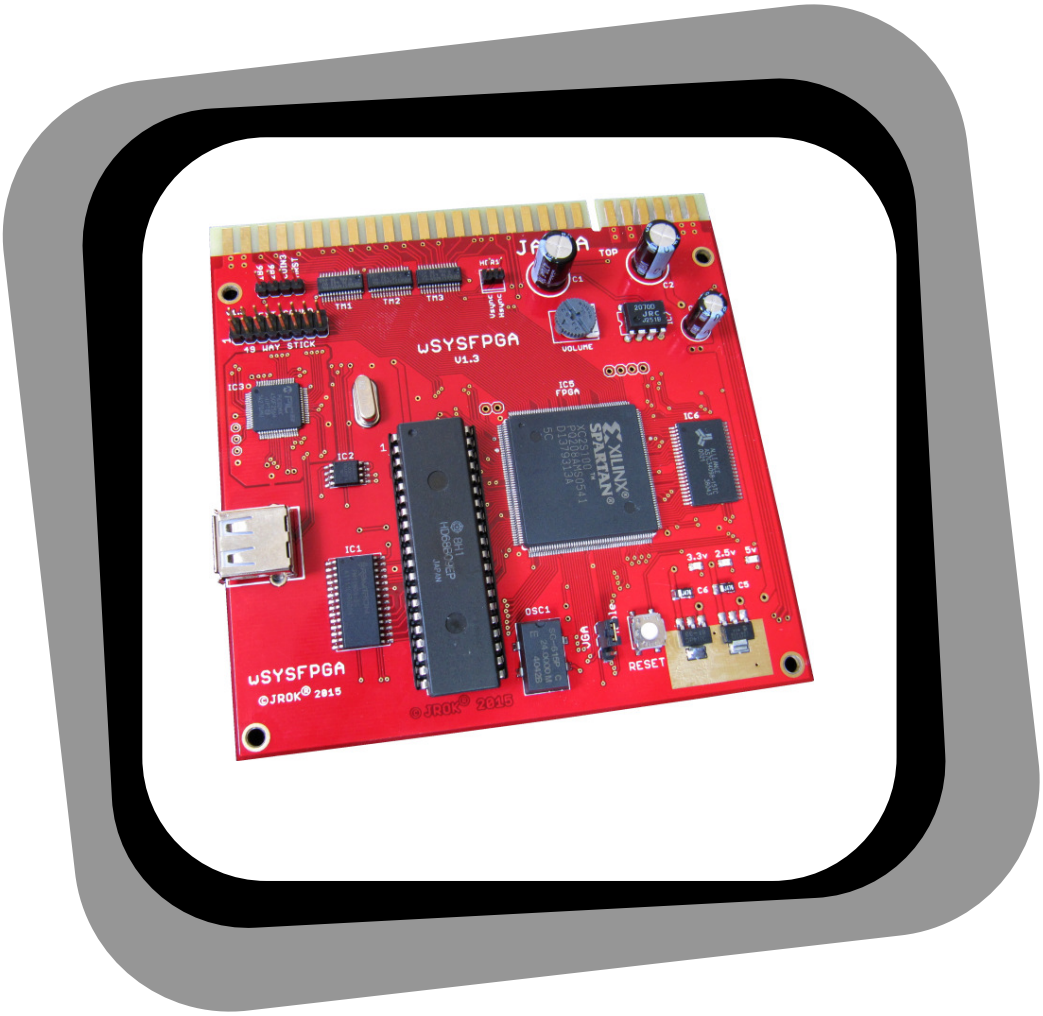
System FPGA



wSYSFPGA – 6809 System FPGA

Setup Guide revision v1.4
For v1.3 boardset hardware

Table of Contents

Board Requirements & Controls

Connectors

The board uses a standard JAMMA connector, with player one and two buttons 4 & 5 being used in the ‘Standard’ input mode.

A ‘multi-WMS’ mode is available where only player one & two buttons 1 through 3 are required.

Refer to “Button Map Scheme” in the setup menu.

The Three pin headers on the board are used for additional inputs and outputs.

2 pin = Video Sync output
4 pin = Additional inputs
16 pin = (2 x 8)* = external soundboard and 49 way joystick connector
* only 8 pins are required for 49-way joystick support

See the section “Button and Video Sync Headers” for pin connections.

Mating connector types are:

2 position = molex kk 0.1” 22-01-3027 or TE Connectivity/AMP CST-100 0.1” 770602-2
4 position = molex kk 0.1” 22-01-3047 or TE Connectivity/AMP CST-100 0.1” 770602-4

16 position (2 x 8)* = molex 90143-0016 or FCI 65043-029LF

*single row 8 position for 49-way joystick = molex 90123-0108 or FCI 65039-029LF

Joysticks and Controls

Depending on the game setup the board requires two 8 way joysticks, for Robotron and Splat. The player 2 joystick can be used for directional firing in these game, or optionally player buttons 1,2,3,4 for the firing direction.

Cocktail games will require two complete sets of player controls for each side of the cocktail table.

49 Way Joystick Support

The 49 way joystick connection is for use **ONLY** with Sinistar and Blaster. It is not functional in the main menu, setup or in any other games. It supports only a single 49-way joystick.

See the section “SYSFPGA v1.3 Board Layout & Connectors” for the pinout of the 49 way joystick connector.

Voltage & Current

The board requires **only** 5v regulated DC power. Maximum current draw is 400mA when using a 4ohm speaker at maximum volume. A minimum of 500mA power supply should be used to ensure stable operation.

If long runs of cabling are used significant voltage drop may occur, ensure the power supply is adjusted to provide a reliable 5v at the edge connector of the board.

A voltage at the edge connector of the board under 4.75v will cause the board to suspend and remain in reset mode.

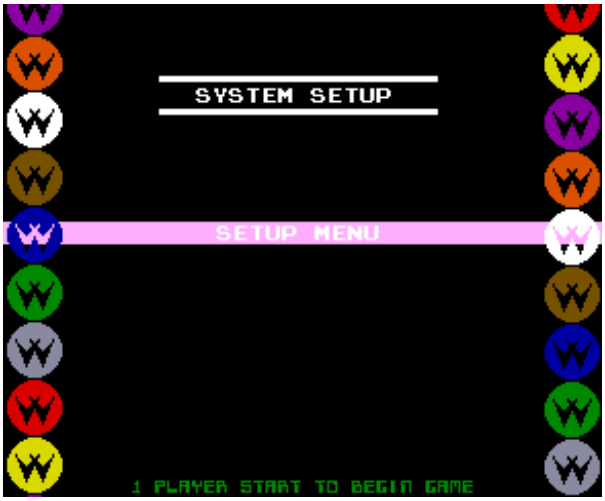
Power Requirements

5v DC regulated
400mA

BOOT UP

When first powered on, or when the board “BOOT TO” option set to “MENU”, the version numbers for the MENU, FPGA and sound/USB controller are displayed.

At initial power-on no games will have been loaded so the only option displayed is the “Setup



The Setup Menu allows loading of game ROMs and the configuration of board options and

IMPORTANT NOTE:

The setup menu can ALWAYS be accessed by pressing and holding down the JAMMA “SERVICE” (Advance) switch & powered on the machine or pressing RESET on the board.

System Setup Menu

The option setup menu can be accessed from either the Main Menu, if “SETUP” is enabled, or at boot time by two methods.

If the SETUP menu is **disabled** or “BOOT TO” is set to a game use either of the following methods to get to menu.

- Hold down the “SERVICE” (Advance) switch & power on the machine or press RESET on the board. This method is always available.

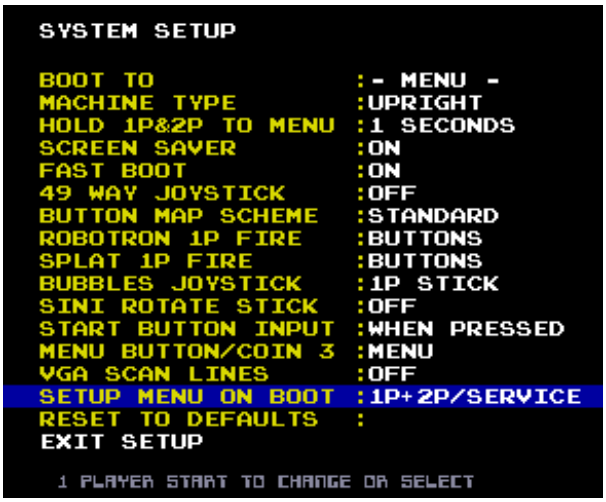
- Press and hold 1P start and 2P start together & power on the machine or press RESET on the board. **NOTE: This option can be disabled.**

System options, ROM loading and updates are controlled from this menu.

