

The Cruciball User Manual

Documentation Version: 1.0.0

Created By: Timothy Letkeman

More information at:

<https://cruciball.com>

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1. Description:

The Cruciball is a physically controlled action roguelike played by **throwing balls at enemies that are projected onto a wall in the real world!** You journey across many magical stages and unique environments, collecting powerful upgrades to suit your play style. Use your strength and upgrades to defeat challenging and unique boss fights! You'll solve puzzles and unlock secret stages where peril and prize await. Grow your strength with powerful upgrades, refine yourself in The Cruciball, and save your pet from the nefarious Warlock!

Requires a projector and 2 web cameras. The Cruciball is controlled by physically

throwing balls in the real world at targets that are projected onto a wall using the projector. The thrown balls are then tracked by the cameras to create 'hits' in game.

Features:

- 9 unique stages to explore, all with their own special challenges, enemies, and boss fights to face.
- 11 exhilarating boss fights, and over 30 different enemies to defeat.
- Over 40 unique and powerful upgrades to obtain, collect and stack them together to suit your play style and achieve ultimate power!
- A fun, exciting, and challenging way to exercise and improve your health.
- Balanced for both singleplayer and multiplayer.
- Cooperative and competitive multiplayer modes.
- Just as fun for kids birthday parties as it is for elite athletes looking to improve their skills!
- An innovative physical "beyond virtual reality" game-play experience.

Read more about The Cruciball at: <https://cruciball.com/>

2. Equipment Needed:

The Cruciball has a unique method of player input and immersion. The Cruciball is controlled by physically throwing balls in the real world at targets that are projected onto a wall using the projector. The thrown balls are then tracked by the cameras to create 'hits' in game.

To fully experience The Cruciball, you will need to connect a projector as an additional display. You will also require 2 high-speed webcams. The Cruciball detects ball throws by using that pair of cameras. The game has built-in ball tracking to convert ball throws to in-game hits. The game is very adaptable to any kind of set-up, screen, or room size you have.

To request an installation of "The Cruciball" either dedicated or portable for under \$5,000 CAD, contact us at: <https://cruciball.com/contact> or email tiggy02@gmail.com

If you wish to create a full DIY set-up, these are the 4 primary requirements you need to fulfill:

- Computer
 - A laptop or a computer that can run The Cruciball software.
 - Recommended CPU, any processor made in the last 10 years.

- Recommended GPU, at least an RTX 1060 or better.
- Recommended to be setup within 40 feet of the play area, for easier cable running and better data transmission.
- Ideally should be out of the playable arena, to prevent damage by throws gone awry.
- Projector
 - Ideally should be ceiling mounted in a protected cage.
 - At least 3000 lumens for bright projection.
 - Low latency highly recommended (< 20ms).
 - 1080p recommended.
- 2 Webcams
 - Ideally should be wall-recessed or wall-mounted.
 - 120 frames per second highly recommended (at < 90fps a lot of accuracy is lost for fast moving balls).
 - 720p recommended.
- Wall Surface
 - Should be blank/white for a clear projection.
 - Must be able to withstand balls being thrown at it.

2.1. Dedicated Installation:

For a dedicated installation, when done officially by “The Cruciball” developers. We will first meet with you to discuss if The Cruciball would be right for you, and how exactly it could benefit your business. After that we will take a more detailed look at the spaces available in your venue, and make some recommendations at options for setup, mounting, projection, etc..

After a location for the game is decided, and all the details are determined, we will begin mounting the projector and cameras in a safe location. The projector will ideally be ceiling mounted (to prevent it blocking the game, or having the projection blocked by players), the projector will also be enclosed in a small protective cage, to avoid stray throws damaging it. The cameras will ideally be wall-recessed or wall-mounted. The cameras will be attached to custom

camera mounts, and pointed at the screen, ready to capture ball throws.

A computer will be setup in a nearby control room, the projector and cameras will both have cables ran to this computer. The cables will either be ran through the corners of the room, under cable ramps, or through the roof where applicable. The goal with cable running is to minimize the chance of the cables getting disturbed, damaged, or becoming a tripping hazard.

Once the computer, projector, and cameras are all mounted and connected, then there will be a very quick calibration process. The game will be fully playable now! It should also require little to no maintenance, aside from replacing the odd ball. Depending on the camera mounting set-up, there may be a possibility of a camera getting slightly moved, knocked, or jostled out of position. If this happens, it may require an associate to re-calibrate that camera. This is very quick and easy, it can be done in under 10 seconds, and it can also be done without stopping the game or disturbing the players.

