

Modern Day Gepetto

Bill Barschdorf uses Roland's SRP™ system to revolutionize toy making



Bill Barschdorf and Friends

While most artists sculpt everything by hand, Barschdorf has thrown that painstakingly long and dirty process to the curb. Now his toy prototypes come to market faster and more closely resemble the toy company's vision.

"The Roland MDX-650 has changed every aspect of my workflow," said Barschdorf. "There is simply no reason to sculpt anything entirely by hand anymore. Ninety-eight percent of all my work is done now with this process. Every time I see my models being milled, I am amazed at the capabilities of the machine.

"My work is now more precise and accurate and my hands stay much cleaner," added Barschdorf. "The merging of art and technology is now my passion."

Some service bureaus make toy prototypes with an additive rapid prototyping process. While these companies also enjoy improved speed and efficiency, Barschdorf has that plus and so much more. Roland SRP technology gives his models higher resolution and greater detail. Plus, since SRP systems costs several times less, he can afford to create models in house using a wide variety of materials.

Thanks to new, easy-to-use CAM software like MODELA Player, SRP is only recently a feasible solution for making toys. Previously, Bill would have had to learn G-code. Instead, he uses Visual Mill by Mec Soft.

As for quality, Barschdorf's work is legendary. The skilled artist does the final detail work by hand. "That's what takes it over the top," said Barschdorf. "It gives my models that hand sculpted feel. The folks over at Mattel tell me 'no one else offers the same detail or precision.'"

For more information about Bill Barschdorf or BNT Studios, visit www.bntstudios.com or www.bnt4cnrcp.com. For more information about Roland SRP technology, visit www.roland3d.com.

Don't tell Buzz Light Year, but all action figures begin as merely a glimmer in some designer's eye. They are sketched onto paper and approved by the toy company that would eventually manufacture them. From this point, however, one innovative artist has revolutionized the process of making toys.

Using a Roland MDX-650 benchtop Subtractive Rapid Prototyping (SRP) device, Bill Barschdorf (BNT Studios in CA) quickly and easily mills toy prototypes out of modeling wax. He uses CAM software to rescale and edit models when his client

A Passion for Monsters

When Bill Barschdorf was a boy in Las Vegas his passion was movie monsters. "I would mess up my face with gory, scary makeup as a hobby," said Barschdorf. "In my mom's kitchen, I used to experiment my craft on any willing friend who would dare sit in my makeup chair."

When Barschdorf was 22, he moved to Los Angeles to follow his dream of becoming a professional movie monster maker. He worked in the motion picture industry in the field of special makeup effects from 1987 to 1991 with various studios and special effects shops.

"I was a key technician for six years with world famous makeup studio Steve Johnson's XFX," said Barschdorf. "I have worked on many blockbuster films such as The Abyss, Nightmare On Elm Street part 4 & 6. The Howling, Michael Jackson's Scream Video, Robocop and Suburban Commando to name a few."

After working as a crewmember at XFX, Barschdorf realized it was time to break out on his own. So in 1991 he opened his own FX Studio called Altered Anatomy FX. He and partner Robert Marino built a 4x4 vacuum-forming machine and produced effects work for films.

"Then Mattel toys called us out of the blue in 1994 and asked us to create some specialized sample work," said Barschdorf. "I guess the rest is history as they say. I never even thought of creating toys, but now I know I was put on this earth to create them."

Barschdorf now owns and operates BNT Studios, a toy design shop that is dedicated to client needs. Those clients include Mattel Toys, Hasbro, Jakks Pacific, and Fisher Price. Top selling product lines include He-Man, Elmo, Bat Man, Max Steel, Jimmy Neutron, WWF, Real Monsters and Hot Wheels.

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A detailed look at Bill Barschdorf's SRP toy making workflow:

1) 2D Art Work -- Barschdorf obtains 2D concept drawings (also known as Turns) on paper that represent the vision of the company designer and toy company. This drawing depicts armor and weapons for the He-Man action figure line by Mattel Toys.

The action figure and model is merely six inches tall.



2) 3D virtual models - Barschdorf scans the 2D art work into his computer and rescales them in Photoshop to the final toy's scale 1-to-1.

He then maps them into Lightwave or Rhino modeling software. Using the 2D images as reference or a template to model the parts, he creates the curves and surface geometry that make up the 3D virtual model. Barschdorf is a master at this process.

Depending on the complexity of the model, this process takes about four to six days. Here are pictures the virtual models for He-Man's armor and weapons.

This image shows the fine detailed work in Barschdorf's sculptured He-Man accessories.

3) Approval - He sends the 3D virtual models to the toy company for comments, changes or additions. This is much easier with the Roland MDX-650, as changes can be made right in the software before Barschdorf mills any parts. "This simplifies the process because the client sees the entire sculpt or model before it is too late," said Barschdorf. "The designers really like that because they are never surprised when you show up to deliver a sculpt and it is all wrong. I love this because I rarely do re-sculpting anymore. I give the client exactly what they wanted from the get go."