In turn each of the selections will be covered in the following pages:

SYSTEM SETTINGS

Major hardware settings for the board are controlled from this menu



BOOT TO

This option allows the board when powered on to start immediately in the selected game, bypassing the normal startup and menu.

If a game ROM has been loaded it is available as a selection.

MACHINE TYPE

cocktail Enables the 2 player inputs and screen flipping for cocktail tables.
This mode is only supported for Defender (Red), Stargate, Robotron & Bubbles.

Upright Standard Machine

HOLD 1P + 2P TO MENU

1/2/4 Number of seconds that holding down 1P & 2P start button together will jump back to the game main menu.
OFF Disables the option to jump to then main menu when holding 1P + 2P start buttons.

NOTE: Even if “boot to” is set to a specific game holding 1P + 2P Start will jump back to the main menu unless this option is set to “OFF”

SCREEN SAVER

ON/OFF
If no buttons are pressed on the game select screen for 10 minutes the screen saver will automatically kick in.
When in screen saver mode any button press will restart the menu.

The screen save does not start when in the setup or game enabled menu.

FAST BOOT
Enable fast startup of games.

ON The self test of each game is disabled. There will be no 'rug pattern' or initial test message.
OFF Standard power on self test is run when a game is selected.

NOTE: If customized or non-standard game ROMs are used this option may need to be turned **OFF**.

49 WAY JOYSTICK
Enable 49 way joystick through expansion pin header.

ON 49 way joystick support for a stick connected to the pin header on the board.
OFF Standard 8 way joystick input is translated into a 49 way joystick input.

***NOTE*:** This option is ONLY available for Sinistar & Blaster. In all other games and in the menus the 49-way joystick has NO effect.

BUTTON MAP SCHEME

STANDARD Mapping uses player inputs and buttons 1 through 6. Refer to "***JAMMA Button Mappings***"
MULTI-WMS Both 1P and 2P buttons 1 through 3 are used for inputs. Refer to "***MULTI-WMS Button Mappings***"

NOTE:
For Cocktail Mode only ***STANDARD*** mapping should be used.
Splat 2 player mode is NOT supported in ***MULTI-WMS*** mode

ROBOTRON 1P FIRE
Inputs used for firing direction.

Buttons Inputs for buttons 1 through 4 are used for firing directions and should be connected to a joystick
2P Joysticks The JAMMA player 2 joystick is used for the firing directions.

NOTE: In cocktail mode this should be set to Buttons.

SPLAT 1P FIRE
Inputs used for firing direction.

Buttons Inputs for buttons 1 through 4 are used for firing directions and should be connected to a joystick
2P Joysticks The JAMMA player 2 joystick is used for the firing directions.

NOTE: For true two player support the Buttons mode should be used and second pair of joysticks is required for player 2.

BUBBLES JOYSTICK

1P STICK / 2P STICK
Select which joystick should be used for control in Bubbles.

SINI ROTATE STICK

Rotates the joystick 90 degrees for Sinistar in both 49way and 8way mode. This allows sinister controls to be used when playing in a horizontal cabinet.

NOTE: When playing in a horizontal cabinet the screen will be sideways. Sinistar still requires a vertically mounted monitor to play correctly.

*****This feature is only available with FPGA version 1.1 or later.

START BUTTON INPUT

Controls how the 1P and 2P start buttons operate after a game is selected. This feature is only available with FPGA version 1.2 or later.

- **WHEN PRESSED:**
  The input for 1P and 2P start are passed directly into the game.

- **ON RELEASE:**
  1P and 2P inputs are only passed as "ON" into the game for ¼ of a second AFTER the button is released.

In this mode the 1P and 2P start inputs DO NOT REGISTER AS PRESSED WHEN THE BUTTON IS HELD DOWN.

The purpose of this setting is that is allows 1P and 2P buttons to be held down, to jump back to the main menu, without a new game starting.

MENU BUTTON/COIN 3

The "menu" button can be configured as a third coin input for 'Center Coin'.

MENU Grounding the input will force a return to the main selection menu when button is grounded. It is an alternative way to get to the menu other than hold 1P & 2P Start buttons.

COIN3 The input functions as 'Center Coin', this feature is for early version of Defender which featured a 3rd 'Center Coin' input.

*****This feature is only available with FPGA version 1.3 or later

VGA SCAN LINES

This option is only available in VGA mode.

ON Every other video line is blanked to give the appearance of a standard resolution CRT display.

OFF Standard VGA mode every video line is displayed.

SETUP MENU ON BOOT

This option allows disabling player start buttons for booting to the service menu.

1P+2P/SERVICE When booting holding down 1P + 2P start buttons, or the JAMMA service button will start the System Setup Menu.

SERVICE ONLY When booting ONLY holding down the JAMMA service button will start the System Setup Menu.

RESET TO DEFAULTS

Hold down the 1P start button for approximately 2 seconds to clear the boot menu NVRAM settings back to the defaults.

NOTE: This does not reset the individual game settings.

OPTION SETTINGS

Secondary system settings are controlled in this menu

HS RESET BUTTON

The High-score reset button used with Defender may be configured to share player 1 button 1. This option allows settings for defender to be adjusted without the need for a separate “high-score reset” button.

It is recommended this option set to “enabled” for normal gameplay and only be set to “P1 BUTTON 1” when settings need to be changed.

ENABLED The “HRST” (high-score-reset) button input on the 4 pin header in enabled to function as the high-score-reset input.

P1 BUTTON 1 Player 1 button 1 also acts as the “high-score-reset” button.

NOTE: This option is enabled only for Defender

BLASTER EXT SOUND

This option is only required if an additional soundboard is added to support stereo sound in an original Blaster cabinet. By default all sound triggers and handled by the internal micro-controller.

To support stereo a second soundboard is required and would need to be wired to the external soundboard connector on the PCB.

OFF Left & Right sound triggers are handled by the sound micro-controller on the PCB.

ON Right sound triggers are ignored by the onboard sound controller and passed directly to the external soundboard header.

ROBOTRON BUGFIX

The original Robotron ROMs contained a small but which was triggered by a graphics effect overwriting system memory. This patch corrects the problem and stops the corruption from occurring.

ON Bug fix patch is automatically applied when Robotron ROMs are loaded

OFF Bug fix patch is NOT applied and runs the risk of the “shot in the corner” crash.

IMPORTANT NOTE:

DISABLING THIS OPTION MAY RESULT IN ROBOTRON CRASHING IF THE BUG CONDITION ARISES !
IT IS RECCOMENDED TO KEEP IT ENABLED AT ALL TIMES !

DEFENDER TURBO

Defender hardware originally ran at a 1MHz clock speed, limited by the original hardware. This option allows a board populated with a 68B09 series CPU that is rated for 2MHz to run at the higher clock speed, speeding up program execution and removing some of the slow-down effects of Defender. For an experienced player this can make the game more challenging.

OFF Standard 1MHz CPU clock rate

ON [2MHz] 2MHz CPU clock rate

NOTE: It is only recommended this option be enabled **ONLY** on boards populated with a **68B09** CPU.

