

Project PAM

A Reference Design for

Photoresin Additive Manufacturing for

The Open Source Community

Saluki Engineering Company

Reference Number: S14-75-3DPR

Date

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# Transmittal Letter: CWB

2014-04-18

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Mr. Blair,

On behalf of the Saluki Engineering Company, I would like to thank you for including us in the bid for a project to design a digital light processing printer. Attached is a design report for a DLP photoresin printer, Project PAM. Along with this report, we have included the computer host software code and build instructions of the prototype.

Talk about Prototype here

Project PAM proposes a reference Photoresin Additive Manufacturing (PAM) system which maximizes accessibility to the hobbyist. It is intended to be flexible by allowing for configurations of hardware available or easily obtainable to the end user. This is achieved through extensive use of currently available or easily fabricated hardware and open-source software. The reference design will be open-source hardware and software to the lowest practical level. Thorough documentation will provide the necessary means for the end user to go from an empty table to a functioning printer.

Please feel free to contact me at (815) 214 9661 or by email, burdickjp@siu.edu, if you have questions about this project.

Sincerely,

Jeffrey P Burdick

Project Manager

Project PAM: Team75-3DPR

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# Acknowledgements: CWB

To begin we would like to express our thanks to Dr. Tragoudas and Dr. Koc along with the Electrical and Computer Department and the Mechanical Department for the support and financial contributions. The project would not have been possible without their financial backings.

We would also like to take the time to thank the backers of the crowed funding campaign. Very person’s contribution was very much accommodating to the needs of our group. We would like to thank them for not only their financial report but their words of encouragement and belief in our project.

From the beginning of the project Dr. Chevalier has given priceless words of encouragement and advice that has been very critical to the success of the project.

At this time we would like to thank Lakendria Kenner of WSIU, Scott J. Grunewald of 3D Printing Industry, Eddie Krassenstein of 3D Print, and Austin Miller of Dailey Egyptian for the kind words in their articles. Their articles have help spread the work of Project PAM out to the global community.

We would like to take this opportunity to thank Dr. James Mathias for him allowing us to have use to his laboratory space giving Project PAM a place to call home.

We also would like to express a deep sense of gratitude to the team’s Faculty Technical Advisors; Dr. James Mabry and Joe Linux, for their constant support, valuable guidance, and professional advice throughout the various stages of the design project.

We are grateful for the assistance of Tim Attig of the SIUC Machine Shop. His vast machining skills and knowledge have been a great part of the project’s success. Tim’s time and technical advice was invaluable to the team.

Lastly, we would like to thank the professors and teachers of the class; Dr. Tod Policandriotes, Dr. Vidya Singh-Gupta, Dr. Frances Harackiewicz, and Dr. Alan J. Weston for their support, ideas, and suggestions.

# Table of Contents: CWB

[Transmittal Letter: CWB 2](#_Toc403040715)

[Acknowledgements: 3](#_Toc403040716)

[Table of Contents: CWB 3](#_Toc403040717)

[Table of Figures: CWB 3](#_Toc403040718)

[Table of Tables: CWB 3](#_Toc403040719)

[Table of Drawings: CWB 3](#_Toc403040720)

[1 Executive Summary: 4](#_Toc403040721)

[2 Project Description: 4](#_Toc403040722)

[2.1 overall Printer Diagram: 4](#_Toc403040723)

[3 Costs: 4](#_Toc403040724)

[4 Schedules (PZ) 4](#_Toc403040725)

[5 Subsystem Descriptions 4](#_Toc403040726)

[5.1 Mechanical Motion-JPB 4](#_Toc403040727)

[5.2 Chassis-JPB 4](#_Toc403040728)

[5.2.1 Process of Design 4](#_Toc403040729)

[5.2.2 Process of Assembling 4](#_Toc403040730)

[5.2.3 IMPLEMENTATION SCHEDULE 4](#_Toc403040731)

[5.2.4 Equipment Needed 4](#_Toc403040732)

[5.2.5 Health, Safety and Environmental Issues 4](#_Toc403040733)

[5.2.6 Conclusions and Recommendations 4](#_Toc403040734)

[5.3 Printer Control Software- DMO 4](#_Toc403040735)

[5.4 Hardware-Software Interface- NAL 5](#_Toc403040736)

