

TODAY'S

TW

MACHINING WORLD

Vol. 1 No. 9 Nov/Dec 2005



## The Reemergence of the U.S. Bicycle Industry

How the bike business got its  
groove back in a high-end market.

Today's Machining World Magazine  
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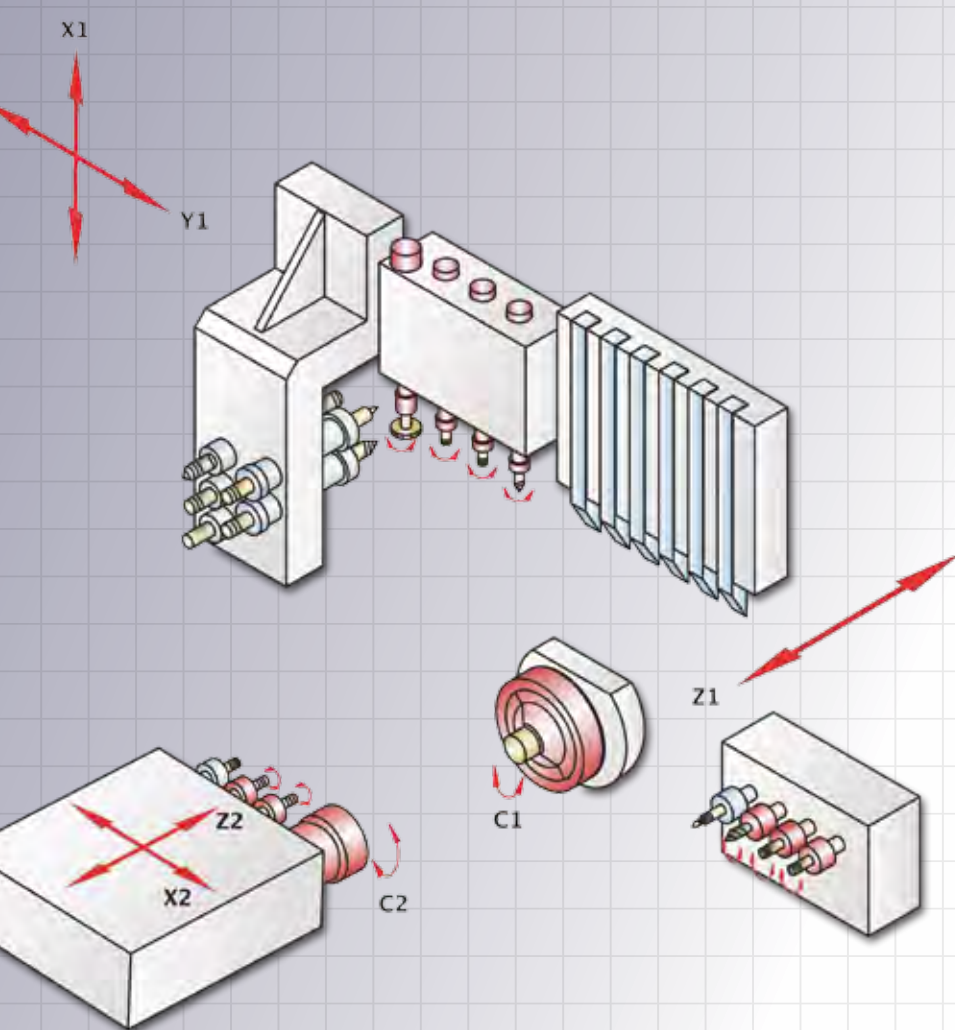
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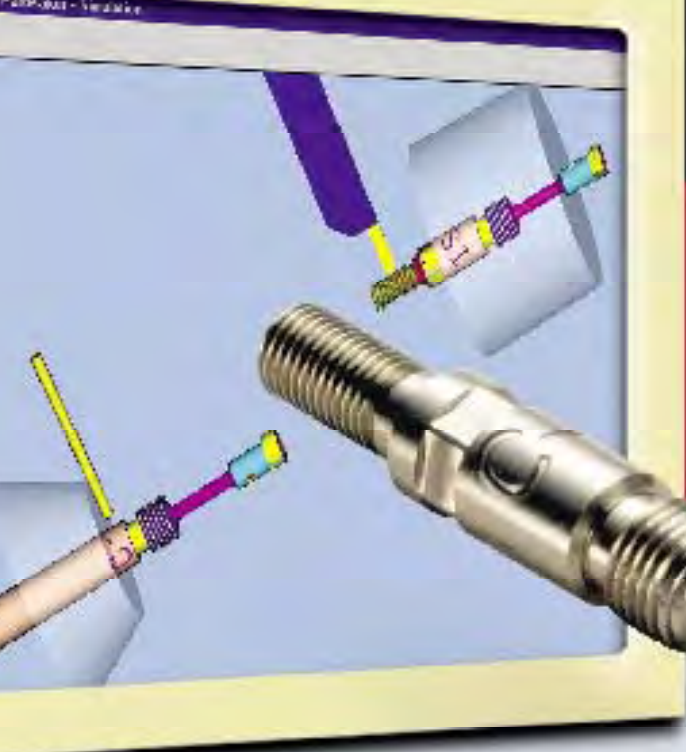
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*Happy Anniversary*

by Lloyd Graff



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# from the editor

## Big League

Beginning in 2006 with our next issue of *Today's Machining World*, we will become a monthly magazine publishing twelve times per year. For you, this means you will no longer have to guess whether the publication is in vacation mode. From now on we'll work like you do, month-to-month.

This is another significant step for us at TMW. In effect, we are doubling our output over a twelve-month period, because we went from six issues to nine in 2005, and in 2006 we go from nine to twelve.

To use a manufacturing metaphor, it is like putting on a second shift. We will be able to amortize our fixed costs over a larger number of issues. We have added a new Art Director, Rob Bocok, to facilitate this upgrade, and Noah Graff will be devoting more of his time to developing magazine content.

From a financial viewpoint, we are now providing our advertisers with more opportunities to reach their prospects. Time-sensitive material like auction announcements will become easier to accommodate. A calendar of upcoming events will make more sense to run.

For a one-title publishing company like ours, it is challenging to make money on a few issues. More issues should drive more revenue and greater income.

For me personally, it feels like coming up from the minor leagues to the Big Leagues. I think that to be truly recognized as a Major League magazine, you need to be at least a monthly.

Also, it means I get to do more Swarf columns, which should make me sharper and closer to the action. Writing is akin to yoga practice; the more often you do it, the more worthwhile it becomes. I hope you feel the same way.

*"From now on  
we'll work like  
you do, month-  
to-month"*

**Lloyd Graff**  
**Editor/Owner**  
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## The Davenport Camp

I read your article titled "Running Swiss in Boca" with great interest. If only we could restore the old machining world where mechanically brilliant types like Earl Brinkman were creating a stir, and people with a desire to produce something often made a small fortune! But what excites the New Davenport the most isn't the past, but the fantastic opportunities that lie in the future.

We are excited about Davenport's future prospects because we have witnessed a dramatic change in the nature of who is spending money on new Davenport equipment, and who is not. Simply put, there are two distinct camps.

The first camp consists of companies like the ones you described in your article, where gritty determination and gutting it out with six or eight older-vintage, multi-spindle cam machines just isn't good enough anymore. The second camp, on the other hand, is profiting handsomely from their investments in new Davenport equipment. This camp seems to principally consist of OEMs with captive shops and larger, more progressive job shops.

The second camp has figured out that for their needs there is not

a faster, more economical way of manufacturing turned parts than utilizing new Davenport equipment. These are the operations that are regularly running more than four machines per operator (and some more than that), doing complex set-ups in less than 8 hours (making short part runs a profitable endeavor) and utilizing the HP Servo B like it is a six-spindle machine (leveraging sell-rates from a \$170,000 fully-loaded machine like they were being generated from a much more expensive six or eight spindle machine).

To be sure, none of this is how it was 20, or even 10, years ago. Even so, concluding that Davenport's future will be like running uphill with a forty pound backpack doesn't seem accurate either. The future of Davenport, as with all things that have stood the test of time, lies in Davenport's ability to offer common-sense enhancements and technological improvements that burnish Davenport's already superior value proposition, and educate potential users accordingly.

**Andrew J. Laniak**  
Davenport Machine/Brinkman  
International Group, Inc.  
Rochester, NY

## Chips Ahoy

Noah, I read your chip/puck article. It had the beginnings of a real article but left many questions. Why won't the scrappies give a real quote? Wasn't your granddad a scrap dealer? What are these scrap dealers hiding if they won't give an honest quote? What is going on? You're the writer; find out why. Then write about it. Tell your dad I love his magazine. It makes all the other ones look like those ½-hour commercials. Your article about pucks is no different than the other magazines. An article about your family's history (if I have the facts close) in the scrap business is better. An article about how the people may change in the scrap business, but are all still crooks is gold. Solid gold.

**Mike from a shrinking plant in PA  
who will never, ever change.**

## An American in Hanover

This year I had the opportunity to attend the EMO show in Hanover, Germany for the first time, exhibiting my company's product in our German distributor's booth. For me, the show was a huge success, and I even managed to learn quite a bit of German. Following are some of the fascinating characteristics I found about the show.

Other than the German language, the biggest difference between EMO and other machine tool shows I've attended is that EMO has no exhibitor or attendee badges. To compensate, some exhibitors had nameplates pinned to their lapels provided by their companies.

No badges meant no centralized lead retrieval. Exhibitors relied on the old-fashioned technique of collecting business cards and scribbling notes on the back of them. Overall, it didn't seem like too many exhibitors were focused on capturing the contact information of these people who came through their booth as we are at machine tool shows in the U.S. When I quizzed one of the show organizers why they did not require badges, I merely got a puzzled look with the

response: "That's just not how we do things at EMO."

Surprisingly, not having badges seemed to create a more attendee-friendly show. Attendees seemed more relaxed and had more time to really put their heads inside machines and ask questions, without fear of being hounded by a salesperson.

On the downside, the amount of espionage going on was embarrassing. Competing builders swarmed each other's stands, and despite numerous signs banning cameras inside the halls, a number of people sported digital cameras and video recorders.

At EMO, eating and drinking in the booth isn't just encouraged, it's a sport. Even the smallest stands offered visitors something to nibble on, while big boys like DMG and Mori Seiki seemed to have veritable cafeterias setup in their booths.

The sheer size of the Hanover Fairgrounds is astonishing. EMO probably has twice the number of exhibitors as IMTS and only takes up an estimated 1/3 of the Hanover Fairground, which has exhibit halls spread across its massive campus. By the way, don't forget to set aside an

extra 30 bucks for the show directory. Incredibly, the same show where exhibitors spend enormous amounts of money pouring wine for their visitors charge attendees for the guide to get them around the show.

As a first time visitor to Germany, I didn't honestly know what to expect of the cuisine. The answer: the food in Hanover was great. If you don't have plans with friends or colleagues for dinner, fear not. On the evenings I dined alone, the restaurant I chose always sat some other lonesome dove at my table, something I've not experienced in all my years of business travel around the world.

These communal dining experiences embodied the intimate atmosphere, which sets EMO apart from every machine tool show in the U.S.

Hanan Fishman  
IMCS/Partmaker  
Fort Washington, PA

### Something on your mind? We'd love to hear it.

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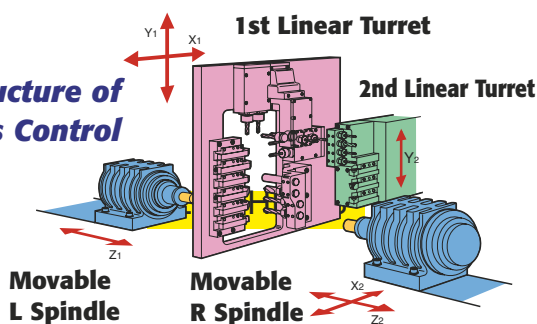
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## Industry News & Whispers

BY LLOYD GRAFF

**T**he Delphi bankruptcy is the biggest story of the year for our industry. Finally, the magnificent inefficiency of big automotive is being addressed. Steve Miller, the head of the company (The *Wall Street Journal* nicknamed him the “Oracle of Delphi”), is taking on fifty years of management and labor malfeasance. Nobody knows how the bankruptcy will turn. It is going to be one nasty mess. The workers will probably strike. There is going to be a lot of pain in Dayton and Kokomo and Lockport.

For close to forty years I have walked through the big-box car factories looking at used machinery. I must admit I am usually too numbed by the experience to judge the competency of the management, but when I can unthaw my brain after one of these near-nausea experiences, I usually think about the grand-scale of mediocrity in these monster, million-square foot factories. It reminds me of what they used to say in Communist countries – “They pretend to govern, we pretend to work.” Same with the socialist republic of Delphi; Delphi has 4,000 workers who have been taking their 100 grand a year for reading magazines. Lop that expense off and you save \$40 million.

When GM tried to separate their Siamese twin and rename it Delphi in 1999, we were still in the Internet bubble; Bill Clinton was President; and gas was a buck and a half. We could still live the illusion that the cement

anomaly of ridiculous embedded costs could be overcome by the brilliant marketing and engineering know-how of General Motors. Today it seems laughable that we believed GM could SUV themselves through the rapids.

Now people routinely use the “B” word with GM. Detroit seems as hapless as the Tigers.

I hope that in the longer run, the Delphi bankruptcy will be a good thing for the manufacturing arena of North America. Some elephantine factories will be demolished; others will be dissected. Talented vendors with one third of the overhead will get more work. Some good companies are going to go bust in the interim. A lot of folks are going to take nasty hits while the workout guys, lawyers, lenders and appraisers do their dances.

Big American automotive has just started chemotherapy. The prognosis is guarded, but at least the process of treatment has begun.

“A lot of folks  
are going to take  
nasty hits while  
the workout guys,  
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One of the smarter job shop guys I know says his current business plan is to get rid of his old mainstay manufacturing tool, multi-spindle screw machines, and do the bulk of his machining with Hydromats and CNC Swiss. This seems counter-intuitive, because I associate Hydromats with long runs and Swiss with short. What about all the stuff in the middle? He says it isn't all going away; it's just too competitive, too tough to make money on.

We understand that one of the major CNC Swiss distributors now believes that the big market opportunity for their product is in automotive-related products. This too seems counter-intuitive, until you think about the Delphi bankruptcy. With the hegemony of the UAW and old school white-bread management under siege in Tier One, a lot of second operation work, routinely done by sclerotic mandated processes in million-square foot future indoor soccer complexes, will now end up running lights-out in somebody's former greenhouse. We used to say, "CNC Swiss, too slow," but what is slow? Obligatory workers that costs \$78 per hour is slow. Moving parts around gigantic factories is slow. One machine, one bar, one eighth of a person, tiny power, little noise, pygmy footprint, maybe that is the new "fast," even if it is "slow."



In the last couple of years, Apple computer stock has moved from \$14 a share to \$60, while Microsoft has been stuck around \$25 for 5 years. Microsoft still coins money on their Windows operating system but they are stuck. Google has killed them on search, and Apple is attacking the PC market. The reason the stock is on fire is that the clever I-Pod and I-Tunes are converting young people into Apple aficionados. They are migrating to Macintosh computers, which have big margins. Microsoft, Dell, Hewlett-Packard, etc. are all feeling this shift.

Dell was brilliantly successful in manufacturing and selling on price, but Apple is starting to change the game. Dell stock is languishing at a 3-year low.

Apple currently owns the cool, and it got there through the back door of the I-Pod. Motorola became cool through



the RazR phone after struggling for years. The Apple phenomenon is both a reminder of the randomness of business sometimes, but also about the premium the marketplace allots to design and creativity.



Seldom does any magazine blow me away with its quality, especially a business publication, but the recent *Inc.* Magazine, celebrating the change of ownership from Gruner + Jahr to Joe Mansueto, really did it.

Gruner + Jahr is a German media division of the giant Bertelsmann Corporation. Back in 2001, they decided to jump into the American market. They bought a package of women's magazines and two business pubs, *Fast Company* and *Inc.* Their timing was terrible, and their management was worse. *Fast Company* shriveled, certainly hurt by the bursting of the Internet bubble. The magazine lost a ton of money.

*Inc.* had prospered under the entrepreneurial leadership of its founder Bernie Goldhirsh. He sold *Inc.* after being diagnosed with brain cancer. Gruner + Jahr ruined the magazine in four years.

Earlier this year, Gruner + Jahr decided to sell their American venture. Meredith bought the consumer magazines. *Inc.* and *Fast Company* were put up for sale as a package.

The October issue of *Inc.* recounted a detailed play-by-play of the sale of the two magazines. It was an absolutely fascinating account of the intrigue of the battle to buy them. From both a publishing and business standpoint, the piece written by the accomplished writer Bo Burlingham, was a masterpiece.

Joe Mansueto, who had made his fortune building the financial rating firm, Morningstar, won the auction for the two magazines. He bid the same amount as *The Economist*, but won because he was willing to ignore the warnings of his lawyers not to accept the accounting figures of Gruner + Jahr without recourse if they proved to be inaccurate in any way. *The Economist* refused to take a chance because they were publicly held, though they offered \$2.5 million more if Gruner + Jahr did not make the final audit figures binding. Gruner + Jahr was in a huge rush to complete the deal and needed the binding agreement.



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Mansueto, by running the article about his purchase of the company, showed his commitment to transparency and provocative journalism. He illustrated as dramatically as he could that the new *Inc.* was going to be completely different from the discredited model he had just bought.

After reading the piece, I subscribed to *Inc.* for the first time in several years. I can't wait to see the next issue.



The recent leak of a memo from a high Wal-Mart official that discussed the possibility of trying to hire healthier people to reduce their health care costs produced a flurry of media coverage.

