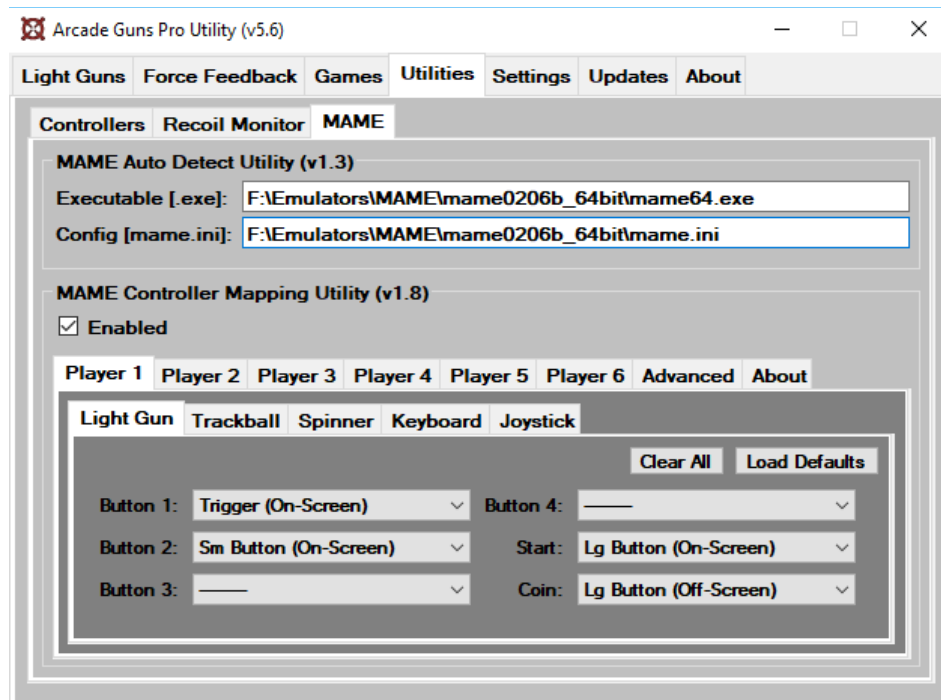


MAME Controller Mapping Utility (Draft Version 1.0)

MAME supports using custom controller files (ctrlr files). Our MAME Controller Mapping Utility uses this MAME feature to map your light guns and other controls to up to six players in MAME. We have a User Interface (UI) that allows you to easily setup all of your Light Guns, Trackballs, Spinners, Joysticks and Keyboard in MAME.



Our MAME Controller Mapping Utility is part of our Arcade Guns Pro Utility software package. With our MAME Controller Mapping Utility, as seen in the lower part of the image above, you can map your controllers to a specific player. That player will always be mapped to the controllers you specify, no matter what. Controllers can be added/removed/moved/restarted and your player -> controller mapping will not change.

There is also a separate utility called MAME Auto Detect, as seen in upper part of the image above. This utility detects when a MAME games is launched and automatically locates where your MAME executable and mame.ini config files are located on your PC. The mame.ini file path is used by the MAME Controller Mapping Utility. When you enable the MAME Controller Mapping Utility it will update your mame.ini file with settings that are required for the mapping to work. Look near the end of this manual for the complete list of changes to your mame.ini file that this utility makes.

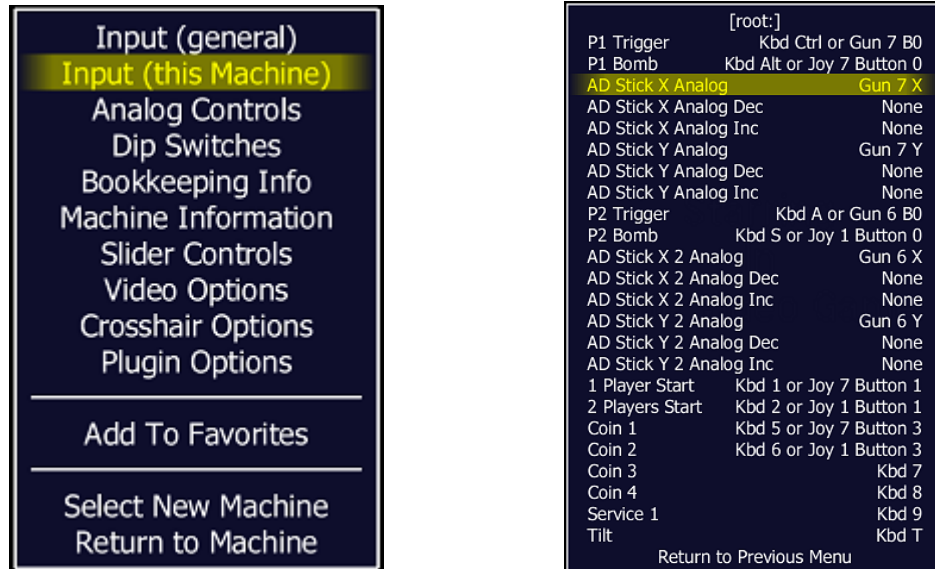
There is no denying that MAME is a great Emulator with just about every possible input option for any type of controller you would possibly want to use. However, MAME also has issues with keeping your player -> controller mapping from getting messed up. Rebooting your PC, removing a controller, changing USB ports or adding new controllers can and most likely will mess up your player -> controller mappings. It can be extremely painful to have to redo your controller settings after you have already set everything up perfectly. That is where our MAME Controller Mapping Utility comes in. This utility constantly monitors your Mice and Joysticks for changes (added, removed, moved, reboot) in the Windows OS, then in real-time updates our custom Arcade Guns ctrlr mapping file to correctly remap all of your controllers to the correct players in MAME.

I know that sounds pretty technical. What you really want to know is how do I enable this utility and use it to setup all of my controllers in MAME. Well, it just so happens that the Utility comes with a really easy to use UI. We will go through each type of controller (Light Guns, Trackballs, Spinners, Joysticks and Keyboard) and how to setup these controllers to specific Players in MAME.

Caveats

There are some caveats that should be mentioned prior to using this Utility. This utility works best with fresh copy of MAME that hasn't already been configured with controller mappings from within MAME. When you map controls within MAME, rather than using this Utility UI, the mappings performed within MAME will override settings in this utility UI. This might not sound like a big deal, but if your controller mappings change due to rebooting your PC or adding/removing or moving a controller to another USB port, then your changes within MAME will be wrong and our MAME Controller Mapping Utility won't be able to fix it. This is because your changes that you made within MAME override the controller mapping in this Utility UI. You won't see your overridden changes in our UI, but they will be silently overriding what you have set in our UI.

If you changed controller mapping within MAME, it would be in the Input (general) or Input (this Machine) menu. You would have then mapped the controls for each directional movement and each button, as seen below:



You can verify the controller mappings that you have already made in the MAME input menu, or by looking in your cfg directory:

PC > Emulation (F:) > Emulators > MAME > mame0206b_64bit > cfg				
Name	^	Date modified	Type	Size
_empty.cfg		2/16/2019 11:40 AM	CFG File	1 KB
88games.cfg		2/15/2019 11:04 AM	CFG File	1 KB
default.cfg		2/17/2019 9:41 AM	CFG File	1 KB
hotd.cfg		2/16/2019 11:43 AM	CFG File	1 KB
term2.cfg		2/17/2019 9:41 AM	CFG File	1 KB

When you launch games for the first time, they will show up in this directory. You can open each of the files and see if game specific mappings have been made. After we played Terminator 2 for the first time, a term2.cfg file was created in this directory. Having a file there doesn't immediately mean that you have made controller changes. You can verify by opening the game .cfg files. If no controller mappings have been made to a game, it will look something like this.

```
<?xml version="1.0"?>
<!-- This file is autogenerated; comments and unknown tags will be stripped -->
<mameconfig version="10">
  <system name="term2" />
</mameconfig>
```

