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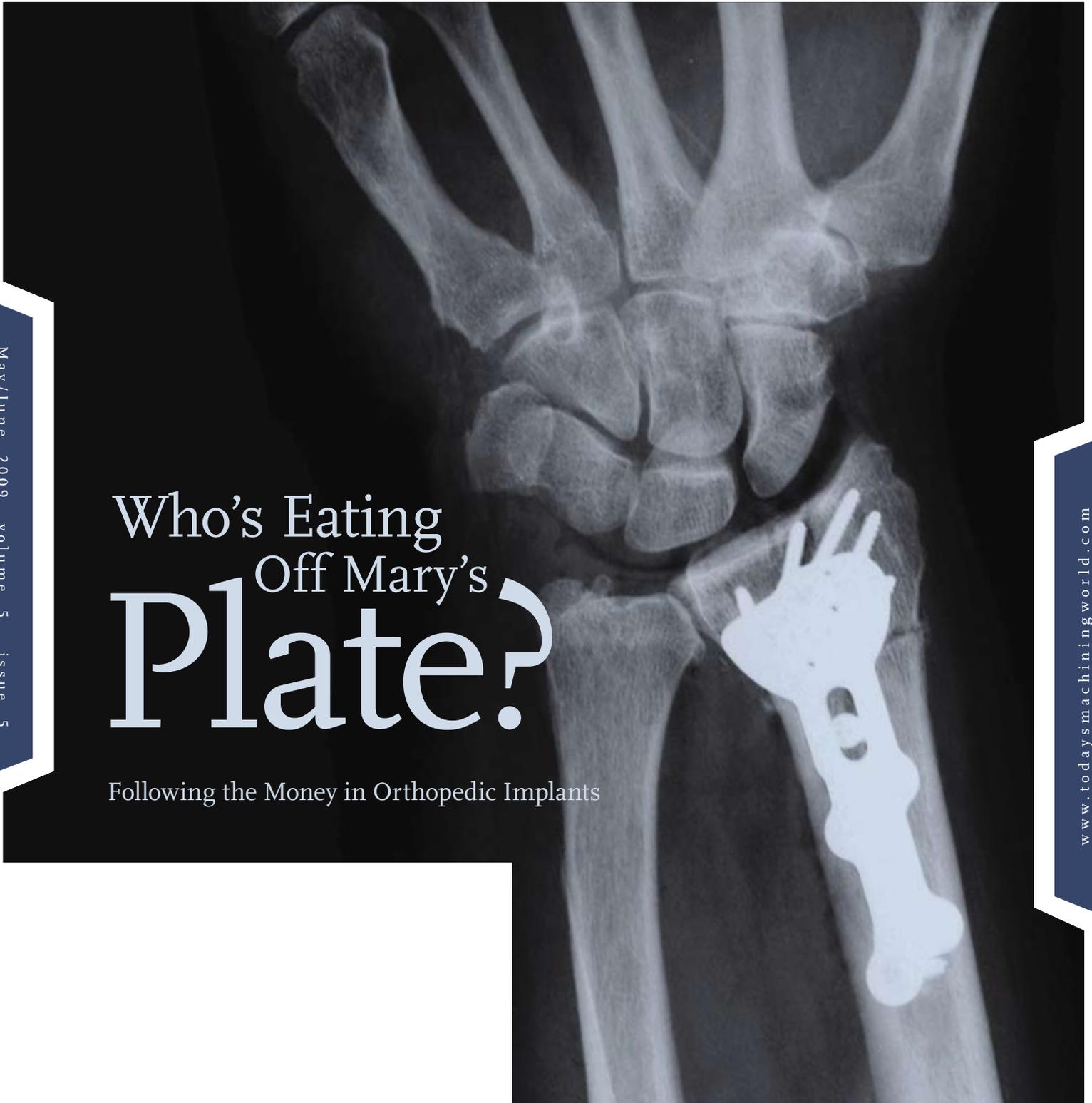
THE MAGAZINE FOR THE PRECISION PARTS INDUSTRY

May/June 2009 Volume 5 Issue 5

Who's Eating Off Mary's Plate?

