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# Today's Machining World

THE MAGAZINE FOR THE PRECISION

PARTS INDUSTRY

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February 2009 volume 5 issue 2

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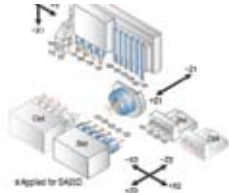
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# editor's note

## Connection is the Key

I just finished reading the January-February issue of *The Atlantic Monthly* — absolutely loving it. The magazine has new, young owners and a fresh energy that knocked me out. They used to do 40,000 word opuses with no photos, about Iraq, which was nice, but frankly I don't give a damn. I allowed my subscription to lapse because I wasn't finding the time to read it anymore. But I'll find the time for the publication they are starting to do.

I know you do not have a lot of time to read a trade magazine next to the hearth at night. Do you have a hearth?

But I know you still thirst for ideas and creative energy. The survey in December's Afterthought evoked a stunning 350 responses, including many personal emails and phone calls. You care about what we write and how we approach it.

In this issue I chose to begin Swarf with Greg Knox's rant about contemporary America and General Motors, which has had over one million hits on Google. I knew Greg from a complimentary note he sent me recounting *TMW* with other American machine tool guys while they traveled through Korea via bus.

Do I agree with Greg on every point? No. But I love his passion, his personal story and his authentic view. To connect with Greg Knox is to connect with the industriousness of America and its good will. That is why it has spread virally around the Web.

As long as *Today's Machining World* connects with Greg Knox of Cincinnati and closes the loop of the disparate threads of our audience's interest, I'll be joyful sharing this magazine with you.

Lloyd Graff  
Editor/Owner





**Mary Ethridge** is a freelance writer in Akron, Ohio. She has written for *Newsweek*, *MSN.com*, *Cleveland Magazine* and many other national and regional publications. Before going solo in late 2006, Ethridge spent 18 years as a journalist with *Knight Ridder* newspapers, most recently as a business writer for the *Akron Beacon Journal*. Her award-winning stories have appeared in publications across the country, including the *Miami Herald*, the *Dallas Morning News* and the *Philadelphia Inquirer*. A graduate of Princeton University, Ethridge was a classmate of former New York governor Eliot Spitzer when he still had hair and a promising future.



**Barbara Donohue** has been turning technology into English since 1993. An MIT-educated mechanical engineer with more than a decade of industrial experience, she started her career in journalism as editor of a small-town weekly newspaper. She regularly contributes "How It Works" articles to *TMW* and loves that it gives her an excuse to research different technologies and visit machine shops and factories wherever she goes. When she's not writing, Barbara likes to take her therapy dog, Luke, to visit patients in nursing homes and hospitals.



**Lloyd Graff** is the founder and owner of *Today's Machining World*. He also co-owns Graff Pinkert and Company — a machinery trading firm — with his brother, Jim. He has been around metalworking equipment since he was a child, when his father, Leonard, would bring him to the screw machinery factory he owned. *Today's Machining World* developed out of his love of writing and his fascination with buying and selling used machinery. In his spare time he watches TV and worries a lot.



**Noah Graff** has been working at *Today's Machining World* since 2005. He holds the titles of features editor, videographer, and "the web guy" of the magazine. He graduated from the University of Wisconsin majoring in film and history. He currently has a reality show on YouTube called "Jew Complete Me" documenting his search to find the Jewish love of his life. Noah is psyched for a trip to Japan in February, to interview Japanese businessmen for *TMW* and to go on a Karaoke binge.

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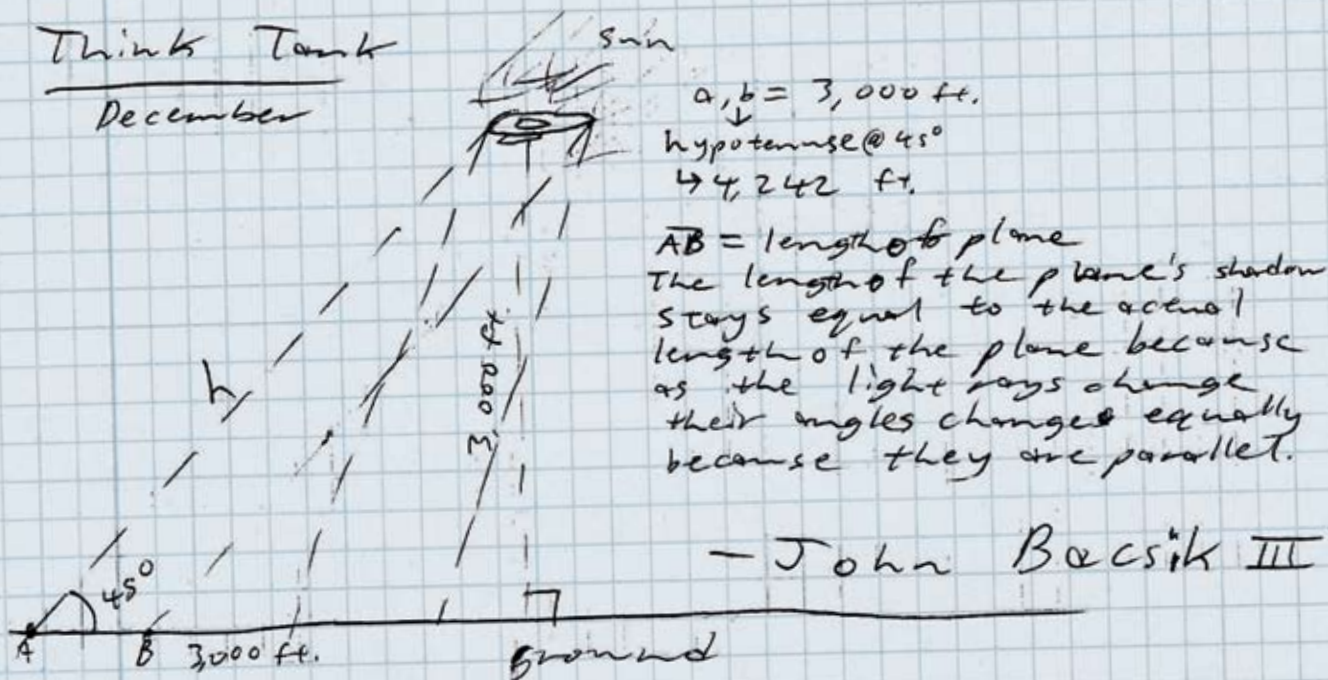




Today's Machining World

forum

Think Tank  
December



### Obama video

I just watched [Lloyd's] video on why he voted for Obama and consider it the most inane thing I've ever witnessed. He disagrees with 80 percent of Obama's policies and yet he voted for him? In your latest issue, you cite those who have a vested interest in chaos and express the hope that Barack Obama can bring in knowledgeable people to cool the rampant fear that seemingly pervades the country. Well, don't hold your breath, as Obama in the last few days has fanned the flame of fears about the "financial crisis" and that further depths are coming in the future. I assume now that the American people have elected the ultimate politician and fear that it will be politics as usual.

E. Menninger

Menninger Associates

The video Mr. Menninger refers to can be seen at [www.todaysmachiningworld.com](http://www.todaysmachiningworld.com). Click on the videos tab on the left.

### Taking Think Tank seriously

The following is a response to the December 2008 Think Tank. The question posed was — An airplane flying at several thousand feet casts a shadow on the ground. Will the shadow be larger, smaller or the same size as the airplane?

The size of the airplane's shadow is the exact same length and width, no matter its altitude above the ground, and it remains the same. As light rays pass by its body and hit the ground below to form the shadow, note that the edges of the shadow, though they may be skewed outward at an angle, are ALWAYS equidistant from each other. This is because of how the sun's rays travel parallel to each other. So as the plane moves forward or backward, the angle of the rays outside of the interference line are changing equally, because, of course: If two lone segments are parallel to each other, then their corresponding angles are congruent to each other.

John Bacsik

Air Parts Mfg. Co.

Arlington, TX

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

Send your comments to: TMW Magazine 4235 W. 166th Street, Oak Forest, IL 60452

Or email us at: [emily@todaysmachiningworld.com](mailto:emily@todaysmachiningworld.com) or [lloyd@todaysmachiningworld.com](mailto:lloyd@todaysmachiningworld.com)



## TMW's Report Card Results

The December 2008 issue of TMW had a report card on the last page asking readers to rate different aspects of the magazine. The following is a compilation of some of the more interesting comments.

"My Mother, an English teacher  
— likes TMW!"

"Lloyd, nice move. Print your own  
magazine, gives you free advertising."

"Your magazine's the only one I read.  
Thank you."

"This is the greatest magazine ever!"

### I WOULD LIKE TO READ A NEW ARTICLE IN TMW ABOUT:

- "Servo Cams"
- "Wire EDM"
- "The Big 3"
- "American molders looking for American mold makers"
- "Tips, tricks and ideas for basic job shops. Not everyone wants to learn about the new 5-axis and CAM stuff!"

### I THINK THE MACHINING BUSINESS:

- "Has been good to me."
- "Is a rewarding but challenging business."
- "Is really the only thing I know anymore."
- "Is in trouble and in decline for the next generation unless health care fees for insurance are reduced."

### IF I HAD TO CHOOSE ONE THING TO CHANGE ABOUT TMW IT WOULD BE:

- "Discontinue the support for anti-business political candidates."
- "More interviews with people in industries such as machine tools."

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BY LLOYD GRAFF

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# It's a Hard Knox Life

**G**reg Knox is a machine tool dealer who sells Kitamura and Ganesh among others in Cincinnati. He is an avid fan of this magazine. And now he is the author of a phenomenally viral email which has had over 1,000,000 Google hits in a month.

Greg received GM's cry for help second-hand from a Detroit machinery dealer via email, which he perused in his office at 6:00 a.m. over a cup of coffee. As he read it his blood boiled after 30 years of calling on automotive plants. He sent his email without a return address to a few friends and his mother. A couple of days later he received a call from a NASA scientist asking him if "he was *the* Greg Knox who wrote the letter to GM." Somehow Fox.com had picked up on it. Eventually Knox

was contacted by radio stations for interviews, deluged with calls and emails and was even meeting strangers at his office door who wanted to talk about the letter. Most people have agreed with him, though a 1 percent fringe are downright scary. Greg says most of the union people who contact him reluctantly agree with his rant. He's often up until one in the morning sending out thank you notes. Greg — thank you, for caring enough to write.

swarf

## A Letter from Troy Clarke, President General Motors, North America

Dear Employees and Suppliers,

Congress and the current administration will soon determine whether to provide immediate support to the domestic auto industry to help it through one of the most difficult economic times in our nation's history. Your elected officials must hear from all of us now on why this support is critical to our continuing the progress we began prior to the global financial crisis. As an employee or supplier, you have a lot at stake and continue to be one of our most effective and passionate voices. I know GM can count on you to have your voice heard. Thank you for your urgent action and ongoing support.

