# Completion Checklist (DELETE BEFORE POSTING)

* Update <MONTH> and <YEAR> in header
* Update V<X.Y.Z> in header
* Update <DEVICE NAME> in header
* Add logo to or remove the “Place Logo Here” textbox in header
* Update <YEAR> in footer
* Update <Author> in footer
* Update webpage link in footer
* Complete Overview page
* Complete Introduction
* Complete Requirements
  + List goals
  + List functional requirements
  + List non-functional requirements
  + List constraints
* Complete Research
  + Document commercially available options
  + Document DIY / maker friendly options
* Complete Ideation
  + Describe ideas created to meet the goals / requirements of the project
  + Include decisions about which ideas to continue with
* Complete Conceptual Designs
  + Describe the concepts created to meet the goal / requirements of the project
  + Include decisions about which concepts
* Complete Prototyping
  + Document prototypes developed
  + Include decisions on prototypes
* Complete Testing
  + Describe tests completed (or that would be good to complete)
  + Include results of tests
* Complete Detailed Design
  + Describe all aspects of the current version of the device to be released
* Complete Opportunities for Improvement (OFIs)
  + List OFIs for the device
* Check images have been inserted where required
  + Can search for <INSERT IMAGE OF DEVICE>
* Update Table of Contents
* Delete all help text
* Delete Completion Checklist
* For detailed instructions on completing the Design Rationale, please see the [OpenAT Documentation Guide](https://github.com/makersmakingchange/OpenAT-Template/blob/main/OpenAT_Template_Guide.pdf)

# Overview

The Design Rationale is intended to provide designers and maker information about the design process and design decisions behind the development of the <DEVICE NAME>, <INSERT ONE-LINE DESCRIPTION OF DEVICE>.

<INSERT IMAGE OF DEVICE>

Contents

[Completion Checklist (DELETE BEFORE POSTING) 1](#_Toc169095782)

[Outline 2](#_Toc169095783)

[Introduction 3](#_Toc169095784)

[Research 3](#_Toc169095785)

[Requirements 3](#_Toc169095786)

[Goals 3](#_Toc169095787)

[Functional Requirements 3](#_Toc169095788)

[Non-functional Requirement 4](#_Toc169095789)

[Constraints 4](#_Toc169095790)

[Ideation 4](#_Toc169095791)

[Conceptual Design 4](#_Toc169095792)

[Concept 1 4](#_Toc169095793)

[Concept 2 4](#_Toc169095794)

[Concept 3 4](#_Toc169095795)

[Prototyping 5](#_Toc169095796)

[Testing 5](#_Toc169095797)

[Detailed Design 5](#_Toc169095798)

[Opportunities for Improvement 5](#_Toc169095799)

# Introduction

<DESCRIPTION OF WHERE IDEA FOR THE DEVICE ORIGINATED>

<Do NOT include identifying information on a specific end-user if they requested the device be designed (ex: name, age, gender, sex, location). >

<DESCRIPTION OF NEEDS BEING MET BY DEVICE>

<DESCRIPTION OF INTENDED END-USER. INCLUDE SPECIFIC NAMES OF CONDITIONS IF KNOWN.>

# Requirements

The goals and requirements outlined here can be used to assess if a device would meet the needs of a user, and determine when a design is sufficient for release.

## Goals

<GOALS ARE THE NEEDS THAT NEED TO BE MET BY THE DEVICE>

|  |  |
| --- | --- |
| G01 |  |
| G02 |  |
| G03 |  |

## Functional Requirements

<FUNCTIONAL REQUIREMENTS ARE REQUIREMENTS RELATED TO HOW THE DEVICE WILL WORK TO MEET THE GOALS>

|  |  |
| --- | --- |
| F01 |  |
| F02 |  |
| F03 |  |

## Non-functional Requirement

<NON-FUNCTIONAL REQUIREMENTS DO NOT RELATE TO HOW THE DEVICE WORKS, BUT ARE RELATED TO THE GOALS OF THE PROJECT>

|  |  |
| --- | --- |
| NF01 |  |
| NF02 |  |
| NF03 |  |

## Constraints

<CONSTRAINTS ARE LIMITS ON THE DESIGN, SUCH AS COST, SIZE/WEIGHT, OR MATERIAL TYPES>

|  |  |
| --- | --- |
| C01 |  |
| C02 |  |
| C03 |  |

# Research

<DESCRIBE HOW AND WHEN RESEARCH WAS CONDUCTED>

## Commercially Available Options

Options that can be purchased but not made by a maker.

