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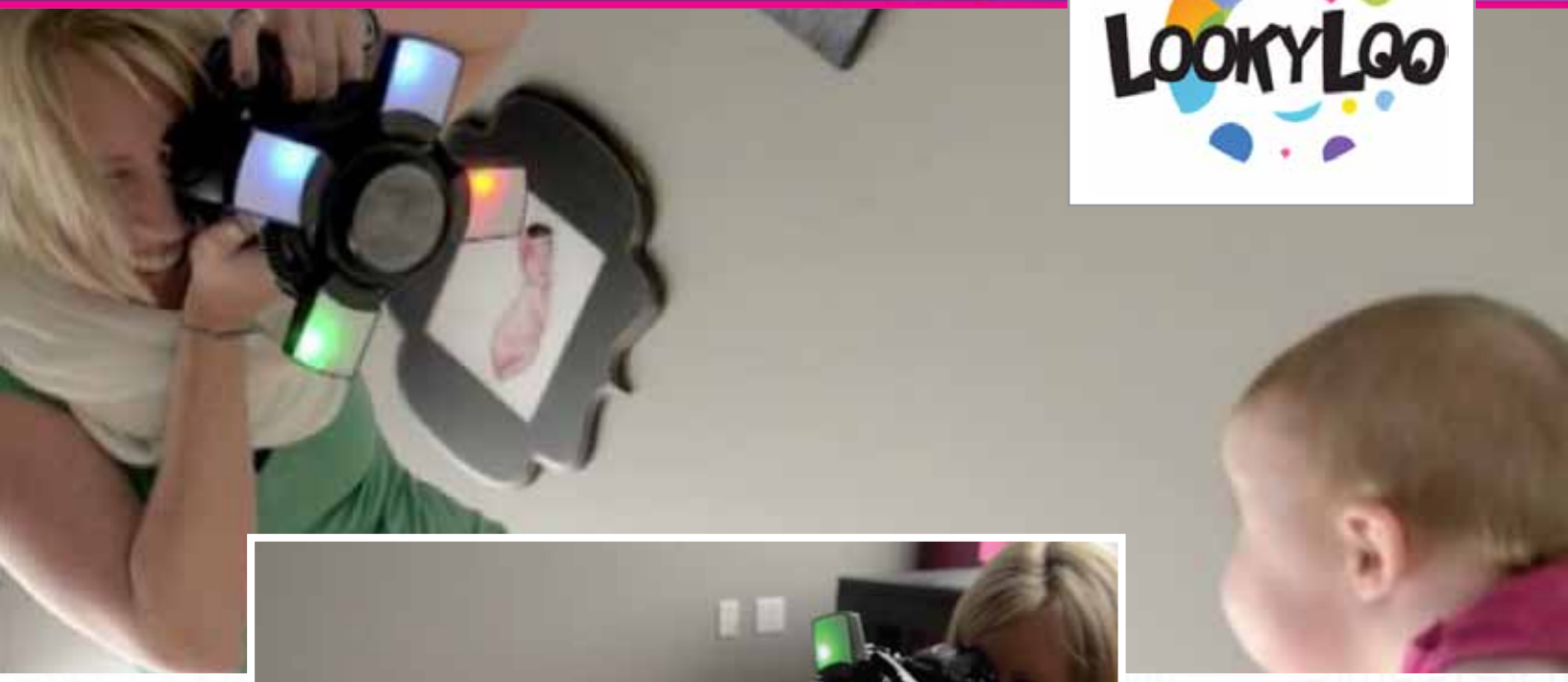
Electronics Solutions on a Fast Track®

CASE STUDY

Producing Exceptional Solutions by Fusing Technology and Expertise

LOOKYLOO



“If I had to do this all over again, I would have started with an Electronics Engineer, instead of starting with the plastics.”

– Allison Carenza - Photographer, Inventor and “Winner of Dream Big America”

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The Challenge

Every photographer who deals with small children struggles to keep their attention to capture that one, brilliant, inspired shot. The shot that parents want and advertisers pay for. However, trying to keep a child's attention with a squeaky toy, noise and waving provides only brief seconds of attention before the child is bored and looks away.

Allison Carenza, a successful photographer and industry innovator, began playing with light and sound concepts to capture the attention of her subjects in 2009. After being inspired by the old electronic game, Simon, Allison developed the Looky Loo Light – a light and sound unit designed for professional photographers who specialize in working with children.

In order to create a product that other photographers would buy, a few things had to be present. The unit would have to stretch to fit different size lenses, the lights had to be behind the flash blast to not interfere with the studio or outdoor lighting, and the weight of the unit had to be practical for the photographer.

It was after Allison had an initial prototype developed that she turned to MJS Designs to make corrections and design functionality that the prototype did not have.

The Wish List

When Allison found MJS Designs, she was very clear about her "wish list" for the Looky Loo Light based on the first prototype. In fact, she gave MJS Designs this overview of what worked, what needed improvement, and what her dream version of her product included.

