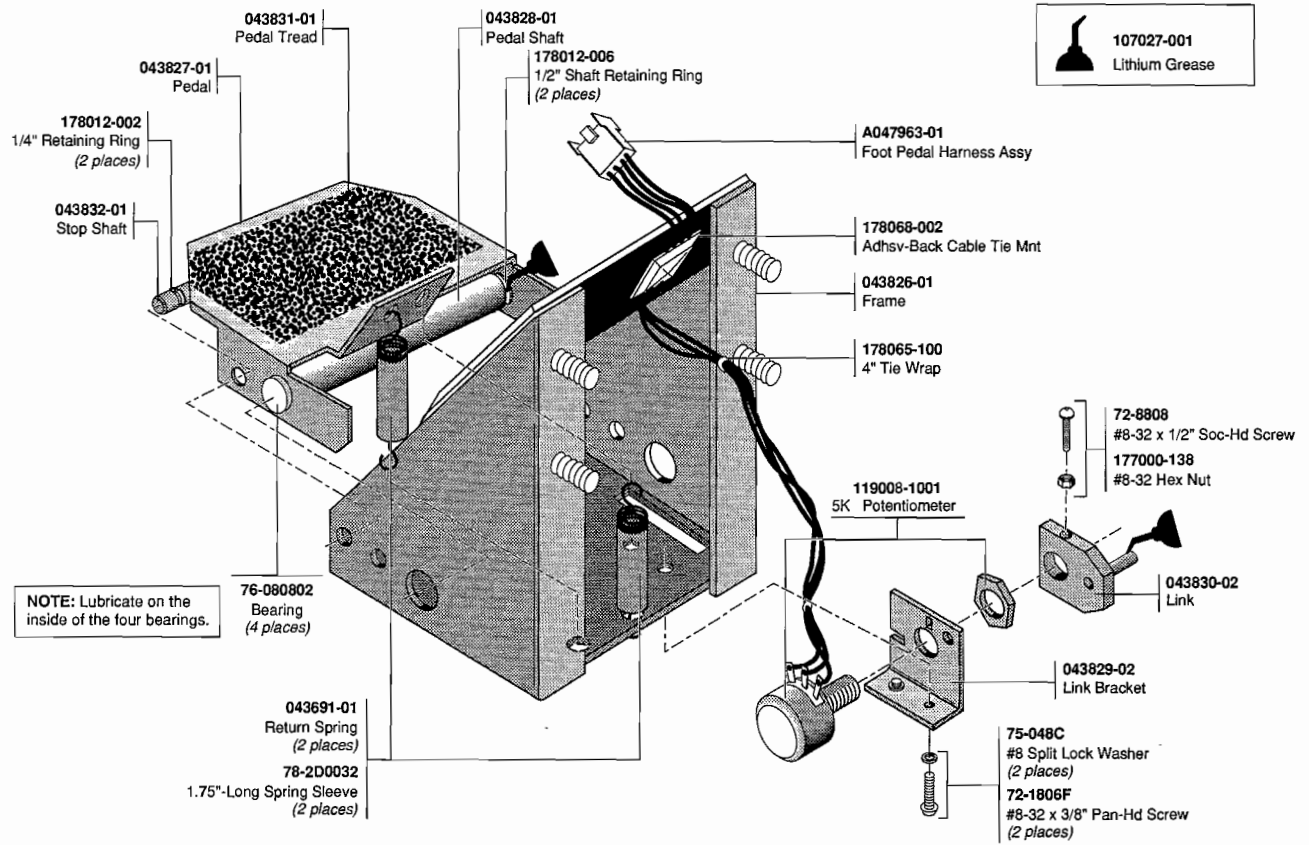


Figure 4-2 Shaker Steering Control Assembly
A049454-01 C

Shaker Steering Control Assembly Parts List

Item	Part No.	Description	Item	Part No.	Description
1	049452-01	Frame Weldment	23	119008-1001	5K Ω Pot
2	049453-01	.156-Inch-Dia.-Hole Counterweight	24	175002-001	Large .750-Inch-Dia.-Shaft Washer
3	049455-01	Cover			
4	047482-01	Shaft Weldment	25	175005-004	.762 x .010 Thick Shim Flat Washer
5	047479-01	Pot Bushing	26	178012-001	Retaining Ring with .750-Inch-Dia. Shaft
6	047488-01	Pivot Shaft Torsion Spring	27	72-8010	10-32 x 5/8 Lg Soc Hd Cap Screw
7	047485-01	O-Ring Stop	28	175002-004	#10 .062 Thick Flat Washer
8	047475-01	Centering Plate	29	177010-241	10-32 Polymer Hex Lock Nut
9	047487-01	Spring Catch	30	176041-3608	6-32 x 1/2-Inch Tamper-Proof Button-Head Torx T-10 Screw
10	040241-01	Bearing Spacer	31	106007-001	Loctite 290 Green Wicking Adhesive
11	171100-001	Right-Hand Kit Handle Assembly	32	177000-138	8-32 Hex Nut
12	171100-002	Left-Hand Kit Handle Assembly	33	72-8808	8-32 x 1/2 Lg Soc Hd Cap Screw
13	047476-01	Pot Bracket	34	106007-001	Lithium Grease Lubricant
14	145008-001	Motor 12 Vdc (Globe)	35	76-081202	.750 I.D. (Nyliner) Bearing
14.1	178311-1008	1/8-Inch Clear Heat-Shrink Tubing (2 Inches Req'd)	36	178294-0606	.50 Lg Tubing (1 Inch Req'd)
17	178244-220	Hose Clamp	37	178027-001	Nyogel 779 Lubricant
18	72-8812	8-32 x 3/4 Lg Soc Hd Cap Screw	38	A049462-01	Shaker Control Harness Assembly
19	177010-238	8-32 Polymer Hex Lock Nut	39	178068-002	1-Inch Sq. Adhesive-Back Cable Tie Mount
20	178181-7806	#8 Clearance I.D. x .375 Lg Steel Spacer	40	178065-100	4-Inch-Long Wire & Cable Tie
21	048861-01	X-Y Steering Modified Screw	41	72-CT604	6-32 x 1/4 Hex Washer-Hd Screw
22	178223-006	.549 I.D. x .103 W (2-133) O-Ring			



