

Openflex Boardview

Chapter 1

Preface

1.1 Introduction

Welcome to Openflex Boardview (from hereon referred to simply as OFBV). OFBV is an advance development fork of OpenBoardView (OBV) by Chloridite in May 2016 as a response to seeing a need for an Open Source board viewing software to assist in the repairs of many electronics systems.

At the time of writing, OFBV supports brd, bdv, asc, fz (with correct key) and bv (with converter to bvr) board formats and is available on Windows (7 onwards), OSX and Linux.

1.2 Contact

Contact can be made with the developer(s) of OFBV via the following means;

Web <http://openboardview.org>

IRC [#openboardview@irc.freenode.net:6667](https://freenode.net)

GitHub <https://github.com/inflex/OpenBoardView/tree/inflex-ui-features>

Chapter 2

Installing

2.1 Windows

No installation required, simply run the executable.

2.2 Linux

2.2.1 Installing using debian package

```
$ sudo dpkg -i openboardview-R5.deb
```

Run it

```
$ openboardview
```

2.2.2 Building source from github

If you haven't already installed the required development packages;

```
$ apt-get install build-essential cmake libsdl2-dev libgtk-3-dev
```

Clone the project

```
$ git clone --recursive 'https://github.com/inflex/OpenBoardView'
```

Build it

```
$ ./build.sh
```

Run it!

```
$ ./bin/openboardview ...or... $ ./openboardview.sh
```

2.3 OSX

???

