mylFPGA

8088 All-in-One Gameboard

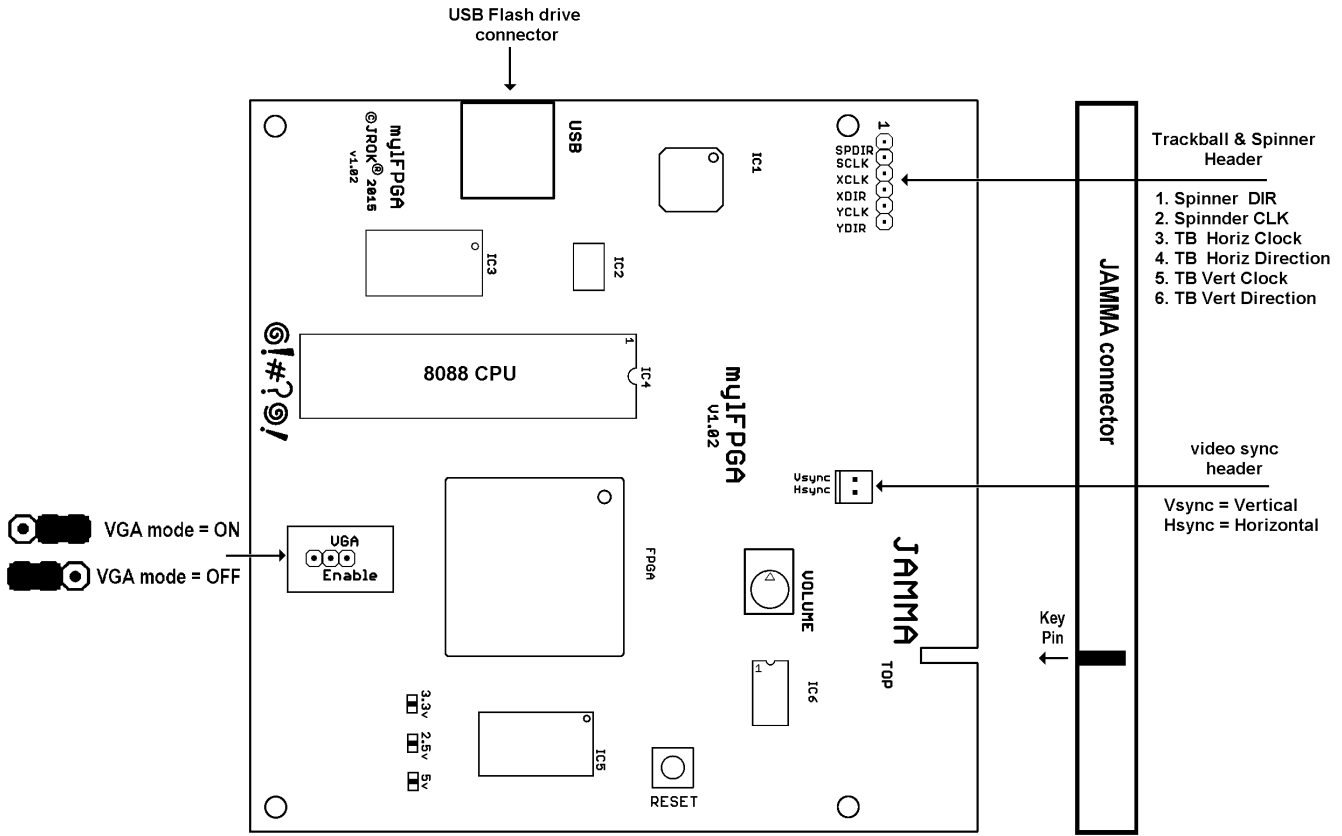**Setup Guide**
For v1.02 / 1.02 Rev.A / v1.03
board hardware

Table of Contents

Board Layout

Before plugging the board in make sure the connector is standard JAMMA and not a Capcom 56 way connector or another variation of 2 x 28 way edge connector.

A six pin headers is provided on the board for Spinner and Trackball inputs. If the spinner or trackball is not used this header does not need to be connected.

NOTE: Ensure the VGA enable is OFF when used in a standard resolution monitor !

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

Hardware & Connectors

Connectors

The board uses a standard JAMMA connector, in an upright cabinet player 1 & 2 joysticks and 4 buttons are required.

USB connector is only used for flash drives.

The six pin header on the board is used for trackball and spinner inputs.
Mating connector types are:
6 position = molex kk 0.1" 22-01-3067 or TE Connectivity/AMP CST-100 0.1" 770602-6

Monitor Horizontal and Vertical sync, the 2 pin header provides separate positive going Horizontal and Vertical synchronization pulses. This should only be used if a monitor does not have a composite sync input option.

NOTE: Composite sync is provided on the JAMMA edge connector.

Mating connector types are:
2 position = molex kk 0.1" 22-01-3027 or TE Connectivity/AMP CST-100 0.1" 770602-2

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** 500mA power supply should be used to ensure stable operation.

If long runs of cabling are used significant voltage drop will 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

JAMMA wiring

Joystick Direction

An 8-way stick must be used to support all games. If a joystick is used without being rotated 45 degrees for q*bert support the setup option of "Angle stick" can be used. This option requires two joystick switches in the corner positions to be activated before registering a movement. For example UP & LEFT, DOWN & RIGHT.

Player 1 joystick controls, or player 2 in cocktail mode

JAMMA switch	**Q*Bert Direction**
UP	UP & RIGHT
LEFT	UP & LEFT
DOWN	DOWN & LEFT
RIGHT	DOWN & RIGHT

3 Stooges Joysticks Wiring

The game '3 stooges' requires 3 joysticks and 3 buttons. The single button required for Player 1 and 2 are automatically mapped to the JAMMA Player 1 Start and JAMMA Player 1 button 1, for player 1 and JAMMA Player 2 Start and JAMMA Player 2 button 1, for player 2.

So both JAMMA player 1 start and JAMMA player 1 button 1 act as the player 1 button in the game.

Left Player	Player 1 Joystick Player 1 Button 1 & Player 1 Start
Middle Player	Player 2 Joystick Player 2 Button 1 & Player 2 Start
Right Player	Player 1 button 3 = UP Player 1 button 4 = RIGHT Player 2 button 3 = DOWN Player 2 button 4 = LEFT Player 1 button 2 (= start / fire / throw)

Q*Bert Knocker

A solenoid knocker (Kicker) is supported for Q*Bert and should be wired to:
JAMMA coin COUNTER 2 connector.

