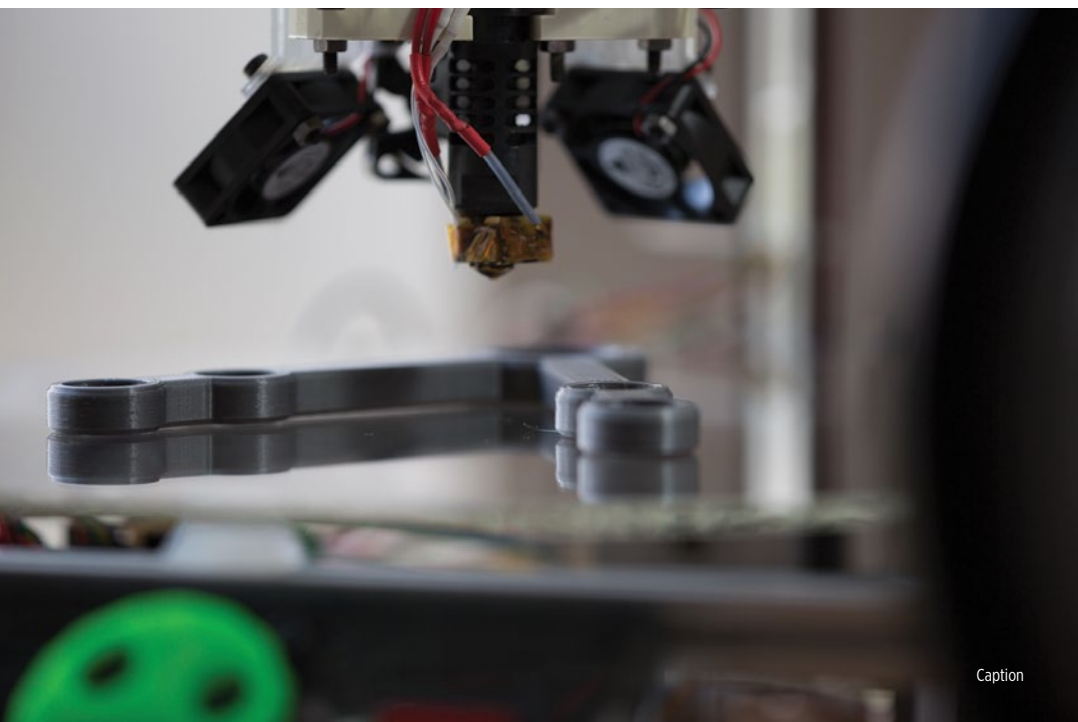


THOUGH 3D PRINTERS
ALREADY CREATE
WATCH PROTOTYPES IN
MANY MANUFACTURING
FACILITIES, A FEW PIONEERS
ARE ALREADY CREATING
FINISHED PRODUCTS.
By Jan Tegler



caption

If you've paid even scant attention to emerging technologies in recent years, it's likely you've heard about three-dimensional (3D) printing. Also known as "additive manufacturing," "3D printing" describes various processes for making a three-dimensional object in almost any shape from a three-dimensional model or other electronic data source – essentially, successive layers of material are laid down under computer control.



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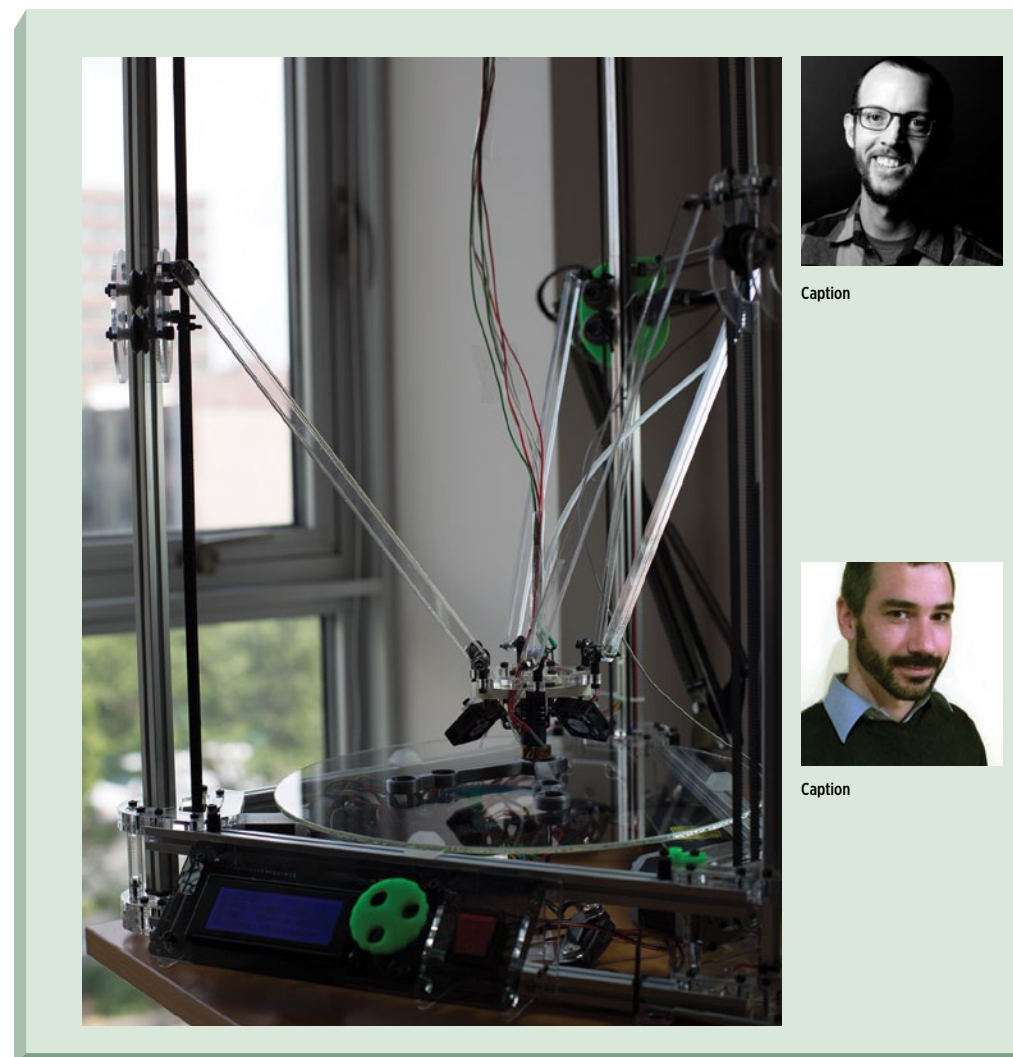
SIMULTANEOUSLY TOUTED AND met with skepticism, this evolving technology is changing the manner and speed with which a host of products are made. Already a fixture in the global watch industry, 3D printing is used primarily for rapid prototyping today.

