If reading through this manual does not lead to solving a certain maintenance problem, call TELEHELP® at the Atari Customer Service office in your geographical area, as shown below.

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**062-52155**
POLE POSITION II

Operators Manual

Safety Summary

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

⚠️ WARNINGS ⚠️

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 3-wire outlet. If you have only a 2-wire outlet, we recommend you hire a licensed electrician to install a grounded outlet. Players may receive an electrical shock if the control panel is not properly grounded! After servicing any parts on the panel, check that the grounding clip is firmly secured to the metal tab on the inside of the control panel. Only then should you lock up the game.

AC Power Connection. Before connecting the game to the AC power source, verify that the proper voltage-selection plug is installed on the game's power supply.

Disconnect Power During Repairs. To avoid electrical shock, disconnect the game from the AC power source before removing or repairing any part of the game. When removing or repairing the video display, extra precautions must be taken to avoid electrical shock because high voltages may exist within the display circuitry and cathode-ray tube (CRT) even after power has been disconnected. Do not touch internal parts of the display with your hands or metal objects! Always discharge the high voltage from the CRT before servicing this area of the game. To discharge the CRT: Attach one end of a large, well-insulated, 20-kV jumper to ground. Momentarily touch the free end of the grounded jumper to the anode by sliding it under the anode cap. Wait two minutes and discharge the anode again.

Use Only ATARI Parts. To maintain the safety integrity of your ATARI game, do not use non-ATARI parts when repairing the game. Use of non-ATARI parts or other modifications to the game circuitry may adversely affect the safety of your game, and injure you or your players.

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

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. Note that they are keyed to fit only one way. If they do not slip on easily, do not force them. A reversed connector may damage your game and void the warranty.
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This Act provides for increased 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 $250,000 in certain cases. Infringers may also have to pay costs and attorneys' fees and face an imprisonment of up to five years.

Atari will aggressively enforce its copyrights against any 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, INC.
790 Sycamore Drive
P.O. Box 906
Milpitas, California 95035

Printed in the U.S.A. 11M
Notice Regarding 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.

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 green 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.
- The game printed-circuit boards (PCB) are properly installed within the Electromagnetic Interference (EMI) cage.
- The EMI Shield PCB is properly installed and connected in series with the game PCB harness.
- All filter capacitors required on the EMI Shield PCB are properly soldered in place.

If you are still unable to solve the interference problem, please contact ATARI Customer Service. See the inside front cover of this manual for service in your area.
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1 Set-Up Procedures

Introduction

Pole Position II, the sensational sequel to Pole Position, offers you a choice of 4 racetracks! These tracks—FUJI, TEST, SUZUKA, and SEASIDE—are based on actual international raceways.

This document is a supplement to TM-218 (Pole Position Operation, Maintenance, and Service Manual) because the Pole Position II cabinets are very similar to the Pole Position cabinets. Part numbers that are different between the two games are listed in Table 1-1.

Information about game play, option-switch settings, self-test procedures, printed-circuit boards (PCB), and part numbers for Pole Position II is contained in this document. We also describe how to change the Pole Position Schematic Package (SP-218 or SP-219) to support Pole Position II. If you need more information, refer to TM-218.
Figure 1-1 Game Overview—Upright Pole Position II
WARNING

Connect this game ONLY to a grounded 3-wire outlet. If you have a 2-wire outlet, we recommend you hire a licensed electrician to install a grounded outlet. You may receive an electrical shock if the game is not properly grounded.

Figure 1-2 Game Overview—Sit-Down Pole Position II
A. New Features

Pole Position II has several new features:

- Pole Position II presents a choice of 4 racetracks—FUJI, TEST, SUZUKA, and SEASIDE. Each track offers the player a unique challenge and different racing times.

- Faster game play—the times listed in Table 1-5 in this document are faster than the times listed in Table 1-6 in TM-218. The time displayed on the screen is not in real seconds but “game” seconds.

- The option-switch settings for Pole Position II are different than the Pole Position settings. For complete listings of the option-switch settings, refer to Tables 1-2 through 1-6.

---

**CAUTION**

Do not set toggle 8 of the option switch at location 9JA (Atari PCB) or 7E (Namco PCB) to on! The on setting causes the screen image to freeze. If the image is frozen for a long time, phosphor burn may occur.

---

**WARNING**

Connect this game ONLY to a grounded 3-wire outlet. If you have a 2-wire outlet, we recommend you hire a licensed electrician to install a grounded outlet. You may receive an electrical shock if the game is not properly grounded.

---

B. Inspecting the Game

Inspect your game carefully to ensure that it was delivered to you in good condition. Game inspection and setup procedures are listed in TM-218, Sections B, C, and D.

---

**WARNING**

Do not plug in the game until the procedures in Sections B, C, and D in TM-218 have been completed.

---

After you have completed these procedures, connect this game ONLY to a grounded 3-wire outlet. If you have a 2-wire outlet, we recommend you hire a licensed electrician to install a grounded outlet. You may receive an electrical shock if the game is not properly grounded.

---

**CAUTION**

Do not depress the accelerator or brake pedal when you turn on the game or switch to the Self-Test Mode. Doing so will cause faulty program initialization and incorrect action of the player controls.

---

C. Switch Locations

1. **Power On/Off Switch**

The on/off switch is behind the game on the lower left side (see Figure 1-3).

2. **Utility Panel Switches**

The volume control(s), self-test switch, coin counter(s), and auxiliary coin switch are located on the utility panel. The utility panel is located inside the upper coin door. The volume control adjusts the level of sound produced by the game. The Upright cabinet has two volume controls: one for each speaker. The Sit-Down cabinet has four volume controls: one for each speaker. The self-test switch is used to enter and exit the Self-Test diagnostic routine. The coin counter(s) records the number of coins entered into the game. The auxiliary coin switch is used to credit the game without activating the coin counter(s). See Figure 3-15 in TM-218 for more information about the utility panel.

3. **Option Switches**

If your game has Atari PCBs, the option switches are at locations 9L and 9JA on the CPU PCB. If your game has Namco PCBs, the option switches are at locations 7E and 9E on the CPU PCB (see Figure 1-3).
Figure 1-3 Switch Locations
Table 1-1 Comparison of Pole Position and Pole Position II Part Numbers

