

PC-JAMMA Installation Guide (Rev 2 PCB)

Before we begin

This installation guide is written with the assumption you have a working arcade machine and know your way around inside it. This guide is broken into sections that will step you through the installation. Get help from someone who has experience with arcade machines if you are unsure about anything in this manual.

Always exercise common sense when working on arcade machines. If you do something stupid and destroy your machine or any other component, it is your problem. I take no responsibility for your actions. This document is only a guide and is to be used only as a guide.

Linking Cables

Before any installation takes place, you need to establish what linking configuration to use to connect your computer to the PC-JAMMA.

PC-JAMMA supports VGA and HDMI inputs as well as a 3.5mm analog audio input.

What option you use depends on the PC you have and what ports are available.

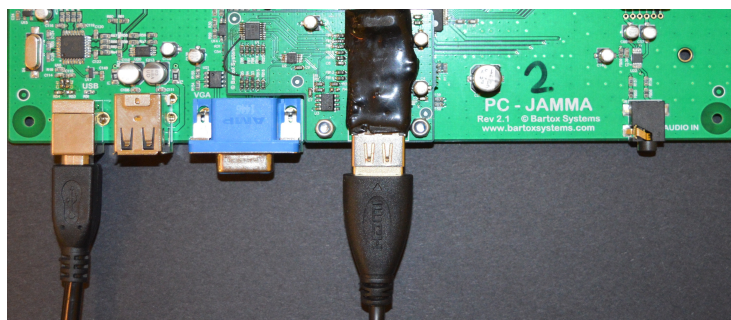
The three linking cable options are:

- HDMI + USB,
- HDMI + Analog Audio + USB and
- VGA + Analog Audio + USB.

HDMI + USB

HDMI + USB is the best and easiest installation option. It gives superior sound and picture quality using only two cables. This configuration only works if your computer supports audio over HDMI.

Most modern video cards support this feature and a simple way to test this is to connect your PC to a flat screen TV using only an HDMI cable. If you can hear the PC sound coming through your TV, your video card supports audio over HDMI.

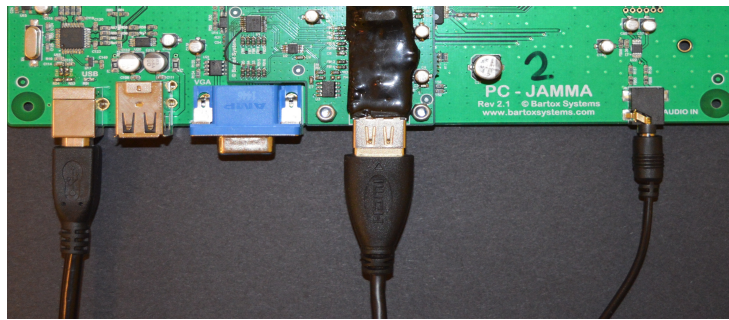


HDMI + USB

HDMI + Analog Audio + USB

HDMI + Analog + USB is the next best option for computers that don't have HDMI audio support. With this option, you will still benefit from HDMI's superior picture quality but an additional 3.5mm stereo extension cable for audio is required.

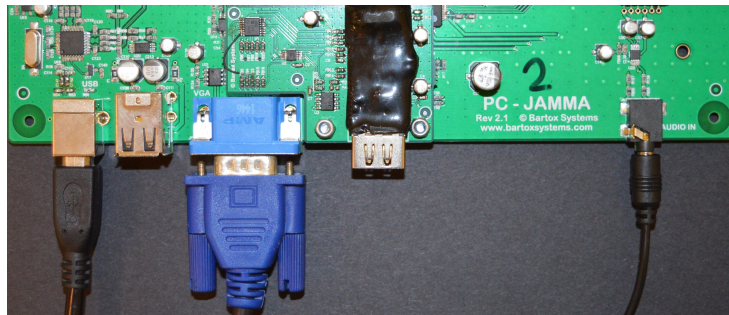
For this option to work, the PC-JAMMA audio mode must be set to "Force Analog" using the configuration utility. This is covered in more detail later in the manual.