## A response from Gregory Knox of Knox Machinery Company

Gentlemen:

In response to your request to contact legislators and ask for a bailout for the Big Three automakers please consider the following, and please pass my thoughts on to Troy Clark, president of General Motors, North America.

Politicians and management of the Big Three are both infected with the same entitlement mentality that has spread like cancerous germs in UAW halls for countless decades, and whose plague is now sweeping this nation, awaiting our new "messiah," Pres-elect Obama, to wave his magic wand and make all our problems go away, while at the same time allowing our once great nation to keep "living the dream." Believe me folks, the dream is over!

This dream [the management of these companies seem to have], where they can ignore the consumer for years while myopically focusing on personal rewards packages at the same time factories have been filled with the world's most overpaid, arrogant, ignorant and laziest entitlement minded "laborers" without paying the price for these atrocities. This dream where you still think the masses will line up to buy our products forever and ever.

Don't even think about telling me I'm wrong. Don't accuse me of not knowing of what I speak. I have called on Ford, GM, Chrysler, TRW, Delphi, Kelsey Hayes, American Axle and countless other automotive OEM's throughout the midwest during the past 30 years and what I've seen over

those years in these union shops can only be described as disgusting.

Troy Clarke, President of General Motors North America, states:

"There is widespread sentiment throughout this country and our government, especially via the news media, that the current crisis is completely the result of bad management, which it certainly is not."

You're right Mr. Clarke, it is not *just* management. How about the electricians who walk around the plants like lords in feudal times, making people wait on them for countless hours while they drag ass so they can come in on the week-end and make double and triple time for a job they easily could have done within their normal 40-hour work week? How about the line workers who threaten newbies with all kinds of scare tactics for putting out too many parts on a shift and for being too productive? We certainly must not expose those lazy bums who have been getting overpaid for decades for their horrific underproduction, must we?!?

Do you folks really not know about this stuff?!? How about this great sentiment abridged from Mr. Clarke's sad plea, "Over the last few years we have closed the quality and efficiency gaps with our competitors."

What the hell has Detroit been doing for the last 40 years?!? Did we really *just* wake up to the gaps in quality



# swarf

and efficiency between them and us? The K car verses the Accord? The Pinto verses the Civic?!? Do I need to go on? What a joke!

We are living through the inevitable outcome of actions [that went on in] the United States auto industry for decades. It's time to pay for your sins, Detroit.

I attended an economic summit last week where brilliant economist, Alan Beaulieu, from the Institute of Trend Research surprised the crowd when he said he would not have given the banks a penny of "bailout money." "Yes," he said, "this would cause short term problems," but despite what people like politicians and corporate magnates would have us believe, the sun would in fact rise the next day and the following very important thing would happen. Where there had been greedy and sloppy banks, new efficient ones would pop up. That is how a free market system works, [and] it does work, if we would only let it work."

But for some nondescript reason we are now deciding that the rest of the world is right and that capitalism doesn't work — that we need the government to step in and "save us." Save us, hell — we're nationalizing, and unfortunately

too many of our once fine nation's citizens don't have a clue that this is what is really happening. But, they sure can tell you the stats on their favorite sports teams. Yeah — *that's* really important, isn't it.

Does it ever occur to anyone that the "competition" has been producing vehicles *extremely profitably*, for decades in this country? How can that be? Let's see — fuel efficiency, listening to customers, investing in the proper tooling and automation for the long haul, ever increased productivity through quality and intelligent planning, treating vendors like strategic partners, rather than "the enemy," efficient front and back offices, non-union environment and not being too complacent or arrogant to listen to Dr. W. Edwards Deming four decades ago, when he taught that by adopting appropriate principles of management organizations could increase



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quality and simultaneously reduce costs. Again, I could go on and on, but I really wouldn't be telling anyone anything they really don't already know down deep in their hearts.

I have six children, so I am not unfamiliar with the concept of wanting someone to bail you out of a mess that you have gotten yourself into. My children do this on a weekly, if not daily basis, as I did when I was their age. I do for them what my parents did for me (one of their greatest gifts, by the way). I make them stand on their own two feet and accept the consequences of their actions and work through it. Radical concept, huh? Am I there for them in the wings? Of course, but only until they are fully on their own as adults.

I don't want to oversimplify a complex situation, but there certainly are unmistakable parallels here between the proper role of parenting and government. Detroit and the United States need to pay for their sins. [Here's the] bad news people — it's coming whether we like it or not. The newly elected Messiah really doesn't have a magic wand big enough to "make it all go away." I laughed as I heard Obama reeling it back in almost immediately after the final vote count was tallied. "We really might not do it in a year, or in four..." Where was that kind of talk when he was *running* for office?

Stop trying to put off the inevitable folks. That house in Florida really isn't worth \$750,000, people who jump across a border really don't deserve free health care benefits, that job driving that forklift for the Big Three really isn't worth \$85,000 a year and we really shouldn't allow Wal-Mart to stock their shelves with products acquired from a country that unfairly manipulates their currency and has the most atrocious human rights infractions on the face of the globe.

That couple whose combined income is less than \$50,000 really shouldn't be living in that \$485,000 home. Let the market correct itself folks, it will. Yes it will be painful, but it's going to be painful either way, and the bright side of my proposal is that on the other side of it all is a nation that appreciates what it has, doesn't live beyond its means, gets back to basics and redevelops the patriotic work ethic that made it the greatest nation in the history of the world. And will probably turn back to God.

Sorry, don't cut my head off, I'm just the messenger sharing with you the "bad news." I hope you take it to heart.

GREGORY J. KNOX, PRESIDENT  
KNOX MACHINERY, INC.  
FRANKLIN, OHIO

## According to recent

press accounts Gene Haas left the Lompoc California Federal Prison late last year after serving 10 months of a 24 month sentence. He moved to a halfway house in Los Angeles.

Personally, I am happy he's out of jail. He built a phenomenally successful machine tool company in the U.S. against all odds. The Haas Automation Company has shrewdly attempted to visibly move away from Gene Haas, though he still apparently remains the owner. They recently announced a layoff of 200 workers, though they stand by their announced goal of selling \$1 billion worth of goods in 2010.

It will be fascinating to see if Gene assumes his duties at Haas in May, focuses on his car racing interests or decides to go in an entirely different direction in his life.

## Entering this year

I feel like Rocky. In every one of the six Stallone films the gritty Philadelphia fighter takes a bludgeoning, yet endures and comes back in the end.

Personally, I've taken a pounding physically. But like most people in business, I've also been hammered financially. When people feel threatened by a falling economy they hold back. I have seen that both with the machine tool business and with the magazine. Dealing with pessimism and falling sales is discouraging for most people and I am no exception. One way that I deal with my own negativity is to play a role with myself. I say, "Ok, Lloyd, things are tough, but from your experience you know they will eventually turn. If you were *optimistic* how would you behave now?"

Acting confident even when you aren't can change your attitude because it alters the way people connect with you. Most people in business hate to deal with negative people. Who wants to buy a car from a salesman who is staring down in pain? Playing a role is not necessarily faking it. The actor who commits himself to a role must buy into the story to make it convincing.

Seth Godin, who has written several fascinating business books coined the term "authentic stories" to describe the process of building believable fictions about ourselves that enable other people to follow us or buy our goods and services. Nobody has all the answers or produces perfection in every lot, but it is vital that the people in an enterprise give their customers and their peers an authentic "lie." If it is backed up by an honest effort to make it come true it can be the adhesive to keep a business and a person going in hard times.

"If I *could do this*, how would I be acting now?" is one of those bridges from pessimism to belief that keeps us going when our world stinks.

• • • •

Sometimes you can't document things but you know in your bones something big is going on. I felt that way when Barack Obama announced for the presidency on a frigid day in February 2006 in Springfield, Ill. Of course an obscure black man could not win the office, but with Obama it felt like it was going to happen. When I heard that speech I told everybody around me that we just heard the next president of the United States.

As the economy sinks like a stone and unemployment heads toward 10 percent I feel a bottom being put into the residential real estate market. I know people who are buying first homes and it seems like everybody is thinking of refinancing their mortgage or has done it already. The mortgage brokers are adding staff and a lot of people are buying books on how to purchase homes out of foreclosure.

I know the horror story scenario of spreading insol-

# swarf

vency and vacant neighborhoods, but I am smelling a bottom in housing, which will be the first building block of the economic recovery of the United States.

• • • •

In Chicago, February is the bleakest of months. Whatever misery winter holds is dumped on us in the shortest month.

But February has its saving grace. Spring training begins for pitchers and catchers. Can baseball be that far away?

Some odd things are going on in the world of baseball. As the game of baseball is losing its appeal as a

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participation sport for America's kids to soccer, lacrosse and of course, basketball, it is becoming more and more successful around the world. In Japan, Taiwan and Korea it is a hot sport. In Australia we are seeing a lot of major league prospects emerging. The Caribbean and Venezuela continue to produce phenomenal young players.

For me, baseball is a personal passion. I love the strategy, the statistics, the history — and I just love to watch a ballgame, on TV — but if I can get a good seat I enjoy going to the ballpark too.

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BY BARRY HALGRIMSON

## Outliers: The Story of Success

Why some people succeed and others don't, is the subject of thousands of books. Americans are fascinated by the geniuses, virtuosos, billionaires and all-stars that shine in our culture. The newest term for them is "Outliers," referring to their lying outside of statistical norms.

*Outliers: The Story of Success*, Malcolm Gladwell's latest book, dives deep into several cases of success and failure, and through selective storytelling provides a convincing case that talent and ambition are often wasted without opportunity.

Scratch the surface of an outlier and what you'll usually find is sweat and luck. Mr. Gladwell described an All-Star Canadian junior hockey league where most of the players were born in the first three months of the year. The league's January 1 birthday cut-off was his not-so-obvious explanation, because at 10 years of age, every month of growth counts. Since the older boys exhibited superior attributes first, the coaches awarded them with more ice time and individualized attention. Those boys born later in the year received less opportunity to prove their potential. Bad luck? Sure. But to Gladwell opportunity is rarely fair.

The author applied similar criteria to several well-known success stories including Bill Gates (Microsoft), Bill Joy (Sun Microsystems), and even the Beatles. Gates and Joy enjoyed virtually unlimited access to early university computer labs at exactly the right time for carving out their own niches in the fledgling computer industry. In the same way, John Lennon admitted that the Beatles perfected their craft while performing eight hours a night at strip clubs in Hamburg, Germany, in the early 1960s. Gladwell then juxtaposed these success stories with the life of an American genius named Chris Langan (IQ=200) who was born with great gifts but experienced primarily failure in his attempt to achieve societal acceptance as a master. Gladwell's common denominator for success was 10,000 hours of practice toward mastery. Without it, success could be virtually unattainable. And though one could practice indefinitely, without talent and opportunity, one still might not succeed.

