

## Introduction

I'm pretty sure that a spinner was my first experience of perfect analog controls.

I definitely was impressed by controlling the paddle in Atari's Breakout in the early 80's long before I ever saw a computer mouse.

And some of my favorite games of all time have spinners as a core control.

Because I can't find an exhaustive list,

I've created a list of spinner games and attempted to give the best, most accurate sensitivity settings for MAME based upon my testing.

For more information about how sensitivity is calculated and for some technical information, visit the BYOAC wiki page at:

[http://wiki.arcadecontrols.com/index.php?title=Spinner Turn Count](http://wiki.arcadecontrols.com/index.php?title=Spinner_Turn_Count).

For more information about spinners and dials both original and aftermarket:

[http://wiki.arcadecontrols.com/index.php/Spinners and Dials](http://wiki.arcadecontrols.com/index.php/Spinners_and_Dials)

The format I'm using will be [original spinner resolution] and (MAME sensitivity)

If there's a question mark, it means that it's my best guess.

So, [288?] (24) would mean that information points to the original resolution being 288 and a MAME setting of around 24 seems to be correct.

(24?) alone indicates that the resolution is a mystery (could be a free spinning potentiometer?), but that a setting of 24 works in game.

If there is no question mark, then I'm using information from the spinner turn count Wiki linked above.

Sometimes, the Wiki information seems wrong and I've noted what settings seemed to work better in the description.

All settings are using the resolution of 1200 utilized by both GroovyGameGear's TurboTwist 2 and Ultimarc's Spintrak.

Other spinners, such as the GRS, seem to have a lower maximum resolution (GRS might be 1024, but can be set lower?).

If you have a different type of spinner and you know the resolution,

you could easily tweak the formula by replacing 1200 with your resolution to get your MAME settings.

All Steering Wheel games tested with small 7" Wheel

Games like Super Sprint and Ivan Stewart used (16-ish?) inch steering wheels,

so the settings likely won't match up exactly with gameplay, even when they are known.

I also have excluded games that used a 12 position rotary joystick, such as Ikari Warriors.

Those were included as analog controls in MAME, but they aren't analog.

To assign button presses to these rotational features

check this wiki page for specific directions:

[http://wiki.arcadecontrols.com/index.php/Joysticks#MAME Settings for Mechanical Rotary Joysticks](http://wiki.arcadecontrols.com/index.php/Joysticks#MAME_Settings_for_Mechanical_Rotary_Joysticks)

Optical rotary joystick games like Caliber 50 are included.

As far as sensitivity settings , generally, for block breakers,

I'm using the Breakout/Arkanoid standard of 120-130 degrees twist to move the paddle from one end of the screen to the other.

For spinning turret-based games, I've tried to match the turret 1:1 with the spinner movement.

Keep in mind that spinners on the original cabinets varied a lot in size

and functionality and that these settings are just a potential starting point or guideline.

I often tweak the sensitivity 1 or 2 degrees higher in Breakout style games

because the original knobs tended to be half an inch or so bigger in diameter than the knobs I got from GGG.

If you notice any glaring errors or omissions or want to share your opinions, please post below.

\* Regarding MAME settings: Analog controls should be mapped to Trackball/Dial/Paddle X and Trackball/Dial/Paddle Y.

Trackball/Dial/Paddle dec and Trackball/Dial/Paddle inc are for digital controls mapped to analog functions.

Digital Speed and Autocenter Speed adjust how digital inputs affect analog controls.

For spinner and trackball controlled games, only Sensitivity affects performance.

Sensitivity settings on the wheel games will be even more subjective and somewhat dependent upon the diameter of your controls.

I have a Turbo Twist 2 spinner with a 7 inch mini-racer wheel attachment from Groovy Game Gear, so the settings here generally reflect that.

If you have a smaller wheel or just a spinner knob, higher sensitivity may work better.

The format is [original resolution] (MAME sensitivity).

I've labeled guesses with question marks.

It's also worth repeating that the guesses are the best settings for me based upon available information and my own testing.

As always, if you notice any glaring errors or omissions or want to share your opinions, please post below.

FYI, if the game utilizes a shifter,

MAME often has a helpful onscreen shift position indicator that you can enable by pressing Tab and going into the Video Options menu.