HDMI + Analog Audio + USB

VGA + Analog Audio + USB

The VGA + Analog Audio + USB option is used on computers that do not have any HDMI support. To get the best results when using this option, use a high-quality VGA cable. Lower quality cables cause excessive signal attenuation and result in a substantial loss in detail of the CRT image. A 3.5mm stereo audio cable is also required.



VGA + Analog Audio + USB connections

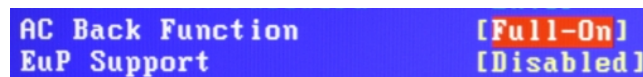
PC Installation

This section covers the installation of a PC into your Arcade machine and also covers the configuration and testing of the completed setup.

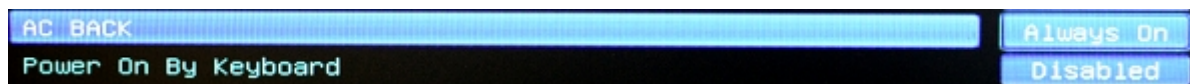
Make sure your cabinet is powered off and unplugged before continuing.

PC Power On Options

If you are installing a PC in your arcade cabinet, you need to establish how it will be powered on. The standard option is to enable the AC Back function in BIOS which starts the PC every time power is applied. Pictured below are two examples of this setting by different BIOS vendors.



Award Bios



AMI Bios

In an OEM BIOS, this option is commonly referred to as AC Recovery.

Another power on option is to use a keyboard that has the PC power button facility. This allows PC powered on and off external to the cabinet. Using this option requires the Power On by Keyboard BIOS option enabled in BIOS.

Placement of your PC

Find a suitable place to mount your PC. It needs to be somewhat accessible with adequate ventilation.

In the example machine, the best placement option is behind the cash box next to the monitor. It is secured with a Velcro strap that is screwed directly to the cabinet in multiple places. This allows for easy PC removal when required. (Velcro brand luggage strap: 1.5m x 50mm part number VL22873)



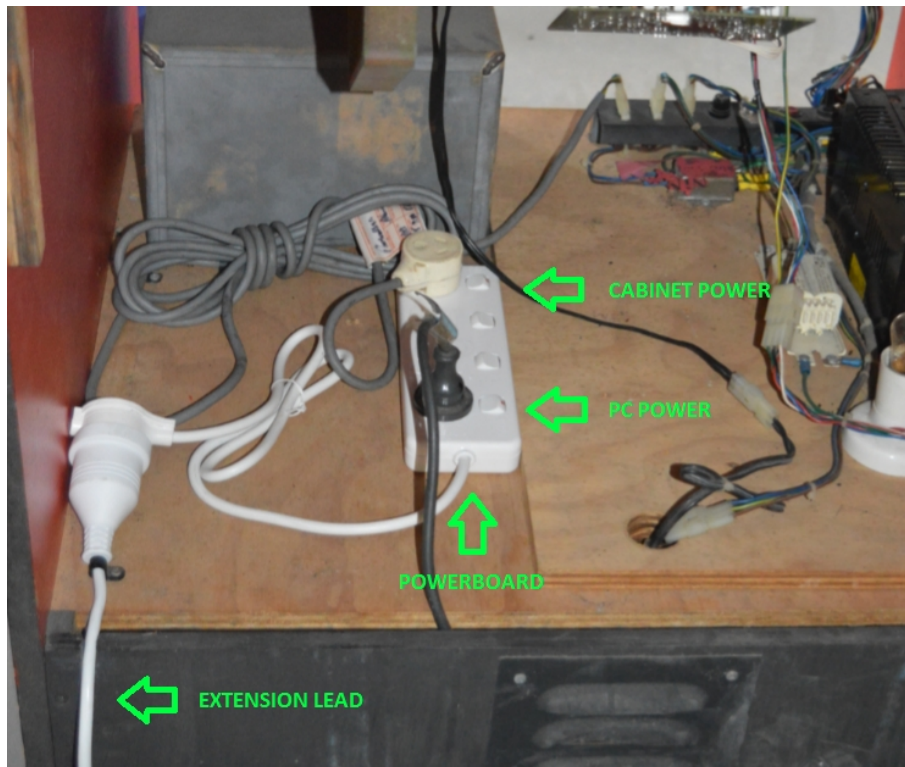
Computer placement in the example cabinet.