If you have made controller mapping changes within MAME it will look something like this. We made some of the controller mappings for this example. These controller mappings in the term2.cfg file, as seen below, will override the controller mappings in our MAME Controller Mapping Utility. This will cause problems because our MAME Controller Mapping Utility won't be setting the controls for

Page | 2 [Copyright © 2019 Harbo Entertainment LLC]

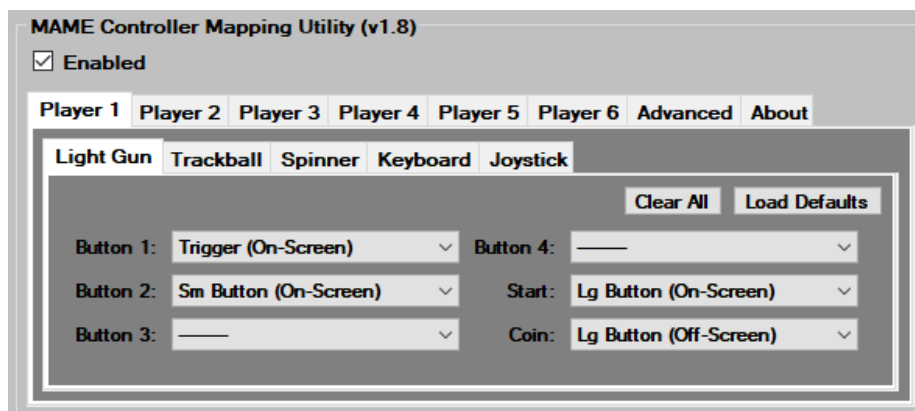
Terminator 2. Instead, Terminator 2 will be using the controller mappings that were made within MAME. It might work at first, but if your controllers change unexpectedly, it won't work later on. You might be scratching your head as to why it suddenly stopped working.

```
<?xml version="1.0"?>
<!-- This file is autogenerated; comments and unknown tags will be stripped -->
<mameconfig version="10">
  <system name="term2">
    <input>
      <port tag=":IN0" type="P2_BUTTON1" mask="4096" defvalue="4096">
        <newseq type="standard">
          JOYCODE_7_BUTTON5
        </newseq>
      </port>
      <port tag=":IN0" type="P2_BUTTON2" mask="8192" defvalue="8192">
        <newseq type="standard">
          JOYCODE_7_BUTTON1
        </newseq>
      </port>
      <port tag=":IN1" type="COIN1" mask="1" defvalue="1">
        <newseq type="standard">
          JOYCODE_7_BUTTON4
        </newseq>
      </port>
      <port tag=":IN1" type="START1" mask="4" defvalue="4">
        <newseq type="standard">
          JOYCODE_7_BUTTON2
        </newseq>
      </port>
    </input>
  </system>
</mameconfig>
```

If you really need to make game specific controller mapping changes in MAME, you can make certain controller mapping changes within a MAME game without issues. Namely, games that use Keyboard Input won't have any major side effects when changes are made within MAME. The reason for this is because Keyboards don't have problems like other controllers have in MAME. Keyboards don't get messed up in MAME like other controllers do. If you have a game like Mortal Kombat for example, you can change the button mappings for that specific game from within MAME to fix the single Block button to be mapped to two buttons. You are essentially overriding the utilities keyboard mappings, but only for that one game. Other games will still use the controller mappings in our MAME Controller Mapping Utility.

Light Guns

Light Guns are the easiest controllers to configure in this Utility. Your light guns will be setup automatically in MAME when this utility is enabled. Notice the Enabled Checkbox is checked. There is really nothing more you need to change. However there are some settings that can be changed for light guns along with other things you should know, so here it is.



- Button 1: Trigger (On-Screen)

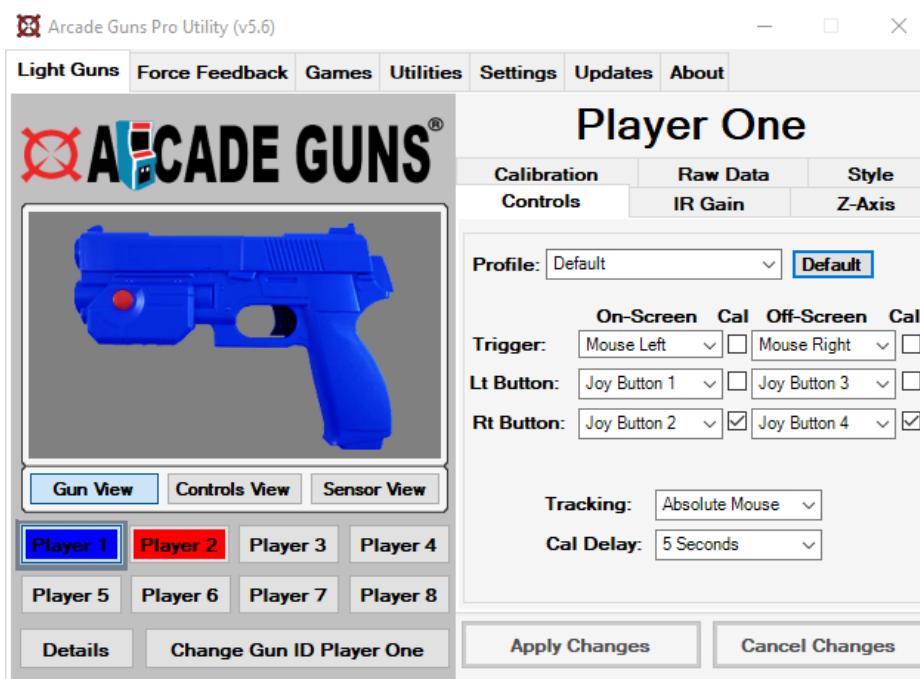
- For gun games, “Button 1” performs a Trigger Shoot. Note: When shooting Off-Screen, this setting will also do a gun reload, but you don’t have to set Trigger (Off-Screen) in this utility because MAME does this for you automatically.
- Button 2 : Small or Left Button (On-Screen)
 - This is an alternate button for light gun games that supports an extra button.
 - Some games might use this for reload. There are a few games that don’t support off screen reload. If that is the case, then this button will do a reload.
 - This button also works as a grenade or rocket launcher depending on the game being played.
 - Some games don’t use this button at all.
- Start : Large or Right Button (On-Screen)
 - When you are playing a gun game, you can point the gun at the screen and press this button. It will start the game, assuming you have added credits already or configured MAME for free play.
- Coin : Large or Right Button (Off-Screen)
 - If you point the gun off-screen and press this button, it will add credits to the game you are playing.

Light Gun Mapping works with Players 1 – 3. There are no light gun arcade games that ever supported more than 3 guns and all of the light gun games in MAME have a maximum of 3 players. If there ever changes we will update this utility to allow additional players to be added, but as of this writing, 3 light gun players is the max.

If you ever make a mistake or change settings, you can click the “Load Defaults” button to revert back to our original settings for the player tab you have selected. In the picture above, Player 1 Light Gun is selected.

This utility currently only works with Aimtrak Type Light Guns (Ultimarc Aimtrak Light Guns and Arcade Guns v1/v2 Light Guns) as of this writing. We do plan to add other types of light guns that can be used at a later date.

There are some additional thing needs to be mentioned about Light Gun Mapping. Our Arcade Guns Pro Utility knows what your light gun settings are because your light gun configuration settings are shown in the “Light Guns” tab, as seen in the image below:



You can configure your light guns in the “Controls” tab, shown in the image above, and the MAME Controller Mapping Utility will map these setting and everything will work correctly. However, there are a couple of cases where this isn’t completely true.

Case 1:

If you disable a button in the Controls tab, it won’t be set to anything. Disabling a button on the gun will have ----- assigned to that button, as seen in the image below. This means that the gun button isn’t a Mouse button or Joy button. If the button is set to nothing, then the MAME Controller Mapping Utility can’t map it to anything.