Chapter 3

Getting Started

3.1 Main display

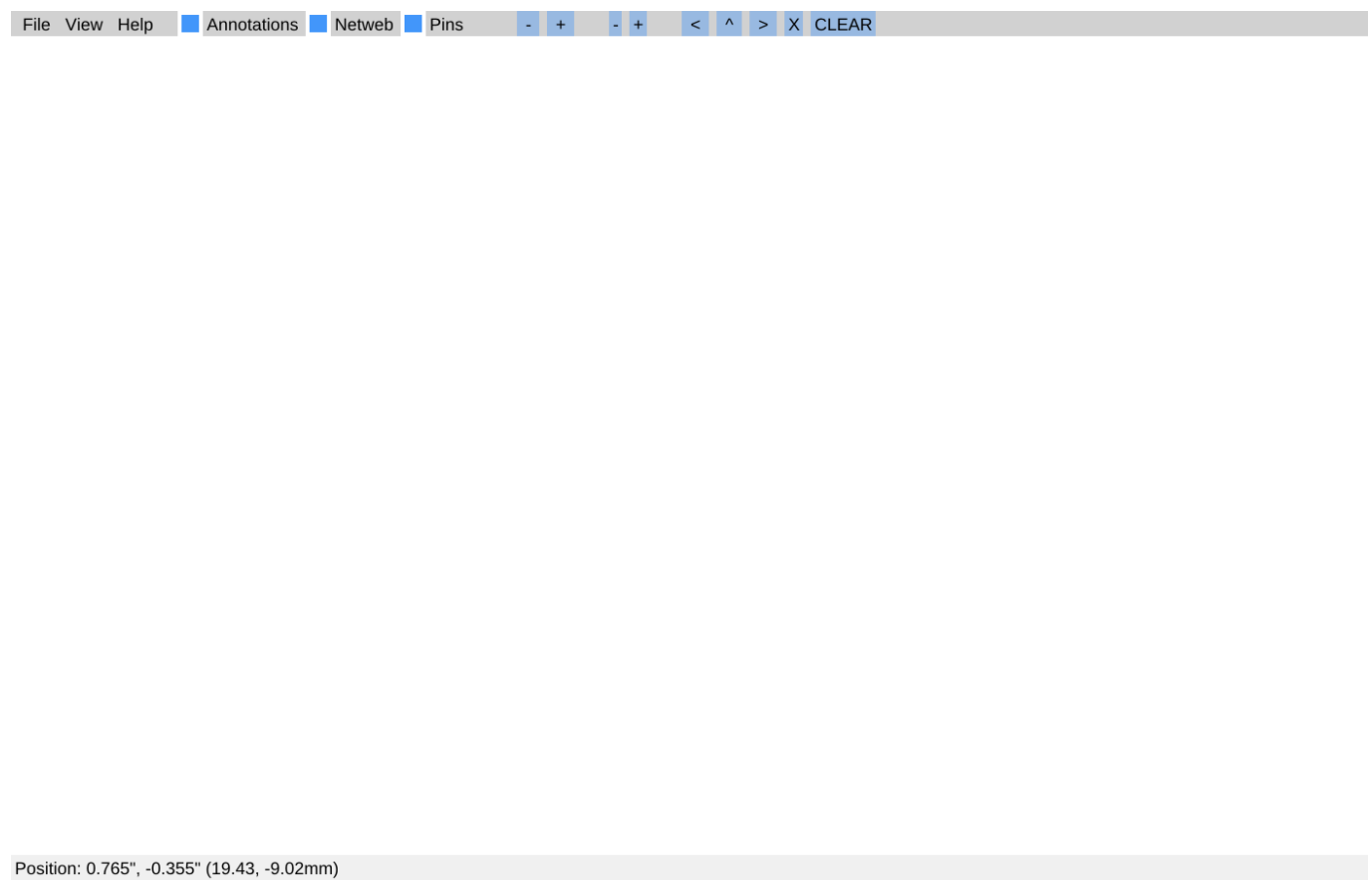


Figure 3.1: Openflex Boardview opened, no file

3.2 File Menu

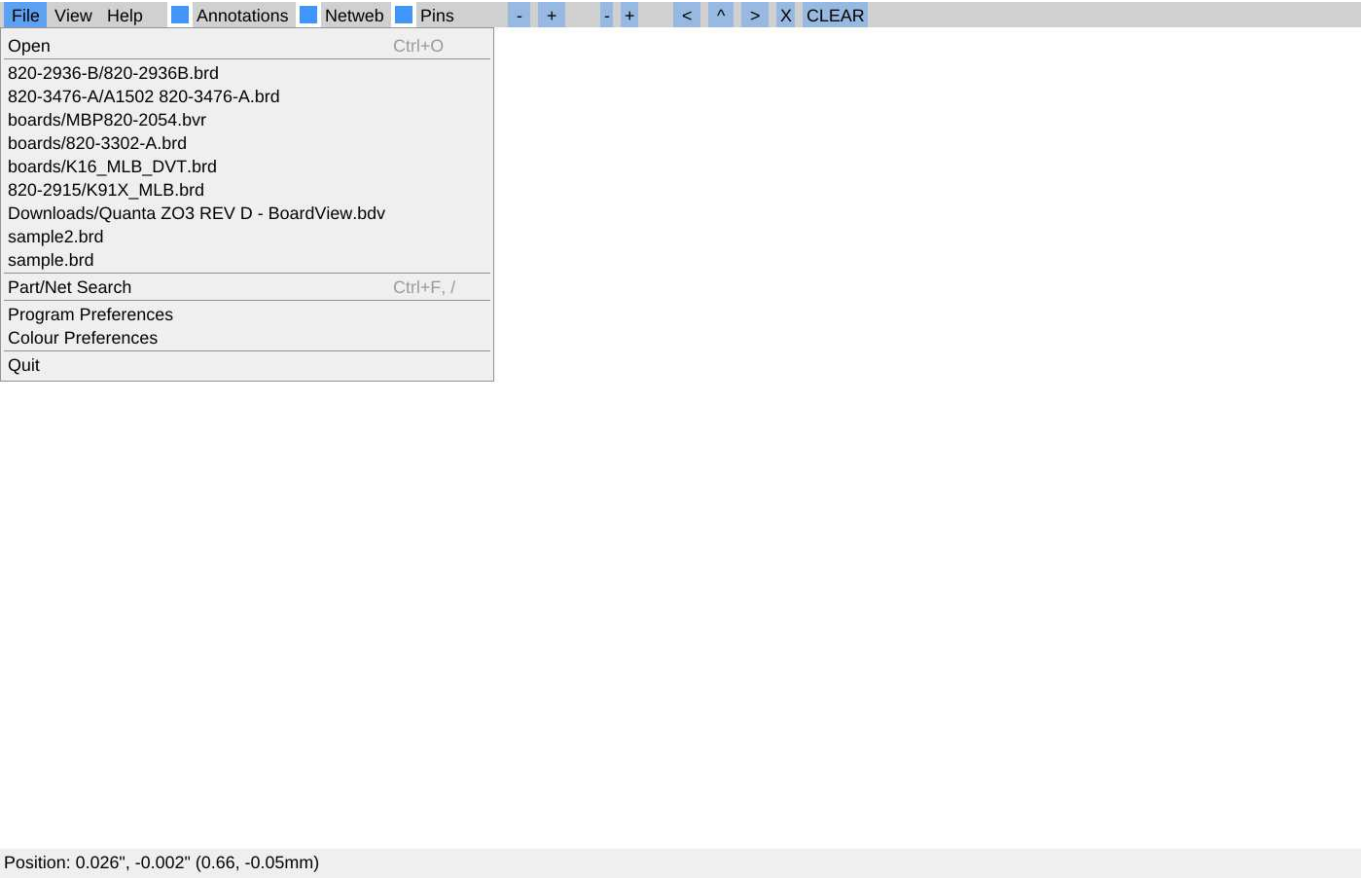


Figure 3.2: File menu

3.3 Open file dialog (linux)

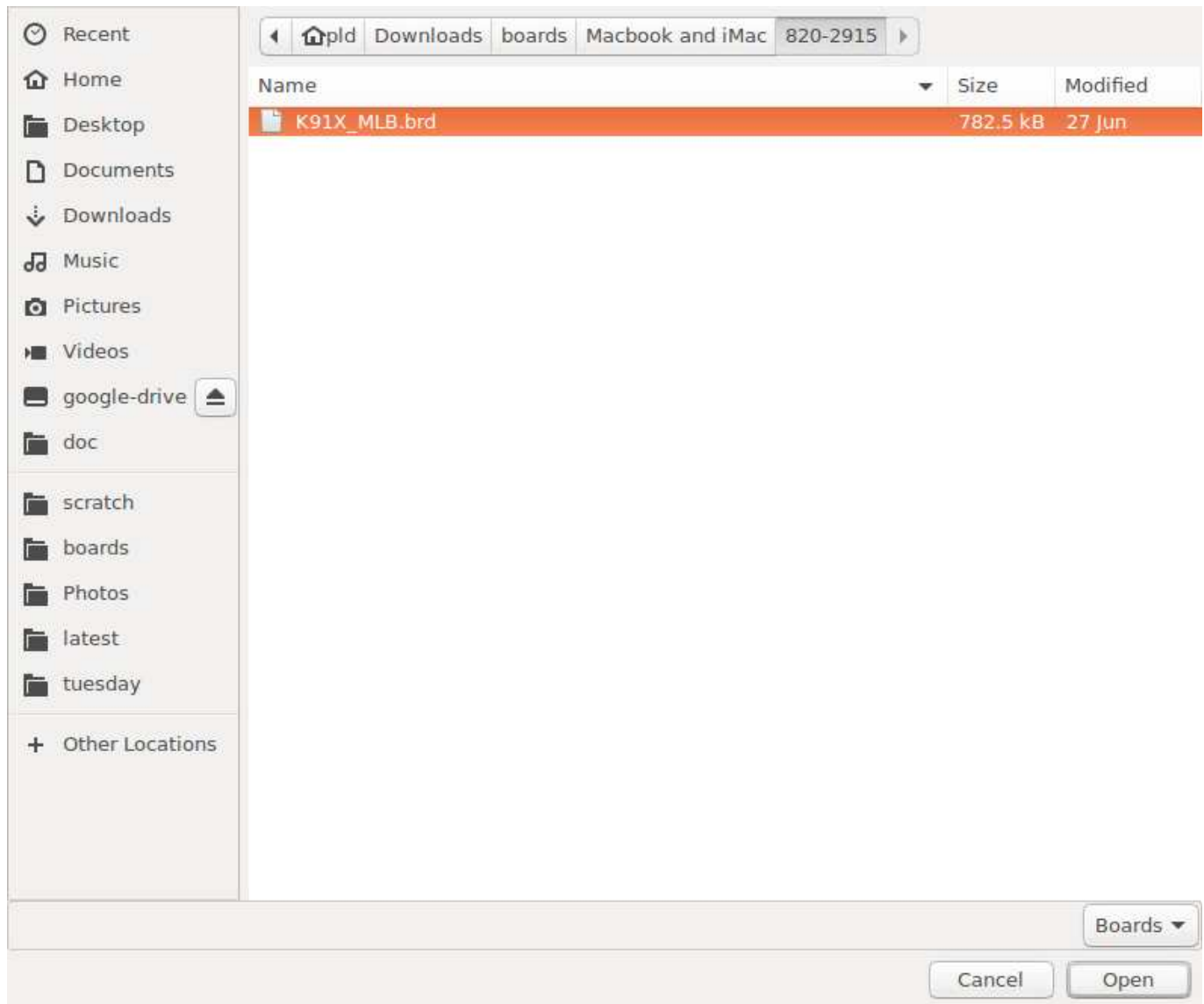


Figure 3.3: Selecting board file from file picker

3.4 File opened

Each file successfully loaded is added to the recent history, allowing for quicker access for subsequent loads of the same board.

3.5 Command line parameters (linux)

Flag	Description
-h	Display help for command line parameters
-V	Display current OFBV Version
-l	Enable slow CPU mode
-c <file>	Load alternative configuration <file>
-i <file>	Load board <file>
-x <width>	Set window to <width> pixels wide
-y <height>	Set window to <height> pixels high
-z <size>	Set font size to <size>
-p <dpi>	Set DPI resolution to <dpi>
-r <renderer>	Explicitly select a type of rendering engine [0..2]
-d	Enable debug mode

