# Sega Chihiro

The **Sega Chihiro** is an arcade system board developed by **Sega** in collaboration with **Microsoft**, released in **2002**. It is based on the original Xbox hardware with doubled RAM (128 MB vs 64 MB) and additional arcade-specific boards for GD-ROM loading, JVS I/O, and VGA output. It was Sega's last arcade board derived from a home console. Notable games include *The House of the Dead III*, *OutRun 2*, *Virtua Cop 3*, *Ghost Squad*, and *Wangan Midnight Maximum Tune*.

### Quick reference

- **Emulator:** xemu
- **Folder:** `/userdata/roms/chihiro`
- **Accepted ROM formats:** `.iso`

Sega Chihiro emulation requires an **x86_64** system. ARM devices (Raspberry Pi, Odroid, etc.) are not supported.

Only a handful of Chihiro games are currently playable through xemu. See the game compatibility section below.

## BIOS

The following BIOS files are required and must be placed in `/userdata/bios/`:

| File | MD5 | Description |
|---|---|---|
| `mcpx_1.0.bin` | `d49c52a4102f6df7bcf8d0617ac475ed` | Xbox/Chihiro boot ROM (MCPX) |
| `cerbios.bin` | `f23d7e00ae8fbf88908ed1f9165f35eb` | Cerbios custom flash ROM |

Unlike regular Xbox emulation which uses `Complex_4627.bin`, Chihiro requires **Cerbios** (`cerbios.bin`) as its flash ROM. Batocera handles this automatically.

## ROMs

Place your ROM files in:

`/userdata/roms/chihiro/`

ROMs must be in **XISO format** (`.iso` extension). These are Xbox-compatible patched versions of the original Chihiro GD-ROM disc images. Standard MAME ROM sets (.zip / .chd) are **not** used for this

system.

## Game compatibility

Only a few Chihiro games have been converted to work with xemu. The following games are known to be supported in Batocera:

| Game | Year | Input type | Status | Note |
|---|---|---|---|---|
| Ghost Squad | 2004 | lightgun | Playable | Light gun not supported in xemu. Only controller. |
| OutRun 2 | 2003 | steering wheel / pedals | Playable | Steering wheel not supported in xemu. Only controller. |
| Virtua Cop 3 | 2003 | lightgun | Playable | Light gun not supported in xemu. Only controller. |

## Full Chihiro game library

The complete Chihiro arcade library includes the following titles. Most of these are **not yet playable** through xemu in Batocera.

### Lightgun games

| Game | Year | Notes |
|---|---|---|
| The House of the Dead III | 2002 | 2-player lightgun + reload button |
| Virtua Cop 3 | 2003 | 2-player lightgun + foot pedal (bullet time) |
| Ghost Squad | 2004 | 2-player lightgun + weapon/mode switch buttons |

### Racing games

| Game | Year | Notes |
|---|---|---|
| Crazy Taxi High Roller | 2003 | Steering wheel + pedals |
| OutRun 2 | 2003 | Steering wheel + pedals + gear shift |
| OutRun 2 Special Tours | 2004 | Steering wheel + pedals + gear shift |
| Wangan Midnight Maximum Tune | 2004 | Steering wheel + pedals + 6-speed shift (Namco) |
| Wangan Midnight Maximum Tune 2 | 2005 | Steering wheel + pedals + 6-speed shift (Namco) |

### Other games

| Game | Year | Notes |
|---|---|---|
| Ollie King | 2003 | Skateboard controller |
| Sega Golf Club Network Pro Tour 2005 | 2004 | Joystick + buttons, network game |
| Sega Club Golf 2006 Next Tours | 2005 | Joystick + buttons, network game |
| Quest of D | 2004 | Card reader + joystick, network RPG |
| Quest of D Ver. 3.02 | 2007 | Card reader + joystick, network RPG |
| Quest of D The Battle Kingdom | 2007 | Card reader + joystick, network RPG |
| Sega Network Taisen Mahjong MJ 2 | 2005 | Mahjong panel, network game |
| Sega Network Taisen Mahjong MJ 3 | 2006 | Mahjong panel, network game |
| Sega Network Taisen Mahjong MJ 3 Evolution | 2007 | Mahjong panel, network game |
| Gundam Battle Operating Simulator | 2005 | Special cockpit controls (Banpresto) |

| Game | Year | Notes |
|---|---|---|
| Mobile Suit Gundam 0079 Card Builder | 2005 | Card reader + joystick (Banpresto) |
| Mobile Suit Gundam 0083 Card Builder | 2007 | Card reader + joystick (Banpresto) |

# Emulators

### xemu

xemu is an open-source Xbox emulator that also supports Chihiro arcade hardware. It is the only emulator available for Chihiro in Batocera.