**Figure 4-3 Foot Pedal Assembly
A043825-02 D**

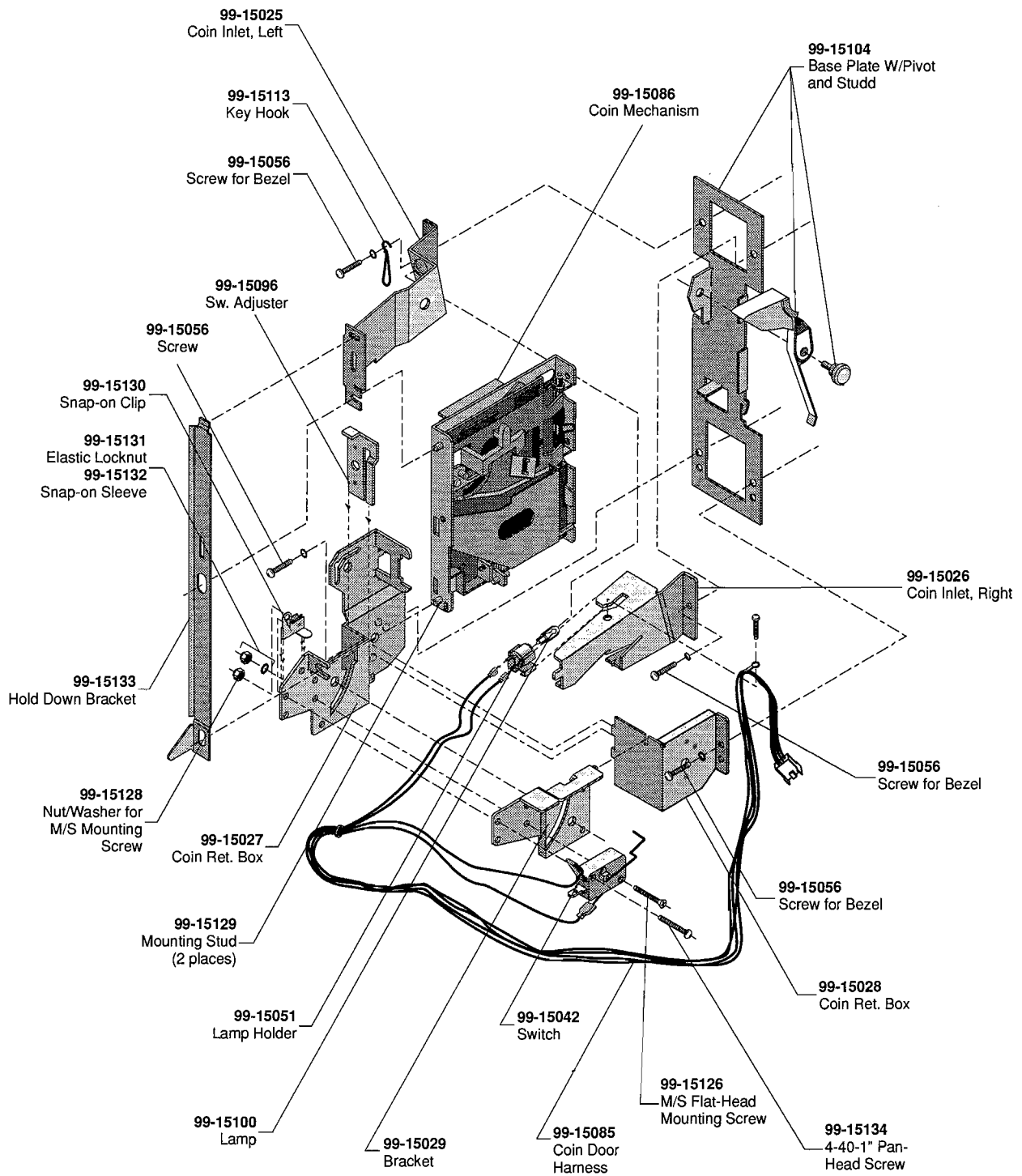


Figure 4-4 Four-Entry Coin Door Assembly
171101-001

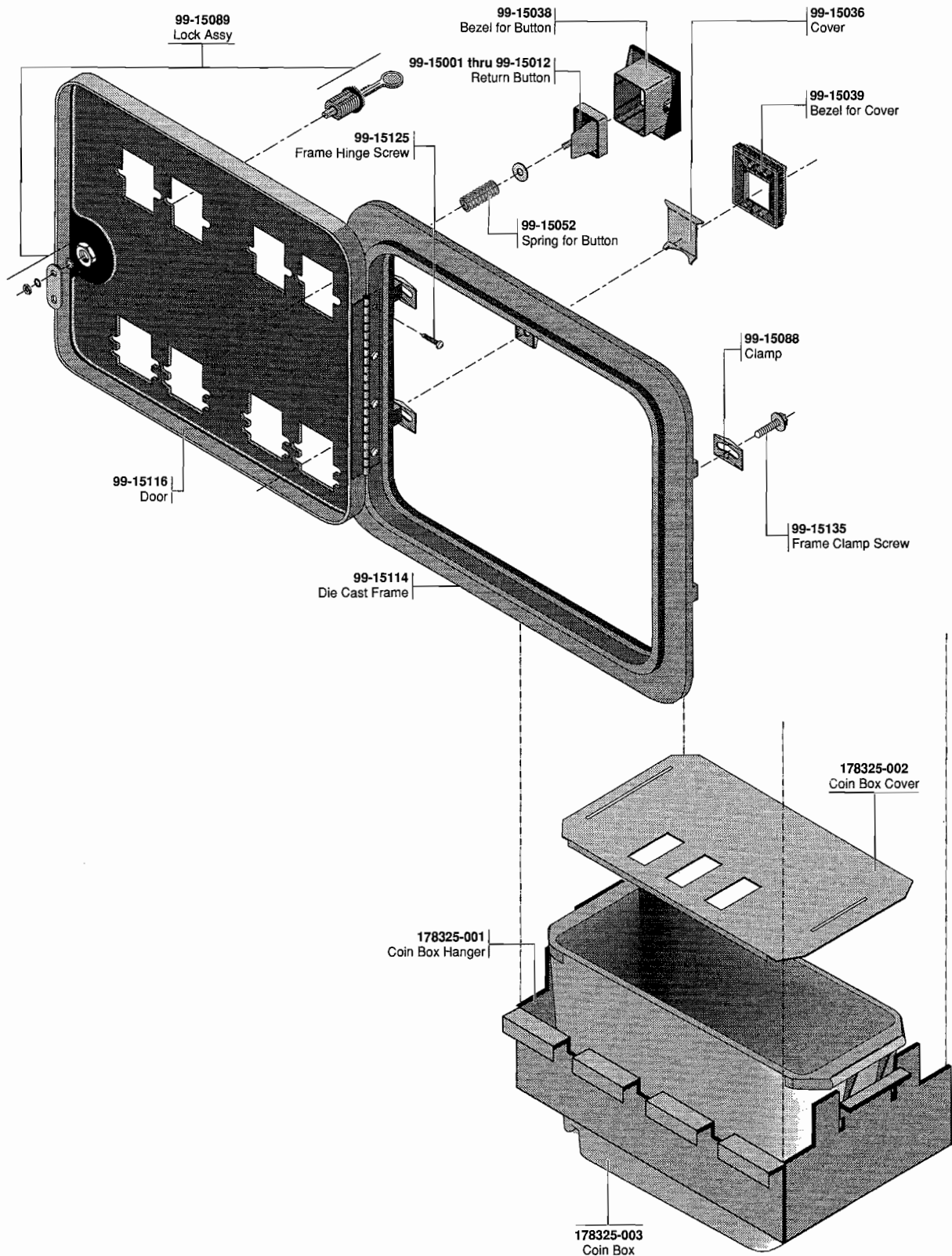
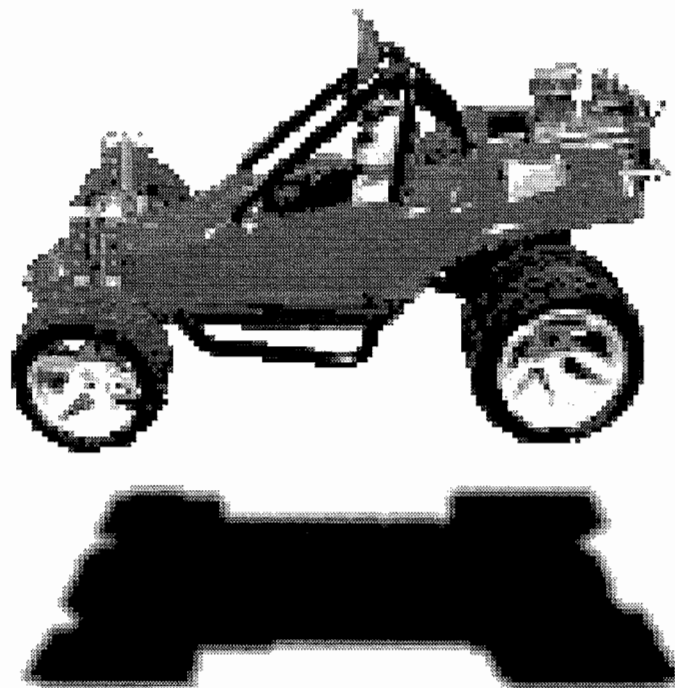
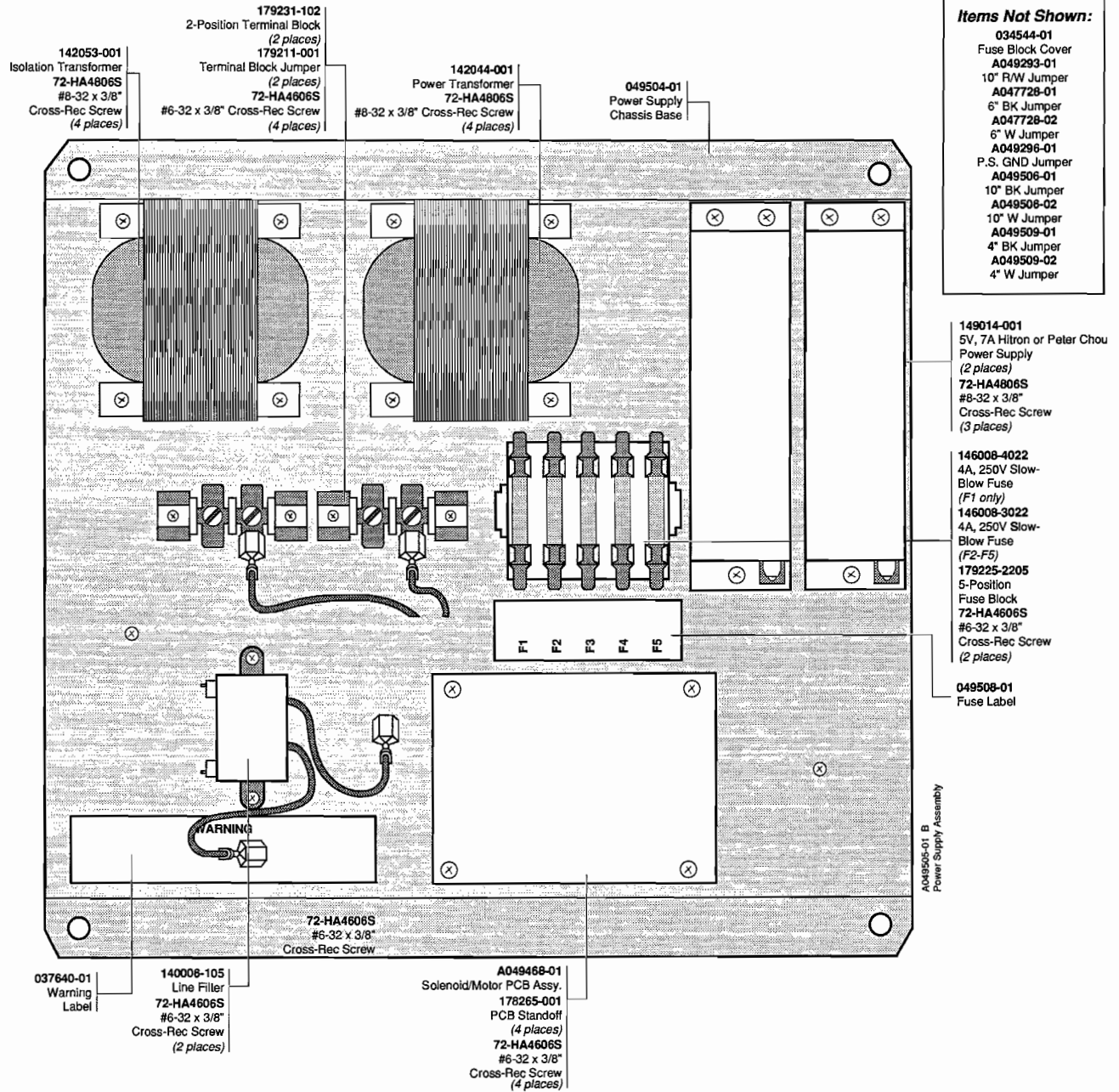