As an employer I can sympathize with the Boys from Bentonville. They want to hire \$7 an hour people, and often end up with primarily poor, fat women who tend to be unhealthy. If you hire on the cheap, this is what you are apt to get.

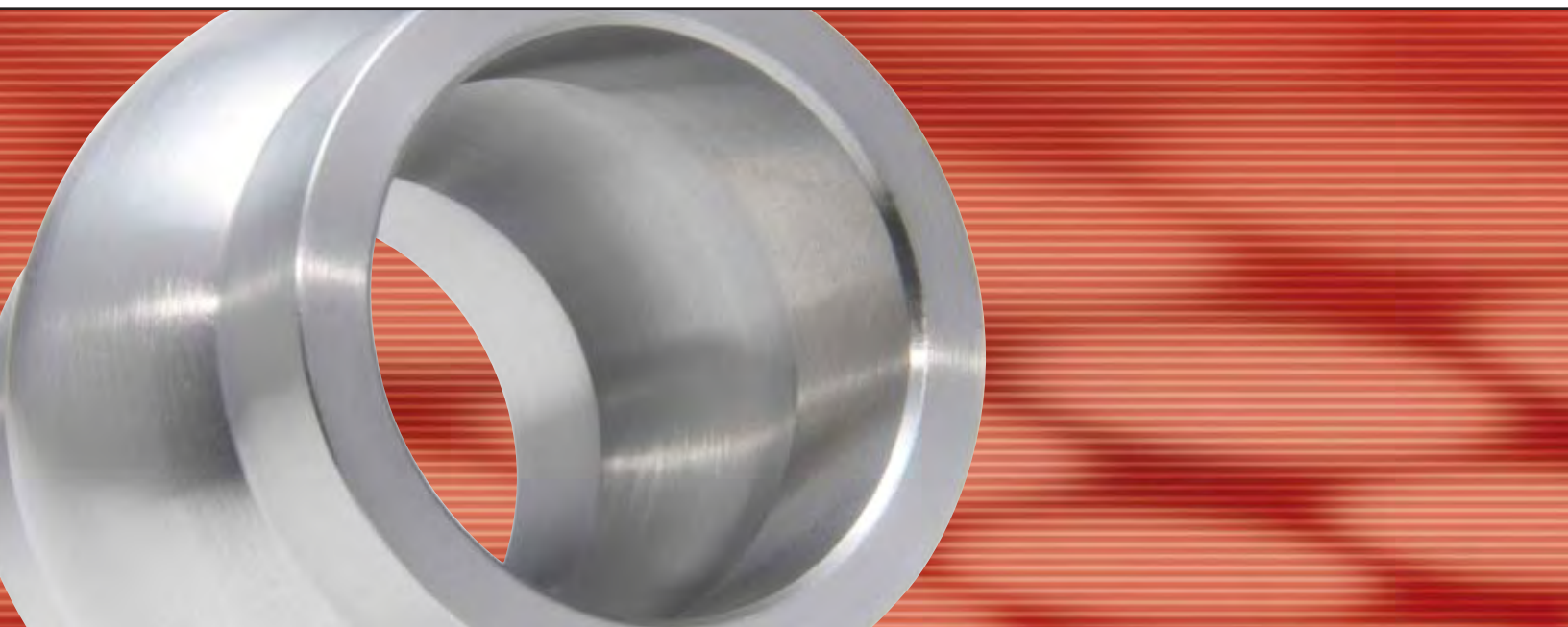
On the other hand, look at Starbucks. They pay low hourly wages but they tend to get bright, cheerful, attractive young people to work for them.

There is something to be learned from this. The quality of the people that you attract and hire is determined by more than just money or benefits.

Having spent many hours observing Starbucks, I would argue that one of the reasons the coffee chain attracts pleasant young people to work is the sociability factor. Starbucks workers connect on the shop floor with the customers with a smile and often some banter. They talk to each other behind the counter as they prepare the drinks. There is a camaraderie and a sense of team at the small stores. In a 150,000 square foot sterile Wal-Mart big box, the employees are dispersed physically and socially by the expanse. I see very little of the stickiness of the people at Starbucks in the factory atmosphere of Wal-Mart.

The health profiling at Wal-Mart is the symptom of a retailing monolith that has lost its mojo. They hire dumb, they sell on price, they beat up their suppliers, they provide a stale work place and an unpleasant buying experience. Sounds a lot like Delphi.

As we run our own businesses, I think we need to make them feel more like Starbucks than Wal-Mart. There needs to be some sense of cohesion, of teamness, of community. There needs to be an authentic energy and optimism.



People want to be part of something alive and joyful. This became clearer to me by doing the container mural project. The original skepticism and confusion about the effort gave way to happiness about creating a spectacular piece of art right on our doorstep. Our people gradually became more and more a part of the project, making suggestions and taking joy in its creation. Doing an open house and exhibition revolving around the mural brought everybody in the company into the enterprise.

I firmly believe that a factory, an office, a Wal-Mart can always be more than just a grind, just a job, just a big old bore.



The White Sox have won the World Series. Yay. This is as much joy as I can summon for an amazing effort by a bunch of no-name players who had a magical season.

The Sox and their fans belong to a different tribe than I do. I am a member of the Chicago Cubs tribe, particularly, a fanatical wing of the tribe known as the South Side Cub fan. I grew up, and still live on the south side of town inhabited primarily by Sox rooters. When I was a kid, the Sox were the

better team in Chicago, and I was part of a tiny minority of Cub fans rooting for a lousy team amidst an army of cocky belligerent Sox fans.

My life as a kid would have been so much easier if I had converted to the dominant religion, which was Sox, but it was never an option. My mother was a passionate Cub fan, born near Wrigley Field, and she raised me Cub. She was not a Sox hater; they just did not even exist in her world. Her father was also an ardent Cub fan, and he used to tell me about the old-time Cub players, some of whom he had even met as a child, like Mordecai "Three Finger" Brown, and Jolly Charlie Grimm. He remembered when the Chicago Cubs won the World Series in 1908.

I believe that you have to be true to who you are. For me to root for the Sox would be like a Jew converting to Islam.

I admire the 2005 White Sox. I hope the Cubs learn from them, and acquire a speedy lead-off man and pitchers who can complete a season without their arms falling off. I love the manager, Ozzie Guillen, who is smart enough to not be too smart, and plays the game with his gut.

For me the Sox have always been the forbidden tribe. They are the "untouchables," to always be hated in my secret soul. They are "other," and always will be for me.

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I grew up in a family business. My father went into the junk business with his Dad in 1938. I joined him in 1969 in the used screw machine business, and we had a good run until he died in 1995.

I have been a student of family business and a practitioner for as long as I can remember. I started working for my father and Uncle when I was 17. I grew up on the stories my father told me about the daily battle of wits of the scrap business in the latter days of the Great Depression. Growing up, the world of business seemed like an endlessly fascinating poker game, full of bluffing and posturing and colorful characters. My Dad and my Uncle Aaron, his partner, were wonderful storytellers. Their stories were authentic, tantalizing tales of intrigue and success. When I graduated from college, the lure of business trumped my love of journalism, and I joined Graff-Pinkert.

As my children were growing up, I told them stories about my daily skirmishes, my travels, some small successes, yet I usually felt that they just didn't get it. My stories were real,

but they just weren't as much fun as my Dad's were to me. In retrospect, I think that my stories were more nuanced tales of frustration and family tension at the company than colorful stories of jackals and scoundrels beaten by the good guys.

At my dinner table I wanted to be the attentive listener, not the dominant voice like my father. My wife, Risa, an educational therapist, teacher, and diagnostician of learning problems, spoke more than me. I had no desire to recreate the dominant voice of my father at my table. All this was probably healthy, but my wife and children lived without the myth of family business, for better or worse. I never connected my passion for "the deal" with their emotional lives, like my Dad had done for me. This liberated them to do their own thing.

My daughter Sarah moved down the spiritual path to become a Rabbi. My oldest son, Ari, went into psychology, and my youngest son Noah became a filmmaker and moved to Florence, Italy.

But it appears that I defined family business too narrowly. In some respects the Graff family business seems more



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enduring than I imagined. Sarah and I frequently consult on sermons, which often draw upon anecdotes from my business life experience. Noah is now an editor of this magazine and doing film work for Graff-Pinkert. And Ari, who wanted absolutely nothing to do with the company, just earned his Doctorate, and is working as a psychologist at a middle school in suburban Chicago. He calls his mother frequently to consult on the tough cases. He and his mother, Risa, have become colleagues in the world of education.

We celebrated Ari becoming Dr. Graff on October 30th. In a quiet moment in the washroom of the restaurant where we were gathered, Ari and I hugged. With a wry smile Ari said to me, "I never imagined that I would join the family business." And it felt just fine that it was Risa's, not mine.



On October 28th the Graff-Pinkert and *TMW* truck mural formally made its debut. Mike Eisenwasser, the artist, sipped

cokes with art critics from Buffalo and Pittsburgh and Fort Wayne, who also came for the L-20 Citizen and the pizza. Tom Scanlon of *Surplus Record* stopped by after watching the White Sox World Series victory celebration earlier in the day. Pat Emerick drove in from Rockford and bought a 3-1/4" Wickman and ate a 9" hot dog. It was one big old festival of art and feedfingers - or was it food fingers?



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# Uncommon Grounds

By Jerry Levine

It first grew in the ancient Ethiopian rainforest high on the hillside. It's a small berry encasing an unremarkable seed. What makes it unique is that these seeds and berries, and the glossy green leaves, are all laced with caffeine – the world's most ubiquitous psychoactive drug.

Like 90% of adult Americans, I need my daily fix to start the day, and several more to keep me going. The story of coffee is fascinating – the history, the business, the politics and our love affair with high-end brews. Mark Prendergast's book, *Uncommon Grounds*, has it all, even an appendix on "How to Brew the Perfect Cup."

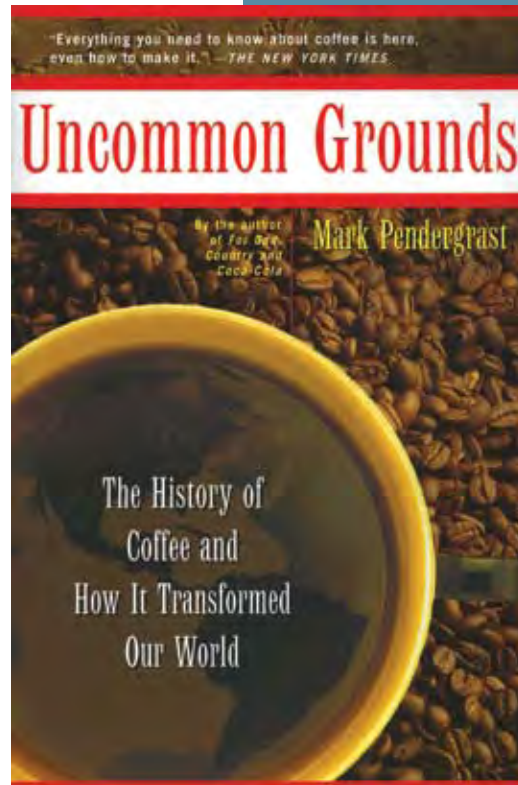
## History

According to folklore, an Ethiopian goatherd named Kaldi discovered the joys of coffee when his goats ate the berries and became so frisky they "danced." Soon Kaldi joined in, as did the rest of the village. Today, coffee is the

second most valuable legal commodity (after oil) exported throughout the world.

Once the Ethiopians discovered coffee, it quickly spread throughout the ancient Arab world. According to legend, Mohammed proclaimed that under the influence of coffee he could "unseat 40 horsemen and possess 40 women." The name "coffee" comes from the Arabic word "qahwa," meaning wine. Wealthy Arabs had a room in their houses for ceremonial imbibing, while the less well off sipped at the coffeehouses. Coffee houses soon gained a reputation as subversive hangouts. This led to coffee being banned by some Muslim clerics, only to be reinstated by others who were coffee lovers. The plant variety became known as Arabica, and was shipped from the Yemeni port of Mocha.

In the 1900s Robusta coffee was discovered in Africa, and spread



*"The best stories are told over coffee,"*

*wrote one commentator 100 years ago,*

*"as the aroma opens the portals of the soul."*

to Brazil and the Far East. Robusta turned out to be more disease resistant and prolific (hence the name); however, it tasted harsher and contained double the caffeine of Arabica. Robusta coffees don't

taste as good as all-Arabica blends, but it is cheaper, so it eventually made up the majority of the beans in traditional American blends, including Folgers and Maxwell House.

## Business

While coffee is produced mainly in the southern hemisphere, most consumption is in the north. Consumption in the U.S. took off during and after the Civil War. Soldiers on both sides were given large coffee rations as a stimulant for nighttime guard duty, and as a motivator to fight harder. After the war, real coffee was scarce in the war-torn South. Many substitutes sprang up, most notably chicory.

For the rest of the 19th century demand grew. By the beginning of the 20th century, the coffee industry was an enormous interconnected global force. It was the first major commodity traded worldwide, with futures markets in New York, London and Hamburg. U.S. demand in the 1890s grew with the huge influx of immigrants and rising prosperity. This encouraged increased production, mainly in Brazil. But it took five years after planting for a bush to mature, which led to tremendous "boom and bust" cycles. When prices rose, planters planted millions of trees, and until they matured, prices were high. But when the new harvests came in, surpluses arose and prices plummeted. This cycle repeated itself every ten years. Eventually, the International Coffee Agreement was signed, which, like the OPEC cartel, loosely controls supply. Brazil accounted for 80% of all production, and, like Saudi Arabia, was the main counterweight to balance supply and demand.

World War II, just like the Civil War, addicted millions of soldiers. Sales boomed, and to meet growing demand, many old-line



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coffee sellers introduced cheap, harsh tasting Robusta beans. Advertising was aimed at the over 40-year old housewife. Baby boomers (aka the Pepsi Generation) were marketed caffeine-laced soft drinks. It wasn't until the 1990s that Peet's and Starbucks began marketing high-quality, high-priced, all-Arabica coffee in a big way.

### Politics

The Great Depression and its low coffee prices brought revolution, dictatorships and social unrest to Central America. In El Salvador, Guatemala, Honduras and Nicaragua, dictators came to power, often with U.S. support. General Somoza became the largest landholder in Nicaragua, owning 46 coffee plantations. As the Cold War intensified in the 1950s the Dulles brothers at State and the CIA began pulling more strings in Latin American coffee politics.

### High End Brews

After the long post-war experience of low-quality Robusta coffee chasing an ever-aging market, a new market niche emerged, with Starbucks and Peet's leading the way. In 1987 Howard Schultz, Starbucks' former marketing director, purchased the company. Schultz changed the coffee-only format to selling Italian-like drinks, often with goofy names. He instituted a rapid expansion plan, and by 1991, Starbucks had sales of \$57 million through 100 stores. Now they have almost 10,000. Starbucks has often been criticized, but they can take credit

for rejuvenating America's love of high quality coffee.

Coffee is one of the staples of our lives. Wherever it is brewed and consumed there will be lively controversy, strong opinions and

good conversation. "The best stories are told over coffee," wrote one commentator 100 years ago, "as the aroma opens the portals of the soul."

