

DMD Extender

Application Note 2 Bally/Williams LCD Replacement

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Important



This document is a guide to installing an LCD panel to replace a plasma display in Bally/Williams pinball machines.

The user installs the DMD Extender and LCD Panel Kit entirely at their own risk – Dr Pinball cannot accept responsibility for damage or other problems caused by this system or its use.

The installation instructions are given purely as a guide. The user must exercise caution when performing the installation.

Introduction

This Application Note is a guide to replacing the 128 X 32 dot DMD plasma panels in all Bally / Williams DMD games. Some of these games include a lamp panel below the existing display – the position of the LCD replacement screen should be adjusted upwards to allow for this.

What's Needed

This section details what is needed to complete the installation.

Tools

Set of Imperial sized sockets – small

Saw

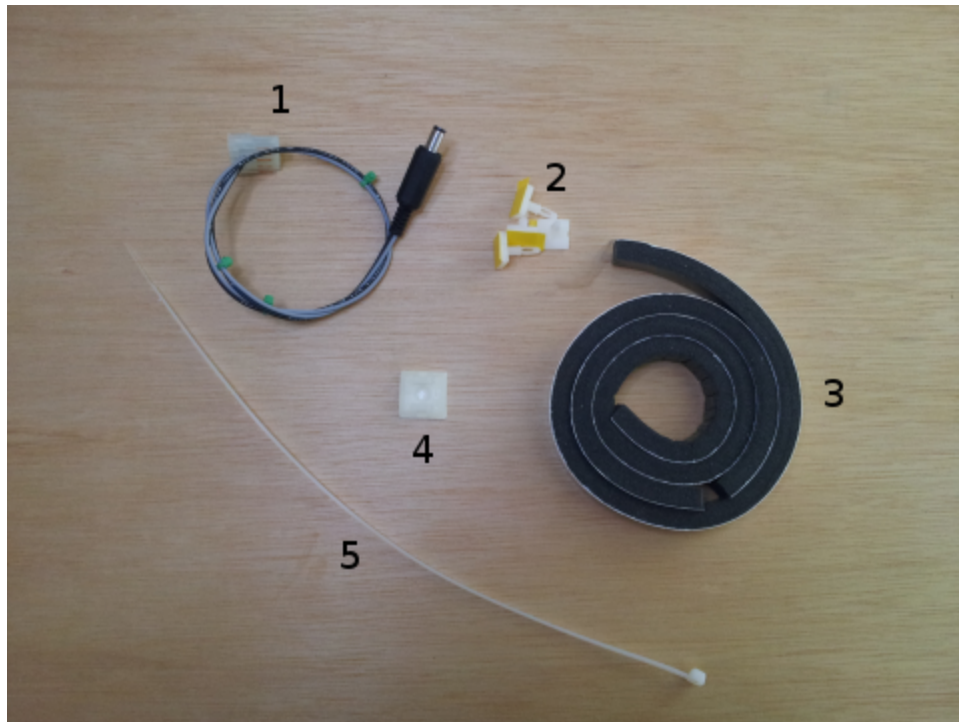
Components

Components available from Dr Pinball

DMD Extender comprising:

- DMD Extender Board
- 14 Way Ribbon Cable – Not needed for this installation
- Power cable
- Power splice
- SD Card with Raspberry Pi software
- Cable tie

LCD Interface Kit comprising:



1. LCD Controller power cable
2. 4 X adhesive PCB mounts
3. 2 X Extra thick foam weather strip, suitable for 4mm to 7mm gap
4. Cable tie adhesive mount
5. Cable ties

Components available from other sources

Raspberry Pi – Model A or Model B

LCD Panel – 15.6” 16:9 1920 X 1080. Model used in this guide is LG LP156WF1

LCD Controller – DVI to LVDS to drive the panel above

DVI to HDMI Cable 1m

Plywood, 6 mm thickness

See Appendix A for retailers of these items.

Method

Step 1 - Preparation

Switch off the pinball machine and remove the plug from the wall outlet.

Remove the backbox translite glass. Remove the speaker panel and place onto the pinball machine – use magnets or blutac on the side rails to stop the speaker panel from slipping.

You may also need to open the backbox light door to gain access to the cabling inside.

Step 2 – Remove the DMD plasma display

Figure 1 shows the DMD plasma screen. Remove the data ribbon cable and power connector from the screen. These cables are marked in the figure.