Figure 4-4 Four-Entry Coin Door Assembly, Continued
171101-001

NOTES





**Figure 4-5 Power Supply Assembly
A049505-01 B**

Road Riot 4WD Game PCB Assembly Parts List

Designator	Description	Part No.	Designator	Description	Part No.
2/3F	Socket, 44 Pin, Plcc	179237-044	2/3F	ASIC 65	136089-1012
2C	Socket, 24 Pin, .300	179259-024	2A	Res, R/2R, 1K/2K	118016-001
2P, 2S	Socket, 32 Pin, .600	179257-032	2B	Integrated Circuit, 74F374	137420-001
3C	Socket, 24 Pin, .300	179259-024	2C	Integrated Circuit, RAM, 2KX8, 35 ns, .3	137534-001
3K	Socket, 20 Pin, .300	179259-020	2D	Integrated Circuit, 74LS374	137144-001
3P, 3S	Socket, 32 Pin, .600	179257-032	2J	Integrated Circuit, 74F32	137486-001
4/5M, 4M	Socket, Zip 28	179302-028	2K	Integrated Circuit, 74F169	137496-001
4P, 4S	Socket, 32 Pin, .600	179257-032	2M	Integrated Circuit, 74LS377	137145-001
5C	Socket, 24 Pin, .600	179257-024	2P	EPROM, 200 ns, 128KX8	136089-1017
5M	Socket, Zip 28	179302-028	2S	EPROM, 200 ns, 128KX8	136089-1018
5P, 5S	Socket, 32 Pin, .600	179257-032	3/4A	Integrated Circuit, 74LS260	137332-001
6B	Socket, 28 Pin, .600	179257-028	3A	Res, R/2R, 1K/2K	118016-001
6C	Socket, 20 Pin, .300	179259-020	3B	Integrated Circuit, 74F374	137420-001
6P, 6S, 7P, 7S, 8C, 8D, 8P, 8S	Socket, 32 Pin, .600	179257-032	3C	Integrated Circuit, RAM, 2KX8, 35 ns, .3	137534-001
9/10F	Socket, 68 Pin, Plcc	179237-068	3D	Integrated Circuit, 74LS374	137144-001
9C, 9D, 9P, 9S, 10C, 10D, 11C, 11D	Socket, 32 Pin, .600	179257-032	3J	Integrated Circuit, 74LS377	137145-001
11S	Socket, 20 Pin, .300	179259-020	3K	GAL16V8, 25 ns	136089-1005
12F	Socket, 40 Pin, .600	179257-040	3M	Integrated Circuit, 74LS157	137029-001
14B/C	Socket, 64 Pin, .900	179256-064	3P	EPROM, 200 ns, 128KX8	136089-1019
14F	Socket, 24 Pin, .300	179259-024	3S	EPROM, 200 ns, 128KX8	136089-1020
15F	Socket, 20 Pin, .300	179259-020	4/5M	Integrated Circuit, VRAM, 256KX4, 100 ns	137682-100
15N	Socket, 28 Pin, .600	179257-028	4A	Res, R/2R, 1K/2K	118016-001
17J	Socket, 20 Pin, .300	179259-020	4B	Integrated Circuit, 74HCT273	137655-001
17N	Socket, 28 Pin, .600	179257-028	4C	Integrated Circuit, 74LS244	137038-001
18E, 18J	Socket, 40 Pin, .600	179257-040	4D	Integrated Circuit, 74LS374	137144-001
20/21C, 20/21D, 20C, 20D	Socket, 32 Pin, .600	179257-032	4E	Integrated Circuit, 74F138	137521-001
20P	Socket, 20 Pin, .300	179259-020	4F	Integrated Circuit, 74LS378	137305-001
20R/S	Socket, 68 Pin, PLCC	179237-068	4J	Integrated Circuit, 74F153	137492-001
21L, 21P	Socket, 20 Pin, .300	179259-020	4K	Integrated Circuit, 74LS153	137104-001
22C, 22D, 22J	Socket, 32 Pin, .600	179257-032	4M	Integrated Circuit, VRAM, 256KX4, 100 ns	137682-100
22P	Socket, 20 Pin, .300	179259-020	4P	EPROM, 200 ns, 128KX8	136089-1021
1A	Integrated Circuit, 7406	137052-001	4S	EPROM, 200 ns, 128KX8	136089-1022
1B	Integrated Circuit, 74HCT273	137655-001	5C	Integrated Circuit, 28C16-200, 200 ns	137648-200
1C	Integrated Circuit, 74LS244	137038-001	5D, 5E	Integrated Circuit, 74LS74	137023-001
1D	Integrated Circuit, 74LS374	137144-001	5F	Integrated Circuit, 74F32	137486-001
1E	Integrated Circuit, 74LS244	137038-001	5J	Integrated Circuit, 74F153	137492-001
1J	Integrated Circuit, 74F260	137570-001	5K	Integrated Circuit, 74LS153	137104-001
1K	Integrated Circuit, 74LS378	137305-001	5M	Integrated Circuit, Vram, 256KX4, 100 ns	137682-100
1M	Integrated Circuit, 74LS157	137029-001	5P	EPROM, 200 ns, 128KX8	136089-1023
2/3A	Integrated Circuit, 74LS260	137332-001	5S	EPROM, 200 ns, 128KX8	136089-1024
			6/7C	Integrated Circuit, 74F260	137570-001
			6B	Integrated Circuit, ADC0809	137243-001
			6C	GAL16V8, 25 ns	136089-1009
			6D	Integrated Circuit, 74F74	137436-001