- The knocker **MUST BE FUSED** with a 1A slow blow fuse.
- **DO NOT CONNECT THE SOLENOID TO JAMMA COIN 1 or COIN 2 inputs**

Direction of diode

12 to 40v

FUSE

JAMMA connector COIN COUNTER 2
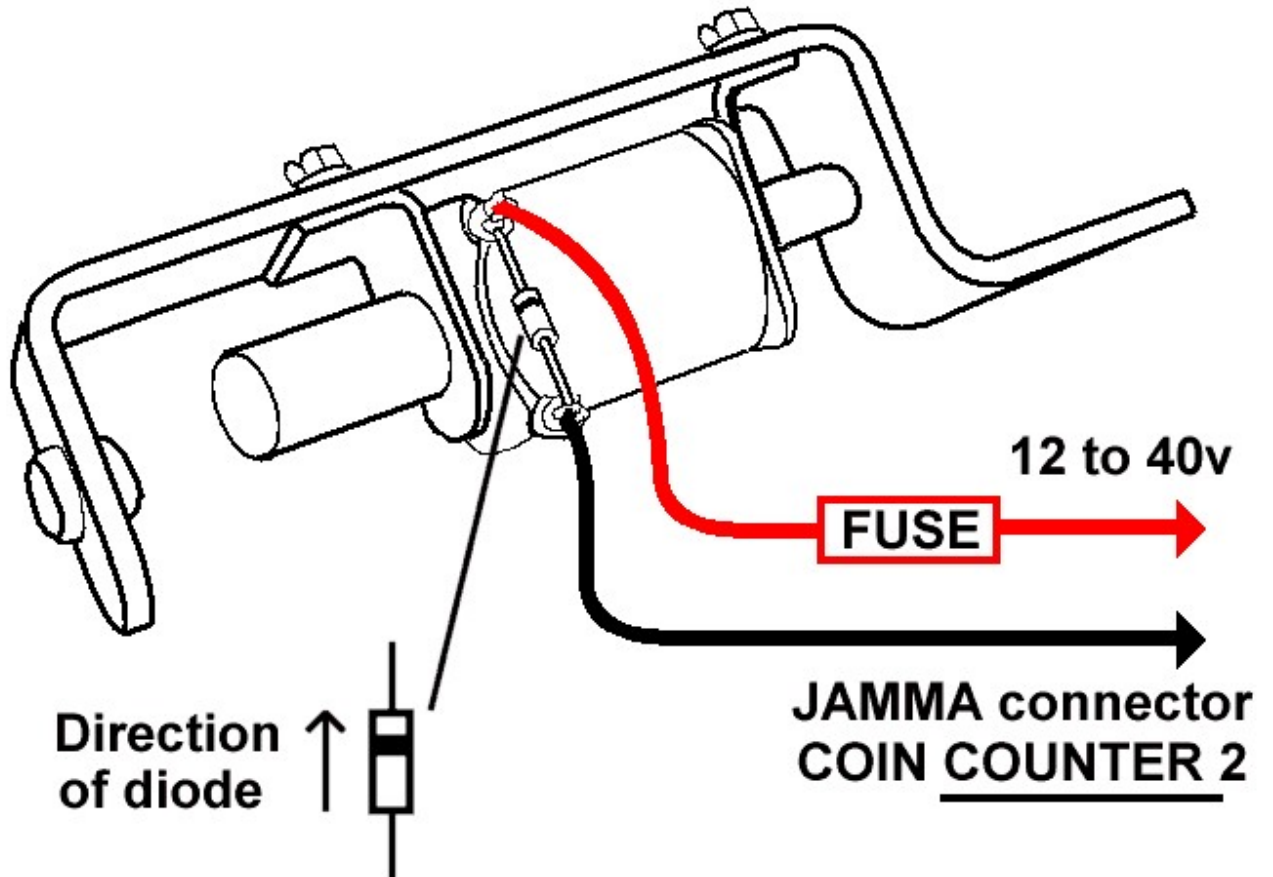
DO NOT CONNECT TO JAMMA COIN 1 or COIN 2

Two possible coils can be used **DEPENDING ON THE VOLTAGE USED !**

In a system where only 12v is available to drive the knocker solenoid the alternative coil can be used.

30v DC (Standard Coil)	A-5195	12.3 ohm
12v DC	A-5194	4.8 ohm

Knocker JAMMA Connector Pin

On a standard JAMMA harness, 'Coin Counter 2' is the control for the knocker solenoid.

The picture below shows which pin should be populated and connected to the knocker.
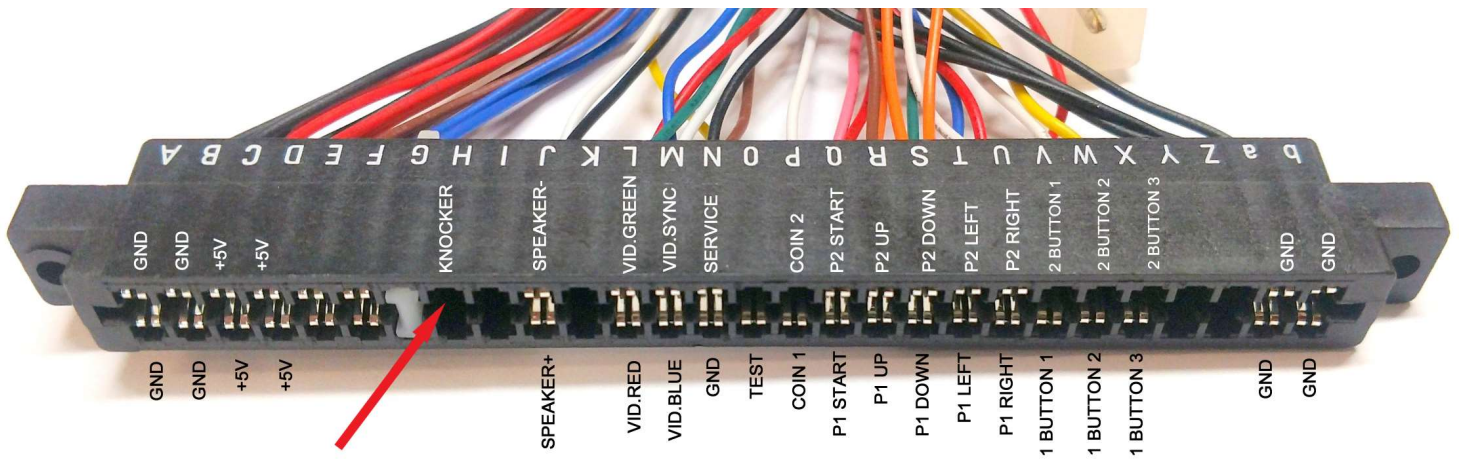
KNOCKER pin

Note: The JAMMA connector pictured is flipped so the bottom side is facing up.