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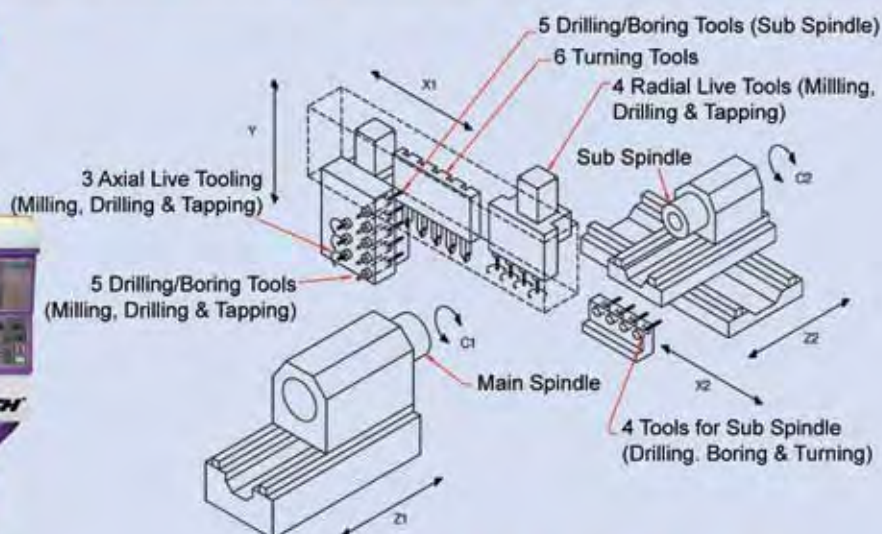
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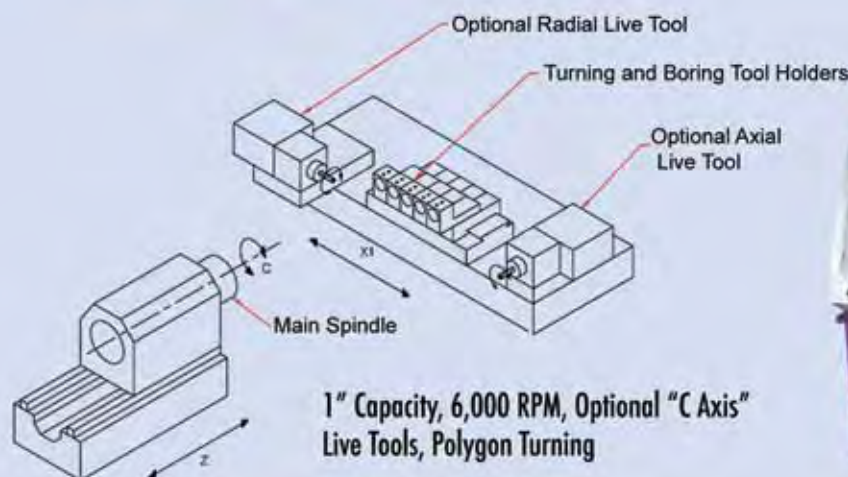
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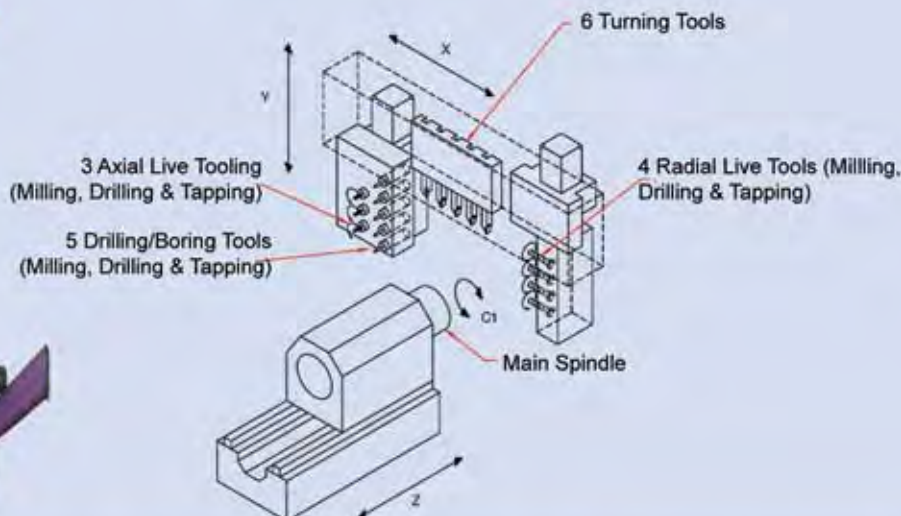
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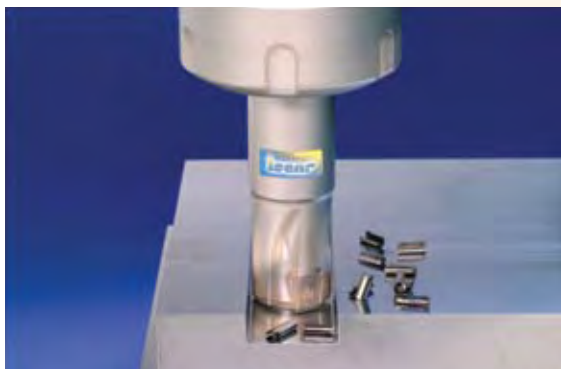




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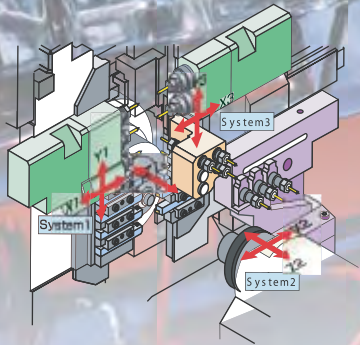
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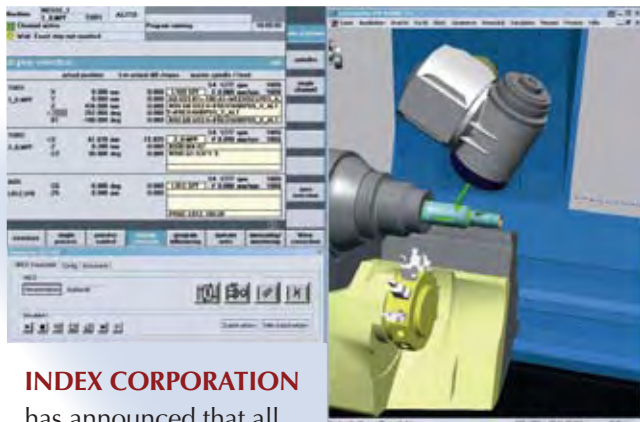


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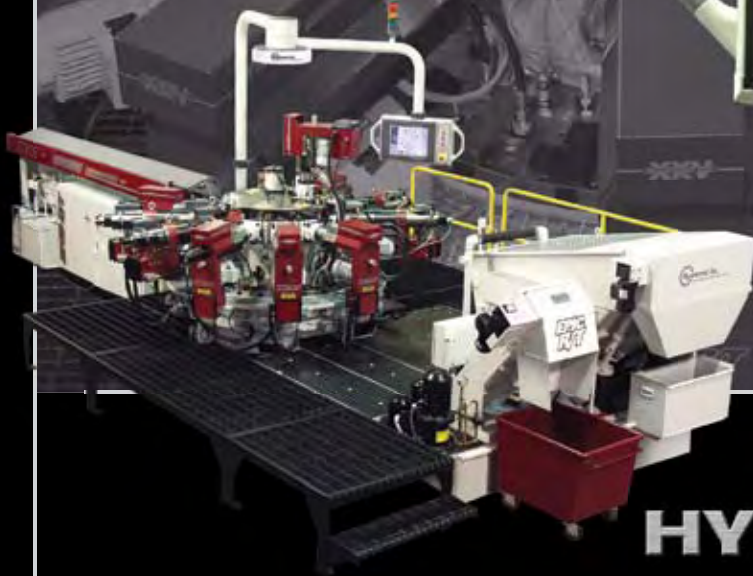
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Now each station has its own control system integrated into each toolspindle unit resulting in a plug & play control architecture. The by-products of this technology are substantially lower re-tooling costs and superior flexibility, with changeover times that are generally only 1-3 hours.

Set-up is simple, with standard G-Code programming the work can be done elsewhere and downloaded at the machine, or from a remote location via a network connection. The optional Esprit software bolsters your programming efforts by significantly cutting contouring program time.

All EPIC R/T units employ a linear scale for

position feedback creating a true closed loop CNC system. The Fixture Compensation feature adds an additional level of accuracy by applying individual offsets for each fixture. This impressive system has a feedback resolution of 1 micron.

Quality Control and inspection is always crucial. The EPIC R/T can identify and track specific parts, or groups of parts, and segregate them as required for offline Statistical Process Control. A full array of in-process gauging and measurement capabilities are available to keep production in tight control.

Hydromat's EPIC R/T provides the ultimate in productivity combined with unparalleled flexibility for cost competitive lean manufacturing.

With all the advanced CNC capabilities of Embedded Motion Control coupled with the legendary Hydromat design, don't you think it's time you should take a look?

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### **Shaft**

430F Stainless Steel

Cycle Time

**4.1 sec**





A rapidly evolving machining technology is emerging for finishing inside diameter parts such as gears. Diamond-plated and super-abrasive single-pass bore-finishing technology from **ENGIS CORP.** holds extremely tight tolerances reliably and consistently. Engis super-abrasive bore-finishing tools are capable of achieving bore geometries to within 0.000020" in standard, blind, and semi-blind bores.

Engis single-pass bore finishing machines feature a series of pre-set barrel-shaped tools, with a slow-wearing diamond coating that pass once through the bore while the tool, part, or both rotate. As the single-pass bore-finishing tool need not expand or contract over the finishing cycle, the system maintains maximum control over bore size and finish.

Engis provides a range of standard and customized single-pass bore-finishing machines configurable to a range of gear-production processes. The SPM Series overall is designed for finishing parts with bore sizes of 1.5 inch and below, configurable in four, six, or eight-spindle models. The Performance Series is designed for parts with bores ranging from 1 inch up to 4 inches, configurable in four, six, or eight-spindle models.

According to Engis, single-pass bore-finishing system benefits include: lower labor costs through

automated finishing; lower cost per hole through long tool life; improved bore quality; fewer rejects; less frequent part inspection; higher production rates and  $\bar{X}$ -SPC values  $>2.0$  Cpk.

**For more information, contact Engis at 1-800-99-ENGIS or visit the company's website at [www.engis.com](http://www.engis.com).**



**EDM Network** and CHMER EDM have announced the introduction of their new Linear Glass Scale option to their complete line of wire EDMs.

Effective immediately, all of their new models CW-420HS, CW-530HS, CW-640HS, CW-850HS

and CW-1065HS wire EDMs will be available with Fagor .5mm (20 millionths) resolution Linear Glass Scales. In addition to making the table positioning a full closed-loop system for improved accuracy, the Linear Glass Scales will help assure long term accuracy as ball screws eventually wear.

The Fagor Linear Glass Scales have been used on all CHMER CNC EDM sinker EDMs for the last five years, and come standard on the CNC sinkers.

**For more information, please contact EDM Network at 888-289-3367 or visit the company website at [www.edmnetwork.com](http://www.edmnetwork.com).**



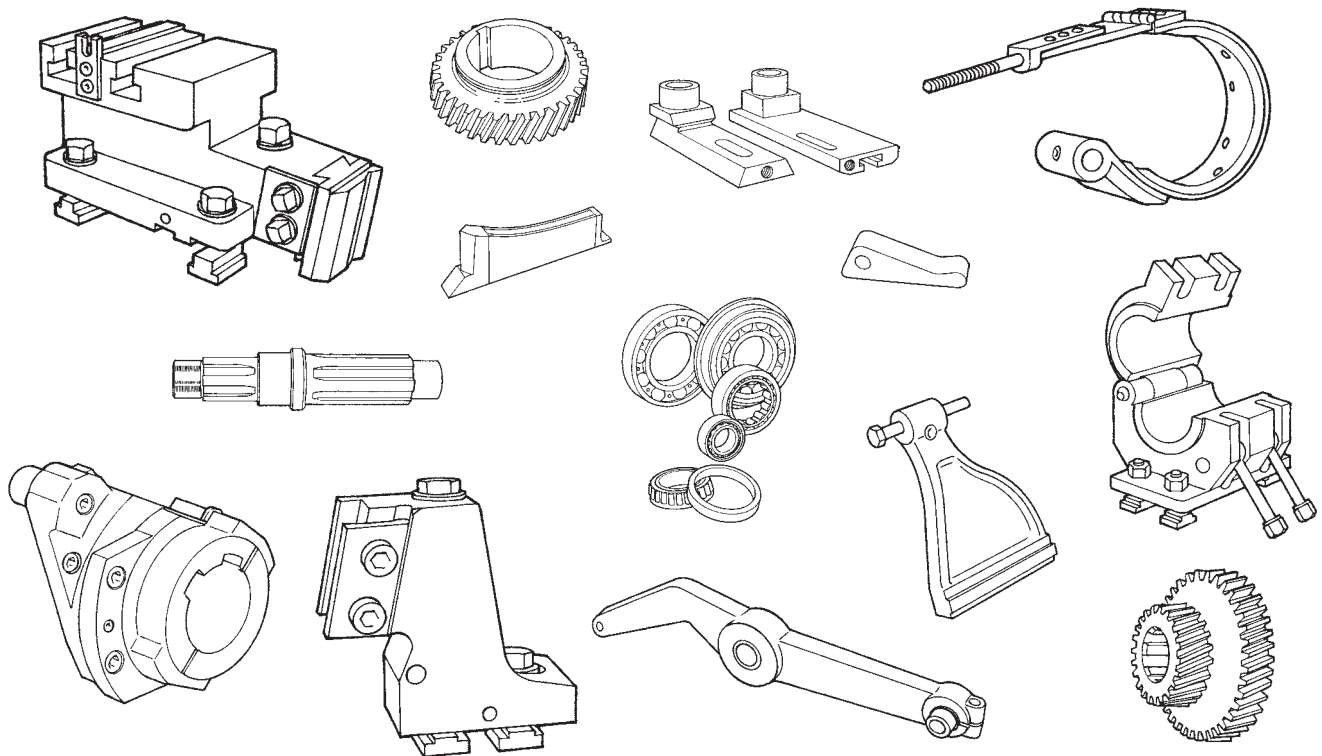
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# HOT SPOTS

Each issue, *Today's Machining World* searches for hot new information going on in our industry. This issue explores an interactive machinery website, a glimpse into the National Manufacturing Week conference, a trade association dedicated to the medical device arena, our source for automotive news and an interactive map of the world.

MORI SEIKI has unveiled the new NT series, an integrated mill turn center. Their website, [www.moriseiki.com](http://www.moriseiki.com), has an interactive feature which gives a detailed, comprehensive view of their new machine's features, including the machine's DCG(tm) or "Driven at the Center of Gravity" technology which minimizes vibrations, octagonal ram, specs on the machine's work envelope and 120 degree B-axis rotation range and a turret with a built-in milling motor(tm). Their comprehensive site offers detailed specifications on their range of machines.

The 2006 NATIONAL MANUFACTURING WEEK CONFERENCE, scheduled for March 20-23rd in Rosemont, IL, will place an intensified emphasis on education, seminars, training and network opportunities. The conference will contain five primary tracks: Design, Plant, Automation, IT and Management, as well as 23 sub-tracks. Keynote speakers include Caterpillar Chairman and CEO Jim Owens, on "Manufacturing Leadership in the Global Marketplace." As part of the 4-day event, four interrelated shows will be held, including the National Design Engineering Show, the National Industrial Automation Show and Conference, the National Enterprise IT Show and Conference and the National Plant Engineering and Maintenance Show and Conference. For more information, go to [www.manufacturingweek.com](http://www.manufacturingweek.com).

The **Medical Device Manufacturers Association** (MDMA) is a national trade association based in Washington, D.C. that represents independent manufacturers of medical devices, diagnostic products and health care information systems. MDMA seeks to improve the quality of patient care by encouraging the development of new medical technology and fostering the availability of beneficial innovative products. Visit [www.medicaldevices.org](http://www.medicaldevices.org).

For up-to-the-minute information and a great pulse on the automotive industry, we look to [www.detroitnews.com](http://www.detroitnews.com). THE DETROIT NEWS AUTOS INSIDER section has a bevy of staff writers with deep knowledge and insight into the inner workings of Detroit's auto industry.

Friday afternoons, you'll want to DOWNLOAD THE FREE VERSION OF "Google Earth," a 3D interface of the planet. Google earth combines satellite imagery, maps and Google Search to put the world at your fingertips. You can see a close-up of your home, then fly in space from your home anywhere in the world. You must have a computer four years old or less to reap the benefits of this site. Meet me in Sydney!

**For more Hot Spots visit  
[www.todaysmachiningworld.com](http://www.todaysmachiningworld.com).**



# CNC SWISS

## PRODUCT FEATURE:

Each month, *Today's Machining World* works to help you understand how the precision parts marketplace works, what's available in the industry, and how you can use available resources, as well as knowledge, to run a more efficient and effective shop. In every issue, we'll feature a product category and focus on equipment key to remaining competitive in our marketplace.

CNC, or computer numerical control, is a microprocessor-based controller dedicated to a machine tool that permits the creation or modification of parts. Programmed numerical control activates the machine's servos and spindle drives and controls the various machining operations. Originally developed for the Swiss watch-making industry, Swiss-type turning centers are designed to turn small, complex parts with high precision. With tight tolerances and rapid turnaround, CNC Swiss machines are an increasingly important vehicle in the metal turned parts industry.

TMW asked Olaf Tessarzyk, president of Index Corporation, to describe some of the benefits of CNC-controlled turning machines.

"Unlike cam-controlled machines, which need tool setting to be done manually, presettable tool holders allow the cutting edge of the tool to be set and measured in X-(diameter) and Z-(length) axis, and in the vertical direction (which determines the center-height) off-machine," says Tessarzyk. "Presettable tooling makes it possible to accomplish any tool adjustment with a tool offset in the CNC control. This is the primary reason for the short set-up and tool change times."

The CNC spindle drive permits exact spindle positioning and C-axis control on all spindles, and because each of the six spindles is actually driven by its own motor, individual speed control for each spindle is possible. "The 2-axis CNC allows a single point tool to produce contours," furthers Tessarzyk, and "a wide variety of chip geometries with a range of speeds and feed rates make it easy to control or break chips, which has an impact on surface finish and reduces the setup time and improves flexibility since no contour tools are used."

The following are a list of specific CNC Swiss machines available from companies who supplied information. Websites provided by these companies provide substantial additional information about particular machines, their specifications, company information and customer support. We encourage you to contact the company directly for more information.



Cubic Machinery has introduced the Cubic Diamond 20 series Swiss-type CNC with maximum machining diameter of 20mm (0.78"). The Diamond 20 series is designed for maximum tooling versatility at a low cost. Features such as sub-spindle and cross milling unit can be tailored to suit a wide range of applications. Its modularity of design is key to accommodating different use cases and budgets. The Diamond 20CSB configuration features a maximum of 26 tool positions, including 6 OD turning tools on overhead cross slide, 6 cross slide driven tools for milling, 4 front stationary tools for ID turning and 3 driven tools for off-center machining on the front face. 5 degree spindle indexing comes standard on the entire Diamond 20 series for drilling, milling and tapping applications. Cf axis is also available as an option. Diamond 20CSB includes a sub-spindle that can synchronize and pick up a part from the main spindle and continue working on the back side. To this end, Diamond 20CSB includes 4 ID stationary tools and 3 driven tools for back side work. This allows many jobs to be finished complete in one setup.

For more information, please contact Cubic Machinery, Inc. at 909-590-9995 or visit the company website at [www.cubicmachinery.com](http://www.cubicmachinery.com).



KSI Swiss, Inc. is an American-owned company and manufacturer of CNC Swiss Type Automatics. Products are made of the finest components from around the world with assembly operations in South Korea and USA. Their Swiss Quality Center has three models: SQC 20, SQC32, and SQC38, which are all fully loaded with options and features.

KSI machines are rugged, precise and ready to run even the toughest parts the day it hits your floor. KSI offers training at your plant and KSI School throughout the year to assist in keeping operators and programmers at their best. Even new Swiss customers can learn quickly with the KSI programs. When you buy a KSI Swiss machine not only are you buying from an American company, but you are also getting the training and experience you expect from a machine tool builder.