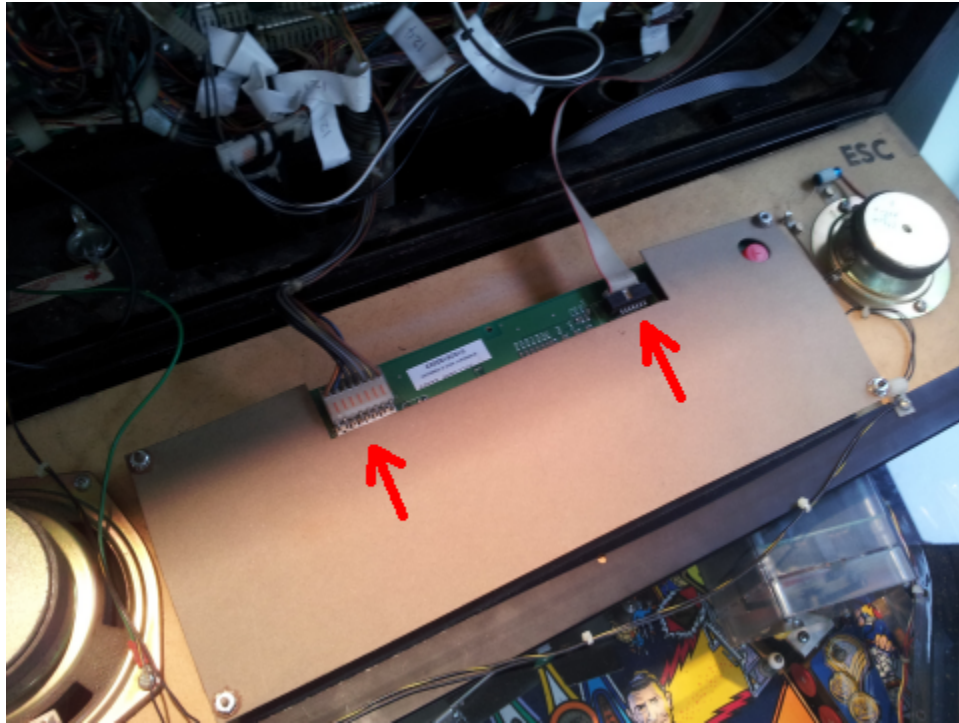


Figure 1 – DMD plasma screen, remove marked cables

Also remove the 4 nuts and washers that hold the screen in place – keep the nuts and washers to mount the LCD panel.

The power cable removed is not needed by the LCD replacement and can be pushed safely out of the way.

Remove the card screen cover, and lift the plasma screen carefully away from the speaker panel. The screen maybe stuck to the surround – gently pull the screen away.

Step 3 – Make the LCD panel mount

It is necessary to make a mounting panel from plywood. Use 6mm (1/4") ply and cut to the size 131mm X 383mm.

It is possible to use the card screen cover removed earlier as a template for the mounting panel, especially when deciding on the 4 X 5mm holes.

Stick weather strip foam to the back of the panel to help retain the LCD screen, as shown in figure 2.



Figure 2 – Foam weather strip on the back of the plywood mounting plate

Step 3 – Install the LCD panel

Place the LCD screen onto the speaker panel ensuring it sits square and central to the window.



Figure 3 – LCD panel in position

Ensure enough space is left at the bottom of the screen to allow the speaker panel to go back into the backbox.



Figure 4 – Leave a gap at the bottom of the screen

Prepare the plywood mounting panel by fixing the DMD Extender, Raspberry Pi and LCD Controller

as shown in figure 5.

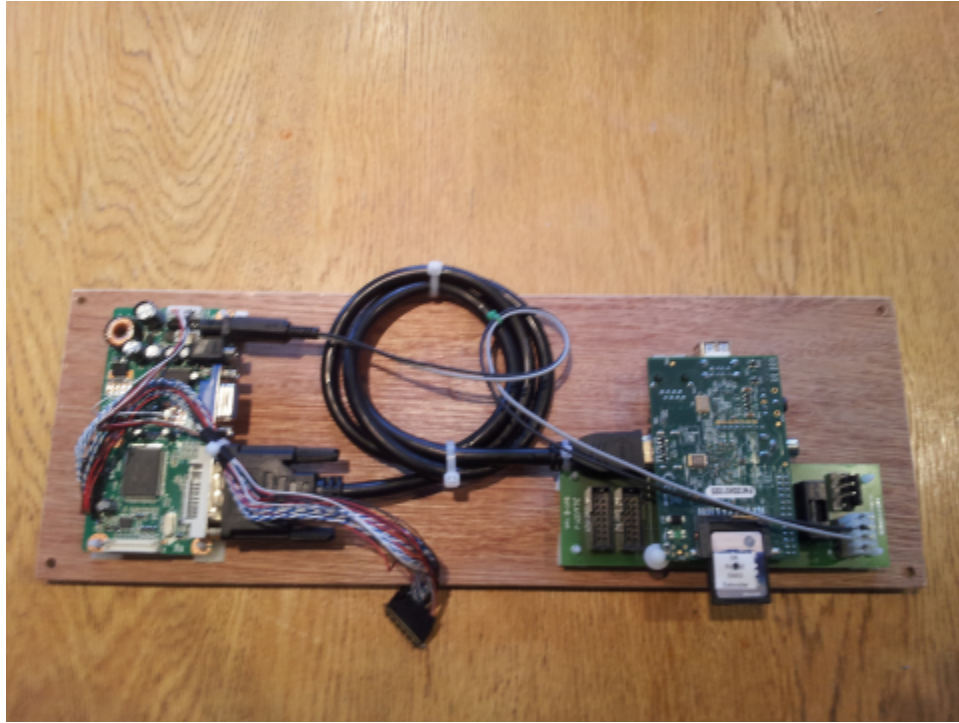


Figure 5 – Components mounted on the plywood panel

Figure 5 shows the DMD Extender mounted with the adhesive stand-offs as supplied with the Extender.