	On-Screen	Cal	Off-Screen	Cal
Trigger:	Mouse Left	<input type="checkbox"/>	Mouse Right	<input type="checkbox"/>
Lt Button:	-----	<input type="checkbox"/>	-----	<input type="checkbox"/>
Rt Button:	-----	<input checked="" type="checkbox"/>	-----	<input checked="" type="checkbox"/>

Case 2:

If you configure your gun's tracking as Joystick, then you may need to make one additional change to your mame.ini config file so that your guns track correctly. Setting the Tracking to Joystick can be seen in the image blow.

	On-Screen	Cal	Off-Screen	Cal
Trigger:	Joy Button 5	<input type="checkbox"/>	Joy Button 5	<input type="checkbox"/>
Lt Button:	Joy Button 1	<input type="checkbox"/>	Joy Button 3	<input type="checkbox"/>
Rt Button:	Joy Button 2	<input checked="" type="checkbox"/>	Joy Button 4	<input checked="" type="checkbox"/>

Tracking:	Joystick
Cal Delay:	5 Seconds

If the light gun is set to Joystick Tracking mode, you will need to update your mame.ini config file with the following setting:

```
joystick_deadzone    0.0
```

When using a light gun in Joystick tracking mode, not having the deadzone set to 0.0 makes the tracking lock to the center of the screen when you are aiming the gun near the center of the screen. This will causes the gun's tracking to behave poorly and not work like a light gun should.

However, when using a real joystick controller in MAME, like an Xbox controller, the deadzone should be set to 0.3 (that is the default value). When the deadzone is set to 0.3, for example, it makes your Xbox Controller's movement lock near the center of the screen within the deadzone value selected (0.3). This is desired for an Xbox Controllers. Setting the deadzone to 0.0 isn't good for an Xbox Controller because when you aren't moving the analog stick, it might stray from the center of the screen. This might cause movement in the game you are playing even when you are not moving the analog stick on the Xbox Controller.

Unfortunately, there is only one joystick_deadzone setting allowed for all joystick controllers in MAME. In general, we recommend configuring your guns in Mouse Tracking mode, rather than Joystick tracking mode, to avoid possible issues with other joysticks you plan on using with MAME.

How Light Gun Controller Mapping Works:

Beast Busters

A game like Beast Busters has a trigger and 1 additional button that can be mapped to controls. Beast Busters is one of a few gun games that supports up to 3 light guns. Beast Busters uses Light Gun X,Y Analog input, which is basically Mouse Input. There are 2 different types of light gun games in MAME. Some games will map light guns as a Light Gun X,Y Analog. Other games will map light guns as AD Stick X,Y Analog. Both will work basically the same way.



In this example, the Light Gun buttons are mapped in MAME Controller Mapping Utility for Player 1 as:

Button 1 => Trigger (On-Screen)

Button 2 => Small/Left Button (On-Screen)

Start and Coin are also mapped, but for this example they will be ignored.

Player 1	Player 2	Player 3	Player 4	Player 5	Player 6	Advanced	About
<div> <div>Light Gun</div> <div>Trackball</div> <div>Spinner</div> <div>Keyboard</div> <div>Joystick</div> </div> <div> <div>Clear All</div> <div>Load Defaults</div> </div> <div> <div>Button 1: Trigger (On-Screen) ▾</div> <div>Button 4: — ▾</div> <div>Button 2: Sm Button (On-Screen) ▾</div> <div>Start: Lg Button (On-Screen) ▾</div> <div>Button 3: — ▾</div> <div>Coin: Lg Button (Off-Screen) ▾</div> </div>							

The Gun Controls for Player 1 are configured as:

Trigger (On-Screen) => Mouse Left

Small or Left Button (On-Screen) => Joystick Button 1

Controls

Profile: Default ▾

Default

On-Screen

Cal

Off-Screen

Cal

Trigger: Mouse Left ▾

☐

Mouse Right ▾

☐

Lt Button: Joy Button 1 ▾

☐

Joy Button 3 ▾

☐

Rt Button: Joy Button 2 ▾

☒

Joy Button 4 ▾

☒

Tracking: Absolute Mouse ▾

Cal Delay: 5 Seconds ▾

So basically,

Tracking => Absolute Mouse X,Y

Button 1 => Mouse Left

Button 2 => Joystick Button 1

Now let's look at what was mapped by our MAME Controller Mapping Utility in MAME for Beast Busters.

Tracking X => Lightgun X Analog => Gun 7 X

Tracking Y => Lightgun Y Analog => Gun 7 Y

Button 1 => P1 Fire => Gun 7 B0

Button 2 => P1 Grenade => Joy 7 Button 0

[root:]		
P1 Fire	Kbd Ctrl or Gun 7 B0 or Mouse 1 B0	
P1 Grenade	Kbd Alt or Joy 7 Button 0 or Mouse 1 B1	
Lightgun X Analog	Gun 7 X	
Lightgun X Analog Dec	None	
Lightgun X Analog Inc	None	
Lightgun Y Analog	Gun 7 Y	
Lightgun Y Analog Dec	None	
Lightgun Y Analog Inc	None	
P2 Fire	Kbd A or Gun 6 B0	
P2 Grenade	Kbd S or Joy 1 Button 0	
Lightgun X 2 Analog	Gun 6 X	
Lightgun X 2 Analog Dec	None	
Lightgun X 2 Analog Inc	None	
Lightgun Y 2 Analog	Gun 6 Y	
Lightgun Y 2 Analog Dec	None	
Lightgun Y 2 Analog Inc	None	
P3 Fire	Kbd T	
P3 Grenade	Kbd Y	
Lightgun X 3 Analog	None	
Lightgun X 3 Analog Dec	None	
Lightgun X 3 Analog Inc	None	
Lightgun Y 3 Analog	None	
Lightgun Y 3 Analog Dec	None	
Lightgun Y 3 Analog Inc	None	
1 Player Start	Kbd 1 or Joy 7 Button 1	
2 Players Start	Kbd 2 or Joy 1 Button 1	
3 Players Start	Kbd 3	

The Mapping goes like this:

Tracking X => Lightgun X Analog => Gun 7 X

- "Lightgun X"
 - In MAME, Gun X tracking is Mouse X horizontal movement.

Tracking Y => Lightgun Y Analog => Gun 7 Y

- "Lightgun Y"
 - In MAME, Gun Y tracking is Mouse Y vertical movement.

Button 1 => P1 Fire => Gun 7 B0 => Left Mouse Button

- "Gun"
 - In MAME, a Gun button is a Mouse button.
- "7"
 - In MAME, 7 means Mouse #7.
 - The number 7 is a unique identifier in MAME. It's a unique for each mouse connected to your PC, but the #7 can change randomly each time you start MAME, so it doesn't really mean anything. It won't necessarily be 7 when you do your own mappings.
- "B0"
 - In MAME, B0 means Left Mouse button.
- Put it all together "Gun 7 B0"

- Left Mouse Button for Mouse #7

Button 2 => P1 Grenade => Joy 7 Button 0 => Joystick Button 1

- “Joy”
 - In MAME, Joy is a Joystick
- “7”
 - In MAME, 7 means Joystick #7.
 - The number 7 is a unique identifier in MAME. It’s a unique for each joystick connected to your PC, but the #7 can change randomly each time you start MAME, so it doesn’t really mean anything. It won’t necessarily be 7 when you do your own mappings.
- “Button 0”
 - In MAME, Button 0 means Joystick Button 1.
 - MAME numbers things starting from 0.
 - Out Utility numbers things starting from 1.
- Put it all together “Joy 7 Button 0”
 - Joystick Button 1 for Joystick #7

Beast Busters also has recoil outputs. This is a great game to use with our Aim-Force One recoil guns. This game will control the rate of recoil for each gun (players 1-3), just like the original arcade version did.

Terminator 2



Terminator 2 maps directional analog controls as “AD Stick X Analog” and “AD Stick Y Analog”. This will be done automatically for you when using our MAME Controller Mapping Utility, as seen in the image below.

Tracking X => AD Stick X Analog => Gun 6 X means Mouse X horizontal movement.

Tracking Y => AD Stick Y Analog => Gun 6 Y means Mouse Y vertical movement.