STARGATE TURBO

This option allows stargate to run at 2MHz CPU clock rate (see Defender Turbo)

OFF Standard 1MHz CPU clock rate

ON [2MHz] 2MHz CPU clock rate

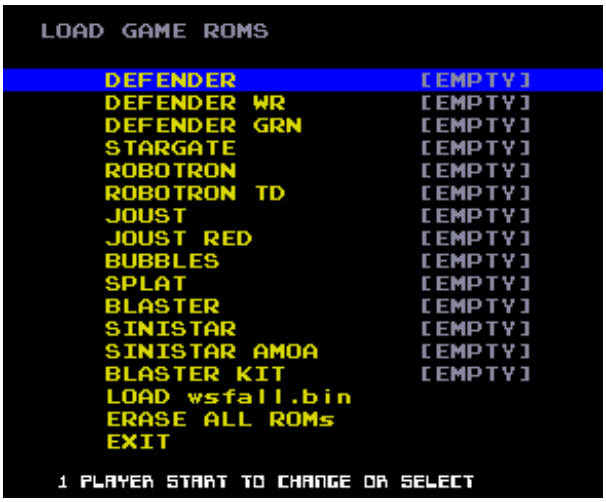
NOTE: It is only recommended this option be enabled for board populated with a 68b09 CPU.

LOAD GAME ROMS

Using this menu game ROMs are transferred from USB flash drive to the gameboard's internal flash memory storage.

Loading ROMs ROM files must be unzipped raw binary and placed into directory folder on the root of the flash drive.

When a set of game ROM has been loaded successfully the text will change to [LOADED] and the game automatically enabled in the "GAME ENABLE MENU".



- To load a ROM it must be in an unzipped binary format in a specified directory folder on the USB flash drive.

  Insert the flash drive with the game ROM images and select that option to load.
  See the following section for details of each directory and file name.

- The option "LOAD wsfall.bin IMAGE" loads a single binary file containing all the game ROM images

LOAD wsfall.bin

The file "WSFALL.bin" should be placed into the root folder of the USB flash drive, the file should contain all the game ROM images concatenated together into a single file. Once loaded successfully all games will be automatically enabled.

ERASE ALL ROM IMAGES

"ERASE ALL ROM IMAGES" will clear all of the stored ROM storage area on the internal flash on the gameboard. This will automatically disable all games and return the board to a blank state.

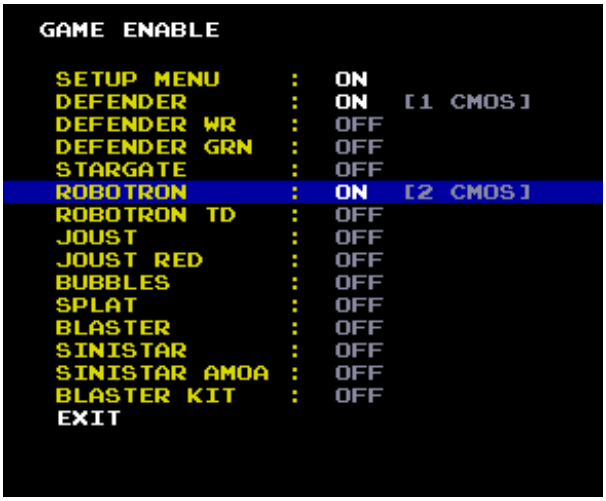
NOTE: see "ROM File Names & Directory Names" section for the directory name and ROM file names for each game that can be loaded.

GAME ENABLE

This option allows the list of games which can appear on the main menu to be turned on or off.

It also allows the use of a second set of game settings to be enabled.

Each game allows for 2 completely independent sets of settings which includeds the high-score table, difficulty settings.



Each game allows for 2 completely independent sets of settings, if [2 CMOS is enabled] when a game is selected then a second menu requests which settings should be loaded before playing the game.

GAME ENABLE – CMOS SETTINGS

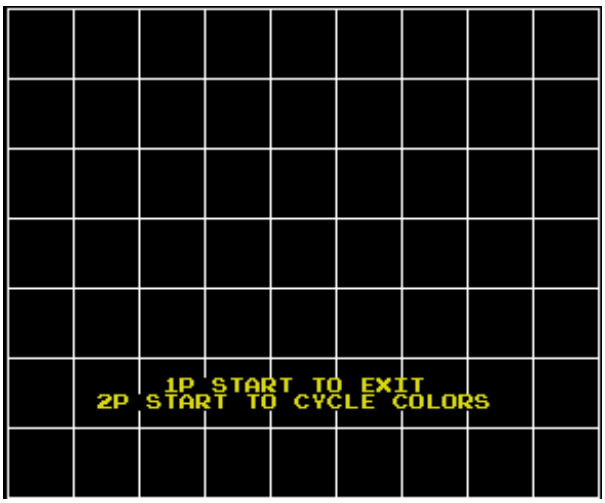
[2 CMOS] has been enabled so the option to select which to run is displayed.

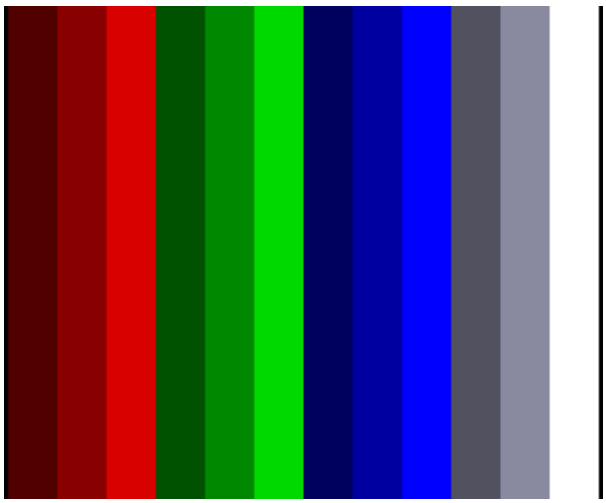
SWITCH TEST

Shows status of all switched inputs and the status of the 49-way joystick input header.

DISPLAY TEST

Use this option to position and set the display to the center of the monitor. Also to adjust the colors if necessary. Four test screens are displayed showing a grid out to the edge of the display, then the colors, red, green, blue and finally colors bars along with white.



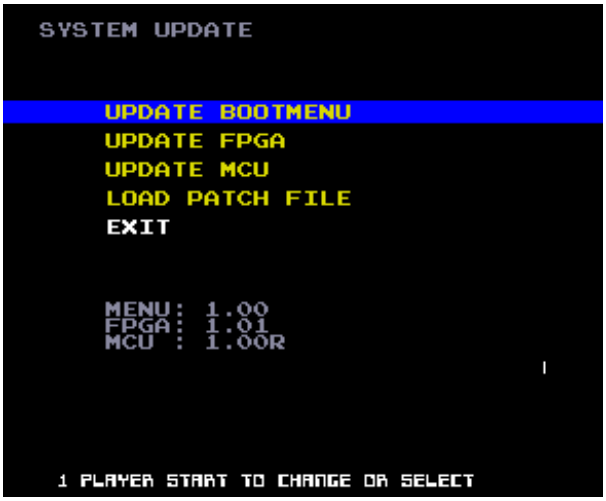


SYSTEM UPDATE

This option is used to update the boot menu, FPGA firmware and the MCU program code if required.

Updates will be placed into the root folder of the USB stick and the option selected. The onscreen display will show the progress of the update and if it was successful.

Updates will cause the gameboard to automatically reboot if they are applied successfully.



Lower section of the screen displays the currently loaded versions.