Placement of the PC will vary depending on its size and component configuration of your arcade machine. For safety reasons, you must always have your computer secured inside the arcade machine. It is dangerous to have a non secured computer especially when the cabinet is being regularly moved. Having a keyboard and mouse is usually a good idea. A wireless keyboard with an integrated mouse is recommended for ease of installation.

Powering the PC

Unless you are suitably qualified, do not mess with mains wiring!

The example cabinet came pre-wired with a 2-way general purpose power outlet. It is likely your cabinet will not have this arrangement. It is strongly recommended that you use an off the shelf solution like a 4-way power board and extension lead.



Power board setup with extension cable powering the cabinet. Cabinet Power is plugged into the power board as indicated

Linking Cables

Linking cables are used to connect your PC to the PC-JAMMA.

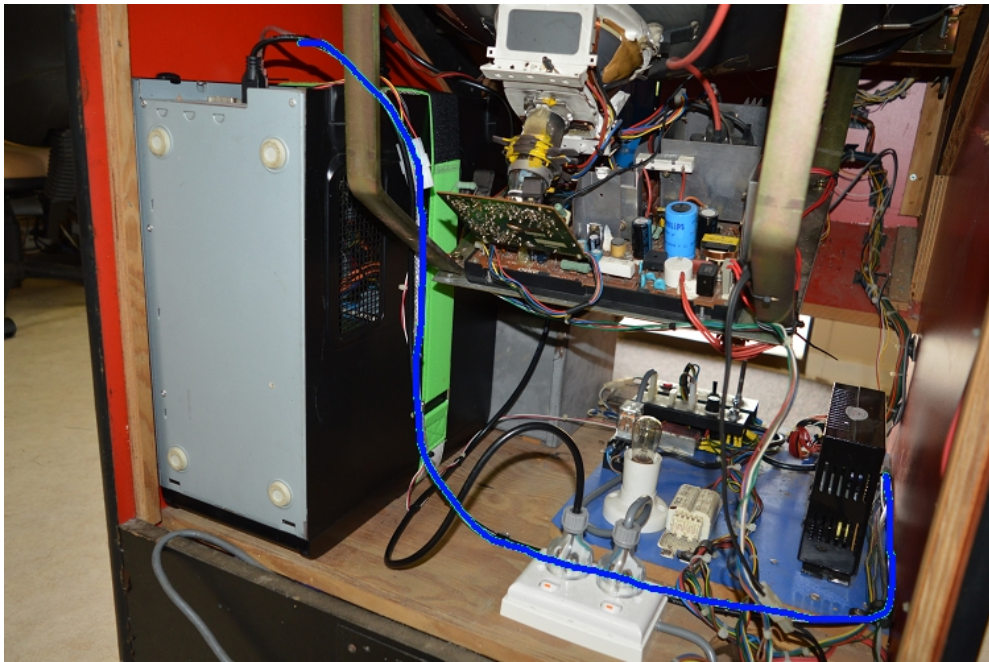
If you haven't already worked out what linking cable configuration is going to be used, refer to the Linking Cable section at the start of this manual before continuing.

Cable paths will differ between cabinet types. Try to place your cables in existing cable runs where possible. Do not run cables on top of the monitor chassis or near fluorescent lights as doing so can cause unwanted audio and video interference.