<table>
<thead>
<tr>
<th>Description of Item</th>
<th>Type of Cabinet</th>
<th>Pole Position Part Number</th>
<th>Pole Position II Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Test Chart</td>
<td>Upright and Sit-Down</td>
<td>ST-218-01</td>
<td>ST-255</td>
</tr>
<tr>
<td>CPU PCB (Atari)</td>
<td>Upright and Sit-Down</td>
<td>A039185-21</td>
<td>A039185-22</td>
</tr>
<tr>
<td>Video PCB (Atari)</td>
<td>Upright and Sit-Down</td>
<td>A039187-21</td>
<td>A039187-22</td>
</tr>
<tr>
<td>CPU PCB (Namco)</td>
<td>Upright and Sit-Down</td>
<td>171031-001</td>
<td>171031-001</td>
</tr>
<tr>
<td>Video PCB (Namco)</td>
<td>Upright and Sit-Down</td>
<td>171032-001</td>
<td>171032-001</td>
</tr>
<tr>
<td>PCB Label (for CPU and Video PCB)</td>
<td>Upright and Sit-Down</td>
<td>Not Required</td>
<td>041377-01</td>
</tr>
<tr>
<td>Left Side Panel Decal</td>
<td>Upright</td>
<td>*</td>
<td>041353-01</td>
</tr>
<tr>
<td>Right Side Panel Decal</td>
<td>Upright</td>
<td>*</td>
<td>041353-02</td>
</tr>
<tr>
<td>Instrument Panel Decal</td>
<td>Upright</td>
<td>*</td>
<td>041355-03</td>
</tr>
<tr>
<td>Attraction Panel Film</td>
<td>Upright</td>
<td>039485-03</td>
<td>041354-02</td>
</tr>
<tr>
<td>Attraction Glass</td>
<td>Upright</td>
<td>037410-01</td>
<td>037410-01</td>
</tr>
<tr>
<td>Foam Tape (for attraction glass)</td>
<td>Upright</td>
<td>78-6900404</td>
<td>78-6900404</td>
</tr>
<tr>
<td>Video Display Shield with Graphics</td>
<td>Upright</td>
<td>039417-01</td>
<td>041356-01</td>
</tr>
<tr>
<td>Left Side Panel Decal—Rear</td>
<td>Sit-Down</td>
<td>*</td>
<td>041378-01</td>
</tr>
<tr>
<td>Right Side Panel Decal—Rear</td>
<td>Sit-Down</td>
<td>*</td>
<td>041378-02</td>
</tr>
<tr>
<td>Left Side Panel Decal—Front</td>
<td>Sit-Down</td>
<td>*</td>
<td>041379-01</td>
</tr>
<tr>
<td>Right Side Panel Decal—Front</td>
<td>Sit-Down</td>
<td>*</td>
<td>041379-02</td>
</tr>
<tr>
<td>Left Control Panel Decal</td>
<td>Sit-Down</td>
<td>*</td>
<td>041380-04</td>
</tr>
<tr>
<td>Right Control Panel Decal</td>
<td>Sit-Down</td>
<td>*</td>
<td>041380-05</td>
</tr>
<tr>
<td>Front Panel Decal</td>
<td>Sit-Down</td>
<td>*</td>
<td>041382-01</td>
</tr>
<tr>
<td>Foam Tape (for display shield)</td>
<td>Sit-Down</td>
<td>78-6900804</td>
<td>78-6900404</td>
</tr>
<tr>
<td>Video Display Shield with Graphics</td>
<td>Sit-Down</td>
<td>039148-01</td>
<td>041381-01</td>
</tr>
</tbody>
</table>

*Pole Position did not have decals because its panels were silkscreened.

D. Option-Switch Settings

Tables 1-2 through 1-5 explain options and switch settings. Options preset at the factory are shown by the ◄ symbols. But you may change the settings to suit your needs.

Table 1-2 lists switch settings for options relating to racing difficulty levels (A is easiest; D is hardest). It also lists settings for laps per game, preliminary game time, and speed.

Table 1-3 describes the switch settings for options relating to game pricing (coin mechanism* multipliers), unit of speed (MPH or KPH), attract mode sound, and freezing the screen.

Table 1-4 provides qualifying lap times and bonus point information.

* A coin mechanism is a device on the inside of the coin door that inspects a coin to determine if the correct coin has been inserted. The mechanism either accepts or rejects the coin. The coin door has two coin mechanisms. The multipliers (9JA switches 1–5) determine the value of the coin mechanisms to the game's logic. The basic unit of measurement is a coin worth $2.50 or 1 DM, which equals a multiplier of x1. For example, if you have a 2 DM/1 DM coin door, you may want to set the left multiplier at x2 and the right multiplier at x1.

Table 1-5 provides racing lap times for extended laps.

**NOTE**

Game and price options are at location 9JA on the Atari CPU PCB and 7E on the Namco CPU PCB. Game and play options are at location 9L on the Atari CPU PCB and 9E on the Namco CPU PCB.

To verify option-switch settings, set the self-test switch to the on position. Compare the information on the screen (see Figure 2-1 for an explanation of messages on the screen) to the option-switch settings listed in the tables in this section. If these settings are the ones you want, set the self-test switch to the off position. If you want to change settings, set the self-test switch to off, set the power on/off switch to off, and change the switch settings.

Pole Position II leaves the factory with option switches set at the manufacturer's recommended difficulty level. The game will be exciting and challenging for players at these settings.
NOTE
Table 1-2 contains average and high speed settings. The average speed setting enables the game to reach top speeds of 458 KPH (286 MPH); however, due to the varying difficulty of different tracks, the typical top speed will be 411 KPH (256 MPH). The high speed setting enables the game to reach top speeds of 582 KPH (363 MPH); however, due to the varying difficulty of different tracks, the typical top speed will be 450 KPH (280 MPH).

NOTE
Atari, Inc. tested the Upright game and found that, in an arcade environment, earnings will be excellent with option switches set to Sit-Down game settings.

Table 1-2  Switch Settings for Play Options

<table>
<thead>
<tr>
<th>Settings of 8-Toggle Switch on Pole Position II PCB (location 9L or 9E)</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>On</td>
<td>On</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliminary Game Time</td>
</tr>
<tr>
<td>90 seconds ★</td>
</tr>
<tr>
<td>120 seconds ▼</td>
</tr>
<tr>
<td>Preliminary Rank</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B ★</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>Extended Rank</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B ▼ ★</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>Number of Laps</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4 ★</td>
</tr>
<tr>
<td>5 ▼</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>Speed</td>
</tr>
<tr>
<td>Off Average speed</td>
</tr>
<tr>
<td>On High Speed ▼ ★</td>
</tr>
</tbody>
</table>

★ Manufacturer's recommended settings for Sit-Down
▼ Manufacturer's recommended settings for Upright
<table>
<thead>
<tr>
<th>Settings of 8-Toggle Switch on Pole Position II PCB (location 9JA or 7E)</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>On</td>
<td>Off</td>
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<tr>
<td>Off</td>
<td>On</td>
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<tr>
<td>On</td>
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<tr>
<td>Off</td>
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<tr>
<td>On</td>
<td>Off</td>
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<tr>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>On</td>
<td>On</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Right Coin Mechanism</td>
<td></td>
</tr>
<tr>
<td>1 coin for 1 credit</td>
<td>2 coins for 1 credit</td>
</tr>
<tr>
<td>3 coins for 2 credits</td>
<td>1 coin for 6 credits</td>
</tr>
<tr>
<td>Unit of Speed</td>
<td>Kilometers per hour</td>
</tr>
<tr>
<td>Attract Mode Sound</td>
<td>Sound</td>
</tr>
<tr>
<td>Screen Freeze</td>
<td>Normal Action</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Manufacturer's recommended settings for Sit-Down
* Do not turn switch 8 on!
★ Manufacturer's recommended settings for Upright
### Table 1-4 Qualifying Lap Times and Bonus Points

#### Seconds to Qualify

<table>
<thead>
<tr>
<th></th>
<th>Fuji Track</th>
<th>Test Track</th>
<th>Suzuka Track</th>
<th>Seaside Track</th>
<th>Position</th>
<th>Bonus Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td><strong>B</strong></td>
<td><strong>C</strong></td>
<td><strong>D</strong></td>
<td><strong>A</strong></td>
<td><strong>B</strong></td>
<td><strong>C</strong></td>
</tr>
<tr>
<td>56</td>
<td>55</td>
<td>54.5</td>
<td>54</td>
<td>54</td>
<td>53</td>
<td>52.5</td>
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<td>60</td>
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<td>58.5</td>
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<td>58</td>
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<td>62</td>
<td>61</td>
<td>60.5</td>
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<td>60</td>
<td>59</td>
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</tr>
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<td>64.5</td>
</tr>
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<td>70</td>
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<td>68.5</td>
<td>68</td>
<td>68</td>
<td>67</td>
<td>66.5</td>
</tr>
</tbody>
</table>

*Manufacturer's recommended settings.*
<table>
<thead>
<tr>
<th>Track</th>
<th>Number of Laps</th>
<th>Extended Rank</th>
<th>Race Lap</th>
<th>Number of Game Seconds For Each Lap</th>
<th>Extended Lap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Race Lap</td>
<td>Lap 1</td>
<td>Lap 2</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
<td>80</td>
<td>43</td>
<td>57</td>
<td></td>
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<td>55</td>
<td></td>
</tr>
</tbody>
</table>

1 Number of laps is identified in Self-Test as "GOAL."
2 If your racing lap time is less than the time listed, the remaining seconds are added to the next lap.