Looky Loo (Currently):

What Works

- Attracts the attention of babies and young children indoors
- Stays put on the lens 24-70mm (wide lens)
- Has good battery life
- Button placement is in a good spot

What Could Be Better

- "Fins" are too tall, when children are looking to the end of the "fin" their eyes are off camera
- Band doesn't adjust to a smaller size without moving around

• Wires are bulky and repetitive
• Can't tell if the device is off or on when behind the camera
• Needs two light intensity settings, one stronger for outside and one lighter for inside

Looky Loo (Dream Version)

• Has several programs with different flashing light patterns
• OLED panels or technology that is programmable so clients can download new programs from the computer
• Sound that matches the light program
• Wireless
• Power - large button on the end of the "fin" that possibly lights up to easily see that it's on or off
• Program - a rotary possibly, that can change the program or use the power button that changes every time it is depressed and turns off when it is held down
• Inside/outside settings - slider sound

The Solution... MJS Designs!

MJS Designs was keen on producing the results Allison required and also sensitive to providing a point-by-point solution to help Allison manage her budget and priorities with the product development.

Design Review and Specification Development

The initial phase of the Looky Loo development involved a review of the Master Board and the LED Board assemblies. A specification was generated to capture the requirements so that both MJS Designs and the customer understood the scope of the development. The following development activities were implemented for the Looky Loo Project:

Master Board Design

The Master Board design provided to MJS was relatively well defined. The development activities associated with the Master Board included the following:

• Review of the existing design and coordination of design changes with the customer
• Electrical Design and Schematic Generation
• Major goals to include:
  - Replace U1 with a USB capable PIC microcontroller (This will facilitate USB communication with a windows computer running a "to be developed" GUI interface)
  - Support for a USB communication interface to enable download of user defined LED programs
  - Addition of a sound module that will be capable of playing multiple sounds depending on the LED program selected

Master Board Design - continued...

- Enable the selection of multiple LED programs for playback using a multi-position switch or other means
- Enable the selection of 2-3 brightness levels to accommodate varying light levels using a multi-position switch or other means
- Provide hardware support if needed for multiple brightness levels
- Provide a visual indicator that the system has been powered on and is active (This would be implemented using an illuminated switch or with an on-board LED and light pipe combination)
- Reduce the size of the PCB assembly to allow easier packaging
- Resolution of any issues with the bill of materials

LED Board Design

The LED Board design provided to MJS for review was relatively well defined. The engineering effort included the following:

• Review of the existing design and coordination of changes with the customer
• Electrical Design and Schematic Generation
• Major goals to include
- Reduction in size on the interconnect wiring (The current wiring is bulky and cumbersome)
- Reduce the size of the PCB assembly to allow easier packaging and to enable a reduction in the size of the "fins" on the unit
- Replace the connecting bands with a smaller more elastic material that will fit better on smaller cameras (The reduced "fin" size will assist in this process)
- Investigate Velcro attachment
- Resolving issues with the bill of materials

"We customize each quote and each technical solution to meet specific customer requirements. We generate a product specification that addresses the customer's requirements point-by-point to make sure we satisfy all of their needs. This process assures that the products we deliver function as expected and are free of surprises."

– Chuck Chase
Director of Engineering

Electronic Design Documentation

MJS provided a schematic diagram, BOM, PCB Assembly Print, PCB Fab Drawing, and PCB Electronic Design File for the Master Board and the LED Board assemblies.

System Prototype Test

MJS Designs generated a test procedure that defined the testing to be performed on the prototype Looky Loo units. The procedure assumed minimal need for test fixtures or other support hardware. The testing was performed on 5 prototype units.

The RESULTS!

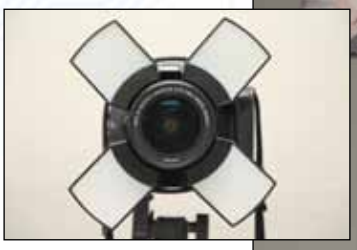
MJS Designs completed two revisions for Looky Loo. Allison owns all the files and documents needed to proceed with manufacturing.

Rev A: (Initial Design)

- Schematic Design
- Software Design
- PCB Design
- 5 Unit Prototype Build and Test
- Provided Rev A Documentation – Altium Electronic Schematic/PCB Design File, Excel BOM, Gerber Files, Design Specifications

Rev B: (Design Update)

- Updated Schematic Design
- Updated PCB Design
- Provided Rev B Documentation – Altium Electronic schematic/PCB Design File, Excel BOM, Gerber Files, Design Specifications



Words of Wisdom from Allison Carenza, first time inventor

"Don't go cheap" Allison shared with us that she had contracted with a couple of independent CAD designers and was unhappy with their responses and ability to deliver on the job.

"Don't skip prototyping" Allison said being able to work with a functioning prototype was the best way to be hands-on with the product and really fine tune it in order to prepare it for market.

"Start with functionality" Allison shared if she was going to do this over again, she would have started with the electronics development over the plastics development. She learned the plastics could be molded to fit the electronics, however, it was more challenging to make the electronics fit inside the plastics.

Allison has gone on to win the Dream Big America contest and is currently taking orders for Looky Loo – learn more at http://lookyloolight.com/

Turn to MJS Designs for high-quality and accuracy in electronic system engineering, complex printed circuit board CAD layout, prototype build, box / system build, cable assembly, component procurement, volume assembly, test development, testing and fulfillment.

Your electronics manufacturing services partner...from design to production since 1976.

Company Certifications		
ISO 9001: 2008	AS9100: 2009 Rev C (Aerospace)	ITAR Registered
	ISO 13485:2003 (Medical)	ANSI / ESD S.20.20-2007 Standard

Staff Certifications		
	IPC-A-610E	IPC / WHMA-A-620
	J-STD-001E	CID +

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