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Today's Machining World

THE MAGAZINE FOR THE PRECISION PARTS INDUSTRY

may 2008 volume 4 issue 05

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Musical Machining in the U.S.

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volume 4 issue 05

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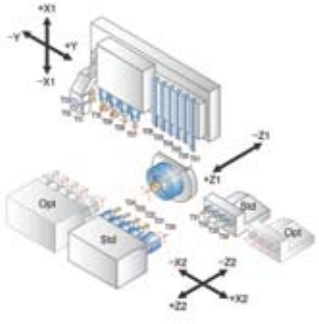
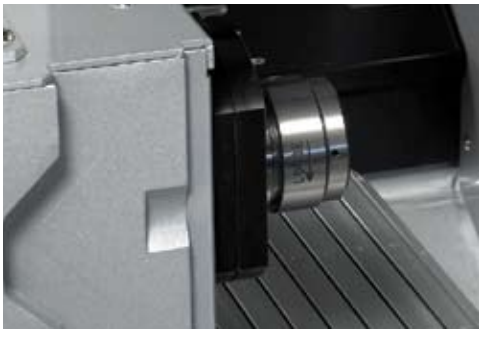


SA20D Tool Layout

Back End Tool Station



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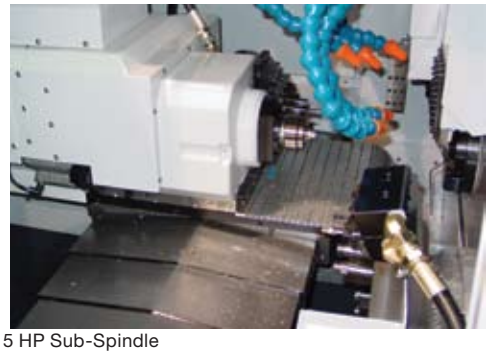
5 HP Sub-Spindle


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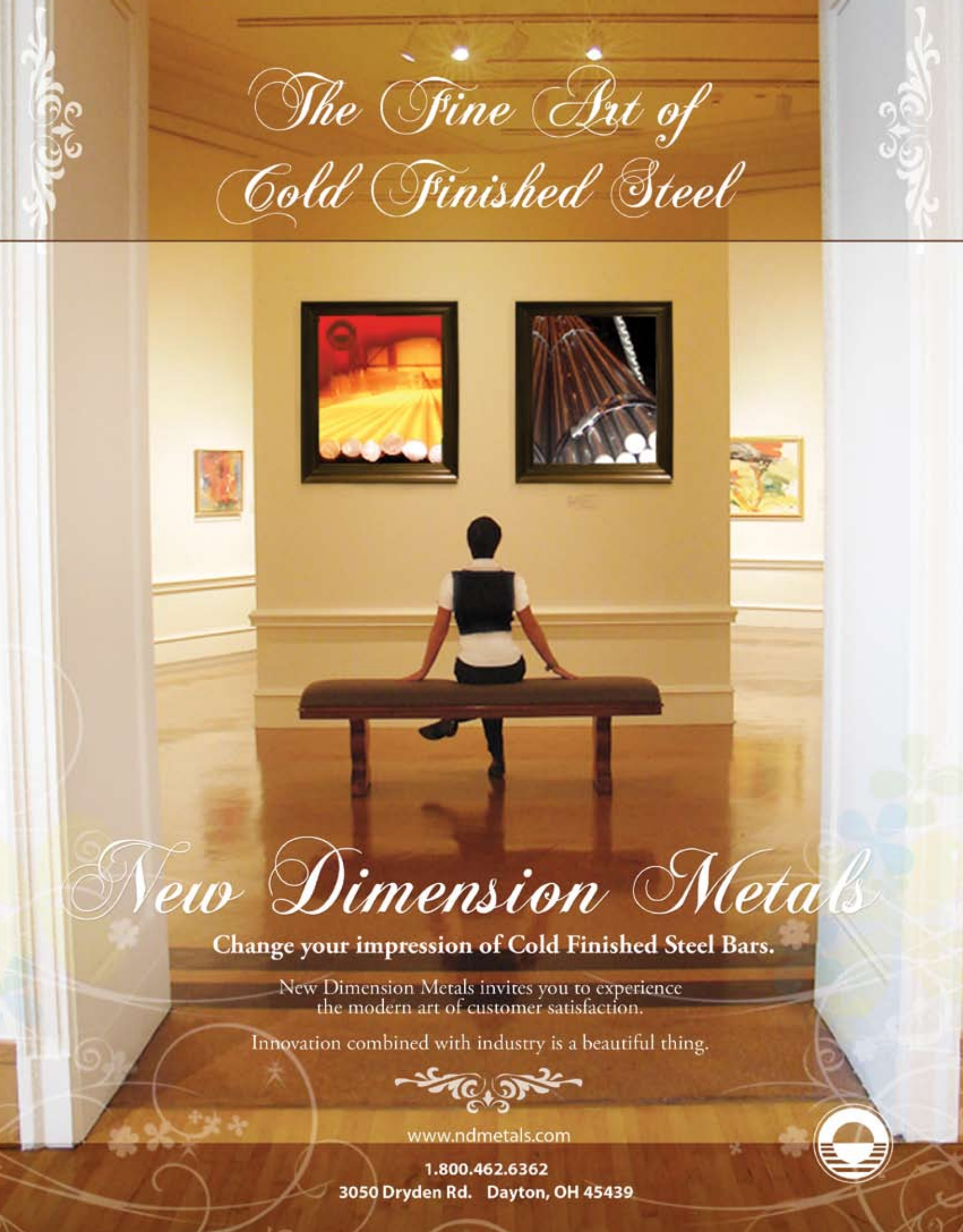
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A Screw Machine World Inc. Publication
4235 W. 166th Street
Oak Forest, IL 60452
(708) 535-2200

One out of Two
Lloyd Graff
(708) 535-2237

Managing Editor
Jill Sevelow
jill@todaysmachiningworld.com

Features Editor
Noah Graff
noah@todaysmachiningworld.com

Web Manager
Noah Graff
noah@todaysmachiningworld.com

Creative Director
Terry Ntovas
terry@todaysmachiningworld.com

Circulation Director
Sue Ravenscraft - RS Media Services
smravenscraft@comcast.net

National Sales Manager
Bill Papp - 845-613-7329
bill@todaysmachiningworld.com

Sales Manager serving IL, IN, MN, MO & WI
Dianne Lach - 708-460-6383
smlddl@comcast.net

Sales Manager serving KY, MI, OH, W. PA & WV
Charlie Payne - 717-666-3200
adsalespro@comcast.net

Sales Manager serving CA
Craig Zehntner - 626-683-3996
wnja@aol.com

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BPA WORLDWIDE

editor's note

Opposite Ends

At WESTEC I ran across a salesman for a major machine tool builder who confronted me on the approach of *Today's Machining World*. "Tom" told me emphatically that his customers "never read" and are a "bunch of 8th grade dropouts." He was perplexed by my enthusiasm for publishing a stimulating, challenging publication for customers he considered to be Neanderthals. He proclaimed himself to be "an engineer who reads," though he had never heard of *TMW*.

A few yards away two youngish members of a successful machine tool software firm discussed the incredibly cool projects they were working on in the realm of mass customization of products like orthotics and motorcycle helmets. They lauded *TMW* for never talking down to their clients – the bright people in the machining community – and always treating the reading audience as "adults."

Opposite ends of the spectrum a few yards away on the WESTEC floor. I'll always bet on the guys who view their customers as worthy of their respect and best efforts.

Lloyd Graff
Editor/Owner

Today's Machining World

MAY'S TALENT POOL.

contributors

Noah Graff has been working at *Today's Machining World* since 2005. He graduated from the University of Wisconsin Madison, majoring in film and history. He is the features editor for *Today's Machining World*, as well as the videographer for *TMW* and Graff-Pinkert & Co., producing training videos on screw machine maintenance and video stories for the *TMW* website. Noah enjoys investing, filmmaking and improvisational comedy. He is also a master of the sacred art of live band karaoke.

Robert Strauss was formerly a reporter for *Sports Illustrated* and *the Philadelphia Daily News*, and a news producer at KYW-TV in Philadelphia. Now a freelance writer based in Haddonfield, N.J., where he revels in his two daughters' basketball prowess and their eye-rolling at his bad puns, his work appears most often in the *New York Times,* the *Washington Post,* the *Los Angeles Times Today's Machining World.*

Barbara Donohue received her mechanical engineering degree from MIT. She worked in design, heat transfer and manufacturing for several years before changing careers to become a journalist. Now she writes about technology and business from her home office in Acton, Massachusetts. When not writing, she sings in a choir, volunteers as a literacy tutor, and is weekend "foster mom" to a yellow Lab puppy named Tikva that is training to become a wheelchair assistance dog.

Lloyd Graff has had a love of writing since getting his first letter to the editor published by the *Chicago Daily News* at age 12. In high school he wrote short pieces for Reader's Digest. In college he became Sports Editor of *The Michigan Daily*, and weighed a career in Journalism before joining the family used machine tool business in 1969. His passion for writing never died as he wrote a "magalog" called the *Graff-Pinkert Times* in the 1990s. In 1999 he decided to build on his knowledge of the machining world and his writing experience by starting *Screw Machine World,* which became *Today's Machining World* in 2005.

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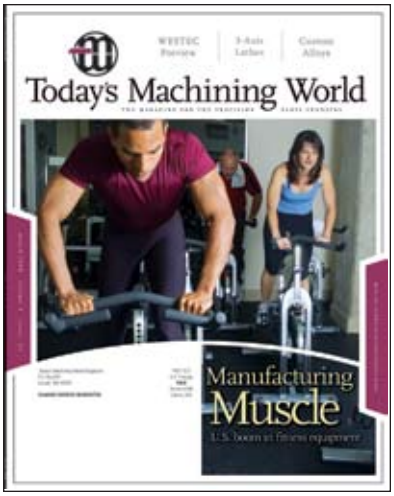

April on Review

I went to Eugene's breakout session (PMPA Management Update Conference; see Lloyd's Afterthought, April 2008). The guy was really genuine. I thought it was kind of ironic that you just did an article on exercise machines. He was really funny. I went to the Thursday workout session and was too whopped to attend on Friday. I haven't had that kind of soreness since football in high school. I really liked him, but he wasn't the best of all of the speakers.

Regarding this latest edition of *TMW*, I share your thoughts about Olaf at Index. We have many MS32's. Their equipment has taken our company into a better, more competitive place. Olaf is a good friend and I have communicated with him since his departure at Index. He will be staying in the U.S., but would not elaborate on where or what he would be doing.

I'm glad to hear that *TMW* is getting more advertising revenue. I got it today and have already finished it, retiring it to my library. It would be a shame to see it disappear. I enjoy your "Swarf" section the best. I don't always agree with your opinions or conclusions, but find them thought-provoking. Keep up the good work.

Regarding the Update Conference, PMPA has to work hard to provide good programming for the members. It's expensive to send employees to the conferences, but I think necessary to keep our companies on the cutting edge. We have a good program set for the annual meeting in October. Hawaii is very expensive too. I think I remember your opinion on Hawaii meetings.

What do you think of the Indians this year? Can they overtake the Sox? I'm a little scared of Sabathia and Carmona's arms. They threw a lot of innings last year. I hope I'm wrong on this, but I think Sabathia will regret not taking the 4 years and $80 million. He's a free agent after this year. Kind of ironic that you talked about over-priced pitchers.

Scott Eighmy
American Turned Products
Fairview, PA

Blogging Response

My comment on "Should a president know how to change a tire?" (see todaysmachiningworld.com Swarf Online) Yes, it shows a minimum level of ability to read an owner's manual and follow directions. I think that any of the candidates could do it. They may not want to get their hands dirty but if they were stuck with a flat tire on a deserted road alone and the cell phone didn't work, they would do it.

[In reference to the website's eBay video] eBay changes may be driven by the consumer; I get a lot of people who email me to ask what the reserve price is. Depending on my mood I either tell them, or tell them it's an auction and bid what they want to pay and see what happens.

Have a great day and keep up the good work.

Peter Schroth
Auburn Ball Bearing / Fairport Products
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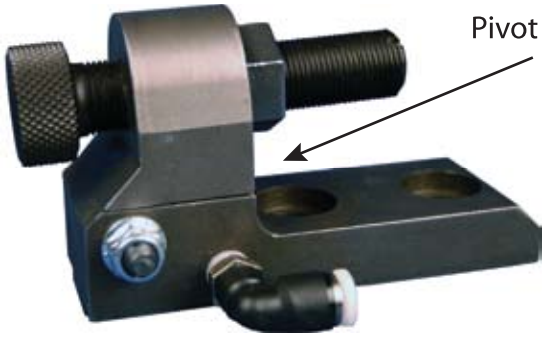

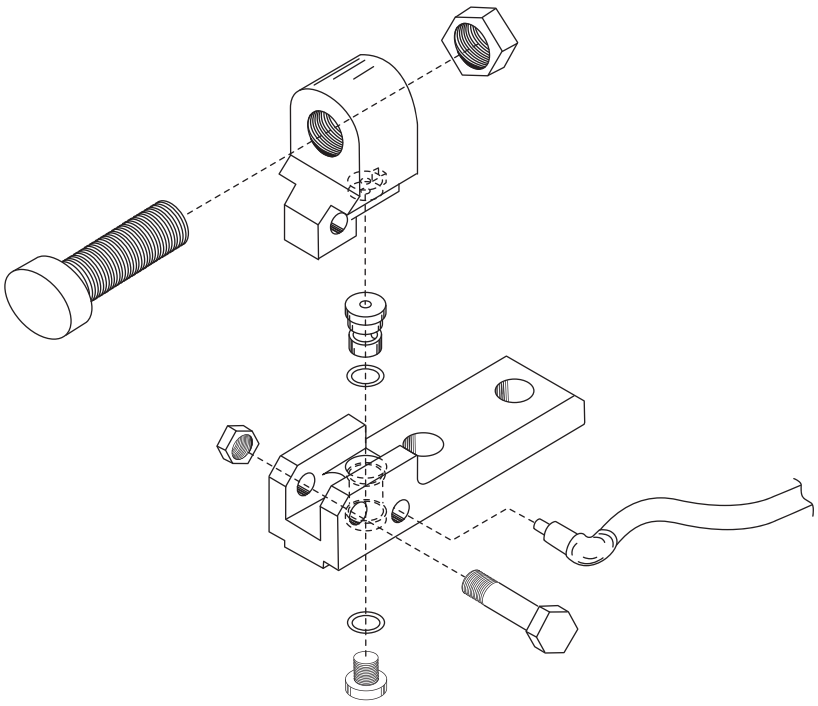

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By Lloyd Graff

Copper Mines

King Solomon's copper mine, mentioned prominently in the Bible, is going to be reopened in Israel. With copper near $4 a pound, old mines are being reexamined and revived. A Mexican mining concern is pumping $160 million into the Arava mine, 18 miles north of Eilat in southern Israel. The copper mine rebirth is part of the worldwide scramble for natural resources which will be fueling the machining industry for many years to come.

We finally will be getting the untapped natural gas of Prudhoe Bay in Alaska down to the lower 48 states through Alberta. The importance of bringing the gas through Alberta is to provide the fuel to extract the tar sands oil at an economic price to help satisfy America's thirst for gasoline. The pipeline is a $30 billion project over 10 years.

There is a lot of natural gas in North America. Wyoming, North Dakota and Pennsylvania are going to be big producers. There is also a lot offshore in California and Florida, but the "not in my backyard" mentality prevents its development today – but that may change with economic necessity. But the fittings makers and steel tubing producers stand to prosper in a big way from the boom in energy exploration and distribution.

The big run up in commodity prices has produced an anomaly. Driving is down in the U.S. Gasoline stockpiles are rising, yet the price of oil also continues to rise.

The price of a barrel of oil is now virtually an alternate currency as the speculators push the price of the commodity up and down with the price of the dollar. Same story with copper. There is no copper shortage. Brass mills have slack capacity and will give concessions to excellent customers to get a competitive advantage. Chase recently picked up some of the assets of Bolton Brass, which was the successor to Cerro in Bellefonte, Pa. This leaves Chase and Mueller as the last two brass bar stock manufacturers in the United States. This duopoly allows them to be sluggish in lowering brass prices when raw material prices fall, just like the gas stations push prices up in an instant, but are leisurely about dropping. Commodity escalation during a soft economy is the classic stagflation misery, unless you position yourself on the right side of the trade. Energy, mining and agriculture are the places to be for a long time to come.

(Swarf continued on next page)

We are at the tipping point of a major shift

in American manufacturing. In conversations with job shop owners and directors of global corporations, the 1.6 euro to the dollar and 100 yen to the dollar ratios are forcing tectonic shifts in the outlook of decision makers.

It appears that 15 to 20 percent is the price differential that dictates major shifts in where people send business. What is happening before our eyes, precisely at the time Barack Obama and Hillary Clinton are flopping to protectionism to win the no-nothing vote, is companies are bringing their manufacturing to the United States because it is the land of the low cost producer.