\*Edit\* I should add that I'm not including games like Road Blasters.

it used an optical encoder rather than a pot, but the steering yoke was physically limited to 270 degrees of movement

It really doesn't play well with free spinning controls, IMO.

The following games are playable with 360 degree spinners that do not need physical restriction or centering springs.

## *Single Spinner:*

Game Name	Original	Mame	Additional Changes	Review
<b>720 Degrees:</b>	144	12		Playing this game well requires a ton of spinning the custom spinner-mounted joystick in precise whole or half-circle motions, which is really difficult without the joystick and auto-calibrating disc that the original had attached to the spinner. For those of us with a standard arcade spinner, this game is still fun in small doses.
<b>Arkanoid:</b>	486	40.5		The original often-imitated mega hit that itself was just a variant on Atari's original Breakout game. Arkanoid added so much that became standard to the formula of later block breakers and it's still an amazing game to play today, although be prepared for unfair difficulty spikes. Adding to the brutal difficulty is the fact that the game resets the stage each time you continue, Forcing you to beat each level in one credit. You can use save states to alleviate some of the pain, or even change the dip switches to easy mode and give yourself 5 lives, but it still hurts.
<b>Arkanoid - Revenge of Doh:</b>	972	81		The sequel brings more power ups, more special blocks, as well as a power-down making your paddle smaller. Of interest is that the US version of the game has a different and more interesting version of the first level, but the real change between the US version and the rest of the world is that the blocks you destroy stay destroyed when you continue, which makes the US version my preferred version of the game.
<b>Avalanche:</b>	5k POT	50		Kaboom! started as an attempt to port this game. Avalanche is an okay game, but lacks the charm of Kaboom!'s smiling bomber.
<b>Aztarac:</b>	288	24		An ambitious vector game where you use a joystick to drive a tank while controlling the tank's swivel turret with your spinner, somewhat like the tank stage in Tron. You fight off wave after wave of enemies and sweep the area with your radar. It's fun, but repetitive.
<b>Bomb Bee:</b>		50		Breakout crossed with pinball. It looks and sounds pretty decent for 1979.
<b>Boxing Bugs:</b>		11		This is a fun game that is sort of like Star Castle in reverse. You have a weird two sided turret that extends a boxing glove out of one end and shoots out of the other. The turret spins pretty much 1 to 1 with a Turbo Twist 2 in MAME with a sensitivity of 11.
<b>Cameltry:</b>	486	40.5		A fun and unique labyrinth game where you rotate the entire maze instead of moving the ball directly.

Game Name	Original	Mame	Additional Changes	Review
<b>Cerberus:</b>	72	6		You control the rotation of a small ship with the spinner, along with buttons for thrust and fire similar to Blasteroids. In the game, you have to return fuel pods to your space station and the game is unique in that you don't have a set number of lives. You can die as many times as you want as long as you get at least one pod back to the ship. Graphics are okay, but it gets repetitive quickly.
<b>Circus / Acrobat TV</b>	5k POT	50		The original game where you have two guys on a see saw and have to send them up to pop balloons. It's fun enough for a few minutes.
<b>Clowns:</b>	5k POT	50		Essentially, the same game as Circus with a few small changes in graphics and sounds.
<b>Cosmic Chasm</b>	288	24		Once again, you have the spinner rotating a ship with asteroids style thrust, shoot, and shield, but sweet vector graphics and a cool mini-map make this an excellent lesser-known title.
<b>Crater Raider:</b>	64	5.3333		Rescue "survivors" on a barren landscape, the original controls have a trigger stick that only moves up and down to control your tank's forward and reverse movement. All steering is controlled by the spinner. You have a shot that kills enemies in one hit and a shield button. It's a decently fun game.
<b>Cutie Q:</b>		50		Similar to Bomb Bee, a mix of breakout and pinball, but Bomb Bee seems superior.
<b>D-Day:</b>		50		You use the spinner to rotate a gun to shoot at a gallery of military targets. I remember playing games like this on my old Apple IIC. Gameplay is pretty lackluster.
<b>Dark Planet:</b>	64	5.3333		A bizarre game with the spinner again controlling the ship's rotation and utilizing three buttons for fire, thrust, and laser (which looks like a red cloud?). You're supposed to be stopping the enemy from building bases, but it's difficult to understand what's happening because of the rudimentary graphics.
<b>Discs of Tron:</b>	128	10.66667		Another classic, it had an up/down spinner, but you can certainly map those buttons elsewhere on your panel. I find this game fun in small doses. It's pretty funny that it offers you extensive written directions before you play the game.
<b>Exterminator:</b>		24		A terrible game where you play a digitized disembodied hand that shoots "juice" all over the house to kill a variety of pests.
<b>Gigas:</b>	486	40.5		Gigas is a pretty lackluster copy of Arkanoid/Breakout. It's fun enough and not too difficult if you're desperate for more block breaking action with powerups.
<b>Gigas Mark II:</b>	486	40.5		Looks almost exactly the same as Gigas with different block layouts.