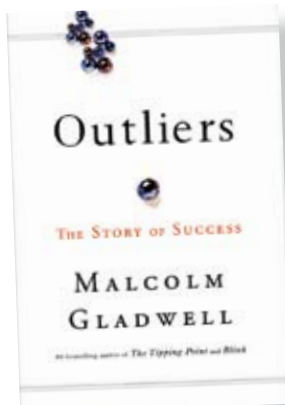
This discussion of mastery then led Gladwell to the topic of "Legacy," and the role it plays in a person's readiness to grasp an opportunity when it appears. Culture impacts our effectiveness in many ways. For example, both Jewish garment workers

who emigrated to New York in the 1930s and Chinese farmers working in their rice paddies demonstrated the link between hard work and success. They imbued a work ethic in their children that prepared them for achieving their own dreams.

Gladwell provided many other examples of cultural legacies as well. Language can be viewed as a liability or an advantage. For example, Chinese numbers are perfectly conceived for mathematical calculations (e.g., rather than "twelve", they say "10 and 2"). Gladwell theorized that this reduces the stress of learning early math so much that Chinese kids are willing to spend more time on difficult problems. His studies showed the more time they spent on a problem, the better their chances were of doing well on achievement tests. (One test showed that American kids spend an average of 9.47 minutes on a tough problem before giving up, while Chinese kids lasted 13.93 minutes.) Add to this the disparity in days spent in schools around the world (180 days per year in the U.S. versus 220 in Korea and 243 in Japan) and some cultural advantages seem to be virtually insurmountable. When given an international achievement test, Japanese students said that 92 percent of the questions had been covered in their class work, compared to 54 percent for their American counterparts.

*Outliers* presents dozens of these precursors to success and challenges us to investigate the conventional explanations for success. Traditional wisdom long ago placed perspiration well above inspiration on the list of desirable personality traits. But *Outliers* reminds us that without opportunity and an enabling culture, even the greatest of gifts can be wasted.

Truly successful people will quickly acknowledge their own luck. Even more importantly, a truly great society will recognize the potential contribution of every person who has an opportunity to succeed. Creating of opportunities is what makes America great, even if it's something as simple as starting a junior hockey league in April, extending the hours in a computer lab or offering Chinese language courses in summer school.



Comments? You can email Barry Halgrimson at [bhalgrimson@yahoo.com](mailto:bhalgrimson@yahoo.com).





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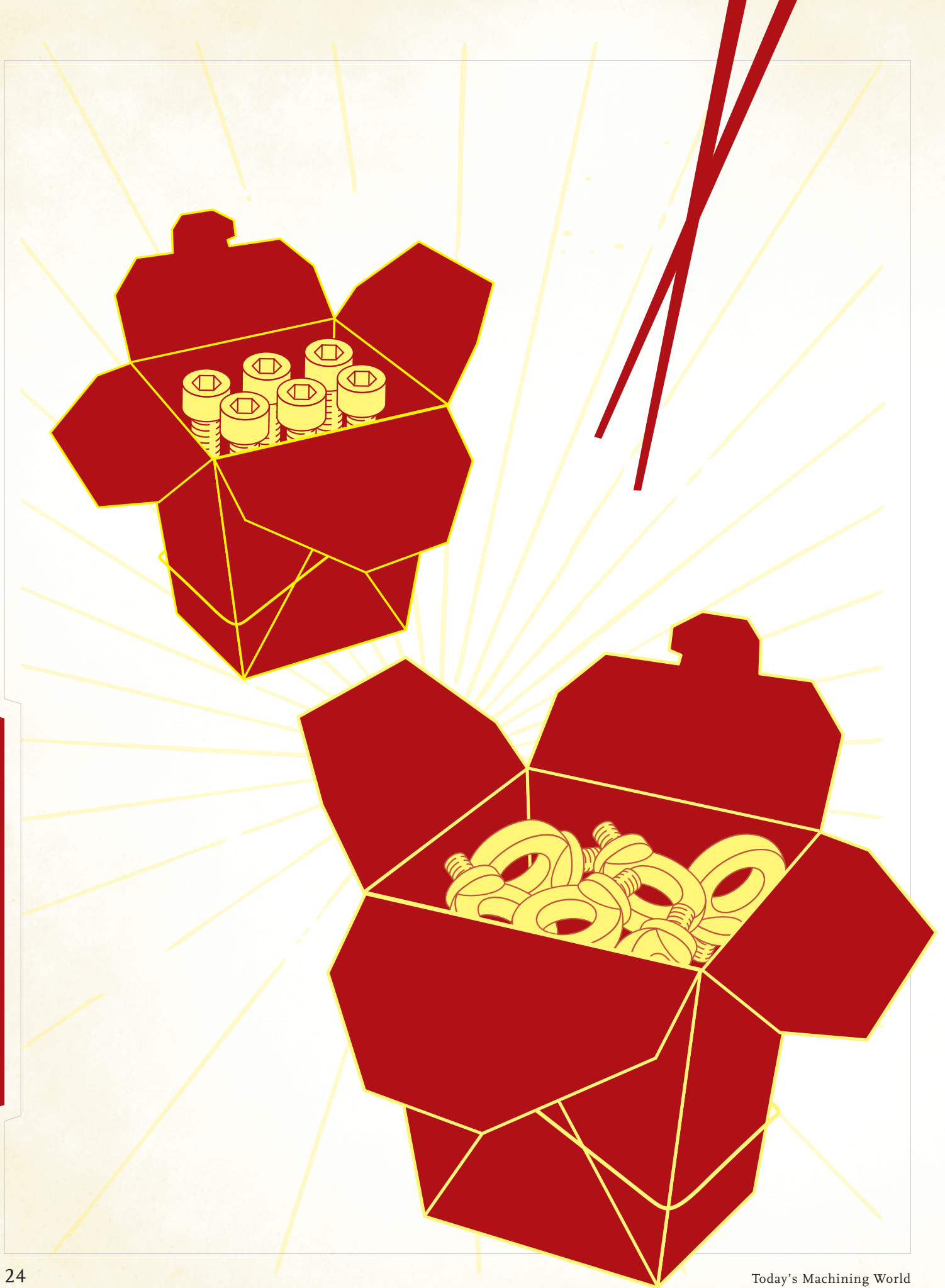
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fresh stuff



# 2009: The Work is not all Coming Back

By Mary Ethridge

**N**ot all the heavy lifting in China late this summer was going on in Olympic venues. The country's financial leaders found themselves facing something they hadn't expected — at least not so soon and in such dramatic fashion.

China's economy — which despite some scandal, seemed as healthy and unstoppable as an Olympic athlete a year earlier — was showing distinct and measurable signs of trouble. Many outside China were happy to chronicle the return of prodigal U.S. manufacturers, who'd found there's no place like home to manufacture.

"Globalization is reversible," analyst Jeff Rubin of CIBC in Toronto told the *Christian Science Monitor* in September. At least it seemed that way. Skyrocketing oil costs, which threatened to reach \$200 a barrel, a stronger Chinese currency, rising wages, fewer tax rebates for exporters and more tainted-product scandals were all signs pointing to

home — or at least someplace closer, like Mexico.

"Factories Bring Jobs Home Again," a headline in the *Wall Street Journal* read this summer. In September, the *Christian Science Monitor* predicted a boom in "reverse globalization."

Could we dare believe in the vision of a revived Rust Belt?

However, philosophers as far back as Confucius will tell you that things are never simple when it comes to China. The one established hallmark of the evolving global economy is rapid change, to which China has proven itself a swift adapter. In a matter of two to three months the landscape shifted again remarkably. As the reasons prodigal manufacturers gave for returning home evaporated (oil prices, for one), spinning heads ended the year trying to determine the next best step for U.S. companies.



“What do we do and where do we go now?” said Lisa Reisman, a metals specialist and managing director at Aptium Capital in Chicago.

China? Home? Someplace else? Where in the world is the best place for a U.S. manufacturer right now?

Before trying to answer that question, let’s look back to spring and summer. What could make even skeptical analysts believe that China, which has drawn thousands of U.S. manufacturers to set up operations there, was yesterday’s news? The evidence seemed compelling, especially for those who had been hoping for decades for a reversal of America’s manufacturing fortunes.

Crude oil prices were quickly on their way to reaching \$140 a barrel in July, and many were predicting prices of \$200 a barrel by fall. Few people were seeing an end to astronomical fuel costs, which raised the transportation costs when moving products between countries. More than half of China’s manufactured exports to the United States are what’s called “freight intensive.” At \$200 a barrel, shipping a 40-foot container from Shanghai to the East Coast would cost about \$15,000, experts estimated. In August, it was \$8,000, versus \$3,000 in 2000 when many U.S. manufacturers began moving operations to China.

China’s currency — officially the RMB, but called colloquially by its dollar-like denomination, the Yuan — was holding strong against U.S. currency. The U.S. government has often accused the Chinese of keeping their currency artificially low against the dollar to keep prices of Chinese-made products low — thus appealing to cost-conscious U.S. consumers. It got to the point that in April U.S. Senate Democrats introduced something called the China Currency Manipulation Act of 2008, which outlined punishments for the Chinese if they were found keeping the Yuan artificially low. It seemed China was getting the message. Since 2005, when China began pegging its currency to a “basket of currencies” instead of just the U.S. dollar, the Yuan had appreciated 20 percent to reach 6.88 against the U.S. dollar in July, and was predicted to appreciate more.

China had also started rapidly phasing out generous tax rebates offered to U.S. manufacturers that produced in China and then exported to sell in the U.S. and else-

where. Thousands of manufacturers have been adversely affected by the rebate cuts.

Chinese wages were on the rise. No reliable figures for average wages exist because the figures from the Chinese are notably unreliable. However, factory owners and labor experts said businesses were having a hard time finding good workers and were having to pay the workers they found more money. In January of last year, China began enforcing new laws mandating certain protections for workers and requiring the use of longer-term contracts, which some employers said locked them into high costs they couldn’t afford.

By late summer, word was beginning to leak out that Chinese-made baby formula had been watered down and tainted with poisonous melamine to fool inspectors. At least four babies died in September as a result. It followed a string of product-quality scandals for China that included toys contaminated with lead and the “date rape” drug GHB. Last February, a Maryland candy company pulled Pokemon-brand Valentine lollipops from store shelves after bits of metal were found in the

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**“Some U.S. manufacturers said it just didn’t make sense to keep production in a country with such problems and fewer payouts.”**

# “It makes sense to produce where a product is sold.”

sealed treats. Many top officials resigned or were fired, and several arrests were made in the wake of the tainting scandals. In response, the Chinese government took steps to improve quality control and safety, and tried to reassure the world that the vast majority of its products were fine.

Oil prices, a strong Yuan, few rebates, higher wages and product scandals — when adding those to existing concerns over pirated intellectual property, some U.S. manufacturers said it just didn't make sense to keep production in a country with such problems and fewer payouts. Desa LLC, a heating product manufacturer based in Bowling Green, Ky., moved its manufacturing from China back to its home state. It had held onto all the necessary equipment and machines to do the job, it said.