Road Riot 4WD Game PCB Assembly Parts List, Continued

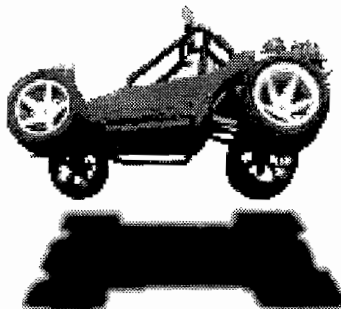
Designator	Description	Part No.	Designator	Description	Part No.
6E	Integrated Circuit, 74LS74	137023-001	12L, 12N, 12P	Integrated Circuit, 74F169	137496-001
6F	Integrated Circuit, 74LS32	137019-001	13D/E, 13E	Integrated Circuit, 74F04	137437-001
6J	Integrated Circuit, 74F153	137492-001	13F	Integrated Circuit, 74F02	137481-001
6K	Integrated Circuit, 74LS153	137104-001	13J	Integrated Circuit, 74F174	137531-001
6M	Integrated Circuit, 74LS377	137145-001	13L	Integrated Circuit, 74LS245	137134-001
6P	EPROM, 200 ns, 128KX8	136089-1025	13N, 13P, 13R	Integrated Circuit, 74F153	137492-001
6S	EPROM, 200 ns, 128KX8	136089-1026	14A	Integrated Circuit, 74LS257	137136-001
7F	Integrated Circuit, 74LS86	137079-001	14B/C	Integrated Circuit, 68000, 16MHz	137669-0001
7J	Integrated Circuit, 74F153	137492-001	14D/E	Integrated Circuit, 74F244	137502-001
7K	Integrated Circuit, 74LS153	137104-001	14F	GAL6001, 35 ns	136089-1010
7M	Integrated Circuit, 74LS244	137038-001	14J	Integrated Circuit, 74F04	137437-001
7P	EPROM, 200 ns, 128KX8	136089-1027	14K	Integrated Circuit, 74F00	137327-001
7S	EPROM, 200 ns, 128KX8	136089-1028	14L	Integrated Circuit, 74LS245	137134-001
8A/B	Integrated Circuit, 74F245	137591-001	14N	Integrated Circuit, 74F374	137420-001
8C	EPROM, 150 ns, 128KX8	136089-1013	14P	Integrated Circuit, 74LS374	137144-001
8D	EPROM, 150 ns, 128KX8	136089-1014	14R, 14S	Integrated Circuit, 74F153	137492-001
8J/K	Integrated Circuit, 74F02	137481-001	15A	Integrated Circuit, 74LS257	137136-001
8K/L	Integrated Circuit, 74LS153	137104-001	15B/C	Integrated Circuit, 74LS74	137023-001
8M	Integrated Circuit, 74LS244	137038-001	15C	Integrated Circuit, 74LS148	137417-001
8P	EPROM, 200 ns, 128KX8	136089-1029	15D	Integrated Circuit, 74F20	137530-001
8S	EPROM, 200 ns, 128KX8	136089-1030	15E	Integrated Circuit, 74F244	137502-001
9/10F	FPLA	136089-1004	15F	GAL16V8, 25 ns	136089-1007
9A/B	Integrated Circuit, 74LS245	137134-001	15L	Integrated Circuit, 74F153	137492-001
9C	EPROM, 200 ns, 128KX8	136089-1015	15N	Integrated Circuit, RAM, 32KX8, 70 ns, .6	137615-070
9D	EPROM, 200 ns, 128KX8	136089-1016	15R, 15S	Integrated Circuit, 74F163	137345-001
9K	Integrated Circuit, 7497	137090-001	16A	Integrated Circuit, 74LS244	137038-001
9M	Integrated Circuit, 74F174	137531-001	16B/C	Integrated Circuit, 74F08	137483-001
9P	EPROM, 200 ns, 128KX8	136089-1031	16C	Integrated Circuit, 74F163	137345-001
9S	EPROM, 200 ns, 128KX8	136089-1032	16D	Integrated Circuit, 74F74	137436-001
10A	Integrated Circuit, 74LS257	137136-001	16E	Integrated Circuit, 74F32	137486-001
10A/B	Integrated Circuit, 74LS245	137134-001	16F	Integrated Circuit, 74F138	137521-001
10K	Integrated Circuit, 74LS378	137305-001	16K/L	Integrated Circuit, 74F153	137492-001
10L	Integrated Circuit, 7497	137090-001	16L	Integrated Circuit, 74F00	137327-001
11/12A/B	Integrated Circuit, 74LS174	137122-001	16R, 16S	Integrated Circuit, 74F163	137345-001
11A	Integrated Circuit, 74LS257	137136-001	17A	Integrated Circuit, 74LS244	137038-001
11A/B	Integrated Circuit, 74LS174	137122-001	17A/B	Integrated Circuit, 74LS197	137240-001
11K, 11L	Integrated Circuit, 74F169	137496-001	17B/C	Integrated Circuit, 74F32	137486-001
11N	Integrated Circuit, 74LS377	137145-001	17D	Integrated Circuit, 74F04	137437-001
11P	Integrated Circuit, 74LS157	137029-001	17E, 17F	Integrated Circuit, 74F138	137521-001
11S	Integrated Circuit, 74F138	137521-001	17J	GAL16V8, 25 ns	136089-1008
12A/B	Integrated Circuit, 74F245	137591-001	17L	Integrated Circuit, 74LS245	137134-001
12C/D	Integrated Circuit, 74F244	137502-001	17N	Integrated Circuit, RAM, 32KX8, 70 ns, .6	137615-070
12F	Integrated Circuit, SOS	137550-001	17R, 17S	Integrated Circuit, 74F163	137345-001
12K	Integrated Circuit, 74F153	137492-001	18A	Integrated Circuit, 74LS257	137136-001
			18A/B	Integrated Circuit, 74F08	137483-001