Game Name	Original	Mame	Additional Changes	Review
Goindol	486	40.5		Another Arkanoid/Breakout copy, but it redeems itself by being very quirky. There is a caveman wandering around the block patterns and driving a tank across a floating line of balloons between stages. There are bonus shooting stages, as well as some pinball elements in here, similar to Bomb Bee and Cutie Q.
Ixion:		15		An interesting game where you play a tank with a rotating turret on a grid where you must collect the letters of IXION without getting blasted by many enemies. A sensitivity of 15 seems to be almost 1:1 with the turret, but a little higher sensitivity seems to play better with the frantic gameplay.
Kick:	12	2 or 1 (Wiki)		Originally, it was a trackball game that only used the one axis. Gameplay is simple and fun with the cute addition of Pac-Man and the ghosts. I find a sensitivity of 1 to be too sluggish and 3 causes some reversing of inputs when you spin too forcefully, so I set it to a sensitivity of 2 and that seems to be a happy medium.
Kosmik Kroozr:		18		Discs of Tron style cabinet and control layout, the cartoony design of the sprites was done by the same guy who did Rampage and it looks good, but the gameplay is incredibly thin. A sensitivity setting of 18 puts the spinner roughly 1:1 with the turret aiming, but since you can only fire in 8 directions anyway, it may play better to set the sensitivity higher.
Mad Planets:	72	3 or 6 (Wiki)	The resolution indicated by the wiki doesn't make your ship spin 1:1 with the spinner, which is odd. Your ship spins roughly 3 times per rotation. A sensitivity of 3 seems to be correct, as a full turn of the spinner rotates the ship more than a full turn, maybe 380 degrees.	A very strange game with Tron style controls where you control a nimble ship that resembles an Imperial star destroyer from Star Wars being attacked by swarms of planets. The gameplay is fast and fun and the soundtrack has a catchy beat that is unfortunately drowned out by the other gameplay noises once you start shooting. *Edit*
Major Havoc:	288	24 or 50	This one used a roller, kind of like a skateboard wheel turned on its side. I set sensitivity to 29 50. It seems to play well, especially the game of Breakout in before you have each space battle	
Moonwar:		25	Controls don't feel great here no matter what the setting. However, the game plays fine at sensitivity 25	The game is asteroids style shoot, thrust, shield, with the spinner controlling ship rotation. It has a fourth button that flips your ship like the reverse button in Defender, which is odd.
Omega Race:	64	5.3333		This is one of the very best of the shoot, thrust, spin spaceship games.
Peggle:		50		A unique puzzle game where you spin a pegboard to try to get a falling character to hit and break the pegs. It originally used a trackball and it doesn't play particularly well with my spinner.