Manufacturer's recommended settings.
Table 1-5  Switch Settings for Racing Lap Times, continued

<table>
<thead>
<tr>
<th>Track</th>
<th>Number of Laps 1</th>
<th>Extended Rank</th>
<th>Race Lap 2</th>
<th>Number of Game Seconds For Each Extended Lap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lap 1</td>
<td>Lap 2</td>
</tr>
<tr>
<td>3</td>
<td>B</td>
<td>75</td>
<td>48</td>
<td>57</td>
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<td>3</td>
<td>C</td>
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<tr>
<td>4</td>
<td>C</td>
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<td>56</td>
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<td>SEASIDE</td>
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</tbody>
</table>

1Number of laps is identified in Self-Test as "GOAL".
2If your racing lap time is less than the time listed, the remaining seconds are added to the next lap.

E. Game Play

Pole Position II is a one-player game using a color raster-scan video display. Game action takes place at 4 different raceways—the Fuji Speedway in Japan, the Test Track (an oval track like Indy), the Seaside Speedway (with the Long Beach Pike in the background), and the Suzuki Speedway in Japan. The unique and picturesque scenery around each raceway adds exciting realism to each race!

The driver drives a Formula-1 race car on each track. Player controls consist of a steering wheel, a two-position gear shifter, an accelerator, and a brake pedal (on the Sit-Down cabinet). The first objective of the game is to finish the qualifying lap as quickly as possible. If the driver beats the times specified in Table 1-4, he qualifies for the race. If he does not qualify, he drives the remainder of his time along the qualifying course.

As a qualifier, the driver is ranked according to his qualifying lap time, from position one (the pole position) to position eight. Then the driver's second objective is to race against the clock and other cars to finish the race laps (operator selects the number of laps) as fast as possible, and to achieve the highest score possible. The driver earns points for passing cars, driving on the track, and finishing the race with time remaining. The time remaining from the Racing Lap is added to the extended lap time listed in Table 1-5.

Pole Position II has four modes of operation: Attract, Play, High-Score, and Self-Test. Self-Test is a special mode for checking the game controls, switches, and computer functions. You may enter the Self-Test Mode from any other mode. However, all credits will be cancelled. See Chapter 2 for complete Self-Test information.

1. Attract Mode

The Attract Mode begins when the power on/off switch is set to on or after the Play, High-Score, or Self-Test Modes. The Attract Mode ends when the correct amount of credit for a game is inserted or when the Self-Test Mode begins. The Attract Mode begins with the words "Pole Position" and "II" tumbling toward you until they stop.

Then, the Attract Mode simulates game play (one track at a time). Eight cars are at the starting line. The driver's car, located in the eighth position, flashes on the screen. The starting lights flash from red to green and the race starts. The race continues until the driver's car crashes into another car and explodes into a red ball of fire.

The message GAME OVER appears in the center of the screen.

Finally, the Attract Mode displays the High-Score Table. Each track has its own high-score table, and this section of the Attract Mode will display a map of the track, the name of the track, the fastest lap time of the track, and the top speed reached at that track. It will also list information about the top six scores reached at that track—the position number, the score, the time, and initials of the driver.

Pole Position II appears on the screen, and at the bottom of the screen is the copyright message.
2. Play Mode

To start the Play Mode, a driver must first enter the correct number of coin(s) for a game. Then the driver turns the steering wheel until the track he wants to drive on is highlighted in white. The Play Mode will begin when the driver steps on the accelerator. The driver’s car will appear behind the starting line and 90 (or 120) seconds will be on the clock (see Table 1-2 for settings for Preliminary Game Time seconds). The car must finish the qualifying lap within the time listed in Table 1-4 to be in the race. If the driver does not qualify, his car continues on the track until 120 seconds elapse.

If the driver has qualified, just before the race begins, the driver’s car (flashing on the screen) is placed at the starting line with seven other cars. The position of the car depends on the position earned during the qualifying lap.

The starting lights flash from red to green, and the race begins. Racing hazards are other racing cars, sharp turns, puddles, and road signs. As the race progresses, more cars appear on the track. If the driver’s car hits another car or a road sign, the driver’s car is destroyed in an explosion. The driver’s car reappears in a few seconds and the race continues. Driving through wet puddles or off the track slows down the driver’s car considerably.

Experience will teach a driver which turns on which tracks require slight steering (because they’re banked) and which turns require fast and forceful steering. He should position himself with the other racers, while keeping his eye on the clock at the top of the screen. When his time runs out, the race is over. If he has beaten the racing lap time listed in Table 1-5 and has seconds remaining, the remaining seconds are added to his next lap.

The top score achieved by a driver appears at the top of the screen. The time allotted for the lap is displayed under the top score. Increasing lap time (in seconds and hundredths of a second) and the speed of the car appears last.

3. High-Score Mode

The High-Score Mode begins when the driver has earned one of the 100 highest scores. The screen will show his ranking from 1 to 100. If his score is in the top 20 scores for the track, he’ll have one minute to record his initials (each track has its own high-score table). The driver rotates the steering wheel to change initials, and presses the accelerator to select the initial. The third press will enter the initials into the high-score table.

4. Hints for Game Play

- Avoid puddles and the sides of the track because these slow the driver down.
- Accelerate before the green light appears, and stay ahead of other racers.
- Drive the inside of the track to make the corners.
- Do not oversteer (tracks are banked).
- Engine sound will cue the driver when to shift to high gear.
- When sliding, steer into the skid.

5. Scoring

Points are scored for completing laps and passing cars. 10,000 points are awarded for completing a lap. Points are also scored for every foot of track driven. 200 points are awarded for each second remaining on racing laps. At the end of a game, 50 points are scored for each car the driver passes.
A. Comments on Troubleshooting

When troubleshooting, first determine the symptom(s) of the failure. After determining the symptom, look over the wiring diagram and determine what assemblies could cause the failure. Could it be caused by the power supply, Regulator/Audio II printed-circuit board (PCB), or the video display?

The next step is to check all harness wires and connectors to the suspected assembly. If you do not find a harness or connector problem, substitute an assembly known to be good for the suspected failing assembly. If the game functions properly, you have successfully isolated the failure. If it doesn’t, repeat the procedure with another assembly.

When you have isolated the failing assembly, you must troubleshoot that assembly and make the necessary repairs. If the video display fails, we suggest that a qualified video-display technician handle the troubleshooting and repair.

Be sure to refer to The Book—A Guide to Electronic Game Operation and Servicing, published by Atari, Inc., whenever you need help with the techniques, tools, and terminology associated with coin-operated electronic games.