Road Riot 4WD Game PCB Assembly Parts List, Continued

Designator	Description	Part No.	Designator	Description	Part No.
18B/C	Integrated Circuit, 74LS153	137104-001	C14-C18	Capacitor, 100 pF, 100 V, ±5%, Ceramic	122016-101
18C	Integrated Circuit, 74LS298	137201-001	C19-C40	Capacitor, .01 µF, 50 V, +80%–20%, Ceramic	122002-103
18E	Integrated Circuit, SOS	137550-001	C41	Capacitor, 100 µF, 16 V, Electrolytic	124008-107
18J	Integrated Circuit, PFHS	137419-104	C42-C57, C59-C70, C72-C149	Capacitor, .1 µF, 50 V, +80%–20%, Ceramic	122002-104
18L	Integrated Circuit, 74LS245	137134-001			
18N	Integrated Circuit, 74F374	137420-001			
18P, 18S	Integrated Circuit, 74LS244	137038-001	C150, C151	Capacitor, 10 pF, 100 V, ±5%, Ceramic	122016-100
19A	Integrated Circuit, 74LS257	137136-001	C152-C180	Capacitor, .1 µF, 50 V, +80%–20%, Ceramic	122002-104
19C	Integrated Circuit, 74LS298	137201-001	C181, C182	Capacitor, 100 pF, 100 V, ±5%, Ceramic	122016-101
19F	Integrated Circuit, 74F04	137437-001	C183-C244, C246-C252, C254-C262	Capacitor, .1 µF, 50 V, +80%–20%, Ceramic	122002-104
19J	Integrated Circuit, 74LS378	137305-001			
19K	Integrated Circuit, 74LS163 A	137114-001	C263-C274	Capacitor, 100 pF, 100 V, ±5%, Ceramic	122016-101
19L	Integrated Circuit, 74F86	137649-001	C523	Capacitor, .1 µF, 50 V, +80%–20%, Ceramic	122002-104
19N	Integrated Circuit, 74LS374	137144-001			
20/21C	EPROM, 200 ns, 128KX8	136089-1041	CR1, CR2	Diode, 1N4001	131048-001
20/21D	EPROM, 200 ns, 128KX8	136089-1038	CR3	Diode, MV5053, Light-Emitting	131027-002
20/21F	Integrated Circuit, 74LS378	137305-001	CTR	Connector, 2 Ckt, Header, .100	179048-002
20/21J	Integrated Circuit, 74LS157	137029-001			
20/21K	Integrated Circuit, 74LS377	137145-001	GND1,GND2	Test Point	179051-001
20C	EPROM, 200 ns, 128KX8	136089-1042	J4, J9, J10	Connector, 2 Ckt, Header, .100	179048-002
20D	EPROM, 200 ns, 128KX8	136089-1039	JAUD	Connector, 36 Ckt, .1 Header, Long	179300-036
20F	Integrated Circuit, 74LS377	137145-001	JPL3	Connector, 11 Ckt, Header, .100 Ctr, Key 7	179118-011
20J, 20K	Integrated Circuit, 74LS163 A	137114-001	JSYNC	Connector, 3 Ckt, Header, .100 Ctr	179048-003
20L	Integrated Circuit, 74F138	137521-001	JX	Connector, 60 Ckt, Header, .1 X .1C	179291-060
20N	Integrated Circuit, 74F163	137345-001	L1	Inductor, 100 µH	141024-001
20P	PROM	136089-1001	Q1-Q3	Transistor, 2N3904	133041-001
20R/S	CPU, PLCC	136079-2053	Q4-Q6	Transistor, 2N5306	133033-001
21F	Integrated Circuit, 74LS378	137305-001	Q7	Transistor, 2N3904	133041-001
21L	GAL16V8, 25 ns	136089-1006	R1	Resistor, 100 Ω, ±5%, 1/8 W	110027-101
21N	Integrated Circuit, 74F163	137345-001	R2	Resistor, 15 Ω, ±5%, 1/8 W	110027-150
21P	PROM	136089-1003	R3	Resistor, 100 Ω, ±5%, 1/8 W	110027-101
22C	EPROM, 200 ns, 128KX8	136089-1040	R4	Resistor, 15 Ω, ±5%, 1/8 W	110027-150
22D	EPROM, 200 ns, 128KX8	136089-1037	R5	Resistor, 100 Ω, ±5%, 1/8 W	110027-101
22F	Integrated Circuit, 74F85	137685-001	R6	Resistor, 15 Ω, ±5%, 1/8 W	110027-150
22J	EPROM, 200 ns, 128KX8	136089-1046	R7-R9	Resistor, 470 Ω, ±5%, 1/8 W	110027-471
22L	Integrated Circuit, 74LS151	137101-001	R10	Resistor, 2.4 K Ω, ±5%, 1/8 W	110027-242
22N	Integrated Circuit, 74F163	137345-001	R11	Resistor, 1 K Ω, ±5%, 1/8 W	110027-102
22P	PROM	136089-1002	R12	Resistor, 10 Ω, ±5%, 1/8 W	110027-100
22R	Integrated Circuit, 74LS379	137374-001	R13	Resistor, 2.4 K Ω, ±5%, 1/8 W	110027-242
22R	Integrated Circuit, 74LS379	137374-001	R14	Resistor, 1 K Ω, ±5%, 1/8 W	110027-102
C1-C3	Capacitor, 100 pF, 100 V, ±5%, Ceramic	122016-101	R15	Resistor, 10 Ω, ±5%, 1/8 W	110027-100
C4-C7	Capacitor, .1 µF, 50 V, +80%–20%, Ceramic	122002-104	R16	Resistor, 2.4 K Ω, ±5%, 1/8 W	110027-242
C8-C11	Capacitor, .01 µF, 50 V, +80%–20%, Ceramic	122002-103	R17	Resistor, 1 K Ω, ±5%, 1/8 W	110027-102
C12, C13	Capacitor, 1000 pF, 100 V, ±10%, Ceramic	122015-102	R18	Resistor, 10 Ω, ±5%, 1/8 W	110027-100

Road Riot 4WD Game PCB Assembly Parts List, Continued

Designator	Description	Part No.	Designator	Description	Part No.
R19	Resistor, 0 Ω , $\pm 5\%$, 1/4 W	110005-001	R117	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103
R20-R42	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R118, R119	Resistor, 10 Ω , $\pm 5\%$, 1/8 W	110027-100
R43-R45, R47, R49-R58	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R120-R122	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103
R59	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R123	Resistor, 100 Ω , $\pm 5\%$, 1/8 W	110027-101
R61, R62	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103	R124	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471
R63, R64	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R125	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103
R65-R68	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R126-R128	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102
R69-R72	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R129, R130	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103
R73-R76	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R131	Resistor, 100 Ω , $\pm 5\%$, 1/8 W	110027-101
R77, R78	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R132	Resistor, 10 Ω , $\pm 5\%$, 1/8 W	110027-100
R79	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R133	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102
R89	Resistor, 220 Ω , $\pm 5\%$, 1/8 W	110027-221	R134	Resistor, 10 Ω , $\pm 5\%$, 1/8 W	110027-100
R90, R91	Resistor, 100 Ω , $\pm 5\%$, 1/8 W	110027-101	R135	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102
R92-R100	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103	R136, R137	Resistor, 10 Ω , $\pm 5\%$, 1/8 W	110027-100
R101	Resistor, 240 Ω , $\pm 5\%$, 1/8 W	110027-241	R139-R141	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102
R102	Resistor, 100 K Ω , $\pm 5\%$, 1/8 W	110027-104	R142	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471
R103	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103	R143, R144	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102
R105-R107	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	STEST	Connector, 2 Ckt, Header, .100	179048-002
R108, R112, R113	Resistor, 10 Ω , $\pm 5\%$, 1/8 W	110027-100	VCR	Connector, 2 Ckt, Header, .100	179048-002
R114-R116	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	WDOG	Connector, 2 Ckt, Header, .100	179048-002
			X2	Crystal, 14.318MHz	144000-004