Spinner & Trackball Wiring

Spinner
Pins 1 & 2 on the 6 pin header are used for a spinner.
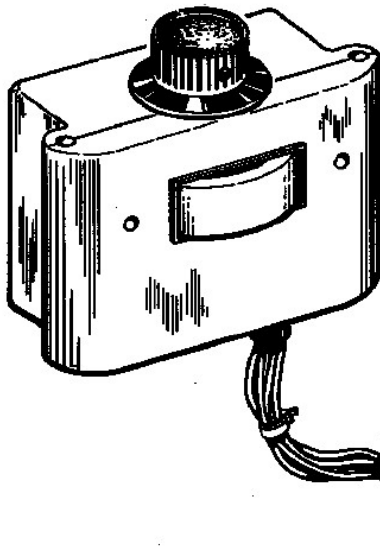
Spinner Wiring

To 6 pin Header

CLK P1 → **Pin 2 - SCLK**

DIR → **Pin 1 - SPDIR**

+5V DC → **Power supply
5V and GND**

GND →

Trackball
Pins 3, 4, 5, 6 on the 6 pin header are used for a trackball.

Trackball Wiring

GND — P1	**Power supply**
+5V DC	**5V and GND**

Y1	pin 6 - YDIR	
Y2	pin 5 - YCLK	6 pin Header
X1	pin 4 - XDIR	
X2	pin 3 - XCLK	
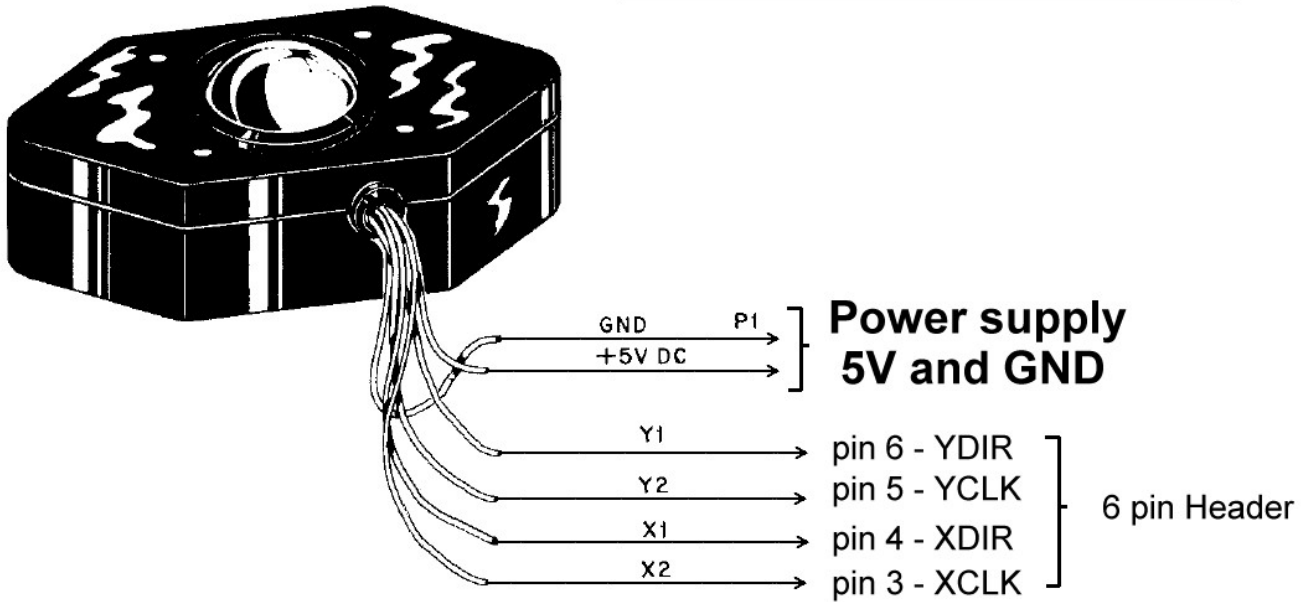
NOTE: boards before version "1.02 Rev.A" may require upgraded opto sensors in the trackball or spinner.

Select & Play Menu

After power on tests have completed and the "BOOT TO" option is set to "menu" the game select screen will be displayed.

To select a game or Setup use the player 1 joystick up & down, or 2 player start, Press player 1 start to choose the option selected.

During gameplay, when the "BUTTON TIMER" option has been set to 1, 2 or 4 seconds, pressing and holding both "player 1 start" and "player 2 start" buttons together at the same time, the system will restart back to the game menu after 1,2 or 4 seconds.

Changing Individual Game Setting & Options – "Test Mode"

Each game maintains a set of options & parameters which are independent from the setup menu and DIP switch settings. **Changing game settings must be done from within the game when it is selected and running**. These settings cannot be changed from the system setup menu.

To change in-game options requires the following:

JAMMA TEST   - position "15" to be wired to a switch
JAMMA SERVICE   - position "R" to be wired to a button.

After a game has been selected and is running the original Test Mode screens are available through the JAMMA "TEST" switch.

Depending on the particular game the Test Mode is used to change game options, clear bookkeeping or run board tests.

The JAMMA test switch is connected to the game "TEST" switch and when enabled takes the booted game into the "TEST MODE" display. Also the JAMMA service button is connected to the game "SELECT" button.

NOTE: See the board "SETUP MENU" option "TEST SWITCH" that controls if the switch is active closed or active open.

Q*bert as an example:

Starting Q*Bert and activating the JAMMA TEST switch will start the game "TEST MODE".

The JAMMA "SERVICE" button steps though the options (a short press) or selects that option (a long press). Details of the game option settings can be found in the specific game manual.

SETUP MENU

Option Setup Menu can be accessed from the Main Menu if "SETUP" is enabled in the "Game Enable Menu".

If the SETUP menu is **disabled** or "BOOT TO" is set to a game use the following method to get to setup menu.

Method 1:

- Press and hold the "SERVICE / CREDIT" switch button on the JAMMA harness and press RESET on the board, or power the machine on.

Method 2:

NOTE: This method can be disabled in the setup menu under the "BOOT TO SETUP" option.

- Press and hold Player 1 and player 2 start buttons and press RESET on the board, or power the machine on.