I attended the DMG Open House on April 16th (very impressive stuff) and heard Thorstein Schmidt, an influential Board Member, say that they very likely will soon begin manufacturing in the United States.

My automotive clients are all telling me that their Japonese and German clients are moving work here. The reason is clear. We have burst through the 15-20 percent cheaper barrier that dictates big moves in manufacturing product.

It makes sense. You go to China if you can deal with the aggravation, the travel, and the fear of a Heparin-type debacle, if the price difference between American costs and landed Chinese cost is 15 to 20 percent cheaper on the import. If it is less than that, who needs it?

It works that way for the Japanese and Europeans. If the price difference between the status quo and significant change is minor, they stick with what they know. But when it hits that discomfort level – the profit shattering level – firms are almost compelled to change.

Certainly, outsourcing decisions are more complicated than just a number. Many companies have moved to China because they must be close to their customers, but for so many export-oriented firms around the world, it is the U.S. market that looms large.

Currencies do shift, but structural changes here, like the now realism of organized labor and the drop in real estate prices, also dictate the gravitation to North America.

The biggest impediment to a massive shift in manufacturing to the U.S. is our poorly trained industrial workforce. I look for many new initiatives in worker development coming soon. We may even see the Lou Dobbsian anti-immigration blather begin to subside.

I spent three days in early April

at WESTEC, the important SME show in Los Angeles and enjoyed the vibe. The aerospace business is booming so California manufacturing has life. Everybody I talked to said it was the best WESTEC in many years, yet the rumors were rife that this show is in jeopardy as we know it.

The Los Angeles Convention Center is an attractive venue esthetically, but WESTEC is an expensive show for machine tool builders and tooling vendors to justify, especially during an IMTS year. SME, which puts on WESTEC and a dozen more happenings each year is now scheduling a show in Las Vegas in 2012. I am guessing that this may ultimately supplant WESTEC as the giant Western show of the year. Vegas is a significantly cheaper venue to display in, hotel rooms are cheaper, air fares are cheaper, exhibiting is

cheaper, and the unions are easier to deal with. A lot of folks from the rest of the country like the attraction of the town. Except for the folks in Los Angeles it is much easier to get to Vegas. Considering the terrible traffic in L.A., it may even be easier for some folks in that sprawling megalopolis to get to Las Vegas than to the L.A. Convention Center.

SME may also want to squash Joe Smith's upstart AMMO Expo Las Vegas show by staging their own event.

With many of the builders spending heavily on their own open houses with decentralized technical centers around North America, they may have fewer bucks available for an L.A. WESTEC.

Haas still seems to love WESTEC, but they could rent an alternate venue and put on their own big show if WESTEC disappears or moves to Las Vegas.

During a visit to the Bay area in

March I visited Norbert Kosar and Jeff Harrington at their shop in Milpitas near San Jose.

They brought Precision Swiss Products three years ago and have been doubling sales to a projected $7 million in 2008, they told me. They have purchased eight new Stars and just had a Mori-Seiki vertical machining center delivered.

Norbert hails from Austria, same town as the Governator Arnold Schwarzenegger, who is an acquaintance. His energy and dynamism fills a large space while his partner, Jeff Harrington, is so low key he could vanish behind a potted fern. But the two have giant aspirations for their company.

The men have worked for numerous start-ups and high-tech businesses over the last 20 years and always wanted a chance to build their own business. Norbert was hired to sell the small Swiss shop, but ultimately the former owner offered him such an attractive deal he couldn't refuse. He brought in colleague Jeff, and decided to go after the really tough jobs that other people passed on or failed at.

Norbert used his Rolodex, cold called, and schmoozed his way into the office of health care and aerospace firms, and won the chance to bid on some really tight work. When he showed he could run the nasty parts he also got the opportunity to show the designers how they might make the parts a little less hellacious – and cheaper – by making minor redesigns. This approach of win/win won him more jobs and a reputation for doing whatever it takes to get the task accomplished on time.

Norbert and Jeff's company strategy for hyper-growth is to use the Swiss shop as the cash cow for their aspirations to build a big product-based company.

Norbert is working on a collector quality pen, while Jeff has designs and prototypes for a mountain bike that he feels will revolutionize the peddling universe. They are far along on the bicycle and expect to be shipping product shortly. Like most inventor-entrepreneurs they are worried about piracy, but they think with their manufacturing prowess and innovative capability they can stay ahead while their competitors wonder what hit them.

Meanwhile, they are hoping their ship will come in on a revolutionary variable speed motor they have done development work on.

The innovation has big venture capital dough behind it and they think the motor firm will go public soon if the

investment banking climate improves.

They realize that they need the best employees in their immaculate shop to make their dreams materialize. Norbert has developed plans for a three-year licensed apprenticeship in the shop for carefully chosen applicants. The lucky apprentices will work in the Swiss shop and commit to taking online classes from Tooling University and spending extra hours each week learning programming and machine operation in the plant.

It is an ambitious program for a still-small firm, but Norbert has plans even bigger than his old neighbor Arnold's biceps. And he's doing it in possibly the highest priced labor market in the country.

North Dakota may be the least

talked about state in the lower 48, but recently the heel of America's frozen steppes has been inching into the spotlight.

North Dakota has gas – of the natural variety – and with the price over $10 in the spot market, there is keen interest in developing North American supplies. Geological formations that were interesting curiosities for drillers at $3 now look like potential bonanzas as energy supplies are looking more like national strategic chips with Russia,

China and India lusting for fossil fuels. North Dakota also has lots of wind and open space, which makes it an ideal source of wind power. Wind turbines are bisecting the nation from Sweetwater, Texas, to Bismarck, North Dakota.

The state produced the magnificent plodding slugger Travis Hafner of the Cleveland Indians. But it is also producing excellent talent for the machining trades. I talked to Dick Sivertson of Semitool, a Kalispell, Montana, manufacturer of silicon wafer machinery at WESTEC. Kalispell is too small and remote to produce the machinists that the fast growing firm requires, so Dick roves the country recruiting promising rookies for the shop floor. California and Nebraska have been good to him, but he says North Dakota is a favorite hunting ground for

swarf

technical skills. Semitool will pay up to $10,000 as a signing bonus to cover the costs of a manufacturing education. They also pay for relocation to Montana.

For a long time, North Dakota has sent its best and brightest to the Twin Cities, but with the potential energy wealth soon to be developed and the benign effects of global warming, could Bismarck be the next Charlotte?

Managing Editor Jill Sevelow

attended Exact Software's Engage 2008 customer conference in Las Vegas, Nevada. Jill said the 1,100 attendees included over 250 people using JobBoss shop floor manufacturing software. JobBoss is now partnering with quality management and compliance software provider CEBOS to bring CEBOS' MQ1™ quality management software system to users of Exact's JobBOSS. MQ1 manages quality documents, including keeping a record of printouts, recording non-conformances and tracking corrective and preventative actions, and help organizations maintain equipment and machines by providing analytics for companies to evaluate the success and cost of their quality program.

Included in the conference were 13 customer presentations and 160 breakout sessions. In such a male dominated industry, Jill was struck by a high number of females within the workshops, both with Exact's employees and JobBoss attendees. Jill spoke to a number of JobBoss users and was impressed with the positive feedback from both a technical and a support standpoint. Many of the attendees were from purchasing or office management, and seemed completely engaged in learning JobBoss' updates at the "Where are My Parts?" segment of the conference.

swarf

Another of America's venerable

machine tool builders is folding the tent. K.O. Lee of Aberdeen, South Dakota will be auctioned off in June by Hoff-Hilk.

The firm, named after its founder Knute Oscar Lee, began as a farm machinery sales company in 1888. Son Clifford Lee came in as a partner in 1915 and they shifted to dealing in gasoline tractors rather than the old steam machines. In the 1920s they stopped selling implements and started repairing tractor and car engines. A machinist-engineer, Theodore Purnis, who had immigrated from Germany, began training machinists and developing machines and tools to assist in engine rebuilding. This was the beginning of K.O. Lee as a manufacturer, but the company's core business was reselling binder twine at that time, which was used to tie grain into shocks. The twine was imported from Europe, so when World War II broke out, the supply lines for twine were cut and they had to look for another line of work to survive.

They decided to go into the grinder business and thrived during the War. Growth continued during the 1950s, 60s and 70s. The K.O. Lee surface grinder, and tool and cutter grinder became the industry standard.

They expanded into a 127,000 sq. ft. building in Aberdeen and made their own castings for a 100 percent American-built product.

But the family got old, descendants of Knute and Clifford lost interest, and outside management could not make money with the old lines.

So they finally decided to give up. Le Blond Corporation in Cleveland bought the intellectual property and the name to continue the spare parts business. About 20 new machines will be sold at the auction if you want to buy one of the last grinders of solid old K.O. Lee of Aberdeen, South Dakota.

For machine tool builders, one

of the most important keys to the American market is strong local distribution backed by consistent national marketing. In the Swiss-type sliding headstock arena, Citizen and Star have distanced their brands from the competition by landing many of the top players in distribution.

For Citizen, two interesting shifts have taken place in recent months. Methods Machine Tools of Sudbury, Mass., which sells Citizen in the Carolinas, Virginia and Arizona, and the crucial Los Angeles market, also sold, nationwide, the Maier Swiss CNC, made in the Black Forest in Germany. Maier makes an excellent machine, but it may have been an uphill climb for Methods to commit the marketing muscle to make it a credible player in the North American playing field.

Michael Maier, who runs the German builder, is young and aggressive and was pushing Methods for more American share.

I imagine Methods was confronted with a tough business decision. Do we push Maier and hope to develop it into maybe number three or four in America in a decade, while probably losing our Marubeni Citizen franchises and the possibility of landing other lucrative markets in the future?

Methods chose the Citizen relationship and Maier has now begun building its own national distribution network with Jim Kucharski, formerly with Tornos, leading the charge, along with the active participation of Michael Maier.

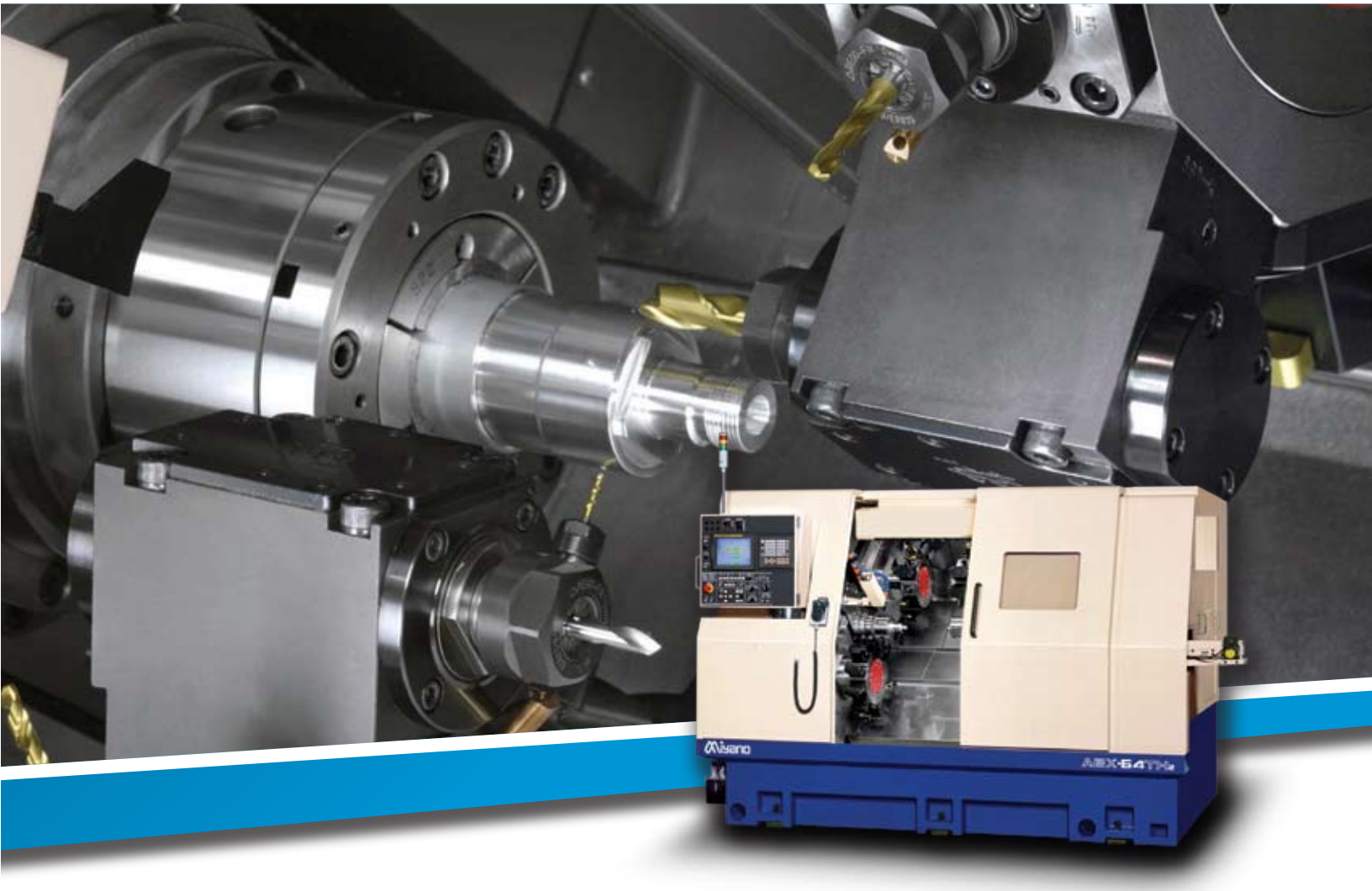
Gosiger Inc., operated out of Dayton, Ohio by the Haley family, chose a different route. They saw an opportunity to develop the Nomura Swiss line into a viable player despite the risk of losing their valuable Florida and Mid-Atlantic Citizen Marubeni exclusives. Nomura was an early entry in the American market, but had languished under a perceived indifferent management.

The lure of having the entire American market trumped the Citizen franchises for the Haleys, and recently Marubeni-Citizen chose to sever ties with Gosiger. The jury is still out on Nomura. The company is now in a period of financial reorganization in Japan. Nomura is shipping product, but in a brutally competitive market, financial doubts about Nomura cannot help sales against Citizen, Star and a host of others.

Meanwhile, Manhurin is rejuvenated in Europe under the ownership of ZPS-Tajmac, and is reentering the U.S. market, KSI has their act together again, and Tsugami and Tornos have a joint venture worldwide hoping to capitalize on each others' strengths.

To use the baseball slang – "you need a scorecard" to keep track.

WHEN PRODUCTIVITY COUNTS, NOTHING BEATS A MIYANO



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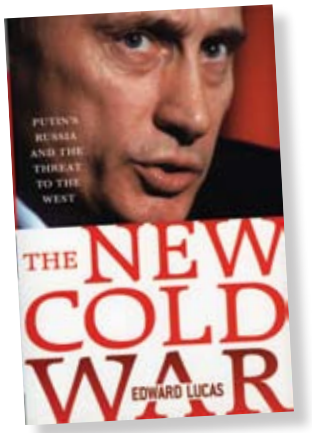
By Jerry Levine

The New Cold War

Now that Vladimir Putin has pulled the strings to elect his hand-picked successor as Russian President, he is poised to run his country for many years to come. Since taking power, Putin has – thanks to the current high oil price – presided over the transformation of Russia from a threadbare economy and a fragile democracy to a prosperous but treacherous autocratic state. A former KGB agent himself, Putin has filled most governmental and business positions with other KGB operatives, all hostile to the West. Edward Lucas, former bureau chief for *The Economist* in Moscow, rings the alarm bells in his recently published book, *The New Cold War – Putin's Russia and the Threat to the West.*



The book begins by relating the brutal murders of journalist Anna Politkovskaya in Moscow and former KGB agent Aleksandr Litvinenko in London, both of whom crossed Putin. Lucas mentions the dozens of other journalists and dissidents murdered in the past few years, and the many hundreds imprisoned or sent to "psychiatric wards."

There was barely a peep out of the West due to the subtle mix of Russia's deceptive diplomacy and its promise of vast oil and gas riches, coupled with much of Europe's disdain for George W. Bush. This allowed Russia to divide and conquer the Western Alliance.

Putin came to power when Yeltsin appointed him Prime Minister in 1999. Almost immediately, a rash of mysterious bombings of Moscow apartment blocks, theatres, and other targets panicked the population into demanding more security and less freedom. The Chechens were blamed, but as Lucas details, the KGB was probably behind the bombings. To further panic the population and legitimize his security crackdown, Putin restarted the war in Chechnya.

Putin was challenged by an economy dominated by oligarchs, mafia, and general corruption. He gradually arrested or exiled the oligarchs. The mafia, which had been collecting "protection money" from smaller businesses, were arrested and replaced by KGB operatives who took part ownership in each of those firms. Skimmed money now flows to the Kremlin.