JSA III PCB Assembly Parts List

Designator	Description	Part No.	Designator	Description	Part No.
8D	Socket, 16 Pin, .300	179259-016		Nut/Washer Assy.	177026-0036
9C1	Socket, 24 Pin, .600	179257-024			
11C	Socket, 40 Pin, .600	179257-040	C1,C2	Capacitor, 47 μ F, 50V, Electrolytic	123015-476
12C	Socket, 28 Pin, .600	179257-028	C3	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
12E	Socket, 32 Pin, .600	179257-032	C4	Capacitor, 10 μ F, 25 V, Electrolytic	124009-106
15C	Socket, 28 Pin, .600	179257-028	C5-C7	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
15E	Socket, 32 Pin, .600	179257-032	C8	Capacitor, 10 μ F, 25 V, Electrolytic	124009-106
17C	Socket, 20 Pin, .300	179259-020			
17E, 19E	Socket, 32 Pin, .600	179257-032	C9, C10	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
20C	Socket, 20 Pin, .300	179259-020	C13	Capacitor, 47 μ F, 50V, Electrolytic	123015-476
++1005V1	Test Point	179051-001	C14-C22	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
1D	Integrated Circuit, Quad Op-Amp, LM3403	137673-001	C23	Capacitor, 10 μ F, 25 V, Electrolytic	124009-106
2A	Integrated Circuit, TDA2030	137301-001	C24, C25	Capacitor, .22 μ F, 50 V, \pm 10%, Ceramic	122015-224
3D	Integrated Circuit, 4066B	137580-001	C26-C28	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
4A	Integrated Circuit, TDA2030	137301-001			
4C, 5C	Integrated Circuit, 4066B	137580-001	C29	Capacitor, 1000 pF, 50 V, \pm 10%, Ceramic	122015-102
6D, 6F	Integrated Circuit, Quad Op-Amp, LM3403	137673-001	C30-C32	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
7C	Integrated Circuit, 74LS273	137040-001	C33	Capacitor, 3300 pF, 50 V, \pm 5%, NPO, +80%-20%	122019-332
8A	Integrated Circuit, 74LS174	137122-001	C34, C35	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
8D	Integrated Circuit, YM3012	137402-001			
9C1	Integrated Circuit, YM2151	137401-001	C37	Capacitor, 2200 pF, 50 V, +80%-10%, Ceramic	122015-222
10A	Integrated Circuit, 74LS273	137040-001	C38	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
11C	Integrated Circuit, 6502 A	137577-001	C39	Capacitor, .015 μ F, 100 V, \pm 5%, Poly	126009-153
12C	EPROM, 200 ns, 64KX8	136089-1047	C40	Capacitor, 10 μ F, 25 V, Electrolytic	124009-106
12E	EPROM, 200 ns, 128KX8	136089-1051			
13A	Integrated Circuit, 74LS240	137251-001	C41	Capacitor, 1000 pF, 50 V, \pm 10%, Ceramic	122015-102
14A	Integrated Circuit, 74LS374	137144-001	C42, C43	Capacitor, 6800 pF, 50 V, 80%-10%, Ceramic	122015-682
15C	Integrated Circuit, RAM, 8Kx8, 100 ns, .6	137535-004	C44, C45	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
15E	EPROM, 200 ns, 128KX8	136089-1050	C46, C47	Capacitor, 1000 pF, 50 V, \pm 10%, Ceramic	122015-102
16A	Integrated Circuit, 74LS374	137144-001	C48, C49	Capacitor, 3300 pF, 50 V, \pm 5%, NPO	122019-332
17B	Integrated Circuit, 74F74	137436-001	C50	Capacitor, 10 μ F, 25 V, Electrolytic	124009-106
17C	GAL16V8, 25 ns, 137646-025	136085-1038	C51-C54	Capacitor, .1 μ F, 50 V, +80%-20%, Ceramic	122002-104
17E	EPROM, 200 ns, 128KX8	136089-1049	CR1, CR2	Diode, 1N4001	131048-001
18B	Integrated Circuit, 74LS74	137023-001	CR3	Diode, MV5053, Light-Emitting	131027-002
18C	Integrated Circuit, 74LS138	137177-001	CR6-CR8	Diode, 1N4001	131048-001
19B	Integrated Circuit, 74LS393	137146-001	CR9	Diode, MV5053, Light-Emitting	131027-002
19C	Integrated Circuit, 74LS74	137023-001			
19E	EPROM, 200 ns, 128KX8	136089-1048			
20B	Integrated Circuit, 74LS393	137146-001			
20C	GAL16V8, 25 ns	136085-1039			
AGND1	Test Point	179051-001	GND1,GND2	Test Point	179051-001