Button 1 => P1 Trigger => Gun 6 B0 => B0 means Left Mouse Button

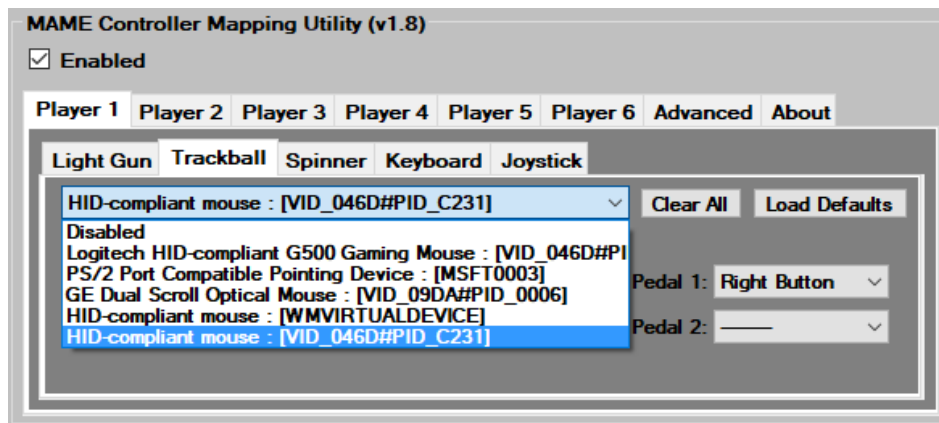
Button 2 => P1 Bomb => Gun 6 B1 => B1 means Right Mouse Button



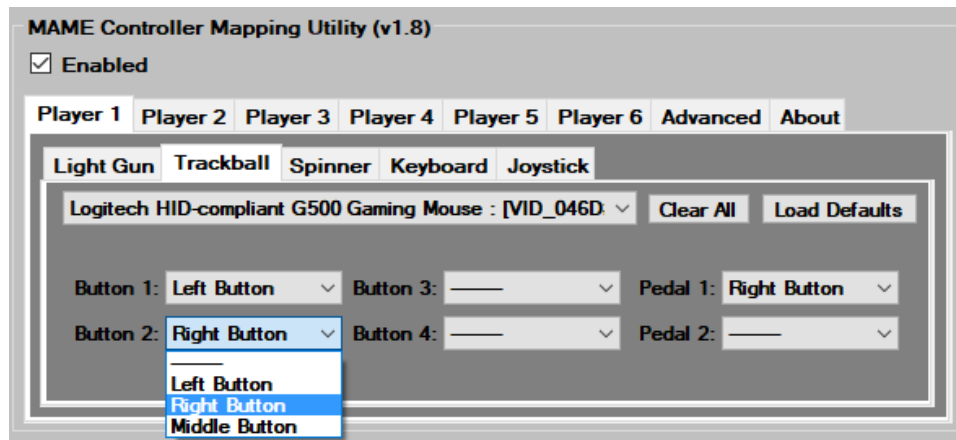
Trackballs

A trackball is essentially an (x,y) 2-Axis Mouse. This can be a standard mouse, or it can be an actual arcade trackball, like the ones used with Golden Tee Golf.

To enable a Trackball for Player One, you first select the mouse device that you want to use for Player One, as shown below.



Next, you can configure your mouse buttons as Left, Right or Middle mouse button, as seen below. Most of the time you only set "Button 1" and "Button 2" (And possibly "Button 3"), since most trackballs only have 2 (possibly 3) buttons.

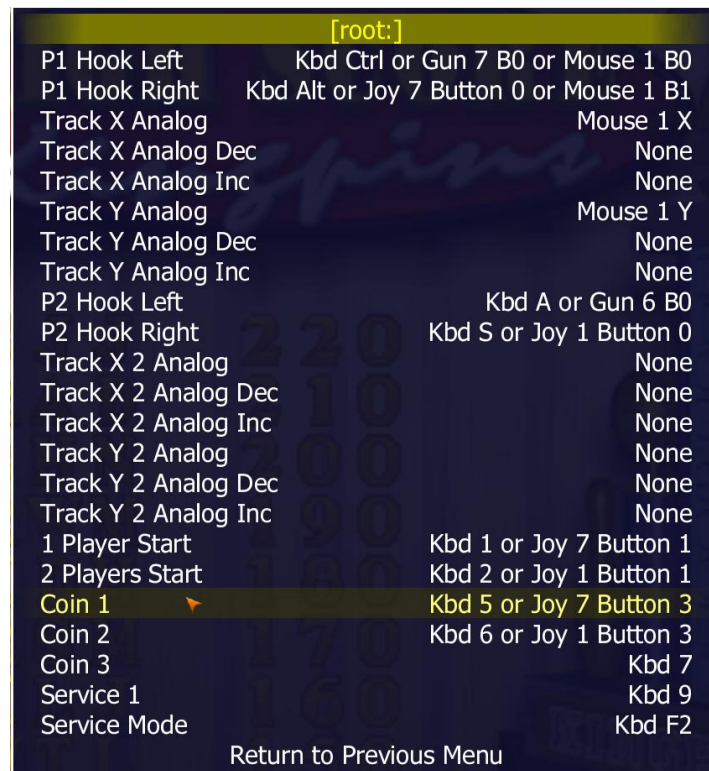


World Class Bowling

A game like World Class Bowling has 2 buttons available to map controllers to, as seen in the image below. In this example, the buttons map to the following.

Button 1 => P1 Hook Left => Mouse B0 => B0 means Left Mouse Button

Button 2 => P1 Hook Right => Mouse B1 => B1 means Right Mouse Button



For World Class Bowling, it works out perfectly if you plan on using your trackball buttons to map to Hook Left or Hook Right.

Golden Tee Fore! 2006 Complete

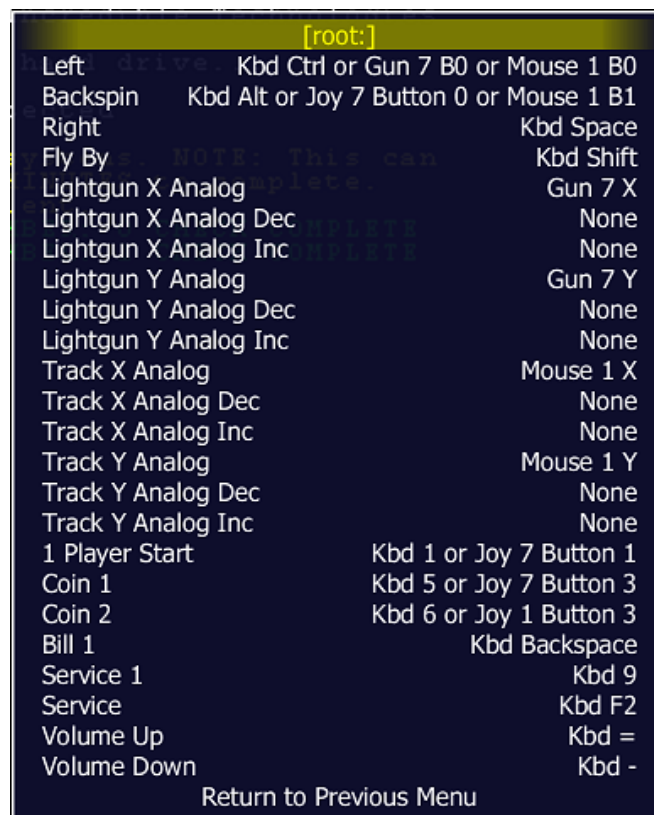
With a game like Golden Tee Fore! 2006 Complete, it actually has 4 buttons available to map controllers to, as seen in the image below. In this example, the buttons map to the following:

Button 1 => Left => Mouse 1 B0 => B0 is Left Mouse Button

Button 2 => Backspin => Mouse 1 B1 => B1 is Right Mouse Button

Button 3 => Right (We didn't set Button 3 in the Trackball UI, so it's not mapped to a mouse button)