Game Name	Original	Mame	Additional Changes	Review
Plump Pop:		81		A good update to Circus/Clowns, but you control a movable trampoline rather than a see saw, which makes the game easier. There are bosses, music and bonus stages, so the game has a decent variety.
Prebillian:		40.5		Futuristic billiards with annoying music. You use the spinner to aim the cue ball. It's alright.
Quester:		40.5		Very basic Arkanoid imitation. The blocks make different melodious sounds when they break and there is a funny moment at the beginning when your ship, which is a cylinder on its side, takes off from a hangar full of fighter jets.
Razzmatazz:		40.5		Carnival style gallery shooter, you control a rifle that sweeps side to side at the bottom of the screen like a paddle. It doesn't have much to offer.
Riddle of Pythagoras:		100		Another Arkanoid imitation, this one with an Indiana Jones vibe. It's not bad. It might be the only spinner game that plays well at 100% sensitivity?
Star Trek:	72 or 64 (Wiki)	5.3333		I'm not sure what's going on with the Wiki resolution of 64 for this game, but the ship rotates 1:1 for me at a sensitivity setting of 72. This one is fun, although most of the game is on the mini map, so it feels tiny.
Straight Flush:		40.5		Breakout with the gimmick that there are cards that you change by hitting them with the ball.
Super Breakout:	120-130	40		It's difficult to go back to a game this basic when you have Arkanoid style games.
Super Free Kick:		40.5		Breakout with soccer players instead of blocks and a goal with a goalie at the top of the screen.
Tac/Scan	64 or 256	5.3333 or 21.333	the ships turn nearly 1:1 at sensitivity 24. Maybe the 64 tooth encoder was quadrupled for a true resolution of 256? Or maybe the tooth count was actually 72?	This is a fun classic
Teeter Torture:		10	I get backspin whenever I try increasing the sensitivity above 10, but it plays well enough there.	It's an interesting gallery shooter where the floor is a scale that will explode if it tips too far to one side or the other. Enemies fall down and hang on it if you don't shoot them.
Tempest:	72	6		Tempest is an amazing game. I remember it in the arcade back in the 80's. If you spun the spinner on that machine too hard, it would vibrate to a stop.
Tempest Tubes:	72	6		This is one of those well-done hacks that just adds variety to the original.
Tournament Arkanoid	486	40.5		A US exclusive variant that plays identically to the original game. Block patterns are unique and round 2 has a block pattern that resembles the American flag. This one is supposedly more difficult than the already brutally difficult original, but I haven't played enough to comment.

Game Name	Original	Mame	Additional Changes	Review
<b>Tron:</b>	128	10.66667		It'll take you five minutes to play through the four minigames, but the execution is stunning and the game is a classic, especially for those of us who experienced this mind-blowing cabinet back in the day. You'll need a joystick and a fire button as well as a spinner.
<b>Victory</b>		18		Colorful graphics and lots of voice samples highlight this otherwise bland thrust and fire space shooter.
<b>Wiz Warz</b>		2	I have no idea how this one is supposed to play, but 50 6 seems okay. The correct sensitivity seems to be 2, as one full turn of the spinner moves the letter selection after the game just past the letter B.	The game is a mix of Robotron and Tempest and it is really fun. You use a joystick in your right hand to aim your shots like in Robotron and the spinner in your left hand to spin around the outside of the arena like in Tempest.
<b>Arena</b>		2	I have no idea how this one is supposed to play, but 50 6 seems okay. The correct sensitivity seems to be 2, as one full turn of the spinner moves the letter selection after the game just past the letter B.	The game is a mix of Robotron and Tempest and it is really fun. You use a joystick in your right hand to aim your shots like in Robotron and the spinner in your left hand to spin around the outside of the arena like in Tempest.
<b>Zektor</b>	64	5.3333 or 11	Plays better at sensitivity 11 or 12.	Similar to Omega Race with some cool voice samples.
<b>Zwackery</b>		16		Another game by the guy who designed Rampage, so it has that cartoony look, as well as unusual gameplay, with platforming and the spinner controlling 360 degree aiming of your wizard's sword and shield. it feels very experimental in design and is definitely worth a try.