Options Setup

The setup menu allows the system settings, game setup and dip switches to be changed.
Also screen test and Game ROM loading.

```
OPTION SETUP   M:1.00 F:0.00


    SYSTEM SETUP
    GAME SETUP
    SET DIP SWITCH
    SWITCH TEST
    MONITOR TEST
    GAME ENABLE MENU
    LOAD GAME ROMS
    SYSTEM UPDATE
    EXIT
```

SYSTEM SETUP

```
OPTION SETUP   M:1.00 F:0.00
 BOOT TO           : *MENU*
 HOLD FOR MENU     : 1 SEC
 SCREEN SAVER      : ON
 QB ANGLE STICK    : OFF
 SPINNER           : BUTTONS
 TRACKBALL         : JOYSTICK
 FIRE CONTROLS     : JOYSTICK
 FLIP SCREEN       : OFF
 ROTATE SCREEN     : OFF
 VGA SCAN LINES    : OFF
 TEST SWITCH       : ON = RUN
 BOOT TO SETUP     : 1P & 2P
 START BUTTONS     : ON PRESS
 EXIT
```

BOOT TO

Select the game the machine should boot to when powered on. Default is the Menu.

If the game ROMs are loaded, any loaded game can be chosen.

It is recommended that when using "Boot To" then the "Button Timer" should be set to "OFF" so the game select menu will be disabled and never displayed.

HOLD FOR MENU

1/2/4   Number of seconds that holding down 1P & 2P start buttons together will reset the board and jump back to the game main menu IF the menu is set in "BOOT TO".

OFF   Disable the option to jump to then main menu when holding 1P & 2P start buttons.

SCREEN SAVER

ON/OFF
If no buttons are pressed on the game select screen for approximately 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.

QB ANGLE STICK

ON/OFF
When using an 8-way joystick not installed at an angle, movement of is only reported when the joystick is moved into the corners. Two joystick switches must be engaged for the game to register joystick movement.

When using a 4 way or 8 way joystick installed at 45 degree angle this option should be disabled.

SPINNER

Allows for using a spinner for control in Mad Planets, also the use of a trackball or player buttons 1 & 2 to report the trackball.

BUTTONS   Player 1 buttons 1 and 2 are used for Rotate Left and Rotate Right
JOYSTICK 2   Player 2 joystick control left & right Rotate
SPINNER   Spinner input is used for spinner control
TKBALLH   Horizontal movement of the trackball reports as a spinner

NOTE: use of a spinner uses pins 5 & 6 on the expansion header or pins 1,2,3,4 for trackball control on the expansion header.

TRACKBALL

Allows for using a trackball or a joystick.

JOYSTICK   Joystick input is used to simulate the control of a trackball
ENABLED   Trackball input is enabled

NOTE: use pin 1,2,3,4 for trackball control on the expansion header.

FIRE CONTROLS

For games that feature a second joystick for directional fire, this allows the use of either the JAMMA player 2 joystick or player 1 buttons 1,2,3,4 for directional fire.

JOYSTICK   Player 2 Joystick controls directional fire
BUTTONS   Player 1 buttons 1,2,3,4 are use for FIRE UP / DOWN/ LEFT/ RIGHT

FLIP SCREEN

ON/OFF
Screen is flipped either horizontally or vertically depending on game orientation.

ROTATE SCREEN

This option allows horizontal games to be played on a vertically mounted monitor, or vertical games to be played on a horizontally mounted monitor

OFF	No rotation
V to H	Vertical games are rotated 90 degrees to be displayed on a horizontal monitor.
H to V	Horizontal games are rotated 90 degrees to be displayed on a vertical monitor.

VGA SCAN LINES

Adds blank lines in the display to simulate a standard resolution monitor. This option is **only** available in VGA mode.

ON	Blanks every other video line
OFF	All video lines are displayed

TEST SWITCH

Controls if the test switch should be closed for the game to go into test mode, or open to go into test mode.

ON = RUN	Test switch close (ON) for the games to run
OFF = RUN	Test switch should be open (OFF) for game to run(*)

Default for JAMMA is the test switch is in OFF position for games to run and ON position to start the game's test mode.

BOOT TO SETUP

During system boot, or reset, the SETUP menu can be access by wither pressing and holding 1P & 2P start, or by holding the credit switch. This option allows the 1P & 2P start option to be disabled.

1P & 2P	When system is booting from power on or reset holding 1P & 2P start buttons will cause the machine to go into the setup menu.
SERVICE	If the setup menu has been disabled from the main menu the only way to get into setup is to hold the JAMMA SERVICE/CREDIT switch down during booting.

START BUTTON MODE

ON PRESS   The player start button are passed directly to the game as soon as they are pressed.

ON RELEASE   The player start buttons are passed to the game for ½ a second AFTER the start button is released.

Default setting is "ON PRESS" so a game will start when the button is pressed.

GAME SETUP

This screen allows configuration of game options.

```
GAMES SETUP   M:1.01 F:1.03
MP FAST BOOT     : ON
REACTOR HS SAVER : ON
GAME BOOT SPEECH : ON
SPEECH FREQ ADJ  : 00 [*]
SPEECH VOL  ADJ  : 00 [*]
SPINNER DELAY    : 0
EXIT
```

NOTE: Speech Freq Adj, Speech Vol Adj, Spinner delay NOT available on Menu version 1.00

MP FAST BOOT

Allows Mad Planets to perform a fast boot, the ROM test and "clear-ultras scores" at power up is bypassed.

ON   Fast boot enabled.
OFF   Long ROM test and clear daily scores is displayed, approx 30 seconds boot time.

Note: This option should be turn ON if ultra-scores are to be cleared.

REACTOR HS SAVER

When "ON" adds a high-score saving patch to reactor, so scores are saved after the game is exited or the machine reset. To clear scores turn the option "OFF" and restart Reactor.

ON   Score saving patches are applied.
OFF   Scores are reset every time the game is booted

GAME BOOT SPEECH

Enables the startup speech for Q*Bert, MY Q*bert, FHMC Q*bert, Q*bert's Qubes and Reactor.

ON   Speech at startup.
OFF   No speech at startup.

Menu Version 1.01 Additional Features.

These features are ONLY available with FPGA firmware version 1.03 and MCU firmware version 1.01
Although the menu is compatible with all version of the FPGA & MCU firmware these options will have no effect.

SPEECH FREQ ADJ:

Setting from 00 to 0F   [*] shows default value

Allows the speech frequency for Q*bert and Reactor to be adjusted, 00 is the default frequency, 0F is the maximum frequency.

SPEECH VOL ADJ:

Setting from 00 to 0F   [*] shows default value

Sets the relative volume of speech to the game sound effects, 00 is the default value with 50/50 mix between speech and sound effects. 0F is the maximum with speech 4x louder than default.

SPINNER DELAY:

Settings from 0 to 63

To allow for spinners with higher counts per rotation, this controls the number of spinner pulses read before recording the direction of the spinner and passing it to the game hardware.

Press and hold Player 1Start button to auto-increment the value, joystick left decreases value by 10, joystick right increases value by 10.