“What looked like an albatross 1.5 years ago, today looks like a pretty good asset,” Claude Hayes, the head of Desa's retail heating division told the *Wall Street Journal* in June.

In a survey of executives called the “Future of Manufacturing,” taken in August and September by the consulting and accounting firm Crowe Horwath for *IndustryWeek*, one executive of a steel furniture manufacturer summed up his industry's general feeling.

“In our industry, more and more production is being outsourced to China,” the executive said. “Should the cost differential change due to improved exchange rates, increased freight costs, higher wage rates in China, lower material costs, etc., then U.S. companies with manufacturing capacity should be able to make a comeback.”

U.S. newspapers were filled with stories of other happy homecomings. Thomasville Furniture, Excel Outdoors and Regal Cookware were just a few of the

American companies featured in stories about “reverse globalization.” Caterpillar reportedly expanded its U.S. plants in part because production in China was not as cost-effective as it had once been. The Wisconsin-based Coatings Excellence International (CEI), which makes poly-coated papers, said it was able to convince the printers who make Sweet ‘N’ Low packets to source from them instead of overseas by making some simple, cost-saving production changes. Lexmark of Lexington, Kentucky, which makes printer cartridges, didn't quite make it all the way home. It moved production out of China to Mexico. Still, North America's gain was China's loss.

Others said they were beginning to look back home. Mark Stephens, director of logistics for Faultless Starch/Bon Ami consumer products, said in September that his company was “actively” pursuing partners closer to the United States. St. Louis based Emerson, which makes electronics, moved some manufacturing home from China over the summer.

“It makes sense to produce where a product is sold,” Emerson Chief Executive Officer Edward Monser told the *Wall Street Journal* in June.

Mark Levinson, author of “The Box”, a history of the shipping container, summed up the attitude this way: “Many companies want to be in China anyway because of the Chinese market. But is it the best from which to serve the U.S.?” Numbers backed up the anecdotal stories about happy homecomings, but those numbers were anything but happy for the Chinese. Manufacturing in China is undergoing its sharpest contraction since the modern wave of outsourcing began. The Purchasing Managers Index, which is used as a measure of China's overall manufacturing health, began falling in August and kept falling through the end of the year — a sure sign of a faltering sector. By November, the World Bank



had cut its 2009 China economic growth forecast to 7.5 percent from the 9.2 percent it predicted in June. Beijing has long held that economic growth of at least eight percent is needed to provide the population the improvement of employment and income the ruling Communist Party rely on for popular support.

China's overall growth has slowed to its weakest pace in five years, with output expanding just nine percent in the third quarter from a year earlier, after gaining nearly 12 percent in 2007, if you believe their stats. When taken by itself, the number of exports fell 2.2 percent in November, the first drop in nearly eight years. And half of China's exports come from foreign-based companies manufacturing in China. Foreign direct investment in China fell 36.5 percent in November, according to China's commerce ministry. Chinese factories have been closing at an unprecedented rate, saying they can't keep up with the demand for higher wages and a shrinking demand for their services.

For those who'd been keeping very careful watch, the economic turn shouldn't have surprised the Chinese the way it did. In March last year, Dexter Roberts, bureau chief of China for *BusinessWeek*, was predicting problems for the Chinese economy, but said the government seemed not to notice.

"They don't realize the scale of it. At this point, they don't seem concerned," he told listeners of a March 8, 2008, podcast.

A survey in April by Iowa-based consulting firm RSM McGladrey, said the number of companies planning offshore production fell 20 percent from the same time in 2007.

Although they were a bit slow on the uptake, the Chinese were beginning to realize the scale of the problem by the time the Olympics closed up shop in late August. They also realized the U.S. economy was continuing to slump, which meant consumers would soon be shutting their wallets — even to deals at Wal-Mart. The Chinese cut interest rates four times between September and November to stimulate growth. In November, China unveiled an economic stimulus program it billed as totaling \$586 billion, aiming to bolster domestic demand and help avert a global recession.

The stimulus plan, although focused primarily on domestic growth, was designed to build up the failing confidence of Chinese businesses and consumers, as well as impress the United States and other foreign governments. The plan was accompanied by other outward-looking measures, such as a reinstatement of many of the export tax rebates the government had phased out.

And then, curiously, in early December, the Yuan, which had been steadily appreciating against the U.S. dollar, began to lose value. But not much — and there were caps in place to keep it from depreciating and appreciating too much in any day or week. However, it was enough to revive the old cry of currency manipulation from the United States.

"I think it's a just-under-panic mindset among the Chinese these days," said Reisman of Aptium Capital. "They know they have so many mouths to feed, and when the economy's growth rate goes under the double digits, they're going to take action," said Reisman. "The environment, politics, everything else is going to take a back seat while they fix things."

Some things have seemed to work out themselves for the Chinese. After peaking in July at nearly \$150 a barrel, crude oil nosedived to about \$40 a barrel by November. Prices at the U.S. gas pump fell from just over \$4 a gallon to under \$1.70. Within a matter of weeks, the primary factor U.S. manufacturers cited as their reason for leaving China, was gone.

"They're saying, 'Now what?' So much for reversing globalization," said Tompkins of Tompkins Associates in Raleigh.

Tompkins said a few companies made the decision to abandon manufacturing in China and bring it home in light of fuel prices and other issues, but he stressed they were relatively few in number and in no way represent any sort of lasting trend. Barring some sort of monumental occurrence, outsourcing will remain a way of life for U.S. manufacturers.

"It's still about TDC — total deliverable cost. And companies are always going to go where that's lowest," he said. Fuel costs represent only about five percent of an average product's TDC, Tompkins said. And companies still need to pay shipping across the United States,



# “They have a one-party system. They have the ability to move very quickly.”

which includes fuel surcharges at the height of gas prices. Boats are more fuel-efficient than planes, trains or trucks, he said. Fuel costs aren't that much of an issue for outsourcers, at least not in light of the challenges of moving a manufacturing operation back to the United States from abroad, he said.

“In most cases, there's no ‘back’ to come home to. The equipment is gone, the building sold. The basic infrastructure needed has dwindled or is gone,” said Tompkins.

Desa was lucky it still had its machinery in place for production, he said, because many outsourcers don't.

“And then once you bring it back here, where are the suppliers? They're gone too. And who are you going to have work there? The people needed to fill those jobs have moved on to other things.” The capital to rebuild operations and retrain workers isn't there, he said.

Tompkins predicts the Chinese will continue making rapid moves to keep U.S. businesses manufacturing there and will create new enticements.

“They have a one-party system. They may take awhile to see what needs to be done, but when they do, they just do it,” said Tompkins. “They have an ability to move very quickly.”

Offshore outsourcing is by no means an out-of-date notion, but it is a rapidly evolving one, said Mark Sarros, Chicago-based executive in charge of manufacturing and distribution segments at consulting firm Crowe Horwath. (Sarros helped design the “Future of Manufacturing” survey for *IndustryWeek*). He believes what we're seeing is a move toward “regional globalization.” Smart companies are beginning to figure out that it makes sense to manufacture as close to the selling point as possible — as long as the country has the educated workforce, security and infrastructure to support manu-

facturing.

We have only “temporary relief” from high gas prices, he said. They'll rise if supply is cut, which seems likely, and the outsourcing landscape will change again. Companies need to assess their manufacturing locations more frequently than ever. (Sarros believes fuel prices will fluctuate for a while and then level off at about \$2.75 to \$3 a gallon.)

Sarros said the survey found that smaller companies (\$25 million or less) feel more of a sense of control over corporate culture than larger ones and feel better able to drive a cost-efficient mindset among workers — and thus stay put.

“These are the people who are going to be investing in U.S. plants three to five years out,” said Sarros. “For the big ones, it sometimes seems easier to move and start over. It makes shareholders think they're taking action whether it makes sense or not. It could be a good idea, but that's not always the case. You have to assess the situation frequently.”

As for China? While the outlook for the country's once-booming economy has rapidly dimmed, China remains relatively well-placed to deal with any kind of slowdown. The boom years have been good ones for China. It has plenty of muscle — including a budget surplus — to shore up the economy while the global economy evolves.

For U.S. manufacturers, it seems, the heavy lifting has just begun.



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1-3/4" 6-spindle, 1965, 1993 (10)  
1-3/4" 8-spindle, 1970  
2-1/4" 6-spindle, 1962, 1973-79 (3)  
6-5/8" 6-spindle, 1979

## ACME

7/16" RA6, 1970  
1-1/4" RB8, 1981  
1-5/8" RBN8, thdg, 1979, thdg., pickoff  
1-5/8" RB8 thdg., pickup '68-72 (5)  
2" RB6, 1979  
2" RB8, 1973, like NEW 1978, '74  
3-1/2" RB6, heavy recess, '66  
2-5/8" RB8, 1990, 1979

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G200, 1997, Index  
G300, 1997, Index  
ABC 60mm Index '96  
MS25, 1990 Index (3)  
00-R/S 1/2" B&S  
#2 1-1/4" 1974 B&S  
#2 1-5/8" 1975 B&S

## SCHUTTE

SF51, 1979 (2)  
AF32, DNT, 1998 (2)  
SF26, 1979

## CNC SWISS

Star SR-20, 1998

## NEW BRITAIN

Model 51, 1" 6-spindle, 1966

## DAVENPORT

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3/4" 1981 (4)  
3/4" thdg., pickup, 1977-66 (8)  
Noise Tamers

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HW 25-12, 1994  
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John Griner, president of Griner Engineering. Photography by Mike Taylor

# Lloyd Graff

# John

## Interviews

# Griner

John Griner has built Griner Engineering of Bloomington, Indiana, into a prominent, high-production, automotive parts supplier. The core of his business is a Hydromat rotary transfer operation.

**LG: HOW MUCH OF YOUR BUSINESS IS AUTOMOTIVE, JOHN?**

JG: About 65 percent.

**LG: HAS IT BEEN THAT WAY FOR A WHILE, OR HAVE YOU GONE UP OR DOWN LATELY?**

JG: We might be down a little bit. We had no automotive for the first 10 years of the business but we have been as high as 90 percent. In the last few years we got into more heavy truck and heavy equipment.

**LG: WHY DID YOU WANT AUTOMOTIVE WORK IN THE FIRST PLACE?**

JG: The money was good. Back in the early 1980s there were some local opportunities with a Ford plant and we dipped our toe in the automotive arena — some really great volumes. Then I had the “opportunity” to meet the real buyer in Detroit for the first time. He was kind enough to tell me if I didn’t cut my price in half he was going to throw me out of the vendor base. At that point in time Ford was 70 percent of our sales. They’d gone from nothing to about 70 percent in about three years. That’s what prompted us to go get Hydromat machines like some of the other early adopters around the Midwest. In the case of our initial part, we went from 32-second cycle time, running single spindle equipment with 10 people and seven single spindle machines with one CPK to one Hydromat, two people and a 3-CPK. Begrudgingly, the customer got their 50 percent price reduction and life went on. I guess the money, the higher volumes and the interest in running fewer higher dollar value jobs, versus the complexity of running many low dollar jobs from multiple customers is what attracted us.