To effectively troubleshoot a game PCB, learn as much as you can about the PCB. The diagrams in the Schematic Package (SP-218 for Atari PCBs; SP-219 for Namco

<table>
<thead>
<tr>
<th>Table 2-1 Component Locations on the Atari Video PCB</th>
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<tbody>
<tr>
<td><strong>Symptom Area</strong></td>
</tr>
<tr>
<td>Large Car Pictures</td>
</tr>
<tr>
<td>Large Sign Pictures</td>
</tr>
<tr>
<td>Small Cars &amp; Signs</td>
</tr>
<tr>
<td>All Cars &amp; Signs</td>
</tr>
<tr>
<td>Alphanumerics</td>
</tr>
<tr>
<td>Raceway</td>
</tr>
<tr>
<td>Background</td>
</tr>
<tr>
<td>Raceway &amp; Background</td>
</tr>
<tr>
<td>Middle &amp; Sides of Raceway</td>
</tr>
<tr>
<td>All Video</td>
</tr>
<tr>
<td>Red</td>
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<tr>
<td>Green</td>
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<tr>
<td>Blue</td>
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<table>
<thead>
<tr>
<th>Table 2-2 Component Locations on the Atari CPU PCB</th>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Inputs</td>
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<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Control—Audio &amp; Inputs</td>
</tr>
<tr>
<td>Sync</td>
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</table>

<table>
<thead>
<tr>
<th>Table 2-3 Component Locations on the Namco Video PCB</th>
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</thead>
<tbody>
<tr>
<td><strong>Symptom Area</strong></td>
</tr>
<tr>
<td>Large Car Pictures</td>
</tr>
<tr>
<td>Large Sign Pictures</td>
</tr>
<tr>
<td>Small Cars &amp; Signs</td>
</tr>
<tr>
<td>All Cars &amp; Signs</td>
</tr>
<tr>
<td>Alphanumerics</td>
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<tr>
<td>Raceway</td>
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<tr>
<td>Background</td>
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<tr>
<td>Raceway &amp; Background</td>
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<tr>
<td>Middle &amp; Sides of Raceway</td>
</tr>
<tr>
<td>All Video</td>
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<tr>
<td>Red</td>
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<tr>
<td>Green</td>
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<tr>
<td>Blue</td>
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</tbody>
</table>
PCBs) show the functions of the circuitry. To troubleshoot a PCB, first determine the symptom of the failure, then locate the suspected area on the schematic diagram. Tables 2-1 and 2-2 will help you locate faulty components on the Atari PCBs, and Tables 2-3 and 2-4 will help you locate faulty components on the Namco PCBs.

Table 2-4 Component Locations on the Namco CPU PCB

<table>
<thead>
<tr>
<th>Symptom Area</th>
<th>PROM</th>
<th>Custom IC</th>
<th>RAM</th>
<th>A-to-D Converter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voice</td>
<td>2E</td>
<td>3D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screech/Clash</td>
<td>4E</td>
<td></td>
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<tr>
<td>Player's Motor</td>
<td>5A, 6A</td>
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</tr>
<tr>
<td>All Other Sounds</td>
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<td>7H, 8H</td>
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</tr>
<tr>
<td>Inputs</td>
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<tr>
<td>Brake and/or</td>
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<tr>
<td>Accelerator</td>
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<tr>
<td>All Other Inputs</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Control—Audio &amp; Inputs</td>
<td>6E, 6F</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sync</td>
<td>10H</td>
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</tr>
<tr>
<td>High Scores</td>
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<td></td>
</tr>
</tbody>
</table>

B. Performing the Self-Test

This game will test itself and provide data to show if the game's circuitry and controls are operating properly. This data is provided on the video display and speakers. No additional equipment is necessary.

We suggest you perform the self-test procedure when you first set up the game, when you collect money from the game, when you change game options, or when you suspect game failure.

CAUTION

If this game needs servicing, repair should only be performed by a qualified electronic technician.

Self-Test Procedure

The self-test switch is located on the utility panel inside the coin door. The option switches are on the CPU printed-circuit board (see Figure 1-3).

---

CAUTION

Do not depress the accelerator or brake pedal when turning on the game or when turning on the self-test switch. This will cause faulty program initialization and incorrect action of the player controls.

1. Without touching the pedal(s), turn the self-test switch on. The self-test program will test the game memory (RAM and ROM). All credits will be cancelled.

Test Passes: Random symbols are displayed on the screen for about 5 seconds as RAM and ROM are tested. If the memories are good, the screen will look like Figure 2-1 or 2-2.
**Test Fails:** If the Pole Position II Custom integrated circuit (IC) has failed, the screen will continue to display random symbols and colors, and the message **ERROR IC25** will be in the upper left corner. Whenever a ROM fails, its name will appear on the screen (e.g., ROM 1 failed in Figure 2-3). Use Table 2-5 to locate the ROM that the screen indicates is bad. A failed RAM will also appear on the screen. Use Table 2-6 or 2-7 to locate the RAM that the screen indicates is bad.

**Action:** Replace the failed RAM or ROM. Start the self-test again (turn the self-test switch off, then on.)

![ROM Image](image)

**Figure 2-3 Self-Test Screen 1 — Test Fails**

<table>
<thead>
<tr>
<th>Screen Message</th>
<th>Location on Atari CPU PCB</th>
<th>Location on Namco CPU PCB</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROM 0</td>
<td>7H</td>
<td>6H</td>
</tr>
<tr>
<td>ROM 1</td>
<td>7F</td>
<td>5H</td>
</tr>
<tr>
<td>ROM 2</td>
<td>3L</td>
<td>8M</td>
</tr>
<tr>
<td>ROM 3</td>
<td>4L</td>
<td>8L</td>
</tr>
<tr>
<td>ROM 4*</td>
<td>3K</td>
<td>7M</td>
</tr>
<tr>
<td>ERROR IC25</td>
<td>4K</td>
<td>7L</td>
</tr>
<tr>
<td>ROM 6</td>
<td>3E</td>
<td>4M</td>
</tr>
<tr>
<td>ROM 7</td>
<td>4E</td>
<td>4L</td>
</tr>
<tr>
<td>ROM 8</td>
<td>3D</td>
<td>3M</td>
</tr>
<tr>
<td>ROM 9</td>
<td>4D</td>
<td>3L</td>
</tr>
</tbody>
</table>

*Not used*

<table>
<thead>
<tr>
<th>PCB</th>
<th>Screen Display</th>
<th>RAM Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td>RAM 0</td>
<td>8F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 1</td>
<td>7F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 2</td>
<td>8H</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 3</td>
<td>7H</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 4</td>
<td>3F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 5</td>
<td>3E</td>
</tr>
<tr>
<td>CPU</td>
<td>RAM 6</td>
<td>7J</td>
</tr>
<tr>
<td>CPU</td>
<td>RAM 7</td>
<td>7K</td>
</tr>
<tr>
<td>CPU</td>
<td>RAM 8</td>
<td>7E</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 20</td>
<td>8F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 21</td>
<td>7F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 22</td>
<td>8J</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 23</td>
<td>7J</td>
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<tr>
<td>Video</td>
<td>RAM 24</td>
<td>8H</td>
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<tr>
<td>Video</td>
<td>RAM 25</td>
<td>7H</td>
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<tr>
<td>Video</td>
<td>RAM 26</td>
<td>8K</td>
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<tr>
<td>Video</td>
<td>RAM 27</td>
<td>7K</td>
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<tr>
<td>Video</td>
<td>RAM 28</td>
<td>3F</td>
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<tr>
<td>Video</td>
<td>RAM 29</td>
<td>4F</td>
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<tr>
<td>Video</td>
<td>RAM 30</td>
<td>3E</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 31</td>
<td>4E</td>
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<tr>
<td>Video</td>
<td>RAM 40</td>
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<tr>
<td>Video</td>
<td>RAM 41</td>
<td>7F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 42</td>
<td>8J</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 43</td>
<td>7J</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 44</td>
<td>8H</td>
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<tr>
<td>Video</td>
<td>RAM 45</td>
<td>7H</td>
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<td>Video</td>
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<td>Video</td>
<td>RAM 47</td>
<td>7K</td>
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<tr>
<td>Video</td>
<td>RAM 48</td>
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<td>RAM 49</td>
<td>4F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 50</td>
<td>3E</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 51</td>
<td>4E</td>
</tr>
</tbody>
</table>

2. Now, start testing the controls and switches. Press the accelerator pedal.

**Test Passes:** The numbers to the right of **ACCEL** increase from **00** to **A0** as you press down on the pedal.

**Test Fails:** The numbers to the right of **ACCEL** do not change, or no numbers appear.

**Action:** Suspect a bad A-D converter on the CPU PCB or a mechanical problem on the foot pedal assembly. Troubleshoot using the information in TM-218 (Chapter 3, Section B) and the game schematics.
Table 2-7  RAM Locations (Namco)