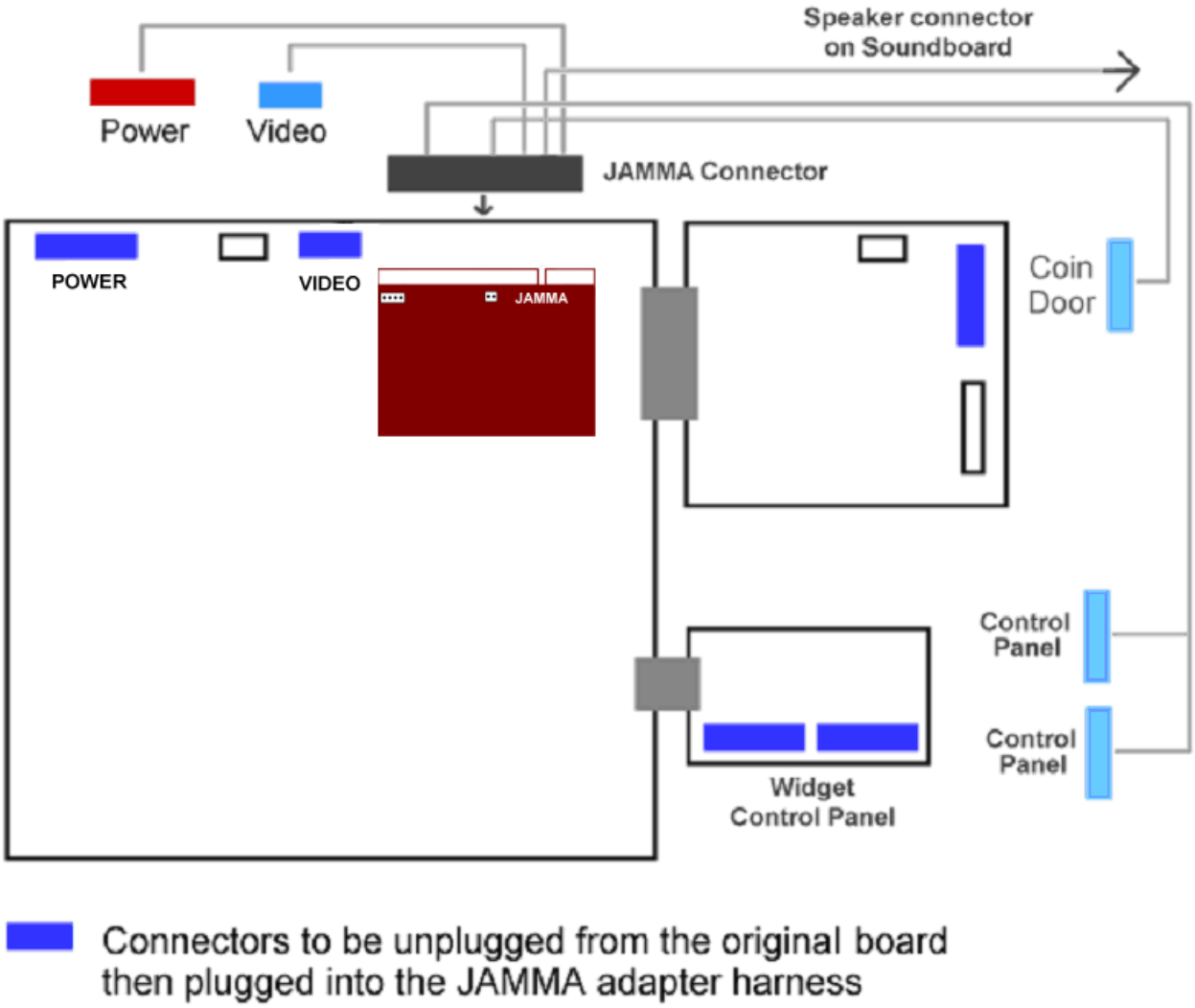
Filename for update are:

MENU:	WSFMENU.BIN
FPGA:	WSFPGA.BIN
MCU:	WSFMCU.BIN

JAMMA to Original Wiring Harness Adapter

The connectors for Power, Video, Coin Door and Controls should be plugged into the keyed connectors of the original cabinet harness.

Use the diagram to locate the plugs which should be removed from the original boards. Power, Video, Coin Door, Widget/Control Panel



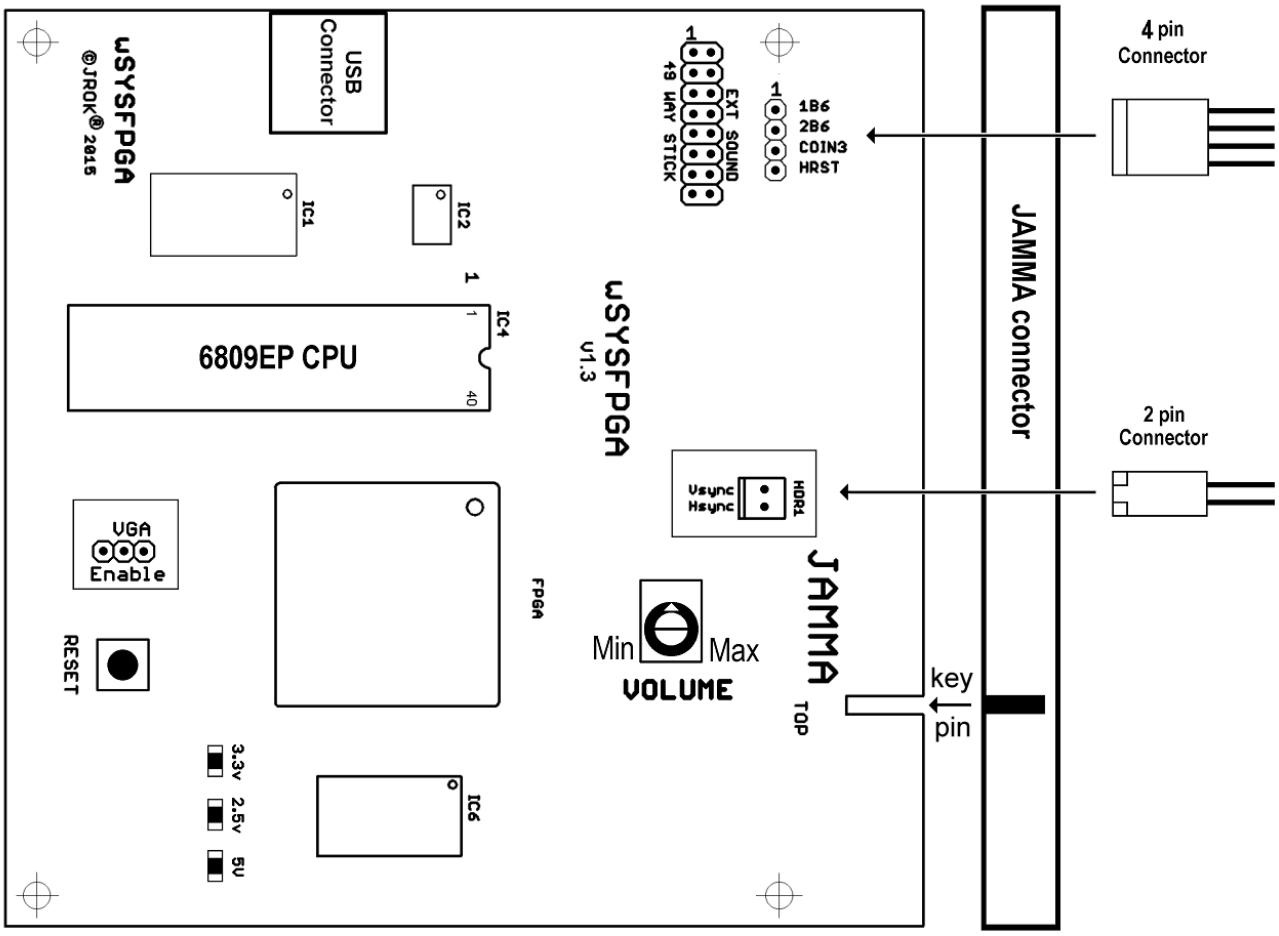
Use the two mounting feet to secure the board over the top of the original gameboard, note the location of the two mounting screws.

The video header on the original board will be blocked by the WSF board. Be sure to remove the video connector plug first.

Button and Video Sync Headers

Two pin headers are also required for wiring the board to an original harness.

2 pin plug = required for the Horizontal and Vertical Sync
4 pin plug = required for the “high-score-reset” input and button 6 for Stargate.