For a standard spinner with 24 pulse clock per rotation the value should be set to 0.   Depending on the resolution of the spinner used, the delay should be set to give the nearest result to 24.

Examples:

1200 pulses per revolution => spinner delay => (1200/24) = 50
72 pulses per revolution => spinner delay => (72/24) = 3

SET DIP SWITCHES

Game DIP switch options for each game can be configured in this menu,

```
SET DIP SWITCHES
-------------------------
Q*BERT
M-Y Q*BERT
FHMC Q*BERT
Q*BERTS QUBES
MAD PLANETS
KRULL
REACTOR
SCREW LOOSE
3 STOOGES
QB QUBES [CT]
ARGUS
EXIT
```

Q*BERT

```
SETTINGS : Q*BERT
-------------------------
AUTO ADVANCE  : OFF
ATTRACT SOUND : ON
FREEPLAY      : ON
CABINET TYPE  : UPRIGHT
KICKER        : ON
EXIT
```

Mellow Yellow Q*Bert

```
SETTINGS : M-Y Q*BERT
-------------------------
AUTO ADVANCE  : OFF
ATTRACT SOUND : ON
FREEPLAY      : OFF
CABINET TYPE  : UPRIGHT
KICKER        : ON
EXIT
```

Faster Harder More Challenging Q*Bert

```
SETTINGS : FHMC Q*BERT
-------------------------
AUTO ADVANCE  : OFF
ATTRACT SOUND : ON
FREEPLAY      : OFF
CABINET TYPE  : UPRIGHT
KICKER        : ON
EXIT
```

Q*Berts Qubes

```
SETTINGS : Q*BERTS QUBES
-------------------------
ATTRACT SOUND : ON
COIN/CREDIT   : A2/1 B1/2
EXTRA LIFE AT : 15K
ADD LIFE EVERY: 25K
DIFFICULTY    : HARD
EXIT
```

Mad Planets

```
SETTINGS : MAD PLANETS
-------------------------
DEMO MODE     : OFF
ATTRACT SOUND : ON
COIN/CREDIT   : FREEPLAY
LIVES/SHIPS   : 3
BONUS         : 10K
DIFFICULTY    : STANDARD
EXIT
```

Krull

```
SETTINGS : KRULL
-------------------------
LIVES/SHIPS   : 3
ATTRACT SOUND : ON
COIN/CREDIT   : FREEPLAY
HEXAGON       : ROVING
DIFFICULTY    : STANDARD
BONUS         : 30K & 30K
EXIT
```

Reactor

```
SETTINGS : REACTOR
-------------------------
ATTRACT SOUND : ON
LOGO SOUND    : ON
CABINET TYPE  : UPRIGHT
FREEPLAY      : ON
COIN/CREDIT   : 1C/1CRED
BOUNCE CHAMBER: 15 PTS
BONUS         : 15K
EXIT
```

Screw Loose

```
SETTINGS : SCREW LOOSE
-------------------------
FREEPLAY      : OFF
ATTRACT SOUND : OFF
HANDS         : 5
COIN/CREDIT   : 1C/2CRED
BONUS HAND    : 5K
BONUS ATOM    : 50K
DEMO MODE     : OFF
EXIT
```

3 Stooges

```
SETTINGS : 3 STOOGES __
----------------------

LIVES/SHIPS  : 3
ATTRACT SOUND : ON
COIN/CREDIT  : FREEPLAY
DIFFICULTY   : STANDARD
BONUS        : 10K & 20K
EXIT
```

Q*Berts Qubes [Cocktail]

```
SETTINGS : QB QUBES [CT]
----------------------

ATTRACT SOUND : OFF
CABINET TYPE  : COCKTAIL
EXIT
```

Argus

```
SETTINGS : ARGUS __
----------------------

FREEPLAY     : OFF
ATTRACT SOUND : ON
HUMANS       : 4
BONUS        : 15K
DIFFICULTY   : NORMAL
EXIT
```

SWITCH TEST

Allows testing of the JAMMA control inputs for both cocktail and upright inputs.

Each button, joystick and switch input state is displayed.

```
             SWITCH  TEST

COIN 1   :OFF       COIN 2   :OFF
1P START:OFF        2P START:OFF
1P UP    :OFF       2P UP    :OFF
1P DOWN :OFF        2P DOWN :OFF
1P LEFT :OFF        2P LEFT :OFF
1P RIGHT:OFF        2P RIGHT:OFF
1P BTN 1:OFF        2P BTN 1:OFF
1P BTN 2:OFF        2P BTN 2:OFF
1P BTN 3:OFF        2P BTN 3:OFF
1P BTN 4:OFF        2P BTN 4:OFF
TEST     :OFF       SERVICE :OFF

TRACKBALL H: 00
TRACKBALL V: 00

SPINNER    : 00


-HOLD 1P & 2P START TO END-
```

Trackball & Spinner

When a trackball or spinner is connector rotating or rolling will cause the trackball or spinner counters below the switch display to increase or decrease depending on the direction of spin.

MONITOR TEST

Use this option to adjust a monitor and check primary colors.

Player 1 Start steps through each test and Player 2 start ends the test.

Grid pattern for image centering

Red, Green, Blue, White color Bars

Red, Green,Blue,White

GAME ENABLE MENU

This menu allows loaded games to be displayed as options on the main game menu.

If a game ROM has not been loaded that game will display [NO ROM] and cannot be selected.

```
ENABLE OR DISABLE GAMES

Q*BERT           :  OFF
M-Y Q*BERT        [NO ROM]
FHMC Q*BERT       [NO ROM]
Q*BERTS QUBES     [NO ROM]
MAD PLANETS       [NO ROM]
KRULL             [NO ROM]
REACTOR           [NO ROM]
SCREW LOOSE       [NO ROM]
3 STOOGES         [NO ROM]
QB QUBES [CT]     [NO ROM]
ARGUS             [NO ROM]
SETUP MENU       :  ON
EXIT
```

When a game ROM has been loaded, setting the option to ON will display the game in the main menu list of games, setting to OFF it will not be displayed on the menu.

If the setup menu needs to be disabled from the main list, set that option "OFF" on the list.

NOTE:

- If the setup menu has been disabled, if can still be booted into, see the "SETUP MENU" section and the "BOOT TO SETUP" option detail in this manual.

- When no games are loaded the SETUP MENU will automatically be enabled and cannot be turned off.

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".

```
LOAD GAME ROMS

Q*BERT          [LOADED]
M-Y Q*BERT      [EMPTY]
FHMC Q*BERT     [EMPTY]
Q*BERTS QUBES   [EMPTY]
MAD PLANETS     [EMPTY]
KRULL           [EMPTY]
REACTOR         [EMPTY]
SCREW LOOSE     [EMPTY]
3 STOOGES       [EMPTY]
ARGUS           [EMPTY]
LOAD mylall.bin IMAGE
ERASE ALL ROM IMAGES
EXIT
```

- 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 mylall.bin IMAGE" loads a single binary file containing all the game ROM images
  See later in this section for details.