**LG: SO RUNNING AUTOMOTIVE WORK APPEALED TO YOU BECAUSE IT WAS SIMPLER?**

JG: Yes. Fewer parts and larger orders made the business easier to manage.

**LG: DOES IT MATTER TO YOU IF THE DETROIT THREE FILE FOR BANKRUPTCY?**

JG: Griner Engineering has had several of our customers file on us and it has actually not caused too much pain. In the case of Delphi, they paid their bills up within 30 days, and then we sold the paper to someone else for 74 cents on the dollar. So while it hurt, it wasn't the end of the world. We've had other customers where similar things happened. I think if they file for bankruptcy and there isn't a huge shortage in cash flow going out to the vendors it probably is a good thing, because they will be able to deal with the union, close plants and get rid of dealers. If they choose to not pay their bills, horde a bunch of cash, stretch everybody out 90 days and then cut them off — that would be a lot more of a problem for a supply base.

**LG: SOME PEOPLE THINK THIS IS A GOOD TIME TO BE LOOKING FOR AUTO WORK BECAUSE SO MANY PEOPLE ARE WALKING AWAY FROM IT.**

JG: It does seem like there will be opportunities for people who can be very quick on their feet. If a supplier goes out of business or has supply problems and someone else can respond immediately to that, they could get a premium price for doing the work. You almost wonder if part of the "buyer's game" is that if a supplier goes out of a business and they can't match the price, they get to plug in a new higher price into the system and then they start the game over again.

**LG: HAVE YOU FOUND THE TIER 1 AND AUTOMOTIVE PEOPLE TO BE REASONABLE?**

JG: Are my automotive customers reasonable? I like to say when people are drowning they're not always on their best behavior. We work with some clients that are very reasonable and we've worked with others that are just totally unreasonable. I wish I could be more specific but it just really seems to depend on the people that you're dealing with. Is the PPAP process reasonable? It does add cost. If I put a number on it, I'd say doing a PPAP costs \$2,500 to \$5,000. Some people in the industry charge some amounts of money for them, 500 bucks, 1,000 bucks or something.

My quality department will spend three days putting the package together, and then you have all the other requirements and things that you're tied down to doing or not doing, which adds cost.

**LG: I THOUGHT IT COULD TAKE MONTHS AND MONTHS TO PPAP.**

JG: We got a project last fall that was delayed getting through the PPAP process by four months. Sometimes it just drags on forever over silly stuff. But are we going to save the world by throwing PPAPs out? Much as I don't like bureaucracy and procedures, I think for higher volume work it really does bring value. I don't feel that it brings any value to prototype work. But it does force you to come up with a process that's capable. We found if it's not 2-CPK or better, you're going to fuss with the process a lot. So it does force you to have a stable process, have things documented and to think things through.

**LG: DO YOU BUY INTO THIS IDEA THAT IF THERE WAS A DISRUPTION WITH GM, CHRYSLER OR FORD THAT IT WOULD HARM THE ENTIRE INDUSTRY INCLUDING THE TRANSPLANTS?**

JG: To the extent that 35 percent or so of your business just goes away, yes. I think that a meltdown of the Detroit Three could affect the other companies. The net effect would be that you'd have less suppliers here and some of the work would go back offshore.

**LG: DO YOU BUY THE IDEA THAT IF YOU CAN DO AUTOMOTIVE WORK, YOU CAN DO JUST ABOUT ANY KIND OF METAL TURNING?**

JG: I think that doing automotive work does put a certain amount of discipline into your business practices. On the other hand, what automotive work does not train you to do is have flexibility or be creative. It's about repetition, using a stabilized process and doing the same thing over and over again.

**LG: IF YOU WERE STARTING YOUR BUSINESS TODAY WOULD YOU DO AUTO PARTS?**

JG: Would I do auto parts? If I was going to start a business again I would just find whoever has stuff they want to have made and figure out how to serve that niche — automotive, medical, you pick it. But I think initially you need to find a customer with money that's willing to buy stuff from you





**ABOVE:** Griner Engineering's 54,000 square foot, climate controlled building, contains 11 Hydromat rotary transfer bar/chucking machines, four CNC multi spindle screw machines, 12 conventional multi spindle screw machines/chuckers, eight CNC bar and 2nd operation machines and six centerless grinding and superfinishing machines. The company employs 50 people.

at a fair price, then you organize the business around that. I know a lot of people who come up with a grand vision and it takes 10 years of perseverance to make it happen. I'm more the type of person who will go out and ask what kind of opportunity exists, and then figure out how to get the right technology and people to make it happen.

#### LG: How do you feel about investing in automotive with the shakiness of the industry?

JG: Years ago, when I was young and stupid, we bet the company a number of times on new projects. There was an anti-lock brake project which we literally bet the company on to do. We bought about \$3 million worth of technology back in the late 1980s when at that point in time we were only doing a little over \$2 million in sales. It was supposed to be a 3-year contract. At the end of the day it worked out quite well for us. We actually had one year where we made a million dollars profit off one job. This was during the Lopez Era, and they were kind enough to tell us their contract wasn't worth the paper it was written on — that got me worried. Since then, especially when we had the metal surcharges the first time in 2004 and then in 2008, what I've discovered is that having a long term automotive contract is actually a

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**ABOVE:** John Griner, left, with plant manager, John Elmore, operating a Hydromat rotary transfer machine with robotic loading that machines cold formed, starter parts for the automotive industry.

liability. I think that as a supplier you're better off not having a contract because the auto contract is really just a one-way contract. You're obligated to provide this part for such and such a price and you really can't get out of it for the length of contract. The automotive customer can essentially fire you for any reason they want to and pay you darn near little, if nothing at all. So based on having a contract like that, [would] I want to invest millions of dollars to do new work for the auto companies? Our strategy nowadays is to invest in lower cost technology to fill the niche but not necessarily buy machines that are going last 20 years. We're looking more for 5-year solutions.

**LG: HAVE YOU LOOKED INTO MAKING PARTS FOR THE MILITARY? ISN'T NAVISTAR MAKING THOSE ANTI-MINE VEHICLES NOW?**

JG: A little bit. There's Crane Naval Weapons which is close by — they always have a lot of low volume stuff. There is also some high volume ordnance work. One of my engineers here used to work for an ordnance plant. But the real answer is that we've never explored that market very thoroughly. There seem to be ups and downs in military spending, depending on which way the winds blow.

**LG: WHAT IF GAS STAYS AT \$1.70 OR \$1.80 FOR THE NEXT YEAR, DO YOU FORESEE A SIGNIFICANT MOVE BACK TOWARDS LARGER VEHICLES LIKE PICKUP TRUCKS, SUVs?**

JG: Yes. Matter of fact, Ford truck sales are up. We have

firsthand experience that Ford truck sales are pretty hot right now — one of the best movers at the moment. I guess some people really do need to have trucks, maybe not necessarily SUVs though. Although, if gas prices stay low, that might be what I continue to drive, even though they're not popular anymore.

**LG: WHAT CAR DO YOU DRIVE TODAY?**

JG: I've got a Jeep Grand Cherokee Limited. I've had about eight of them. I used to choose them because you can take it down to the dealership, they give you another lease and you drive another one home. The buying process is very simple. You don't have to spend three days driving around negotiating for a car.

**LG: DO YOU THINK YOU'RE GOING TO STAY IN THE AUTOMOTIVE GAME, OR ARE YOU LOOKING TO DIVERSIFY MORE?**

JG: I'm definitely going to stay in the automotive game. We've talked a little bit about diversification though, which Griner Engineering has tried over the years. We've done things as diverse as trying to get into the waterjet cutting business. We are really, really good at running rotary transfer machines and high volume type parts. I attempted to start a couple other ventures, including software development. I also tried to develop a print-on-demand book machine which you put in bookstores. But it seems like I'm destined to be in the auto industry, so I'm just going to suck it up and make the best of it.



To see a slideshow with an audio excerpt of this interview, go to the videos link on [www.todaysmachiningworld.com](http://www.todaysmachiningworld.com)



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

BY NOAH GRAFF

next

## In three years will unemployment in the U.S. be closer to 5 or 10 percent?

*The U.S. lost 2.6 million jobs in 2008 and the unemployment rate soared to 7.2 percent from 4.9 percent the year before.*

I think three years from now we're much more likely to be closer to 10 percent than 5 percent, but likely below 10 percent. My thinking is based on the historical experience of the last three recessions, which are useful benchmarks. In all three of those cases the official recession was over long before the "labor-market recession" finished, with unemployment not falling for two years in the case of the last two recessions, and three years in the case of the early 1980s recession. It's a given that the present recession is likely to be at least as bad as the one of the early 1980s, and likely worse. The best bet is that the unemployment rate is going to remain quite high for some time, even if there's a pretty sizable stimulus package.

John Schmitt  
Senior Economist  
Center for Economic and Policy Research

In three years there is a very high risk that unemployment will remain closer to 10 percent than 5 percent. The shadow unemployment rate, which accounts for discouraged and marginalized workers has already exceeded 13 percent, so even if we do see a significant improvement by then, the economy is still likely to feel less than good to most workers. The fly in the ointment could be baby boomers who are now forced to deal with the reality that they have lost a significant amount of wealth and

### the facts:

1.9 million jobs were lost in last four months of 2008.

In December 2008, 524,000 people lost a job in the U.S. The biggest job decline occurred in the manufacturing sector, which lost 149,000. A total of 791,000 manufacturing jobs disappeared in 2008, an average loss of 66,000 per month.

#### Who is counted as unemployed?

People are only classified as unemployed if they do not have a job, have actively looked for work in the prior four weeks and are currently available for work.

A huge population of jobless Americans fall into a "no man's land" of the labor market, in which they do not hold all of those criteria, yet still want to work. They are classified as "marginally attached" to the labor force.

When marginally attached and involuntary part-time workers were included, the rate of unemployed or underemployed workers in the U.S. reached 13.5 percent in December, up almost six percentage points from a year earlier.

will have to work much longer than younger age cohorts. This is already true in "older" states, like Michigan, which has been at the front end of the curve of both demographics and weakening economic conditions.

**Diane Swonk**  
Author, Chief Economist  
Mesirow Financial

With the current trends of technology, unemployment will rise close to 10 percent by 2012. Advanced technology is eliminating low- to semi-skilled positions across the board. Most people do not possess the knowledge, ability or experience with these new systems to keep their positions, so many are now laid off. Companies that are not laying people off are "tightening" their operations, still employing only the individuals who can multi-task between several high-level production systems. Many effected workers will have opportunities through technical education centers to increase their skills, which will lead to increased opportunities higher up the career ladder. The issue is that individuals with good jobs usually become satisfied with their current situations and do not seek to upgrade their skills, or simply do not have the time to attend outside education courses. People must begin thinking about career pathways so they can continuously improve their knowledge before their skills become outdated.

