Twin Stick Multi-Platform Videogame Controller

Background

Battlezone is a 1980 Atari arcade game where players control a tank from a first-person perspective, battling enemy tanks and other threats in a 3D wireframe environment. The game is notable for its innovative use of 3D vector graphics and its influence on the first-person shooter genre.

Players navigate a landscape that includes an erupting volcano and various geometric obstacles, using a radar to locate and destroy enemies while avoiding their counterfire.

Battlezone remains one of my favourite arcade games since the first time I played it on a full-size upright machine complete with its periscope back in 1980.

Roll forward to today, where I mostly enjoy playing the game on my Vectrex in all its vector glory, or on my PC via MAME. Wanting to create a more arcade feel I set to work and created the controller you now own! The bonus is that it not only works on the Vectrex but also PC and more!

I hope you enjoy it as much as I do!

Sean

What Does It Work With?

The controller supports a variety of selectable modes which allow it to work with Vectrex, PC USB and Atari DB9 joystick ports.

It has been tested with a variety of systems and Battlezone implementations:

- Vectrex
    - Battlezone - PiTrex
    - Battlezone - VecFever
    - Stramash Zone
    - BZ Duel (awaiting public release as of early July 2025)
- PC USB
    - Battlezone - MAME
    - Battlezone II by Peter Hirschberg
- Commodore 64
    - Battlezone

It should also work on Battlezone and Activision's Robot Tanks on the Atari 2600 and any other system that utilises the Atari DB9 joystick port pinout.

It may also be possible to add additional support through future firmware updates for other twin (2-way) stick games.

Mode Selection

When the controller is first powered up it starts in Vectrex (PiTrex/Stramash Zone) mode.

To the left of the joysticks is a black button. Press this button to cycle through the modes. As of July 2025, there are 6 primary modes:

PiTrex / Stramash Zone

VecFever
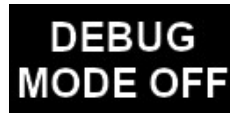

PC USB Joystick

PC USB Keyboard

Atari Joystick

Battlezone Duel

Special Modes

Holding the mode button for around 6 seconds enters debug mode. This mode displays various debugging information on the built-in screen.

Once in debug mode, holding the mode button for around 6 seconds will exit debugging mode.

If you hold the mode button for around 11 seconds the controller enters update mode. The display may cycle through other modes during this period. This is normal and can be ignored.

This, if the controller is connected to a PC via USB, presents the controller as a drive on the PC to allow the uploading of new firmware if any is released. Once new firmware has been uploaded the controller will automatically restart

Modes

RCS/SCE	Support
PiTrex / Stramash	Battlezone - PiTrex (start button mapped to game start) Stramash Zone (start button acts as fire in this game)
VecFever	Battlezone - VecFever
PC Joystick	Presents as a joystick on PC with fire mapping to joystick button 0 and start button mapping to joystick button 1
PC Keyboard	Presents as a keyboard on PC using the arrow keys mapped for movement and left CTRL key for fire. Start button generates press of '1'
Atari	Atari DB9 joystick mode with one fire button. Start button unmapped in this mode
Duel	Special mode for Battlezone Duel

New firmware, if released, will be available from the **retrocontrollers.com** website and GitHub repository.

Additional Technical Information

If you're looking for technical information about how the joysticks present in the various configuration modes, you can find this on our GitHub repository at:

https://github.com/retrocontrollers/vector_tankage

Useful References

PiTrex (The hardware)	https://www.ombertech.com/gaming.htm
Baremetal (the software that runs on PiTrex)	http://vide.malban.de/pitrex
Stramash Zone (expected re-release late 2025)	http://www.clockworkrobot.com/shop/
VecFever (out of production)	https://www.vecfever.com/
MAME – Multi Arcade Machine Emulator	https://www.mamedev.org/