## **Dual Spinner Games:**

Game Name	Original	MAME	Additional Changes	Review
Arkanoid Returns	144 or 486	12 or 40.5	a sensitivity setting of 12 makes it match the feel of the other games	This is a great game, 2 player co-op Arkanoid.
Blasteroids	288	29 or 24	I set my spinners to 29	This is Atari's somewhat fun 2 player co-op update of Asteroids utilizing the hilariously-named "Housequake" sound system and graphics digitized by Industrial Light and Magic. The first boss yells at you, reminiscent of Sinistar.
Block Block	486	40.5	Only the Japanese version has spinner support	a decently fun co-op block breaker. The difficulty at least through the first part of the game seems to be quite a bit lower than Arkanoid.
Caliber 50	24	8 or 2	I have this one set to sensitivity 8. The game used an optical rotary joystick with a 24 slot encoder wheel and apparently no multiplier, but it really plays like crap in MAME at 2% sensitivity	I played this one in my local arcade way back when it was new, but my memories of the rotation are really hazy, although I remember thinking that it felt weird compared to Ikari Warriors, since there was no clicking in the rotation.
Eco Fighters	288	24		"it can be seen as a spiritual successor to Forgotten Worlds." In graphics and gameplay, Eco Fighters is as good as or better than Forgotten Worlds. Give this one a try if you have a spinner, joystick and a reachable button. It's amazing.
Fighting Soccer	24	25 or 2	it supports 4 spinners and works fine at the MAME default sensitivity of 25	it supports four players and seems to be another with an optical spinner joystick similar to Caliber 50. There is a joystick hack of this game that is much easier to control, but obviously lacks the precision of the spinners for aiming your shots and passes.
Forgotten Worlds	1792	150		An absolute classic, the first game on Capcom's CPS hardware. The spinner itself seems to have four gears like Arkanoid, although, IIRC, it used a bigger and heavier spinner knob that spun slightly more freely. I'm not sure why the spinner sensitivity is so high, but setting it at 150 makes the spinning pretty much 1:1 with the shooting, which feels right to me.
Ghox	486	40.5		This Toaplan classic is another 2-player co-op block breaker, but it mixes in good music and absurd gameplay, including fairies you can collect and a "bomb" that you can trigger with a button to split the ball into dozens of balls. The original spinner used an up/down button mechanism similar to Discs of Tron, there seems to be little reason for moving up from the bottom of the screen. The buttons can be mapped to the joystick just in case.
Off the Wall (Atari)	256	21.3333	3 spinners	Basically Pong crossed with Arkanoid, I prefer this game to Arkanoid in some ways. It supports 3 players and the ball reacts more realistically, bending and curving if you hit it while moving the paddle. The graphics and music are cute and feel like a product of the times.
Off the Wall (Sente)	288	50 or 24	It's playable at the default sensitivity of 100, but feels better to me at 50. Apparently, the original used the same spinner as Aztarac, but a sensitivity of 24 feels a little sluggish to me	This game is a really fun classic.



<b>Pop 'n Bounce</b>		22	can be controlled by dual spinners if you change the input method in the dip switches. Although it may have commonly used an Arkanoid spinner, a sensitivity of 22 feels right to me, maybe because you only ever utilize half the screen, even when playing single player.	This is an interesting and decently fun head-to-head block breaker on the Neo Geo that
<b>Puchi Carat</b>	144	12		It plays like a mix of Breakout and Puzzle Bobble and it has a two player head to head mode. A good game, but not too exciting as it can be difficult to pinpoint your shots like you can in Puzzle Bobble.
<b>Puzz Loop</b>	972	81	Select dial controls in the service menu to enable analog controls	Of all the games on this list, this one made me want dual spinners the most. Even though the presentation feels a bit budget, the Puzz Loop concept is so great that it was copied by the PC game Zuma.
<b>Puzz Loop 2</b>	972	81	Select dial controls in the service menu to enable analog controls	The sequel is a great game that feels a bit more polished, although I miss the Caribbean-esque funky music from the original and the guy sitting in the middle shooting the balls from between his legs is totally bizarre.
<b>Squash (squaitsa.zip)</b>		6		This seems to be a poorly designed clone of Sente's Off the Wall. Mainly, the physics just don't play well at all. There's very little interest or enjoyment playing the computer. It might be fun with two human players, but I don't see why anyone would choose this over the original Off the Wall.
<b>Touchdown Fever</b>	24	25 or 2	4 Spinners, the MAME default sensitivity of 25 works fine on my Turbo Twist 2 spinners	The most fun part of the game is the run button that you tap to run faster, similar to Track and Field. You can zoom down the field if you tap the run button really fast and it's pretty hilarious. Otherwise, the game just isn't fun because you can't see enough of the field to make a decent pass play.
<b>Touchdown Fever II</b>	24	25 or 2	4 Spinners, the MAME default sensitivity of 25 works fine on my Turbo Twist 2 spinners	For me, the cheesy voice samples made testing the games sort of enjoyable.
<b>Twin Squash</b>	486	40.5		A lackluster block breaker where you face off against either a human or a computer in a race to break all the blocks before they advance down to the bottom of your screen.
<b>Two Tigers</b>	64	11 or 5.3333	the sensitivity seems to be better when it's set to 10 or 11, even though the BYOAC wiki has it listed at a resolution of 64.	A Tron conversion that uses dual spinners to control fighter planes trying to shoot down planes and sink ships. Just like Tron,
<b>VS Block Breaker</b>	486	40.5		Despite the generic title, this incredibly cute game has a delightfully absurd premise of the balls actually being balled-up hamsters kept in the air by a character running across a floor and holding the paddle. The game is intentionally slow-paced, as it has a unique timer of a large sprite squeezing your window of play, forcing you to keep the pace as quick as possible. You have a little jump move to help keep your hamster at full speed, which you'll need to do in order to beat the timer. The game also features a slew of bizarre voice samples. It never gets old seeing your character's shock when the hamster ball splats on the floor and walks away.

