MESA STEP Summer Internship

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Spectrum Scientific, Inc

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STEM Talent Expansion Program (STEP)
Science, Technology, Engineering, Math
San Diego State University
NSF
City San Diego College
SWC
STEP Partnership of San Diego (SPSD)
MESA Mathematics Engineering Science Achievement

Introduction

•SSI is a manufacturer of holographic diffraction gratings, including blazed and standard types; mirror surfaces including parabolic, on and off axis, ellipsoidal and hollow cube retroreflectors.
• Spectrum Scientific's proprietary blazing technique yields 10x lower stray light and significantly higher efficiency than ion-etched blazed holographic gratings, UV as low as 120nm, as well as VIS/NIR applications.
Contact: sales@ssioptics.com;
•Solid Works is used to design in house fixtures.
• Engineering drawings are then stored, catalogued and organized for easy accessibility.
•These drawings are then converted into customer sales drawings and implemented into website design.

SSI Spectrum Scientific, Inc.

Purpose

Goals of this Internship are to:

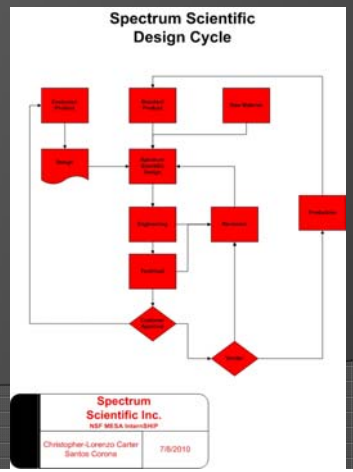
- create new fixtures to hold optical masters more securely and safely.
- catalog and organize engineering drawings.
- use organized drawings to display products, specifications and drawings for website customers.

Method

Fixture Design Process

•Utilize Solid Works to custom design fixtures that securely hold the optical pieces and allows more pieces to be integrated.
•Analyze how the fixtures would withstand the wear and tear of the actual optical process.
•Design fixtures for ease of use by the production team.

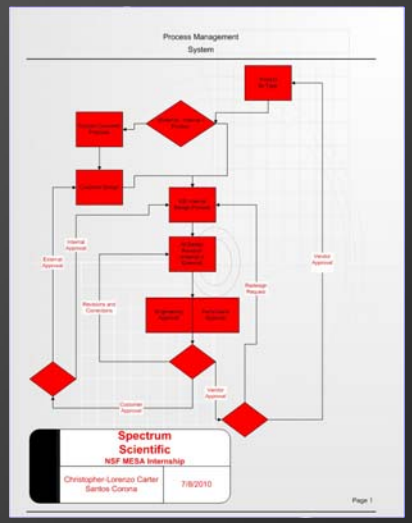
Product Design Chart



Internal Product Organization

•Examined existing corporate rules and protocols along with ISO 9000 standards.
•Met with engineers to create a format to organize engineering drawings and files.
•Organized a universal structure to standardized the locations of files and documents.
•Met with the Senior Principal Engineer and the General Manager to present our proposed structure.
•Implemented the new structure to meet both their immediate and future needs.

Process Management Chart



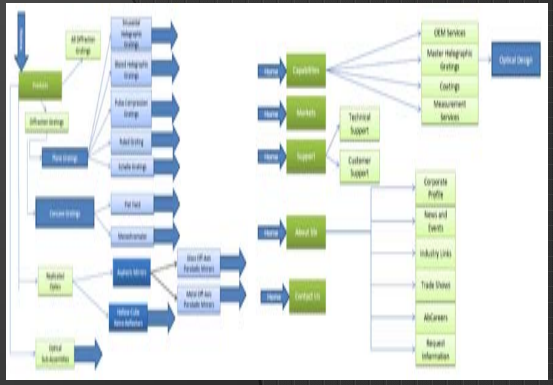
•Integrated internal corporate documentation and ISO 9000 standards to track products from design to distribution.

•Created an internal product organizational structure for drawings, fixtures and parts.

•Created product line categories for sales and marketing.

•Prepared the existing product line for the establishment of web based sales.

Website Design Structure



Left side product file structure Right side is company contact information

•Website **Top Down Design** based on universal product structure.
•Internal and external documentation system uses same structure.

Results

•The new fixtures allowed SSI to safely and securely mount more optical pieces for grating.
•The organization of files allowed SSI to readily access all files.
•The universal file system for SSI assisted engineers and customers by providing a single search path for document and product retrieval.

Conclusion

The internship opportunity provided:

- a learning experience in parts design that incorporated the design needs of the production team.
- a more in depth understanding of the inter-workings of an engineering firm.
- an insight into how to analyze a problem, propose a solution, present and implement the solution.

Acknowledgements

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