Protowerx Design Inc.

www.protowerx.com

Who we are and what we do...

Protowerx Design Inc. is a company that seeks to provide design solutions to suit our clients needs. Whether it be Milling, 3D printing, Electronics development, or show quality models—we are here to help.

No matter which stage of development you are at we can assist you in getting your design to product verification and deployment. We are here to help—and we love to help!

Our services

- 3D printing: ZCorp 310
- CNC milling: MDX 650 4 Axis Mill
- Electronics Design: concept to production ready prototype
- SolidWorks and Rhino3D: Mechanical design and 3D modeling
- Casting: Direct pour non-ferrous (Zcast)
- Finishing: Painting and Airbrushing available

Screen shot of Rhino3D: a digital scan taken of Sir Ian McKellen for prop making in X-men 3.

Rhinoceros®
NURBS modeling for Windows

Milling

In milling, a variety of materials may be used such as modeling wax, plastic, wood and metal. Repeatability and part strength are huge benefits to this form of RP. Parts made of solid materials will stand up to repeated use and handling, dense foam can be milled which is ideal for model and prop making. Small run manufacturing is affordable even when producing quantities less than 50 pieces.

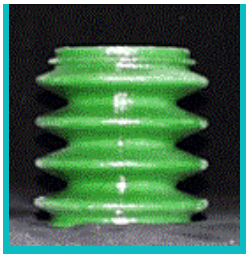
Protowerx scanned the artists original carved part, creating a 3D computer image that was increased in size and altered at the joints. The part was then milled out of maple wood using 4 axis CNC milling for the client who designs and sells the high end maple dolls. Our client takes advantage of the small run manufacturing to have local fast production of parts such as arms, legs hands and feet made in small quantities.

The MDX 650 is a versatile bench top CNC mill. It is ideal for milling the body parts for solid hard wood dolls, molds for investment casting, engravings, relief's, and small quantity production runs. The MDX can handle almost a variety of media; foams, wood, plastics, non-ferrous metals and specialty products like Reshape.

Office: 604-532-1160 Shawn Cell: 778-908-4693
Jeannine Cell: 778-908-4694
Website: www.protowerx.com
Email: info@protowerx.com

3D Printing...

The 3D printer is fast, versatile and cost effective.



This part has been infiltrated with an Elastomer to make it flexible and similar to rubber.

Uses for 3D prints:

- *Fit and form testing.*
- *Design confirmation before purchasing injection molding tools and dies.*
- *Trade show models*
- *Art design*
- *Modeling*
- *Movie props*

With 3D printing, quite often an ordered part can be completed as early as the next day! 3D printing is the right way to go when your budget is tight or the part is needed quickly. We can produce show quality pieces at very reasonable and competitive pricing. We offer the most diverse material set for the ZCorp printer in the Pacific NorthWest. Snap fit materials; making parts that have some flex and give for parts that fit and snap together, Elastomeric materials produce parts that are rubber-like and will stretch and twist. Rigid parts; we use CA (cyanoacrylate) for delicate display only pieces and Zmax epoxy parts that will be handled and used in testing... It is easy and fast using Protowerx as your prototyping service bureau. Give us a call to find out what we can do for you.

3D print of Sir Ian McKellen's head laying in the printer. The surrounding powder acts as support for the part being printed and is totally recoverable, reducing the cost of prototyping as there is no wastage of material in the making of supports

Finished, airbrushed print of Sir Ian McKellen's head, the part is now ready to go to make-up on the set at X-men 3.

Materials used:

Protowerx offers a wide range of materials:

- Plaster powder for rigid models.
- Zsnap for flexible plastic type parts.
- Elastomer: a flexible rubber like part that flexes and twists.
- Zcast: Printing direct pour molds for non-ferrous metal casting.

Office: 604-852-9090 Shawn Cell: 778-908-4693
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Electronics Design...

Cool down timer:
Designed from concept to completion, BD Engine Brake Inc.

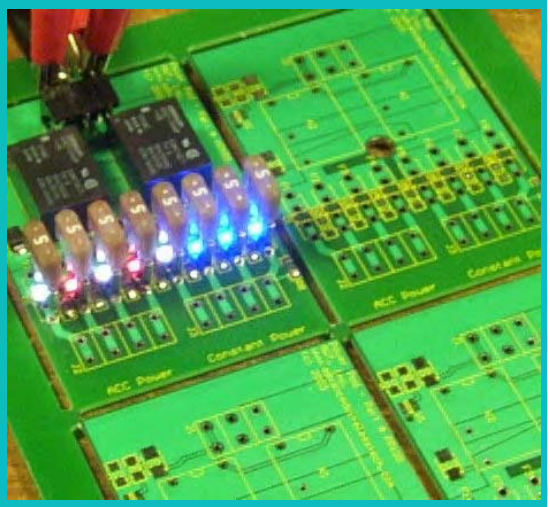
Protowerx Design has been involved with electronic development for many years. The majority of the time we develop control systems for use in wireless, gaming, lighting and vehicular systems. Our knowledge and experience is constantly augmented with continued training, experimentation and of course; the hands on R&D we do for our clientele. We keep up to date with current technology trends to offer the best solutions to our customers.

