# Introduction

[Intro]

# Architecture Overview

[Overview/Summary]

[High Level Diagram]

## Module Decomposition Table

[Description]

[Module Decomposition Chart]

## Module Decomposition Diagram

[Description]

[Module Decomposition Diagram]

## Module Data Flows Table

[Description]

[Module Data Flows Table]

## Producer Consumer Table

[Description]

[Producer Consumer Table]

## Module Functional Descriptions

### Use Interface Layer Modules

[Module Functional Descriptions]

### Preprocessing Layer Modules

[Module Functional Descriptions]

### Processing Layer Modules

[Module Functional Descriptions]

### Post Processing Layer Modules

[Module Functional Descriptions]

### Physical Layer Modules

[Module Functional Descriptions]

### Printer Feedback Layer Modules

[Module Functional Descriptions]

### Communication Layer Modules

[Module Functional Descriptions]

# User Interface Layer

The Interface Layer’s purpose is to collect user information and serve it to the processing layers. There are three subsystems providing data to lower levels. The GUI subsystem provides the user the ability to interact with the system and provides the ability to import files, create material profiles, set general configuration, and print specific configuration. The database subsystem provides a persistence framework for the other subsystems in this layer for storage and retrieval of configuration and material information. The controller subsystem decouples the user interface from the program logic. The controller provides the GUI with the information to present and takes in the user actions allowing the initiation of a print run, then packing the collected configuration, object files, and material data in to a print request object for the preprocessing layer.

## GUI Subsystem Modules

The GUI Subsystem is responsible for providing an interface to the user so that he or she can import model files and manage print input configuration information related to materials and printing hardware. The GUI Subsystem is also responsible for providing an interface from which the user can set configuration options for a specific print and initiate a print. During an ongoing print, GUI Subsystem is responsible for displaying the printer and current print status to the user.

### Import GUI Module

#### Prologue

Import GUI Module is a button or menu option that begins the event to import an object file

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Material GUI Module

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Configuration GUI Module

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Print GUI Module

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Status GUI Module

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

## Controller Subsystem Modules

The Controller Subsystem is responsible for collecting all the material and printer configuration information required for the print, bundling that information with the object file information received from the Import Subsystem, and sending that bundle to the Pre Processing Layer to begin the printing process. The Controller Subsystem is also responsible for telling the Printer State Controller to pause, resume, or stop a print job based on user input.

### Import Controller

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Material Controller

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Configuration Controller

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Print Controller

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Status Controller

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

## Database Subsystem Modules

The Database Interface subsystem is responsible for providing an abstract interface between the database of the system and any subsystems that need to store or retrieve information from the database. As such, the Database Interface Subsystem is responsible for exposing all the methods necessary for the other subsystems to communicate with the database in an abstract manner.

### Persistence Framework

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

### Command Structure

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS]

#### Process

[Pseudo-code]

# Preprocessing Layer

[Description]

## [Subsystem] Modules

[Description]

### [Module Name]

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS

#### Process

[Pseudo-code]

# processing Layer

[Description]

## [Subsystem] Modules

[Description]

### [Module Name]

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS

#### Process

[Pseudo-code]

# Post processing Layer

[Description]

## [Subsystem] Modules

[Description]

### [Module Name]

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS

#### Process

[Pseudo-code]

# Physical Layer

[Description]

## [Subsystem] Modules

[Description]

### [Module Name]

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS

#### Process

[Pseudo-code]

# Printer Feedback Layer

[Description]

## [Subsystem] Modules

[Description]

### [Module Name]

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS

#### Process

[Pseudo-code]

# Communication Layer

[Description]

## [Subsystem] Modules

[Description]

### [Module Name]

[Description]

#### Prologue

[Name/Description/Function]

#### Interfaces

|  |  |  |
| --- | --- | --- |
| Interface | Information Required | Information Returned |
|  |  |  |
|  |  |  |
|  |  |  |

#### External Data Dependencies

|  |  |
| --- | --- |
| Data | Source |
|  |  |
|  |  |

#### Internal Data Descriptors

[NOT EXACTLY SURE WHAT THIS IS

#### Process

[Pseudo-code]

# Quality Assurance

[Description of test plans and procedures]

## Unit Testing

### [Layer Name]

#### [Subsystem Name]

##### [Module Name]

[Description of tests on the module]

## Component Testing

[NOT SURE WHAT EXACTLY THIS IS YET]

## Integration Testing

[Description of integration testing]

## System Verification Testing

[Description of system verification testing (possibly take from SRS)]

## Test Cases

[Description]

|  |  |
| --- | --- |
| Test Case | Expected Result |
|  |  |
|  |  |

# Requirements Traceability Matrix

[Description]

[Requirements traceability matrix (probably want to break this into layers)]

# Acceptance Plan

[Description/Overview]

## Package and Installation

[Probably use requirements from SRS]

## Acceptance Testing

[Description]

## Acceptance Criteria

[Reiterate acceptance criteria for requirements]

# Appendices