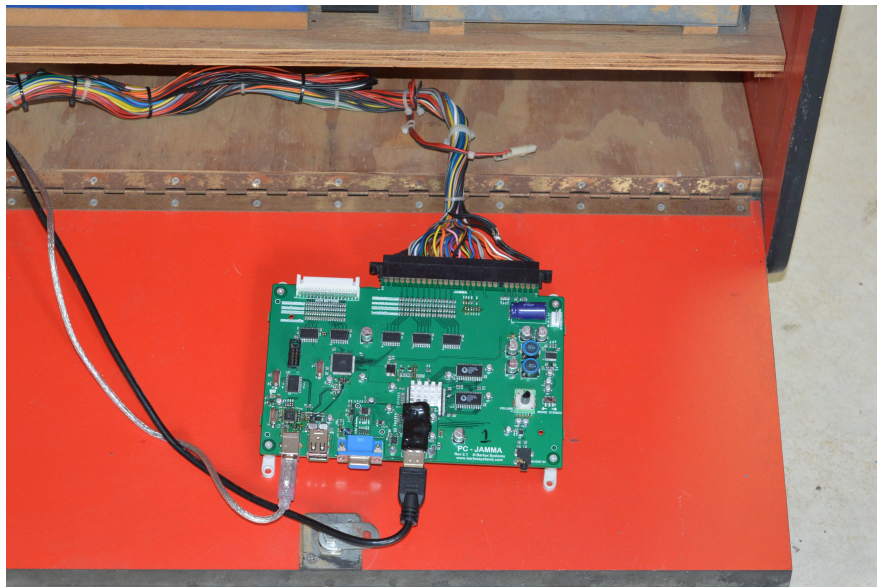
To get the cable placement correct, unplug and remove your existing game board.

Install and mount the PC-JAMMA as this will let you easily establish the best cable path for the linking cables between the PC and the PC-JAMMA.

Leave enough slack so that the Linking Cables can be tucked out of the way when using other game boards.



The Linking Cable Path is shown in blue in the example cabinet



PC-JAMMA cable arrangement in the example cabinet

Testing and setup

Recheck the cabinet wiring and connections to the PC.

Turn on the cabinet and check that the monitor, the PC, and the PC-JAMMA are powered up. The PC-JAMMA has voltage LEDs that indicate the presence of power.

If everything is running correctly you should be able to see your computer desktop on the arcade machines CRT display.

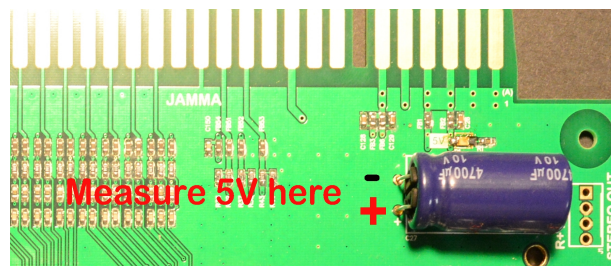
Power Supply Settings

Before going any further, check the 5V logic voltage setting.

Using a multi-meter, measure the 5V rail across capacitor C27 as shown below. It should read close to 5V.

The PC-JAMMA operates at 5V. Adjust the voltage to be between 4.8V and below 5.3V but ideally as close to 5V as possible. **5.3V is the absolute maximum voltage! Any voltage above this will damage PC-JAMMA.**

This is an important step to ensure the trouble-free operation of PC-JAMMA.



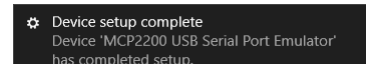
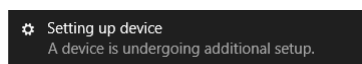
Measure 5V across C27

PC-Settings

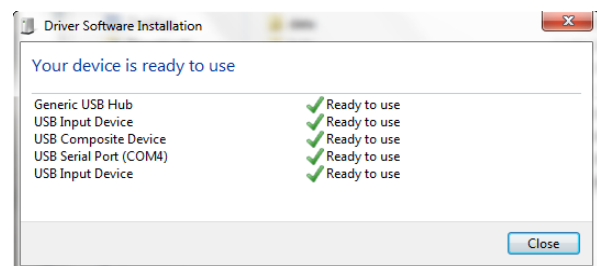
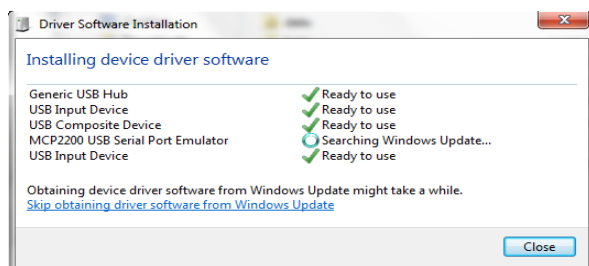
By default, your PC will set the video resolution to 800 x 600 when first connected to the PC-JAMMA. This is done intentionally to make it easier to read text on the CRT monitor during the initial setup. After settings are complete it is recommended that the resolution be set to 1024 x 768 @ 60Hz. Higher resolutions send more video information to the PC-JAMMA scan converter and higher resolutions remove scaling artifacts that can be seen in low-resolution modes.