JSA III PCB Assembly Parts List, Continued

Designator	Description	Part No.	Designator	Description	Part No.
HS1	Heat Sink, TDA2030	178190-032	R38	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103
JAUD	Connector, 36 Ckt, .1 Bottom Entry Assy, PCB, Surface-Mount (includes MSM 6295 Integrated Circuit)	179299-036 A048972-01	R40	Resistor, 30 K Ω , $\pm 5\%$, 1/8 W	110027-303
R1, R2	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103	R41	Resistor, 15 K Ω , $\pm 5\%$, 1/8 W	110027-153
R3	Resistor, 33 K Ω , $\pm 5\%$, 1/8 W	110027-333	R42	Resistor, 150 K Ω , $\pm 5\%$, 1/8 W	110027-154
R4	Resistor, 1 Ω , $\pm 5\%$, 1/8 W	110027-010	R43	Resistor, 7.5 K Ω , $\pm 5\%$, 1/8 W	110027-752
R5	Resistor, 33 K Ω , $\pm 5\%$, 1/8 W	110027-333	R44	Resistor, 15 K Ω , $\pm 5\%$, 1/8 W	110027-153
R6	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R48	Resistor, 3.3 K Ω , $\pm 5\%$, 1/8 W	110027-332
R7	Resistor, 33 K Ω , $\pm 5\%$, 1/8 W	110027-333	R49	Resistor, 33 K Ω , $\pm 5\%$, 1/8 W	110027-333
R8	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R50	Resistor, 30 K Ω , $\pm 5\%$, 1/8 W	110027-303
R9	Resistor, 33 K Ω , $\pm 5\%$, 1/8 W	110027-333	R51	Resistor, 6.2 K Ω , $\pm 5\%$, 1/8 W	110027-622
R10	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R52, R53	Resistor, 12 K Ω , $\pm 5\%$, 1/8 W	110027-123
R11	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R54	Resistor, 7.5 K Ω , $\pm 5\%$, 1/8 W	110027-752
R12	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R55	Resistor, 560 Ω , $\pm 5\%$, 1/8 W	110027-561
R13	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R56	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471
R14	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R57	Resistor, 100 Ω , $\pm 5\%$, 1/8 W	110027-101
R15	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R59	Resistor, 10 Ω , $\pm 5\%$, 1/8 W	110027-100
R16	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R62	Resistor, 15 K Ω , $\pm 5\%$, 1/8 W	110027-153
R17, R20	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R63	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103
R22	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471	R64	Resistor, 15 K Ω , $\pm 5\%$, 1/8 W	110027-153
R23	Resistor, 33 K Ω , $\pm 5\%$, 1/8 W	110027-333	R65	Resistor, 7.5 K Ω , $\pm 5\%$, 1/8 W	110027-752
R24	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102	R66	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103
R25	Resistor, 1 Ω , $\pm 5\%$, 1/8 W	110027-010	R67	Resistor, 3.3 K Ω , $\pm 5\%$, 1/8 W	110027-332
R26	Resistor, 1.2 K Ω , $\pm 5\%$, 1/8 W	110027-122	R68	Resistor, 6.8 K Ω , $\pm 5\%$, 1/8 W	110027-682
R28B	Resistor, 10 Ω , $\pm 5\%$, 1/8 W	110027-100	R69	Resistor, 16 K Ω , $\pm 5\%$, 1/8 W	110027-163
R29	Resistor, 5.1 K Ω , $\pm 5\%$, 1/8 W	110027-512	R70	Resistor, 2 K Ω , $\pm 5\%$, 1/8 W	110027-202
R30	Resistor, 15 K Ω , $\pm 5\%$, 1/8 W	110027-153	R71	Resistor, 6.8 K Ω , $\pm 5\%$, 1/8 W	110027-682
R31	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103	R72	Resistor, 10 K Ω , $\pm 5\%$, 1/8 W	110027-103
R32	Resistor, 620 K Ω , $\pm 5\%$, 1/8 W	110027-624	R73	Resistor, 20 K Ω , $\pm 5\%$, 1/8 W	110027-203
R33	Resistor, 330 K Ω , $\pm 5\%$, 1/8 W	110027-334	SW1	Switch, Slide, SPDT Nut/Washer, Zinc Screw, Pan-Head, #6-32x3/8, Cross-Recessed, Cadmium Thermal Compound	160040-001 177026-0036 72-1606S 107031-001
R34	Resistor, 82 K Ω , $\pm 5\%$, 1/8 W	110027-823			
R35	Resistor, 20 K Ω , $\pm 5\%$, 1/8 W	110027-203			
R36	Resistor, 39 K Ω , $\pm 5\%$, 1/8 W	110027-393			
R37	Resistor, 160 K Ω , $\pm 5\%$, 1/8 W	110027-164			

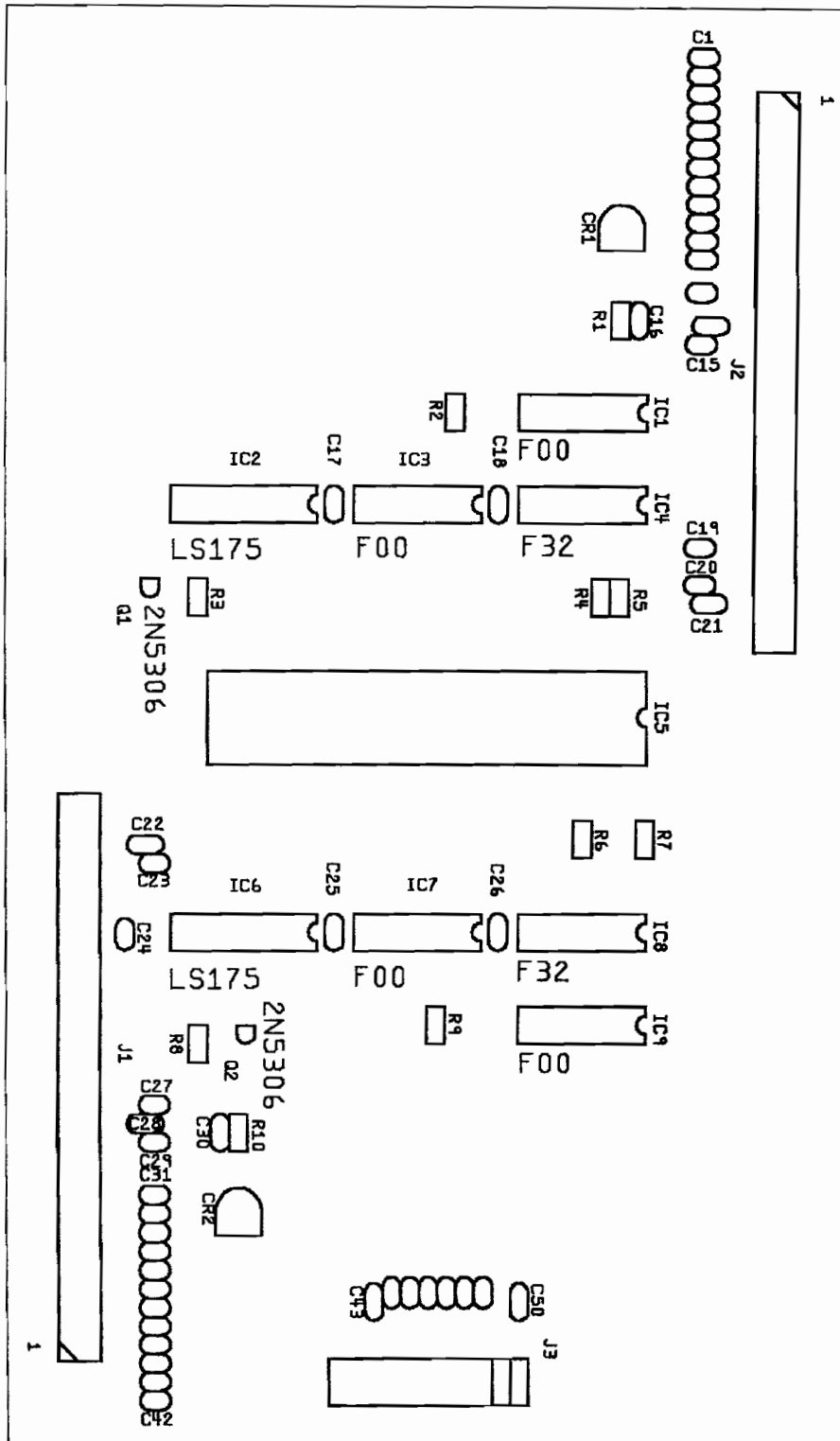
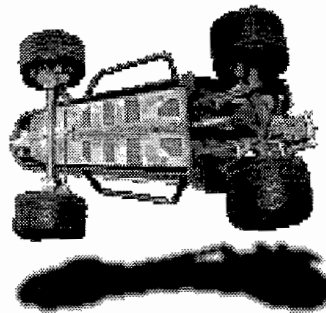
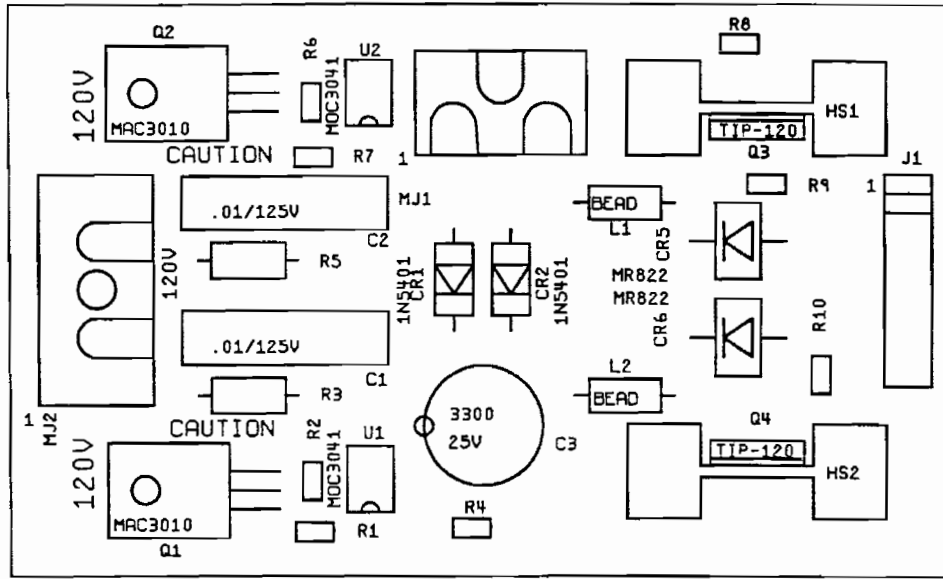