4) Milled Parts - He mills a wax model out of a block of freeman machinable wax using the Roland MDX-650 SRP device with the 4th rotary axis and automatic tool changer. "There is nothing I can't mill with it," said Barschdorf. This picture shows a variety of milled items, including the War Lord action figure.

The surface qualities of the parts I mill are outstanding. The parts are typically 95% to 98% completely finished right off the MDX-650. "The accuracy and precision of the MDX 650 exceeds any Rapid Prototyping system on the market," said Barschdorf.



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5) Snap Molds - The milled parts get snap molded with a two-part, catalyst-based Silicone, which cures around the model to form a rubber mold. It takes about six hours to harden. Here's a picture of the milled War Lord and his snap mold.



6) Cast Models - Barschdorf pours the casting material in the mold and bleeds it so that the model has no trapped air. At about 42 psi, the pressure chamber pushes all the air out for a perfectly cast model. "I can cast in a wide variety of materials such as a rigid resin material or soft pliable materials," said Barschdorf.

"Typically, I use a rigid material to cast for a more geometrically shaped non-organic model," said Barschdorf. "If I am doing an action figure or an organic sculpture, I would cast the parts in toy sculpting wax, then do all the final sculptural details and clean up by hand."

Here's a picture of Barschdorf pouring a two-part urethane casting resin to create a proof or test casting of the model.



7) Final Prototype Sculpture - He takes the casted model and finishes it by hand to create a hand sculpted feel. Here's a picture of Barschdorf adding final touches to the War Lord, which is now ready to be manufactured.



Here is a picture of the finished War Lord prototype. He's ready for action!

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Roland 3D

Roland is an established leader in the manufacture of 3D scanning and milling machines for a wide variety of industries, including Computer Aided Manufacturing (CAM), Subtractive Rapid Prototyping (SRP™), reverse engineering, 3D modeling and mold making. Each and every device is designed to establish a new benchmark for performance and price. Powerful, easy-to-use software compatible with industry standards is included in the price of the machines.

Scanning Machines

PIX-4 & PIX-30 Precision Desktop 3D Scanning

PIX-30 and PIX-4 3D scanners use RAPS (Roland Active Piezo Sensor) technology to generate wire-frame models for reverse engineering, rapid prototyping, and computer graphics and animation. The PIX-30 has a maximum work area of 12" x 8", and the PIX-4 has a maximum work area of 6" x 4". Both have a Z-axis height of 2.38" and a minimum scan pitch of 0.002".

LPX-250 Dual Mode Laser Scanning

The LPX-250 3D laser scanner performs both rotary and plane scanning and includes professional 3D scanning and editing software. For less than \$10,000, the LPX-250 lets engineers, animators and game developers scan objects quickly, right on their desktop. With plane scanning, the LPX-250 captures side cuts and cavities with up to 0.008" resolution. With rotary scanning, it scans entire objects at up to 1800 steps per revolution. Maximum work area is 10" (diameter) by 16" (height).

Milling Machines

MDX-650 & MDX-500 Benchtop SRP and CNC Milling


MDX-650 and MDX-500 benchtop milling machines turn CAD files into 3D prototypes and molds quickly and inexpensively with virtually no finishing required. Powered by AC Servo motors on all three axes, they use Feed Forward Processing technology to mill ABS, modeling wax, aluminum, brass and other non-ferrous metals with speed and precision. With its optional rotary axis, the MDX-650 can mill the full circumference of objects. The Roland Automatic Tool Changer (ATC) further reduces the time and cost associated with product development by enabling the MDX-650 to mill prototypes completely unattended. Both MDX machines mill up to 200 inches per minute at up to 0.00039"/step resolution. The MDX-650 has a maximum work area of 25.56" x 17.69" x 6.06", and the MDX-500 has a maximum work area of 19.63" x 12.94" x 4.13".

Combo Machines - Scan & Mill

MDX-15 & MDX-20 Desktop Rapid Prototyping

MDX-15 and MDX-20 desktop milling machines are ideal for jewelers and product designers working on a budget. They mill chemical wood, resin, aluminum and brass and incorporate RAPS technology to scan with a resolution up to 0.002". Maximum work area is 6" x 4" for the MDX-15 and 8" x 6" for the MDX-20. Both have a Z-axis height of 2.38".



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PIX-4 – \$1,995 US
PIX-30 – \$3,495 US



LPX-250 – \$9,995 US



MDX-500 – \$19,995 US
MDX-650 – \$23,995 US



MDX-15 – \$2,995 US
MDX-20 – \$4,495 US

Prices subject to change.