Putin also instituted a 13 percent flat tax. This lower tax is simple and reasonable enough that the people actually pay it. Meanwhile, Putin and the KGB gradually took over all industry and most of the media, including TV stations and newspapers. They also control the banks and heavy industry.

Political opposition has been so successfully stifled that Putin has created his own shell opposition party called, Just Russia. This sham has a threefold value. First, it crowds out real opposition. Second, the Kremlin distrusts any strong political organization, even one that it has created, so it lets a few Just Russia candidates win to warn Putin's own United Russia politicians that they can always be removed. Finally, any new regional politician gets the message – sign up for one of the two approved parties or face political oblivion.

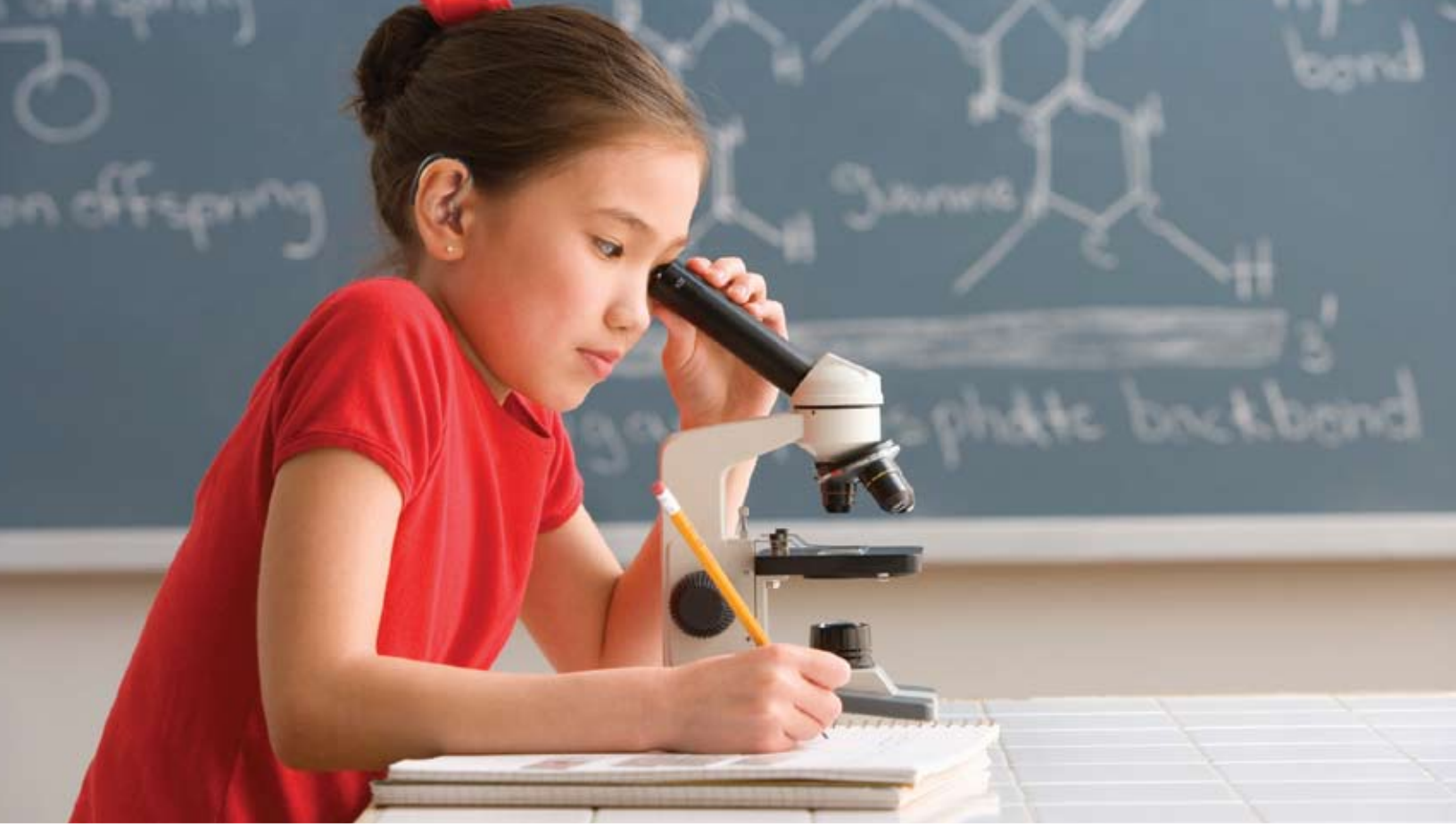
As an important ingredient of Soviet pride, Putin is working to regain control of Eastern Europe. Russia is scheming to split the EU through economic initiatives (favorable natural gas price and supply).

The Russians are great chess players, as exhibited in the chapter entitled "Pipeline Politics." Russia's policies are camouflaged by stealth, gradualism, and apparent reasonableness. One ominous event is a 1 billion euro loan guarantee issued by former German Chancellor Schroeder just before he left office, to a new Russia to Europe pipeline project which Schroeder then moved into as CEO.

Russia is now re-energizing its military and engaging in old Cold War saber rattling. There have been incidents of Russian bombers flying into U.S. controlled air space for harassment. Russia is talking about reinserting a fleet into the Persian Gulf.

Finally, Lucas explains how the West can win the New Cold War: First, by restructuring collective security to deal with their divide and conquer strategy, and secondly by restoring the moral self-confidence that fueled our victory in the Cold War in 1989. The next President will have his work cut out, and it won't be easy.

Comments? You can email Jerry Levine at jerroldlevine@yahoo.com.



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BIG Kaiser- Booth #5244 (right)

BIG Kaiser Precision Tooling Inc. will showcase a number of tooling product lines and new products from BIG Daishowa, Kaiser, Sphinx, Speroni and Unilock. BIG Kaiser's new Straight Shank FCR is designed for greater DOC and lower cutting resistance. Its geometry expands capabilities in multi-functional milling, achieving supreme performance for ramping, helical-, shoulder- and plunge-milling operations. C-Cutter Mini's compact design reduces the cutting diameter to the lowest limit feeds. The ultra high-feed chamfer mill delivers multi-functional cutting, including chamfering, back chamfering and face milling. Its high speed back chamfering capability reduces hand de-burring, and face milling is possible with a 45 degree chamfering type with .394" square insert

BIG Kaiser: 888-TOOL-PRO or www.bigkaiser.com.

Datron Dynamics- Booth #1261

A heavy-duty, 40,000-rpm spindle using HSK tool-holders is now available on Datron's line of vertical machining centers cutting at speeds up to 40,000 rpm. They are ideally suited for Datron's machining centers. The radial rigidity and clamping force of the toolholders have been optimized with a concentricity of less than 3 microns. A special chamber system, filled with thermosetting plastic, has vibration-dampening properties, resulting in better surface finishes and tool life extension.

Datron Dynamics, Inc.: 888-262-2833 or www.DatronDynamics.com.

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Emuge- Booth #5222

Emuge Corp. will be showcasing their new Solid Carbide Micro End Mills. A geometrically optimized cutting edge combined with a slim, concave, tapered neck provides flexible milling solutions in a wide variety of materials from 66 Rc hardened steel to graphite. The tools are offered in cutting diameters from .2mm (.008") to 2mm (.080"), with effective cutting length-to-diameter ratios of 2.2:1, 5:1 and 10:1. The line of Emuge Micro End Mills include ball nose, torus and flat end styles and are available in different 24 designs, uncoated or with TiAlN coating – 300 new items in total. For added versatility, these tools are suitable for diamond coating, which is available upon request.

Emuge: 800-323-3013 or visit www.emuge.com.

FLP Tooling- Booth #5665

FLP Tooling will exhibit its full line of cutting tools, and has added Schlenker GmbH to their line of collets and guide bushes. In addition, Applitec introduced new tooling systems to their Modu-Line modular tooling series designed with a built-in coolant supply feed. These new systems are compatible with Citizen-Cincom, Star and Tornos screw machines.

FLP Tooling Inc.: 310-306-0987 or www.flptooling.com

GBI Cincinnati- Booth #1357 (above)

GBI Cincinnati, Inc., will be introducing the Revolution Series of VMCs. The Revolution, equipped with the MTI CV control, has a minimum block-processing speed of 50,000 BPS in 8-axis simultaneous movement. The Revolution utilizes 80

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internal high speed buffers that continuously shuffle programming data through its proprietary software, optimizing the control's speed and efficiency.

GBI Cincinnati: 513-841-8684 or visit www.gbicincinnati.com.

Genevieve Swiss – Booth #4305 (left)

Genevieve Swiss Industries will feature the expanded line of thread whirling 12 form insert cutter rings Swiss for CITIZEN, STAR, TORNOS, MAIER, TSUGAMI, NEXTURN and TRAUB machines. Developed by UTILIS® and Genevieve, the system delivers thread whirling of long threaded forms, bone screw thread profiles, miniature ball screws and uses the UTILIS' standard 1600 series MULTIDEC-CUT® insert blanks. Also on display will be the 2150 Series Precision Micro-Broach holder for Swiss type machines which allow for rotation of broach tools 2mm and under. This series is especially suited for hex profiles under 2mm or .078" and when no other holder fits into the machine's tooling zone without interfering with other stations.

Genevieve Swiss: 413-562-4800 or www.genswiss.com.

IEMCA – Booth #1033

IEMCA will feature the new Elite 112, which is able to feed bars of 0.8 mm to 12.7 mm even on lathes with very high rotation and headstock acceleration speeds. IEMCA's hydrodynamic guide channel system allows the guide diameter to be changed by only changing the front guide sections. The bar pusher is contained in a tube fixed to the upper wall of the rear guide. The Elite 112 boasts a minimum inertia (-40%) mechanical synchronization system to ensure precision following of headstocks, even those actuated by linear motors, regardless of bar diameter. The Elite 112 has been engineered with closed, calibrated, round section channels, enabling high performance, even with high-rotation spindle speeds.

IEMCA: 888-55-IEMCA or email info@bucci-industries.us.

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Johnson Gage Co.– Booth #4004

The Johnson Gage Company will feature its full range of portable or bench external and internal Thread Inspection Systems that incorporate functional and pitch diameter size measurements for UN, Metric, NPT, and all other thread forms subject to virtually all thread acceptance standards. Products on display will feature medical, aerospace and automotive applications.

In addition the company will demonstrate the new ThreadSpecs 2.0 fully integrated thread engineering software program designed to simplify the calculation of critical thread elements and characteristics for UN, UNJ. Buttress, Acme, Metric, Metric J and Whitworth thread forms.

Johnson Gage Co.: 800-245-4243 or www.johnsongage.com.

LNS America– Booth #1117

LNS America, Inc. will showcase bar feeds, chip conveyors, coolant systems and other machine tool accessories. Alpha Series bar feeds start at only $20,300. Model ST 320 feeds round bar stock from .12" to .78" diameter and Alpha ST 212 are designed to load small diameter, round bar stock from .078" to .47". A synchronization system for use with high-speed sliding headstock machines or when running special materials is standard on the Alpha 212 and an option for the Alpha 320. Microfine 3 chip conveyors handle heavy chip loads of mixed or dedicated materials and filter coolant to 50 microns. Five oil mist collector models with capacities of 170 – 1250 CFM will also be featured.

LNS America: 513-528-5674 or www.LNSamerica.com.

L.S. Starrett – Booth #3013

The L. S. Starrett Company is showcasing DataSure®, a new wireless data collection system with proprietary design features. Utilizing radio transmission, DataSure can cover thousands of square feet while reliably preserving the integrity of measurement data. DataSure interfaces with most electronic measuring tools and software and installs on Windows XP Professional. The system gathers data from the measuring tool and sends it to the software. Once data is received, a confirmation signal is sent back to the tool to indicate the data was successfully (or unsuccessfully) received. Readings can be stored at the end node and re-sent until they are safely recorded. Collected data can then be analyzed utilizing Starrett or other software products.

L.S. Starrett: 978-249-3551 or www.starrett.com.

Lyndex-Nikken- Booth #5355

Lyndex-Nikken will feature Shrink Fit Holders, which feature solid construction and Japanese engineering, and offer minimal variations of unbalance when changing cutting tools. Used in combination with a Shrink Fit Unit, Shrink Fit Tool Holders rapidly heat up to expand the inside diameter of the holder. As the holder cools, the thermal contraction exerts a uniform pressure that shrinks down around the tool for uniform and superior gripping. This process not only ensures accuracy, but also allows for tool changes of less than 30 seconds.

Lyndex-Nikken: 800-543-6237 or www.lyndexnikken.com.

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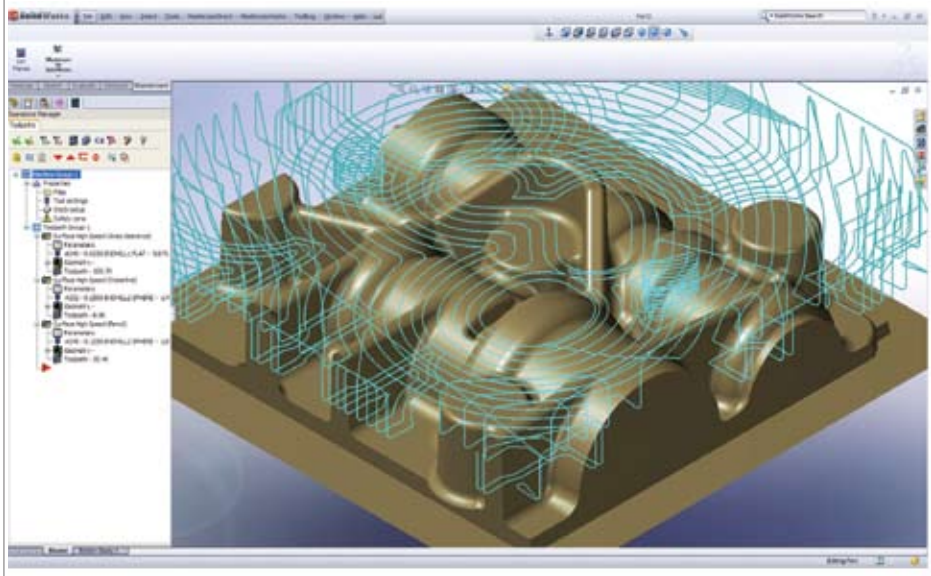

Mastercam- Booth #5245

Eastec 2008 features the unveiling of two major developments in CNC Software's Mastercam® CAD/CAM software. Attendees will get the first look at Mastercam's new Feature Based Machining (FBM) as well as the Mastercam in SolidWorks add-in. Mastercam's new Feature Based Machining automates the machining process. Mastercam's FBM automatically evaluates a part and programs pockets, contours, bosses, and drilling routines with minimal user input. Mastercam's FBM will be part of the Mastercam X3 release, later this year.

Mastercam: 800-228-2877 or visit www.mastercam.com.

Mazak- Booth #2115

Mazak Corporation will have a three-machine exhibit: INTEGREX 100-IV ST, and the Florence, Kentucky-built VERTICAL CENTER NEXUS 510C-II 5x and VERTICAL CENTER NEXUS 410A-II. The VCN 510C-II 5X Vertical Machining Center is equipped with a #40 taper, 25-Hp, 12,000-rpm integral spindle/motor. Full five-axis contouring is possible because of the tilting rotary table, which provides 360-degree rotation and plus or minus 120 degrees tilt with no backlash due to the table's roller gear drive. The VCN 510C-II 5X has a maximum workpiece weight of 440 lbs and a maximum part diameter of 21 in.

The other Kentucky-built VERTICAL CENTER NEXUS 410A-II delivers up to 30 percent greater productivity than previous models through a number of factors. Maximum spindle speed is 12,000 rpm, driven by a 25-Hp spindle motor. The high-speed rapid traverse rate of 1,417 ipm at 0.5 G acceleration slashes non-cutting time in favor of increased production. Equipped with dual opposed spindles for turning and synchronized C-axis control, the INTEGREX 100-IV S Multi-Tasking Machining Center can machine parts complete by exchanging them between spindles for front and back processing. In addition, it is a full five-axis machining center.

Mazak: www.mazakusa.com.

MC Machinery Systems-
Booth #1043

Mitsubishi will highlight the latest in wire EDM, sinker EDM, waterjet, and high-speed vertical machining equipment. The new FA10S Advance wire EDM features a new M700 Series Mitsubishi control. The Windows-based system with 15-inch LCD touch screen display provides a simple menu configuration allowing for easy navigation. The machine has a 3D adaptive EDM control, which can analyze 3D data and recognize shape characteristics. Also at the show will be the BA24, Mitsubishi's newest, large-capacity wire EDM. The machine was designed to accommodate a variety of machining needs, from parts to dies. The 4-axis Waterjet Suprema's software features Intelligent Tapering Control, which corrects the natural tapering of the cut automatically.

MC Machinery Systems: 630-860-4210 or www.mitsubishi-world.com.