[5.5 Resin Management-CWB 5](#_Toc403040737)

[5.6 Opitics-CWB 5](#_Toc403040738)

[5.7 Vat-NBT 5](#_Toc403040739)

[5.8 Coupler-NBT 5](#_Toc403040740)

[6 References 5](#_Toc403040741)

# Table of Figures: CWB

[Figure 1: Overall Printer Block Diagram (WW) 11](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v2.docx#_Toc385446916)

[Figure 2: SEC Semester Schedule, As planned and as worked (ALL) 13](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v2.docx#_Toc385446917)

[Figure 3: Implementation Schedule (PZ) 14](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v2.docx#_Toc385446918)

[Figure 4: Original design of the frame (PZ) 15](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v2.docx#_Toc385446919)

[Figure 5: Original design of the X/Y carriage and platforms (PZ) 16](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v2.docx#_Toc385446920)

[Figure 6: Second design of the frame (PZ) 16](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v2.docx#_Toc385446921)

[Figure 7: Third design of the frame (PZ) 17](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v2.docx#_Toc385446922)

[Figure 8: Bottom base of frame (PZ) 18](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v2.docx#_Toc385446923)

# Table of Tables: CWB

[Table 1: Prototype Costs 11](#_Toc385423812)

[Table 2: Implementation Costs 11](#_Toc385423813)

[Table 3: Detail of parts in frame subsystem (HL) 21](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423814)

[Table 4: Prototype cost of frame subsystem 25](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423815)

[Table 5: Implementation cost of (PZ)frame subsystem 25](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423816)

[Table 6: Prototype cost of X/Y translation subsystem (JC) 31](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423817)

[Table 7: Implementation cost of X/Y translation subsystem (JC) 31](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423818)

[Table 8: Production cost of roller mechanism subsystem (JC) 34](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423819)

# Table of Drawings: CWB

[Drawing 1: Makerslide cross section (JC) 90](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423866)

[Drawing 2: Roller plate - Motor (JC) 91](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423867)

[Drawing 3: Pwdr. Project's X/Y Translation assembly drawing (JC) 92](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423868)

[Drawing 4: Rolling Plate - Bearing (JC) 93](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423869)

[Drawing 5: Makerslide belt clip (JC) 94](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423870)

[Drawing 6: Makerslide motor mounting plate (JC) 95](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423871)

[Drawing 7: Makerslide eccentric nut (JC) 96](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423872)

[Drawing 8: Rolling Mechanism Flange (JC) 97](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423873)

[Drawing 9: Base Panel (PZ) 98](file:///E:\Documents\Homework\SIUC\Senior%20Design%203D%20Printer\Design%20report\Design%20Report%20v1.docx#_Toc385423874)

# Executive Summary:

With the increasing demand for a high precision desktop three-dimensional printer, the use of digital light processing (DLP) printing is growing. Currently, this technology is not easily accessible to the hobbyist or open-source community. Existing DLP printers are costly and are not within the budget of the hobbyist.

Project PAM proposes a reference Photoresin Additive Manufacturing (PAM) system which maximizes accessibility to the hobbyist. It is intended to be flexible by allowing for configurations of hardware available or easily obtainable to the end user. This is achieved through extensive use of currently available or easily fabricated hardware and open-source software. The reference design will be open-source hardware and software to the lowest practical level. Thorough documentation will provide the necessary means for the end user to go from an empty table to a functioning printer.

The project will be completed in three phases: build phase, testing phase, and presentation phase. The build phase is expected to be completed by September 26, 2014, allowing for several weeks of testing and tuning before the demonstration during the week of December 1, 2014. The total cost of the project is not expected to exceed $1000.00.

# Project Description:

## overall Printer Diagram:

# Costs:

# Schedules:

# Subsystem Descriptions:

## Mechanical Motion-JPB

## Chassis-JPB

### Process of Design

### Process of Assembling

### IMPLEMENTATION SCHEDULE

### Equipment Needed

### Health, Safety and Environmental Issues

### Conclusions and Recommendations

## Printer Control Software- DMO

## Hardware-Software Interface- NAL

## Resin Management-CWB

## Opitics-CWB

## Vat-NBT

## Coupler-NBT

# References: CWB

**There are no sources in the current document.**