### <COMMERCIALLY AVAILABLE DEVICE NAME>

<COPY AND PASTE THIS SECTION, AND COMPLETE IT FOR EACH COMMERCIALLY AVAILABLE DEVICE>

|  |  |
| --- | --- |
| **Title / Name of device** | <TITLE / NAME OF DEVICE> |
| **Link** | <LINK TO WEBSITE, IF AVAILABLE> |
| **Author** | <DESIGNER / MANUFACTURER / DISTRIBUTOR> |
| **License** | <DISTRIBUTION LICENSE, IF APPLICABLE> |
| **Cost** | <COST (INCLUDE TYPE OF CURRENCY: CAD, USD< ETC.)> |

<INSERT IMAGE OF DEVICE>

<SHORT DESCRIPTION OF THE DEVICE AND HOW IT WORKS>

|  |  |
| --- | --- |
| **Requirements Met** | **Requirements Unmet** |
| <LIST REQUIREMENTS FROM PREVIOUS SECTION THIS DEVICE MEETS> | <LIST REQUIREMENTS FROM PREVIOUS SECTION THE DEVICE DOES NOT MEET> |

#### Useful Design Features

<INCLUDE ANY DESIGN FEATURES OF THE DEVICE THAT COULD / SHOULD BE CONSIDERED IN THE DESIGN OF ANOTHER DEVICE>

## DIY / Maker-Friendly Options

Options that can be made by a maker.

### <DIY / MAKER-FRIENDLY DEVICE NAME>

<COPY AND PASTE THIS SECTION, AND COMPLETE IT FOR EACH COMMERCIALLY AVAILABLE DEVICE>

|  |  |
| --- | --- |
| **Title** | <TITLE / NAME OF DEVICE> |
| **Link** | <LINK TO WEBSITE, IF AVAILABLE> |
| **Author** | <CREATOR OF THE DEVICE> |
| **License** | <DISTRIBUTION LICENSE, IF AVAILABLE> |
| **Cost** | <COST (INCLUDE TYPE OF CURRENCY: CAD, USD< ETC.)> |
| **Test Build (Y/N)** | <HAVE YOU BUILT THIS DEVICE?> |
| **Add to Library (Y/N)** | <SHOULD THIS DEVICE BE ADDED TO THE MMC LIBRARY?> |

<INSERT IMAGE OF DEVICE>

<SHORT DESCRIPTION OF THE DEVICE AND HOW IT WORKS>

|  |  |
| --- | --- |
| **Requirements Met** | **Requirements Unmet** |
| <LIST REQUIREMENTS FROM PREVIOUS SECTION THIS DEVICE MEETS> | <LIST REQUIREMENTS FROM PREVIOUS SECTION THE DEVICE DOES NOT MEET> |

#### Useful Design Features

<INCLUDE ANY DESIGN FEATURES OF THE DEVICE THAT COULD / SHOULD BE CONSIDERED IN THE DESIGN OF ANOTHER DEVICE>

# Ideation

<DESCRIBE THE INITIAL IDEAS GENERATED TO MEET THE GOALS OF THE PROJECT. THESE ARE BROAD CONCEPTS, NOT SPECIFIC IDEAS FOR PROTOTYPES, SPECIFIC COMPONENTS BEING USED, OR EXACT SOLUTIONS>

<INCLUDE SKETCHES, DESCRIPTION OF DESIRED FUCTION, AND HOW IT WOULD WORK>

<GIVE IDEAS NAMES / NUMBERS TO REFERENCE LATER>

## Ideation Decisions

<DESCRIBE AND JUSTIFY WHY DIFFERENT IDEAS WERE ABANDONDED, MODIFIED, OR CHOSEN TO PROCEED>

|  |  |  |
| --- | --- | --- |
| **Idea** | **Decision (Abandon, Modify, Proceed)** | **Justification** |
| <IDEA 1> | <DECISION> | <JUSTIFICATION> |
| <IDEA 2> | <DECISION> | <JUSTIFICATION> |

# Conceptual Designs

<DESCRIBE DIFFERENT DESIGNS BEING WORKED ON. SHOULD INCLUDE DESIGNING PARTS, SELECTING COMPONENTS, AND OUTLINING CODE (IF APPLICABLE)>

<GIVE CONCEPTS UNIQUE NAMES / NUMBERS TO REFERENCE LATER>

<COPY THE BELOW SECTION FOR EACH CONCEPT CREATED>

<IF PARTS ARE SHARED BETWEEN CONCEPTS (EX: THE CODE FUNCTION / STRUCTURE), ONLY DESCRIBE IT ONCE AND REFER TO IT IN OTHER CONCEPT SECTIONS>

<REMOVE IRRELEVANT SECTIONS IF NOT USED IN THE DESIGN>

## <CONCEPT 1>

<INSERT ONE-LINE DESCRIPTION OF THE CONCEPT>

### Physical Component / Enclosure

<INSERT DESCRIPTION OF THE PHYSICAL COMPONENTS / ELECTRICAL ENCLOSURE. INCLUDE IMAGES, LINKS TO PARTS, ETC.>

### Electrical Components

<INSERT DESCRIPTION OF THE ELECTRICAL COMPONENTS. INCLUDE IMAGES, LINKS TO PARTS, ETC.>

### Code Structure / Function

<INSERT DESCRIPTION OF THE CODE STRUCTURE / FUNCTION. LINK TO EXTERNAL LIBRARIES (IF USED)>

## Concept Decisions

<DESCRIBE AND JUSTIFY WHY DIFFERENT CONCEPTS WERE ABANDONDED, MODIFIED, OR CHOSEN TO PROCEED>

|  |  |  |
| --- | --- | --- |
| **Concept** | **Decision (Abandon, Modify, Proceed)** | **Justification** |
| <CONCEPT 1> | <DECISION> | <JUSTIFICATION> |
| <CONCEPT 2> | <DECISION> | <JUSTIFICATION> |