The LCD Controller is mounted with the adhesive stand-offs as supplied with the LCD Installation kit.

The LCD Controller is powered by the supplied cable connected to POWER OUT on the Extender.

The DVI / HDMI cable is kept secure using the cable ties supplied.

Place the plywood mounting panel over the LCD panel locating it on the 4 posts as shown in figure 6.



Figure 6 – Plywood mounting panel in place

Connect the LVDS cable from the LCD Controller to the LCD panel.



Figure 7 – LVDS cable connected to the LCD panel

The 14 way ribbon that was removed from the plasma screen should be connected into the DMD Extender, socket marked DMD IN or DMD OUT.

Connect the Power Cable Assembly in the DMD Extender POWER IN socket – see the DMD Extender installation instructions for locating and installing this cable.

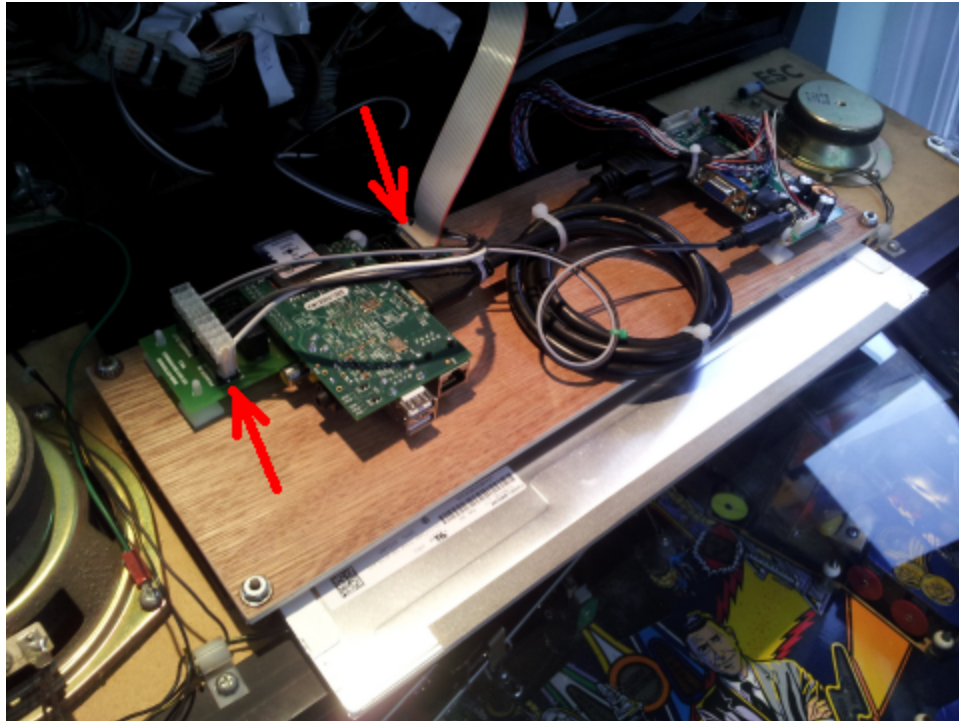


Figure 8 – Ribbon and power cables replaced

Use the nuts and washers from the original screen mounting and replace them to hold the new screen in place. Tighten them to ensure the screen is held firmly.

Replace the speaker panel into the back box and ensure the screen sits squarely.



Figure 9 – Check the screen is square to the top of the speaker panel

Step 4 – Configuration

Follow the instructions for using the Configuration Utility supplied on the SD Card of the DMD Extender - <http://www.drpinball.co.uk/documentation.htm>

As a minimum you must select the following options:

Screen Type – HDMI/DVI

Screen Aspect Ratio – 16:9

Screen Resolution – Medium

Dot Matrix Type – Bally/Williams

DMD Position – Adjust to move DMD portion into view

You may also want to change the dot colours and effects as required.

Step 5 – Finishing steps

Before completing the installation please check all connections made for correct insertion and orientation.

Remount the speaker panel and translite. The installation is now complete.

Appendix A

This section gives details of sources for items needed to complete the installation.

Raspberry Pi – Model A or Model B

This mini computer can be purchased from RS/Newark or Farnell/CPC – look online for more details.

LCD Panel

The following panel is recommended due to its superior viewing angles which are important in a pinball machine:

15.6” 16:9 1920 X 1080. Model used in this guide is LG LP156WF1.

This panel can be purchased from eBay or in the UK from Accupart – www.accupart.co.uk

LCD Controller

DVI to LVDS to drive the LCD panel, available from eBay:

http://www.ebay.co.uk/itm/B-NTA92C-VGA-DVI-LCD-controller-4-LG-PHILIPS-LP156WF4-SLB1-LED-Panel-2ch-6-bit-/370796210733?pt=US_Server_Boards&hash=item56552d2a2d

Please contact the vendor 'njytouch' to confirm compatibility.

DVI to HDMI Cable 1m

Available from eBay

Plywood, 6 mm thickness

Available from any DIY store