For more information, please contact KSI Swiss, Inc. at 303-468-8080 or visit the company website at [www.ksiswiss.com](http://www.ksiswiss.com).

Gildemeister Italiana has introduced the new SPEED linear Series. Simple axis configuration for simultaneous processing of up to three tools is the main feature of this machine. More highlights include a future orientated complete design, stable castiron structure in monoBLOCK® design, a high level of comfort, short setup times, a bar passage of up to 15 mm and numerous options that range all the way up to the dynamic drives. Maximum productivity is achieved with a rotational speed of the main and counter spindle at up to 12,000 rpm, a rapid traverse speed of 40 m/min and an axis acceleration of 10 m/s<sup>2</sup>. The main and counter spindles can operate simultaneously with different cutting speeds with the two integrated,

independently operating spindle drives.

The SPEED 20-11 linear is designed for fast and precise machining on a large range of workpieces. Optimum accessibility in the work area, ease-of-use, 11 controlled axes (with three Y and two C-axes) and up to 36 tools (12 driven tools as standard equipped) are all features that open up numerous production possibilities. This machine allows machining with fixed or driven tools, as well as machining with up to three tools in simultaneous operation. Complex machining on the main spindle can be completed simultaneously with two tools, with independent feed rates. At the same time, rear-sided machining can also be executed. Shortest cycle times are achieved with the driven tools that make three independent milling operations possible. The complete standard configuration offers features such as the C-axis, driven tools, rotating bushing guide collet, parts discharge with a conveyor belt and several Fanuc options. Range of Parts Machine



For more information, please contact DMG Chicago at 847-781- 0277 or visit the company website at [www.gildemeister.com](http://www.gildemeister.com).





Marubeni Citizen-Cincom, Inc. has introduced the new R07 Swiss-type turning center specializing in the fast and efficient machining of small diameter parts up to 7 mm diameter. The new R07 offers a compact rotary guide bushing unit developed exclusively for high-speed, high-precision machining. With this new rotary guide bushing, the R07 can perform metal cutting at high speeds of up to 12,000 RPM. The sub-spindle delivers 10,000 RPM. The R04 with its stationary guide bushing has a maximum spindle speed of 16,000 RPM, with 10,000 RPM on the back spindle as well.

The R series machines use linear motors to drive the slide and tool posts. This system achieves fast part processes with quick response and quiet operation as well as eliminating thermal distortion. A scale feedback control system is also used with all axes, which offers the perfect machine configuration for machining small, high-precision parts.

Even while the super-high-speed built-in spindle motor is running at a high speed, the chuck can be opened or closed without first decreasing the speed. This feature reduces non-cutting idle time. Use of two independent tool posts on the machine increases operation efficiency eliminating idle time due to a tool exchange.

Complementing the R series machines is the optional ALPS Automatic Bar Loader. This special bar loader is specifically designed to grasp and feed small wire-like bars into the machine. Rotary tools are now part of the gang tool post. This allows small-diameter parts requiring complex machining such as polygon turning and end face drilling to be machined easily.

Marubeni Citizen-Cincom was founded in 1984 to market and service Citizen's CINCOM (Citizen Numerically Controlled Machines) family of Swiss-type turning centers. This venture represents the amalgamation of two of Japan's largest and most highly regarded companies, Marubeni Corp. and Citizen Watch Company.

**For more information on the full line of Citizen Machines and for the Distributor closest to you, please log on [www.marucit.com](http://www.marucit.com).**



Maier CNC Swiss turning centers provide start-to-finish machining (simultaneous turning and milling/drilling) in a single operation. Versatile ML ProLine machines are available in 5 different series with configurations ranging from 4 axes with up to 11 tools to 11 axes with up to 30 tools.

Maier machines can handle bar stock to  $\Delta 32$  mm. Machines feature 6000 or 8000-rpm 5/7.5 HP main spindles, 6000 or 8000 rpm 3.5 HP sub-spindles, and 1260 IPM rapid traverses within a distance of .03937". Several models offer simultaneous processing with 2 or 3 tools and are capable of secondary processing (milling and drilling) by means of a 2 HP front drilling spindle. To facilitate complex machining combinations, three independent carriages are available for automatic placement.

ML ProLine machines achieve high dimensional accuracy through extreme rigidity. In the Z axis, the tool is stationary and the stock advances from the main spindle through a guide bushing to expose only the length to be machined. The bushing and, when necessary, a sub-spindle clamp the stock tightly in place to minimize deflection. Meanwhile, the machine's Y axis provides milling. Productivity is further enhanced by Maier software and a standard Fanuc CNC control.

Methods Machine Tools, Inc., has been a supplier of precision machine tools and accessories for over 45 years. Methods is the exclusive North American source for Maier Swiss-type Turning Centers, providing installation, parts, service, and training through a nationwide network of dealers.

**For more information please contact Methods Machine Tools, Inc., at 978-443-5388, or visit the company website at [www.methodsmachine.com](http://www.methodsmachine.com).**

Tyler Machine Tool Co., Inc. was recently appointed exclusive importer of the NexTurn line of CNC Swiss style screw machines for all states east of the Mississippi River. NexTurn, located in South Korea, was formerly marketed in the US under the KSI Swiss name.



With a variety of standard features traditionally offered as optional upgrades, Nexturn's SA Series of 7-axis Swiss turning machines presents manufacturers with a comprehensive approach to the most demanding jobs. Designed to minimize the effects of thermal displacement, machines in

the SA Series excel at providing consistency and repeatability over extended periods of production. The line includes six models from 12 mm to 38 mm capacity.

The SA Series uses dual pre-loaded bearings and direct mounted drive motors to attain the best possible surface finish and sizing. This can eliminate the need for grinding operations, which is particularly beneficial when meeting critical CPK values.

SA Series machines feature a rugged, one-piece casting bed to ensure high levels of rigidity throughout operations. Precision ball screws and linear guides from THK coupled with NSK bearings allow for high levels of accuracy. Local sales, service and applications support is provided by a growing distribution network established throughout the eastern US.

**For more information, contact Tyler Machine Tool Company at 603-474-7730 or visit the company online at [www.tylermachine.com](http://www.tylermachine.com).**

Marubeni Citizen-Cincom, Inc. has also introduced the new low cost Citizen CINCOM 4-axes A-16 Swiss-type lathe. The new A-16 concept was actually based on Citizens successful B series machine and was developed to upgrade current automatic CAM type users to CNC Swiss-type users.

The main spindle motor housing is built-in, NO BELT. This technology offers higher spindle rotation accuracy resulting in better machining of parts. The maximum speed of the main spindle is 10,000 RPM's and the standard independent sub-spindle has a maximum 6,000 RPM's.

Also standard on the A-16 are three cross live tools and four front AND four back drills offering a higher standard machine with a variety of machining capability. The Citizen A-16 is controlled by a Fanuc Series Oi-T Model B System and has four cutting axes (X, Y, Z, and A2).

Marubeni Citizen-Cincom was founded in 1984 to market and service Citizen's CINCOM (Citizen Numerically COntrolled Machines) family of Swiss-type turning centers. This venture represents the amalgamation of two of Japan's largest and most highly regarded companies, Marubeni Corp. and Citizen Watch Company.



In the US, MCC is headquartered in Allendale, NJ, and maintains sales-service offices in both California and Illinois. These three offices are responsible for supporting a nationwide network of 26 distributors located throughout the United States.

**For more information on the new A16 as well as the full line of Citizen Machines and for the Distributor closest to you, please log on [www.marucit.com](http://www.marucit.com).**



The New Tsugami BA26L high precision CNC automatic lathe is the ultimate small parts CNC turning machine for production rates that rival automatic cam type machines. An inexpensive



Tornos Technologies' new DECO 20s Swiss-type machine is targeted to automotive, electronics, connector, medical, and general manufacturing companies producing parts that are moderately complex and up to 20 mm in diameter.

According to the company, the DECO 20s is a "mirror image" machine, having almost an equal number of tools available for both the main and counter spindle. A total of 22 tool positions are available. Quick-mount powered or "live" tooling

can perform milling and drilling operations in addition to turning, so that many parts can be completely produced in a single setup. Further, special attachments can be incorporated to perform operations such as thread whirling, polygon milling, etc.

Simplicity, power, versatility, and an excellent price-to-performance package are the primary benefits of this new offering from Tornos. As part of the DECO series, the 20s also provides the speed of traditional cam-driven Swiss types with the flexibility of CNC.

**For more information, contact Tornos at (203) 775-4319 or visit the company website at [www.tornos.ch](http://www.tornos.ch).**



The TRAUB TNL26 sliding headstock series Swiss-type turning machines offer the advantages of both fixed and sliding headstock turning processes in the same modular machine design concept. The new machine design saves set up time, material cost, and capital cost while providing high-precision Swiss-type and screw machine type turning capability in a single machine. Bar stock capacity up to 32mm (1.25 in.) diameter.

The TNL26 is available with two 12-station turrets (Y-axis optional on both turrets), a 5-station end-working tool carrier, a heavy duty counter-spindle,

and a 5-station back-working tool carrier; the max. Z-axis travel is approx. 10 in. on the L- version and 4 in. on the K- version. The maximum number of fixed tools is approx. 58; of these 32 can be live tools. Up to 4 tools can be in the cut simultaneously, for high production rates.

12-station tool turret concept offers a high tool capacity in the machine, including one live tool in each turret station. The high-speed indexing of the turrets throws chips away from the tools. This is an important advantage when machining tough materials such as stainless steel and titanium, and is just one reason the machine is well-suited to medical parts. The turrets also permit mounting more than one thread-whirling attachment, allowing the whirling of different thread sizes.

**For more information please contact INDEX Corporation at 317 770 6300 or visit the company website at [www.index-usa.com](http://www.index-usa.com).**



optional kit can convert the BA26L to a traditional sliding headstock Swiss machine. This new age CNC Gang tooled turning machine fully answers the demands of today's manufacturing challenges.

The BA26L is capable of metal removal in the X,Z,A & Y axis. Its tool compliment consists of fourteen tools; 6 OD tools, 4 ID tools, and 4 cross rotary tools. The BA26L comes standard with a Fanuc 32i-TA 2-path control, A.C. drives, spindle speeds of 7,000 RPM, and Tsgami's superior tool mounting arrangement. These features combined with rapid traverse rates of 944 IPM result in "right-now" tool indexing and cut-to-cut times. Secondary operations such as cross drilling, tapping, and milling are also possible.

**For more information, please contact Rem Sales, Inc. at 860-653-0071 or email [jboulden@remsales.com](mailto:jboulden@remsales.com).**



*Hand finishing brings out  
the titanium's satin luster.*



# The Reemergence of the U.S. Bicycle Industry

*by Scott Livingston*

For much of the industrial age, bicycles have been big business. From their emergence as curious machines in the 19th century, to the realization of their useful purpose as inexpensive, ecological transportation for millions, to their role in cycle sports at the highest level, bicycles have commanded our attention. Aerospace pioneers, Orville and Wilbur Wright, were bicycle shop proprietors, and that is symbolic of how the innovation and development of the bicycle has

influenced other inventions, and continued over the course of the more than 100 year history of the bicycle age. Technology has come full circle and just like bicycles influenced the first airplanes, airplanes have influenced bicycles. The first airplanes reside in museums as great inventions, as do the first bicycles.

*Photos Courtesy of Seven Cycles*

# Sachs Appeal

By Scott Livingston

**N**estled in the small hamlet of Chester, Connecticut, among artists' studios, restaurants and Colonial era homes, is a bicycle factory operated by Richard Sachs, a craftsman bicycle frame builder. Sachs has been building bicycle frames since 1972, and is the only employee at this factory. He proudly proclaims that he does it all when it comes to making your custom frame.

Of course, Sachs, production capacity is not conducive to short lead times. In a conversation with Sachs about the US bicycle industry and his unique approach, he proclaims, "40 months is just a guess." That backlog is due to both his popularity as a custom builder and his craftsman approach to the process of making bicycle frames one at a time. Sachs sells client direct, rather than through bicycle shops. He meets with the client, "fits" the client, measures their current bicycle, and interviews them about their riding style. This approach is much different from custom builders like Seven Cycles, who delegate the ordering and fitting process to their dealers while focusing on the "mass-customization" process of producing high quality bicycles with a small team of builders.

Sachs does it all, so he can only turn out a limited number of bicycles each year. He feels that he has more in common with craftspeople making other products one at a time than he does with larger bicycle makers. Sachs has strong opinions about the industry. He is heralded as one of the top custom frame builders in the world. He only builds with steel, and he only uses lugs to join the tubes. His welding and other processes are meticulous and for the most part, he builds frames the way he always has. However, after more than 35 years of experience, he feels that the frames he builds

The bicycle is deeply rooted in American industrial culture. From the early to middle part of the 20th century, U.S. factories pumped out bicycles for a public that could not get enough of the two wheeled transporters. Some of the greatest global bicycle brands were our own; Schwinn, Columbia, Huffy, Murray are just several of the classic American builders. So what happened?

Of course, the automobile replaced the bicycle as the primary means of transport, while garages for "horseless carriages," as the first cars were known, popped up all over suburban America. Still, bicycles have remained a big business to this day, and outside of the U.S., bicycles are not primarily just for recreation. They are still used by millions of people to get around. The question needs to be asked, why can't a mass-produced U.S. made bicycle be made economically? Bicycles were some of the earliest products to get "off-shored." American bicycle businesses have been through bankruptcy over and over again, and many have closed their doors for good. For many, their name is all that remains. The process of building bicycle frames and components are familiar to those of us in manufacturing. Tube bending, butting, molding, spring making, mitering, turning, milling, welding, forging, casting, screw machining, heat treating, finishing, plating, painting, and assembly are all part of the bicycle making process. What is so difficult about using these processes efficiently to make mass production bicycles domestically?

Today, there are still pockets of successful U.S. bicycle manufacturers. There are companies that have adapted to the realities of the modern bicycle world. They have adjusted to the demands of bicycle consumers. They have led with design, materials development, and manufacturing technology. However, the bicycle is now produced differently. Bicycle production is divided amongst a global set of specialty companies. There are frame builders, wheel makers, and component specialists. There are even specialists within each of these areas. Frames are built for different



*A recently painted Seven carbon fork receives finishing touches.*



*A Seven frame undergoes nearly 50 alignment checks during production.*

styles of bicycles and different price points. The same is true for wheels, and there are a myriad of sub-markets within the component market. Today's bicycles are a jigsaw puzzle of parts that come from all over the world. Within the bicycle industry, vertical integration of manufacturing processes is quite rare, especially in the U.S. Production is divided by manufacturing process with each company focusing on one aspect of the whole product.

Cannondale, Trek and Specialized have emerged as the big three of the U.S. based bicycle industry. They produce bicycles across nearly all platforms and price points, excluding the least expensive imported bicycles that comprise the mass market and are sold at the "big box" retailers. Complete low end bicycles typically sell for less than \$250 and often for less than \$100 at major retailers. Mid-tier bicycles cost up to \$1,500 at specialty bicycle shops and from catalog retailers, and high end bicycles can cost up to \$10,000. A single component on a high end bicycle, like the headset assembly that holds the fork to the frame, can cost three times more than a mass produced Chinese bicycle. It is hard to believe that a bicycle can retail for less than a hundred bucks, and be made of 45 pounds of steel and aluminum. Domestically, the cost of the material alone would be more than the cost of a completely manufactured and assembled imported bicycle.

The major bicycle categories are road, mountain bike, hybrid, triathlon, tandem, BMX, kids, touring, and cyclocross. There are categories within these categories like cross country, downhill, freeride, and consumer mountain bikes. Modern bicycle makers are populated with passionate entrepreneurs and employees. At all levels of the industry, you find people combining their work with their hobby. You see this in other industries, like aerospace, but the average person cannot afford a single personal jet, whereas one person can easily have a fleet of bicycles. This is both good and bad for the industry, according to Rob Vandermark, President and Founder of Seven Cycles, a high end frame

today are far superior to those built in his early days. Sachs' focus is on the function of the bicycle, but his frames look great too, though the responsibility for finishing and painting each Sachs frame falls to Joe Bell and his team in San Diego, California.

Sachs' product seems a bit out of place in today's industrial world, where the U.S. bike builders survive by selling ultra light bicycles made from space age materials, sometimes without one bit of metal in them. Sachs builds bikes for a lifetime of use, and refers to some of today's high-end, one-piece carbon fiber bicycles as "disposable." He is a throwback to the way things used to be, and is proud of his way of doing things. He notes that the big U.S. builders like Trek are successful, and that all of the technological advancements have made a difference. "They have made a better bicycle. The customer can get it for less, and the company makes more money," Sachs says.



He readily acknowledges that trickle-down technology from the mountain bike boom of 10 years ago is what drives the innovation in today's high-end, U.S. built road bicycles, and that more efficient manufacturing processes have given the consumer more value. Sachs has stayed out of the race to make bicycles ever lighter. He has had personal experience with lightweight components failing, and feels that the consumers are naïve to the risks that they face when choosing lightweight over durable. He is fond of saying, "One pound of steel equals one pound of carbon fiber." Since his bicycle frames cost more than \$3000 (a complete bicycle with good components would be more than \$5500), they may not be for the masses, but judging from the long list of customers waiting to be next in line, Richard Sachs can choose to make bicycles his way for a long time.





manufacturer in Watertown, MA. He feels that an industry comprised of enthusiasts is what makes the culture unique, and drives the innovation, but it is not always the best thing for the business of bicycles.