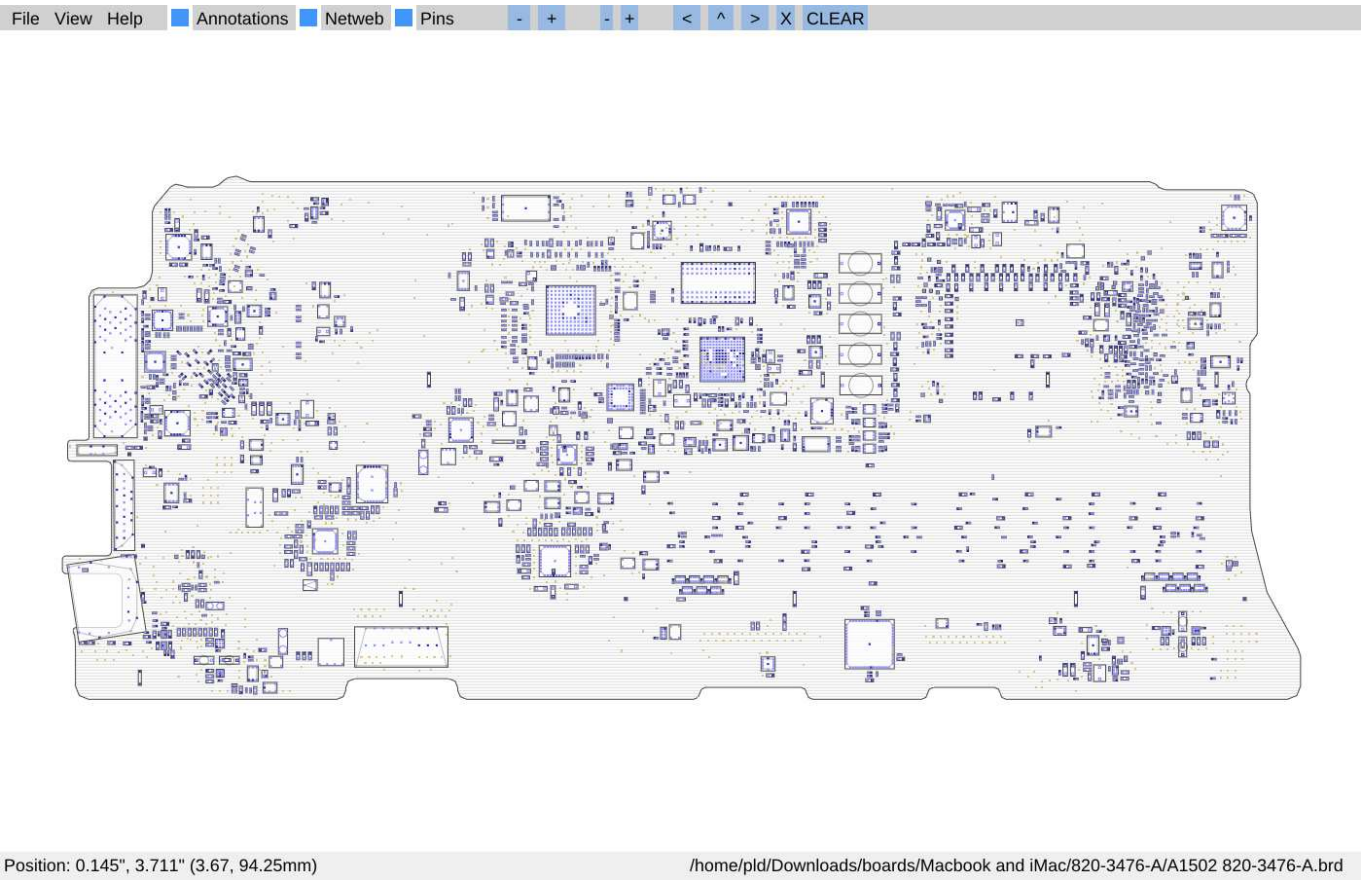


Figure 3.4: Board file successfully loaded.

Chapter 4

Controls

4.1 Keyboard

Action	Key(s)
Open file-load dialog	CTRL-o
Quit Openflex Boardview	CTRL-q
Pan viewport UP	w, up-arrow
Pan viewport DOWN	s, down-arrow
Pan viewport LEFT	a, left-arrow
Pan viewport RIGHT	d, right-arrow
Search for component/net	CTRL-f, /
Display component list	k
Display net list	l
Clear all highlighted items	ESC
Mirror board	m
Flip board	<space> (ctrl+<space> for alternative origin)
Zoom in	+, numpad +
Zoom out	-, numpad -
Center board and zoom to fit	x, numpad 5
Rotate Clockwise	. (period), numpad period
Rotate Counter-Clockwise	, (comma), numpad 0
Toggle pin blanking	p

4.2 Mouse

Action	Mouse control
Select pin/network	Left click on pin.
Select part (only)	Left click on non-pin part area. CTRL+Click to select additional parts
Zoom	Scroll wheel
Flip board	Middle/Scroll click
Annotations	Right click

Chapter 5

Menus

5.1 View

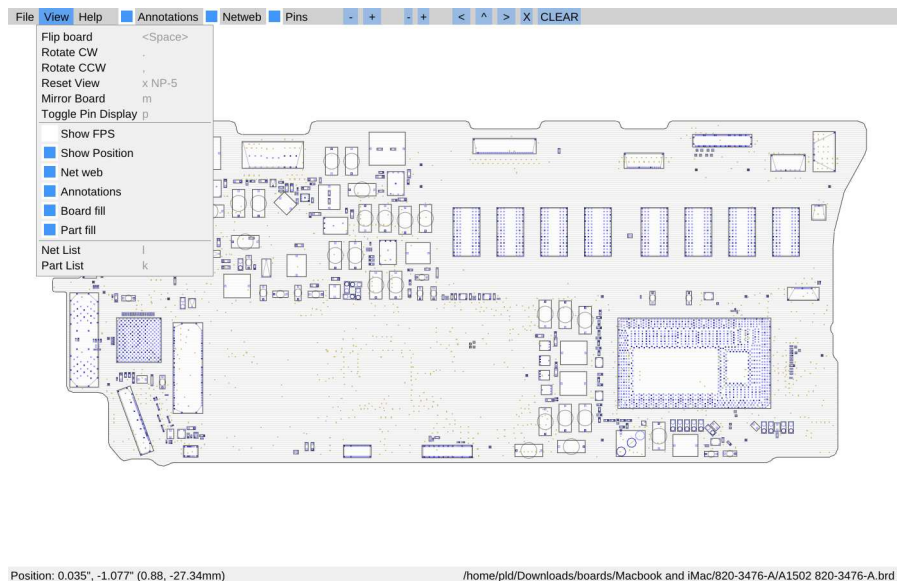


Figure 5.1: View menu

Flip Board Visually turn the board over to show the other side. Flipping is done around the X-axis (some would refer to this as flipping vertically)

Rotate CW Rotate the board clockwise

Rotate CCW Rotate the board counter clockwise

Reset View Zoom and pan the board back to fit the window

Mirror Board Mirror the board over the Y-axis (mirroring horizontally). This is used with some files that have been generated relative to a different coordinate plane. This is not the same as flipping the board.