Controlling Your Tank
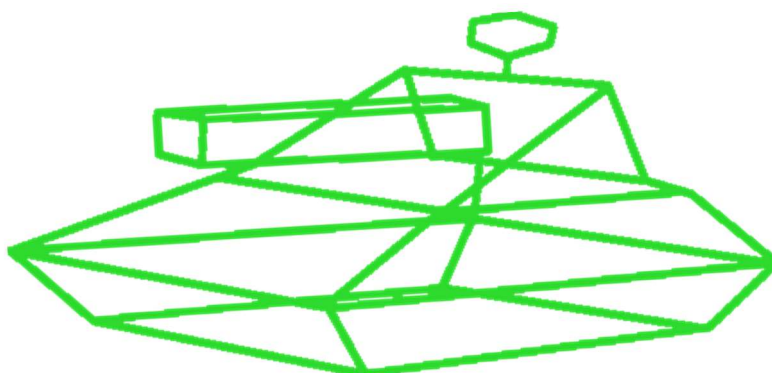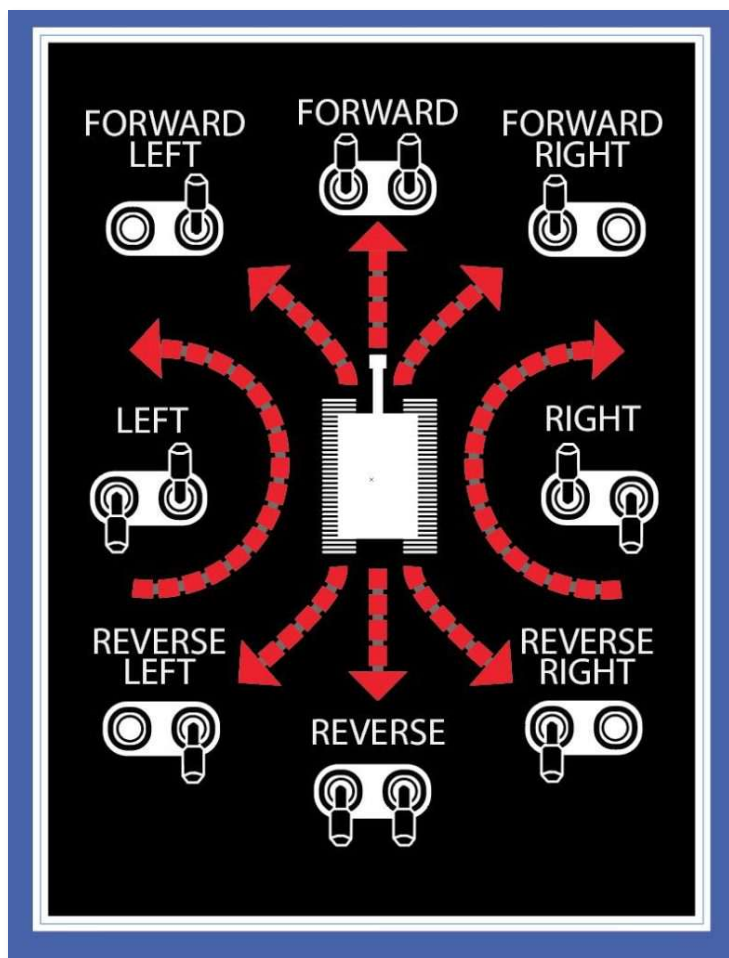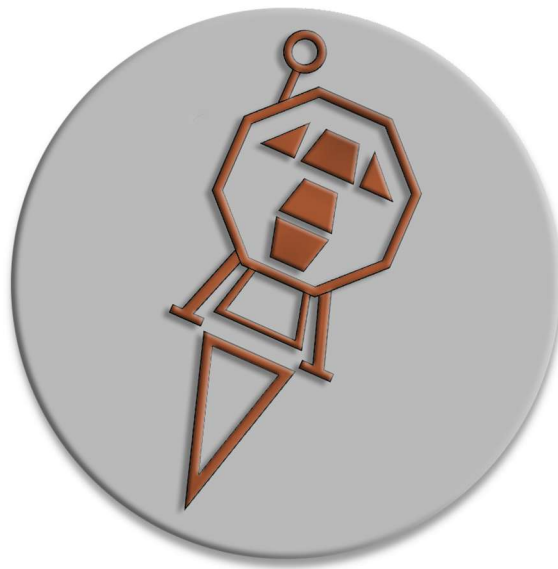
Happy Zapping!

Important Note

This controller is hobbyist designed, and hand assembled. Therefore, consider it a prototype with no warranty and likely some design flaws. Whilst effort has been made to ensure that it will provide enjoyment over a long period of time there are no guarantees!

Lastly, if you have any ideas for improvements to this controller or other controller ideas I'd love to hear from you! Just drop me an email – vectrex@retrocontrollers.com