The modern era of bicycles has evolved over the last twenty years since the commercialization of the mountain bike. Advancements in design, technology, and materials have flowed from mountain bikes to all other types of bicycles. There was explosive growth in the early 1990s as technology trickled down from aerospace and other defense related industries. A lot of new companies entered the market and it seemed as if a new age had dawned. Niches formed, and mountain biking capitalized on the adrenaline fueled nature of participatory extreme sports. In recent years, the success of American professional cyclists on the European road racing scene, especially during the month of July, have driven further demand and innovation for U.S. bicycle products, and even a resurgence of road bicycles.

Entrepreneurs at all levels of the supply chain have let their emotions override good business sense resulting in a litany of flame outs and bankruptcies for U.S. bicycle manufacturers. Frequently, those in the industry warn outsiders that they should avoid the romance of bicycles if they expect to make money. Only the strong and innovative companies with smart marketing and loyal customer bases have thrived. U.S. based mass production is all but gone and even amongst the modern niche producers, weakened companies have faded, or been consolidated with other manufacturers who produce multiple brands across the different bicycle sub-markets.

Until recently, Cannondale was the only major U.S. bicycle company that produced all of its bicycles in America, but even that has changed. Their mainstay line of aluminum frames was completely fabricated in their Bedford, PA factory. Their assembly was also U.S. based, though many of the components were sourced globally. Today, even Cannondale has tapped the inexpensive labor in China to produce its latest carbon fiber bicycles. Shimano, based in Japan, is the world leader in bicycle components, and is a major supplier to the OEM builders like Cannondale and the vast U.S. network of bicycle distributors and retailers. Will the production of high end bicycles suffer the same fate that ended the domestic manufacturing of mass produced bicycles?

"I don't think there is any looking back for Cannondale," says Seven's Vandermark. "Cannondale is the closest of the large manufacturers to making all U.S. bikes (frames), but



*Seven's welds are legendary for their beautiful, uniform look. Cotton gloves prevent frame contamination from hand oils during welding.*

they have made the leap to China with their carbon bike. Mathematically, there is no way to compete with China." Vandermark has made several trips to Asia to research the market. He says, "Taiwan is the hub of the bike world, now it has shifted to China, but it is still Taiwanese direction. Taiwanese companies are using Chinese land and labor."

Seven's 33 employees set it apart from other bicycle frame builders. The big dogs of the U.S. based industry have hundreds of employees. Cannondale, Trek, and Specialized are the large builders. Mid-sized builders like Seven, Dean, Moots, Litespeed and Independent Fabrications focus on niches with a small team of employees. The smallest builders like Richard Sachs, Spectrum Cycles, Rivendell, Peter Mooney and a host of others are either single builder operations, or they have only a few employees. On the component side, the industry is highly fragmented, though there are some U.S. companies making parts domestically, like Chris King, Paul's Components, and S and S Machine.

Seven is one of those unique companies that have developed a nice niche. They have websites for the U.S.,



German, Japanese, Korean, and Chinese markets. Vandermark says, "Seven competes with any bike in the same price range. It helps that the big three have high end bikes. It legitimizes it. When Trek sells an \$8,000-\$10,000 bike, it makes it easier for everyone." Vandermark has never bought into the idea of excelling at just one thing. He had a difficult time seeing it work in the bike industry. From the beginning, his vision for Seven was to be world class at lots of different elements. "We had the vision to excel on all fronts and have multiple priorities of focus. We wanted to be good at everything; email, phone, and all the different elements of connecting to the customer." Seven's customers include end users, retailers, and international distributors. "Ten years ago, there was no model for this in the bike industry," says Vandermark.

Seven makes steel, titanium, and carbon fiber bicycle frames in different configurations, and they do it using one piece flow, a tenet of their internal lean enterprise production system, known as the Seven Process Methodology. Their approach to quality assurance is systematic. Vandermark says, "We make sure we are always getting better. Growing

profitability is good. There are a lot of passionate people drawn to the bike industry." Seven has cultivated an eclectic mix of loyal employees. He continues, "It's really exciting working with people in a manufacturing environment and not making it be a miserable job. They raise families, have houses, and we are making a positive impact on the local economy. It's more than the bike." Vandermark refers to his company and products as "authentic," and feels that their customized bicycles go beyond the customer's typical definition of custom.

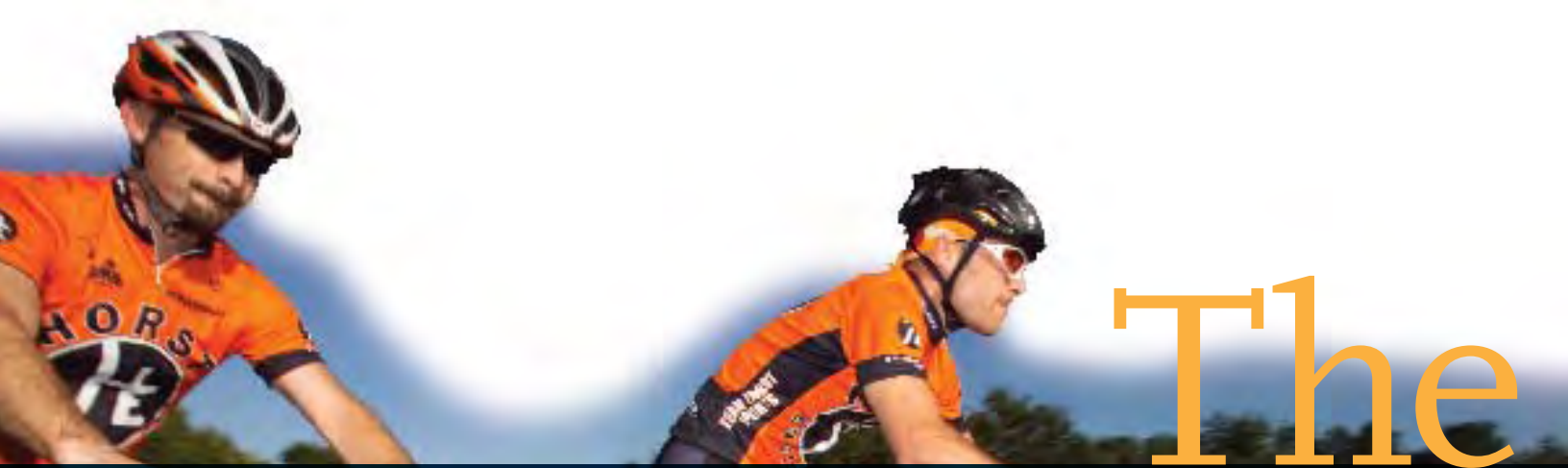
Vandermark talks a lot about the Toyota Production System. "We adopted it early on. We manufacture one frame at a time in house. We have now stretched the TPS to do one piece flow of a fully customized product." That approach is quite unique to the bicycle industry, and others have emulated Seven's methods in recent years. It is clear that when high end bicycle frames retail for \$1500 to \$6,000, and Seven's offerings fetch a minimum of \$2500; commanding a premium for a better product in a niche of a larger market can be profitable and rewarding in many ways. Vandermark has developed a lean system that can compete, but he is not optimistic about anyone ever being able to produce a lower end or mass market bicycle in the U.S. again. Of China, Vandermark says, "The labor cost is so low. Even though it is increasing, it is still unbelievably low. It all backs up to labor cost which is close to free."

Even fickle European consumers, the ones steeped in cycle sport tradition, have clamored for U.S. built bicycles in the mid and high end segment of the market. Italian and other European frame brands dominated for years, but now American bicycles are popular because of the innovation, technology and effective marketing. Will Americans and foreigners alike continue to value U.S. built bicycles in the future? Will the innovation for which the current crop of successful U.S. bicycles is known, continue? Will a domestic manufacturer ever grow beyond their niche to mass produce a bicycle again? Time will help us answer these questions, but the current state of the global market lends credence to the argument presented in Tom Friedman's best seller, *The World Is Flat*, that the "flattening" of the world has changed the economic landscape. Has the landscape of the bicycle industry changed for good?

**TMW**

**Scott Livingston is President and CEO of Horst Engineering & Manufacturing Co., a 60 year old East Hartford, CT contract manufacturer of precision machined components.**





"I've never been to Wal-Mart." There, I said it. After I spoke with Lloyd, and accepted this assignment for *TMW*, I phoned back for guidance. He wanted me to really get a feel for the mass production end of the bicycle market. That meant only one thing... I was going to have to go to Wal-Mart. You have to understand that I lead a 59 year-old manufacturer of U.S. made precision products, and the roots of our founder are in pre-WWII Germany. I grew up in New England where Wal-Mart is only a recent phenomenon, and my second favorite state is Vermont, where they don't allow Wal-Mart at all. I was a total rookie.

On a beautiful Thursday afternoon, I made the pilgrimage. Art Roti, Horst Engineering's Vice President of Operations, and a fellow cyclist and bicycle mechanic, came along to advise me on my bicycle purchase, but more importantly, to offer emotional support. He was well aware that I would "pay more for less," and that I was not all that interested in "Always Low Prices." Our main objective was to see how far we could stretch a dollar when it came to shopping for a "rideable" mountain bike. We knew a lot about the high end of the market, but we were disconnected from the low end, and whether or not there

was value to be found.

The experience was surreal. Some bicycles were parked outside in front of the store, and the rest were in the sporting goods department. All of the bicycles were assembled, whereas, my Seven Sola had to be built up when I bought it, because the frame and components came from several specialist retailers. Shopping for a bicycle at Wal-Mart is a lot different than going to a specialty bicycle shop. There was no offer to help us "fit" the bicycle and we were not assisted in accessory choices, (helmet, shoes, pump, etc.) though a couple shelves containing accessories were

available for purchase. It was obvious that for the adult bicycles, one size fits all. Only some of the bicycles had quick releases for the wheels, but all of them had quick releases for the seat post, which allows easy adjustments.

One clerk asked us if we needed help when he spied us taking photographs of the bicycles. We said we were OK, but he was concerned about our picture taking. I assured him we were going to buy at least one bicycle, and that we were "aficionados" who collected photos of bicycles. That brought a chuckle from Art. There were 8 models to choose from among 4 brands, Schwinn, Next, Roadmaster, and Mongoose. They were all made in China. We could have spent as little as \$53.73 or as much as \$237.82.

We thought that \$99.96 had a nice ring to it, so we settled on a full-suspension, aluminum/steel Mongoose. While rolling it to checkout, we noticed that the rear wheel was bent and rubbing the rear brake pads, and there was a stain on the saddle. This bicycle probably spent a lot of time in a cramped container on a large ship during its trans-oceanic journey. These problems were nothing that a little cleaner and a spoke wrench could not solve, but we figured that since this bicycle was new, we could push for a discount. I told the cashier about the two issues, and said that we really wanted this particular bicycle.



*Sticker shock of a different kind at Wal-Mart: Always Low Prices.*



*Stamped cantilever brakes are inexpensive.*



*Our Chinese made test bike in all its glory!*





# Purchase

"Could we have a discount," I asked. She replied without hesitation, "The most we can do is 10%." For a split second, I thought about haggling, but then I snapped back, "I'll take it!" She never left her position behind the check out counter to confirm my claims, though the seat stain was plainly visible. My first Wal-Mart receipt will proudly hang in my office. It shows that I paid \$90.00 (she gyped me out of \$.04 by rounding up), and \$5.40 for Connecticut sales tax for a total of \$95.40. One swipe of the American Express card, and I was the proud owner of another new bicycle to add to the fleet.

## The Ride

We loaded the bicycle in the pickup truck and noticed the first real difference between the low end and the high end. This bike was a tank. It was nearly 45 pounds compared to my 24 pound Seven. We drove back to the shop to show off our purchase. After a short conversation with some of our colleagues, we suited up in our Team Horst uniforms and headed to Riverside Park in Hartford for our first test ride. Art volunteered to put the Mongoose through its paces and I rode my Seven. We did an out and back route along the Connecticut River on some twisty and bumpy double-track. Art must have felt like Chuck Yeager on a test flight. Would this bicycle hold

up under all of the G force?! Art is a bike junkie, so he rattled off his initial observations, and I took mental notes, and fired off questions while drafting behind him.

"How does she corner? (Like cars, bikes are frequently female in gender) "How does she climb? How much travel does that front shock have? Does she soak up the bumps? Are you comfortable? Is she going to break? Would you do the Vermont 50 Miler on this bicycle?" I peppered him with questions as he hammered down the trail. Dismounting to climb over a big log, he stabbed himself in the leg with the kickstand, which is one extra (like reflectors) that the Mongoose had and my Seven lacked. I have never seen a high end bicycle with a kickstand. Our ride was pretty tame, and Art was eager to test the bicycle more, but the late-August sun was getting low in the sky, and the park rangers had warned us that 7:30 P.M. was curfew. We agreed that next time, we would take the bicycle to Case Mountain, one of our favorite trail systems, and that we would really test the bicycle on the rocky and rooted trails. We would bring lights, and get in a longer post-work ride. Of course, a prominent decal on the top tube of the Mongoose reads; "Always wear a helmet, and do not ride at night." There was an 800 number listed. We knew we had to call.

## Conclusion

So what did we get for \$95.40? The Mongoose is clearly not made for racing, but how many people race? It is very heavy, but how many people will carry the bicycle on their roof rack? The materials are low grade, but how much stress will this bicycle be under? A Wal-Mart bought bicycle is good for a lot of things. Riding around the neighborhood, riding on a Rail Trail, a trip to the convenience store, cruising the boardwalk...these would be great uses for this bicycle, and all for less than a hundred bucks. Frankly, I was amazed. The quality is awful, but why does it have to be overbuilt? The bicycle had rust on it when we rolled it out of the store, but why does that matter when many owners would leave the bicycle outside in the elements anyway? This is a bicycle for masses. Only a small segment of the population will ever own a \$6000 bicycle. There is a lot to be learned from my Wal-Mart experiment. Whereas I am willing to pay a premium for a domestic product, most shoppers are not. Like many products that come out of China, this one offered value that is simply unattainable in a U.S. manufactured product at that price point.



*Inexpensive spring style rear suspension.*



*Low quality suspension fork crown welds do the job but aren't that pretty.*



*No quick release, but Shimano bolt on rear derailleur with index shifting.*

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## INVENTORY



### *New! ACW Wickman*



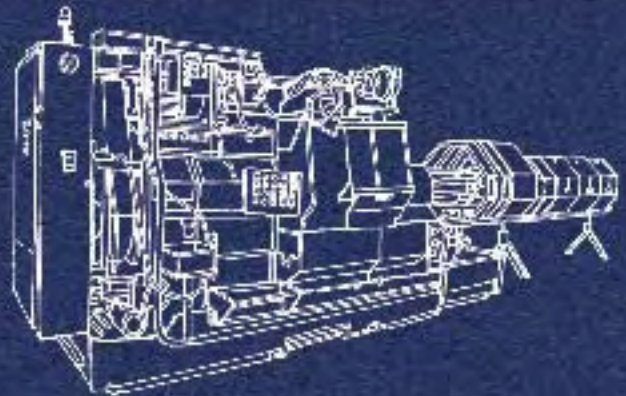
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1-3/8" 6-spindle, 1980  
1-3/4" 6-spindle, 1965-1979 (3)  
1-3/4" 6-spindle, factory rebuild  
1-3/4" 6-spindle, thdg., 1969  
1-3/4" 8-spindle, 1970  
2-1/4" 6-spindle, 1973-79  
2-5/8" 6-spindle, 1982  
6-5/8" 6-spindle, 1979

## ACMES

1-1/4" RA6, 1973-1958-1982 (6)  
1-1/4" RA6 collet chucker, 1982, superb  
1-1/4" RB8, 1956-1979 (5)  
1-5/8" RB8, 1980, pickup (2)  
2" RB6, 1979-1985-1956  
2-5/8" RB6, thdg., 1980



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Hydromat HW 25-12, 1984  
Hydromat HW2 25-12, 1985  
Hydromat HW 25-12, 1985  
Hydromat V-12, 1986 Trunnion  
Gos & DeLeeuw 1-2-3, 7-spindle, 1970  
Goss & DeLeeuw 1-2-3, 21-sp., 1970  
Hydromat 30-60, 36-100, 20-80 units  
for drilling, threading, recess

Swiss-CNC  
Sliding Headstock  
Citizen L-32, 1998  
Star SA-12, 2000  
Tsugami 38mm, 2003

Brown & Sharpe  
1-5/8" #2, 1970

CNC Machines  
Miyano ANC 35S, 1989

Davenport  
3/4" Model B Servo,  
2002  
3/4" Logan Clutches,  
Rebuilt 2001  
3/4" Model B, 1989  
3/4" Model B, 1970-89 (7)

New Britain  
Model 52 1-1/4", 1979  
Model 657 5-7/8" 6-  
spindle chucker, 1971

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Davenport Thread Rolling, 3rd & 4th pos.  
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Hydromat Woodpecker Valves \$6000

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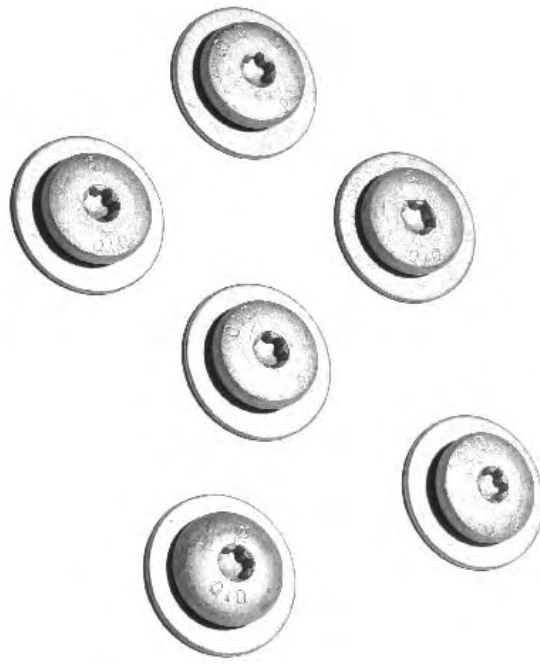
Hydromat 36-100 Oil fed unit \$8500

Hydromat ST-8-100 Control valves \$1500/ea

Alps 12-ft barloader for L-20 Citizen \$3950







**SIX BOLTS** Twenty-five years ago, when he was a young engineer for Textron, the multi-dimensional industrial corporation, Tim McGuire's bosses asked him to design a bolt that would make it easier for line workers to fasten together the bed of a truck to its base. Textron was trying to grab a piece of the Ford F-150 truck market, which seemed about to burgeon.