Toggle Pin Display Enable/disable the drawing of the pins on the board

Show FPS Enable/disable the display of the frame rate in the status bar

Show Position Enable/disable the display of the current cursor position in the status bar

Net Web Enable/disable the drawing of radial lines to all other pins/pads within the same net

Annotations Enable/disable the display of the annotations flags

Board Fill Enable/disable the filling of the board with the pinstripe/floodfill

Part Fill Enable/disable the drawing of fill of the individual parts

Net List Show/hide the Net list window

Part List Show/hide the Part list window

5.2 Quick access & Tablet/Touch Controls

Along the menu bar, after the HELP menu, there are Quick Access buttons for enabling/disabling Annotations, NetWeb and Pins. These have the same function as those items located in the FILE->VIEW menu, as well as the configuration preferences.



Figure 5.2: Annotation completed, red flag indicates annotation location. Hovering will show partial text

OFBV is equipped with controls on the menu bar to facilitate use on tablets and touch screens.

- [-] [+] Zoom in normal steps
- [-] [+] Zoom in reduced steps
- < Rotate counter clockwise
- ^ Flip board
- > Rotate clockwise
- X Reset view
- CLEAR** Clear all highlighted items

Chapter 6

Searching

Openflex Boardview uses a compound searching system, which lets you mix nets and parts, both complete and partial searches in to a single search with up to three (3) separate search parameters. All parts/nets matching will be highlighted when the search is applied. Search results will be fitted and centered to the display window.

The search dialog can be invoked by pressing Ctrl-F, /, or selecting File->Search

Search results can be cleared by pressing the [ESC] key.