We have experience in designing complex analog, digital and mixed- signal systems. We program in C or Assembly and use Altium Designer for our schematic and PC board entry.

Let the experience of Protowerx Design Inc. help next design or evaluation task.

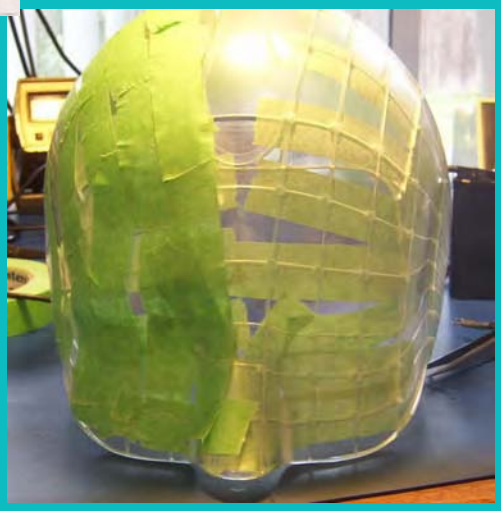
A few of our favourite solutions:

- Microchip Technology
- Cypress Microsystems PSoC
- Anadigm FPAA (field programmable analog array)
- Analog Devices
- Maxim
- Lantronix (XPort and WiPort)
- Melexis



Circuit board design and layout is one of the many services we provide to ensure quality and expediency.

Another prop being wired for X-men 3... Look for this cool special effect in the movie.



Miniature Prop Lighting...
Lighting control firmware run from a Microchip processor driving Luxeon LED's. Variable brightness and a intricate wiring were required for these commercial props. These miniatures were created at Miniature Effects in Burnaby.

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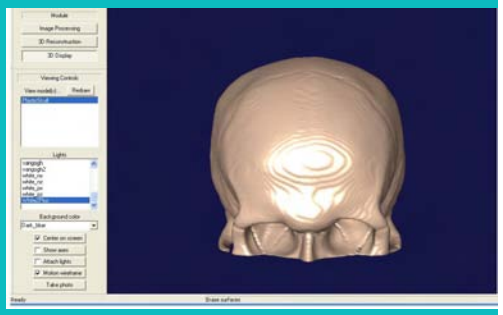
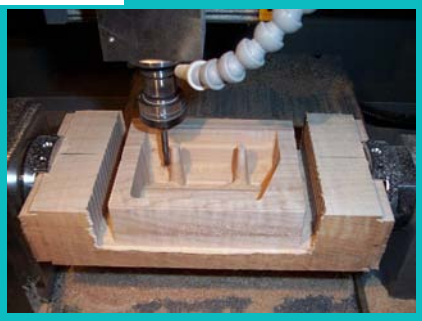
Eye Candy

Pouring molten aluminum directly into a mold printed from Zcast - cool stuff (or hot)!

Section of skull printed for opthalmic surgeon in Vancouver, BC.



Screen shot from Velocity; a program designed to reassemble MRI images into a 3 dimensional file, making it possible to produce models of the tissue or objects scanned. This aids in laparoscopic surgery and conventional pre-operative planning and often reduces surgery time.



Milling a mold on the MDX 650 produces a smooth durable piece that can be reproduced and will need little if any additional finishing.

High performance sleds (snowmobiles) have unique requirements and work in extreme conditions. Premature ignition of gasses, or knock, in the cylinders can destroy an expensive custom engine in seconds. The client, Parker Motorsports required a device to detect and indicate engine knock. If there is knock, it can be caught before the engine is damaged.

Protowerx redesigned the lighting and control system for Battlestar Galactica: Season 3. The control system and battery is compact, each about the size of a deck of cards. The user friendly controller sports a single 5 directional button for navigating the controller menu. The program controls the visor and jaw-line flank lights together or at differing levels of brightness. The software, firmware and hardware for the electronic portion of the helmet were designed and produced at Protowerx.

A new manifold design printed and airbrushed at Protowerx for a client in the automotive industry. This part can be drilled and tapped, or bolted to an engine for fit and form test.

Katie Sackhoff as Kara Thrace, aka 'Starbuck' wearing helmet with visor and flank lights synchronized. Helmet created by the talent at Iguana Film.

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Contact us:

Protowerx Design Inc.
4985 216th Street
Langley BC
V3A 2N1

Phone
604-532-1160
Mobile
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