<table>
<thead>
<tr>
<th>PCB</th>
<th>Screen Display</th>
<th>RAM Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td>RAM 0</td>
<td>7H</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 1</td>
<td>7F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 2</td>
<td>6H</td>
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<tr>
<td>Video</td>
<td>RAM 3</td>
<td>6F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 4</td>
<td>7B</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 5</td>
<td>8B</td>
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<tr>
<td>CPU</td>
<td>RAM 6</td>
<td>7H</td>
</tr>
<tr>
<td>CPU</td>
<td>RAM 7</td>
<td>8H</td>
</tr>
<tr>
<td>CPU</td>
<td>RAM 8</td>
<td>4H</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 20</td>
<td>7H</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 21</td>
<td>7F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 22</td>
<td>5H</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 23</td>
<td>5F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 24</td>
<td>6H</td>
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<tr>
<td>Video</td>
<td>RAM 25</td>
<td>6F</td>
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<tr>
<td>Video</td>
<td>RAM 26</td>
<td>4H</td>
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<tr>
<td>Video</td>
<td>RAM 27</td>
<td>4F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 28</td>
<td>7B</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 29</td>
<td>7C</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 30</td>
<td>8B</td>
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<tr>
<td>Video</td>
<td>RAM 31</td>
<td>8C</td>
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<tr>
<td>Video</td>
<td>RAM 40</td>
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<td>Video</td>
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<td>Video</td>
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<td>RAM 47</td>
<td>4F</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 48</td>
<td>7B</td>
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<tr>
<td>Video</td>
<td>RAM 49</td>
<td>7C</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 50</td>
<td>8B</td>
</tr>
<tr>
<td>Video</td>
<td>RAM 51</td>
<td>8C</td>
</tr>
</tbody>
</table>

3. Press the brake pedal of the Sit-Down cabinet. **Test Passes:** The numbers to the right of BRAKE increase from 00 to FF. For the Upright cabinet, the numbers to the right of BRAKE should always read 00.

**Test Fails:** The numbers to the right of BRAKE do not change as you press the brake pedal. On the Upright cabinet, brake failure is indicated by anything other than 00 appearing to the right of BRAKE.

**Action:** If the test fails, suspect a bad switch, improper mechanical adjustment of the foot pedal assembly, or no ground of the brake edge-connector pin in the harness. Troubleshoot using the information in TM-218 (Chapter 3, Section B) and the game schematics.

4. Turn the steering wheel clockwise, then counterclockwise. **Test Passes:** The numbers to the right of STEERING increase as the wheel turns clockwise and decrease as the wheel turns counterclockwise.

**Test Fails:** The numbers to the right of STEERING do not change properly as you turn the wheel.

**Action:** If the test fails, suspect the Coupler PCB. Troubleshoot using the information in TM-218 (Chapter 3, Section B) and the game schematics.

5. Shift the gear shifter. **Test Passes:** The words to the right of SHIFT change from LO (shifter up) to HI (shifter down) as you shift gears.

**Test Fails:** Failure is indicated if the words to the right of SHIFT do not change from LO to HI as you shift gears.

**Action:** Suspect loose connector wires or a bad switch. Troubleshoot using the information in TM-218 (Chapter 3, Section B) and the game schematics.

6. To test the sounds of the game, shift the gear shift, press the auxiliary coin switch on the utility panel, and activate the coin switches. **Test Passes:** The numbers to the right of SOUND increase from 00 to 20, and a different sound is played with each number. Test all 20 sounds.

**Test Fails:** Failure is indicated by silence when the coin switches or gear shifter are activated.

**Action:** Make sure the volume control is turned up, or check for a loose harness or connector wire. The custom audio I/O chip or the Regulator/Audio II PCB may be bad. Troubleshoot using the game schematics.

7. To verify that the option switches are set the way you need them, and to check game statistics, press the auxiliary coin switch. The screen will display Figure 2-4. **Test Passes:** Game statistics appear at the bottom of the screen. To erase game statistics, simultaneously press the accelerator pedal and press the auxiliary coin switch twice. Statistics will be reset at 999. To reset the high-score table, simultaneously press down on the accelerator pedal and shift the gear-shifter from low to high. The high-score table will be reset to contain fictitious scores.

**Test Fails:** Option switches are not set the way you want them.

**Action:** Turn the game power off. Set the option switches (see Tables 1-2 through 1-5 for possible
options. Turn the power on. Turn the self-test switch off, then on. Verify the switch settings.

8. To see self-test screen two, set the self-test switch to off and immediately back to on.

   **Test Passes:** A white crosshatch pattern appears on the screen (see Figure 2-5). Use this pattern for convergence adjustment (see the raster-scan video display manual).

   **Test Fails:** There is no failure for this test.

9. To end the test, turn the self-test switch off.
3 Parts Lists
## Cabinet-Mounted Assemblies
### Pole Position II Upright Cabinet
#### Parts List

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A037453-04</td>
<td>Strain-Relief Power Cord  (U.S. and Canada)</td>
</tr>
<tr>
<td>A037701-01</td>
<td>Electromagnetic Interference Cage  (includes glides)</td>
</tr>
<tr>
<td>A038600-01</td>
<td>Power On/Off Switch/Mounting Plate Assembly</td>
</tr>
<tr>
<td>A038881-01</td>
<td>Lock Assembly  *(for rear access panel)  Acceptable substitute is part no. A038881-03</td>
</tr>
<tr>
<td>A039353-01</td>
<td>Cabinet Assembly  *(includes glides and PCB retainers, but not the rear access panel)</td>
</tr>
<tr>
<td>A039420-01</td>
<td>Dashboard Housing and Decal Assembly</td>
</tr>
<tr>
<td>A039459-01</td>
<td>Main Harness Assembly</td>
</tr>
<tr>
<td>A039460-01</td>
<td>Power Harness Assembly</td>
</tr>
<tr>
<td>A039576-01</td>
<td>Coin Option Interconnect Assembly  *(not shown)</td>
</tr>
<tr>
<td>A040512-01</td>
<td>Fan Harness Assembly</td>
</tr>
<tr>
<td>A040547-02</td>
<td>Fan and Bracket Assembly  *Acceptable substitute is part no. A040547-01</td>
</tr>
<tr>
<td>003053-01</td>
<td>Attraction Glass Retainer</td>
</tr>
<tr>
<td>009992-01</td>
<td>On/Off Switch Cover</td>
</tr>
<tr>
<td>035438-01</td>
<td>Dashboard Housing</td>
</tr>
<tr>
<td>037243-01</td>
<td>Base Plate for Power Supply</td>
</tr>
<tr>
<td>037332-01</td>
<td>Ventilation Grille</td>
</tr>
<tr>
<td>038091-01</td>
<td>Molded Coin Box  *(not shown)</td>
</tr>
<tr>
<td>038641-01</td>
<td>Speaker Grille  *(not shown)</td>
</tr>
<tr>
<td>038770-01</td>
<td>Metal Coin Box Enclosure  *(Acceptable substitute is part no. 038781-01)</td>
</tr>
<tr>
<td>039144-01</td>
<td>Speaker Grille</td>
</tr>
<tr>
<td>039371-01</td>
<td>Video Display Shield Retainer</td>
</tr>
<tr>
<td>039376-01</td>
<td>Rear Access Panel  *(does not include lock)</td>
</tr>
<tr>
<td>040546-01</td>
<td>Printed Circuit Board Mounting Bracket  *(not shown)</td>
</tr>
<tr>
<td>040564-01</td>
<td>Door Panel Grille  *(not shown)</td>
</tr>
<tr>
<td>040565-01</td>
<td>Exhaust Duct</td>
</tr>
<tr>
<td>041353-01</td>
<td>Left Side Panel Decal</td>
</tr>
<tr>
<td>041353-02</td>
<td>Right Side Panel Decal</td>
</tr>
<tr>
<td>041354-02</td>
<td>Attraction Panel Film</td>
</tr>
<tr>
<td>041355-03</td>
<td>Dashboard Decal</td>
</tr>
<tr>
<td>041356-01</td>
<td>Video Display Shield with Graphics</td>
</tr>
<tr>
<td>139003-1006</td>
<td>19-Inch Disco Color Raster-Scan Display</td>
</tr>
<tr>
<td>148001-013</td>
<td>6- x 9-Inch Oval, 4-Ohm, 6-Ounce Shielded High-Fidelity Speaker  *(located on front panel)</td>
</tr>
<tr>
<td>178114-032</td>
<td>2-Inch Plastic Tape  *(20 inches required)</td>
</tr>
</tbody>
</table>