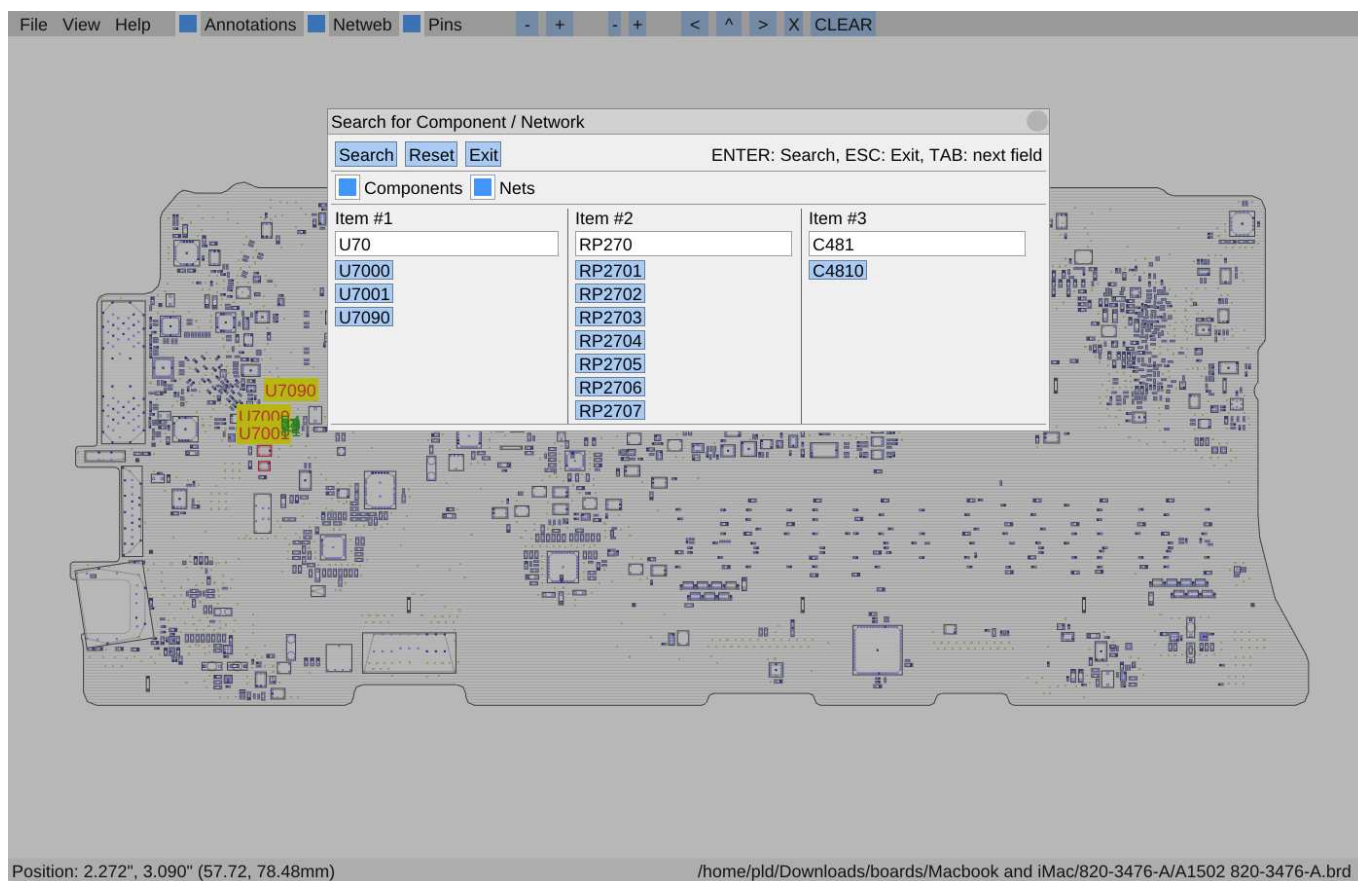


Figure 6.1: Entering the search parameters

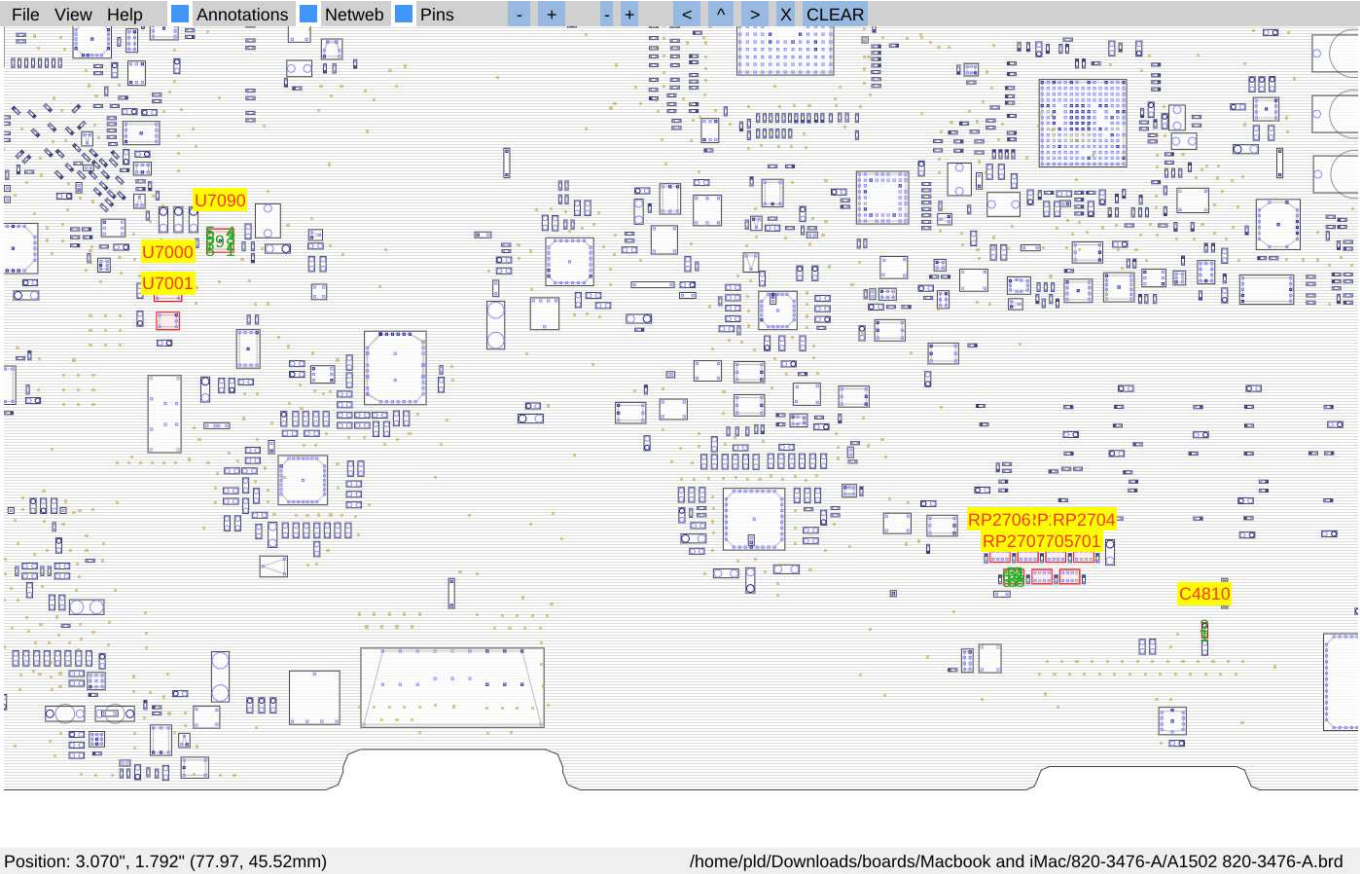


Figure 6.2: Search results

Chapter 7

Annotations

Annotations allow you to leave notes about specific locations, pins, parts or nets for a particular board. Annotations are stored in a sqlite3 database with a filename that mirrors the board (see Files).

To create an annotation, right click on the location, pin, part or net of interest. A dialog will appear and in its reference description it'll have the details of the location, pin, part and/or net depending on where you right-clicked.