**Tony Garritano**  
Advanced Skills Manager  
Manufacturing Works

In December 2008, the labor markets in Milwaukee, Boston and Washington D.C. had less than 5.5 percent unemployment. Employment in education and health care rose 45,000 and the government added 7,000 jobs.

In 1933, at the height of the Great Depression, unemployment in the U.S. rose to 24.9 percent. It remained near or above 15 percent through 1940.

*Source: U.S. Bureau of Labor Statistics*



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Dany Romach in the port city of Jaffa, Israel.

Photo courtesy of Dany Romach



## Israeli machinery dealer **Dany Romach**, originally from Argentina, has been buying and selling machine tools worldwide for 43 years. He has watched Israel's economy transform from primarily agriculture and military to high-tech.

### How did you get started as a machinery dealer?

DR: I was a teacher at a technical high school. One time we didn't have the budget to buy a machine, but I [heard] a rumor that machines were being sold from the military industry. So I went and saw them, and on a budget for one milling machine we bought six. From there the business began. I left teaching and I started rebuilding machines.

### How is business in Israel right now?

DR: I would say that it's strong. Don't forget that we have many factories in Israel — HP and Boeing, and many factories of household goods supplying to Wal-Mart and others in the U.S. The big advantage we have in Israel is that it's one of the only countries in the world, like Finland or Denmark, in which the banks are very strong. There is no fiddling around with mortgages, and we have a very strong person controlling the money — Stanley Fischer. So in finance, it's okay. It's not okay because there is a clamp down of the stock exchange, but people believe the economy is slightly stronger [here] than in other countries.

### What is the typical salary of a machinist in Israel?

DR: I would say today that if you're a good CNC person and know how to render and [solve] problems — and you are working one or two shifts — you could end up with a \$3,500 a month salary. For the simple people, who just keep the machine without programming, it's less. It's a good living in Israel. You can buy a house and pay a mortgage. It's about double the average salary in the market.

### Is it hard to find good CNC people in Israel?

DR: The problem is that the educational system decided about 10 years ago to shut down the technical schools that taught how

to turn, mill and measure. Everybody went running for the high-tech. Now they are reopening those technical schools because they are the basis not only for industry but also for maintenance in the army and aviation, which influence all of the market.

### Are there labor unions in Israel?

DR: There are. Not a lot in manufacturing, but in the ports, electric and water supply — in all the things which can strangle the country. There are no strong unions in the metal industry because there is no car manufacturing. There is no one production that keeps a big percentage of the population working — it's thousands of small factories.

### Do you think in five years there will be an official Palestinian state?

DR: No, because I truly believe that the Palestinians themselves have a problem. They are like a shot blasting machine. A shot blasting machine is a machine that is also called a "self-destructive machine." They have too much terror in the blood. They will have some kind of autonomy, but not a state.

### What would it take for them to get a state?

DR: This is very difficult question — I cannot answer this on the phone. But I will tell you one thing. [I think that] in all of the West Bank, with 2 million people, there is not even one good, modern CNC 4- or 5-axis machine. They do not know how to operate them. They don't have the skills. They have nothing. Even in Saudi Arabia and Egypt the people who handle the machines are Indians and Pakistanis. The Arabs do not have the ability and the skills to operate CNC machines.

Thanks, Dany.



The tooling area inside a Citizen L20 Swiss type turning center.

(Photo courtesy of Marubeni Citizen-Cincom Inc.)

# how it works

BY BARBARA DONOHUE

# Why Swiss?

*Have parts 1.25" diameter or less? You can make them complete on one of these sliding-headstock CNC machines.*

If it's been a while since you've taken a look at CNC Swiss type automatic lathes (screw machines), you might want to check them out. These days, they're more powerful than ever. They still have the fast cycle times and flexibility that have made them the standard in many precision, high-production applications. But now even more tools and more options are available, and sophisticated controls help streamline the machining process.

Always preferred for long, slender turned parts, Swiss machines are now widely used for small, complex parts — even pieces that have no turned surfaces at all. "If the part is 1.25" [diameter] or under, it can most likely be produced on one machine and dropped complete," said Brian Such, customer support group manager at Marubeni Citizen-Cincom, Inc., Elk Grove Village, Ill.



Citizen L720 Type VIII CNC Swiss type turning center.  
(Photo courtesy of Marubeni Citizen-Cincom Inc.)

why swiss?



# how it works

## How Swiss Works

In a conventional lathe that has a fixed headstock, the workpiece is held in a chuck or collet and extends into the machine enclosure as a cantilever or can be supported on the end by the tailstock. What distinguishes a Swiss machine from other types is that its headstock moves. Bar stock passes through a chucking collet in the headstock, which clamps onto it. The bar emerges into the tooling area through a guide bushing, which locates the bar radially during machining. The headstock moves precisely back and forth in the z-direction, taking the bar with it.

The turning tools, carried on gang slides (see machine photos), contact the bar very close to the guide bushing, usually within 1 mm to 3 mm. The motion of the bar provides the feed for this cutting action.

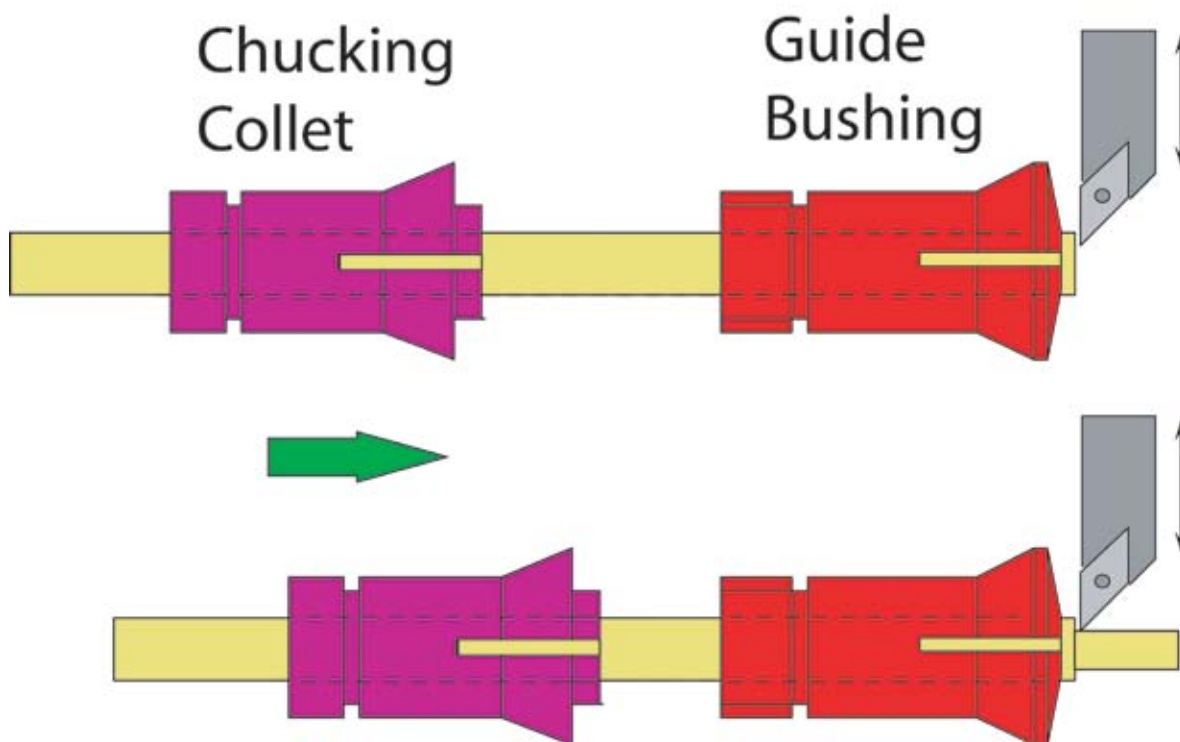
Gang slides carry holders for fixed single-point or other tools, and may support live tooling. Many machines have a secondary spindle, backworking tool stations, and sometimes one or more turrets that carry more tools, as well.

## Deflection Correction

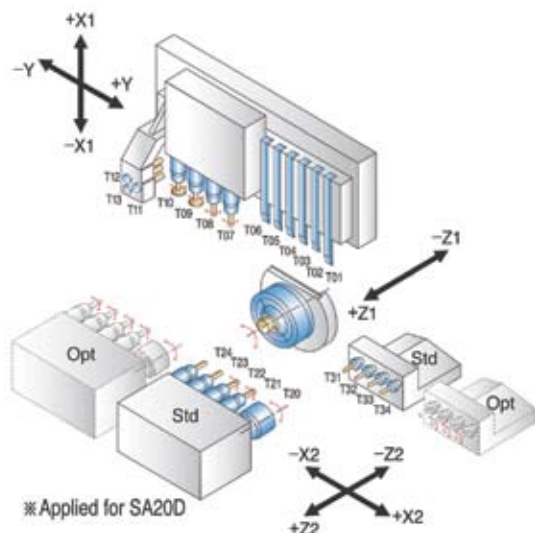
The purpose of supporting the workpiece with the guide bushing is to maintain precision throughout the machining of the workpiece.

A physical object subjected to a force will deflect. On a conventional lathe, if the cutting forces cause too great a deflection the accuracy of the cut will suffer. A widely accepted rule of thumb says that on a conventional lathe when you turn parts with a length-to-diameter ratio of greater than 3:1, you should use a tailstock to prevent excessive deflection. For a ratio greater than 6:1, you would use a steady rest or follow rest to support the middle of the part.

## Swiss - Sliding Headstock



**Above:** How a Swiss type machine works. The chucking collet grips the bar so it is pushed through the guide bushing as the headstock moves. (Based on an illustration provided by REM Sales LLC.)



**Above:** Machining area of a Nexturn SA-20 Swiss type CNC lathe. (Illustration courtesy of Tyler Machine Tool Company, Inc.)

If you hold a workpiece securely at one end and push sideways on the unsupported end, the workpiece bends a certain amount. Push with the same force on a longer workpiece and it will bend more. In fact, the deflection for a given force increases as the cube of distance from the support to the force is twice as long with eight times the deflection. So if you apply a certain side force to the end of a 2" part, and it deflects 0.001", the same force applied at the end of a 4" part of the same diameter will cause 0.008" deflection.

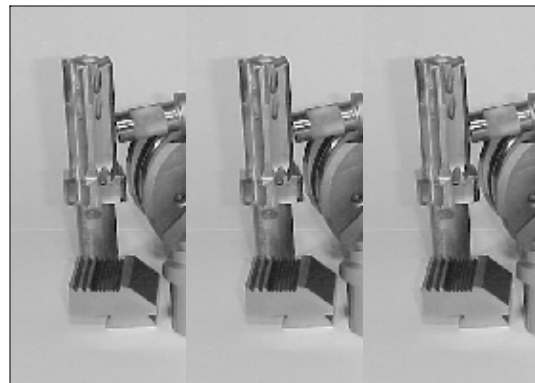
With a Swiss machine, the guide bushing supports the workpiece so close to the tools that the deflection due to the cutting forces is essentially zero. As a result, you can take heavy cuts and still maintain precise dimensions on the part.