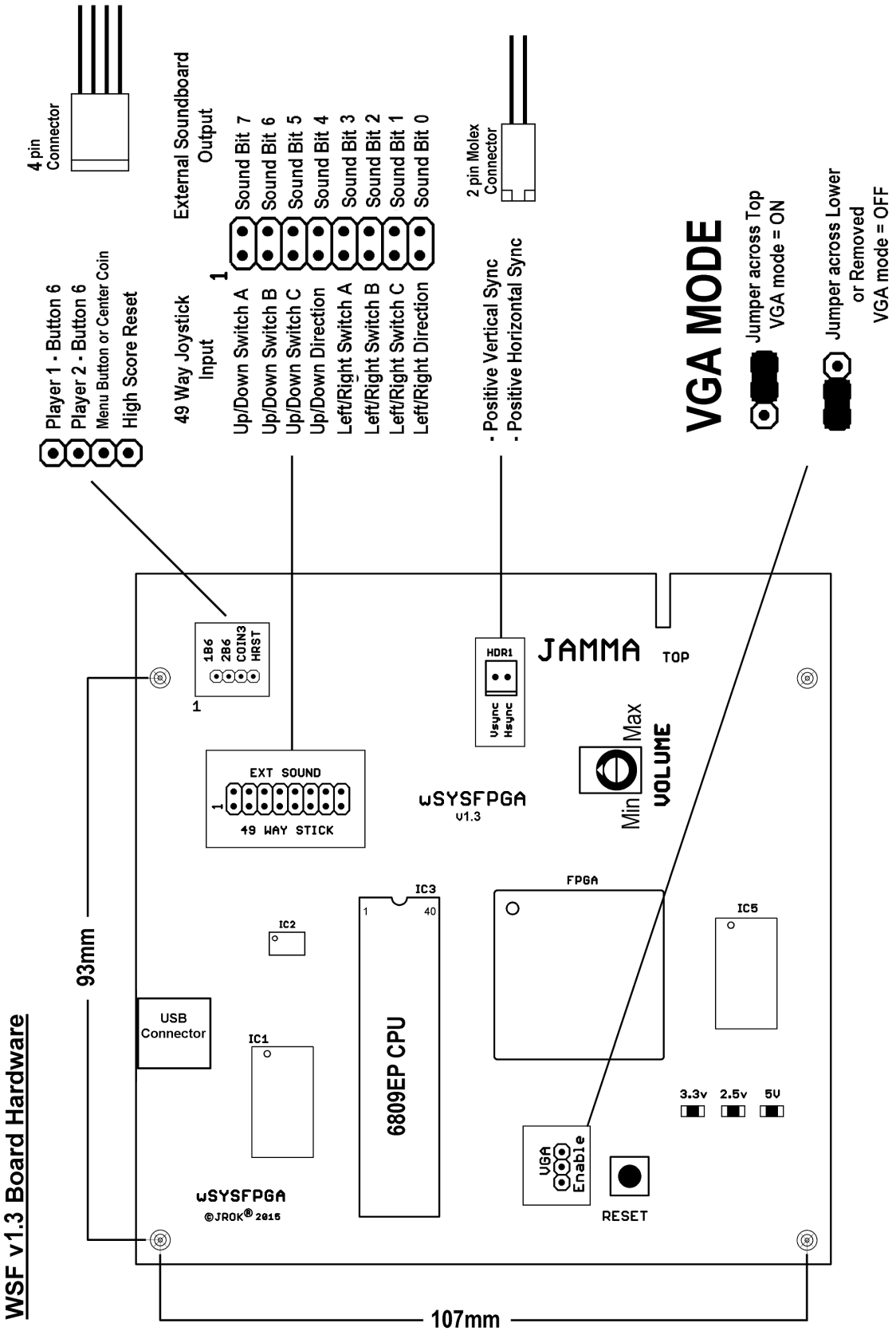
NOTE: Ensure the VGA enable is OFF when used in an original cabinet !

NOTE: Ensure the Keying Pin on the JAMMA adapter lines up with the board. **Do NOT use an unkeyed JAMMA adapter.**

WARNING

Plugging in an un-keyed JAMMA adapter the wrong way around could damage or DESTROY the board !

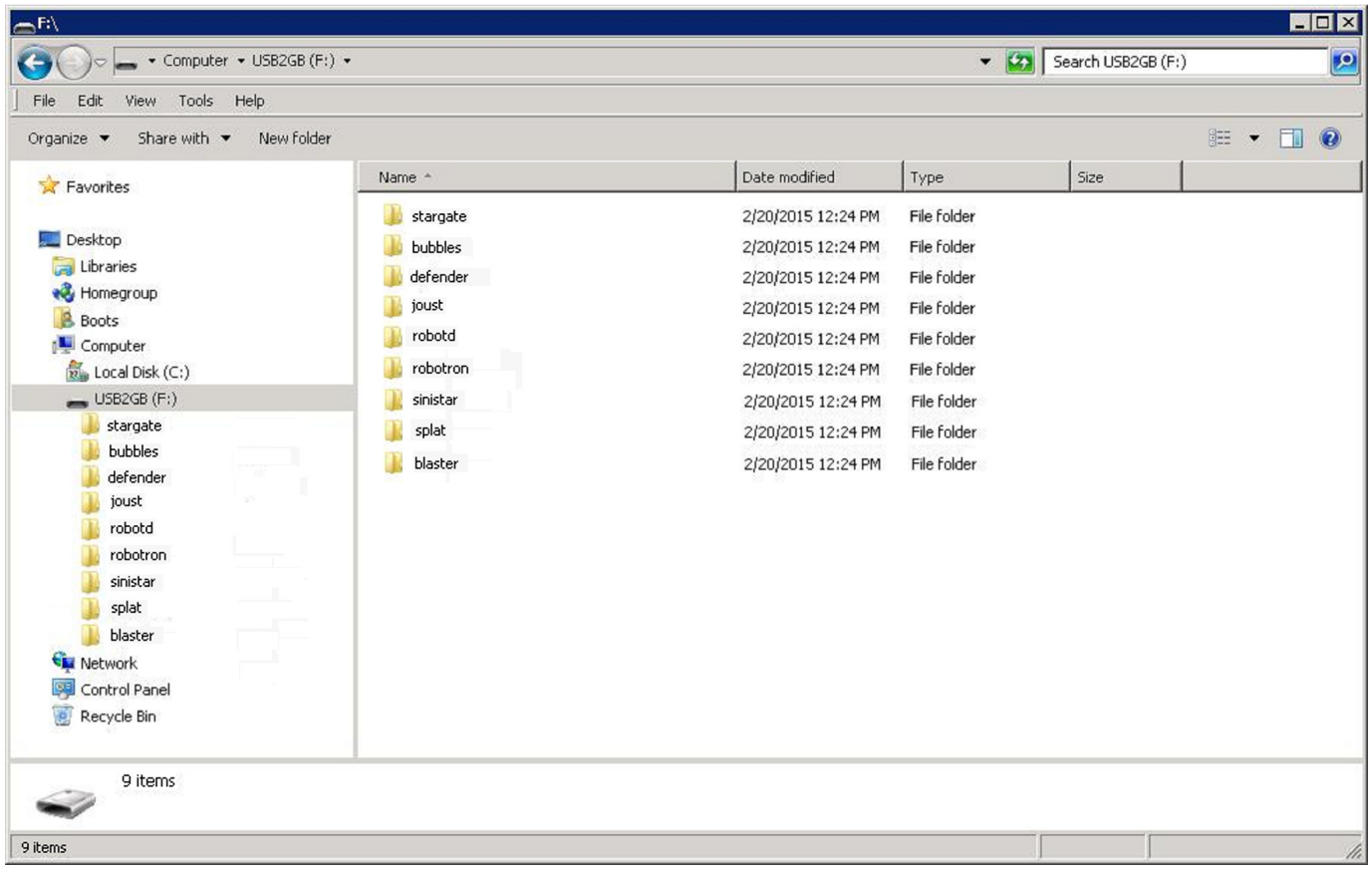
SYSFPGA v1.3 Board Layout & Connectors



ROM File Names & Directory Names

Rom files should be stored on a USB flash drive with the directory folder named matching the name in the left column and the file names matching the name in the middle column. The size if provided for reference.

