

## Appendix D

From: <http://www.arcade-history.com/?n=hard-drivin'&page=detail&id=1083>

## arcadehistory

Earth's biggest coin-operated machine database

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[Video Game] Hard Drivin' © Atari Games (1988)

### *DESCRIPTION*

GENRES : **Driving**

Type of the machine : **Video Game**

**Hard Drivin' © 1988 Atari Games.**

Slide into the contoured seat and adjust it to fit the length of your arms and legs. Put your feet on gas and clutch pedals and try the stick shift. Select manual or automatic transmission, turn the ignition key and you're off!

It's the ride of your life. You feel the tires grip the road when you take a wide turn at high speed. You're alerted to the smallest change in the road by the feedback steering. You catch air as you fly the draw bridge and land on the down ramp. You control the car as it holds the road on the dizzying vertical loop.

Hard Drivin' might look like an arcade game but it drives like a real car. For the best lap times, drive Hard Drivin' as if it were a real car. The main difference between Hard Drivin' and a real car is that Hard Drivin' is much safer to drive. A player can test the limits of our car and his skill with no risk of personal injury, and follow a course that does not exist anywhere in the real world.

After inserting the proper number of coins to start the simulator, the player can select either an automatic or manual transmission. Turning the ignition key starts the simulator.

Drivers can choose between the stunt track or the speed track by following the posted signs on the road. Each player has a certain (operator-selectable) amount of time to reach a checkpoint or the finish line. Crossing checkpoints and the finish line rewards the player with (operator-selectable) bonus driving time.

With Hard Drivin' a player can test drive a high-powered sports car on a real stunt course. He can jump a draw bridge, negotiate a high-speed banked turn and drive a 360-degree vertical loop. These thrilling stunts, among others, provide the ultimate realistic driving experience.

Or maybe high-speed driving is a particular player's type of excitement. He can 'put the pedal to the metal' and try to keep control around the corners, weaving in and out of traffic while avoiding oncoming cars. All this, and more, await the player behind the wheel of Hard Drivin'.

Players especially enjoy the unique instant replay feature on Hard Drivin'. Every time a player crashes, the simulator records and replays the crash sequence. Not only will the player find this entertaining, but it is also informative. The instant replay shows the player exactly what he did wrong and why he crashed (If a player wants to skip the instant replay, he can press the abort switch or turn the key when the replay starts).

A skilled player finds the ultimate competition in the 'challenge' lap (or 'grudge match' as Atari Games likes to call it). The simulator remembers the path of the car driven by the best driver on record. When a player beats the qualifying lap time, he challenges the car of the past winner in a head-to-head race.

### *TECHNICAL*

Game ID : 136052 (cockpit), 136068 (compact)

Main CPU : 68010 (@ 8 Mhz), TMS34010 (@ 6 Mhz),  
TMS34010 (@ 6.25 Mhz), ADSP2100 (@ 8 Mhz)  
Sound CPU : 68000 (@ 8 Mhz), TMS32010 (@ 5 Mhz)  
Sound Chips : DAC



Screen orientation : Horizontal  
Video resolution : 508 x 384 pixels  
Screen refresh : 60.00 Hz  
Palette colors : 1024

Hard Drivin' is equipped with center-feel steering with continuous force feedback, adjustable swivel seat, gas, brake and clutch pedals, four-speed stick shift, and a medium-resolution monitor.

#### *TRIVIA*

This was the world first driving simulator to use 3-D polygon graphics.

Despite claiming to be a real driving simulator, there were a lot of discrepancies between the game's software physics and the car physics on screen. However, the cockpit physics were considered very accurate at the time.

You may have noticed that the Credit Screen lists Doug Milliken as a Test Driver (See Staff section). He is listed as a Test Driver because Atari didn't want anyone to know what he really did. Hard Drivin' had to be as accurate as possible. That meant doing an accurate car model to mathematically describe the physics of how the parts of the car (engine, transmission, springs, shock absorbers, tires, etc.) react to each other, to the road and to the driver's inputs. The pioneer in the field (in the 1950s) was William Milliken of Milliken Research. His son, Doug, has continued his father's work. Doug is probably the world's leading expert in car modeling. Doug and his father wrote the book on car modeling.

Patents that come out of Hard Drivin' are :

5,005,148 : 'Driving simulator with moving painted dashboard'.

5,354,202 : 'System and method for driver training'.