Drivers

Windows will detect new USB devices and install the required drivers.



Serial Port emulator driver installation in windows 10



PC-JAMMA driver installation in Windows 7

If Windows is unable to get the Serial port emulator driver, Get them here:

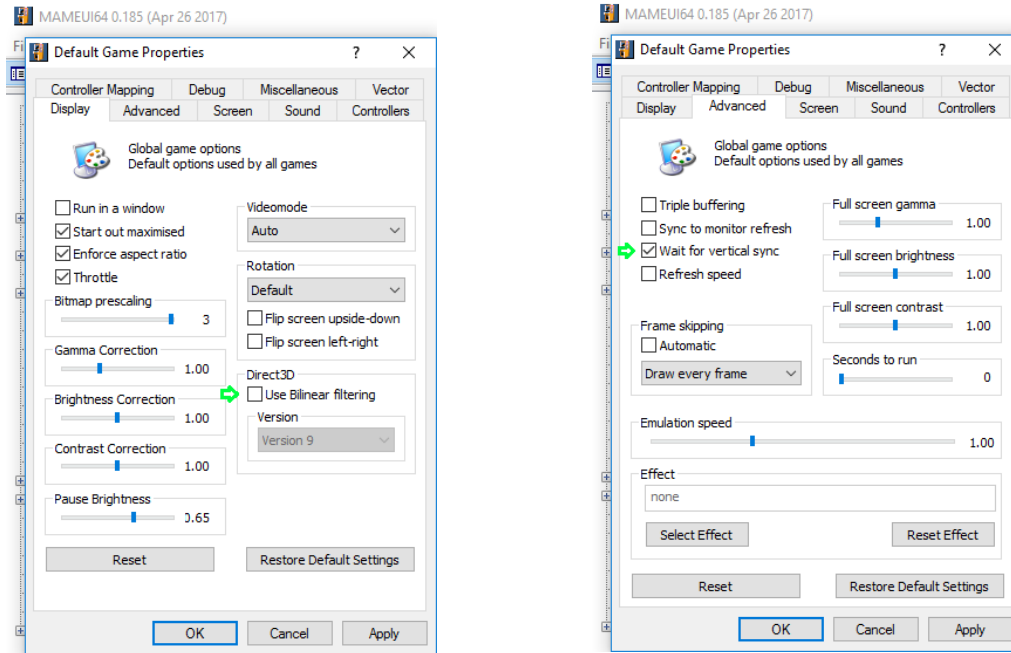
<http://ww1.microchip.com/downloads/en/DeviceDoc/MCP2221%20Windows%20Driver%202014-10-09.zip>

MAME Settings

The following settings will give the best results when running MAME. These settings are shown in MameUI and are the same for standard MAME

To get the best image results using a CRT monitor:

- Disable Bilinear filtering.
- Enable Wait for vertical sync.
- Set Bitmap prescaling to at least 3



MameUI suggested settings

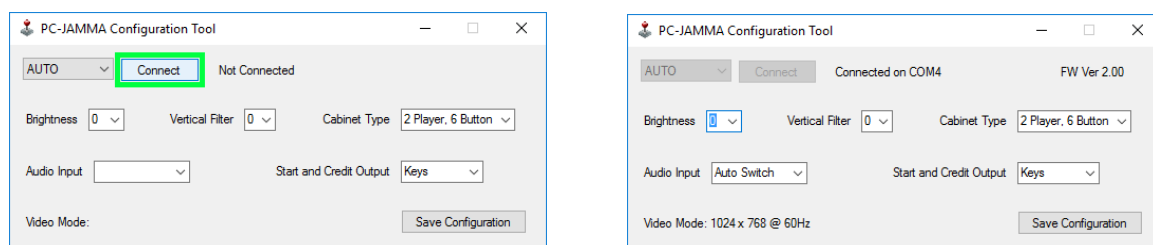
MameUI has joystick inputs enabled by default.