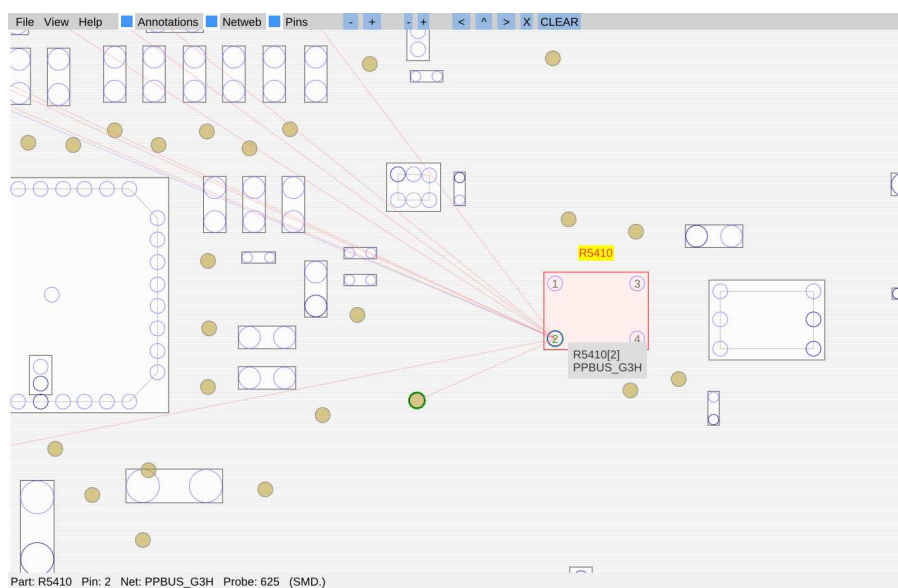


Figure 7.1: Preparation of an annotation, selecting pin [2] of R5410

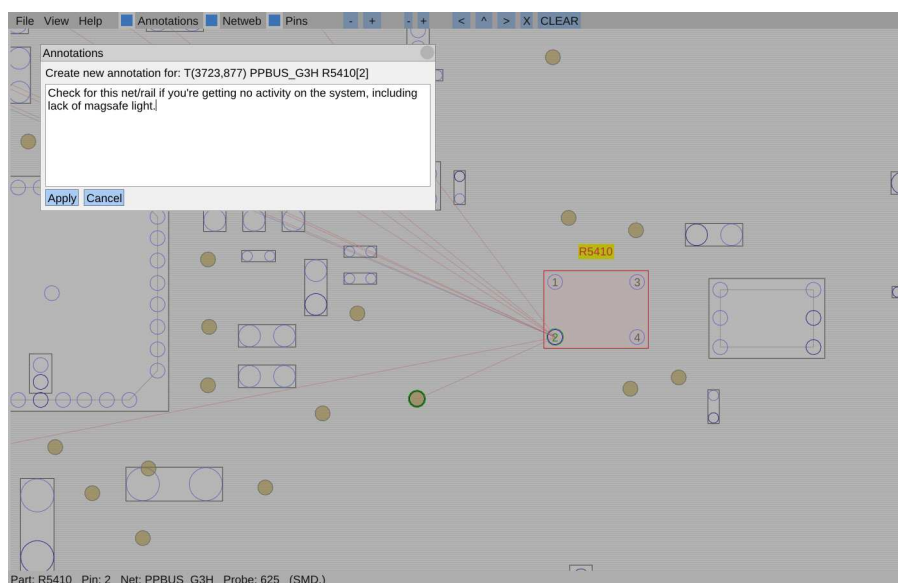


Figure 7.2: Writing the annotation

Type in the annotation and select [Apply]. You can cancel by clicking the dialog close icon on the top-right of the dialog, or the [Cancel] button.

When the annotation has been saved a flag will appear on the board in the location. When the mouse hovers over the flag a short-form of the annotation will be displayed. To edit the annotation you can right click the flag.

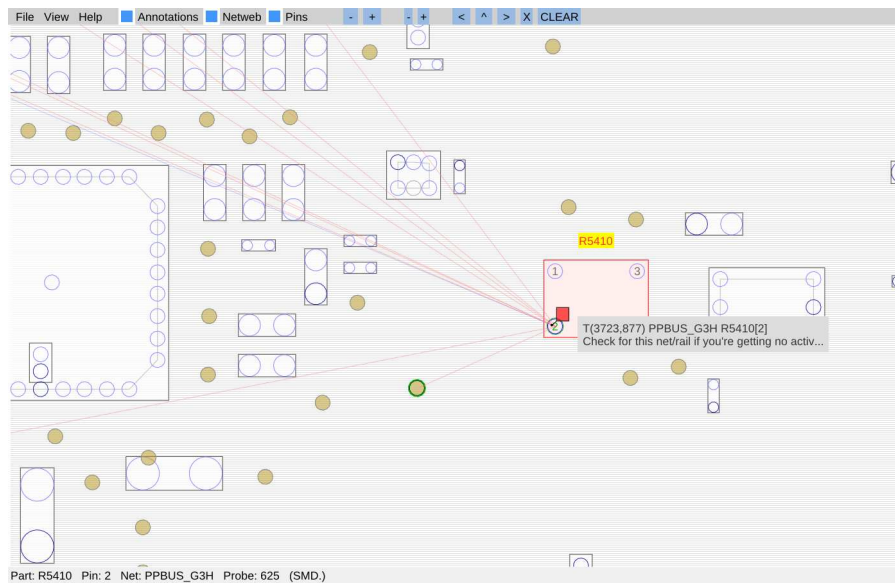


Figure 7.3: Annotation completed, red flag indicates annotation location. Hovering will show partial text