Figure 4-8 Comm-RAM (Common RAM) PCB Assembly
A049465-01 A

Comm-RAM PCB Assembly Parts List

Designator	Description	Part No.	Designator	Description	Part No.
C1-C12	Capacitor, 100 pF, 100 V, $\pm 5\%$, Ceramic	122016-101	C47	Capacitor, .01 μF , 50 V, +80%–20%, Ceramic	122002-103
C13	Capacitor, 33 pF, 100 V, $\pm 5\%$, Ceramic	122016-330	C48, C49	Capacitor, 1000 pF, 100 V, $\pm 10\%$, Ceramic	122015-102
C14	Capacitor, .1 μF , 50 V, +80%–20%, Ceramic	122002-104	C50	Capacitor, .1 μF , 50 V, +80%–20%, Ceramic	122002-104
C15	Capacitor, 33 pF, 100 V, $\pm 5\%$, Ceramic	122016-330	IC1	Integrated Circuit, 74F00	137327-001
C16-C18	Capacitor, .1 μF , 50 V, +80%–20%, Ceramic	122002-104	IC2	Integrated Circuit, 74LS175	137123-001
C19	Capacitor, 100 pF, 100 V, $\pm 5\%$, Ceramic	122016-101	IC3	Integrated Circuit, 74F00	137327-001
C20	Capacitor, 33 pF, 100 V, $\pm 5\%$, Ceramic	122016-330	IC4	Integrated Circuit, 74F32	137486-001
C21, C22	Capacitor, .1 μF , 50 V, +80%–20%, Ceramic	122002-104	IC5	Integrated Circuit, SRAM DP, 2Kx8, 55ns, .6	137681-055
C23	Capacitor, 33 pF, 100 V, $\pm 5\%$, Ceramic	122016-330	IC5	Socket, 48 Pin, .600	179257-048
C24	Capacitor, 100 pF, 100 V, $\pm 5\%$, Ceramic	122016-101	IC6	Integrated Circuit, 74LS175	137123-001
C25, C26	Capacitor, .1 μF , 50 V, +80%–20%, Ceramic	122002-104	IC7	Integrated Circuit, 74F00	137327-001
C27	Capacitor, 33 pF, 100 V, $\pm 5\%$, Ceramic	122016-330	IC8	Integrated Circuit, 74F32	137486-001
C28	Capacitor, .1 μF , 50 V, +80%–20%, Ceramic	122002-104	IC9	Integrated Circuit, 74F00	137327-001
C29	Capacitor, 33 pF, 100 V, $\pm 5\%$, Ceramic	122016-330	J1, J2	Connector, 60 Circuit, Rec, .1 x .1C	179303-060
C30	Capacitor, .1 μF , 50 V, +80%–20%, Ceramic	122002-104	J3	Connector, 11 Circuit, Header, .100 Ctr, Key 2	179118-011
C31-C42	Capacitor, 100 pF, 100 V, $\pm 5\%$, Ceramic	122016-101	Q1, Q2	Transistor, 2N5306	133033-001
C43	Capacitor, .1 μF , 50 V, +80%–20%, Ceramic	122002-104	R2, R3	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102
C44	Capacitor, .01 μF , 50 V, +80%–20%, Ceramic	122002-103	R4	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471
C45, C46	Capacitor, 1000 pF, 100 V, $\pm 10\%$, Ceramic	122015-102	R5	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102
			R6	Resistor, 470 Ω , $\pm 5\%$, 1/8 W	110027-471
			R7-R9	Resistor, 1 K Ω , $\pm 5\%$, 1/8 W	110027-102





**Figure 4-9 Solenoid/Motor PCB Assembly
A049468-01 A**

Parts List

Designator	Description	Part No.	Designator	Description	Part No.
HS1	Nut/Washer Assy, 6-32, Zinc	177026-1036	MJ1	Conn, 6 Ckt, Hdr, .250 Ctr	179069-006
HS1	Screw, Pan, 6-32 x 3/8, Cross-Rec, Cadmium	72-1606S	MJ2	Conn, 3 Ckt, Hdr, .250 Ctr	179069-003
C1, C2	Capacitor, .01 μ F, 125 V Rms, Ceramic Disc	120010-103	Q1, Q2	Triac, 600 V / 25 A, MAC223A8	133053-001
C3	Capacitor, 3300 μ F, 25 V, Electrolytic	123003-338	Q3, Q4	Transistor, TIP120	133051-001
CR1, CR2	Diode, 1N5401	131051-002	R1, R2	Resistor, 330 Ω , \pm 5%, 1/8 W	110027-331
CR5, CR6	Diode, MR822	131019-001	R3	Resistor, 39 Ω , \pm 5%, 1/2 W	110001-390
HS1, HS2	Heat Sink, TO-220, 1.5X.5	178190-124	R4	Resistor, 270 Ω , \pm 5%, 1/8 W	110027-271
HS2)	Nut/Washer Assy, 6-32, Zinc	177026-1036	R5	Resistor, 39 Ω , \pm 5%, 1/2 W	110001-390
HS2)	Screw, Pan, 6-32 X 3/8, Cross-Rec, Cadmium	72-1606S	R6, R7	Resistor, 330 Ω , \pm 5%, 1/8 W	110027-331
J1	Connector, 11 Circuit, Header, .100 Ctr, Key 2	179118-011	R8	Resistor, 270 Ω , \pm 5%, 1/8 W	110027-271
L1, L2	Inductor, Ferrite Bead, N12N	141003-005	R9, R10	Resistor, 1 K Ω , \pm 5%, 1/8 W	110027-102
			U1, U2	Opto-Iso, Triac, MOC3041	138008-001
			HS1, HS2	Thermal Compound	107031-001



Road Riot 4WD Statistics Sheet

Date Recorded: _____ Location: _____

Meter: _____

Statistics Screen

- Left Coins: _____
- Right Coins: _____
- Auxiliary Coins: _____
- New Games: _____
- Continuation: _____
- Free Games: _____
- Idle Time: _____
- Active Time: _____
- Solo Time: _____
- Linked Time: _____
- Shaker Time: _____
- Thumper Count: _____
- Error Count: _____
- Total Credits: _____
- Total Coins: _____



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.

Atari distributors are independent, being privately owned and operated. In their judgment they may sell parts or accessories other than Atari parts or accessories. Atari Games Corporation cannot be responsible for the quality, suitability or safety of any non-Atari part or any modification including labor which is performed by such distributor.



Atari Games Corporation

675 Sycamore Drive

P.O. Box 361110

Milpitas, CA 95036