Mitsui Seiki- Booth #5507

Mitsui Seiki is exhibiting its latest 5-axis vertical CNC machining center. The Vertex 550-5X has a casting design, a gear drive system for the A and C rotary axes which provides high speed radial performance (A – 30 rpm; C- 50 rpm), and overall drive system stiffness. Further, the trunnion tilt axis, A, has an ample dual side support construction bolstering rigidity. Also on the Vertex, the linear axes move the spindle only. The motion of the workpiece is by the rotary axes only. The X, Y, Z-axes work envelope is 21.6 inches x 23.6 inches x 17.7 inches. All three move quickly at 1,890 ipm. With the A and C rotary and tilt axes, the Vertex 550-5X provides a total of 5 integrated axes of motion.

Mitsui Seiki USA, Inc.: 201-337-1300 or www.mitsuiseiki.com.

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Mori Seiki- Booth #1503

Among the machines Mori Seiki will feature include the NZ2000 T3Y3, a new multi-axis machine manufactured with three turrets with built-in milling motors™ and a Y-axis function, and the NMV5000 DCG™ 5-axis vertical machining center.

The NMV5000 DCG implements DD (Direct Drive) motors on the B and C axes. By transmitting power directly, with no gears, backlash is eliminated. Additionally, with no parts to wear out, there is less maintenance and longer machine life. Turning is also possible, with a C-axis rapid traverse rate of 120 min-1 as standard, and 500 min-1 and 1,200 min-1 available as options.

Mori Seiki: 847-593-5400 or visit www.moriseiki.com.

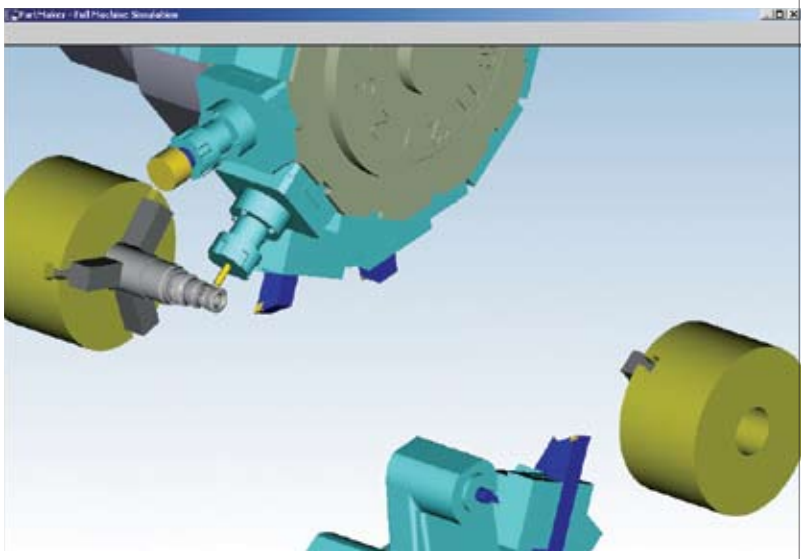
Okuma- Booth #1305

Okuma's LB3000EX SPACE TURN CNC lathes include four new models offering 66 option variations. Built on a box slant bed with a thermo-friendly design, the LB3000EX is able to achieve machining dimensional change over time of less than Ø5µm. Equipped with a PREX motor, the LB3000EX achieves accuracy and flexibility through a max machining diameter of 16.14" and max machining length of 19.69". Up to 10 pairs of NC tailstock positions can be set, enabling continuous machining of workpieces with 10 different lengths without setup along with X and Z rapid traverse rates of 984 and 1,181 ipm, respectively. The LB3000EX can be equipped with milling (M) capability, a sub-spindle (W), (Y)-axis, two bed sizes (500 and 1,000 mm) and two spindle sizes. The LB3000EX features a THINC-OSP control – a true PC, Windows-based platform with open architecture, plug and play USB capability and 40GB of memory.

Okuma: 704-588-7000 or www.okuma.com.

PartMaker, Inc.– Booth #5323

PartMaker Inc., a division of Delcam PLC, will demonstrate its latest release, Version 8.6 of its PartMaker® CAD/CAM software for CNC Mills, Lathes, WireEDM, Turn-Mill Centers and Swiss-type lathes. PartMaker Version 8.6 features improvements to programming inclined turning operations on B-axis lathes equipped with articulating tool heads, including the ability to program angled grooves, in addition to other grooving enhancements. This enhanced capability also improves the simulation of "mini-turrets," tool holders that can hold a number of turning tools in a single station. Additionally, capabilities to program angled thread milling features for inclined tooling attachments for machines without articulating heads and global coordinate systems have been added.



PartMaker Inc.: 215-643-5077 or www.partmaker.com.

SNK America- Booth #1241

SNK will feature the Prodigy GT-27 gang tool lathe with a standard C-Axis and polymer base. The Prodigy GT-27's spindle speeds reach up to 6,000 rpm. The Prodigy GT-27 lathe uses three axes of motion that can be commanded in absolute or incremental modes. The Prodigy's C-Axis spindle allows for indexing and positioning as well as more advanced functions including interpolation and polar coordinate milling. Precision is achieved through the incorporation of non-heat generating collet closers, the absence of a turret and full C-Axis indexing positioning. The Prodigy GT-27 can index in .01 degree increments. Maximum production bar work is up to 1 1/16" diameter.

SNK America: 866-379-6068 or www.snkamerica.com.

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Sunnen- Booth # 2120

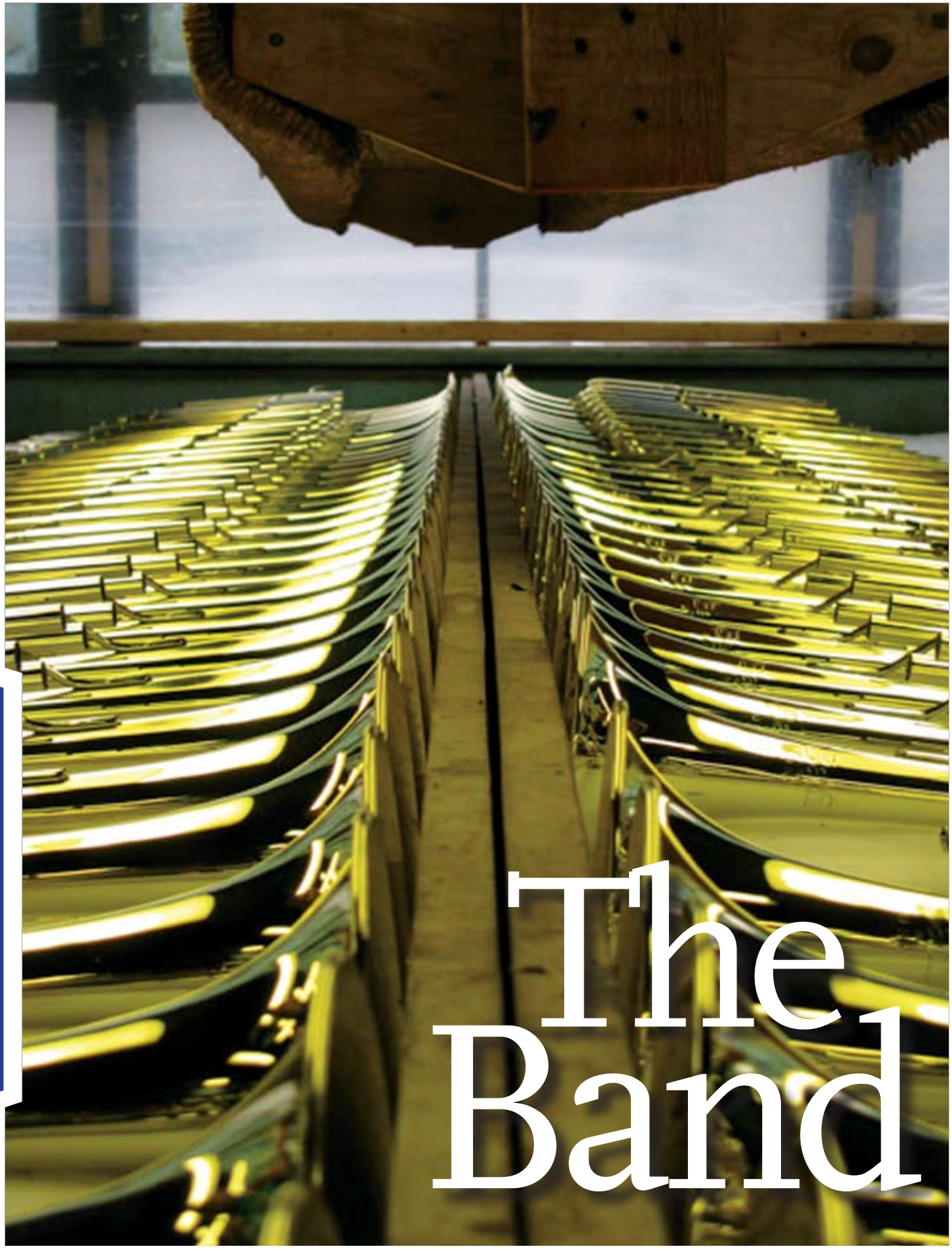
Sunnen will feature its new SV-1000 vertical CNC honing machine series, engineered to scale up from a single-spindle machine to a fully automated multi-spindle unit for bore sizing and finishing. Designed for part diameters of 3-65 mm (0.120-2.56"), SV-1000 series machines can size bores to accuracies of 0.25 µm (0.00001"). The SV-1000 will be demonstrated honing a precision aerospace hydraulic valve. The basic single-spindle SV-1000 module is designed with removable side enclosure panels to facilitate flow-through part processing. It is available with a fixed tooling plate or servo rotary table with 12-position rotary air union for fixture control. Fully automated versions of the SV-1000 can be specified with the servo rotary table or linear part transfer, integrated part handling systems, and up to four spindles.

Sunnen: 800-325-3670 or www.sunnen.com.

Travers Tool Co.- Booth #4238

Travers Tool Co., Inc. will be exhibiting a broad array of new products, including OTMT T-Slot Blocks, NACHI High Performance Roughing End Mills, TTC Long Length Solid Carbide Drills and much more. Visitors at the Travers booth can also win valuable door prizes, raffles, and product give-aways. Travers provides a diverse product selection, including cutting tools (drills, end mills, and indexables), measuring tools, abrasives, hand and power tools, fasteners, safety supplies, and material handling items.

Travers Tool Co: 800-221-0270 or www.travers.com.



The Band

E.K. Blessing photos by Chris Meikle

Band instrument manufacturing in the United States

By Robert Strauss

Plays On

band instruments

Danny Books stands looking like the live version of a some toy soldier from the 19th Century, ready to bayonet the unworthy standing before him. He presses his implement forward and the lathe wheel in front of him whirrs and shudders. The metal on the lathe splays outward into and out of a bigger bell-like shape, the implement pressing tightly at its middle so he gets it just right.

Breathing deeply and adjusting his protective glasses, Books stands back a bit and shuts down the lathe. A closer look at that bayonet-like implement shows that it looks like one of those old baseball bats from the 1950s, the ones your dad had in the garage and taped up for you for your first pee-wee league game. It was too big, too put back together, but it was from Dad, so you took it to the game.

Turns out, it is about the same for Books. "Well, yes, it is a baseball bat," said Books, who is the chief guy making the bells for trombones, tubas and other large horns for the E.K. Blessing Company, one of the largest purveyors of student band instruments in the world. "I hollowed it out and filled it in with something stronger, and put foam padding on it wherever it fits into me.

"High tech, huh?" said Books, with a trombone-like laugh. You almost expect Professor Harold Hill to come down Beardsley Street in front of the Blessing plant in this mid-sized Northern Indiana city, pumping his baton and leading the River City Boys Band. Just down the street, the Elkhart River does drain into the St. Joseph River at Island Park, and while Meredith Wilson didn't set his show, *The Music Man*, in Elkhart, he could have.

For Elkhart has long been, and continues to be, the center of band instrument manufacturing – primarily

Artisan Joe Kilgren visually aligns the inner slide of a trombone, then burnishes it to be perfectly straight.

student band instruments – not just in the United States, but in the world.

"It all started with C.G. Conn, who was quite the guy in 1875 around here," said Vincent McBryde, who has worked for several of the Elkhart music businesses and now consults for Blessing, while also being one of the folk historians of the business.

"Conn was a cornet player and got into some altercation where some guy hit him in the mouth," said McBryde. "That is, as you may imagine, not good for a cornet player. He developed a real sore, so he invented a mouthpiece with a cushion."

McBryde said Conn's cornet reputation soared, and whether it was because of the new cushioned mouthpiece, or just general practice, other cornet players weren't going to take any chances.

"They all said, 'Can you make me a cornet with that mouthpiece'," said McBryde. "One thing led to another and he started making them here. Other manufacturers came here – the Selmers who made clarinets and Gemeinhardts who made flutes, and the Lintons who made oboes and bassoons."

Randall A. Johnson is the president of Blessing, the company his great-grandfather E.K. started in 1906, trying to perfect valves in a cornet.

"We've made everything over the years, but we have mostly concentrated on brass instruments," said Johnson. "Things have consolidated and broken up and gone every which way here over the years, but we still believe it is a good American business, and we like that many companies have chosen to stay here."

It is not all completely cheery and "Music Man"-esque in Elkhart. Some of the manufacturing – or at least the assembly – has gone off-shore. The factories generally work one shift – more often than not 6-to-2 or 7-to-3, so everyone has family time or tavern time at the end of the work day.

"Elkhart thrives on tradition and spunk- and homespun ingenuity."

But, still, while other manufacturing areas have become ghost towns, and solid mid-20th-Century places like Detroit and Cleveland and Harold Hill's hometown of Gary, Indiana, are near-unrecoverable, Elkhart thrives on tradition and spunk – and sometimes what seems like impossibly homespun ingenuity.

Like Todd Hesselbart who stamps the brand names on the Blessing horns. This is no automated stamping

machine. The trumpets and trombones and mellophones are too delicate and oddly-shaped to go through such a stamper, McBryde said. So Hesselbart invented a better way. He hooked up a 1950 Plymouth steering wheel to a roll-stamper, to have a big handle to grab onto while lining up the instruments.

"I eye it up and clamp it down," said Hesselbart. "I go back and forth, back and forth, so every letter is just right. A lot of the work here is people who have done it for ages eyeing it up. It is not anonymous. It is a craft."

Taped-up baseball bats? Ancient Plymouth steering wheels? What century is this place in?

"We are in the business of giving first-time people the best possible instrument we can," said Mark Hutchins, vice president of marketing for Gemeinhardt, a 60-year-old purveyor of brass and woodwinds, mostly flutes and piccolos, primarily for the student market, where Blessing and Conn-Selmer, the largest music business in Elkhart, also send the majority of their wares. "For a while, people thought that eBay or Wal-Mart were going to kill us with cheap $150 flutes, but it just hasn't happened."

Primarily, it hasn't happened because of the way most people – primarily school kids – get their first, and even second or third, instruments in North America.

According to Dan Del Fiorentino, the historian for the National Association of Music Merchants (NAMM), based in Carlsbad, CA, while Elkhart was a center for band instrument manufacturing for decades before World War II, it began to thrive even more soon after the war.

"First, even in the 1930s, the band instrument business was big," he said. "It was the era of the big swing band, and every little town had its own band, not to mention all those that traveled. There were 900 traveling territorial bands in the swing era. They ended up coming to Elkhart lots of times for their instruments."

After the war, said Del Fiorentino, various governments had to figure out what to do with veterans.

"They made a lot of them teachers, but they had to find subjects to teach. Music seemed like a good one," he said. So governments supported music education and, like Harold Hill in the fictitious early part of the century, they needed instruments to give the potential students.

Perhaps the popularity of *The Music Man* when it hit Broadway in 1957 was because in the decade before – and decades to come – each set of parents to rent their kids instruments, just as they bought them in the play and movie, had gleams in their eyes that one day their kid would be the next Tommy Dorsey or Benny Goodman or Al Hirt. In any case, it gave a new life to places like Blessing and Conn-Selmer, which went heavily into the student instrument business.

Student instruments can be junior-sized pieces – like flutes with smaller keys, or trombones whose longer tubes

do not stretch so far out. More often, though, they are more sturdy versions of delicate professional instruments using, for instance, silver plate or harder brass instead of a higher grade of silver or more malleable metals.

"The design differences are really small, though," said Hutchins of Gemeinhardt. "A student flute that sells for $400 has 300 moving parts, the same as the professional's $30,000 instrument. What is important, though, is that first instrument has to sound good, or else there will never be a step-up instrument and, in the end, a professional instrument. If you do too much mass production, that won't happen."

At the Blessing plant, as many as 60 workers could have some hand in making what seems like a simple trumpet or trombone. While not everyone uses that taped-up baseball bat or the Plymouth steering wheel, they are not using sophisticated machinery for the most part.

Curtis Perry, for instance, has, for the last nine years, worked primarily as the person who makes sure the valves on Blessing trumpets line up correctly. He takes three valve casings and wires them together, often just using a simple jig to do so.

"After a while, you can just see how to wire them," he said. "You have a case for a set number and they all get their acid bath to clean them up. I can do 200 of these a day without a problem. Then it goes on to the next person."