But today, a few pioneers are venturing into new dimensions.

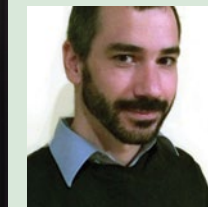
Among the most interesting efforts are those from independent watchmakers Nicolas Manousos and Simon-Pierre Delord. New York City-based Manousos is the man behind 3D Printed Horology while Delord is one of the two founders of A.L.B. Watches, a small, independent French watchmaker.

Both come to watchmaking from non-traditional backgrounds, a trend they agree will continue and perhaps push the industry in new directions as 3D printing advances and young technologists bring new techniques and ideas to the design and manufacture of wrist watches.

Manousos had a very successful career in Silicon Valley as a software engineer but wanted to do something different. He had already become interested in timepiece collecting and is familiar with major brands, but didn't know much about independent makers.



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"One night at a collector's event I met Peter Speake-Marin," Manousos remembers. "He opened my eyes to the concept of having one person, or a very small team, do independent watchmaking."

BACK TO SCHOOL

THUS INSPIRED, HE MOVED FROM California to Miami to attend The Nicolas G. Hayek Watchmaking School and learned traditional mechanical watchmaking. Upon graduation, his classmates went to work for major brands, but Manousos wanted to work for himself, outside a corporate environment.

He taught himself CAD-CAM and CNC processes and set up a traditional workshop with the aim of working in the tradition of independent watchmakers. Like many watchmakers, Manousos considers the late horological giant George Daniels the epitome of the independents.

"After a year of that I thought, 'I'm not able to iterate fast enough. So I started looking into 3D printing,'" Manousos recalls.

He saw 3D printing as a way to achieve his dream of building a tourbillon movement with a unique symmetrical co-axial escapement described and prototyped by Daniels but never produced.



Again, he educated himself thoroughly and realized that if he could accept the one major current drawback to 3D printing for watch production – low resolution – he could succeed.

"I decided to embrace scale limitation and that's where the Tourbillon 1000 came from," Manousos explains.

3D-printed in PLA (a plastic material), the T-1000 is a 1,000 percent scale working tourbillon that incorporates Daniels' symmetrical co-axial escapement. Manousos considers it an educational device.

"You can hold the tourbillon in your hands. You can understand how it works, take it apart and put it back together."

Manousos is currently filling orders for his T-1000 and plans to go further. "The first iteration of it will be as a weight-driven, one-hertz clock that you can hang on your wall or put on your desk."

A.L.B. HOROLOGY

SIMON-PIERRE DELORD and his partner Vincent Candelle Tuheille began A.L.B. Horology Workshop in 2012 with the goal of building artfully-designed timepieces powered by the ETA 6498 movement.

"But it's quite a shame to do the same things everybody else is doing," Delord quips.

A.L.B. turned to 3D printing as a way of doing something new and different. Like Manousos, Delord is an outsider. An expert in 3D cinema for the movie industry, he also shares a passion for timepieces.

After more than a year of development, working with commercial 3D printing firm Sculpteo, A.L.B. perfected a high-resolution 3D process for printing distinctive compound dials for its Balade au Brézéquet and Secondes d'Eclipse models.

"We call the printed parts the top ring and bottom ring," Delord explains. "But there are no specific words for this part because it is a mix between a ring and a dial."

Printed in polyamide – a strong, somewhat flexible material that can take small impacts and resist some pressure while being bent – the parts fulfill the traditional role of a dial and fix the movement inside the 45mm and 41mm stainless steel cases that surround them. They also confer uncommon depth and dimensionality, yielding unique, colorful dials.

Delord says A.L.B.'s biggest challenge aside from obtaining resolution high enough to properly print the parts was developing treatments that would protect the black-colored polyamide ring and dial from damaging ultra-violet light.

THE FUTURE

MANOUSOS AND DELORD agree that it will be a few years before 3D printing for production of components takes hold widely, primarily due to the need to cost-effectively print at a resolution high enough to reliably yield parts small enough to be used in mechanical and quartz timepieces.

Both intend to press on however, printing in new materials including carbon fiber and steel.

"What excites me is the possibility of seeing independent watchmakers using 3D printing more, getting more people into the industry," Manousos says. "3D printing and manufacturing could – in the third dimension – bring forth new technical innovations. How can it improve the escapements we have? What happens when a gear train is no longer flat?"