Batocera automatically applies Chihiro-specific settings when launching games from the Chihiro system:

- Memory is set to **128 MiB** (double the standard Xbox 64 MiB)
- Flash ROM is set to **Cerbios** instead of the standard Xbox flash
- Renderer is forced to **OpenGL** due to a known Vulkan bug with Chihiro games

#### xemu configuration

| ES setting name<br>`batocera.conf` key | Description ⇒ ES option key `value` |
|---|---|
| **EMULATOR**<br>`chihiro.emulator` | Emulator to use. ⇒ `xemu` (default) |
| **RENDERING RESOLUTION**<br>`chihiro.rendering_resolution` | Internal rendering resolution multiplier. ⇒ `1x` (default) through `10x` |
| **SCALING MODE**<br>`chihiro.scaling_mode` | How the image is scaled to fit the screen. ⇒ `scale` (default), `center`, `stretch` |
| **ASPECT RATIO**<br>`chihiro.aspect_ratio` | Display aspect ratio. ⇒ `native` (default), `4:3`, `16:9` |
| **VSYNC**<br>`chihiro.vsync` | Vertical sync. ⇒ `on` (default), `off` |
| **BIOS BOOT LOGO**<br>`chihiro.skip_bios` | Show or skip the boot animation. ⇒ `show` (default), `skip` |

# Controls

Chihiro games use a wide variety of input devices. Standard gamepad mapping works for most titles.

**Lightgun games** (House of the Dead III, Virtua Cop 3, Ghost Squad) require a compatible lightgun device. See the lightgun setup guide for configuration. Virtua Cop 3 additionally uses a **foot pedal** for the bullet time feature — this can be mapped to a button.

**Racing games** (OutRun 2, Crazy Taxi, Wangan Midnight) benefit from an **analog steering wheel and pedals**, but can also be played with an analog gamepad.

**Specialized controllers** (mahjong panels, card readers, skateboard controllers) used by some

Chihiro games are difficult to emulate with standard input devices. Games requiring these controllers may not be fully playable.

# Hardware specifications

| Component | Specification |
|---|---|
| Manufacturer | Sega / Microsoft |
| Year | 2002 |
| CPU | Intel Pentium III @ 733 MHz |
| GPU | NVIDIA NV2A (GeForce 3-class) @ 200 MHz |
| RAM | 128 MB DDR (shared, 2× Xbox) |
| Extended RAM | Up to 512 MB or 1 GB (DIMM board) |
| Sound | MCPX AC'97 + Motorola DSP56362 coprocessor |
| Media | GD-ROM (loaded entirely into DIMM RAM) |
| Display | 640×480 VGA @ 60 Hz |
| Polygon performance | 125 million polygons/sec |
| I/O | JVS (Japan Video Standard) |
| Based on | Microsoft Xbox |

#### Board variants

- **Type 1** — Uses a removable NAOMI-style DIMM board. Less common.
- **Type 3** — Integrated DIMM board in a compact cube form factor, 512 MB or 1 GB RAM. Most common variant. Some early games (Crazy Taxi High Roller, House of the Dead III) are reportedly incompatible with Type 3 hardware.

Games are copied entirely from GD-ROM into DIMM RAM before execution, eliminating disc loading times during gameplay.

# Troubleshooting

#### "BIOS file not found" error

Make sure both BIOS files are present in `/userdata/bios/`:

- `mcpx_1.0.bin`
- `cerbios.bin`

You can verify BIOS files via the Batocera menu: *System Settings* → *Missing BIOS*.

#### Game doesn't boot or shows black screen

- Verify your `.iso` file is a valid XISO-format image. Standard ISO-9660 images will not work.
- Ensure the file is a Chihiro-patched version, not a raw GD-ROM dump.
- Try toggling *BIOS Boot Logo* to `skip` in the per-game settings.

### Graphical glitches

Batocera forces OpenGL for Chihiro due to a known Vulkan bug. If you experience graphical issues, ensure no manual override is set in `batocera.conf`:

```
# Remove or comment out this line if present:
# chihiro.gfxbackend=vulkan
```

### No sound

Audio emulation in xemu for Chihiro games may be incomplete. Some games may have missing or distorted audio. This is a known limitation of the emulator.

### Performance is poor

Chihiro emulation is demanding. Ensure you are running on an **x86_64** system with:

- A modern multi-core CPU (Intel Core i5/i7 or AMD Ryzen recommended)
- A dedicated GPU with OpenGL 4.0+ support
- At least 4 GB system RAM

### Why can't I use MAME for Chihiro?

The MAME Chihiro driver (`chihiro.cpp`) has **preliminary** status for all games — no game is playable, sound is completely unemulated, and 3D rendering is non-functional. This is due to the extreme complexity of emulating the Xbox-derived hardware (NV2A GPU, MCPX APU, modified Xbox kernel). Batocera uses xemu instead, which provides significantly better compatibility through its Xbox-focused emulation approach.

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