The following nine items are technical information supplements to this game:

- **CO-218-12**: Pole Position II Operators Manual
- **SP-218**: Pole Position Schematic Package  *(for Atari PCBs)*
- **SP-219**: Pole Position Schematic Package  *(for NAMCO PCBs)*
- **ST-255**: Pole Position Chart with Self-Test Procedure and Option Switch Settings

*New for Pole Position II.*

(Continued on next page)
<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM-160</td>
<td>Service Manual for 19-Inch Electrohome Color Raster-Scan Display (use with part no. 92-049), or</td>
</tr>
<tr>
<td>TM-210</td>
<td>Service Manual for 19-Inch Disco Color Raster-Scan Display (use with part no. 139003-1006), or</td>
</tr>
<tr>
<td>TM-220</td>
<td>Service Manual for 19-Inch Matsushita Color Raster-Scan Display (use with part no. 139003-1004)</td>
</tr>
<tr>
<td>TM-255</td>
<td>Enhancement Instructions</td>
</tr>
<tr>
<td>78-3201</td>
<td>Adjustable Glide</td>
</tr>
<tr>
<td>78-6900402</td>
<td>Vinyl Foam Single-Coated Adhesive Tape, ¼-Inch Wide x ¹/₁₆-Inch Thick (48 inches required—use on top edge of video display shield, and on top edge of control panel)</td>
</tr>
<tr>
<td>78-6900404</td>
<td>Vinyl Foam Single-Coated Adhesive Tape, ¼-Inch Wide x ¹/₁₄-Inch Thick (48 inches required—used on top and bottom of attraction glass)</td>
</tr>
<tr>
<td>178034-024</td>
<td>¾-Inch Black Plastic T-Molding (located on side panels)</td>
</tr>
<tr>
<td>178034-025</td>
<td>2½-Inch Black Plastic T-Molding (located on front panel)</td>
</tr>
<tr>
<td>178048-001</td>
<td>2-Inch Rigid Caster</td>
</tr>
</tbody>
</table>

*New for Pole Position II.*
Figure 3-2 Cabinet-Mounted Assemblies
Pole Position II Sit-Down Cabinet
A039100-01 R
Figure 3-2 Cabinet-Mounted Assemblies, continued
Pole Position II Sit-Down Cabinet
A039100-01 R
Cabinet-Mounted Assemblies
Pole Position II Sit-Down Cabinet
Parts List

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A037453-03</td>
<td>Strain-Relief Power Cord (U.S. and Canada)</td>
</tr>
<tr>
<td>A037470-01</td>
<td>Power On/Off Switch/Mounting Plate Assembly</td>
</tr>
<tr>
<td>A037701-01</td>
<td>Electromagnetic Interference (EMI) Cage (includes guides)</td>
</tr>
<tr>
<td>A038881-01</td>
<td>Lock Assembly (for rear access panel) Acceptable substitute is part no. A038881-03</td>
</tr>
<tr>
<td>A039101-01</td>
<td>Cabinet Assembly (includes glides and PCB retainers, but not the rear access panel)</td>
</tr>
<tr>
<td>A039245-01</td>
<td>Main Harness Assembly (for NAMCO PCBs)</td>
</tr>
<tr>
<td>A039246-01</td>
<td>Power Harness Assembly</td>
</tr>
<tr>
<td>A039465-01</td>
<td>Main Harness Assembly (for Atari PCBs)</td>
</tr>
<tr>
<td>A040514-01</td>
<td>Fan Harness Interconnect Assembly</td>
</tr>
<tr>
<td>107001-001</td>
<td>Flat Black Paint (not shown)</td>
</tr>
<tr>
<td>171002-001</td>
<td>110 V Exhaust Fan</td>
</tr>
<tr>
<td>178093-001</td>
<td>Fan Blade Guard</td>
</tr>
</tbody>
</table>

The following ten items are technical information supplements to this game:

- CO-218-12 Pole Position II Operators Manual
- SP-218 Pole Position Schematic Package (for Atari game PCBs)
- SP-219 Pole Position Schematic Package (for NAMCO game PCBs)
- ST-255 Pole Position II Chart with Self-Test Procedure and Option Switch Settings
- TM-160 Service Manual for 19-Inch Electrohome Color Raster-Scan Display (use with part no. 92-049)
- TM-201 Service Manual for 19-Inch Wells-Gardner Color Raster-Scan Display (use with part no. 92-055)
- TM-220 Service Manual for 19-Inch Matsushita Color Raster-Scan Display (use with part no. 139003-1034)
- TM-255 Enhancement Instructions

- 78-3201 Adjustable Glide
- 78-6900402 Vinyl Foam Single-Coated Adhesive Tape, 1/4-Inch Wide x 1/4-Inch Thick (72 inches required; used on front window)
- 78-6900804 Vinyl Foam Single-Coated Adhesive Tape, 1/2-Inch Wide x 1/4-Inch Thick (50 inches required; used in top slot of video display cleat and bottom of display shield)

- 009992-01 On/Off Switch Cover
- 035851-01 Top Panel Hinge (not shown)
- 037065-01 Front Window Retainer
- 037442-01 Printed-Circuit Board Mounting Bracket (not shown)

- 038091-01 Molded Coin Box
- 038641-01 Ventilation Grille (on rear access panel)
- 038870-01 Metal Coin Box Enclosure Acceptable substitute is part no. 038781-01
- 039141-01 Front Window

⚠️ New to Pole Position II.

(Continued on next page)
<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>039144-01</td>
<td>Speaker Grille (located behind seat)</td>
</tr>
<tr>
<td>039145-01</td>
<td>Speaker Grille (not shown—located under control panel)</td>
</tr>
<tr>
<td>041378-01</td>
<td>Left Rear Side Panel Decal</td>
</tr>
<tr>
<td>041378-02</td>
<td>Right Rear side Panel Decal</td>
</tr>
<tr>
<td>041379-01</td>
<td>Left Front Side Panel Decal</td>
</tr>
<tr>
<td>041379-02</td>
<td>Right Front Side Panel Decal</td>
</tr>
<tr>
<td>041380-04</td>
<td>Left Control Panel Decal</td>
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<tr>
<td>041380-05</td>
<td>Right Control Panel Decal</td>
</tr>
<tr>
<td>041381-01</td>
<td>Video Display Shield with Graphics</td>
</tr>
<tr>
<td>041382-01</td>
<td>Front Panel Decal</td>
</tr>
<tr>
<td>148001-001</td>
<td>6- x 9-Inch Oval, 4-Ohm, 15 W Unshielded High-Fidelity Speaker (located behind seat)</td>
</tr>
<tr>
<td>148001-013</td>
<td>6- x 9-Inch Oval, 4-Ohm, 15 W Shielded High-Fidelity Speaker (located under control panel)</td>
</tr>
<tr>
<td>178034-034</td>
<td>1-Inch Black Plastic T-Molding (located on seat back)</td>
</tr>
<tr>
<td>178023-001</td>
<td>4-Inch Rigid Caster</td>
</tr>
</tbody>
</table>