By Robert Strauss



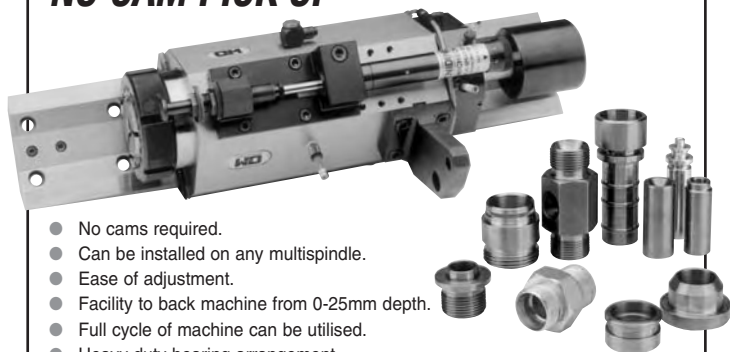


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## Six Bolts/TMW

"Back in those days, they were trying to make things easier on the guys on the assembly line. They were conscious of things coming into play like carpal tunnel syndrome from overuse of the wrist and shoulder problems and so on," said McGuire, now the director of engineering at Textron Fastening Systems, a Textron subsidiary.

So McGuire juggled and juggled and came up with a bolt with a flatter head and an easier way of screwing it to the truck bed. The bolts that originally held the frame and the bed of the truck together had to be fastened from the underside. Ford wanted them to be fastened from the top to make it easier for those on the assembly line. Thus, the head had to be flatter, in that the bolt would be head-first on the bed. Ford liked the design, and even though the contract for the bolt went back and forth to different companies over the next couple of decades, most of the time Textron was happy to make the bolts for the best selling truck in America.

Then last year, Ford decided these bolts had waited long enough in the wings. Like Norma Desmond in "Sunset Boulevard," they were ready for their close-ups.

Ford's ad agency, J. Walter Thompson, produced a television commercial – supported by a print campaign – for the F-150 under its "Built Ford Tough" campaign showing a man strolling somewhat blithely underneath a 5000-pound F-150 suspended only a few feet above him nose first.

The man in the ad talks about the payload capacity of that best-selling Ford truck and how just six 150-millimeter bolts are holding it up from, presumably, crashing down on him. The implication is that if Ford uses bolts strong enough to keep the truck from crushing this guy like so much hash, then imagine what the rest of the truck is built like. To show just how tough



*J Walter Thompson produced a print campaign touting the 6-bolt concept.*



“Then last year, Ford decided these bolts had waited long enough in the wings. Like Norma Desmond in “Sunset Boulevard,” they were ready for their close-ups.”

those bolts were, the commercial was filmed in the same Hollywood studio as the tough-guy Arnold Schwarzenegger action flick, “Terminator III.”

The TV ad became the rage on National Football League games, top NASCAR races, and such popular shows as the various “CSIs,” “Law and Order,” “The Simpsons,” and “Extreme Makeover.” The accompanying print ad, targeted at the tough group to get of men aged 25 to 55, ran in such magazines as *Field & Stream*, *Boating*, and *Car & Driver*. The headline asked, “What Does It Take To Build A Truck Like This?” and the copy answered, “Think of them as six chrome-plated reasons why the new Ford F-150 has more payload capacity in its class. When it comes to attaching a pickup truck box to a chassis, our bolts have a big job to do.”

According to McGuire, though, as popular as the ads have been, they contain at least a smidgen of hyperbole.



“The first time I saw the ad, I burst out laughing,” said McGuire. “You could take a heat-treated steel rod and you could do the same thing – hold up that truck over that guy. They show picking up the truck by the diameter of the bolt, well, you could pick up that truck by the bolt that holds the rear-view mirror up, too.”

Still, said Todd Eckert, the truck marketing manager for Ford, who was the F-150 marketing chief when the ads were made, that does not mean the bolt isn’t a good, strong piece, one that is apparently unique in the business.

“It is the largest, longest, thickest bolt used in a pick-up truck to hold the frame to the bed,” said Eckert. “We believe the pick-up box is the business end of a truck and we thought we had a unique story, not just about a bolt, but how this company builds trucks with all the best parts.”

McGuire, while pooh-poohing the ad a little bit, is still proud of the bolt he developed, though he said the commercial mis-characterizes it somewhat.

“They say it is a carriage bolt in the ad, but it is really not. They use the wrong terminology,” he said. “A carriage bolt has a domed top with a square underneath.”

Essentially, said McGuire, back in 1980, Ford wanted a bolt that would have less of a domed top so it wouldn’t catch, say, on a piece of plywood someone slid into the track. Plus, it wanted something that could be more easily fastened from the top of the bed through the frame, while at the same time

“But for now, it’s  
ironic that there is this  
ad and we aren’t making  
it any more.”

let a worker or machine get under the truck to secure it correctly.

“There were a lot of different layers to drop the bolt through and the holes have to line up,” he said. So Textron and Ford developed a drive system for the bolt, a trademarked one called Torx Plus. The Textron Website ([www.textronfastingsystems.com](http://www.textronfastingsystems.com)) promotes the Torx Plus system, saying that its “straight, vertical sidewalls . . . virtually eliminate camout. Also, the Torx Plus recess completely encloses the driver tip, reducing tool slippage as well as costly and unsightly damage to the fastener and surrounding surfaces.”



"The ad may be a little strong, but it actually is a good product," said Charlie Kerr, of Kerr-Lakeside, Inc., an Ohio manufacturer. The tolerances for something attaching a truck bed to a frame have to be tight, he said, and these bolts have done the trick for a generation.

Ford is apparently happy with the bolts in its ad campaign. According to Eckert, the Ford truck division had its highest sales figures ever in July 2005, even as gas prices were going up and SUV sales were slowing. It sold 126,905 F-150s that month, more than any individual product since the Model T was in vogue. In 2004, when the campaign started its run, Ford sold 939,000 trucks of all sorts, "and no other manufacturer has sold more than 800,000 in any year," said Eckert, and then with a bit of a chuckle went on, "We're not getting rid of those bolts."

But Ford is getting rid of Textron, at least for a while. The famed six bolts are now being made by ITW-Medalist, which won the contract away from Textron. McGuire said that has happened from time to time over the 25 years since he developed the bolt. "Someone has a better price or something for a while and then it is re-bid and so forth, just like any other product," he said. Textron, he said, still gets an unspecified payment due to its Torx Plus trademark on the system. "But for now, it's ironic that there is this ad and we aren't making it any more."

Jim Van Ingen, the vice president and general manager of ITW-Medalist – which is headquartered in Elk Grove Village, Illinois, is happy to be manufacturing the most famous bolt in the industry. The bolt is made, he says, on a "huge machine called a half-inch bolt maker, which forms the bolt into the proper shape." He says Ford's competitors use a less robust, shorter and smaller diameter bolt. Say Van Ingen, "It is manufactured in such a way that it maintains strength. It is not chrome-plated, but made with carbon-based steel with a high-corrosion plating. It is a nice commercial for us. It gives us pride in what we manufacture. In effect, one can say we are just making nuts and bolts, and how hard can that be? If you really truly get into it and understand what the parts do, they are the thing that holds this truck together."

Robert Strauss is a freelance journalist whose work has appeared in *TMW* as well as *The New York Times*, *Sports Illustrated*, *The Los Angeles Times* and *The Philadelphia Inquirer*.

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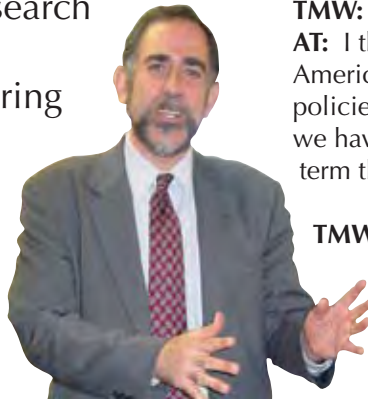
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## With Alan Tonelson

Alan Tonelson is a research fellow at the United States Business and Industry Counsel Educational Foundation in Washington DC. He does research and policy work on issues concerning trade, manufacturing and the globalization of the American economy. His new book, *The Race to the Bottom: Why a Global Worker Surplus and Uncontrolled Free Trade Are Sinking American Living Standards*, was recently published.



**TMW:** Do you think that our membership in the World Trade Organization has been counterproductive for the U.S. economy?

**Alan:** I think joining the WTO has been one of the worst mistakes the American economic policy makers have made in the post World War II era. We've trapped ourselves in what turned out to be an anti-American kangaroo court. And we should get out.

**TMW:** If we got out, what would be the short and long-term ramifications?

**AT:** There would be tremendous fulmination in the nation's chattering class. And the world trading system would go on exactly as it has been, because the U.S. would remain the market everybody has to sell to in the world economy in order to succeed.

**TMW:** What would your ideal world economy look like?

**AT:** I would want a world economy in which lower income countries were able to make progress without exacting undo costs on living standards in the higher income regions in Europe, and especially North America.

**TMW:** What would you tell a person who wants to buy a \$99.00 mountain bike from Wal-Mart?

**AT:** I would tell him to spend his money on whatever value and consumer enjoyment he wants. But I would also remind him that, chances are, he is a producer of something, as well as a consumer, and I would urge him to become politically active to make sure that U.S. trade policy reflects the proper balance between consumer and producer interests.

**TMW:** Is that realistic?

**AT:** I think it is. From what we know, Americans don't like our current U.S. trade policies. People understand that as a society, we have to pay more attention to the long term than we actually do.

**TMW:** What is your favorite T.V. show?

**AT:** I'm still into *Star Trek* reruns. The whole series. And I love to watch baseball, especially my New York Yankees.

**TMW:** Do you like *The West Wing*?

**AT:** I hate *The West Wing*. It's a love affair with Bill Clinton.

**TMW:** What kind of car do you drive?

**AT:** I drive a 1999 Honda Civic DX hatchback. I wanted to buy a U.S. brand car, but the price differential was not as much as I thought it would actually be. Maybe the Honda was being dumped on the U.S. market.

**TMW:** If you could be any kind of machine, what would you be and why?

**AT:** I think I'd be a spaceship that could travel faster than the speed of light, and visit whatever part of the universe I'd like to go to.

**TMW:** How would you feel if China wins at baseball in the Olympics?

**AT:** I would be deeply offended. China can win the soccer World Cup. It could turn out Wimbledon champions, and I wouldn't care. But in baseball and basketball—I want to maintain absolute American supremacy.

Thanks, Alan.



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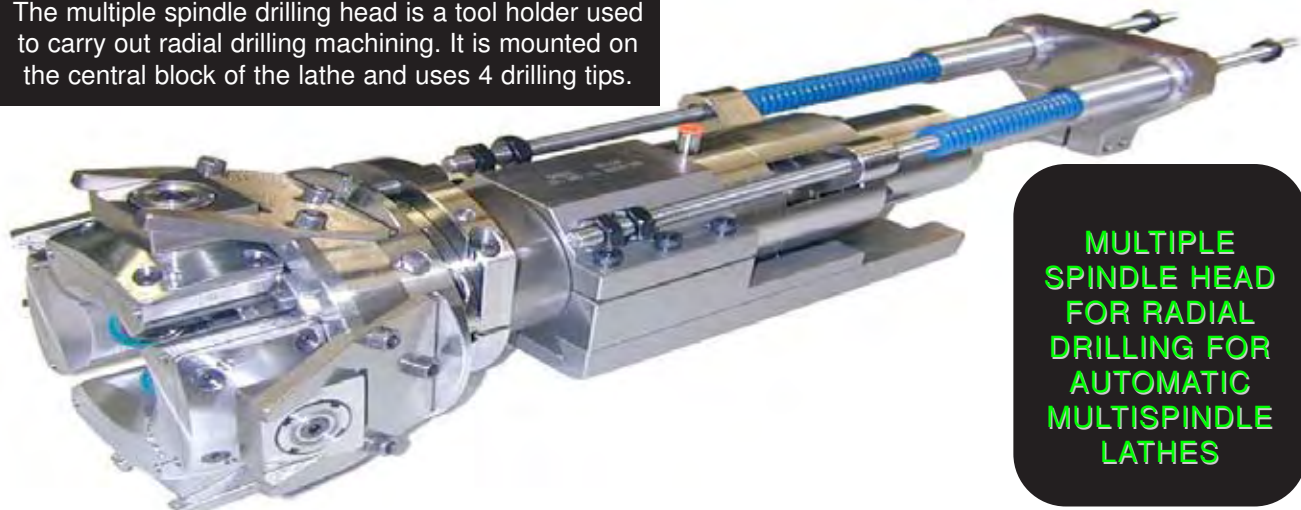
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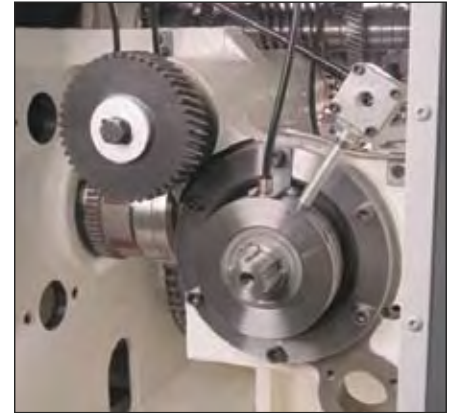


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# Next

**A continuing column in which we ask smart people to discuss their views on topics related to the future of manufacturing**

## **THIS MONTH'S QUESTION:**

**Will a high fuel economy hybrid engine system be the dominant drive train for cars and light trucks in the U.S. in 2012?**

### **Art Schaffer**

Car Salesman

**Community Honda of Orland Park**

It won't happen. The number one reason is that the gasoline people won't let it happen. If half the cars being sold in the U.S. were hybrid, then the gasoline people would lose half of their market. Honda is cutting edge, but the majority of the U.S. car market doesn't have the technology to execute it. So it's impossible. The financial rewards are not there yet. Maybe in six years, but I doubt it.

### **Dr. Kenneth Green**

Executive Director

**Environmental Literacy Council**

If fossil fuel prices remain high, hybrids with higher fuel-economy become more competitive, and should be a larger part of new car sales. However, if traditional internal combustion engine makers can increase fuel economy while keeping their costs below those of hybrid drive trains, the spread of hybrids could be limited to vehicles that use hybrid technology as performance enhancers, more than as a way of improving fuel economy.

### **Chad Snyder**

Founder

**Soultek.com**

By 2012, the hybrid powertrain will not be the dominant powertrain of cars and light trucks, but it will be growing rapidly. Many analysts claim that hybrids will never achieve more than 5% of the total automotive market, but I believe those skeptics are just as wrong regarding that prediction as they were when they predicted the failure of the Toyota Prius. Hybrid technology is still just an emerging technology that will ultimately evolve into diesel and bio-diesel hybrids, plug-in hybrids, or even solar-powered plug-in hybrids, while also helping to develop fully electric, hydrogen and fuel cell vehicle technology. Just 10 years ago, many asked why a computer or the Internet was needed, yet companies such as Yahoo, Google, Microsoft and Dell invested in the potential of those emerging technologies. 10 years from now, the reasons for investing in hybrids will become just as obvious as *technology*, rather than cheap oil, becomes the driver of the automotive industry.

### **Anthony Pratt**

Senior manager of global power train forecasting.

**JD Power Automotive Forecasting**

We anticipate that hybrid penetration through 2012 will be roughly 4.1% of the market. That equates to roughly 750,000 units. This year we anticipate there will be only 220,000 hybrids sold in the U.S., which equates to 1.3% of the market. It's going to be difficult to reach the point where the average consumer will be able to break even economically. Even if there was overall acceptance of the technology, and you could break even, just to generate the capacity of batteries and other components would make it difficult for hybrids to become the dominant powertrain in 2012. We also believe that diesel penetration could be at 7.5% by 2012; almost twice the penetration we anticipate for hybrids.

### **Dr. Andrew Frank**

Professor of Mechanical

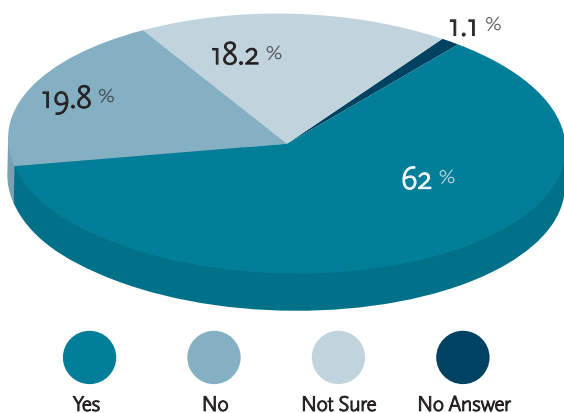
and Aeronautical Engineering

**University of California at Davis**

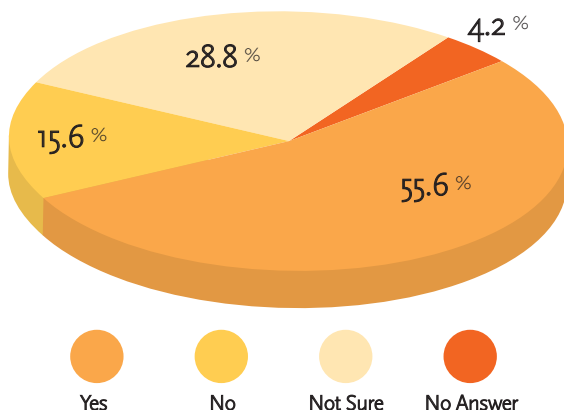
My opinion is a definite yes if gas prices continue to rise. Which will happen! Also, the hybrid is a transition technology to greater hybridization toward the Plug-In hybrid, where the batteries are larger, and can be charged with grid electricity at your own house, or with a Solar or Wind generator. These PHEVs (plug-in hybrid electric vehicles) have fuel costs that are 1/10 to 1/3 the cost of gasoline today, and will have much lower costs in the future, thus will be the dominant choice of new vehicles.