Button 4 => Fly By (We didn't set Button 4 in the Trackball UI, so it's not mapped to a mouse button)



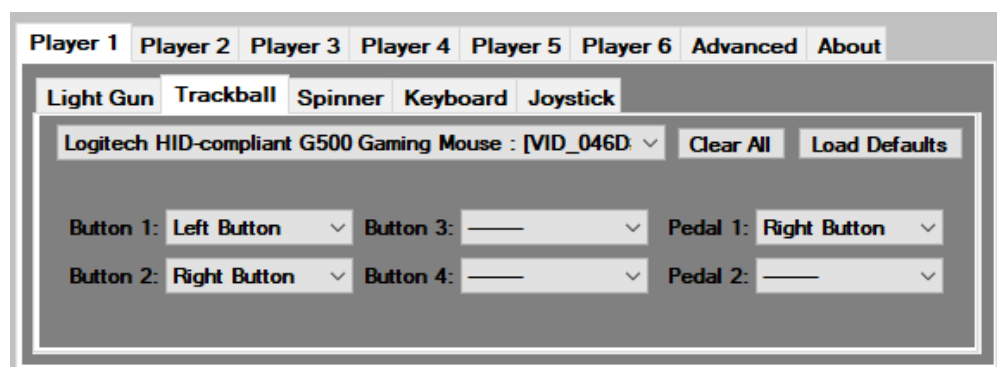
Since Golden Tee Fore! 2006 Complete uses more than the standard 2 mouse buttons, you might consider using other buttons you have on your arcade controller board that use Keyboard Inputs, from a device like an I-PAC, to map the remaining “Button 3” and “Button 4”, for “Right” and “Fly By”. You can also map “Button 1” and “Button 2” for “Left” and “Backspin” to other Keyboard Inputs on your I-PAC as well. You don’t have to use an I-PAC specifically. You can use an actual Keyboard, or a different product that works like an I-PAC. This will be explained in further detail the Keyboards section of this user manual.

Pedal Buttons:

We also give you the ability to set 2 Pedals, “Pedal 1” and “Pedal 2”. If you plan on using your trackball/mouse to play racing games, then you will need to map your pedals too. You can set your “Pedal 1” and “Pedal 2” with Left, Right or Middle mouse buttons for racing games that use a pedal mapping in MAME.

Ivan ‘Ironman’ Stewart’s Super Off Road

Games like Ivan ‘Ironman’ Stewart’s Super Off Road use a Pedal to go. We have “Pedal 1” set to a Right Mouse Button in our MAME Controller Mapping Utility, as seen in the image below. This game also uses “Button 1” for Nitro.

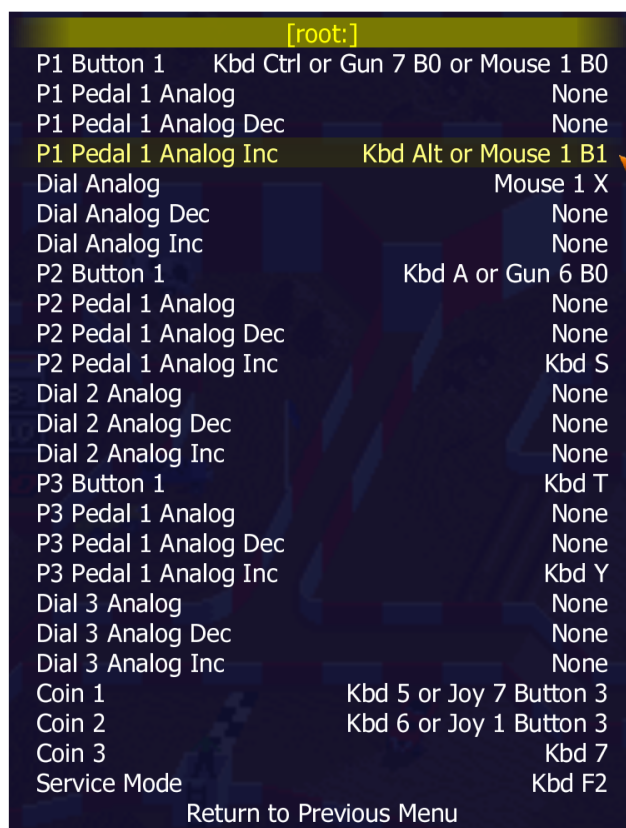


Now let's look at what was mapped for Player 1 for Ivan 'Ironman' Stewart's Super Off Road using our MAME Controller Mapping Utility in MAME.

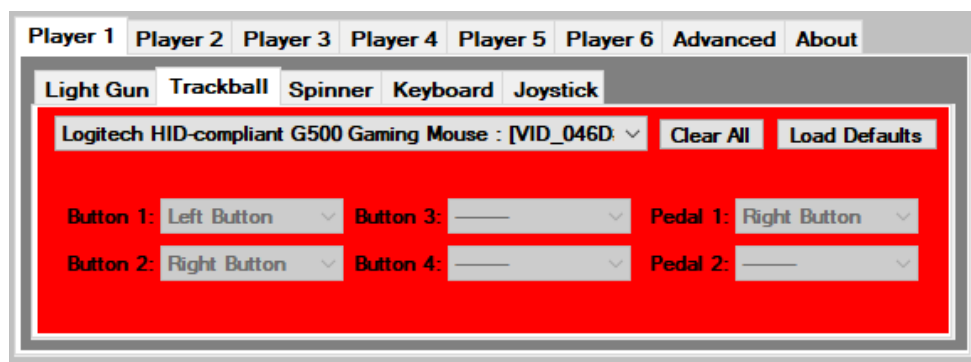
In this example, the right mouse button is the gas pedal to make the car move forward, while the left mouse button is Nitro.

Button 1 => P1 Button 1 => Mouse 1 B0 => B0 is Left Mouse Button

Pedal 1 => P1 Pedal 1 Analog Inc => Mouse 1 B1 => B1 is Right Mouse Button



If at any point you unplug or disable the trackball connected to your PC, it will show up in our MAME Controller Mapping Utility with a red background. This is perfectly normal! It will turn gray again once the trackball is reconnected to your PC.



Spinners

A spinner is essentially a single axis mouse. They are typically used like a steering wheel for games that use a Paddle or Dial. Usually the axis that is supported by your spinner is the x-axis. However, we also allow you to customize it to a different axis (x, y or z), just in case your spinner doesn't use the standard x-axis.



Ultimarc SpinTrak

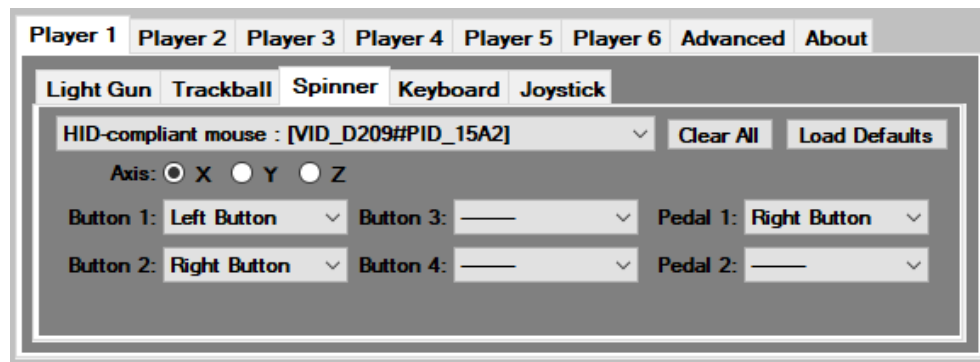


Turbo Twist w/ Mini-Racer Wheel



Tornado Spinner

The HID-compliant mouse I selected in the below image, is an Ultimarc SpinTrak. By default, Ultimarc SpinTrak uses the x axis with the mouse adapter that usually comes with it. You can easily verify the axis of your Spinner by moving the spinner to see which direction the mouse pointer moves. If it moves horizontally (left and right), then it is the x axis (Most Common). If it moves vertical (up and down), then it's the y axis. To be honest, I'm not sure how to test for z axis. You will probably never come across a spinner that uses z axis, but we give you the ability to set it to z axis, just in case you come across a situation where you need it.