*New to Pole Position II.*
Figure 3-3 Fluorescent Tube and Speaker Board
Parts List

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>78-6900402</td>
<td>Vinyl Foam Single-Coated Adhesive Tape, ¼-Inch Wide x ¼-Inch Thick</td>
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<tr>
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<td>Attraction Glass Retainer</td>
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<td>037410-01</td>
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<tr>
<td>039144-01</td>
<td>Speaker Grille</td>
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<td>041354-02</td>
<td>Attraction Glass Film</td>
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*New to Pole Position II.*
### Figure 3-4 Printed-Circuit Board Hardware
#### Parts List

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<td>A037701-01</td>
<td>Electromagnetic Interference (EMI) Cage (includes guides)</td>
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<tr>
<td>A037707-01</td>
<td>EMI Shield Printed-Circuit Board (PCB)</td>
</tr>
<tr>
<td>A039185-22</td>
<td>Pole Position II Central Processing Unit PCB</td>
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<tr>
<td>A039187-22</td>
<td>Pole Position II Video PCB</td>
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<tr>
<td>72-1404F</td>
<td>#4-40 × ¼-Inch Cross-Recessed Steel Screw</td>
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<tr>
<td>72-1604F</td>
<td>#6-32 × ¼-Inch Cross-Recessed Steel Screw</td>
</tr>
<tr>
<td>034536-03</td>
<td>Foam Pad</td>
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<tr>
<td>037873-01</td>
<td>Spacer</td>
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<tr>
<td>039376-03</td>
<td>Dual-Slotted Retainer</td>
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<tr>
<td>175009-221</td>
<td>Plastic Spacer (for EMI Shield PCB)</td>
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<tr>
<td>176015-110</td>
<td>#10 × ½-Inch Cross-Recessed Pan-Head Screw</td>
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<td>178044-242</td>
<td>Grommet</td>
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<td>178045-442</td>
<td>Snap-In Fastener</td>
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*Note: The FCC requires that the game PCB be housed in the EMI cage with the Shield PCB attached.*

*New to Pole Position II.*
# Atari Pole Position II

**Central Processing Unit Printed-Circuit Board Assembly**

**A039185-22 A**

**Parts List**

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<tr>
<th>Designator</th>
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<tr>
<td>C2-C5</td>
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<td>C6</td>
<td>33 pF, 100 V Radial-Lead Epoxy-Dipped Mica Capacitor</td>
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<td>C7</td>
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<td>122002-104</td>
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<tr>
<td>C9</td>
<td>10 μF, 25 V Aluminum Electrolytic Fixed Axial-Lead Capacitor</td>
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| **Diodes** | | |
| CR1 | Type-MV5053 Light-Emitting Diode | 38-MV5053 |
| CR2 | Type-1N4735A 6.2 V, ±5%, 1.8 W Zener Diode | 131000-001 |
| CR3, CR4 | Type-1N914 100 V, Switching Diode | 31-1N914 |
| CR5 | Type-1N4001, 50 V Rectifier Diode | 31-1N4001 |
| CR6 | Type-1N748A 3.9 V, ±5%, Zener Diode | 131000-002 |
| CR7-CR12 | Type-1N914 100 V, Switching Diode | 31-1N914 |

*(Continued on next page)*
### Integrated Circuits

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Atari Pole Position II  
Central Processing Unit Printed-Circuit Board Assembly  
Parts List, continued

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for -22 version only

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Random-Access Memories

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Read-Only Memory

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for -22 version only

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(Continued on next page)
### Atari Pole Position II
### Central Processing Unit Printed-Circuit Board Assembly
### Parts List, continued

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<td>R1</td>
<td>220 Ω, ±5%, ¼ W Resistor</td>
<td>110000-221</td>
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<tr>
<td>R2–R8</td>
<td>2.2 kΩ, ±5%, ¼ W Resistor</td>
<td>110000-222</td>
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<tr>
<td>R9</td>
<td>1 kΩ, ±5%, ¼ W Resistor</td>
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<td>R10–R16</td>
<td>2.2 kΩ, ±5%, ¼ W Resistor</td>
<td>110000-222</td>
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<td>R17–R26</td>
<td>1 kΩ, ±5%, ¼ W Resistor</td>
<td>110000-102</td>
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### Atari Pole Position II
Central Processing Unit Printed-Circuit Board Assembly
Parts List, continued

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### Atari Pole Position II

**Central Processing Unit Printed-Circuit Board Assembly**

**Parts List, continued**

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**Sockets**

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**Switches**

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**Transistors**

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<td>Q2</td>
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<td>Q3</td>
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<td>Q4</td>
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**Miscellaneous**

- Test Point: Acceptable substitute is part no. 020670-01
- Jumper Staple: 179051-001
- BT1: 36 V, 100 mA Nickel-Cadmium Battery: 170208-001
- W1: Lead-Spring Socket Terminal: 179131-001
- Q5, Q6: Nylon Snap-In Fastener: 81-4302

*New to Pole Position II.*
### Pole Position II

**Namco Central Processing Unit Printed-Circuit Board Assembly**

171031-001  A

**Parts List**

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### Pole Position II

#### Namco Central Processing Unit Printed-Circuit Board Assembly

**Parts List, continued**

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#### Diodes

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<td>1J</td>
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### Pole Position II

**Namco Central Processing Unit Printed-Circuit Board Assembly**

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**Random-Access Memories**

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**Read-Only Memories**

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*New to Pole Position II.*

(Continued on next page)
### Pole Position II

**Namco Central Processing Unit Printed-Circuit Board Assembly**

**Parts List, continued**

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*New to Pole Position II.

(Continued on next page)
### Pole Position II
**Namco Central Processing Unit Printed-Circuit Board Assembly**
Parts List, continued

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Pole Position II
Namco Central Processing Unit Printed-Circuit Board Assembly
Parts List, continued

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<td>J2</td>
<td>3-Pin Power Connector</td>
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<td># M3 Metric Split-Lock Washer</td>
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<td>Test Point Acceptable substitute is part no. 020670-01</td>
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* Orientation of leads not pin-compatible between Namco part and Atari part. See Schematic Package for pin configuration.
### Capacitors

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<td>C18-C57</td>
<td>0.1 μF, ± 80, -20%, 50 V Ceramic Disk Radial-Lead Capacitor</td>
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<td>C58</td>
<td>68 pF, 100 V Mica Capacitor</td>
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<td>C59</td>
<td>22 pF, 100 V Mica Capacitor</td>
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### Diodes

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### Inductors

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<td>L4</td>
<td>100 μH, ±10% Inductor</td>
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### Integrated Circuits

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# Atari Pole Position II

## Video Printed-Circuit Board Assembly

### Parts List, continued

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Video Printed-Circuit Board Assembly
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Random-Access Memories

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Programmable Read-Only Memories

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<td>11E</td>
<td>Type-82S129 Programmable Read-Only Memory</td>
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<td>Type-82S137 Programmable Read-Only Memory</td>
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<tbody>
<tr>
<td>3F, 4F</td>
<td>Random-Access Memory (200 ns) Acceptable substitute is part no. 137211-001</td>
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<td>6N</td>
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<td>7N</td>
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️ New to Pole Position II.

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### Atari Pole Position II

**Video Printed-Circuit Board Assembly**  
**Parts List, continued**

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**Resistors**

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<td>R1-R9</td>
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<tr>
<td>R10-R24</td>
<td>1 kΩ, ±5%, 1/4 W Resistor</td>
<td>110000-102</td>
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<tr>
<td>R25-R40</td>
<td>470 Ω, ±5%, 1/4 W Resistor</td>
<td>110000-471</td>
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<td>R41-R48</td>
<td>4.7 kΩ, ±5%, 1/4 W Resistor</td>
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<tr>
<td>R49-R52</td>
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<td>R55-R58</td>
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<td>R59</td>
<td>220 Ω, ±5%, 1/4 W Resistor</td>
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<td>R60</td>
<td>470 Ω, ±5%, 1/4 W Resistor</td>
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<tr>
<td>R62</td>
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<td>R71, R72</td>
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<td>R73</td>
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<td>R78, R79</td>
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<td>R86</td>
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<td>R87-R98</td>
<td>1 kΩ, ±5%, 1/4 W Resistor</td>
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* New to Pole Position II.