5,577,913 : 'System and method for driver training with multiple driver competition'.

Prior to the release of Hard Drivin', Namco had acquired a controlling interest in Atari games by 1986. The sharing of R&D information would spawn many games of the same polygon engine years later. It can be credited that the success of the Hard Drivin' engine set the trend for the high quality simulation games in the early 90's.

One of the buildings along the speed course, a small camouflage-painted building, if approached from behind (a non-trivial task, given the off-road time limit) has a sign above its normally-unseen door that says 'THE HUT'.

If the driver slowed down and stopped in front of one of the buildings, a 'keyhole' appeared on the building's door.

There is no apparent Ferrari license shown in any version of the game.

Jerry Landers holds the official record for this game with 529,800 points.

There were 15 officially released versions, counting 11 cockpit and 4 compact versions, including various British, German and Japanese versions.

A free, playable version of Hard Drivin' was displayed in the Franklin Institute Science Museum in Philadelphia, Pennsylvania in 1989.

### *UPDATES*

Notes : In all British versions, you are in a right-hand drive car.

#### **\* Cockpit versions :**

Revision 1 :

\* World release.

\* Software version : 7.8.

Revision 2 :

\* World release.

\* Software version : 7.9.

Revision 3 :

\* World release.

\* Software version : 8.1.

Revision 4 :

\* German release only.

\* Software version : 8.2.

Revision 5 :

\* British release only.

\* Software version : 8.3.

Revision 6

\* British and Japanese releases only.

\* Software version : 8.4 for Japanese and 8.5 for British.

Revision 7

\* World, British and Japanese release.

\* Software version : 8.6 for all.

**\* Compact versions :**

Revision 1 :

\* World release.

\* Software version : 2.9.

Revision 2 :

\* World, British and German releases.

\* Software version : 3.1 for all.

*TIPS AND TRICKS*

If the driver made a hard left turn at the start of the game, a 'secret' track was available. The track was a long straight road leading to a very short circular track (a skid pad test track) around a tower.

**SERIES**

1. Hard Drivin' (1988)
2. Race Drivin' (1990)
3. Hard Drivin' II - Drive Harder (1991, Atari ST, Commodore Amiga)
4. Hard Drivin's Airborne (1993)
5. Street Drivin' (1993)

*STAFF***\* Main :**

Project leader, game designer, sound system, mech designer, force shifter, analog HW:  
**Rick Moncrief**

Techician, mech, designer, sound recording, dashboard shift, game designer: **Erik Durfey**

Software designer, game designer, car model, force feedback steering, SW tools: **Max Behensky**

Hardware designer, self test, instant replay, integer 3D algorithms, game designer: **Jed Margolin**

Game programming, display software, championship lap, game designer: **Stephanie Mott**

**\* Others :**

Cabinet designers : **Mike Jang, Ken Hata**

Graphics : **Sam Comstock, Kris Moser, Deborah Short, Alan Murphy**

Display math software : **Jim Morris**

ADDN'L programming : **Gary Stark, Mike Albaugh, Ed Rotberg**

ADDN'L hardware : **Don Paauw**

Marketing : **Linda Benzler, Mary Fujihara**

Sales : **Shane Breaks**

Mechanical designers : **Jacques Acknin, Milt Loper, Geoff Barker**

Test drivers : **Doug Milliken, Dave Shepperd**

Music : **Don Diekneite**

Management : **Dan Van Elderen, Lyle Rains, Hide Nakajima**

*PORTS*

**Consoles :**

Sega Mega Drive (1990)

Atari Lynx (1991)

Microsoft XBOX (2004, "Midway Arcade Treasures 2")

Nintendo GameCube (2004, "Midway Arcade Treasures 2")

Sony PlayStation 2 (2004, "Midway Arcade Treasures 2")

**Computers :**

Commodore C64 (1989)

Commodore Amiga (1989)

Atari ST (1989)

Amstrad CPC (1989)

Sinclair ZX Spectrum (1990)

PC [MS-DOS] (1990)

PC [MS Windows, CD-ROM] (2006, "Midway Arcade Treasures Deluxe Edition")

Notes : Upon purchasing the Amiga version, a questionnaire contest was held where the first 5 people to answer correctly via a postcard sent to London would receive a free model Ferrari F-40 model car by January 8, 1990. The model car is 1/18th the size of the actual car.

LAST EDITION  
August 17, 2007

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