There are a lot of soldering guns and assembly stations and a seemingly incredible amount of people who "eye up" things. Amazingly, the levers for the spit holes in the trumpets and trombones are bent to the correct angle by people putting them in vises and turning them just so.

"These are just people who know what they are doing," said McBryde, going from work station to work station as if the factory tour were a trip through a Disney ride. "They are the people of Elkhart and this seems to be what we are good at here."

They are also good at – and this is hardly surprising – playing the instruments they produce. The marching bands at the three high schools in the city routinely win state and national competitions.

"We have an active municipal band, which is a great amenity for a community our size," said Kyle Hannon, the vice president for public policy at the Greater Elkhart Chamber of Commerce. "Also, a New Horizons Band

"They are Elkhart people & this seems to be what we are good at here."

band instruments

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started a couple of years ago. It is made up of retired people who just want to pull their instruments out of the attic and start playing again."

At Gemeinhardt, the workers, both in management and labor, really take their playing seriously. All 60 people at the company play an instrument of some sort, and the Chief Executive Officer, Gerardo Discepolo, is an accomplished flutist with a doctorate in musical studies.

"I am a flutist," said Gemeinhardt marketing man Hutchins. "The fellow who runs the clarinet department went to Julliard. We are a musician-run company and we believe that is important for trust."

The music business in Elkhart has also had some spin-offs. McBryde said that Blessing, for example, gets its primary metals from Anderson Silver Plating, which was founded in Elkhart in 1948, just as the boom in student instruments started. Jesse James Babbitt learned his trade early in the 20th Century at C. G. Conn, and 80 years ago started his own clarinet and flute mouthpiece business – the JJ Babbitt Company. Now the company, with just 40 employees, all in Elkhart, manufactures 300,000 mouthpieces a year, and is run by William R. Reglein, Jesse Babbitt's grand nephew.

Still, Gemeinhardt, as other companies in Elkhart, has decided to "partner" with off-shore firms. Hutchins said that all the parts of its flutes and piccolos are manufactured in Elkhart, but a lot of assembly is done in Taiwan.

"We ship the parts over and then quality check the instruments when they return, so we keep that here in Elkhart," said Hutchins. "But, yes, in order to keep costs down, we have decided to take advantage of what Taiwan and the rest of Asia has – cheaper unskilled labor. We keep the skilled jobs here."

Hutchins said that the price point he and the other student instrument manufacturers in Elkhart have to keep is $20-25 a month for rentals. They sell their instruments to distributors, who then go to schools in hopes of getting those first rentals.

"After that, we hope to rent what we call step-up instruments – the next more sophisticated models," he said. "You hope there is a third step, the one where the students go on long enough to buy the instrument."

That, in turn, he said, makes the next generation rent, and the cycle continues. Fortunately, according to Hutchins, most school systems still support music education, and as long as that happens, it seems that Elkhart's businesses will survive.

"The town is also a center for RV design and manufacture, and because Miles Laboratories – the originators of Alka-Seltzer – was an Elkhart firm, and is now owned by Bayer, there were drug businesses, too," said Hutchins. "But the music business is in our blood here. It is an American manufacturing success story, and we like being a small part of it."

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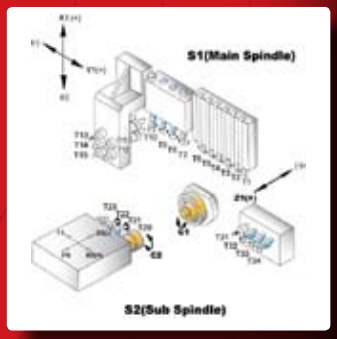

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The World of Inventables

With Noah Graff

An interview with mastermind Zach Kaplan


Zach Kaplan

NG: Zach, could you summarize what Inventables does?

ZK: We help companies innovate. We have technology hunters who go all over the world to try and find the most innovative technology. We then put those into a database, and present the most compelling ones to our customers who are trying to come up with innovative products.

NG: Why wouldn't the inventors want to just patent it themselves? Why would they want to give this to you guys?

ZK: Oh no, they patent themselves. Our customers are companies like Black & Decker, Avon, Nike; big companies that have products on the shelves of Target and Wal-Mart. There's more competition from China and private-label brands, so our customers are trying to come up with innovations to help them compete in a competitive marketplace. The old way used to be they would do the invention in their R&D lab. The new regime has decided to take the approach of what's called "open innovation," where a lot of ideas come from outside of your company. One of the champions of this is the CEO of Procter & Gamble, A.G. Lafley. In 2000, he decided that 50 percent of the ideas for Procter & Gamble products were going to come from the outside. They've got this formal program called "Connect & Develop" that supports this. It's this kind of new approach to R&D and product development and innovation that Inventables has helped them to facilitate.

We're connecting the people who have all these inventions and ideas and technologies and materials to the product developers in large consumer product companies to make that connection efficient.

NG: So you're taking one person's ideas and helping combine it with other peoples' ideas?

ZK: It's organizing the sea of different materials and technologies in a way that when a customer like Procter & Gamble has an idea for the next Swiffer, they can easily connect with the company that makes the technology that can make that new feature.

NG: When you're working with Procter & Gamble's

Origami DVD Player: A portable DVD player concept that could be manufactured with a new e-paper (a full-color flexible display technology).

team, do they ever feel threatened by you guys, like: "Oh, who are you guys coming in and telling us how to do our jobs?"

ZK: No, not at all; we're not telling anybody how to do their job. They love us at Procter & Gamble. Anytime you work in a huge company, it's hard to get stuff done because of the bureaucracy. What we do is cut right through all that. Most of our customers have very little time. They have constant deadlines and meetings, and we're helping them shorten what used to take a month down to a week, so they love us because we save them time.

NG: Give me an example.

ZK: We have two teams at Inventables. We have the Technology Hunter Team. Those are the folks that go out and try to find all the different materials and technologies and get them in the database. Then we have the Client Team. They go out to places like Procter & Gamble or Black & Decker and try to understand: "What are they working on? Where's their opportunity for innovation?" And then help them connect with the right technologies.

NG: As the CEO, do you get to do the hands-on stuff, or are you mostly overseeing everything?

ZK: We're a growing company so I wear a lot of hats. As we continue to hire people, I'm studying the vision more, but I still have a lot of contact with clients on a daily basis.

NG: Do you prefer one hat over the other?

ZK: I enjoy growing the business. I really love product innovation and what we're doing, but I also love the business aspect of it.

NG: What's your background?

ZK: My background's in mechanical engineering.

NG: How did you come up with the idea for Inventables?

ZK: It came from interviewing product developers in innovation groups. We did about 40 or 50 structured interviews and observations to try and understand where were the bottlenecks in their innovation process – what was easy; what was hard. It was through those insights of how people actually did their work that Inventables popped out.

NG: Why did you start doing those interviews?

ZK: I'm personally interested in innovation and product development and I really wanted to understand the industry and how everything worked.

NG: Then it hit you that you would be that facilitator.

ZK: Yeah, I started observing similar themes across

different companies and making prototypes of different ways that could help the guys get access to the materials and technology.

NG: Who was your first client?
ZK: It was Amway, which is Access Business Group. It's the manufacturing part of Amway; they make consumer products.

NG: How do you label what the company produces? Are they "inventions" or "innovations?"
ZK: We're just a platform. We're the connectors. You can call them innovations, materials, technologies, it sort of depends. There's a mix. There's materials, mechanisms, electronics, manufacturing processes, and wild products.

NG: What's a wild product?
ZK: Like a suntan lotion bottle where you can change the SPF; we consider that to be a wild product. You just turn a little dial if you want SPF 2 and your friend wants 30.

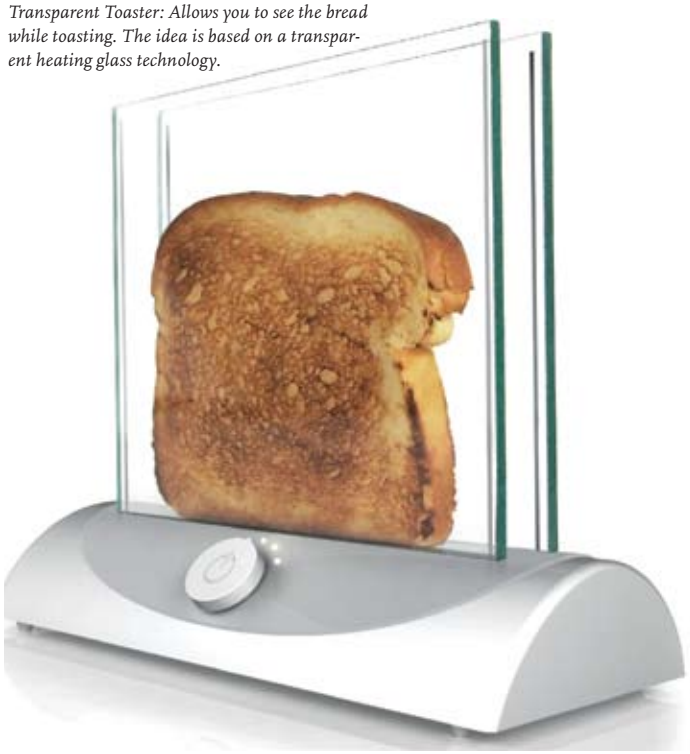
NG: Did you come up with the idea to do that, or did they come up with that and they said, "Help us figure out how to do that."
ZK: There was a company in Germany that actually invented this product, and one of our Technology Hunters found it and added it to the database. Then at a company like Procter & Gamble, who has subscribed to our database, we install an Innovation Center (see photo), and this Innovation Center is like a retail looking display, all the materials and technologies are hanging on it. We update it every quarter, and each technology or product, like the suntan lotion bottle, has a tag on it that they can reference in our database to get more information, find out who the vendor is, and how much it cost. If they have an interest in either using the product directly or modifying it for their product line, they can contact the vendor and start a business relationship.

Our customers have the inventions and own the intellectual property. They come up with the ideas. That's their role. What we're doing is giving them access in a very easy way. Think of it like a virtual tradeshow, a tradeshow that happens in your office.

NG: Is America a creative country?
ZK: Absolutely. I think it comes back to freedom and ultimately capitalism. If you look at capitalism versus communism or socialism, capitalism gives inventors and the population the right to own their own intellectual product. In America you can own the result of your productive thought and then you can build on that, drive value from that and trade with that is the cornerstone of creative innovation.

NG: Do you try to hire people from a lot of different backgrounds?
ZK: I do, especially in our Technology Hunters. We're building a team of Technology Hunters with diverse backgrounds both in terms of their educational background,

Transparent Toaster: Allows you to see the bread while toasting. The idea is based on a transparent heating glass technology.



their technical competency, and also their geography. It really makes a difference to get a broad perspective. Somebody from Turkey has different background experiences from Europe, which is very different than somebody from North America, so they're going to think about the technologies differently; they're going to look in different places. We also have a mix in ages.

NG: Can you explain the exploration budget?
ZK: That's something we have here to keep our team

creative and let them explore with their imagination. The intent is that they go out and use it to explore, but they don't have to ask for budget approval or for permission. Just the way I'm sure you've been at the store and wanted to try something but couldn't really justify the cost, this is a budget to help them satisfy that curiosity.

NG: Who is easier to work with when you're working with companies, older or younger people?

ZK: It really has to do with the client culture and attitude, how optimistic they are, how much their senior executives really want innovation. Our most successful customers are ones where the CEO has boldly stated that innovation is their strategy for growth. When that happens, all sorts of success is possible. But if the CEO says that innovation is what they're doing but the reality is they don't reward innovation – they reward incremental improvements or they reward cost cutting – it creates a tension in the company and that makes it much harder for us to have success. Because on one hand the product development team is trying to innovate, but on the other hand the resources are really geared towards cost cutting.

NG: Do you feel people are less afraid when they're working with you?

ZK: Absolutely. We make it easy, and we make it fun.

NG: I was reading on espn.com that you were coming up with some crazy ideas for the future of sports. Can you name a couple of your predictions?

ZK: The ESPN folks called and asked how technology could impact the future of sports. They wanted us to put the hat of our customer on and say, "If you were a sporting goods company, how do you think they could innovate with materials and technologies in sports that would make things change in the future?" We went to the Innovation Center and thought about existing products like a catcher's glove for baseball, and we found a foam that was a conductive foam. So imagine foam within the catcher's mitt; when the ball came in it would change [the foam's] resistance and you could tell how hard the ball was thrown based on the change in resistance of the foam.

NG: Could it be a replacement for a radar gun?

ZK: Potentially, or a low cost radar gun for kids so you don't need to have another guy standing there when you're just playing. Maybe the back of your mitt could show how hard it was thrown. One of the technologies was a skin conduction switch so when you touched it, it turned on. Imagine you slide in, and when your cleat touches the base, it makes the electrical connection. You don't need an ump to know if you were safe or out, so for playground games you could have a digital ump. In professional games, the digital ump could be more accurate than a real ump.

Innovation Center: For installation in an office to inspire ideas for new products.

NG: You say you don't invent anything, but you come in with knowledge you gleaned from one company and you brainstorm with people from another company?

ZK: We have different levels of service. Most of our customers have a level of service where they do the brainstorming [themselves].

NG: You just give them a bunch of different options?

ZK: Yeah, stimulus and technologies and connections to those technologies. At the highest level of service, we have a process that we'll walk them through, but it's them who are doing the invention and the brainstorming. We're just facilitators.

Gel magnets from GelTek: A jelly with magnetic material infused into it.

We did a project with Coca Cola. They were thinking about the future of beverages, and it was a 12-week project. We worked with a company that went out and did consumer insights to try to understand how people were using the product. Those insights plus technologies from our Innovation Center were used as a stimulus. The Coke Team – their Packaging Innovation Group, Marketing/Design, and Engineering and Finance – used that stimulus to come up with about 300 ideas that they narrowed down to 40 within two days. They made some quick prototypes, then 10 of them were sent to consumer testing. We're hoping one of them comes to the market very soon.

NG: Have people in the manufacturing world consulted with you guys?

ZK: One of our customers is Boeing. Another is GE. 3M is another customer. If a company is a interested in cost cutting and sort of wringing every last cent out of their product, we're not going to be able to provide any help. But as soon as they want to innovate, our service is there.

NG: What are some of the companies you find the most exciting as far as innovating?

ZK: Definitely Procter & Gamble. I think that they're very exciting. Nike is pretty exciting. Under Armor, and Radio Flyer.

NG: What's one of the biggest challenges you face?

ZK: Hiring is our number one challenge. Finding smart innovators who can work with customers but also have a strong technical background. They're excited to work in a start-up and understand the world of innovation and what we're trying to accomplish. We're growing pretty fast right now. We just had an open house. We had about 40 folks we invited to come take a tour of our office and meet the team, go through some brainstorming activities. But hiring is our number one challenge.

NG: Can you summarize the Inventable's process of "stepping, stretching, and leaping forward"?

ZK: Sure. "Step, Stretch, Leap is our graduated approach to introducing new ideas to our customers. Let me give you an example. This is a gel magnet (see photo, left). Flip one over and notice they repel like normal magnets. This is a special gel that can be magnetized and molded into shape, and can be bent and be formed to an external magnet. This is known as magnetostriction, changing shape in the presence of a magnetic field. Step: If you use it on a cabinet door, it closes softly without banging. Stretch: You create a children's dart game that uses magnetic squishy balls thrown at a metal magnet. Leap: Create a tube shape and use a magnet on the outside to create a peristaltic pump. The magnet would collapse the tube to push the liquid along. Stretches are a little bit farther out there, and leaps really stretch your mind.

We believe that after you identify those insights, science and technology are going to help you differentiate your product from all your competitors. You can provide more value to the customers and charge a higher price, and have a happier customer.

NG: You of all people are going to get asked the question: if you could be any machine, what would you be?

ZK: I would be a rapid prototyping machine, because at some point rapid prototyping will be at a level where you can imagine it and then you can make it. The future of rapid prototyping will be where you have some sort of data and then boom, there it is. We can get to the point where invention can move as fast as the imagination.

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CNC 36/100 HSK tool spindles w/2-axis CNC flange and valves w/ 6-axis CNC cabinet. New in 2006- ran prototype work only! Customer never got production job!

MISCELLANEOUS
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Hydromat flanges for HW25-12
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With Noah Graff

shop doc

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.

Have a technical issue you'd like addressed? Please email noah@todaysmachiningworld.com. We'll help solve your problem, then publish both the problem and solution in the next issue of the magazine.

Dear Shop Doc,

We are trying to make a part of beryllium copper that has a .025" square pin on one side. The length of the square pin is .140" long, then transitions to a diameter of .035", and then to a shoulder at .150" diameter. The problem I am having is that we have to turn the raw material down to .035" before we polygon mill the .025" square. We've done polygon milling on much larger parts but this is our first time on a small part. We are using a CNC Swiss lathe that has opposing X- and-Y-axis gang plates that are controlled separately.