USB flash drive top level directory structure



Directory and File Names

Defender [Red ROM]		
Directory/Folder Name	**ROM File Name:**	**Size**
defender	defend.1 defend.2 defend.3 defend.4 defend.6 defend.7 defend.8 defend.9 defend.10 defend.12 defend.11 defend.snd	2048 4096 4096 2048 2048 2048 2048 2048 2048 2048 2048 2048

Defender [White ROM]		
Directory/Folder Name	**ROM File Name:**	**Size**
defender	rom1.bin rom2.bin rom3.bin rom6.bin rom7.bin rom8.bin rom9.bin rom10.bin rom11.bin rom12.bin defend.snd"	4096 4096 4096 2048 2048 2048 2048 2048 2048 2048 2048

Defender [Green ROM]		
Directory/Folder Name	**ROM File Name:**	**Size**
defender	defeng01.bin defeng02.bin defeng03.bin defeng04.bin defeng06.bin defeng07.bin defeng08.bin defeng09.bin defeng10.bin defeng11.bin defeng12.bin defend.snd"	2048 4096 4096 2048 2048 2048 2048 2048 2048 2048 2048 2048

StarGate		
Directory/Folder Name	**ROM File Name:**	**Size**
Stargate	01 02 03 04 05 06 07 08 09 10 11 12 sg.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 2048

Joust		
Directory/Folder Name	**ROM File Name:**	**Size**
Joust	3006-13.1b 3006-14.2b 3006-15.3b 3006-16.4b 3006-17.5b 3006-18.6b 3006-19.7b 3006-20.8b 3006-21.9b 3006-22.10 3006-23.11 3006-24.12 joust.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096

Joust [RED ROM]		
Directory/Folder Name	**ROM File Name:**	**Size**
Joust	joust.wg1 joust.wg2 joust.wg3 joust.sr4 joust.wg5 joust.sr6 joust.sr7 joust.sr8 joust.sr9 joust.sra joust.srb joust.src joust.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096

Robotron		
Directory/Folder Name	**ROM File Name:**	**Size**
Robotron	robotron.sb1 robotron.sb2 robotron.sb3 robotron.sb4 robotron.sb5 robotron.sb6 robotron.sb7 robotron.sb8 robotron.sb9 robotron.sba robotron.sbb robotron.sbc robotron.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096

Robotron [Tie Die]		
Directory/Folder Name	**ROM File Name:**	**Size**
roboTD	robotron.sb1 robotron.sb2 robotron.sb3 robotron.sb4 robotron.sb5 robotron.sb6 robotron.sb7 robotron.sb8 robotron.sb9 robotron.sba robotron.sbb robotron.sbc robotron.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096

Bubbles		
Directory/Folder Name	**ROM File Name:**	**Size**
bubbles	bubbles.1b bubbles.2b bubbles.3b bubbles.4b bubbles.5b bubbles.6b bubbles.7b bubbles.8b bubbles.9b bubbles.10b bubbles.11b bubbles.12b bubbles.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096

Splat		
Directory/Folder Name	**ROM File Name:**	**Size**
Splat	splat.01 splat.02 splat.03 splat.04 splat.05 splat.06 splat.07 splat.08 splat.09 splat.10 splat.11 splat.12 splat.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096

Sinistar		
Directory/Folder Name	**ROM File Name:**	**Size**
Sinistar	sinistar.01 sinistar.02 sinistar.03 sinistar.04 sinistar.05 sinistar.06 sinistar.07 sinistar.08 sinistar.09 sinistar.10 sinistar.11 speech.ic4 speech.ic5 speech.ic6 speech.ic7 sinistar.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096

Sinistar [AMOA]		
Directory/Folder Name	**ROM File Name:**	**Size**
Sinistar	sinrev1.01 sinistar.02 sinrev1.03 sinrev1.04 sinrev1.05 sinrev1.06 sinrev1.07 sinrev1.08 sinrev1.09 sinrev1.10 sinrev1.11 speech.ic7 speech.ic5 speech.ic6 speech.ic4 sinistar.snd	4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096 4096

Blaster		
Directory/Folder Name	**ROM File Name:**	**Size**
blaster	1.ic1 2.ic3 3.ic6 4.ic7 5.ic11 6.ic13 7.ic15 8.ic20 9.ic22 10.ic24 11.ic25 12.ic26 13.ic27 14.ic35 15.ic38 16.ic39 17.ic41 18.sb13 blaster.col	16384 16384 16384 16384 16384 16384 16384 16384 16384 16384 8192 8192 8192 16384 16384 4096 4096 4096 4096

Blaster [Kit]		
Directory/Folder Name	**ROM File Name:**	**Size**
blaster	blastkit.1 blastkit.2 blastkit.3 blastkit.4 blastkit.5 blastkit.6 blastkit.7 blastkit.8 blastkit.9 blastkit.10 blastkit.11 blastkit.12 blastkit.13 blastkit.14 blastkit.15 blastkit.16 blastkit.17 blastkit.18 blaster.col	16384 16384 16384 16384 16384 16384 16384 16384 16384 16384 8192 8192 8192 16384 16384 4096 4096 4096 4096

JAMMA Button Mapping

As each game uses different button mapping these tables shows which button controls the input for each game. The mappings are for the "**STANDARD**" input mode which can support Cocktail mode games:

Joystick controls are consistent across ALL games for up-down-left-right. Except for Defender/Stargate which do not use left & right and Joust which does not use Up/Down.

In Cocktail mode player 2 buttons are used as inputs for a second player, only for games which support cocktail play Defender, Stargate, Robotron.

Player 1 Button	Defender	Stargate	Robotron	Joust	Bubbles	Splat	Blaster	Sinistar
			BUTTONS Setting			**BUTTONS Setting**		
1	P1 Fire	P1 Fire	P1 Fire Up			P1 Throw Up	Thust 2	
2	P1 Thrust	P1 Thrust	P1 Fire Down			P1 Throw down	Thust 1	Fire
3	P1 Reverse	P1 Reverse	P1 Fire Left	P1 Flap		P1 Throw Left		
4	P1 Smartbomb	P1 Smartbomb	P1 Fire Right	P2 Flap		P1 Throw Right	Fire	Sinibomb
5	P1 Hyperspace	P1 Hyperspace						

Player 2 Button	Defender	Stargate	Robotron	Joust	Bubbles	Splat	Blaster	Sinistar
1	P2 Fire*	P2 Fire*	P2 Fire Up*			P2 Throw Up		
2	P2 Thrust*	P2 Thrust*	P2 Fire Down*			P2 Throw down		
3	P2 Reverse*	P2 Reverse*	P2 Fire Left*	P2 Flap		P2 Throw Left		
4	*P2 Smartbomb	*P2 Smartbomb	P2 Fire Right*			P2 Throw Right		
5	*P2 Hyperspace	*P2 Hyperspace						

Additional Buttons Header

		Defender	Stargate
1	P1 Button 6		P1 Invisio
2	P2 Button 6		*P2 Invisio
3	Main Menu	Main Menu	Main Menu
4	High Score Reset	High Score Reset	High Score Reset

*buttons used only in cocktail mode

Multi-WMS JAMMA Button Mapping

When the option “BUTTON MAP SCHEME” is set to MULTI-WMS mode only JAMMA buttons Player 1 button 1 to button 3 and Player 2 button 1 to button 3 are used.

The mapping is shown in the following two tables.

Player 1 Buttons

JAMMA Player 1	DEFENDER	STARGATE	ROBOTRON	JOUST	BUBBLES	SPLAT	BLASTER	SINISTAR
Button 1	Reverse	Reverse		P1 Flap				
Button 2	Hyperspace	Hyperspace						
Button 3		Inviso					Blast	Sini Bomb

Player 2 Buttons

JAMMA Player 2	DEFENDER	STARGATE	ROBOTRON	JOUST	BUBBLES	SPLAT	BLASTER	SINISTAR
Button 1	Thrust	Thrust					Thrust	
Button 2	Fire	Fire						
Button 3	Smartbomb	Smartbomb		P2 Flap			Blast	Fire

NOTE:

DO NOT use multi-WMS mode for cocktail mode games.

Dual player mode in Splat is NOT supported in Multi-WMS mode.