# Prototyping

<DESCRIBE DIFFERENT PROTOTYPES BEING WORKED ON. SHOULD INCLUDE DESIGNING PARTS, SELECTING COMPONENTS, AND OUTLINING CODE (IF APPLICABLE)>

<GIVE PROTOTYPES UNIQUE NAMES / NUMBERS TO REFERENCE LATER>

<COPY THE BELOW SECTION FOR EACH PROTOTYPE CREATED>

<IF PARTS ARE SHARED BETWEEN PROTOTYPES (EX: THE CODE FUNCTION / STRUCTURE), ONLY DESCRIBE IT ONCE AND REFER TO IT IN OTHER CONCEPT SECTIONS>

<REMOVE IRRELEVANT SECTIONS IF NOT USED IN THE DESIGN>

## <PROTOTYPE 1>

<INSERT ONE-LINE DESCRIPTION OF THE PROTOTYPE>

### Physical Component / Enclosure

<INSERT DESCRIPTION OF THE PHYSICAL COMPONENTS / ELECTRICAL ENCLOSURE. INCLUDE IMAGES, LINKS TO PARTS, ETC.>

### Electrical Components

<INSERT DESCRIPTION OF THE ELECTRICAL COMPONENTS. INCLUDE IMAGES, LINKS TO PARTS, ETC.>

### Code Structure / Function

<INSERT DESCRIPTION OF THE CODE STRUCTURE / FUNCTION. LINK TO EXTERNAL LIBRARIES (IF USED)>

## Prototype Decisions

<DESCRIBE AND JUSTIFY WHY DIFFERENT PROTOTYPES WERE ABANDONDED, MODIFIED, OR CHOSEN TO PROCEED>

|  |  |  |
| --- | --- | --- |
| **Prototype** | **Decision (Abandon, Modify, Proceed)** | **Justification** |
| <PROTOTYPE 1> | <DECISION> | <JUSTIFICATION> |
| <PROTOTYPE 2> | <DECISION> | <JUSTIFICATION> |

# Testing

<DESCRIBE THE TESTING COMPLETED, OR THAT SHOULD BE COMPLETED ON THE DEVICE>

<DESCRIBE THE GOAL OF EACH TEST COMPLETED>

<INCLUDE LINKS TO TEST CODE, IF APPLICABLE>

<INCLUDE IMAGES, IF APPLICABLE>

## Test Methods

<DESCRIBE HOW THE TESTS WERE COMPLETED, WITH ENOUGH DETAIL FOR SOMEONE ELSE TO REPEAT THE TEST>

<GIVE TESTS DESCRIPTIVE NAMES / NUMBERS TO REFER TO LATER>

### <TEST 1>

<DESCRIBE THE FIRST TEST, AS EXPLAINED ABOVE>

## Test Results

<DESCRIBE THE RESULTS OF EACH TEST. INCLUDE RELEVANT IMAGES, DATA, AND FIGURES.>

# Detailed Design

<DESCRIBE THE CURRENT VERSION OF THE DEVICE TO BE PUBLISHED>

<INSERT IMAGE OF DEVICE>

<INCLUDE GOALS AND REQUIREMENTS THAT WERE MET AND NOT MET>

### Physical Component / Enclosure

<INSERT DESCRIPTION OF THE PHYSICAL COMPONENTS / ELECTRICAL ENCLOSURE. INCLUDE IMAGES, LINKS TO PARTS, ETC.>

### Electrical Components

<INSERT DESCRIPTION OF THE ELECTRICAL COMPONENTS. INCLUDE IMAGES, LINKS TO PARTS, ETC.>

### Code Structure / Function

<INSERT DESCRIPTION OF THE CODE STRUCTURE / FUNCTION. LINK TO EXTERNAL LIBRARIES (IF USED)>

# Opportunities for Improvement

<DESCRIBE HOW THE DEVICE COULD BE IMPROVED IN FUTURE VERSIONS>

### Physical Component / Enclosure

<INSERT DESCRIPTION OF IMPROVEMENTS TO THE PHYSICAL COMPONENTS / ELECTRICAL ENCLOSURE. INCLUDE IMAGES, LINKS TO PARTS, ETC.>

### Electrical Components

<INSERT DESCRIPTION OF IMPROVEMENTS TO THE ELECTRICAL COMPONENTS. INCLUDE IMAGES, LINKS TO PARTS, ETC.>

### Code Structure / Function

<INSERT DESCRIPTION OF IMPROVEMENTS TO THE CODE STRUCTURE / FUNCTION. LINK TO EXTERNAL LIBRARIES (IF USED)>