Poly Gone

Dear Poly,

I know exactly what you are trying to attempt. What you'll need to do is adjust your methodology to account for the fact that you need to turn the raw material from .250" diameter to .035" and polygon mill at the same time. What is happening in your current method is that after you turn the .035" diameter, the material is no longer supported by the guide bushing. To fix your problem, you need to turn the .035" diameter at the same time you are polygon milling.

Two actions need to be taken:

1. Tooling: In the Z-axis plane, the turning tool needs to be closer to the material than the polygon tool. The reason for this is to turn the diameter before the polygon tool starts creating the flats. I know in most Swiss machines this is already built into the tool holder geometry where the live tools are typically further away from the guide bushing compared to the turning tools. If this is not the case, then you'll need to make some physical adjustments so that you can set the tools properly – either by shimming the polygon tool or grinding the shank on the turning tool. Then find the distance between the two tools in the Z-axis plane. As an example we'll use .010" as the distance between the two tools.

2. Programming: To program this you'll need to understand how to utilize tool offsets. For the turning tool, just program it in the normal fashion where you call the tool and the offset. For example: T0101 – Tool 01 and offset 01. For the polygon tool just call up the tool position without the tool offset. For example: T0200 – Tool 02 and no offset. For the G-Code, simply add the distance between the two tools to your programming of the turning tool to get to the linear dimension of the .025" square.

In your particular component, (using the example of .010") you'll want to program your turning tool to .150" in the Z-axis to account for distance between the turning tool and the polygon tool. This will give you the net result of producing a .025" square that is .140" long. If you need to contour the shape of the square, then the programming gets much more complex and you'll do just the opposite of my example. You'll have to use the polygon tool offset and omit the turning tool offset, then control the path of the polygon tool in the program. However, you'll still need to keep the turning tool in front of the polygon tool and account for the difference. Happy Machining!

David Cogswell
Director, Precision Machining Operations
Bal Seal Engineering,
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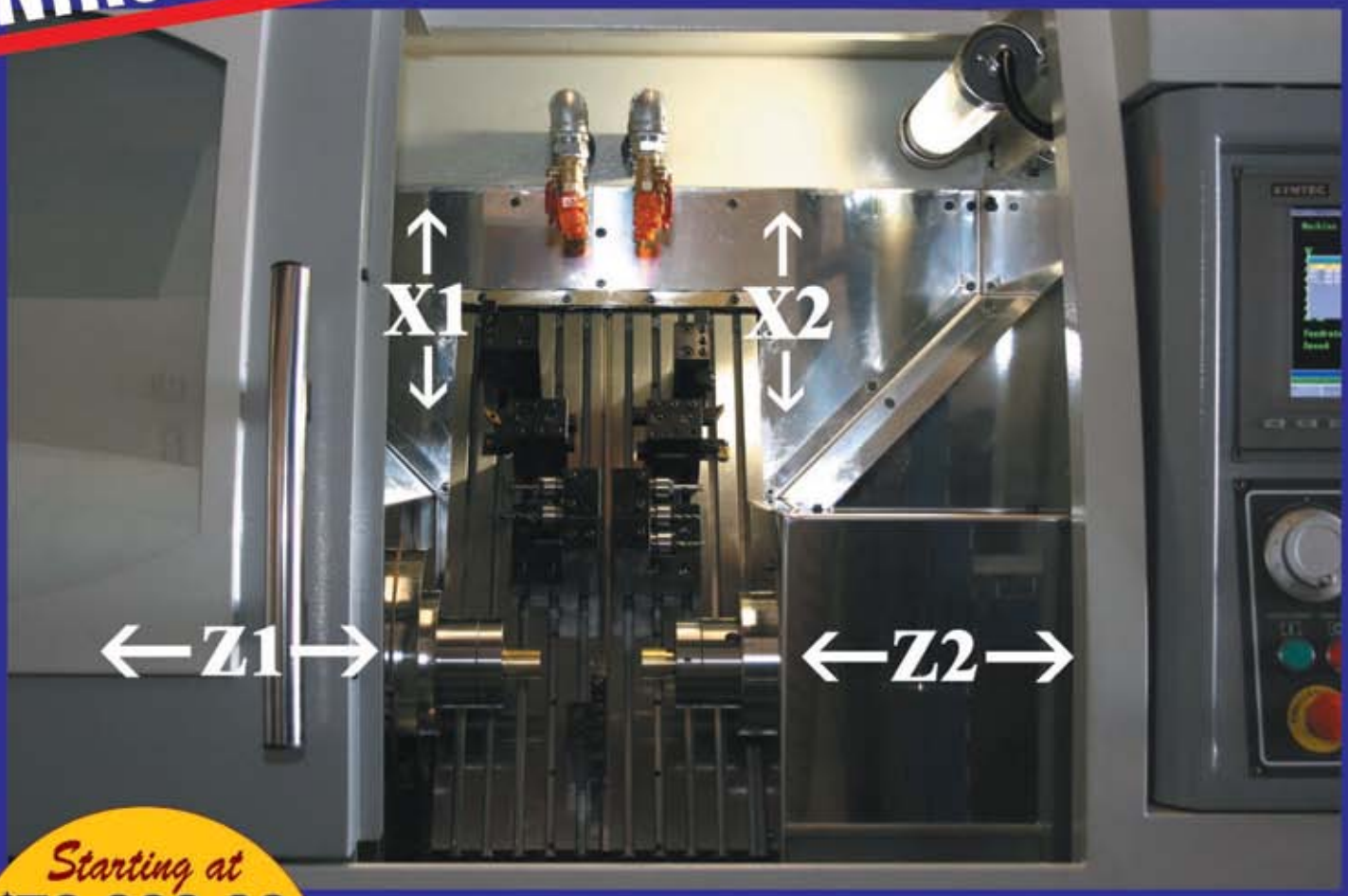

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A continuing column in which we ask smart people to discuss their views on topics related to the future of business

next

BY NOAH GRAFF

Apple iPhone

Americans have quickly become accustomed to free Internet services from Google and Yahoo! and access to free newspapers on the Web, all funded by advertising. Cell phone service providers AT&T Inc., Verizon Wireless, and T-Mobile U.S.A. all recently began offering unlimited call time for around $100.00 per month.

In 5 years will cell phone service in the United States be free?

One of the big trends in mobile communications, especially with young people, is the shift away from voice to IM and text messaging. At least with this generation, voice is the secondary form of communication between them and their friends. At the same time, voice itself has started taking a back seat to data, especially in smart phones where email, text messaging and wireless Web access are becoming the primary applications on these devices.

However, voice is not completely going away any time soon. It will always be a form of communication on phones. But it will come bundled with many more applications and data services, and in essence, within five years, it will just be part of your service plan. Since voice usage is scaled back, it might look like it is free, but it will be included in the price of wireless mobile data and applications.

Tim Bajarin
President
Creative Strategies, Inc.

My answer is no, cell phone service will not be free in five years. Why would we believe that wireless services would be free when wired services are not? It costs billions of dollars to build and operate wireless networks and the amount of bandwidth available is both limited and must be shared between all wireless customers. There might be a transition to a combination of paid and advertising support networks but it will have only just started in five years. We will continue to pay a premium for wireless voice and data services over wired services because of the costs associated with the radio spectrum and the building and operation of the networks. Those who think that access to the Internet is free, therefore all communications are free, are only kidding themselves.

Andy Seybold
Wireless Technology Consultant
Andrew Seybold, Inc.

No, but it'll be a whole lot cheaper because:

1. Competition: So many people who need cell phones already have them, so at this point the carriers have to steal customers from each other – that will continue to drive prices down.
2. Technology: It's reducing the cost per call. And new technology on the horizon will allow people to use their cell phones at home and carry the call over their home's broadband network. These "femtocells" will reduce carriers' costs, ultimately yielding reduced charges for subscribers.
3. Data: The last frontier for carriers to raise revenues is data; web browsing, text messaging, mobile TV, etc. These services are highly profitable – carriers will likely reduce voice costs to entice people into using their data services.

In the meantime, users should be happy that they don't have to purchase their service in Europe; it's about double the cost we pay here.

Scott Goldman
Consultant
"The Wireless Wizard"

the facts:

It can cost anywhere between $500,000-$1,000,000 or more to build a cell site and carriers have hundreds, sometimes thousands of them, in metropolitan areas.

The cost to obtain a new "subscriber" can be as much as **$800 for a carrier** when expenses such as marketing, additional personnel and subsidization are factored in. Carriers don't start making money until subscribers are well into their second year of service. **Scott Goldman** www.thewirelesswizard.com

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In the 1800s San Francisco saloons offered a gratis meal to anyone who ordered at least one beer. Recently **rock icons,** such as Radio Head and Trent Reznor of Nine Inch Nails, gave away their **new albums for free**. On the Internet, people take for granted services such as search (processing power), unlimited storage on Gmail and Yahoo! Mail, and bandwidth on YouTube. Wired Magazine 16.03 "Free! Why $0.00 Is the Future of Business"

Wall Street analysts speculate that Sprint Nextel Corp. will soon undercut competitors, **offering unlimited talk time** for as low as $60 dollars a month.

The Pew Internet & American Life Project found in a survey that **73 percent of U.S. adults** own a cell phone, **68 percent** have a desktop computer, **30 percent** possess a laptop, and **73 percent** connect to the Internet. **Thirty seven percent** regularly use instant messaging, and **41 percent** have sent a text message from a cell phone. cnetnews.com

By Larry Espinoza

Building a Back

If you're still among the living, you're building a back. The question is, are you building a strong back or a bad back? Check how you're sitting right now. Odds are you're either slouching or leaning forward. In either case, your lower back is probably curved forward in the shape of the letter "C."

If you work at a desk, it's possible your body is hunched forward, intent on the task at hand. Your lower spine may be rounded and bent in a forward direction for eight hours a day. When you sit back in your chair, you tend to slouch with your back in that C shape. When you stand, chances are you are bent forward. This C shape is the position most of us adopt throughout the day. It's an open invitation to a bad back.

"Your lower back is probably curved forward in the shape of the letter 'C'."

When you spend your day bent forward, the muscles and ligaments supporting your spine grow and adapt to whatever posture you hold them in most. If you hold your back bent forward, certain ligaments will become shorter, while others will become overstretched and elongated. The ligaments of your back won't be used to being forced in the opposite direction. When you call on them to stretch beyond the limits to which they've adapted, they tear – and you have an injury.

The first time may be minor. But as it heals back to your normal forward hunch position a small scar forms on what once was a healthy – if short – ligament. This scar is now stiffer than the once pliable ligament you were born with. Scar tissue shrinks over time, further shortening the ligament. Returning to your usual forward slouching position makes it more of an effort to stand up straight. When you really overstretch this shortened, stiff, scarred ligament, the tear becomes a major injury.

After a few days you may be able to return to normal activities, but you also return to your habit of bending in that C shape. This injury, when it heals, leaves you stiffer and more scarred. You may re-injure your back when you attempt to pick up anything heavy. You have literally built yourself a bad back!

There is no question that there are many causes of lower back pain and numerous factors that contribute to a bad back. It's natural to blame the most recent (or the most severe) injury for all our troubles. The truth is it's what we did before and/or after "the big one" that really put us over the top.

So what do you do now? You've unknowingly spent years building a bad back. Simple: Rebuild your back. You must begin taking steps to reverse the process. The only solution to a bad back (or neck) is to strengthen and recondition those same muscles, discs and ligaments.

The first order of business is to be aware! When we stand, we have a dominant leg which bears the brunt of our body weight. Make sure your weight is evenly distributed on both legs when standing, and on both "cheeks" when sitting. Next, anytime you burn a CD, stop at a red light or watch a commercial, suck your belly button into your spine without holding your breath, preferably while talking. Lastly, move! Walk up the stairs; take a walk on your break. The more movement in your life decreases the chance of building a bad back.

At home on the road, try these simple exercises. A carpeted floor or thin exercise mat works best. Distribute your weight evenly on your hands and knees. In this quadraped position, make a table out of your back – your spine, hips, shoulders and head should all be level. Suck you belly button into your spine without rounding your back. You should feel a stretch or tug in your low back.

While keeping your hips level, slowly slide your right leg back as far as it can go without lifting your knee – pause - then raise a straight right leg and foot. You want to keep both your hips and shoulders level. Alternate legs and repeat five to ten times. You'll feel the muscles of your low spine and shoulders working hard to keep you level.

Simple movements, simple exercises – a simple conscious effort during the course of the day – all adds up to building a better back.

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LIVESTRONG

Interviewed by Noah Graff

Scott Goldman,

also nicknamed "The Wireless Wizard," is one of the world's foremost authorities on cell phones. For the last 25 years he's been an author, consultant, speaker, entrepreneur, and trainer in the field of wireless communications. You can read his blog at www.thewirelesswizard.com.

NG: How do you rate cell phone carriers?

SG: They all have their advantages and disadvantages. The most important aspect of any carrier for someone considering purchasing a cell phone or switching a cell phone to another carrier is whether or not the coverage is adequate at your home and office. If it's not, no amount of choice in hardware, no reduction in cost, and no other tweaks to the capabilities of the phone will make it worthwhile.

NG: How are the sizes of cell phones changing?

SG: At this point, phones have already reached the minimum size that they can reach from an ergonomic standpoint. The possibility of phones getting smaller from a mechanical standpoint always exists. There are ways to make keypads smaller; there are ways to make screens smaller. You might be able to eliminate screens and so forth. The major factor in the size of the phone today is not the keypad, the screen, the casing. The major factor is the battery size.

NG: Is U.S. cell phone reception inferior to that of other countries?

SG: In terms of reception or coverage, the U.S. is probably behind many other countries, and there are reasons behind that. For one thing, the U.S. has had a terrific landline phone system for many years. In other countries, that has not always been the case. So when it was first introduced cellular service was accepted as an immediate substitute or replacement for landline service, so the demand for coverage – in-building coverage, coverage in subways and elevators, in other places where U.S. carriers have not really refined their coverage – was in demand much sooner than it was in the U.S.

Another reason is that in the U.S., there are two fundamentally different technologies in use. There's a GSM technology which is utilized by AT&T and T-Mobile, and there is a CDMA technology which is utilized by Sprint and Verizon. [Those] split the available coverage. GSM technology is available all over Europe (as mandated by governments).

NG: Can the government track where we are from our cell phones?

SG: Cellular carriers can identify where we are by where our cell phones are. There are two ways that that works. First of all, some cell phones and some carriers, such as Sprint, have a GPS component in their phone. Other phones will work on the basis of triangulation, where they will be located approximately by determining the signal strength differential between three different cell sites. You can be pinpointed within maybe an eighth of a mile or a couple hundred meters.

NG: What are you most excited about for the future of cell phones?

SG: The ability to continue to make and receive calls anywhere is still the killer app for cell phones. As coverage improves, it just makes life easier for everyone. I also think that the location-based services – the ability to know whether or not your friends are nearby, whether or not there's an ATM machine that fits your profiles nearby, whether there's an open pizza place at 11:00 at night nearby – are terrifically exciting and have a brilliant future through the use of mobile devices.

NG: Do you ever turn off your cell phone?

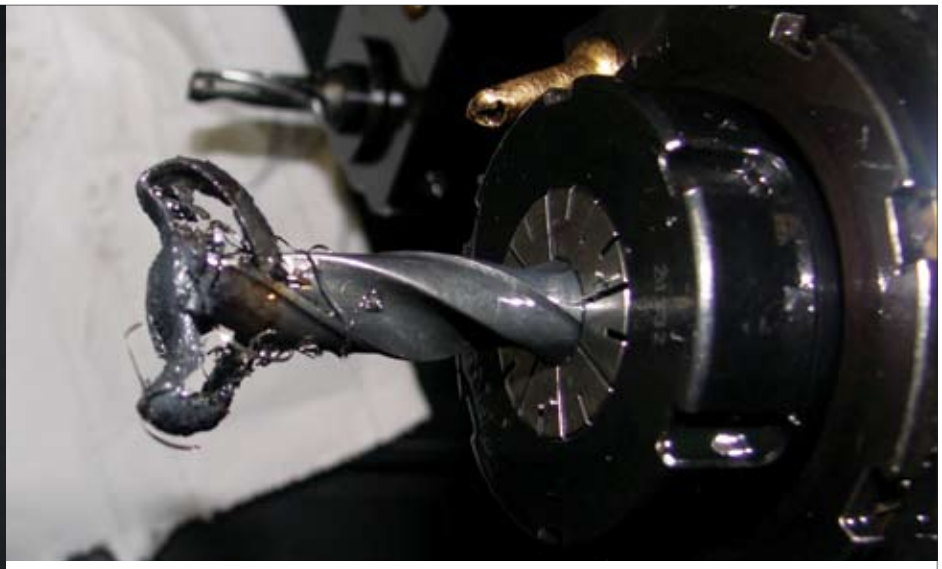
SG: I do. It's got an off switch and I use it. I'm an avid cyclist and I really cherish the time that I spend outside my office on my bike. And while I ride with friends who do leave their phones on and take phone calls while we're riding, I do not and I will not. To me answering the phone is an option not an obligation.