Revision History

Manual Revision: 1.4

FPGA Revisions

1.01 - Initial release

BOOT ROM Revisions

1.00 Initial Release

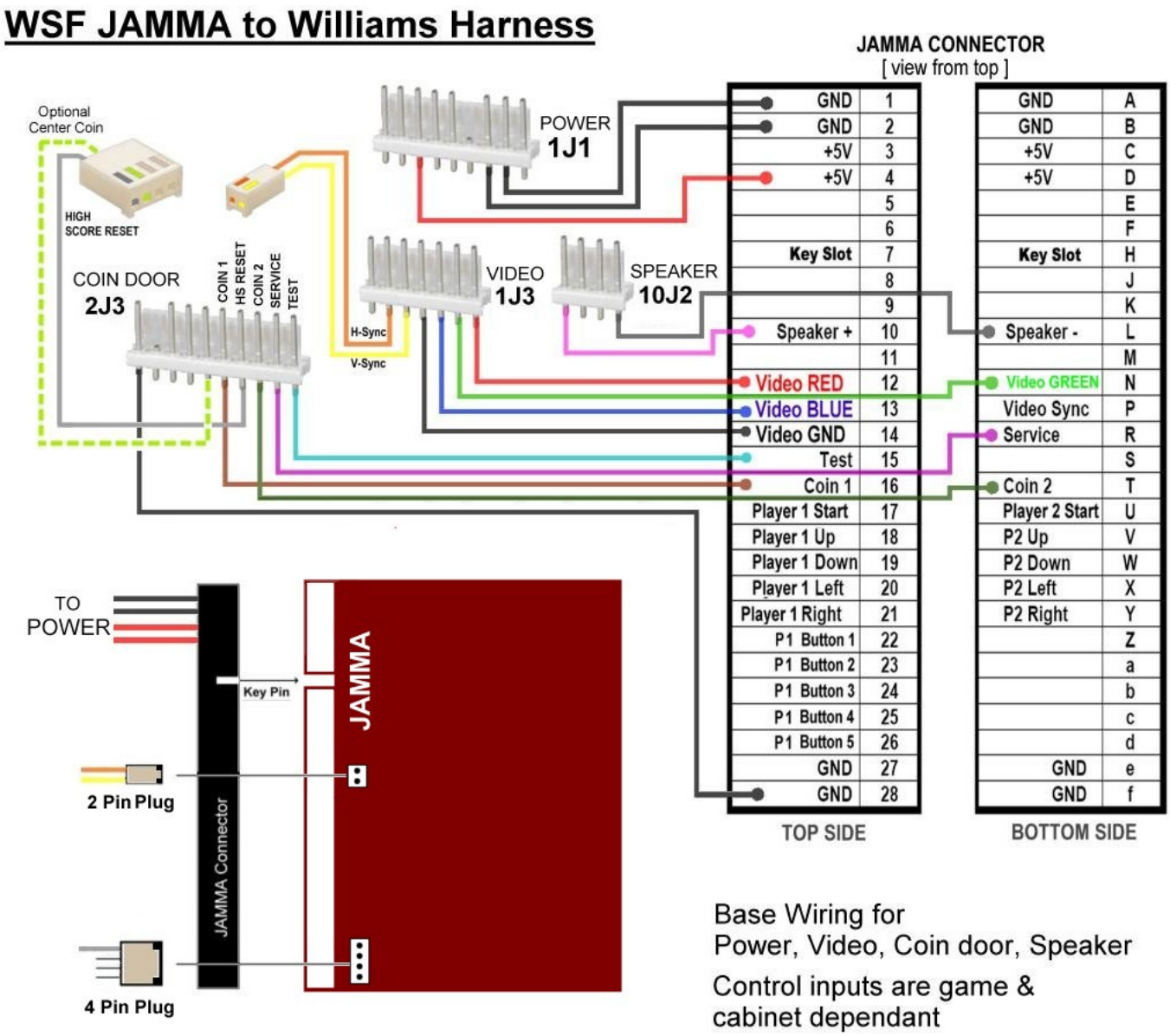
MCU Revisions

1.00R Initial Release
1.01R No-operational changes
1.02R Bug fix for disabled Defender sound:
When running Sinister from the menu Defender sound is disabled until next system reset

JAMMA Wiring Examples

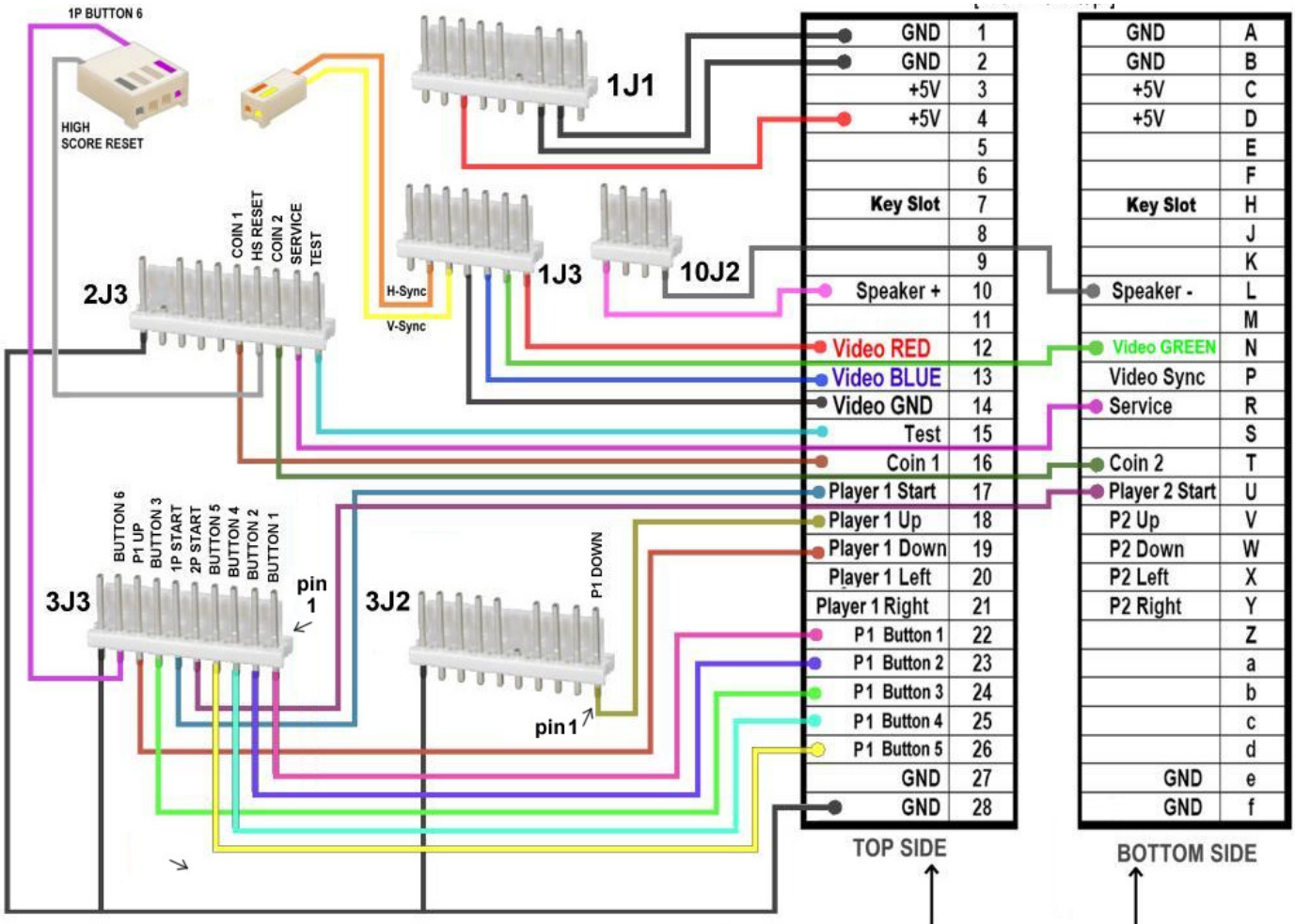
Base Wiring

Base wiring for a JAMMA board to original harness for Power, Video, Speaker and Coin Door.