- "ERASE ALL ROM IMAGES" will clear the ROM storage area of the internal flash on the gameboard.

NOTE:

Q*Berts Qubes [Cocktail version [is a patch set based on the standard Q*bert's Qubes ROM set. Once Qubes is loaded the cocktail version is automatically enabled.

Single File Loading [mylall.bin]

All ROMs can be loaded at once from the file **MYLALL.BIN**

It contains the concatenated ROM files for all games, loading will automatically enable all loaded games.
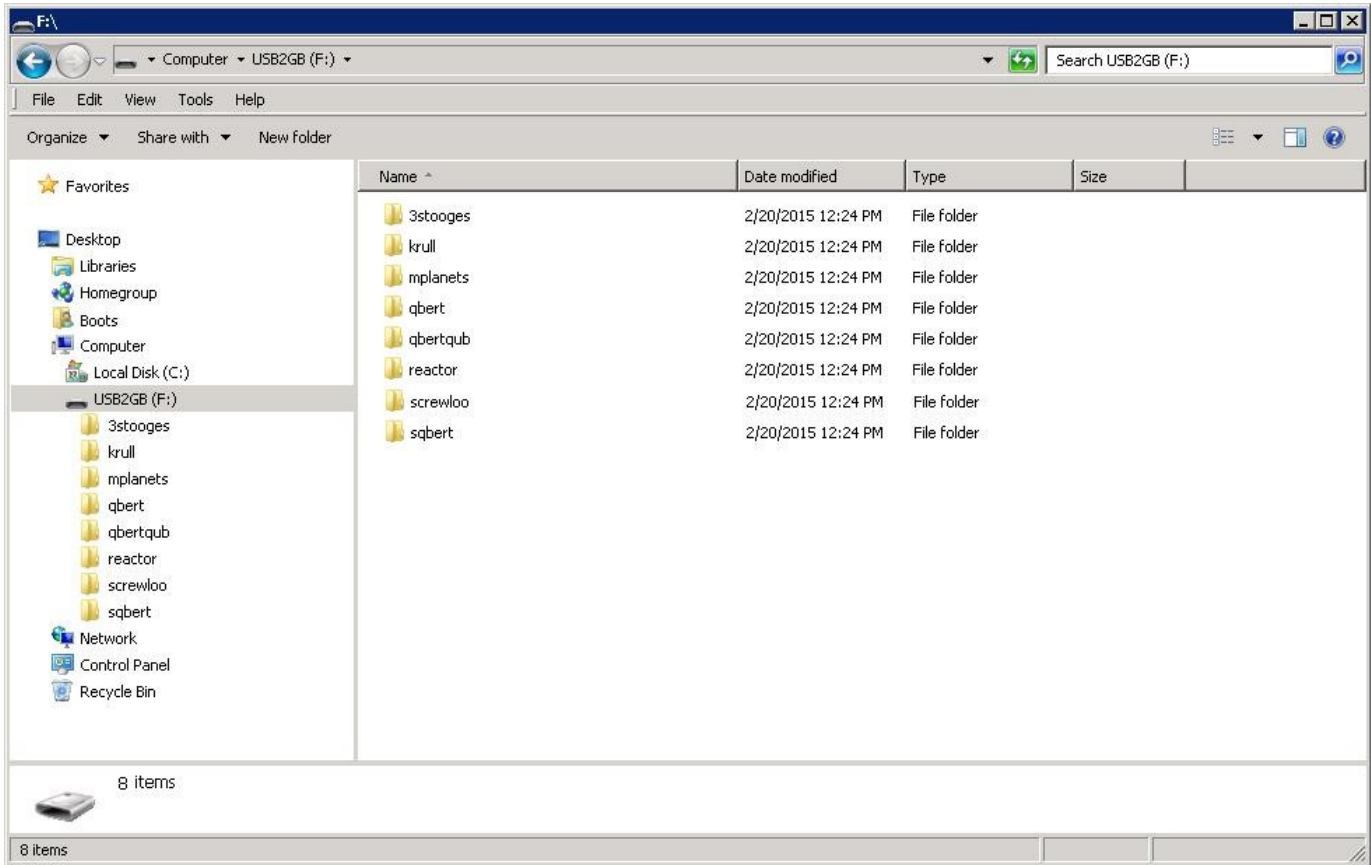
The file needs to be placed in the top level directory of the flash drive.
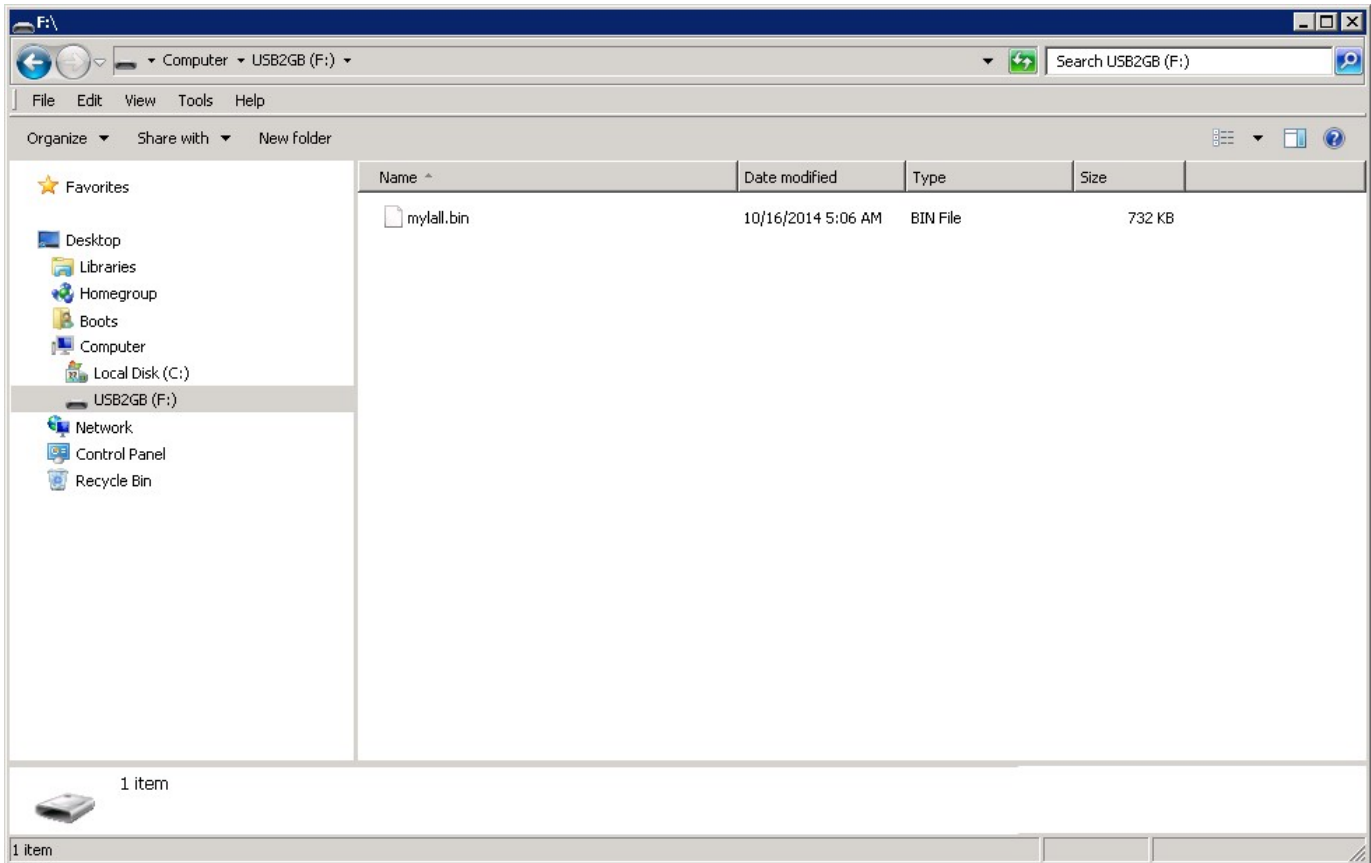
USB Flash Drive Folder/Directory Structure Layout