Spinners work pretty much the same way as a trackball, but spinners are better than trackballs for certain games. Driving games are a great example. A spinner can be used as a steering wheel. You can even buy an actual steering wheel that can mount on a spinner.

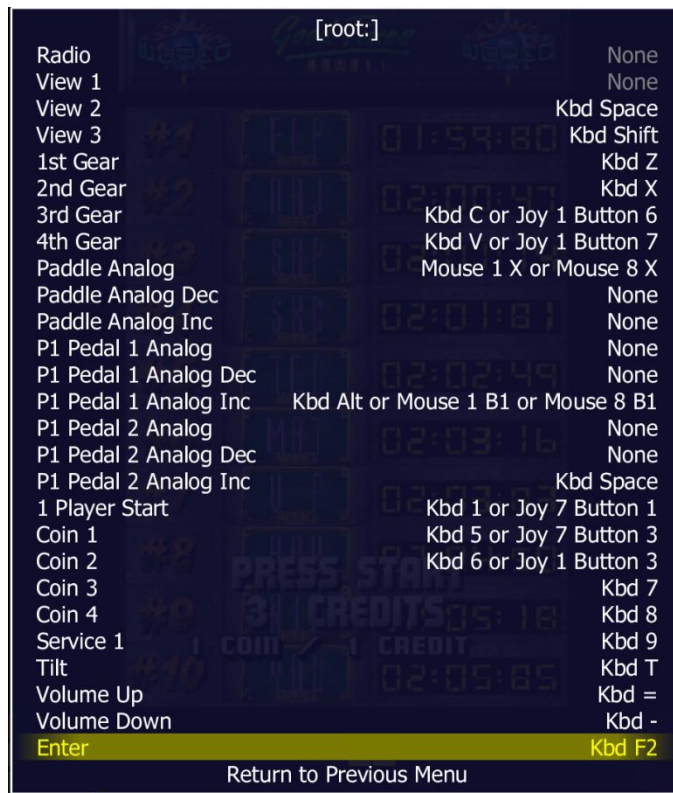
Cruis'n World

With a game like Cruis'n World, you have a paddle, pedal and buttons available to map controllers to, as seen in the image below. In this example, the paddle, pedal and buttons map to the following:

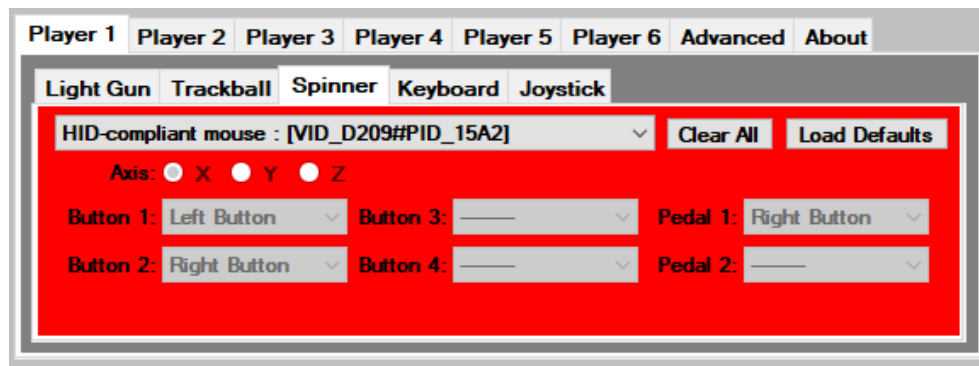
Axis X => Paddle Analog => Mouse 8 X => X is the X Axis for the Spinner
 Pedal 1 => Pedal 1 Analog Inc => Mouse 8 B1 => B1 is Right Mouse Button
 Button 1 => Radio => Mouse 8 B0 => B0 is Left Mouse Button
 Button 2 => View 1 => Mouse 8 B1 => B1 is Right Mouse Button
 Button 3 => View 2 => (We didn't set Button 3 in the Spinner UI, so it's not mapped to a mouse button)
 Button 4 => View 3 => (We didn't set Button 4 in the Spinner UI, so it's not mapped to a mouse button)



If you noticed above, the Right mouse Button is set to “View 1” and “Pedal 1 Analog Inc”. When you press the pedal to go, it will also change your view to “View 1”. This isn’t really desirable. You may want to not set your “Button 1” and “Button 2” for the spinner and just use “Pedal 1”. At least in this game, this holds true, but other games might use “Button 1” rather than pedal. It all depends on what you plan on using your spinner for, and which games work best with a spinner. This is a case, where you could make changes to Cruis’n World’s controller mappings within MAME to fix this problem. For example, I don’t want “Radio” or “View 1” to be mapped to my Spinner’s Left and Right Mouse buttons. I can go into Cruis’n Worlds controls and disable those 2 settings like so, In the image below. I have set “Radio” to None and “View 1” to None. This will not cause any problems with other games, and for Crusi’n World it fixes the issue. You could also assign “Radio”, “View 1”, “View 2”, “View 3” to Keyboard buttons if you still want to use those. Changing them to None or Keyboard buttons for specific games will not cause any issues with our MAME Controller Mapping Utility. You can see the changes I made in the image below.

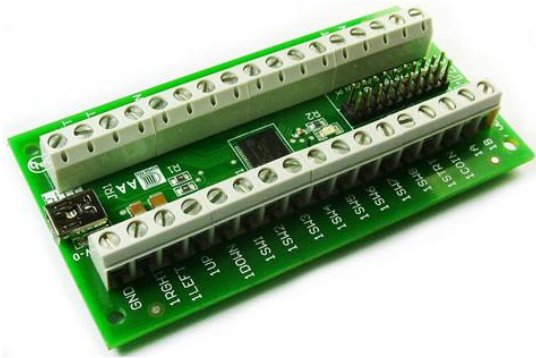


If at any point you unplug or disable the spinner connected to your PC, it will show up in our MAME Controller Mapping Utility with a red background. This is perfectly normal! It will turn gray again once the spinner is reconnected to your PC.



Keyboards

Our utility limits MAME to a single keyboard. This doesn't mean you can't use multiple keyboards, but it does mean that all of your keyboards will map to a single keyboard in MAME. Pressing the "A" button on multiple different keyboards will look like it's coming from the same keyboard in MAME. This isn't really an issue by any means, since most people don't actually use multiple keyboards to play games, but rather, they use something like an Ultimarc I-PAC that acts like a keyboard, but are connected to buttons and joysticks on an Arcade Machine Cabinet. You can even use more than one Ultimarc I-PAC and it will work, since you have something like 108 different keys on a keyboard that you can map to different buttons.



Ultimarc I-PAC (Keyboard Controller)



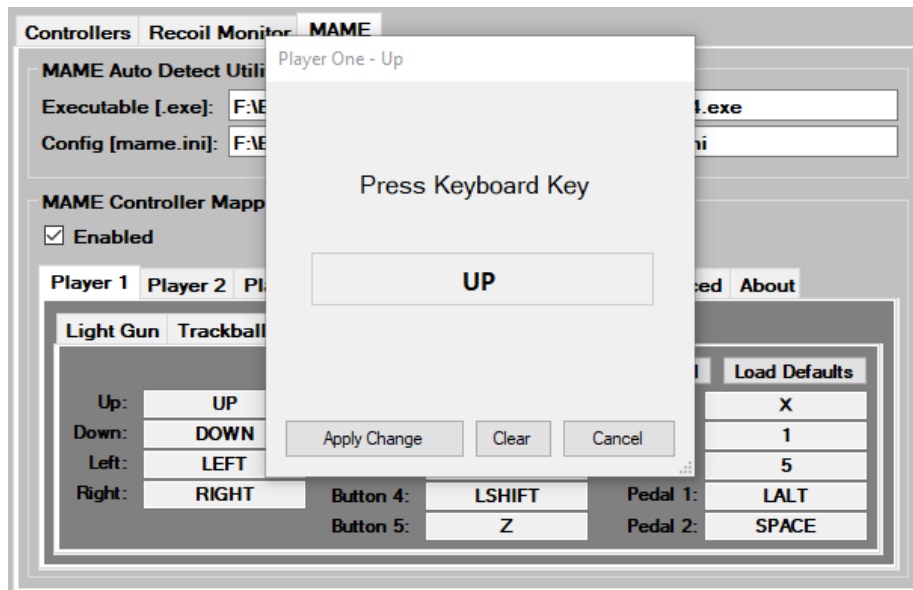
Real Keyboard

We limit MAME to a single keyboard intentionally. By only having a single keyboard mapping, we have eliminated the issues that MAME has with multiple “similar” devices connected to the PC at the same time. You can restart your PC, add, remove, and move devices to different USB port without having your Keyboard button mappings change in MAME. This creates a way to modify individual games within MAME to fix controller mapping issues you might have, that can’t be corrected for individual games using our MAME Controller Mapping Utility.

