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# Software Design Notes



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## What is a miniPCB?

A miniPCB is a printed circuit board that contains a layout of an electronic circuit.

A miniPCB has a mechanical design that is consistent with numerous similar miniPCBs.

A miniPCB has an interface connector that is simple and economical.

A miniPCB has educational documentation that is approved by an engineer.

A miniPCB is sold in minimum-order-quantities determined by the PCB panel size.

[www.minipcb.com](http://www.minipcb.com)

This document is available for free as a download from the GitHub repository:

<https://github.com/miniPCB>

This document is associated with the miniPCB Channel on YouTube:

<https://www.youtube.com/@minipcb>

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## Introduction

### Purpose

The purpose of this document is to record software design notes for the 13A-777 miniPCB.

### Scope

The scope of this document is limited to specifications and requirements, source code, and firmware releases.

### File Locations

FILE NAME	FILE LOCATION
[ALL]	<a href="https://github.com/miniPCB/EAGLE/tree/main/miniPCB/13/A/13A-777">https://github.com/miniPCB/EAGLE/tree/main/miniPCB/13/A/13A-777</a>

## Specification Requirements

### *SSR1 – Hardware Abstraction*

No text (title)

#### *SSR1.1 – Power*

Manage power mode with these functions:

FUNCTION	DESCRIPTION
sleepDeep	Minimal power consumption mode.
sleepActive	Low power consumption mode without sleeping.
activeGame	High power consumption mode.
batteryVoltage	Reads the current battery voltage.

#### *SSR1.2 – LCD*

Control the 2x16 LCD with these functions:

FUNCTION	DESCRIPTION
setContrast	
setBacklight	
refreshScreen	

#### *SSR1.3 – LED*

Control the LED indicator with these functions:

FUNCTION	DESCRIPTION
setLED	
clearLED	
toggleLED	

### SSR1.4 – Primary Select Button

Interface with the primary select button with this function:

FUNCTION	DESCRIPTION
readSelectButton	Signals include: (1) wake, (2) confirm, (3) select.

### SSR1.5 – Rotary Encoder

Interface with a rotary encoder with these functions:

FUNCTION	DESCRIPTION
setEncoderRGB	Sets color of the RGB LED on the encoder.
readEncoderButton	Reads the encoder button switch.
readEncoderRotation	Reads the encoder rotation count.

### SSR1.6 – Device Clock

Maintain a device clock with 1 second resolution with these functions:

FUNCTION	DESCRIPTION
setTimer	Sets value in timer counter.
getTimer	Reads value in timer counter.
incTimer	Increments value in timer counter.
spareTime	Returns with the counts available in the long (8 bytes).
secondsRatio	Returns with the ratio of current_count per max_count.

### SSR1.7 – Device Histogram

Maintain a device histogram with these functions:

FUNCTION	DESCRIPTION
recordHistogram	Adds a new record to the device histogram.
playHistogram	Moves each value of the device histogram through the working register.

#### SSR1.7.1 – Device Histogram Matrix

Device histogram will be comprised of a matrix with three orthogonal vector spaces: (1) game result, (2) device count ratios, and (3) user feedback.

#	DATA NAME	TYPE	INTUITIVE FOCUS
0	GAME RESULT 0	char	GAME CONVITAE * USER CONVITAE
1	GAME RESULT 1	char	
2	GAME RESULT 3	char	
3	GAME RESULT 4	char	
4	GAME RESULT 5	char	
5	GAME RESULT 6	char	
6	GAME RESULT 7	char	
7	GAME RESULT 8	char	
8	SECOND COUNT RATIO	char	DEVICE CONVITAE
9	BUTTONPRESS COUNT RATIO	char	
10	ROTATION COUNT RATIO	char	
11	ENCODERPRESS COUNT RATIO	char	
12	BATTERY VOLTAGE RATIO	char	
13	USER FEEDBACK 0	char	DEVICE * USER CONVITAE
14	USER FEEDBACK 1	char	
15	USER FEEDBACK 2	char	

#### SSR1.7.2 – Device Count Ratios

Device count ratios are computed by dividing a count-value by the max-count-value.

## *SSR2 – Game Functionality*

No text (title)

### *SSR2.1 – Core Functionality*

Selects catalog entries according to three variables: (1) the user control of the button input, (2) the game being played, and (3) the state of game being played.



## Source Code

*Table 1 – \FilePath\FileName1.ext*

INSERT CODE HERE

*Table 2 – \FilePath\FileName2.ext*

INSERT CODE HERE

*Table 3 – \FilePath\FileName3.ext*

INSERT CODE HERE

*Table 4 – \FilePath\FileName4.ext*

INSERT CODE HERE

## Firmware Release History

Table 5 – Release 000-000-0-NM.DDMMYYYY

File Name	
File Size	
File Location	
Target Hardware	
Maturity Level	
Compiler Notes	

Table 6 – Release 000-000-0-NM.DDMMYYYY

File Name	
File Size	
File Location	
Target Hardware	
Maturity Level	
Compiler Notes	

## Change and Liability Notice

This document is subject to change without notice. While effort has been made to ensure the accuracy of the material contained within this document, Nolan Manteufel shall under no circumstances be liable for incidental or consequential damages or related expenses resulting from the use of this document.

## Trademark Notice

miniPCB is a trademark of Nolan Manteufel.

This document does not constitute permission to use the miniPCB trademark.

WORDMARK	FIGUREMARK	FIGUREMARK
miniPCB™		

## Revision History

REV	DESCRIPTION	ECO	DATE
A	Initial Release	N/A	DDMMYYYY

## Related Content

#	TYPE	DESCRIPTION	LOCATION
1	Sale Posting	eBay	
2	Sale Posting	Mouser	
3	Repository	Engineering Files	<a href="https://github.com/miniPCB/EAGLE/tree/main/miniPCB/13/A/13A-777">https://github.com/miniPCB/EAGLE/tree/main/miniPCB/13/A/13A-777</a>
4	Video	Preparation	<a href="https://youtu.be/YeX36dg0lwk">https://youtu.be/YeX36dg0lwk</a>
5	Video	Design	<a href="https://youtu.be/6YcOx_vTpKk">https://youtu.be/6YcOx_vTpKk</a>
6	Video	Documentation	<a href="https://youtu.be/-dhOiV1X4uM">https://youtu.be/-dhOiV1X4uM</a>
7	Video	Development	
8	Video	Testing	
	Video	Engineering Release	