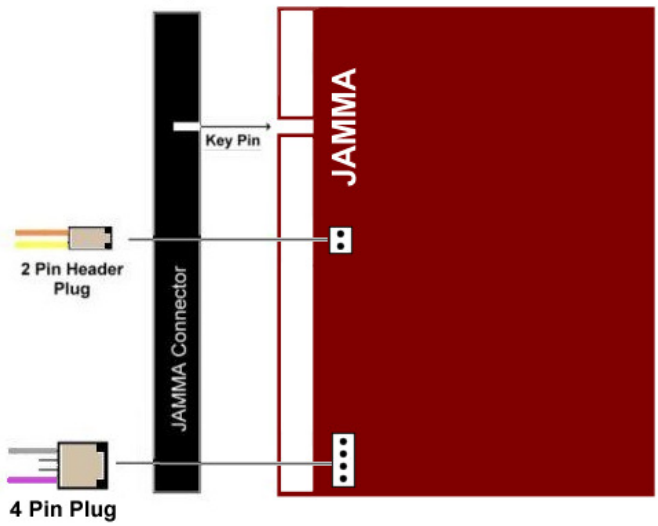


Control wiring would be separate and based on the game to be run.

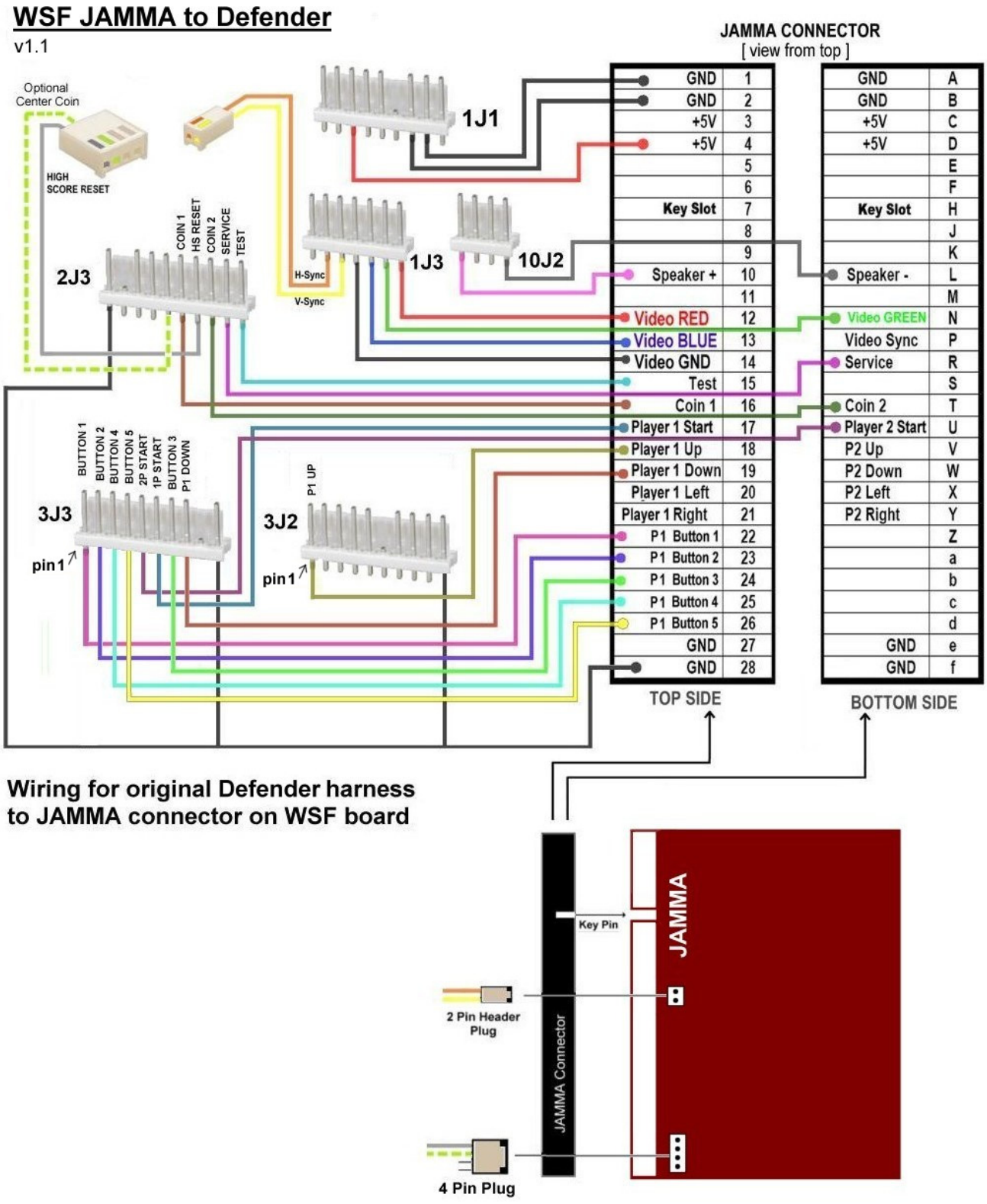
Stargate



Wiring for original stargate harness to JAMMA connector on WSF board

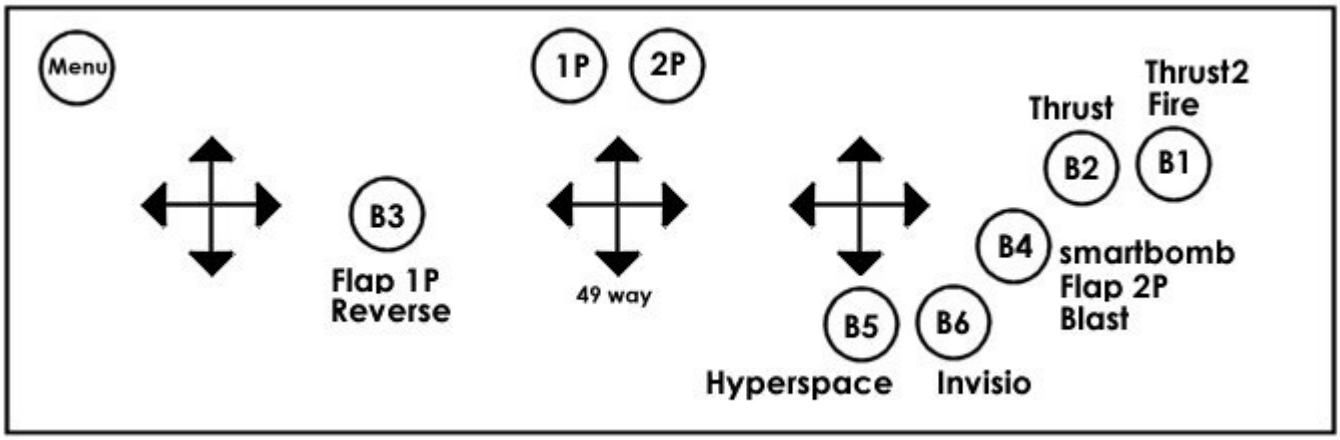


Defender


WSF JAMMA to Defender
v1.1
JAMMA CONNECTOR
[view from top]
Optional Center Coin
HIGH SCORE RESET
1J1
2J3
COIN 1
HS RESET
COIN 2
SERVICE
TEST
H-Sync
V-Sync
1J3
10J2
3J3
BUTTON 1
BUTTON 2
BUTTON 4
BUTTON 5
2P START
1P START
BUTTON 3
P1 DOWN
pin 1
3J2
P1 UP
pin 1
GND 1
GND 2
+5V 3
+5V 4
Key Slot 7
Speaker + 10
Video RED 12
Video BLUE 13
Video GND 14
Test 15
Coin 1 16
Player 1 Start 17
Player 1 Up 18
Player 1 Down 19
Player 1 Left 20
Player 1 Right 21
P1 Button 1 22
P1 Button 2 23
P1 Button 3 24
P1 Button 4 25
P1 Button 5 26
GND 27
GND 28
TOP SIDE
GND A
GND B
+5V C
+5V D
Key Slot H
Speaker - L
Video GREEN N
Video Sync P
Service R
Coin 2 T
Player 2 Start U
P2 Up V
P2 Down W
P2 Left X
P2 Right Y
GND e
GND f
BOTTOM SIDE
Wiring for original Defender harness
to JAMMA connector on WSF board
JAMMA
Key Pin
JAMMA Connector
2 Pin Header Plug
4 Pin Plug

Panel Button & Joystick Layout

For a multi-game panel the following layout could be used. The input mode would have to be set to standard and both Robotron and Splat would be set to Player 2 joystick input (“P2 Joystick”).



Note: This arrangement would not support Splat simultaneous Two Player mode. An additional two joysticks would need to be added.