Chapter 8

Configuration Preferences

File->Program Preferences

Parameter	Description
Window width	Startup width
Window height	Startup height
Font size	Font size in pt
Screen DPI	Screen dpi
Board fill spacing	Gap between board area fill lines
Zoom step	Proportion of zoom with each click/press
Zoom modifier	Divides Zoom Step when CTRL pressed
Panning step	Viewport pixel step with panning
Panning modifier	Divides Panning Step when CTRL pressed
Flip mode	When flipping the board, OFBV can either maintain board-in-viewport position, or flip around current cursor point
Annotation flag size	Pixel size for Annotation flag on board
Annotation flag offset	How far from the actual point of annotation to display the flag
Pin Select Masks	To assist with contrast, if enabled this will mask the non-selected parts off with the bitmasks set in Colour Parameters
Pin Halo	If set, will display an additional ring around the pin(s) selected
Halo Diameter	Multiplier of pin size for the halo size
Halo thickness	Thickness of circle drawn for halo
Center/Zoom Search Results	If active, frame the search results (both sides) within the current display
Show Net Web	If active, draw radial line interconnects to other pins/pads on the board with the same net
slowCPU	If active, deactivates various items to help improve the frame rate
Show FPS	Display the frame rate in the status bar
Fill Parts	Fill parts with colour specified
Fill Board	Fill board area with colour
FZ Key	Required to decode ASUS FZ board files. Consists of 44 32 bit hex values

File->Colour Preferences

Base Theme	There are two core built in themes for OFBV, Light or Dark. Once you have selected a theme you can adjust it further
Background	Background colour of the main board viewing window
Board fill	Colour used to generate the board fill pin striping
Board outline	Perimeter of board
Parts	
Outline	Outline of the parts
Hull	On parts with many pins, there will often be a convex hull generated, this can be drawn with this colour
Fill	Colour to fill the part Outline with
Selected	Outline of selected parts
Fill (Selected)	Inner fill of selected parts
Text	Colour of text of selected part name
Text background	Background of selected part name
Pins	
Default	Default colour of normal (connected and not ground) pins
Default text	Colour of pin number/name text for default pins
Ground	Colour of ground pins
NC	Colour of non connected (NC) pins
Test pad	Outline colour of test pads
Test pad fill	Inner fill colour of test pads
Selected	Outline colour of selected pin
Highlighted	Outline colour of pins additionally highlighted (ie, on same net)
Halo	Colour of extra contrast ring around same net pins
Same net	Colour of text for pins on same net
Net web strands	Colour of interconnect rays drawn from selected pin to other pins on same net for currently visible side
Net web (otherside)	As above but for pins located on opposite board side
Annotations	
Box	Fill colour of box used to flag annotation
Stalk	Colour of stalk and border of annotation
Popup text	Colour of text shown when annotation is hovered
Popup background	Background colour of text show when annotation is hovered
Masks	Masks are applied as originalColour ORmask & ANDmask
Pins	AND'd mask for pins
Parts	AND'd mask for parts
Outline	AND'd mask for board outline
Boost (pins)	OR'd mask for pins
Boost (parts)	OR'd mask for parts
Boost (outline)	OR'd mask for outline

Chapter 9

Board Formats

Type	Details
BRD	Often distributed in an encoded format with a leading 4-byte signature of 0x23, 0xe2, 0x63, 0x28. Decoded text will contain the strings "str_length:" and "var_data:". A lot of Apple schematics are in this format
BRD2	Contains signature strings such as BRDOUT: and NETS:
BDV	Very common board format, detected by the presence of strings such as "dd:1.3" "<<format.asc>>" and "<<pins.asc>>" in the content. It is consolidated version of the multifile ASC format.
ASC	Multi-file version of the BDV format. To load you will only need to select a single file of the group.
FV	Encrypted ASUS distribution format. In order to view these files you will need the 44 quad-byte decoding signature in the Preferences->FZKey else an error will result when attempting to decode.
BVR	An OFBV specific format which is a SQL dump from MSAccess formatted BV file. A separate decoder/converter is required because the tool to do the decoding is covered under the GPL licence but OFBV is MIT licenced and thus incompatible.

Chapter 10

Files

10.1 obv.conf

Configuration file. Plain text. Parameters are accessible via the File->Program Preferences dialog

10.1.1 Location

Windows

%APPDATA%\locate\openboardview

Linux

~/.config/openboardview

OSX

10.2 obv.history

History file. Plain text. Contains recently loaded board files paths.

10.2.1 Location

Windows

%APPDATA%\locate\openboardview

Linux

~/.local/share/openboardview

OSX

10.3 *.sqlite3

Companion files for board files. Contains annotations currently but likely will be expanded out to contain other data associated with the boards.

The sqlite3 companion files are generated by taking the board file name (eg, exampleboard1.brd) converting the filename separator period in to an underscore and appending .sqlite3 to the name (eg, exampleboard1_brd.sqlite3).

These files can be safely removed without affecting the operation of OFBV other than the loss of the (currently) annotations.