Keyboard mapping in our MAME Controller Mapping Utility is a little different then mapping Light Guns, Trackballs, and Spinners. There are so many different buttons on a keyboard; it doesn’t make sense to have a drop down with all of the possible buttons to choose from.

Player 1		Player 2		Player 3		Player 4		Player 5		Player 6		Advanced		About	
<div> <div>Light Gun</div> <div>Trackball</div> <div>Spinner</div> <div>Keyboard</div> <div>Joystick</div> </div>															
<div> <div>Up: UP</div> <div>Down: DOWN</div> <div>Left: LEFT</div> <div>Right: RIGHT</div> <div>Button 1: LCONTROL</div> <div>Button 2: LALT</div> <div>Button 3: SPACE</div> <div>Button 4: LSHIFT</div> <div>Button 5: Z</div> <div>Button 6: X</div> <div>Start: 1</div> <div>Coin: 5</div> <div>Pedal 1: LALT</div> <div>Pedal 2: SPACE</div> <div>Clear All</div> <div>Load Defaults</div> </div>															

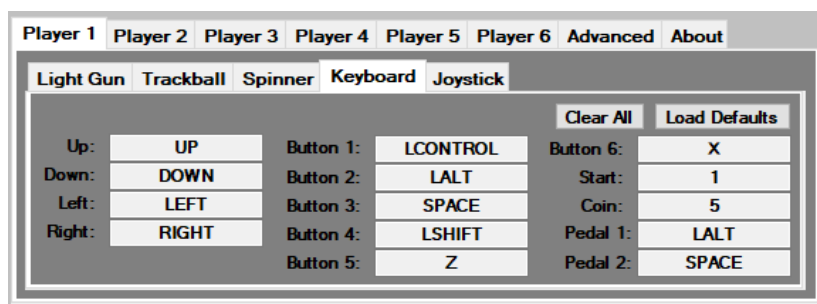
Keyboard mapping is easy. All you have to do is click on one of the UI buttons you want to map. If you click on the “Up” button, for example, a popup titled “Player One – Up” will appear, asking to Press a Keyboard Key. Then, all you have to do it press any button on your keyboard and it will show the key you pressed on the screen. If I press the up button on the keyboard, UP will appear, as seen in the image below. If you are using an I-PAC, you would just move your joystick connected to your I-PAC Up, and it would map to whatever key you have set in the I-PAC software. Don’t forget to Click Apply Changes to save your button mapping. You can configure all of the buttons listed in the image above by going through the same procedure. You can also click “Load Defaults” if you want to start over with our default keyboard mapping. You can also click the “Clear All”, to clear out all keyboard mappings so that you can map each button from scratch.



Super Street Fighter II

A game like Super Street Fighter II, it uses all 4 directional, all 6 buttons, Start Button and Coin Button. You can see how all of the keyboard buttons for player one are mapped using our MAME Controller Mapping Utility. The game Super Street Fighter II, is mapped automatically using the same controller mapping from our utility automatically, as seen in the images below.

[root:]	
P1 Up	Kbd Up
P1 Down	Kbd Down
P1 Left	Kbd Left
P1 Right	Kbd Right
P1 Button 1	Kbd Ctrl or Mouse 1 B0 or Mouse 7 B0
P1 Button 2	Kbd Alt or Mouse 1 B1 or Mouse 7 B1
P1 Button 3	Kbd Space
P1 Button 4	Kbd Shift
P1 Button 5	Kbd Z
P1 Button 6	Kbd X
P2 Up	Kbd R
P2 Down	Kbd F
P2 Left	Kbd D
P2 Right	Kbd G
P2 Button 1	Kbd A or Gun 6 B0
P2 Button 2	Kbd S or Joy 1 Button 0
P2 Button 3	Kbd Q
P2 Button 4	Kbd W
P2 Button 5	Kbd E
P2 Button 6	Kbd H
1 Player Start	Kbd 1
2 Players Start	Kbd 2 or Joy 1 Button 1
Coin 1	Kbd 5
Coin 2	Kbd 6 or Joy 1 Button 3
Return to Previous Menu	



Typically arcade controllers have 6 buttons arranged in 2 rows, as seen in the image below. The reason for this button arraignment is that it is pretty standard across most games. You will be able to play just about any game you throw at it. I've also seen 7 or even 8 button on some controller boards, which can give additional ways to map your keys.

Not all games will map perfectly to your liking. You might have a game that uses only 1 or 2 buttons. You might want that game to use a different set of buttons then the ones you have mapped in our MAME Controller Mapping Utility. You can change individual games that use Keyboard Input, to use different buttons by changing the button mapping within MAME. This only works for Keyboards and won't cause problems with our MAME Controller Mapping Utility. The following is an example.



Mortal Kombat

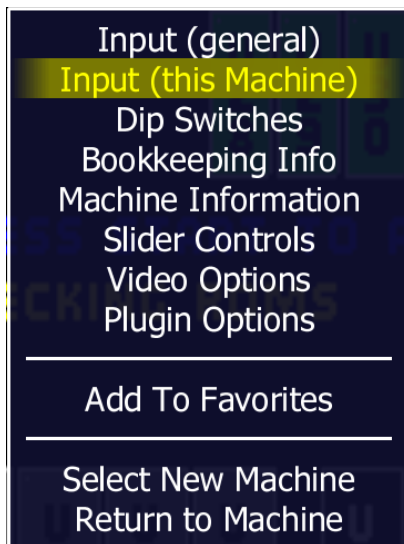
A game like Mortal Kombat only has 5 main buttons. 2 kick buttons, 2 punch buttons, and a single block button in the middle. Mortal Kombat is different than the standard 6 buttons configuration, as seen in the image below.



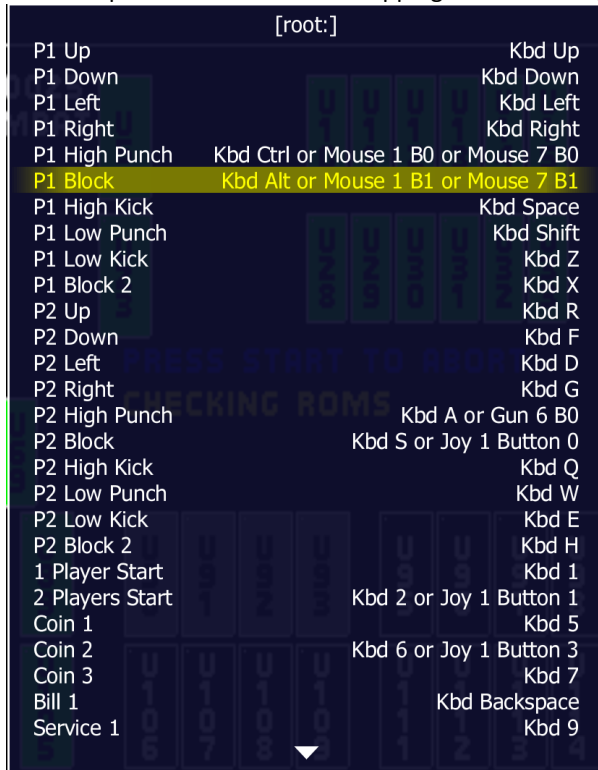
To fix this, you can change your keyboard mappings for individual games from within MAME. In the case of Mortal Kombat, you can map the 2 middle buttons to both be Block. Pressing either of the 2 middle buttons will perform a Block. You can do this with any game that maps keyboard inputs. This will not cause any issues with our MAME Controller Mapping Utility, as long as the game is using keyboard mapping. The mapping must come from a keyboard. An I-PAC from Ultimarc is a good example of a keyboard controller. An I-PAC acts like a real keyboard, but connects to arcade buttons with wires. When you press a button connected to your I-PAC, it performs a keyboard press, such as "Spacebar" or "r", just like a real keyboard. You CAN'T remap games within MAME that use a Joystick Controller or Mouse/Gun/Spinner/Trackball Controller. This will cause problems. Changing Keyboard inputs is fine and won't cause problems.