# 2006 Annual Survey & Forecast

Will your 2005 annual sales volume/value of goods produced exceed 2004 levels?



Do you expect 2006 sales volume/value of goods produced to exceed 2005 levels?



*T*oday's Machining World conducted its annual reader's survey of expectations for the coming year in October of 2005. The methodology was the same as last year, with Irwin Broh and Associates, Inc. of Des Plaines, Illinois, sending questionnaires by mail to a randomly chosen 10% of our audience.

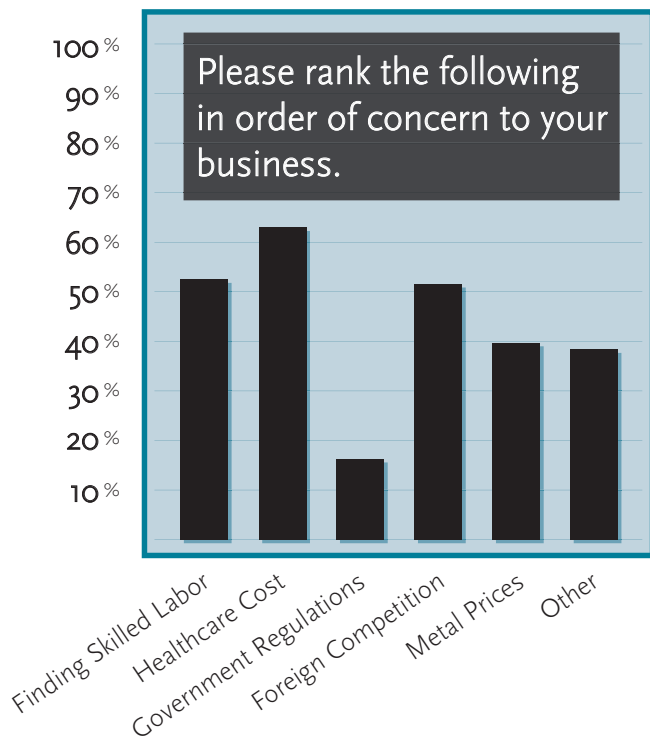
It appears that the machining community continues to be quite optimistic about business for the coming year after a solid 2005. Over 55% of respondents think next year's sales will exceed the current year. 2004 was the big rebound year from the 2001-2003 recession, with 2005 keeping the upturn rolling. Over 25% see sales gains of 10-20% for the coming year.

Buying choices again showed intense interest in CNC Swiss-type lathes, with almost 32% planning such a buy next year. This number confirms other data and anecdotal information, indicating that the decision makers in our industry are confident that profitable Swiss-type work will be available for them. I believe it also indicates that Swiss CNC is biting into categories that used to be done by cam-type machines and other styles of CNC equipment. Sophisticated software and barloaders enable the Swiss CNC to be competitive in a wide array of parts and industries. The extremely strong growth in medical devices and implants is also fueling the continued growth in this area.

Again this year, 42% of respondents plan on buying inspection equipment. This points to a need for perfect parts every time.

The percentage of folks expecting to buy mechanical screw machines fell from 32% in 2005 to 25% for the coming year. Companies planning to buy CNC multis fell from 21% to 15%. I think that these are still fairly robust numbers for multis, but may reflect a changing demographic of our readership away from screw machine shops to broader spectrum machining firms. It also may reflect turbulence in Tier One automotive.





We queried our readers about their hiring expectations. Last year 43% planned on bringing on additional staff. The number was remarkably similar this year, although those not expecting to hire rose by 7%.

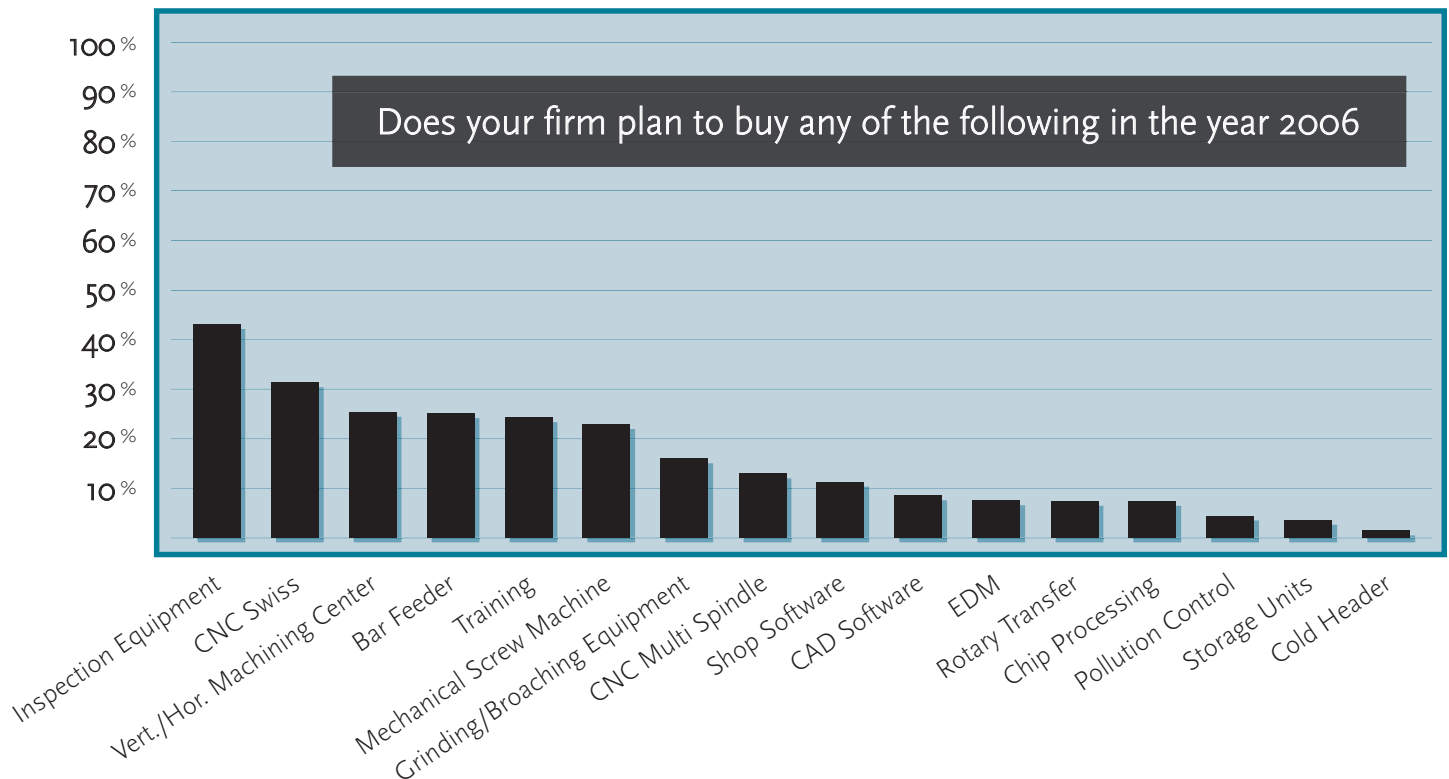
The issues of most concern at the end of 2005 continue to be rising health care costs, finding skilled people, and foreign competition. Metal prices declined significantly as a primary issue of concern in the year-to-year rankings of business obstacles.

This survey confirms our view that the precision machining industry, which this magazine serves, is generally doing quite well, despite turmoil in domestic automotive parts, tough foreign competition and an aging worker pool.

As we enter 2006, we will be dealing with higher energy prices, higher freight costs, higher interest rates and a stronger dollar, than a year ago. Demand in most industries the machining community serves continues to be solid with energy, medical, and defense extremely strong.

At TMW we wish you good health, good luck and great business in the coming year.

**If you are interested in obtaining a complete Annual Report & Forecast, please contact Dan Pels at 312-342-6557.**



# The Ins & Outs of Electroplating

*by Barbara Donohue*

One of the startling things about the metal finishing industry is that it uses chemicals like sulfuric acid and cyanide to turn raw parts into things of beauty. Boxes and bins of parts, smooth, shiny, maybe brightly colored, all go out into the world to do their job.

At F.M. Callahan & Son, a Malden, MA, metal finisher, out of the bubbling, steaming liquids come tiny golden electrical contacts and big sections of jet engine housings, red knobs and green brackets, and tin-plated parts by the thousand.

*Photos by Jean Butler*



*From left, Eric Jacklin, president, and his sister, Heather Jacklin Hennigar, director/treasurer, with their father, Harold Jacklin, owner of Callahan's, in front of the busy receiving dock of their facility in Malden, Massachusetts.*

Some think that plating is a black art and plating shops are like dungeons, dark, dank and damp. Not necessarily. Instrumentation and chemical analysis make the process quite scientific, and good lighting and ventilation make the plating shop look, feel and smell like any other factory floor.

### **Many metal finishes**

Customers can choose from many different metal finishing processes. Which ones they select will depend on the challenges they expect any given part to encounter during its working life. Different finishes offer combinations of corrosion resistance, wear resistance, solderability, optimum electrical contact and attractive appearance.

Plating is a layer of metal so tightly adhered to a surface that it becomes part of that surface. Electroplating uses electric current to inspire atoms of metal to deposit on the part being plated. Most electroplating shops also offer other surface finishes as well. Anodizing imparts to aluminum pieces a hard oxide coating that may be colored to order. Chromating produces an attractive, corrosion-resistant surface that gives excellent paint adhesion. Passivating uses acid to remove iron from the surface of stainless steel parts. Electroless nickel plating, as the name implies, plates nickel onto a surface, but does not require electrical intervention—the part is immersed in a hot bath of chemicals and comes out coated with a uniform layer of nickel, hard and shiny.



## HOW IT WORKS/TMW

### Electroplating in a nutshell

Electroplating can be done using many different metals as the plating material, including tin, nickel, copper, zinc, gold, silver, chromium, lead and various alloys.

To electroplate a part, it must be immersed in a tank of water with a chemical that contains the metal to be plated. If the plating



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*Greg Daley processes a jet engine casing through a series of cleaning, plating, and rinsing steps.*

material is copper, this chemical might be copper sulfate. This supplies the charged metal atoms called "ions" that make electroplating possible. The water bath also includes other chemicals that aid the process. At the same time, a piece of the plating metal, copper in this example, must also be immersed in the tank. As plating occurs, this will replenish the metal ions in the solution.

Now the electricity comes into play. From a source of DC power, the negative terminal connects to the part being plated and the positive terminal connects to the piece of plating metal.

The copper ions in the solution have a positive charge, so they are attracted to the negatively charged part and "stick" to its surface. This depletes copper ions from the solution, but at the same time, copper ions enter the solution from the positively charged piece of copper. This process continues as long as power is applied. The longer the process continues, the



from the size of pin heads to those weighing two tons. In one day, the products coming off the lines might include spacers, bolts, brackets, heat sinks for braking systems used on trains, silver-plated filters for cell phone systems, anodized components for optics, sections of jet engine casings, and many kinds of gold- or tin-plated electrical contacts.

thicker the plating will be.

This is a simplified explanation of the plating process. In a plating plant, the process has more steps. The temperature, current flow and other factors must be carefully controlled.

Any dirt or grease on the surface of a piece will prevent it from plating properly, so thorough cleaning is critical to the plating process. Solvents were once widely used for cleaning, but with today's stringent environmental regulations, water-based cleaners do the job. Electrocleaning, which is something like "reverse plating," also helps to remove any dirt and prepare the surface for plating.

### Parts large and small

Each plating shop offers its own range of processes and can handle different types of parts. In addition to electroplating, F.M. Callahan offers many other surface finishes, and can apply them to parts

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Large parts require large tanks and electric hoists to move the parts in and out of the baths. Moderate-sized parts are placed on racks that provide both easy handling and electrical contact.

Barrel plating works for many small parts that cannot economically be placed on racks. In this process, the parts are placed in a perforated plastic cylinder, or barrel. The barrel rotates slowly, perhaps 12 RPM, while immersed in each bath. Flexible electrodes inside the barrel provide the negative charge required. The parts themselves provide electrical contact with each other.

Very small parts, those too small or delicate for barrel plating, may be plated in a vibratory basket. This provides electrical contact and uses vibration to gently circulate liquids over the parts.

Plating specifications may range from a few ten-millionths of an inch for gold plate on small electrical contacts to a couple of thousandths for non-precious metals on large parts. The thickness of an electroplated finish may be different on different areas of the same part, depending on the geometry. Internal surfaces plate less readily than external surfaces, for example.

How much does electroplating cost? Pricing depends on a number of factors, including which plating process and material are used, how much area

is to be plated to what thickness, plus any special masking, handling or cleaning requirements. Eric Jacklin, president of F.M. Callahan, offered some ballpark pricing for plating different kinds of parts. Plating small electrical contacts with gold might cost \$30 to \$50 per thousand. Barrel plating other small parts might cost pennies per pound. Tin plating inch-wide heavy-duty electrical contacts on racks could cost 25 cents each. A section of jet engine casing costs \$20 to plate with sulfamate nickel, a soft finish used for parts that will be welded.

### Working with platers

For many parts, plating is the last production step. The parts cannot be delivered and nobody gets paid until the plating is done. So customers are often in a hurry, and turnaround time can be critical. Jacklin says normal turnaround is usually three to five days. Customers often need rush jobs, and quality control manager Kevin Reynolds says it is possible to receive the parts in the morning and send them out in the afternoon.

In general, the most important job of a plater is to produce consistently good parts from batch to batch. This requires careful control of all the different factors that affect the plating process. Look for a plater who uses an on-site laboratory for monitoring the different chemical solutions. Ask about established inspection

## F.M. Callahan & Son, Inc.—

Since the company was founded in 1910, four generations of the family have led F.M. Callahan & Son, a metal finishing company in Malden, MA.

Fred Callahan started his plating business in the basement of his home and later moved it to a structure in his back yard. His son Ernie followed in his footsteps. In the 1970s, Harold Jacklin became president after his uncle Ernie Callahan died. And now, Harold Jacklin's son and daughter are managing the company, Eric Jacklin as president, and Heather Jacklin Hennigar as director/treasurer. The company moved to its current location in 1940, and, over the years, has grown to 40,000 square feet, with 55 employees.

"Each generation has had its challenges,"

says owner and former president Harold Jacklin. Fred Callahan founded the company. Ernie Callahan kept it going through good times and bad. "The worst period for me was when all the environmental rules came in. What we had to do was basically rebuild the plant and figure out how to clean the water."

Eric Jacklin grew up around the business. After becoming president in 1993, he dealt with the quality certifications that have become popular with customers. Maintaining quality, of course, is what the company has always done. Getting certified was another matter, and it took a lot of administrative effort to obtain certification under ISO 9000 and NADCAP, he says.





*Overview of small lots area, including gold and silver plating baths.*

## 95 years and four generations in the plating business

Another challenge has been competing with cheap plating services in other countries. Yes, some business has been lost to Mexico or China, primarily high-volume work, Eric Jacklin says. "The lower volumes stay here. So does specialty plating," such as 90/10 tin-lead, a process that can be hard to control and needs careful attention and an on-site laboratory to keep it consistent.

Fortunately, F.M. Callahan still has a healthy share of happy customers. "Callahan is one of our top platers," says John O'Neill, general manager at Alpha Grainger Manufacturing Inc., Franklin, MA, an F.M. Callahan customer. When his company starts working with some platers, things may go well at first, but then quality starts to slide.

After five years of working with F.M. Callahan, O'Neill says, "we're in a real good comfort zone." He especially appreciates the company's responsiveness. "When we say we need an answer for our customer in two hours, they call back in two hours." And when Alpha Grainger has a rush job, O'Neill says, F.M. Callahan willingly turns it around.

With four generations of family leadership, the hard work of many devoted employees, and a knack for changing with the times, F.M. Callahan & Son has not just survived nearly 100 years in the plating business, it has continually grown and thrived as a partner in the machining process.

## HOW IT WORKS/TMW

procedures and equipment such as x-ray thickness measurement systems. If there is a problem, how responsive will this plater be? Is the plater attentive to safety? Does the plant have hazardous materials under control and use an effective wastewater treatment process?

Is the plater certified by some standard such as ISO 9000 or the National Aerospace and Defense Contractor Accreditation Program

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# INDEX



*Jimmy Sylvester (long time employee) masks items to be selectively plated.*

(NADCAP)? These standards indicate that the shop follows documented procedures to produce consistent plating on parts. Some commercial customers may require ISO 9000 and many aerospace customers require NADCAP.

Does the plater keep careful records? For aerospace parts, the paper trail may have to be very detailed, and the plater must keep the records for up to 30 years.

As the customer of a plating house, it is important to keep in mind the needs of the plating process. For example, parts need to be absolutely clean before plating and finishing. A change of cutting fluid in the machine shop could spell trouble on the plating line. The new fluid might seem just like the old fluid, but it could require a different cleaning process at the plater. Always notify the plating house of any change in cutting fluid, oil or other chemicals, advises Reynolds.