Generally, a dedicated setup is recommended over a portable setup. However in certain situations such as mobile birthday parties, conference or convention events, or carting the game from class-room to class-room in a school; a portable setup may be recommend. Contact us now for a professional opinion on what is right for you: <https://cruciball.com/contact.html>

2.2. Portable Setup:

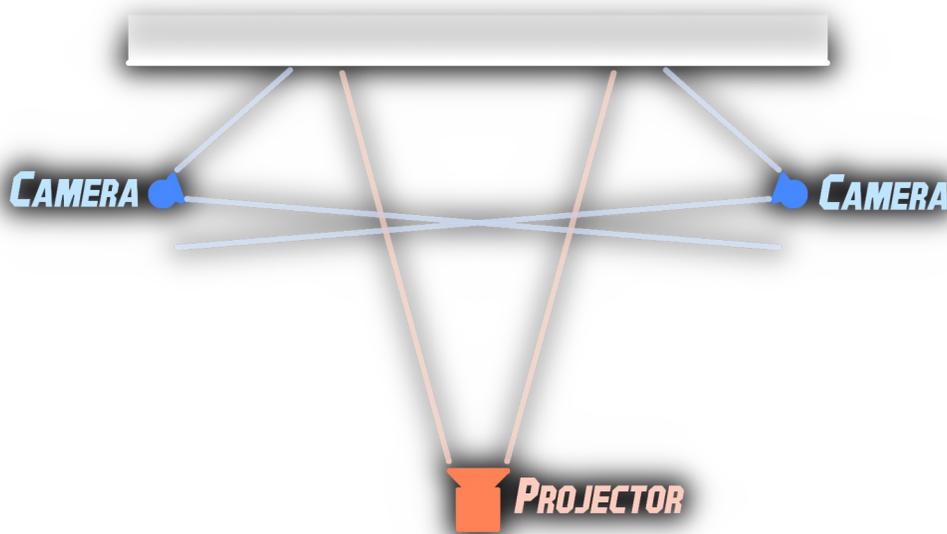
A portable setup of The Cruciball has the advantage that you can pick up and move The Cruciball anywhere. It takes approximately 20-30 minutes for a single person to setup and The Cruciball for use. However, a portable installation of The Cruciball has some disadvantages as well. Due to the projector being bound to the ground, it will be an obstacle that the players need to move around, and if players stand in front of the projector then they will block the projection and their view of the game. It is also more likely that the projectors and cameras may be moved or de-calibrated while playing. As such, it is necessary to constantly have an attendant to supervise the game and re-calibrate it if nessesary.

For a portable setup, the projector will be on the ground, either on a cart or protective box depending on your needs. The cameras will be placed on tripods on the sides of the arena. The laptop used for running the game software will be placed a safe distance outside of the play arena. Once the laptop, projector, and cameras and connected; then it can be calibrated and played the same as a dedicated installation. For more information on what kind of setup is right for you, contact us at: <https://cruciball.com/contact.html>

3. Getting Started:

3.1. Connecting Equipment:

To begin playing The Cruciball, you will first have to setup and connect all of the equipment. Refer to the previous section on equipment for how to mount and position your equipment. To connect everything together, you will need to connect the projector to your laptop using a video cable of some sort (HDMI, Display Port, etc.); you will also need to connect your web-cams to the laptop using USB 3.0 cables. The projector and laptop will also need to be connected to power, the cameras are powered via the USB connection.



For cables, you will require at least:

- 1 video cable (HDMI, Display Port, etc.), the exact type is dependant on your projector.
- 2 USB 3.0 cables. If you need longer cables and need to daisy-chain cables end-to-end. Then ensure you are using “active” or “booster” USB 3.0 so there is no data or signal loss.
- Laptop/computer power cable and adapter.
- Projector power cable.

3.2. First Time Setup and Calibration:

Once all of your equipment is setup and connected. You can begin with the quick and easy setup.

1. Upon loading the game, select “Full Experience” in the initial setup menus. This will start the game with the projector as the game display, and enable the ball tracking and calibration console.
2. On the left side of the screen is the camera and analysis for one camera, and the right side of the screen is for the other camera. Click the numbered buttons at the bottom to select the correct camera for each display. Thrown balls should travel in the same direction as the green arrows at the top of the console.
3. Once the correct camera indexes are selected, then you can setup the display projection. Press “C” on the keyboard to enable the calibration aids, then drag the 4 circle symbols on each camera display to the corner of the corresponding calibration aid. This instructs the game with where the projection is located on the game, and enables the pixel-perfect throw tracking built into the game. This calibration step may need to be redone if the cameras are moved during the game. Re-calibrating and toggling the calibration aids can be done without disrupting the game or it’s players.