To change keyboard mappings for individual games from within MAME, do the following:

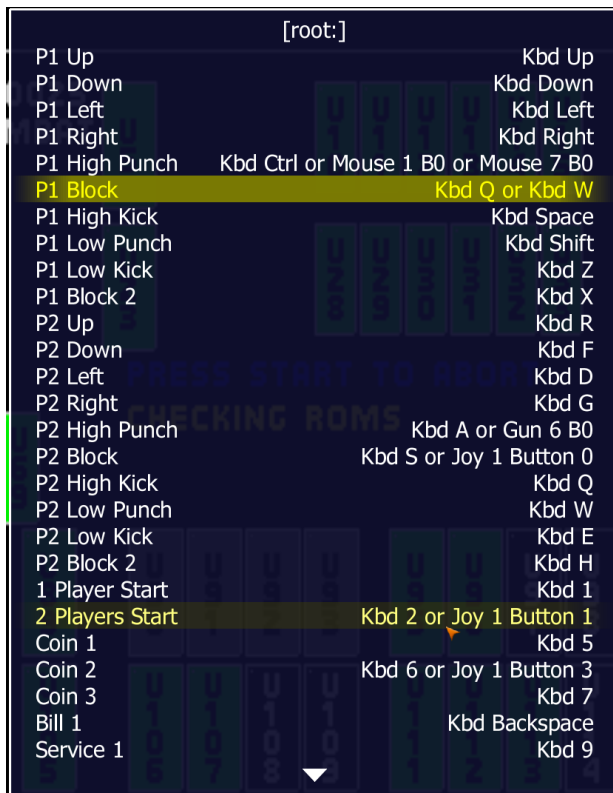
- 1) Launch the game in MAME, such as Mortal Kombat.
- 2) Hit the "Tab" key on your keyboard.
- 3) This will open a MAME menu.
- 4) Select Input (This Machine)



- 5) This will open MAME controller mapping menu for the game you selected, in this example Mortal Kombat.



- 6) The “P1 Block” is assigned to the “Alt” key, as seen in the image above, but we want it to be mapped to differently for Mortal Kombat.
- 7) Choose “P1 Block” from the menu, and then click the Enter key on your keyboard, as seen in the image above.
- 8) It will be waiting for you to press a button on your keyboard that you want to map for the Block button.
- 9) For this example we pressed “Q”, as seen in the image below.
- 10) Then you will do this again. Click the Enter key on your keyboard again for “P1 Block”.
- 11) It will be waiting for you to press another button on your keyboard that you want to map for your second Block button.
- 12) This time, we pressed “W” for the second block button. As seen in the image below, “P1 Block” is now mapped to “Q” and “W”.



- 13) Your P1 Block is now mapped to two keyboard buttons, instead of just one keyboard button.
- 14) You can do this for any game that you want to change the button mapping, to something different then you have in our MAME Controller Mapping Utility. You can do this as long as the game is using Keyboard Input Mapping.

Joysticks

Advanced Settings

For all intensive purposes, the default values are recommended for all games that you will be playing in MAME. The only time I can think of changing these settings would be if you don't have a Trackball, but wanted to play Trackball games with a joystick or keyboard. Or you don't own a light gun (Hypothetical situation) and want to use your trackball with gun games. This will even allow you to do some really strange things. For instance, you can set your light gun to joystick. This will make it so that playing a fighting game like Street Fighter 2, work with your light gun. Yes, we tried this, and it's really hard to fight someone, but it's funny to watch!

Enabling and Disabling our MAME Controller Mapping Utility

Enabling:

When you enable this utility, it does the following:

- 1) Your mame.ini config file is updated with the following settings. If your mame.ini config file doesn't exist, it will be created first. You can also create the mame.ini file by running your mame.exe with -cc like: mame64.exe -cc from within your MAME directory.

ctrlrpath	ctrlr
ctrlr	ArcadeGuns
cfg_directory	cfg
joystick	1
lightgun	1

multimouse	1
multikeyboard	0
lightgun_device	lightgun
mouse_device	mouse
dual_lightgun	0
offscreen_reload	1
output	windows
mouseprovider	rawinput
lightgunprovider	rawinput
joystickprovider	dinput
keyboardprovider	auto

Your ROM path isn't changed. You may need to change your ROM path to point to the correct directory where your ROMs are located. By default MAME assumes your ROMS are in the directory called roms within your MAME directory.

rompath roms

- 2) Creates an ArcadeGuns.cfg controller mapping file in your MAME ctrlr directory.
- 3) Creates %appdata%\ArcadeGuns\Mame\AutoConfigUtility\controllerssettings.xml file and directories. This file contains all of your controller settings for this utility.
- 4) If you have controller mappings in your default.cfg file in your cfg directory, the mappings in the file will not be used. To prevent controller mapping issues when our MAME Controller Mapping Utility is enabled, your default.cfg file is renamed so that MAME won't use those mappings. That file is only renamed in the case that you have controller mappings in that file. It won't be renamed if you don't have controller mappings in that file. This is reverted back, if you decide to disable this utility, so that your default.cfg mappings are not lost.

default.cfg is renamed to default_ag_backup.cfg

Disabling:

When you disable this utility, the following happens:

- 1) Your mame.ini config file clears out the following line to just be ctrlr without ArcadeGuns:

ctrlr ArcadeGuns

is now

ctrlr

- 2) The ArcadeGuns.cfg file that was created earlier in your MAME ctrlr directory is deleted.
- 3) The default_ag_backup.cfg file in your cfg directory is reverted back to default.cfg. This only happens when the default_ag_backup.cfg file is present in your cfg directory.

Additional settings you may need to set manually

Newer released versions of MAME (tested with MAME 0.206) also need the following configurations set in your mame.ini file for our MAME Controller Mapping Utility to work correctly. The MAME developers made changes to the controller system again. This happens every so often, so this may change again in the future. Without these additional setting, some games won't be mapped to your controllers correctly when using our MAME Controller Mapping Utility. We will be looking into adding these settings to our MAME Controller Mapping Utility in a later version of our utility, so that you won't need to set these manually. Further testing needs to be done to make sure this doesn't affect older versions of MAME negatively. We are thinking about making mame.ini settings editable in our Utility, so that you can modify these settings for different version of MAME.

If you are running a newer version of MAME (tested with MAME 0.206), you will need to set these manually in your mame.ini config file.

- You will need to enable mouse for trackball game. Trackballs are used with games like Golden Tee Golf and World Class Bowling. These games can be used with a mouse, trackball or spinner. There are many other games that use this too. You will need to set trackball_device to mouse as seen below:

```
trackball_device      mouse
```

- You will need to enable mouse for pedal (racing) games. This is for games like Ivan 'Ironman' Stewart's Super Off Road and Cruis'n USA to be used with a mouse, trackball or spinner. There are many other games that use this too. You will need to set pedal_device to mouse as seen below:

```
pedal_device          mouse
```