NG: Thanks Scott.

how it works

By Barbara Donohue

In a Swiss-style screw machine, this drill failed, starting a fire. The fire suppression system extinguished the fire before the machine was damaged.
(Photo courtesy of Firetrace International, LLC.)



No Cause for Alarm

Fire suppression and machine monitoring can help protect your machines and your profits

Whether you're running lights-out, or running with a reduced staff, any time you don't have an operator right next to a machine paying attention to it, you're taking a chance that a broken tool or some other mishap will result in a heap of bad parts, damage to the machine, or maybe even setting your facility on fire. Automatic systems designed to keep your machines safe can help you reduce this kind of risk.

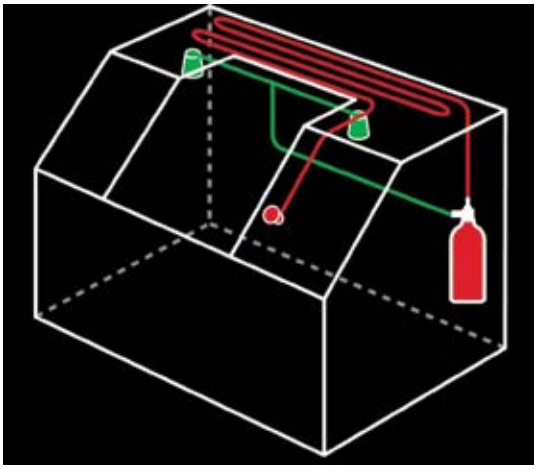
As machining centers and other CNC machines get more expensive, it makes more and more sense to invest in fire suppression and machine monitoring systems that may prevent loss and at the same time help you make the most of the equipment in your shop.

No smoking

No one wants to think about a machine catching fire, but sometimes it happens. If an operator is standing by, there's a chance to stop the machine and hit the fire with an appropriate extinguisher. But if the machine is running unattended, you could lose the machine, or even your whole shop.

A tool breaks, generates a spark, and the oil mist inside the machine ignites. Maybe you're machining titanium and some thin chips catch fire. By the time the fire and smoke escape the machine enclosure and set off the smoke detectors,

How a Firetrace fire suppression system is installed in a CNC machine. *(Illustration courtesy of Firetrace International, LLC.)*

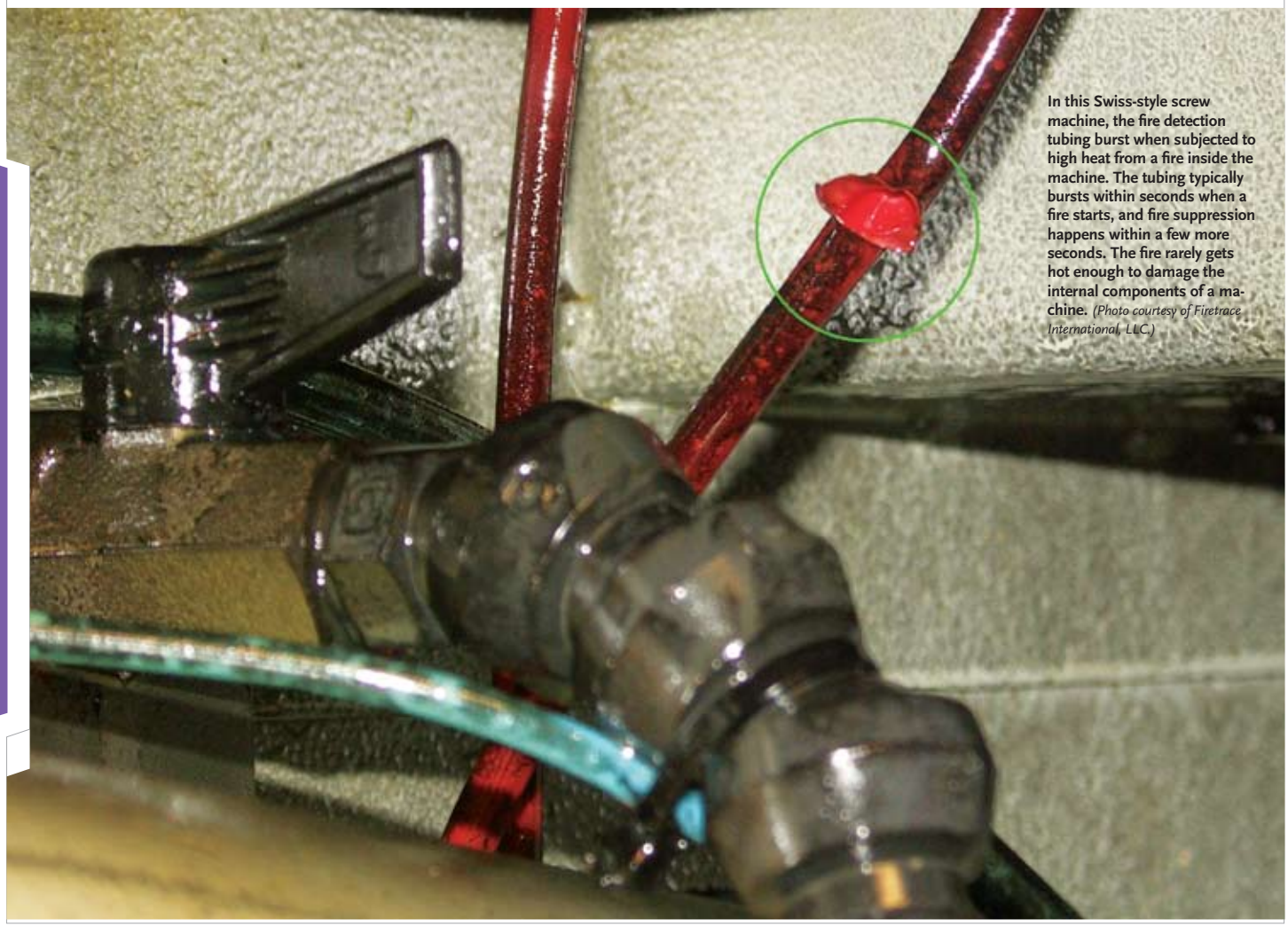


the machine may be a total loss. Then, smoke and water damage could shut down your whole shop for quite a while.

Effective, relatively inexpensive fire suppression systems are available for installation into individual machines. These can detect and extinguish a machine fire within seconds.

A fire suppression system for a medium-sized machining center might cost in the neighborhood of $3000 to $4000, installed, said Scott Starr, marketing manager at Firetrace International, LLC, Scottsdale, Ariz. Not a bad price to pay for protecting a machine that can cost hundreds of thousands of dollars.

A fire suppression system consists of a detection method and a delivery system for the extinguishing agent. In a Firetrace system, the extinguishing agent is stored under pressure in a cylinder, and is delivered inside the machine enclosure through



In this Swiss-style screw machine, the fire detection tubing burst when subjected to high heat from a fire inside the machine. The tubing typically bursts within seconds when a fire starts, and fire suppression happens within a few more seconds. The fire rarely gets hot enough to damage the internal components of a machine. *(Photo courtesy of Firetrace International, LLC.)*

how it works

piping and nozzles.

For detection, a Firetrace system uses polymer tubing installed inside the machine where fire may occur. The detection tubing is pressurized with nitrogen. The valve on the cylinder of extinguishing agent is held closed by the pressure in the tubing. When fire is present, the tubing quickly heats up and ruptures. This releases the pressure in the tubing. The valve on the cylinder opens. This allows the extinguishing agent to flow into the machine enclosure.

Your fire suppression vendor will recommend an appropriate extinguishing agent, depending on what is likely to be burning, and how often fires occur. In many cases, oil-based cutting fluid ignites and a "clean agent" can be used. A "clean" extinguishing agent leaves no residue and does not contaminate the cutting fluid. With a clean agent, the machine can be used again as soon as the problem that caused the fire is fixed and the fire suppression system is recharged.

Where a metal such as titanium would likely be the fuel, a suitable powdered extinguishing agent would be needed. The disadvantage of a powder-type agent is that after it extinguishes the fire, you have to clean it out of the machine, and change the powder-contaminated cutting fluid before operating the machine again.

The system includes a pressure switch that actuates when the detection tubing bursts. In a proper installation, the machine control is connected to this pressure switch; when the switch actuates, the control shuts down the machine. It also turns off the mist eliminator which, if left running, would

Fire detection tubing installed in a machine. *(Photo courtesy of Firetrace International, LLC.)*

An ATAM machine monitor display mounts on the machine it is monitoring. *(Photo courtesy of ATAM Systems, Inc.)*

remove the extinguishing agent from inside the machine. If you want, the machine control can also trigger an alarm within the shop, or initiate sending out an alert through a software program or messaging device.

Fire suppression can offer safety and peace of mind when you run lights-out. Even when you're running machines with operators, many consider it good practice to provide fire suppression on these costly machines

An ounce of prevention

Fire suppression is key, said Harry Kincaid, president of ATAM Systems, Inc., New Albany, Ohio, a manufacturer of tool/machine-monitoring systems. But wouldn't it be better to prevent the fire in the first place?

Machine tool monitors can detect a broken tool almost instantly, and shut down the machine before a spark or frictional heating can ignite anything.

"Our systems apply sensors on the machine to measure power, vibration," and other characteristics of the machining process, said Kincaid. The ATAM unit monitors these signals and initiates an alarm when the measured parameter goes outside signal limits set by the user. If the tool is broken, the result can be a shutdown of the machine. If a tool wears beyond preset limits, the monitor unit can send a signal to the machine control that it's time to exchange the tool for a fresh one provided in the tool magazine.

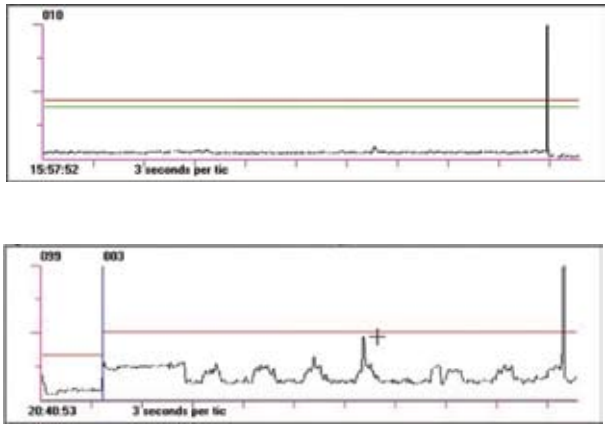
In addition to detecting dull or broken tools, a machine monitor can help troubleshoot problems, including lack of coolant during hole drilling or incorrectly fixtured parts. The ATAM systems provide a real-time, live trace of parameters such as spindle power. This enables the user to see ways in which to optimize the machining cycle. The trace makes clear how to minimize the amount of time the tool is cutting air, for example. Also, the machine monitor's event log can help diagnose problems after they have occured.

Putting principles into practice

Implant Direct LLC manufactures dental implants in the company's dedicated machine shop, where 26 Star Swiss-type screw machines run around the clock, cranking out thousands of the small, complex, titanium-alloy implants.

The current shop was set up and equipped about three years ago, specifically for running lights-out, said Joe Morales, director of manufacturing at the Calabasas Hills, Calif., company. Each machine is equipped with a fire suppression system, and a machine monitoring system from ATAM Systems, he said.

The day shift is fully staffed, and on the second shift just a few employees tend the 26 machines, Morales said. Then everybody goes home, and the machines are on their own, running lights out for the rest of the night. If a machine shuts down overnight, Morales said, "in the morning we look



Traces from an ATAM tool/machine monitoring system shows where drill bits broke. *(Illustration courtesy of ATAM Systems, Inc.)*

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Pump Runtime
Pump GPM
RUNTIME
GPM
Date
Date
Starts Ratio
Station Flow

LEFT: RACO AlarmAgent.com Web-based machine monitoring. Wireless remote terminal unit, left, and sample AlarmAgent.com screen.
(Illustration courtesy of RACO Manufacturing and Engineering Company.)

at the event log on the ATAM [machine monitoring system]" to see what happened.

On alert

If you don't want to leave a machine idle, you'll need to be notified when it shuts down.

Machine controls using a Windows operating system with Internet access can use special notification software to contact the responsible staff members by phone, pager, text message or e-mail, and deliver preprogrammed alerts or instructions.

Another alternative is to use an autodialer to make contact. Autodialers are widely used to monitor pumps and other equipment used in municipal water and wastewater systems, where public health can depend on quick response to problems at any hour of the day or night.

In the machine shop, an autodialer unit watches the signal from the machine control or machine monitor. When pre-selected events happen, such as a machine stop or a tool going dull, the autodialer makes phone calls to alert the responsible persons.

The Guard-It autodialer from RACO Manufacturing and Engineering Company, Emeryville, Calif., monitors up to four machines, and can call as many as eight phone numbers, delivering a pre-recorded message. The unit calls the numbers in a programmed sequence, and continues calling until one of the recipients acknowledges the message, said Gene Cottom, RACO western region sales manager. You can also call the Guard-It unit from any phone to receive a status report on the machines connected to it.

If you want to be able to watch what's going on in the shop from a computer anywhere, you can use a Web-based application such as RACO's AlarmAgent.com service. An AlarmAgent.com wireless remote terminal unit collects data from the machine control or monitor and communicates the data wirelessly to the AlarmAgent.com portal. To see the data, you can log on to your secure account at www.AlarmAgent.com. When an alarm occurs, AlarmAgent.com can notify responsible parties by pre-programmed voice messages to cell or landline phones, alphanumeric paging, e-mail or cell phone text messages.

Attention, shoppers

If there is someone in the shop watching a lot of machines, you may want to provide a local visual or audible alarm that alerts the operator to a machine in trouble.

Many shops use multi-colored signal tower lights – green for OK, red for stopped – which can blink or have a rotating mirror effect to draw attention to a stopped condition. A quick look at a row of machines reveals which, if any, needs attention.

Some say there's not much point to an audible alarm in a noisy, working shop, but there are self-adjusting alarms that sense the ambient sound and make themselves heard by producing a tone or siren several decibels louder than the background noise level.

Whether you're running lights-out with minimal staff, or with a full complement of operators, think about what it might cost you in repairs and lost production if a broken tool, a crash or a fire takes down a machine. You may find it makes economic sense to set up automatic monitoring and fire suppression on your machines to protect them, and protect your bottom line.

For more information

ATAM Systems, Inc., New Albany, Ohio, 614-939-2266, **"http://www.atam.com" www.atam.com**
Firetrace International, LLC, Scottsdale, Ariz., 480-607-1218, **"http://www.firetrace.com" www.firetrace.com**
Implant Direct, LLC, Calabasas Hills, Calif., 818-444-3315,
RACO Manufacturing and Engineering Company, Emeryville, Cal., 510-658-6713, **"http://www.racoman.com" www.racoman.com**

"Gone by Morning: What Happens When a Business Burns," *TMW,* March 2006
"Keeping Tabs on Your Tools," *TMW,* March 2007
www.todaysmachiningworld.com.

The following are companies who have given information on Inspection and Metrology.

product focus

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

Andrew Shemenski, Applications Engineer from Carl Zeiss IMT Corp., in Minneapolis, Minn., said, "Coordinate metrology is necessary to guarantee and verify the process capability in the production environment. Rapid technological changes and more complex parts have increased the importance of metrology in today's manufacturing industry."

HEIDENHAIN (left)

The product lines of HEIDENHAIN Corporation include linear scales, rotary and angular encoders, digital readouts (DROs), digital length gages, CNC controls and machine inspection equipment. Primary industries served are metalworking, machine tool, semiconductor and electronics, motor / drive, automation, and medical, but is useful anywhere highly dependable precision measurement and machine control is needed.

HEIDENHAIN offers not only a variety of standard interfaces such as TTL and 1 Vpp but also serial interfaces such as EnDat for interface to existing and future control systems.

For more information, please contact HEIDENHAIN at 800-233-0388 or visit www.heidenhain.com.


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Lyndex-Nikken (right)

Lyndex-Nikken's E123 features the same solid ground granite column and base construction as more expensive presettters from the Lyndex-Nikken line. The movement accuracy of both X and Z axes is guaranteed through the use of stable granite supporting surfaces. Hand wheels are incorporated for final framing of the profile in the screen. E123 Presetters feature a fixed rotating spindle that uses six mini bearings with radial concentricity error compensation. Two standard versions are available – ISO/BT/CAT40 and ISO/BT/CAT50.

The E123 is equipped with a touch-screen vision system featuring a full-color LCD screen. A C-MOS image sensor with STN screen allows accurate measuring of any kind of tool profile. Measurement is fully automatic and includes both radii and angle values. Focusing bars are included to ensure repeatability. X-Axis measuring range is 130mm (ø260mm) and Z-Axis is 360mm. Resolution is 1–5µm.

For more information, please contact Lyndex-Nikken at 800-543-6237 or visit www.lyndexnikken.com.