### Water becomes waste

Many years ago, platers did not have to worry about what they did with their rinse water, plating baths, acids or any other material. In the 1970s, environmental agencies started enforcing regulations for what can and cannot be done with these chemicals. Plating houses in the U.S. must now treat their wastewater to remove the harmful materials. This can be expensive, but must be done. Platers that do not comply with environmental regulations risk being shut down.

When racks or barrels of parts are moved from one bath to the next, cleaning solutions, rinse water and plating solutions drip down into floor drains. This mixture of fluids usually makes up most of a plant's wastewater. At F.M. Callahan, it is first treated to make the dissolved metals precipitate out of solution. Then most of the water is removed by ultra-filtration. Finally, the resulting sludge is dried and shipped to a company that handles recycling and disposal.

The water coming out of some treatment systems

is as clean as tap water, so some plating plants reuse their treated wastewater. These "zero discharge" systems can be cost effective in places where water and sewer costs are high.

### Plating as a team sport

In a plating process, an error, anywhere along the way can make a good batch of parts go bad, so they have to be un-plated and then re-plated. In metal finishing, maybe more than in other industries, each worker needs to do his or her job just right. "It's like a football team," says QC manager Reynolds. "If you don't do your job, I can't do mine."

Thank you to Eric Jacklin for allowing us to shoot photos at F.M. Callahan & Son.

**Barbara Donahue is freelance writer based in Acton, MA, and graduated from the Massachusetts Institute of Technology with a degree in mechanical engineering. She has worked in design, manufacturing support, thermal analysis and component engineering.**

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**Today's Machining World's "Shop Doc" column taps into our vast contact base of machining experts to help you find solutions to your problems. We invite our readers to contribute suggestions and comments on the Shop Doc's advice. If you consider yourself a Shop Doc., or know a potential Shop Doc., please let us know. You should also check out the TMW online forum at [www.todaysmachiningworld.com](http://www.todaysmachiningworld.com).**

# TMW **shop doc**

*with Noah Graff*

## **DEAR SHOP DOC:**

We are a small shop in the Midwest, and are interested in going lights-out with our Swiss CNC operations. We think it could benefit our productivity greatly, but logically we are very concerned about safety issues. Some shops have said great things about running machines unattended, but I've also heard horror stories about fires or other things going wrong. What measures should I take to make sure lights-out operations run smoothly? I'm worried I won't be able to sleep at night while the machines are running solo.

*Sleepless in Solon*

## **Dear Sleepless,**

First of all, you have to take into account what the machine is going to be producing before you attempt to go lights-out. Sometimes, the simplest looking parts that you would assume could run unattended, can't be. You've got to look at all the "what-ifs" of things going wrong; there are a lot of big "what-ifs" with expensive Swiss equipment. What if there are problems with oil coolant? A machine could reach 130+ degrees Fahrenheit inside. At those temperatures you may be nearing a flash point, so having a fire suppression set-up is essential. There are a lot of people who don't have a fire suppression set-up, and machines burn down regularly across the country.

One of the most important issues to consider when going lights-out with your Swiss is whether you can attain chip control on the part you're making. Lack of chip control is the single largest hindrance to unattended Swiss operations. You can't have metal chips winding around the part. You must make sure that the chips break up, and fall out of the machining envelope. If that doesn't happen, you cannot zero in on the placement of the coolant. Your coolant for the tools becomes a variable at that point, and you must have consistency in everything when running lights-out. The proper selection of coolant for the particular application is also important. If you're machining a lot of stainless steel for example, you want to make sure you're using a safe, premium cutting oil, possibly with sulfur or a chlorinated coolant of some sort. Talk to your coolant rep – they can often make recommendations dependant on specific machining scenarios.

Attaining balance in your run-time is also essential when running lights-out. In a perfect world when you're running unattended, the shortest life span increment of your tools would be 23 hours. That way you could have one hour of down time to maintain, clean up, and change tools each day, enabling 23 hours of unattended or partially attended run-time. It doesn't benefit you to have a tool that's good for 36 hours, because the next shortest tool life would have to be 47 hours. You don't always change your tools X number of pieces; you change your tools X number of hours because you want your machine to run all night. You have to keep this rule

in mind when considering the "what ifs." What if you have a power outage in the middle of the night? Say the power goes out at 2:00 A.M. You come to work at 8:00 A.M., restart the machine, and run the machine until noon? You didn't get the same number of pieces as you normally would, but you still have to change all the inserts again, and get ready for that night's run. This brings us to another important question to consider when having a lights-out operation – how dependable is the power grid in your area, and the power for your building? If the power does go off, is the machine and support equipment able to independently shut down?

You also must know the dependability of all the things that may be piped into the machine, such as air, oil, coolant, support equipment etc. If you have a 20,000 square foot facility, and only 5,000 square feet are devoted to running unattended equipment, can you shut the air off to the rest of the shop? What happens if an air hose blows off on the shutdown side of the shop in the middle of the night? Does your compressor run itself to death? All your support equipment has to be in good order. Remember your manufacturing chain is only as strong as its weakest link.

I would strongly urge the development of a lights-out protocol, which is basically a check list from the front of your shop to the back, with all the little things that you want to make sure are on, off or in the proper order before you leave. At our shop it starts from the back of the shop, making sure the doors are locked, and our set-ups are safe. Then, after one hundred other checks, we turn off the lights, and close the door. We make sure to check the engine lathes, coolant pumps etc., which could unintentionally remain running overnight because you couldn't hear them while your lights out equipment was running. You must check everything.

Remember to ease into running lights-out; take the time to properly train your crew and yourself. Start with running shut down sequences in the daytime. Try running one hour, then two, etc. Have a back-up plan to help you through the unexpected things that inevitably come with any job.

There is little margin for error when running lights-out, but if you're a perfectionist, give it a try.

**Travis Copen, Copen Machine Inc.**  
Kent, OH

*Have a technical issue you'd like addressed? Please email [noah@todaysmachiningworld.com](mailto:noah@todaysmachiningworld.com); we'll help solve your problem, then publish both problem and solution in the next issue of the magazine.*



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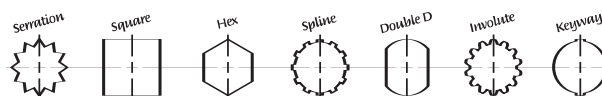
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# TMW show us your ride

## Building a Kit Car

by Jeff Wiltsie  
President-Manufacturing,  
Vanamatic Co.

In October of 2002, my company, Vanamatic Co., began an almost yearlong project – the construction of a new 80,000 square foot manufacturing facility. Around the same time, I began a personal project; building a West Coast Dreams Cobra kit car, which ended up taking a little more than a year and a half to complete.

Building a kit car can be very similar to building a new plant. I began building the car in May of 2003, when the construction of the new plant was moving along well. You don't get everything you need to finish your project up front. I had an instruction manual, chassis, fiberglass body, and an assortment of specialty components for the car, based on the motor and transmission I would later purchase. I had to find and purchase the rest of the car's parts as well.

By July of 2003, I had a rolling chassis, complete with drive train. The motor was ready to crank up for the first time. The sound of the 625 HP Ford Racing 514 crate motor with open headers was awesome! It could be heard a block away. It was time to bring the fiberglass body and frame together.

July was a grueling month for the new plant, as everything was behind schedule from the harsh weather. Salvation came every evening when I went home, ate supper, then headed to the solitude of my workshop. While working on the car, I was able to collect my thoughts on what was happening at the new facility, and could plan the next day's activities at work.

"Salvation came every evening when I went home, ate supper, then headed to the solitude of my workshop."

*Cruisin with my Grandson Damon.*



After we finished the move into the new plant in September of 2003, I took about five months off from building the car. Cold weather in the workshop and concentrating on getting the new plant running efficiently took most of my time.

I finally finished the car my 2-1/2-year old grandson calls "The Cobra" in July of 2004. Would I ever build a car again? You betcha! Would my lovely wife Dianne like that? I don't think so! What would my grandson Damon think about it? Thumbs up, Papa!



*Have you got a favorite ride? Looking for antique cars, skateboards, motor-cycles or anything else that gets you around. E-mail your story and photo to [jill@screwmachineworld.com](mailto:jill@screwmachineworld.com).*



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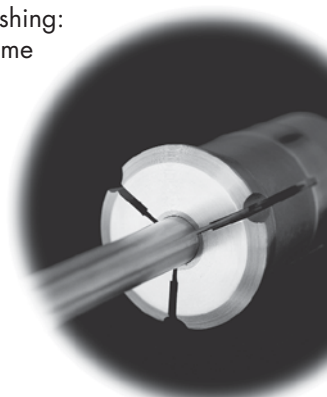


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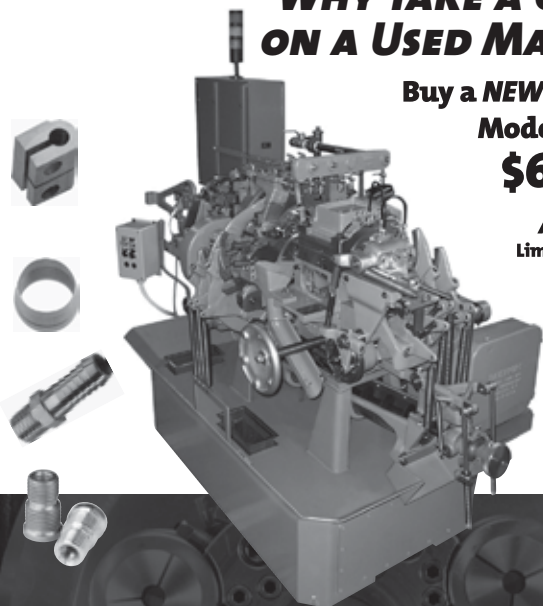


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Y			R		I			
	C							E
		N	E			Y		

Send in your answers—quick!  
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jill@screwmachineworld.com

## Sudoku

Graff-Pinkert's own Parts Manager Cathy Heller used the Sudoku concept to design a puzzle using letters, rather than numbers, for this issue. The result is our very own "machinery" Sudoku. Remember the drill? Sudoku is a grid of nine boxes which must be filled in so the letters M A C H I N E R Y appear just once in each column, row and three-by-three square. Do Cathy proud!



## Dig It!

Ok, so the puzzle answer was a "trick question." After all, it is rather impossible to dig "half a hole"; anything dug is, in itself, a whole hole. However, there were so many wonderfully detailed answers from all of you who think fun is to work with mathematical formulas, I had to list you all too.

The no-half-hole answer: **Doug Pav** of AMS in Clinton Township, MI; **Ray Chalmers** of G. Temple Associates in Farmington Hills, MI; and **John P. Jones** of Honeywell Metal, Inc. in Topeka, IN; **Dennis Davis** of RDS Manufacturing, Inc. in Broken Arrow, OK; **Merle Fisk**; **Steve Tyler** of Tyler Production, Inc. in Arkansas City, KS; **Ashley Boldt** of E & A Manufacturing, Inc. in Dundee, MI.

Other answers included 4 hours, 12/13 hours or .923, 55.45 min, 55.38 min, 55.23 min and 65 minutes:

**David Doctor** of Fordoc, Inc. in River Grove, IL; **Louis D. Pike** of Pike Machine Products in Cleveland, OH; **Mark Kritz** of Parker Hannifin in Reading, PA; **Brian Esch** of Machinery Systems, Inc. in Schaumburg, IL; **Denise Gidaro** of Ashby Manufacturing Company, Inc. in Cranberry Twp, PA (who had a whole office brainstorming on this!); **Mike Bowen** of Bil-Mac Corporation in Northbrook, IL; **Scott Rosen** of Machinery Systems in Brookfield, WI; **Terry Bien** of Ashley Ward, Inc. in Cincinnati, OH; **Loren Lanter** of Brisco Inc. in Swannanoa, NC; **Tom Alexander** of A & B Machine, Inc. in Sidney, OH; **Brian Thomson** of L.H. Thomson Company, Inc. in Macon, GA; **Doug Dampman** of Weatherford International in Wharton, NJ; **Butch LaRue** of Emerson Motor Company in St. Louis, MO; **Terry Kessell** of DTEC, Inc. in Watertown, CT; **David Smith** of Electroswitch Electronic Products in Raleigh, NC; **Dick Goldstein** of Cadillac Machinery Co., Inc. in Elk Grove Village, IL; **Margie** at Southern Gear & Machine, Inc. in Miami, FL and **Rich Gosselin** at IMTEC Corporation in Ardmore, OK.

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The image features a close-up of a Thinbit tool cutting a groove into a metal workpiece. In the background, an American flag is visible. A "40TH BIT" anniversary logo is in the top right corner. The text "GROOVE 'N' TURN®" is centered, with patent information below it: "U.S. Patent Nos. 6,688,816 6,824,333 & Patent Pending". The main headline reads "External & Internal Grooving and Turning Up To A Shoulder". Below this, technical specifications are listed: "Groove Widths .004" through .150" in .001" Increments", "Threading from 8 T.P.I.", "Face Grooving Major Diameter from .300\"", and "Two Grades of Sub-Micron Grain Carbide and HSS". A circular seal on the right indicates "SERVING FROM 24 HOURS". The Thinbit logo and "KAISER TOOL COMPANY, INC." are at the bottom, along with the phone numbers "888-THINBIT • 888-THINFAX".

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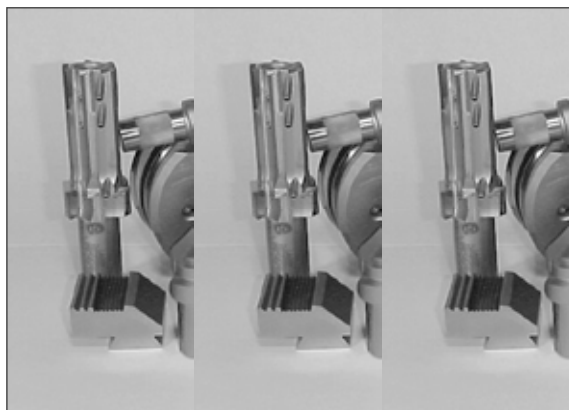
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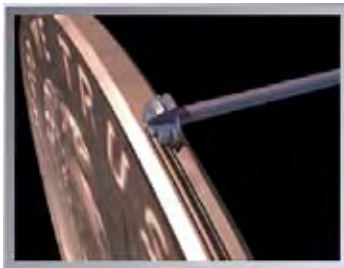
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## HAPPY ANNIVERSARY

BY LLOYD GRAFF

**W**ith this issue of *Today's Machining World*, we celebrate five years of creating this magazine. Please indulge me a few paragraphs while I talk about what this accomplishment means to me.

Originally, *Screw Machine World*, our old name, was going to be an online "zine," with a column like Swarf, a few features, and occasional in-depth articles about the screw machine industry. I had also bought into the broadband dream, and thought that we would develop educational programming that we would sell to an eager audience, which would pay us well to view programs about changing National Acme spindle bearings and setting up jobs on Davenport.

This idea germinated in 1999, when the Internet looked like an unlimited fountain of riches, and I was confident that I could tap into millions of dollars with my screw machine expertise.

I look back at my appalling naiveté with amusement now, but I'm grateful for the optimism of unbridled ignorance. If I had a glimpse of my own folly I would have never started this enterprise.

Fortunately, I got a reality check at IMTS in 2000 when I heard that Gardner Publications in Cincinnati was going to publish a magazine for the screw machine industry. I remember

hearing this rumor and thinking to myself, "They can't do that, it's my idea." And that is when I decided to do this magazine. And the ridiculous thing is that I was sure that I would not fail.

I started with a young editor whose primary experience had been working on an Internet cooking site. He knew nothing about machining, but I figured he would pick it up as we went along. He didn't. Luckily, we had a printer next door, Rob Klauber's Metro Litho, who nursed us through our first several issues. Jill Sevelow, who had been selling Wickman spare parts for Graff-Pinkert, moved over to the magazine to sell ads and do a lot of everything well. And I continued to have this ludicrous belief that I could be a machinery dealer, and win a Pulitzer Prize – in my spare time.

We got a huge break when Dan Pels, who had twenty years in Business-to-Business publishing, was introduced to me by a mutual friend. Dan had learned publishing and selling from Norm Cahners and Bill Ziff, two of the masters of this genre, who had both sold out for mega-millions of dollars. Dan had worked for the best of breed, and then seen the magazines he had helped build be strangled by idiotic corporate gamers. In tiny *Screw Machine World* he found a gig that was the total opposite of what he had left.

I suppose Dan saw me as Don

Quixote with a legal pad at the beginning, but over time I think he has arrived at the conclusion that I am at least "teachable" about making a trade magazine professional and profitable. Dan has been incurably optimistic about our prospects from the outset, because he felt we had the indispensable element that can make a magazine successful; an authentic connection to the readers. While our competitors in the manufacturing trade press focus on the advertising community, we aim passionately at the user world, presenting the drama of business.

When we started this magazine, I worried that my standing as a dealer in used machinery would marginalize the publication. I feared people would accuse us of being a glorified house organ of Graff-Pinkert. For me, one of the big surprises of doing this schizoid enterprise for five years is to observe how this issue has vanished by being upfront about it. My business experience has enriched my writing and interpretive ability. It has given the magazine a hearty authenticity because we have been living the turbulent life of our customers during this five-year run. Their wounds are our wounds, as is their healing.

As I look back on the first five years of this magazine, I feel enormously grateful that you have taken the time to actually read it, and comment on it, critique it, even praise it. I am also grateful to the growing number of advertisers who support it. As immodest as this may read, I am tremendously proud of what we have done. Yet, we have fallen short of my hopes with every issue. My best hope is that we continue to "fail better." Please keep letting me know how you think we're doing.



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