This screen shot shows the folder directory structure of a USB flash drive called "USB2GB".

The files should be placed in the directory folders in this image.

See the next section for the file names for the ROM files required in each directory.

Game Directory/Folder Name & Filename

The following tables give the name of the directory and the ROM files names that are needed for each game.

QBERT		
Directory/Folder Name	**ROM File Name:**	**Size**
qbert	qb-fg0.bin qb-fg1.bin qb-fg2.bin qb-fg3.bin qb-rom2.bin qb-rom1.bin qb-rom0.bin qb-bg0.bin qb-bg1.bin qb-snd1.bin qb-snd2.bin	8192 8192 8192 8192 8192 8192 8192 4096 4096 2048 2048

M-Y Q*BERT		
Directory/Folder Name	**ROM File Name:**	**Size**
qbert	mqb-fg0.bin mqb-fg1.bin mqb-fg2.bin mqb-fg3.bin mqb-rom2.bin mqb-rom1.bin mqb-rom0.bin qb-bg0.bin qb-bg1.bin mqb-snd1.bin mqb-snd2.bin	8192 8192 8192 8192 8192 8192 8192 4096 4096 2048 2048

FHMC Q*BERT		
Directory/Folder Name	**ROM File Name:**	**Size**
sqbert	qb-fg0.bin qb-fg1.bin qb-fg2.bin qb-fg3.bin qb-rom2.bin qb-rom1.bin qb-rom0.bin qb-bg0.bin qb-bg1.bin qb-snd1.bin qb-snd2.bin	8192 8192 8192 8192 8192 8192 8192 4096 4096 2048 2048

QBERT'S QUBES		
Directory/Folder Name	**ROM File Name:**	**Size**
qbertqub	qq-fg0.bin qq-fg1.bin qq-fg2.bin qq-fg3.bin qq-rom3.bin qq-rom2.bin qq-rom1.bin qq-rom0.bin qq-bg0.bin qq-bg1.bin qq-snd1.bin qq-snd2.bin	16384 16384 16384 16384 8192 8192 8192 8192 4096 4096 2048 2048

MAD PLANETS		
Directory/Folder Name	**ROM File Name:**	**Size**
mplanets	fg0.k4 fg1.k5 fg2.k6 fg3.k7-8 rom4.c16 rom3.c14-15 rom2.c13-14 rom1.c12-13 rom0.c11-12 bg0.e11-12 bg1.e13 snd1 snd2	8192 8192 8192 8192 8192 8192 8192 8192 8192 4096 4096 2048 2048

KRULL		
Directory/Folder Name	**ROM File Name:**	**Size**
krull	fg0.bin fg1.bin fg2.bin fg3.bin rom4.bin rom3.bin rom2.bin rom1.bin rom0.bin ram2.bin ram4.bin snd1.bin snd2.bin	8192 8192 8192 8192 8192 8192 8192 8192 8192 4096 4096 2048 2048

REACTOR		
Directory/Folder Name	**ROM File Name:**	**Size**
`reactor`	rom0 rom1 rom2 rom3 rom4 rom5 rom6 rom7 snd1 snd2 fg0 fg1 fg2 fg3	4,096 4,096 4,096 4,096 4,096 4,096 4,096 4,096 2,048 2,048 4,096 4,096 4,096 4,096

SCREWLOOSE		
Directory/Folder Name	**ROM File Name:**	**Size**
`Screwloo`	fg0 fg1 fg2 fg3 rom4 rom3 rom2 rom1 rom0 bg0 bg1 drom1 yrom1	8192 8192 8192 8192 8192 8192 8192 8192 8192 4096 4096 8192 8192

3 STOOGES		
Directory/Folder Name	**ROM File Name:**	**Size**
3stooges	gv113fg0 gv113fg1 gv113fg2 gv113fg3 gv113rom.4 gv113rom.3 gv113rom.2 gv113rom.1 gv113rom.0 gv113ram.4 drom1 yrom2 yrom1	8192 8192 8192 8192 8192 8192 8192 8192 8192 4096 8192 8192 8192

ARGUS		
Directory/Folder Name	**ROM File Name:**	**Size**
Argus	arg_ram2_2732.c7 arg_ram4_2732.c9c10 arg_rom4_2764.c16 arg_rom3_2764.c14c15 arg_rom2_2764.c13c14 arg_rom1_2764.c12c13 arg_rom0_2764.c11c12 arg_fg3_2764.k7k8 arg_fg2_2764.k6 arg_fg1_2764.k5 arg_fg0_2764.k4 arg_snd1_2716.u5 arg_snd2_2716.u6	4096 4096 8192 8192 8192 8192 8192 8192 8192 8192 8192 2048 2048

SYSTEM UPDATE

This menu option is only used when there are updates to the firmware of the board.