<b>VS Hot Smash</b>	486	40.5		Basically virtual air hockey, the game has an odd mechanic where your paddle shoots forward when you spin quickly, allowing you to hit a quick shot at your opponents goal. It takes some getting used to, but it works well once you figure it out. When you play single player, you are always at the bottom of the screen. When you play versus another human, the other player has to be at the top of the screen, which is slightly less intuitive.
<b>Warlords</b>	120-130	50	It seemed to be almost exactly a half turn of the dial to move end to end of the castle, so a lower sensitivity may be more correct. The cocktail version of this cabinet supported up to four players. You can easily add a trackball or mice for the extra players, but this one plays best with spinners	It's a classic with a lot of chaos and fun

## **Single Steering Wheel Games**

Game Name	Original	MAME	Additional Changes	Review
<b>1000 Miglia: Great 1000 Miles Rally:</b>	Free Spinning POT	50	Change Dip switch to 360 Wheel	This series of isometric racers is really fun with or without a wheel attached.
<b>APB – All Points Bulletin:</b>	72	6		It's fun and funny to play a cop terrorizing the streets while you try to arrest "litterbugs" and other law breakers.
<b>Buggy Boy / Speed Buggy:</b>		10		Widescreen format like TX-1, this one is fun, with jumps, obstacles, and points to collect all over the road.
<b>Buggy Challenge:</b>		10		Driving over a seemingly endless desert, the gimmick here is that you follow the sun, rather than a road. Unfortunately, gameplay is lacking.
<b>Change Lanes:</b>		10	In the manual, it seems to use a 36 tooth encoder disk, so a lower sensitivity may be arcade accurate, but it plays well at a sensitivity of 10.	Drive down a straight road dodging other cars and obstacles, similar to Turbo, but not as good. You can even drive in the water. It has a shifter, but it's only to go forward and reverse, although I'm not sure why you would ever go in reverse.
<b>Drift Out:</b>		50	Change dip switch to paddle in order to use a spinner, This game doesn't play too well at any setting	The whole background rotates in a slightly disorienting way, but the game lacks excitement. It is amusing to see how closely they modeled the cars and names after the real versions, using slight spelling changes like "Masda" and "Toyoda," probably to avoid paying licensing fees
<b>Fire Truck:</b>		10	I'm not sure how this one is supposed to steer, but a sensitivity of 10 plays okay.	This one is relaxing and fun as you try to go across the country as fast as possible without running out of gas or getting ticketed by the cops, although the music is pretty terrible. One cool detail I didn't notice at first was the mini-map of the State you're zooming through in the top right corner of the screen.
<b>Grand Champion:</b>		25		Very similar to Turbo, but not nearly as good.
<b>Mille Miglia 2: Great 1000 Miles Rally</b>		50	Change the dip switch to 360 wheel	It's another good entry in this series. The upcoming turn directions don't pop up on screen anymore, so you have to pay attention to the mini-map in the top right corner.
<b>Monte Carlo:</b>	36	3		Very early top down racer, it's decent.
<b>Night Driver:</b>		50		I haven't played this one with original controls, but it controls decently well at a sensitivity of 50.
<b>Pole Position:</b>	102.667	8.555583	10 with 7" mini-racer wheel	"Prepare to qualify." Just a classic game.
<b>Pole Position II:</b>	102.667	8.555583	10 with 7" mini-racer wheel	Not as iconic as the original, I play the Atari version, as the original Namco version has some weird sounds.
<b>Stocker:</b>		50		An unlicensed Smoky and the Bandit game that plays something like Sprint,