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Atari Pole Position II  
Video Printed-Circuit Board Assembly  
Parts List, continued

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<th>Description</th>
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<td>R101</td>
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<td>R102</td>
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<td>R106</td>
<td>150 Ω, ±5%, ¼ W Resistor</td>
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<td>R107, R1099</td>
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<td>R108, R1100</td>
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**Sockets**

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<td>79-42C28</td>
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**Transistors**

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<tr>
<td>Q5-Q7</td>
<td>Type-2N3906, 40 V, 1 W, PNP Transistor</td>
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**Miscellaneous**

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*New to Pole Position II.*
# Pole Position II
Namco Video Printed-Circuit Board Assembly  
171032-001 A

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<td>122002-104</td>
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<td>C3</td>
<td>1000 μF 25 V Aluminum Electrolytic Axial-Lead Capacitor</td>
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### Pole Position II
**Namco Video Printed-Circuit Board Assembly**

#### Parts List, continued

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#### Integrated Circuits

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Acceptable substitute is part no. 137286-002

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### Pole Position II
**Namco Video Printed-Circuit Board Assembly**

**Parts List, continued**

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**Diode**

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**Random-Access Memories**

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# Pole Position II

Namco Video Printed-Circuit Board Assembly

## Parts List, continued

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<td>470 Ω, ±5%, ¼ W Resistor</td>
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<td>R18</td>
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<td>R19</td>
<td>2.2 kΩ, ±5%, ¼ W Resistor</td>
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**Namco Video Printed-Circuit Board Assembly**

**Parts List, continued**

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<td>R26</td>
<td>1 kΩ, ±5%, ¼ W Resistor</td>
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<td>R27</td>
<td>2.2 kΩ, ±5%, ¼ W Resistor</td>
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<td>R28</td>
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<td>R31</td>
<td>1 kΩ Horizontal Potentiometer</td>
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#### Sockets

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<td>1N–6N</td>
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<td>2H</td>
<td>16-Contact Medium-Insertion-Force Integrated Circuit Socket</td>
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<td>18-Contact Medium-Insertion-Force Integrated Circuit Socket</td>
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<td>18-Contact Medium-Insertion-Force Integrated Circuit Socket</td>
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<td>18-Contact Medium-Insertion-Force Integrated Circuit Socket</td>
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<td>79-42C28</td>
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<td>8L–10L</td>
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<td>9C</td>
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*New to Pole Position II.*

(Continued on next page)
### Pole Position II
**Namco Video Printed-Circuit Board Assembly**

### Parts List, continued

<table>
<thead>
<tr>
<th>Designator</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>60-Pin Connector</td>
<td>179157-060</td>
</tr>
<tr>
<td>J2</td>
<td>3-Pin Power Connector</td>
<td>179156-003</td>
</tr>
</tbody>
</table>
| X1         | 24.576 MHz Crystal  
             | Acceptable substitute is part no. 144004-002 | 144004-003 |
|            | Test Points  
             | Acceptable substitute is part no. 020670-01 | 179051-001 |
|            | Heat Sink | 039566-01 |
|            | Printed-Circuit Board Brace | 039562-01 |
|            | Printed-Circuit Board Interconnector Cable Assy. | 171036-001 |

### Miscellaneous

### Metric Screws and Washers

- #M3 x 6mm Pan-Head Stainless Steel Machine Screw
- #M3 x 8mm Pan-Head Stainless Steel Machine Screw
- #M3 x 10mm Pan-Head Stainless Steel Machine Screw
- #M3 Stainless Steel Flat Washer
- #M3 Stainless Steel Split-Lock Washer
- #M3 Metric Stainless Steel Hex Nut

- #M3 x 6mm Pan-Head Stainless Steel Machine Screw 176017-006
- #M3 x 8mm Pan-Head Stainless Steel Machine Screw 176017-008
- #M3 x 10mm Pan-Head Stainless Steel Machine Screw 176017-010
- #M3 Stainless Steel Flat Washer 175005-002
- #M3 Stainless Steel Split-Lock Washer 175006-002
- #M3 Metric Stainless Steel Hex Nut 177005-002
Schematic documentation for Pole Position is shipped with your game. If your game has an Atari PCB game set, this information is contained in SP-218. If your game has a Namco PCB game set, this information is contained in SP-219.

To convert these schematic packages so they support Pole Position II, delete the type numbers of the integrated circuits listed in Tables 4-1 and 4-2.

**NOTE**
Refer to the CPU PCB and Video PCB illustrated parts lists in this document for the proper description and type numbers of the integrated circuits used in Pole Position II.
### Table 4-1 SP-218 Schematic Package Changes

<table>
<thead>
<tr>
<th>Circuit Name</th>
<th>IC Location</th>
<th>Page in SP-218</th>
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</thead>
<tbody>
<tr>
<td>Microprocessor A</td>
<td>4E, 4D, 3E, 3D</td>
<td>Sheet 5A</td>
</tr>
<tr>
<td>Microprocessor B</td>
<td>4L, 4K, 3L, 3K</td>
<td>Sheet 5B</td>
</tr>
<tr>
<td>Sound Microprocessor</td>
<td>7H, 7F</td>
<td>Sheet 6A</td>
</tr>
<tr>
<td>Speech Processor and Memory</td>
<td>9C, 9A, 8C</td>
<td>Sheet 9A</td>
</tr>
<tr>
<td>Vertical Position Modifiers</td>
<td>2D, 2C, 2B</td>
<td>Sheet 11B</td>
</tr>
<tr>
<td>Roadway Memory and Adders</td>
<td>2M, 2N, 2L</td>
<td>Sheet 12B</td>
</tr>
<tr>
<td>Alphanumeric and Background PROM</td>
<td>5K, 4L, 6N, 7N</td>
<td>Sheet 13A</td>
</tr>
<tr>
<td>Match Circuit</td>
<td>11N</td>
<td>Sheet 14A</td>
</tr>
<tr>
<td>Picture Memory (Signs and Cars)</td>
<td>12J, 13J, 12K, 13K, 12L, 13L, 12M, 13M, 12N, 13N</td>
<td>Sheet 14B</td>
</tr>
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</table>

### Table 4-2 SP-219 Schematic Package Changes

<table>
<thead>
<tr>
<th>Circuit Name</th>
<th>IC Location</th>
<th>Page in SP-219</th>
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<tbody>
<tr>
<td>Microprocessor A</td>
<td>8L, 7L, 8M, 7M</td>
<td>Sheet 5A</td>
</tr>
<tr>
<td>Sound Microprocessor</td>
<td>6H, 5H</td>
<td>Sheet 6A</td>
</tr>
<tr>
<td>Speech Processor and Memory</td>
<td>2E, 1E, 2F, 1F</td>
<td>Sheet 9A</td>
</tr>
<tr>
<td>Roadway Memory and Adders</td>
<td>2A, 1A, 3A</td>
<td>Sheet 12B</td>
</tr>
<tr>
<td>Alphanumeric and Background PROM</td>
<td>1E, 1F</td>
<td>Sheet 13A</td>
</tr>
<tr>
<td>Picture Memory (Signs and Cars)</td>
<td>5M, 5N, 4M, 4N, 3M, 3N, 2M, 2N, 1M, 1N</td>
<td>Sheet 14B</td>
</tr>
</tbody>
</table>
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