4. Game-play:

4.1. Main Menu:

The main menu is how you navigate through the game modes of The Cruciball. The menu (like all menus in The Cruciball) can be interacted with either by throwing a ball at the target menu widget, or by clicking on it with a mouse.

4.2. Adventure Mode:

Adventure mode is the primary mode of The Cruciball. In Adventure mode, players will fight through 9 unique stages and 12 challenging boss fights to beat the game, defeat the Warlock, and save their pet! It has 30+ enemies with unique problems to tackle, 10 mini-games to play and earn rewards from, and over 40 unique upgrades for you to choose and grow more powerful with.

Adventure mode also has two difficult options, Hardcore mode and Assist mode.

In hardcore mode, you have 3 max health compared to the normal 10 max health. Health related upgrades are also generally less powerful and enemies are more plentiful. However, you also get a 2x score multiplier. Making Hardcore mode almost a necessity for high-

score attempts.

In assist mode, bosses are much easier and power-ups are far more plentiful. Making this an ideal choice for very young children or less athletically inclined individuals. However, you also get a 0.5x score multiplier. Making Assist mode a good choice for experiencing all of the game, but an unlikely candidate for high-score attempts.

4.3. Versus Arena Mode:

In versus arena mode, the screen is split down the middle, creating a “left team” and a “right team”. One team selects a stage to play, then both teams need to survive as long as they can. The last team left alive wins. Both teams are essentially playing a level of the adventure mode, and the last one standing wins. This is a great option for players seeking some competitive fun instead of a cooperative experience.

4.4. Boss Trial Mode:

Boss trial mode allows you to experience each of the boss fights individually. It also times you and allows you to compete for highscores and fastest-times individually for each boss. You can use this mode to hone your skills or go for new records.

4.5. Minigames Mode:

Minigames mode allows you to individually play through all the minigames that are available in the Adventure mode. There are 5 luck-based mini-games and 5 skill-based mini-games. You can individually play these and then compete against friends for highest scores or fastest times.

5. Trouble-shooting:

5.1. Hits being offset or misaligned?:

This is likely due to the cameras needing to be re-calibrated. To re-calibrate, press “C” on the keyboard to enable the calibration aids, then drag the 4 circle symbols on each camera display to the corner of the corresponding calibration aid. This instructs the game with where the projection is located on the game, and enables the pixel-perfect throw tracking built into the game. This calibration step may need to be redone if the cameras are moved during the game. Re-calibrating and toggling the calibration aids can be done without disrupting the game or it’s players.

5.2. Hits not being registered?:

This could be due to a variety of things. You might need a bit more light in the room, or may need to choose a ball colour that stands out against the background a bit more. The cameras work optically, and if the balls are hard to differentiate against the background, it will be more difficult to track and register hits. If you continue to have issues with this, contact the developer at <https://cruciball.com/contact.html>. They will analyze the environment and some test-videos from the camera and create a custom lighting profile unique to you, that will give you vastly improve hit registration.

5.3. Cameras getting disconnected?:

This is likely due to cables getting disconnected or improper/cables. Ensure you are using USB 3.0 cables (2.0 is not sufficient). Also be careful about daisy chaining USB cables, the data transmission might lose signal across that distance; if you do need to daisy chain cables, use “active” or “booster” USB cables to boost the signal so there is no data loss.

5.4. Camera display freezing?:

This is likely due to data loss in the cameras causing the game to loose signal. Follow the same instructions as 5.3 and use USB 3.0 cables for the cameras. If you continue to have issues, report them to the developer.

6. Contact Information:

If you have any questions or inquires please contact us at: <https://cruciball.com/contact.html>

6.1. How to Purchase The Cruciball:

In order to request a quote to purchase a Cruciball setup, fill out the contact form at: <https://cruciball.com/contact.html>

We will get back to you shortly, ask you some questions about your location and desired setup. We would then compile a quote for you to buy the equipment and software for The

Cruciball. Upon payment and delivery, we would help you set it up at your location. If you ever have any questions or concerns about The Cruciball, feel free to contact us for support.

7. Credits:

The Cruciball is solo developed by Timothy Letkeman.

<https://tigpan.com>

Financially supported by Creative Saskatchewan.

Music by Ben Counsell. <https://music.youtube.com/channel/UCigpp1wyMJMm7P0sNv3nOgg>

Environment Art by Emily Letkeman.

Some game icons from <https://game-icons.net>