<b>Super Bug:</b>		10	Enable the color overlay in the MAME video options to make it look a bit less bland.	An early top down racer from 1977.
<b>Super Speed Race Junior:</b>	64	5.3333	7 with 7" mini-racer wheel	The core gameplay is just bad, forcing you to zigzag through uninteresting traffic patterns on a completely straight road while awful music plays.
<b>Top Secret (topsecex.zip):</b>		25		Exidy blends Spy Hunter and Sprint in an over the top homage to James Bond driving sequences. The graphics and sound are not great, even for the times, but the game features a ridiculous array of weapons and power-ups (8 buttons!) and is still fun to play today.
<b>Turbo:</b>	2.5	10, 18 with 7"	Make Sure you enable the bezel and control panel artwork in the MAME video options for this game.	I remember playing this fun game back in the arcade. You get a tachometer and digital score readout just like the original cabinet. It's pretty amazing.
<b>TX-1:</b>		10		Pole Position with a widescreen format, this one is good and MAME emulates the original 3 screen layout just fine. Gameplay might even be better than Pole Position, but the sense of speed is diminished somewhat.
<b>World Rally:</b>		50	Change to optical wheel in the dip switches in order to use a spinner	It's very similar to the Great 1000 Miles Rally series. This one used a 360 degree spinning wheel and actually was marketed as a conversion for Pole Position, as indicated in the manual. The sequel, .
<b>World Rally 2: Twin Racing:</b>			Uses 270 degree pot based steering wheels and does not play that well using my spinners, at least in MAME .201	

## **Multiple Steering Wheel Games**

Game Name	Original	MAME	Additional Changes	Review
American Speedway		9		2 players, this game is brutally difficult and it taunts you with “Good Job! Buy your way to the top” when you spend money to continue. Otherwise it’s just a forgettable racer compared to the later Sprint games.
Bad Lands		7		2 Players, Mad Max inspired post-apocalyptic sprint, you have a basic machine gun upgradeable to a missile launcher mounted on the top of your vehicle and some other cool upgrades on these otherwise Sprint-looking courses.
Car Polo		??		4 player car soccer, very early precursor to Rocket League, controls don’t seem to work for me. Apparently, player controls were fixed in MAME version 0.211.
Championship Sprint		7		2 players, it’s Super Sprint, but for only 2 players, along with track variations, and it’s just as fun.
Danny Sullivan's Indy heat		30		3 players, it feels like a spiritual sequel to the Super Off-Road games and is really fun.
Demolition Derby		50		4 players, this game isn’t too fun when you take it out of the county fair arcade tent.
Drag Race		10		2 players, I'm not sure how this one is supposed to control, but a sensitivity of 10 works fine for me to keep the car from crashing.
Grudge Match		15		3 players, I have no idea how this is supposed to play. Unfortunately, it’s not that good, either.
Hot Rod		20		3 players, Sega’s take on the Sprint formula, the interesting part of this game was that the screen scrolled, so you travel from one place to another more like a rally game, rather than doing laps around a racetrack. It’s also slightly slower-paced, but manages to still be fun.
Ivan Stewarts's Super Off- Road	155-165	30		3 players, for me, this is the pinnacle of Sprint style games. The off-roading, jumps, constant upgrading, and the nitro boosts add a ton of fun. It’s pretty hilarious that the game allows players to completely upgrade their vehicles right from the start by adding more credits. Leland was really ahead of the curve regarding pay to win microtransactions.
Ivan Stewarts's Super Off- Road Trax-Pak	155-165	30		3 players, basically the same game with different courses and the ability to play as a buggy instead of a truck. I slightly prefer the original’s tracks, but both Super Off-Road games are amazingly fun.
Redline Racer		25		2 players, a lackluster Sprint imitation, it does have a name entry system to apparently save your progress and some funny voice samples, but the gameplay feels pretty hollow.
Rough Racer		10		2 players, bizarre and fun game from Sega adding unique twists to the Sprint/Off-Road formula, like a steam roller on the track or breakable barriers. It has a duck announcer and a track intro that reminds me of Duck Game, if any BYOAC’ers have played that.
Super Dead Heat		??		4 players, this is an early and rare 4 screen Sprint-esque racer added to MAME .215 in 2019. At the moment, I haven't been able to test it, as I'm still using MAME .201.
Super Sprint	72	6		3 players, plays well at sensitivity 7 with a 7 inch wheel, I love this game, but I get annoyed by the AI that always gives you a race or two by going incredibly slowly around the track after you insert a coin. The game is a classic, but a lot more fun with human opponents.
Wheels Runner		10		2 players, a bad Sprint clone.