(below)

Sheffield Measurement

Sheffield Measurement has unveiled the Cordax Discovery III, the next evolution of their shop floor CMM product line. Mechanical design improvements and advanced geometric thermal compensation algorithms form the basis of the Discovery III performance enhancements, and is available in three measuring ranges from 20"x24"x16" to 30"x40"x24".

The main design features of Discovery III are hardened linear guides and recirculating ball bearings in place of air bearings. When combined with the new lighter weight bellows covers, Discovery III is resistant to shop-borne contaminants that resign traditional air bearing CMMs to the quality laboratory.

For more information please contact Hexagon Metrology at 860-399-1147 or visit www.HexagonMetrology.us.

product focus

Brown & Sharpe

Hexagon Metrology, Inc. has announced the release of the new Brown & Sharpe OptivTM line of multi-sensor measurement systems. Optiv systems feature optical, camera, laser and tactile probing options in a wide variety of configurations. Optiv is powered by the dimensional metrology software PC-DMIS, which brings CAD programming functionality to vision based software. Powerful offline programming capabilities using CAD, including simulated lighting, magnification and camera image, allow maximum system uptime. CAD translators and direct CAD interfaces to all major CAD formats ensure complete compatibility regardless of the native CAD system. By combining the power of CAD with the versatility of simplified editing, the user has all the benefits of a toolmakers microscope, optical comparator and CMM combined in a single measurement solution.

For more information please contact Hexagon Metrology at 860-399-1147 or visit www.HexagonMetrology.us.

Metronics (above)

Metronics Inc., has introduced Quadra-Chek 300 (QC300), a digital readout system that combines multiple video measuring functions in a single compact display unit. Metronics proprietary technology combines video display, cross line generator and automated edge detection, providing users significantly improved accuracy, increased measuring speed and reliability.

The QC300 features a large, high-resolution LCD, 2-D measurements and controls, plus integrated direct camera input that provides "live feed" video display. Parts and video measuring routines are displayed in one line of sight, on one screen. Automated video edge detection is also offered.

The QC300 has programming features such as alpha-numeric program naming, user messages, and "arrow to target" stage directions to operator.

The QC300 will also record measuring routines and store them as a program.

For more information please contact Metronics at 603-622-0212 or visit www.metronics.com.

product focus

L.S. Starrett (below)

The L.S. Starrett Company has introduced the Galileo AV1824 Video Measurement System, which offers increased versatility through its multi-sensor measuring capabilities including vision, touch probe, and laser scanning. The Galileo AV1824 provides an intermediate travel multi-sensor metrology solution ideally suited for QC labs, research, engineering and manufacturing environments.

The AV1824's color optical system provides zoom magnification of 12:1 with a programmable magnification range from 15x to 550x with auxiliary lenses. A dual output LED illuminator, ring light and coaxial illumination provides exceptional lighting. Four-quadrant high incidence angle LED transmitted illumination is also available. Other options include a Renishaw PH 6 contact probe with TP20 module, Optimet Mark III Laser Probe and a CNC rotary positioning device. The AV1824 includes industry-leading Metronics Quadra-Chek® QC-5000 3-D Metrology Software with video edge detection and full CNC control.

For more information please contact the L.S. Starrett Company at 978-249-3551 or online at www.starrett.com.

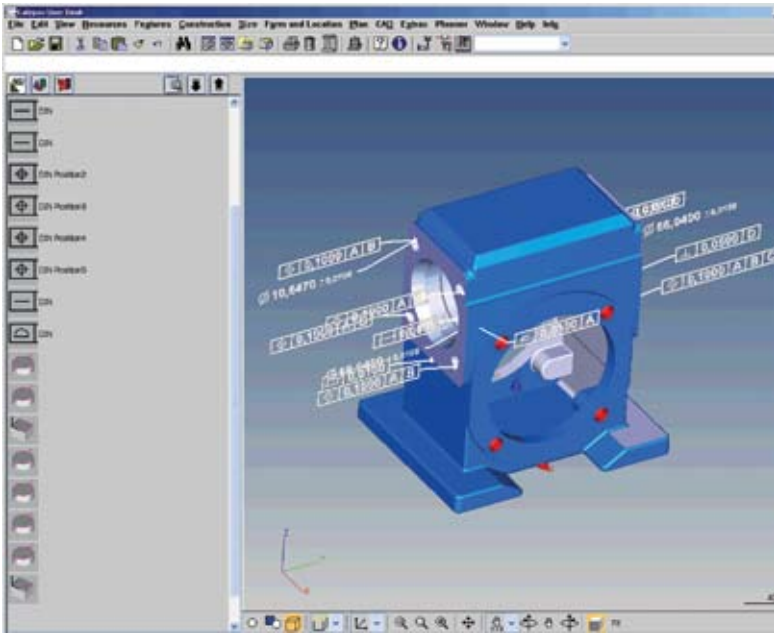
Carl Zeiss (right)

Carl Zeiss has introduced CALYPSO® 4.6, a new version of the CAD-based measuring software. CALYPSO improves combined optical and contact measuring with multi-sensor applications. CALYPSO combines several measurement strategies per geometric element in a single measurement plan.

The corresponding strategies can be stored for single-point measuring and scanning, contact and optical measuring: specifying a few points permits the fast, random inspection of a part or single geometries through single-point measuring. The specification of many points allows analytical assessments and reference measurements, primarily through contact or optical scanning.

Tolerances in the CatiaV5 and Pro/E CAD formats are transferred via a direct interface. With pre-defined measurement strategies, a click of the mouse on the given tolerance of a characteristic in the CAD model is all that is needed. All geometric elements required for the characteristic are t automatically incorporated and the measurement strategy and all travel paths generated.

For more information, please contact Zeiss at 763-744-2409 or visit www.zeiss.com.



Digital Precision Corp. (right)

Digital Precision Corporation (DPC) has introduced the OneTouch optical measuring system. The Field of View (FOV) measuring device automates the measuring process and eliminates the need for traditional gaging, keyboard or mouse. It combines standard and configurable screen overlay targets and a movable Crosshair/DRO with geometric edge acquisition tools. The pattern matching capability of the OneTouch makes part orientation fully automatic. The OneTouch features telecentric optics, a high-resolution digital camera and includes programmable illumination both episcopic and backlight which produce high quality digital images on a 20" LCD monitor. Measuring results and images can be stored in internal memory, internal CD ROM, sent via network or email, or use one of the three USB ports to send to a printer or any external source.

For more information, please contact Digital Precision Corporation at 714-379-6188 or visit www.dpccorp.com.

product focus

Pinpoint Laser Systems (below)

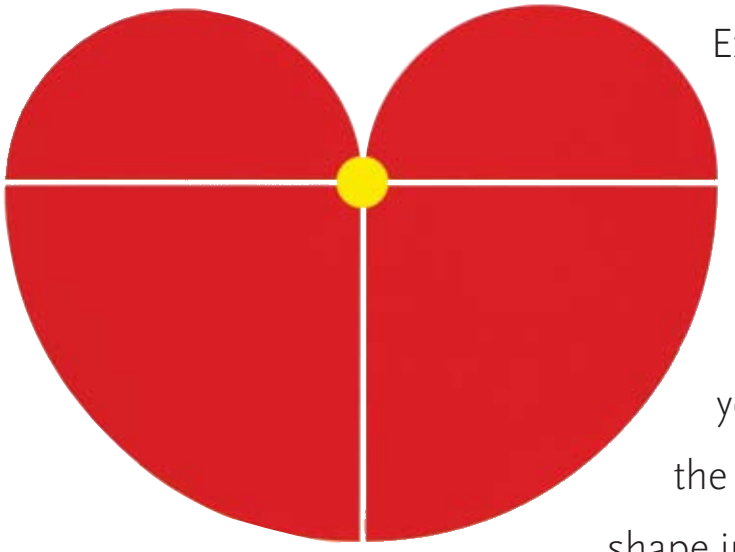
Pinpoint Laser Systems has just introduced the Microgage 2D Laser alignment tool for precision measuring, machinery alignment, calibration, and other industrial applications. The Microgage 2D combines a compact laser transmitter with a receiver and digital display. As the laser moves across the receiver in a vertical or horizontal direction the display provides a reading of the motion, accurate to 0.0001 inch. This new Microgage will operate over a distance of over 100 feet with a bright red beam. Several accessories allow for alignment of straightness, runout, parallelism, squareness, bore alignment, shaft alignment, flatness measuring, and more.

The 2-Axis Laser Microgage operates on batteries and all components are machined of solid aluminum with a hard anodized coating. A serial and USB interface connect to a laptop or PC and link to spreadsheets for plotting and analyzing data for maintenance records, customer compliance, and other uses.

For more information, please contact Pinpoint Laser Systems, Inc. at 1-800-757-5383, or visit www.pinlaser.com.

Halving Heart

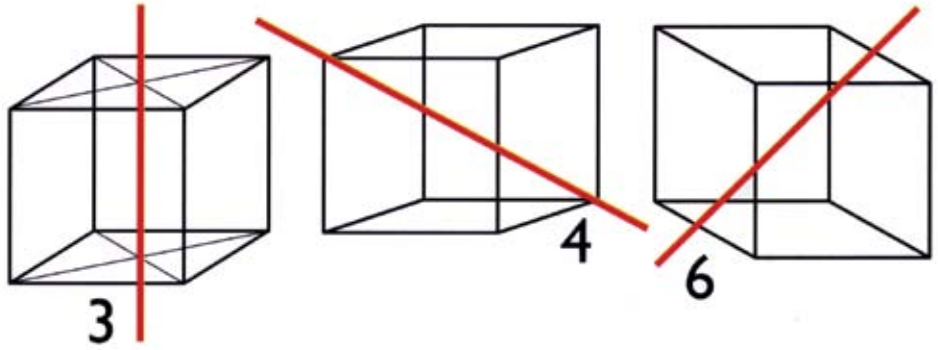
Send in your answer—quick!
Fax Jill at 708-535-0103, or email
jill@todaysmachiningworld.com



Examine the diagram of the heart-shaped figure below. Can you work out which line through the yellow point divides the perimeter of the shape into two equal parts?

Symmetry of the Cube

The cube has three fourfold axes of rotational symmetry, four threefold axes and six twofold axes. In general, having a certain number-fold of rotating axes means that if you rotate the object through part of a full rotation equal to the inverse of that number (for example, one-third rotation for a three-fold axis), you get a figure identical to the original.



Who got their symmetry aligned?

Greg Tetrick of Cass Screw Machine Products in Minneapolis, MN; **John Archibald** of Northfield Engineering Co. of Northfield, MN; **David Schardein** of Hafendorfer Machine in Louisville, KY; **Roger Stillman** of Metric & Multistandard in Hawthorne, MY: **Steve Arora** of National Distribution in Farmingdale, NY; and **Ron May** of Hunter Engineering Company in Bridgeton, MO.

postings

Noteable and newsworthy information and events for the month of June

Competitive Manufacturers Conference

Schaumburg, IL

June 17th thru June 19th

www.sme.org

2008 SME Annual Meeting: A Passion for Manufacturing

Detroit, MI

May 31 ~ June 3

www.sme.org

Manufacturing Innovations: Technologies for Oil & Gas

Calgary, AB, CAN

www.sme.org

June 9th thru June 10th

ATX ~ Automation Technology Expo East

New York, NY

June 3 thru June 5

www.satxeast.com

SkillsUSA: National Leadership and Skills Conference (NLSC)

Kansas City, MO

June 24 ~ 27

www.skillsusa.org/events/

MD&M Medical Design & Manufacturing East

New York, NY

June 3 ~ 5

www.mdmeast.com

Atlantic Design & Manufacturing

June 3~5

New York, NY

www.atldesignshow.com

Green Manufacturing Expo

June 3~5

New York, NY

www.greenmfgexpo.com

Father's Day

Sunday, June 15

First shopping cart invented

June 4, 1937

www.butlerwebs.com

calendar

WHO READS

Driven folks like **Scott Volk,** ***vice-president*** *of* ***MetalQuest Unlimited*** in Hebron, Nebraska.

Since I could crawl I've loved hot cars. I've transferred my passion for mechanical things to our shop of 19 CNC machines making product for energy distribution, hydraulics, and transportation. I read car magazines like Hot Rod and National Dragster. The only manufacturing magazine I read cover to cover is Today's Machining World.

Today's Machining World?

ad index

Today's Machining World

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CNC MACHINIST / PROGRAMMER – up to $26/hr – Houston TX area – aerospace multi axis CNC lathes, must have solid programming, CAD/CAM or Esprit is preferred

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SWISS ENGINEERING TECH – up to $70K – Hartford CT – prove out processes, R&D, program, set up, great opportunity to get into engineering, great retirement, new equip and plant

SWISS CNC MACHINIST – up to $22/hr – Houston TX area – major OEM, busy shop, growing, Star or Citizen, set up, operate, edit, great 401K – low healthcare cost, pd. education

SWISS CNC PROGRAMMER – up to $29/hr – N. Providence RI area – process, program, set up, electronics OEM, R&D, expanding shop

SWISS CNC MACHINIST – up to $27/hr – Redlands CA area – Tornos Deco exp. preferred, set up, operate, edit, programming is preferred, lrg. electronics OEM

SWISS CNC MACHINIST – up to $25/hr – Chicago IL area – new shop, new equip., great oppty., ultra modern, set up, operate, edit, major OEM

SWISS CNC MACHINIST – up to $25/hr – Phoenix AZ – lrg. OEM, sunny, outdoor activities, great relo pkg., Star, Citizen, Tsugami, set up, operate, edit

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SCREW MACHINE ENGINEER – up to $72K – Davenport IA area – CAD and degree not req., estimate, tool sketch, layout, great area for family, relo assist.

CNC MANUFACTURING ENGINEER – up to $82K + bonus – Durham NC area – production CNC's, process, program, problem solve, improve, lathes and machining cntrs, degree req., 401K vested after 1 yr., relo assist

MANUFACTURING ENGINEER – up to $75K – Detroit MI area – tool, process, layouts, fixture, process documentation, CNC, screw machine, APQP, Ppap, product launch, tier one

SWISS CNC ENGINEER / PROGRAMMER – up to $90K – N. Boston MA – medical implant OEM, expanding operation, CNC programming, process, R&D, no degree req., fantastic benefits

MANUFACTURING ENGINEER – up to $72K – HOUSTON TX area – CNC turning, multi spindle CNC lathes, swiss CNC lathes, mill / turn machining cntrs, program, tool, fixture, CADCAM, high volume

SWISS CNC ENGINEER – up to $70K – Dayton OH – major OEM, medical, orthopedics, tool, process, program, set up, 1st article, R&D, all new equip., swiss cnc lathes, fantastic benefits

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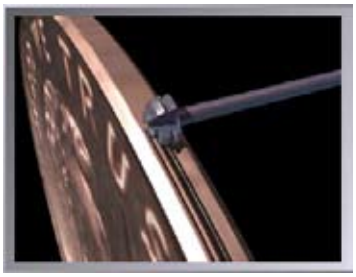

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afterthought

Keeping it Simple

Greg Maddux is one of the greatest pitchers of all time, nearing 350 wins in the Major Leagues. He is a master of pitching in almost every sense, which enables him to still win consistently with a fastball that can't break a window pane.

When Maddux was asked recently about his pitching performance on a particular night he answered very succinctly – "50 out of 73." It was the number of pitches executed perfectly, not the score, his arm, or his mood.

I was stunned by his simplicity. Though Maddux is renowned for his sophisticated knowledge of the game, his acumen in setting up hitters, and his Gold Glove fielding prowess, it is his ability to not think and just execute that marks his remarkable career.

"Business often goes to those who can see through the temptations of tricks and guile."

I am reminded of Tom Hanks' portrayal of Forest Gump. For Forest, life was "like a box of chocolates." He made up for lack of worldly intelligence with a purity of purpose and good humor.

I have observed through the years that success in business often goes to those who can see through the temptations of tricks and guile and just do the simple tasks they can understand. The most recent Wall Street debacle over mortgage instruments is a direct result of building a web of complexity that obscured the safe and simple. The derivative market was so complicated and opaque nobody could really evaluate the risky slices of potential insolvency, but the big players hoped they could buy their home in the Hamptons before the music stopped on their financial musical chairs charade.

Lean manufacturing is a noble effort to pare the tough skin off the perfect mango of proper production management. Nucor Steel was one of the earliest practitioners of simplifying the steelmaking process by using electric furnaces and scrap steel. They demolished the antiquated Bethlehems, and Jones and Laughlins who needed the constant ore boats resupplying the United Steelworkers on the featherbedded floor.

I write this piece from the vantage point of a used machinery dealer who has lived off opaque markets and challenging intrigue. Sometimes complexity is fun if you think you have the teachers' copy of the workbook with the answers in the back. But the periods of time when I've been the most successful and the happiest are when I refined the game down to its essence. "Listen to the customers. Meet their needs. Make a fair profit." Business is hard, but it isn't that hard when you keep it simple.

In my personal life I have learned, at times painfully, that clarity makes life so much easier. If a relationship is not working, state the obvious because to the other party it may not be so obvious.

Greg Maddux. Simply the best. 50 out of 73.

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