PC-JAMMA Settings

Settings are accessible using the Configuration Tool which is available at <http://www.bartoxsystems.com>.

A serial communication manual is also available if you prefer to use the terminal interface.

Run the PC-JAMMA configuration tool and click connect.



Not connected

Connected showing configuration

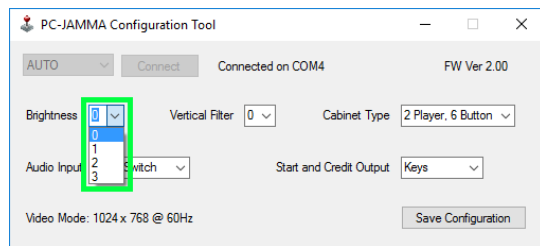
The tool will automatically search for PC-JAMMA and once connected, will display the current configuration.

Display Settings

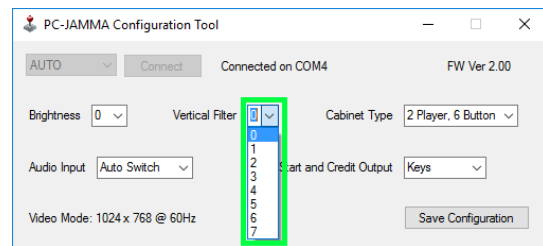
The Brightness setting is used to adjust the brightness level.

The Vertical filter setting is used to adjust the sharpness of the converted image on the CRT.

Both settings are changed using a pull down menu option.



Brightness Setting

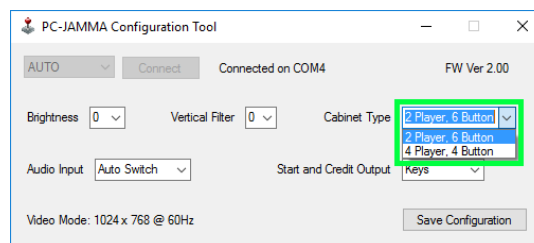


Vertical Filter Setting

Changes done to the brightness and vertical filter settings are displayed on the screen immediately. Click Save Configuration to save the current display settings to PC-JAMMA.

Cabinet Type

The cabinet type setting changes the cabinet configuration between a 2 Player, 6 Button cabinet and a 4 Player, 4 Button cabinet.



Cabinet type setting

2 Player, 6 Button

This option sets the PC-JAMMA control system to enable 2 x 6 Button USB controllers for use on a standard 2 player cabinet.

Buttons 4, 5 & 6 for each player are accessible from the Capcom compatible Kick Harness. Button 4 is also accessible on the JAMMA Edge Connector for compatibility with NEO GEO cabinets.

4 Player, 4 Button

This option sets the PC-JAMMA control system to enable 4 x 4 Button USB controllers for use on 4 Player cabinets

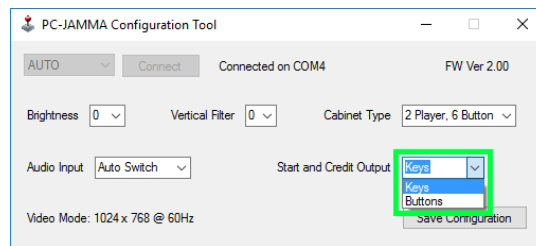
Player 3 and Player 4 controls are accessible from the Kick Harness

Select the cabinet configuration option and click save configuration to save settings to PC-JAMMA.

Note that if the cabinet type is changed, PC-JAMMA will restart with the new configuration. Refer to the Pin out section for wiring information.

Start and Credit Settings

This setting changes how the Start and Credit buttons are reported to the PC.



Start and Credit Output setting

Keys

This options sets the start and credit output for each controller to MAME's default key bindings.