### Better, Faster

The advantages of CNC Swiss machines come from both the guide bushing, and the geometry and mechanics in the tool zone.

- Depending on the machine, there may be room for 20 tools or more in the tool zone. Some higher-end machines have tool changers available.
- Since the machines are relatively compact and the tools do not have to move very far, the chip-to-chip time from one tool to the next can be one second or less.
- Often a single heavy cut removes all the necessary material.

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**Below:** Machining area of a Nexturn SA-20 Swiss type CNC lathe.  
(Photo courtesy of Tyler Machine Tool Company, Inc.)

Nexturn SA-32 Swiss type CNC lathe.  
(Photo courtesy of Tyler Machine Tool Company, Inc.)

# how it works



- Surface finish can be excellent and often eliminates the need for grinding.
- A machine with a sub-spindle allows working on the back side of the part.
- A Swiss machine can make complex parts using simultaneous operations, and may be able to have as many as three or four tools cutting at the same time.
- In most cases secondary operations are eliminated, since a Swiss machine can mill, drill, ream, saw and do other operations within the machine. The part comes off the machine ready to ship.
- Setup times may be relatively short. If you are machining a family of parts it could take 10 minutes to change from one to another. Other changeovers might take an hour or two. Since your Swiss machine may have 20 or more tools mounted, you can plan your tooling so that all the tools you need for several jobs stay right in the machine.
- Once the machine is set up and the bar stock placed in the bar loader, your Swiss machine can run for hours unattended.

## A Little History

Swiss CNC automatics may be the very latest thing, but their mechanical predecessors have been around for more than



a hundred years. In the 1800s, as increased industrialization took place, the need grew tremendously for interchangeable parts made with some degree of precision, and inventors developed technologies to help meet that need. The collet chuck was patented in the 1870s. This allowed use of bar stock and, not long after, the first moving headstock machine was developed in Switzerland. These machines became known as Swiss-type screw machines and were used mainly in the watchmaking industry.

In the 1960s Swiss machines came into more widespread use, and in the 1970s CNC versions became available. Over time tooling-area options came to include turrets and gang slides, live tooling and secondary spindles. By the 1980s



Swiss machines were used extensively in making parts for the semiconductor and electronics industries. Improvements in design, servomotors and controls during the 1990s made for stronger, faster, more sophisticated machines to make parts for medical and aerospace applications, in addition to general machining work.

Like everything else, CNC Swiss type machines vary in cost, depending on the manufacturer, model and selected options. Here are some examples of prices from a number of different manufacturers.

- Expect to pay around \$170,000 for a mid-range 20 mm (about 3/4") unit.
- A simpler 16 mm (about 5/8") unit will be about \$70,000.
- On the higher end, a unit with a package of options for a specific application, will run in the "under \$300,000" range.

You can't read your future, of course, so you'll have to make your best guess as to how you're going to use your new Swiss machine. Spend a little more, and you can get a machine that has more tooling options.

### Swiss Is Different

If you have been working exclusively with lathes and purchase a Swiss machine, you'll find you're processing parts differently in order to take advantage of the machine's capabilities. "On a Swiss type machine, you machine a part from one end to another," said Dan Murphy, regional sales manager at REM Sales LLC, Hoffman Estates, Ill., importer of Tugami products. "If you have a groove halfway down, you turn to the groove, make the groove, then turn the rest."

Because the work is supported right next to the tool, you can safely take heavy cuts on a Swiss machine, where on a lathe you'd take multiple cuts and try to keep cutting forces low enough to prevent too much deflection. On a Swiss machine, often you will do all cutting in a single pass without any backtracking.

Scrap can become an issue, especially for pricey materials. Because of the Swiss machine's geometry, for every piece



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# how it works

of bar you'll have a remnant of 6" to 12". If you are running extremely expensive material, you could buy 10-foot bar stock and join a section of less expensive material at the end of each bar.

On a Swiss machine, the dimensional quality of your parts will, to some extent, depend on the straightness and roundness of the bar you use. "Swiss is as good as your bar stock. If the bar is bent, you get bent. If the bar out of round, you get out of round," said Daniel Dean, national sales manager at REM Sales.

"[The part will be] about 50 percent better than the quality of the bar itself," said Such. "For example, if the bar stock is 0.001" TIR roundness, a Swiss machine can cut that part to about 0.0005" TIR."

Do you need to use straightened, centerless-ground bar stock? Some manufacturers say yes, you always should. Others recommend it, but don't require it. Brian Such suggested using ground stock only when needed to meet the tolerances on the print. In his experience, he said, "many Swiss users say they generally run 60 percent non-ground bar and about 40 percent ground bar stock."

## Adding Swiss to the Mix

If you're running small, complex parts on your CNC lathes, you might be better served by running them on a Swiss machine, freeing up the lathes for larger, more appropriate parts. "When we walk around somebody's shop," said Such, "we [might look at] 10 machines. Usually on seven of them are parts that could be made on Swiss machines. Often you could run all those parts on two Swiss."

Many new Swiss users already run multi-function fixed-head lathes that mill and drill in addition to turning, so they have an idea about how to use a machine with multiple capabilities, said Mike Tyler, president of Tyler Machine Tool Company, Inc., Seabrook N.H., the North American importer of Nexturn Swiss CNC machines. Also, the controls on the Swiss machines are familiar to most users, he said, and off-line programming software helps users generate programs tailored to Swiss operation.

New users are "amazed at the productivity of the Swiss machines and the consistency of the parts," said Tyler, as well as the high-quality surface finish.

Depending on the sizes of parts you're making and the mix of your jobs, acquiring a Swiss machine or two could reduce cycle times and eliminate secondaries for parts on the smaller end of your range, and at the same time free up your other equipment to produce larger parts.



## Complex Parts



**Above:** Complex parts made on Swiss machines. At far left, a part used in a dental instrument has several holes on each end, some reamed, some tapped, all off-center. When made on conventional machine tools, this piece required operations on nine different machines. It is produced complete on the Swiss.

(Photo courtesy of Marubeni Citizen-Cincom, Inc.)

## For more information:

Maier: [www.maierusa.us](http://www.maierusa.us)

Nexturn: [www.nexturnswiss.com](http://www.nexturnswiss.com)

Star: [www.starcnc.com](http://www.starcnc.com)

Tornos: [www.tornos.us](http://www.tornos.us)


Tsugami: [www.remsales.com](http://www.remsales.com)

Precision Machined Products Association: [www.pmpa.org](http://www.pmpa.org)

## Video:

Videos show how Swiss works. One good demonstration: [www.starcnc.com/products/ECAS-2oT.html](http://www.starcnc.com/products/ECAS-2oT.html)

Also, on YouTube, search on "screw machine" + Swiss + the name of the manufacturer.



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# shop doc

WITH NOAH GRAFF

Dear Shop Doc,

Recently a customer contacted us stating he had received several thousand pieces, all of which had rust. I'm using a water-soluble coolant for small-machined parts. The parts are machined, dropped into baskets, processed through a corncob dryer and packed for shipping. We haven't changed the process and products for years, so why are the parts rusting now?

**Dear Never this rusty,**

The first thing you need to do is ask yourself the following questions about your operation:

Can you verify the concentration of your coolant? If the concentration dropped below the recommended level, rust could occur.

Do you use treated or softened water or is it from the municipality? Excess salt from softened water systems can create rust or high levels of chlorine from city water that may require increased coolant concentration levels.

Has your source for metal changed recently? Perhaps the metal had some surface rust present before processing.

Did the metal supplier change the mill oil he uses? Variances in mill oils can create rust.

What day were the parts manufactured? Perhaps they were manufactured on Friday and sat over the weekend, prior to being dried and cleaned?

Look at your employee records and verify that the operators who typically process these parts were present on the day the rusted parts were produced. If a fill-in or temporary employee handled them that day he or she may not have followed the standard procedure.

Did you change suppliers for your cardboard boxes? Cardboard can be acidic due to the way it is manufactured. If a change in suppliers was recently made perhaps the acidity level was increased.

Has anything changed within the plant, such as positioning of fans, vents or placement of parts?

**Never this rusty**

Are the parts near an area with high forklift traffic? Forklifts use propane gas as fuel and the exhaust is highly corrosive.

Did you calibrate your refractometer? To calibrate, place the water you use on the device and look through the eyepiece. The line should indicate zero. If not, adjust accordingly.

If these questions don't reveal your problem, you can send some processed parts, a sample from the sump and a sample of the water that is used for dilution to a lab. They can evaluate the coolant for microbiological activity, tramp oils, foam, rust protection and concentration. If bacteria are present it can deteriorate the rust inhibition package.

In your specific case it's possible that when the operator used the corncob method for drying parts he only processed them for half the standard time. After processing, the operator packaged the parts and sealed them, creating a humidity cabinet. You may be able to decipher this by looking at water stains inside the packed rusty parts. If that's the case, you should consider posting the processing time above the machines so that every operator knows how long the parts are to be cleaned.

**Mike Pelham**  
International Chemical Company

*Mike Pelham is a chemist at International Chemical Company, a manufacturer of machining and grinding coolants, rust preventatives and cleaners. He can be reached at [mpelham@e-icc.com](mailto:mpelham@e-icc.com) or 888-CALL-ICC.*

*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 can also check out the TMW online forum at [www.shopdocforum.com](http://www.shopdocforum.com).*

**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 the problem and solution in the next issue of the magazine.**

THE FOLLOWING ARE COMPANIES WHO HAVE  
GIVEN INFORMATION ON SWISS CNC

# product focus

**E**ach month, *Today's Machining World* features a product category which focuses on equipment that is key to remaining competitive in our marketplace.

A CNC Swiss Lathe has a sliding headstock and fixed bushing that enhances the machining of small, complex, cylindrical parts in one cycle. Their relevance in the turned parts market continues to evolve as better software, increased spindle speeds and sophisticated bar loaders enable more applications. Here is the latest in CNC Swiss Technology.

## Maier

Maier introduces the new CNC Swiss Type Lathe ML20F4 ProLine. The heavy machine base of approx. 2 tons is produced from Polymer Concrete that is cast at only 50 degree centigrade and is fully hardened within 24 hours, requiring no age hardening process. Other standard features include 16 axes, a spindle bore Ø24mm, maximum bar capacity Ø20mm, main and sub spindle with 5.5/3.7 KW power, main

and sub spindle with full 'C' axis, mechanically lockable at five degree increments and three-time tool turrets with full 'C' axis — lockable with 2.5 kw power at any angle.