Selecting an update option will check the USB flash drive for the type of update file, verify it, load the file and reboot the system.

```
SYSTEM UPDATES

UPDATE BOOT MENU
UPDATE FPGA FIRMWARE
UPDATE SYSTEM MCU
EXIT
```

The unzipped Update files should be place in the top level (root) directory of the flash drive and the option for each type of update selected.

Note: If the version of the update file found on the flash drive is older than the loaded version, the file will not be loaded.

NOTE:
Menu version 1.01 and above will display the version of the MENU, FPGA and MCU in the lower half of the screen.

```
SETTINGS : 3 STOOGES
--------------------

LIVES/SHIPS    : 3
ATTRACT SOUND  : ON
COIN/CREDIT    : FREEPLAY
DIFFICULTY     : STANDARD
BONUS          : 10K & 20K
EXIT
```

VGA Monitor Support & Socket Wiring

The board supports native VGA support without the use of an additional adapter or scan converter. To use a standard 15 pin VGA cable the RGB, composite sync and GND from the JAMMA connector should be wired to a female 15 pin high-density D connector. The diagram on this pages shows the necessary connections.

The standard JAMMA pins for Red, Green, Blue & composite video sync are used for VGA output.

The VGA Enable jumper must be set to the upper (ENABLE) position. See page 2 for the jumper location.

VGA connector & pins used

Pinout

1 RED
2 GREEN
3 BLUE

6 GND (Ground)

13 Sync
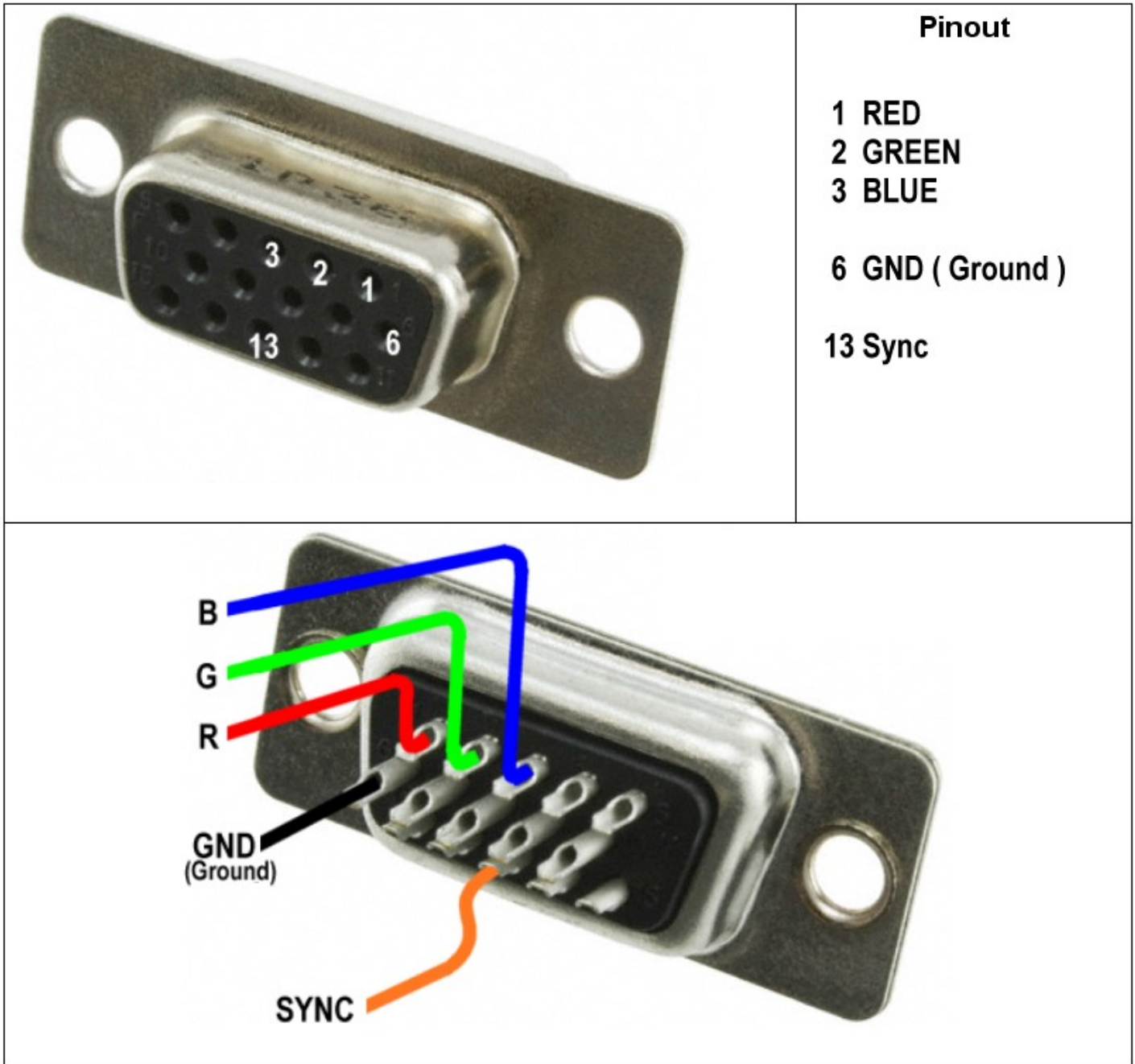
Current Versions

Current Firmware and Menu revisions

- MENU v1.04

- FPGA   v1.09

- MCU   v1.04

Revision History

FPGA Revisions
0.xx   BETA release
1.02   Initial Release
1.03   Feature Update: Spinner delay added
1.04   Q*bert Qubes crash bug fix
1.05   Krull sound trigger bug fix
1.06   Screwloose joystick 2 fire direction bug fix
1.07   Video vertical sync adjustment, start at same time as vertical blank (match with original hardware)
        Improved joystick mode for Reactor (seriously it should only be played with a trackball).
1.08   Corrected timing issue between main CPU and USB MCU which could cause corrupted text during ROM
        loading and system update operations.
1.09   Support for ARGUS added

MENU Revisions
0.xx   BETA release
1.00   Initial Release
1.01   Support for spinner delay, speech volume and frequency adjustment
        Bugfix: Reactor display flipped when in H to V rotation mode
1.02   Patch Loader option added
1.04   Support for ARGUS

MCU Sound Controller
1.00R   Initial release
1.01   support for speech volume & frequency adjustment
1.03   MCU reflash update pause & wait bug fix
1.04   Support for ARGUS added

Manual Revision
0.1   Initial Release
0.2   Addition of VGA wiring diagram
0.3   New features of firmware updates
0.4   Firmware updates
0.5   Stooges joystick wiring
0.6   Argus added, game test/setup mode added
0.7   JAMMA connector knocker pin picture & detail