The Player 1 Start button is output as key '1'. The Player 1 Credit switch is outputs as key '5'
The Player 2 Start button is output as key '2'. The Player 2 Credit switch is outputs as key '6'
The Player 3 Start button is output as key '3', The Player 3 Credit switch is outputs as key '7'
The Player 4 Start button is output as key '4', The Player 4 Credit switch is outputs as key '8'

Buttons

This option sets the start and credit outputs for each controller as buttons

Each player Start button is output on their USB controller as button 7.
All player Credit switch is output on their USB controller as button 8.

For example

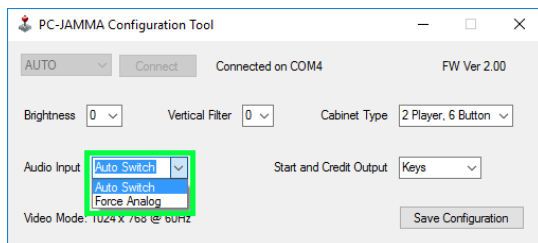
Player 1's Start button is reported as button 7 on USB controller 1.
Player 1's Credit button is reported as button 8 on USB controller 1
Player 2's Start button is reported as button 7 on USB controller 2.
Player 2's Credit button is reported as button 8 on USB controller 2

Buttons and Keys

This option enables both button and key options at once.

Audio Settings

This setting should only be changed if your video card does not have audio over HDMI support.



Auto Switch

This is the default setting. In normal operation, PC-JAMMA will select the audio source based on the video input.

If HDMI is used, Audio is sourced from HDMI.

If VGA is used, Audio is sourced from the 3.5mm audio socket

Force Analog Mode

In this mode, audio is always sourced from the 3.5mm audio socket regardless of the video input used. This option is for video cards that do not have audio over HDMI support.

Setting the volume.

With a game in demo mode, adjust the PC-JAMMA volume control to a suitable volume.

If your arcade machine has an additional volume control installed, take this into account when setting the volume level. If the audio becomes distorted, turn the volume down until the distortion is gone. If your cabinet is wired in stereo configuration, connect the speakers to the Stereo Out Plug on PC-JAMMA and switch the audio selector switch to Stereo.

Pinouts

JAMMA Standard

SOLDER SIDE			COMPONENT SIDE
GND	A	1	GND
GND	B	2	GND
+5V	C	3	+5V
+5V	D	4	+5V
	E	5	
+12V	F	6	+12V
KEY	H	7	KEY
	J	8	
	K	9	
SPEAKER (-)	L	10	SPEAKER (+)
	M	11	
VIDEO GREEN	N	12	VIDEO RED
VIDEO SYNC	P	13	VIDEO BLUE
SERVICE SW	R	14	VIDEO GND
	S	15	TEST SW
2P CREDIT	T	16	1P CREDIT
2P START	U	17	2P START
2P UP	V	18	1P UP
2P DOWN	W	19	1P DOWN
2P LEFT	X	20	1P LEFT
2P RIGHT	Y	21	1P RIGHT
2P BUTTON 1	Z	22	1P BUTTON 1
2P BUTTON 2	a	23	1P BUTTON 2
2P BUTTON 3	b	24	1P BUTTON 3
2P BUTTON 4	c	25	1P BUTTON 4
	d	26	
GND	e	27	GND
GND	f	28	GND

Kick Harness

2 Player, 6 Button

GND	1
GND	2
	3
	4
	5
	6
	7
	8
2P BUTTON 6	9
	10
	11
	12
	13
	14
1P BUTTON 6	15
	16
1P BUTTON 5	17
	18
1P BUTTON 4	19
	20
2P BUTTON 4	21
	22
2P BUTTON 5	23
	24
	25
	26
	27
	28
	29
	30
	31
	32
GND	33
GND	34