For more information, please contact Maier USA LLC  
at 508-671-0055 or visit [www.maierusa.us](http://www.maierusa.us)





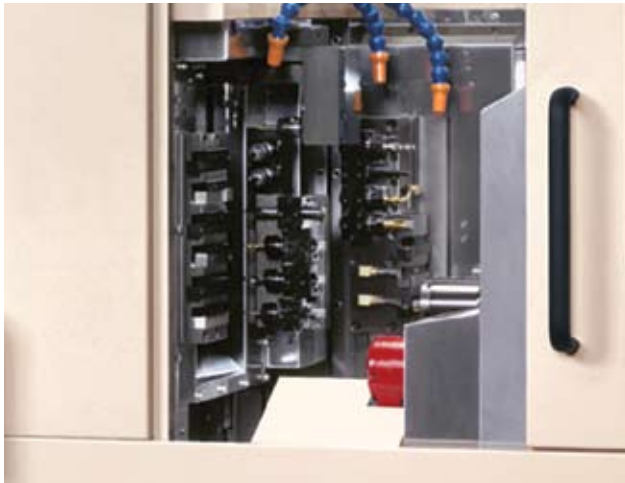


## Marubeni Citizen-Cincom

The CINCOM L20 is more advanced than previous L-series lathes and reduces non-cutting idle time by 40 percent. The L20 features the All Axis Simultaneous Cincom System M7 Control (Mitsubishi Meldas 700LC), which offers quick and smooth parts manufacturing. Its standard seven cutting axes (X1, Y1, Z1, X2, Z2, C1, C2), three miscellaneous axes (A1, A2, A3) and one bar loader axis (A7), can make easy work of your toughest applications. In an ID/OD tooling operation or thread cutting operation, moving another axis can start without waiting before the movement of the other axis is complete. This process reduces time and increases efficiency by 40 percent to 50 percent. Spindle indexing is achieved instantaneously from a high-speed rotation and stops directly at the desired degreed position.

For more information, please contact Marubeni Citizen-Cincom Inc. at 201-818-0100 or visit [www.marucit.com](http://www.marucit.com).

# product focus



## Miyano Machinery USA

Miyano's BX-26S dual spindle gang tool lathe offers part machining of complex barwork (1" diameter and under) in a single setup. Two 3D gang slides for front and back work improve the precision and cycle times of the BX-26S. The BX-26S has a compact footprint of only 87" x 52". High speed turning of up to 8,000 rpm is possible by built in spindle motors and high-rigidity linear guides. Standard features include identical 5 hp left and right spindles, capacity for eight 4,000 rpm revolving tools, L-Spindle brake, cut-off confirmation (by spindle torque), parts catcher and conveyor, high-pressure coolant (160 psi), right spindle inner coolant and all axis rapid traverse (944 ipm).

For more information, please contact Miyano Machinery USA at 630-766-4141 or visit [www.miyano-usa.com](http://www.miyano-usa.com).





## Star CNC

Star's newest machine, the ECAS-20T, is the first 12-axis Swiss style machine with an independent three turret-design that allows three tools to be used at any time, working simultaneously in the cut. It has independent front/back machining capability with a variety of tools that enable them to be completed in a single operation. The ECAS-20T is ideal for traditionally difficult and complex parts to manufacture.

For more information, please contact Star CNC at 516-484-0500 or visit [www.starcnc.com](http://www.starcnc.com).



## TMT Swiss/Nexturn

TMT Swiss/Nexturn offers a line of sliding headstock machines with bar diameters ranging from 12 mm to 45 mm. Capabilities from 3 mm to 11 mm axis allow the machine to fit the part from the most simple application to the most complex. There are a variety of capabilities from our SA Series that includes C-axis on both main and sub-spindle and live tool capability on for cross working, front working and back working. The X-Series machine is the latest addition to the Nexturn Line and employs a sliding headstock without a guide bushing. High horsepower spindles, hydraulic clamping and a variety of tool configurations make the X-Series perfect for tough to cut materials. The gang slide-tooling layout assures the shortest cycle time possible.

For more information, please contact TMT Swiss at 603-474-7730 or visit [www.tmtswiss.com](http://www.tmtswiss.com).

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# product focus

## Tsugami/Rem

Rem Sales announces the release of the TMU1R, an updated version of the popular TMU1 platform. Designed for unattended manufacturing the TMU1R features improved operability, a standard tool probe and optional features like laser tool setting and tool monitoring. The TMU1R is designed to produce complex parts complete from bar stock, and combines the productivity of a Swiss-turn lathe with a 5 axis machining.

A 16 station front turret and 7.5 hp tool spindle serves 38 mm main and the sub-spindles. Other standard features include Tsugami's exclusive "spindle within a spindle" collet

and guide bushing arrangement, full rotary "C" axis on both main and sub sides, 210 degrees of tool spindle rotation at .001 degree increments and 90 degree positioning on the tool spindle for the use of multi-station tooling.

For more information, please contact Tsugami/Rem Sales LLC. at 860-687-3450 or visit [www.remsales.com](http://www.remsales.com).

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# think tank

## Game Show

Imagine that you have been selected for a game show that offers the chance to win an expensive new car. The car sits behind one of three doors; monkeys are behind the other two.

You choose a door, and the host opens one of the remaining two, revealing a monkey. The host then offers you a choice: Stick with your initial choice or switch to the other, still-unopened door. Do you stick with your door, or take the host up on the offer?



1

2

3

## Airplane Shadow Answer



It depends. Because the sun is so large, the shadow will be smaller, but the difference in size is almost imperceptible.

But if the sun is at an angle to the shadow surface, such as an hour or less before sunset, the shadow can be much larger.

Puzzle found in the December 2008 issue

## Who's flying high?

**Kevin Albright** of Gear Headquarters in Kansas City, KS; **John Bacsik** of Airparts Mfg. Corp. in Arlington, TX; **Greg Tetrick** of Cass Screw Machine Products in Minneapolis, MN; **John Lee** of Keystone Dental, Inc. in Burlington, MA; **Nate Burton** of Komatsu Forest LLC in Shawano, WI; **Bob Cookson** of Cookden Industries in North Andover, MA; **Doug Bourque** of Electric Boat Corp. in Groton, CT.



# postings



Noteable and newsworthy information and events for upcoming months.

Design & Manufacturing  
**South**

**MARCH**  
11<sup>th</sup> thru 12<sup>th</sup>

Charlotte, NC

[www.devicelink.com/expo/dmsouth09](http://www.devicelink.com/expo/dmsouth09)

**AM EXPO/**  
**ATX South:**  
**Automation**  
**Technology Expo**

Charlotte,  
NC

March 11<sup>th</sup> to the 12<sup>th</sup>

[www.devicelink.com/expo/atxsamx09](http://www.devicelink.com/expo/atxsamx09)

[www.asq.org/conferences/six-sigma](http://www.asq.org/conferences/six-sigma)

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March  
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[www.wired.com](http://www.wired.com)

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March 27, 1998

[www.howstuffworks.com](http://www.howstuffworks.com)

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**Tradeshow**

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- 33 **MAIER** Maier Power! Call 509-671-0055 or visit [www.maierusa.com](http://www.maierusa.com) for more information on Maier's machines.
- 68 **MARUBENI CITIZEN-CINCOM, INC.** A joint venture company — Marubeni Tokyo & Citizen Watch Co., Ltd., builder of precision Swiss-type lathes.
- 3 **NEXTURN - TYLER MACHINE COMPANY** The CNC Swiss machine leader. Call 603-474-7692 or visit [www.tylermachine.com](http://www.tylermachine.com).
- 35 **NSK AMERICA** Upgrade you machines to flexible, multi-purpose machining centers. Call 800-585-4676 or visit [www.nskamerica.com](http://www.nskamerica.com).
- 37 **PMTS** Precision Machining Technology Show, April 28-30, 2009. Visit [www.pmts.com](http://www.pmts.com).
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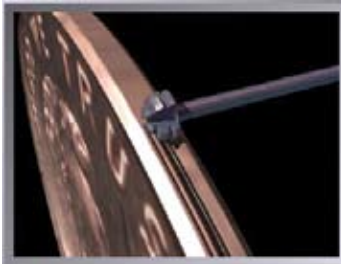
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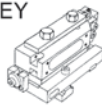
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# afterthought

## A Letter to Sarah

My daughter Sarah approached me on a recent trip to visit her and her family in the Bay area. “I don’t want to be morbid Dad, but ...” she said. I finished the rest of the sentence. “You want me to write my ethical will,” I said.

“Yes,” she said. “You have a lot of wisdom and anecdotes that illustrate your view of the world. I’d like you to get it down on paper.”

I nodded and told her I would work on it, which is like saying, “I’ll try,” meaning you’ll never get it done. But on the flight home to Chicago I actually started writing it.

“I have learned that most people accept critiques or bad news if you are straight with them.”

How do you distill what you’ve learned in a lifetime? I decided to drop the “ethical will” concept and make it a “Dear Sarah letter.” It’s a lot easier to write a letter than a will. I thought about a dozen things I think I have learned, but the one I led off with was “say what you mean, and say it clearly.”

People are not mind readers. As much as you’d like them to understand your needs, quite frequently they misinterpret your signs. This may stem from your own wish to delude yourself or look away from how you really feel.

I remember a personal incident from 20 years ago. My wife, Risa, wanted me to go to a local community function where the primary activity was line dancing. I did not want to go but I did not want to upset her so I went along. I had a visceral negative response as soon as I walked onto the dance floor. I learn physical moves very slowly. When I was playing basketball in high school it took me years to learn the basic “pick and roll” play, one of the simplest moves on the floor. My spatial reasoning is retarded. It’s just the way I am, and I hated to be “exhibit one” of dance ineptitude in front of scores of friends and acquaintances. But I did not tell her this before we went. I sulked to myself and then after embarrassing myself to the throng I walked away, alone, and hid out for the night — offering Risa only the lamest of excuses as she line danced and do-si-doed away.

We had an angry and tearful confrontation afterwards as I explained to her my embarrassment and feelings of inadequacy in front of so many friends. She said, “why didn’t you tell me before we went?”

The answer was that I wanted her to be a mind reader. I did not want to admit my feelings of fear of being shown up, of looking dumb. So I said nothing and wallowed in my sense of inadequacy.

It was one of those miserable, memorable nights of true education. If I had not been such a schmuck and told my wife before we went that this was going to be worse than eating worms, I could have averted my social unraveling.

I have struggled to learn the “people are not mind readers” lesson during a career in business. When I avoided telling my employees or clients what I expected of them I invariably ended up with bad results. Same with kids — in spades.

I have learned that most people accept critiques or bad news if you are straight with them. It’s when you fudge or dance around that they do not do well. Be clear, be real and people will respond. When I try to tell people what I think they want to hear I invariably mess things up. The corollary to this lesson is to think things through before you open your mouth. If you are muddled and confused your message will be fuzzier than an old teddy bear.

This lesson is the first installment of my letter to Sarah. I often ask my writers, “what do you really want to say?” after reading a poorly fashioned article. It is the question I ask myself — still, not often enough.

Lloyd Graff



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