4 Player, 4 Button

GND	1
GND	2
	3
	4
	5
	6
	7
	8
3P CREDIT	9
4P CREDIT	10
3P START	11
4P START	12
3P UP	13
4P UP	14
3P DOWN	15
4P DOWN	16
3P LEFT	17
4P LEFT	18
3P RIGHT	19
4P RIGHT	20
3P BUTTON 1	21
4P BUTTON 1	22
3P BUTTON 2	23
4P BUTTON 2	24
3P BUTTON 3	25
4P BUTTON 3	26
3P BUTTON 4	27
4P BUTTON 4	28
	29
	30
	31
	32
GND	33
GND	34

Kick Harness Connector



Connector Front View

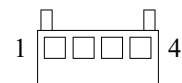
Connector Part No.
Hirose: DF1B-34DS-2.5RC

Pin Part No.
Hirose: DF1B-2022SCF

Stereo Harness

LEFT	1
GND	2
GND	3
RIGHT	4

Stereo Harness Connector



Cable Side View

Connector Part No.
Molex: 0022013047

Pin Part No.
Molex: 0008500113

Troubleshooting

Power

PC-JAMMA has no power	<ul style="list-style-type: none">• Is the cabinet plugged in and powered on?• Check the cabinet fuse.• Check power supply.
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Picture

Blank screen	<ul style="list-style-type: none">• Are you using an unsupported video mode?• Is the Monitor video input connected?• Is the Monitor power connected?• Is the PC video connected to HDMI or VGA inputs?• Does another JAMMA board work in the cabinet?
Blue tearing on bright screens	<ul style="list-style-type: none">• 5V supply voltage is too high.
Multicoloured lines and pattern interference on screen	<ul style="list-style-type: none">• 5V supply voltage is too low.• Is the VGA Plug correctly connected?• Faulty VGA cable?
An overlay zoomed and cropped image is displayed on the CRT and no controls work	<ul style="list-style-type: none">• PC-JAMMA is in flash recovery mode. Reflash with the firmware update utility.
PC-JAMMA is out of focus but other game boards look OK	<ul style="list-style-type: none">• The Vertical filter setting in the configuration utility is set too high.• Disable MAME's Bilinear filtering option

Sound

No sound, but picture OK on HDMI input	<ul style="list-style-type: none">• Does your video card support audio over HDMI?• Is Force Analog Audio mode set correctly?• Is the PC's HDMI Audio set to PCM only mode?
No Sound, but picture OK on VGA input	<ul style="list-style-type: none">• Check the 3.5mm audio lead
No Sound	<ul style="list-style-type: none">• Check speaker connection and continuity.• Check for 12V supply on the JAMMA edge connector
Sound seems to be missing something on a mono speaker cabinet	<ul style="list-style-type: none">• Make sure the MONO/STEREO selector is in MONO mode
Sound is always distorted	<ul style="list-style-type: none">• Turn down PC-JAMMA volume and turn up the cabinet volume (if fitted)• Check if the 12V supply voltage is too low• If using Audio on HDMI reduce the PC volume output.• Are there too many speakers in parallel? Minimum impedance per channel is 4 ohms.

Controls

No USB controllers on PC	<ul style="list-style-type: none">• Check the USB cable.• Try using a different USB port on your PC.• Check if the 5V supply voltage is to high.• Try using a shielded USB cable.
My 2 player cabinet doesn't seem to have all 6 Buttons available	<ul style="list-style-type: none">• Check the cabinet mode setting is correct using the configuration utility.• Check that the Kick harness is plugged in correctly.• Check Kick harness connections to the buttons.
The joysticks stop responding and then briefly recover	<ul style="list-style-type: none">• Check if the 5V supply voltage is to high.

Serial Port

Cannot connect to PC-JAMMA with configuration utility	<ul style="list-style-type: none">• Check the USB cable connection.• Is PC-JAMMA already connected in a terminal session?• Check that the 5V supply voltage set correctly set.• Is the PC-JAMMA serial port driver installed correctly?• Is PC-JAMMA in recovery mode?
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Specifications

Supported video resolutions

- 640 x 480
- 800 x 600
- 1024 x 768
- 720 x 400 (Text Mode)

RGB Output

- Analog RGB with composite sync.
- Output frequency: 15Khz
- RGB signal amplitude: 3Vp-p

Audio Output

- 15 Watt Class D with Mono / Stereo selector