Following the Money in Orthopedic Implants

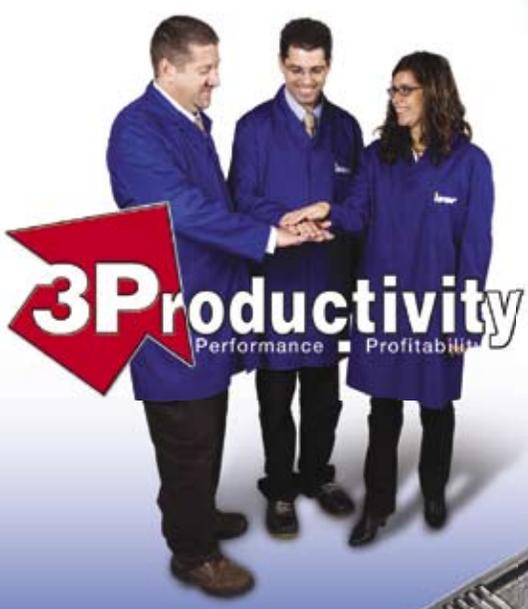
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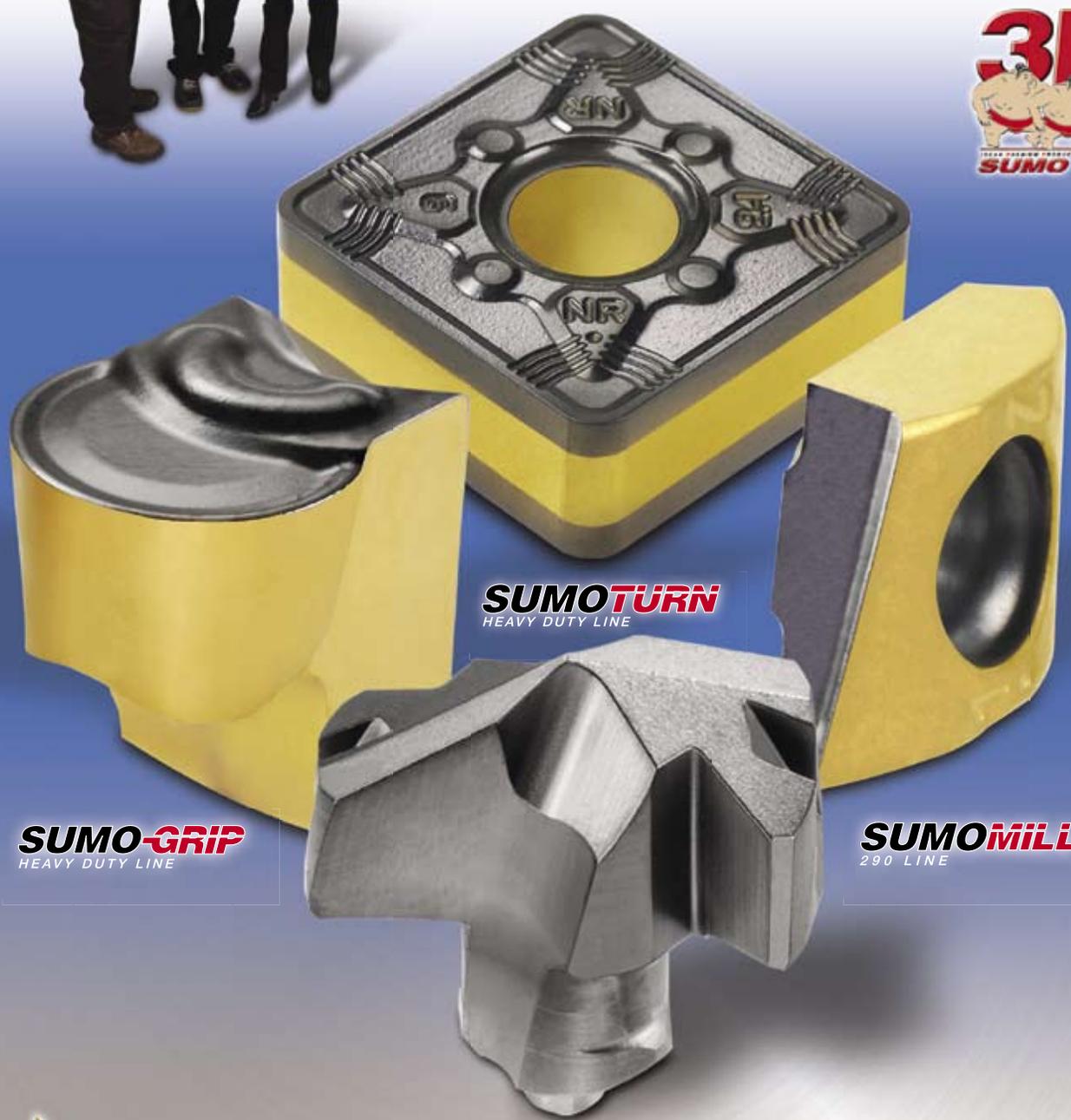


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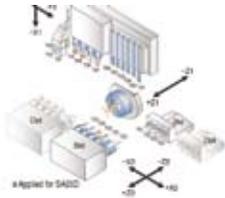
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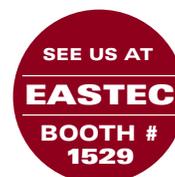


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editor's note

Seeing the Possibilities

The *New York Times* recently ran an article about the angst of the 2009 MBA class of the Wharton School of Business, the acclaimed business school of the University of Pennsylvania. The young Hog Wharts are aghast that their \$150,000 tuition bets on punching their tickets to Wall Street's temple of riches are not working out. The Street is firing, not hiring, so they will have to take their finance degree into an inner city teaching job, the military or even God forbid, the clergy. Man plans, God laughs.

I had planned for 2009 to be the biggest year in ad sales for *Today's Machining World*, but a mini depression got in the way. To deal with the advertising contraction I am cutting back on the number of issues *TMW* will be doing for the rest of 2009 from eight to four. This will save on printing and postage and also give us more time to focus on the huge opportunities to develop online video editorial content and sales video for companies in precision machining. We will distribute the videos online in an expanded "Swarf" email format sent to our growing audience of email readers. Our forays into this approach have been successful because we can be current with our own editorial material and capitalize on the visual possibilities of streaming video.

Our Shop Doc Forum online has really taken off too, creating a community for readers to help one another.

When I started the magazine nine years ago I thought that streaming video would be a core product, but broadband was slow to develop. Now we have the infrastructure in place to do quality videos quickly, and it changes the game.

It does not take a Wharton MBA to see the possibilities.

Lloyd Graff
Editor/Owner



Mary Ethridge spent 18 years as a journalist with the former Knight Ridder newspapers. She most recently covered business news for the *Akron Beacon Journal* in Ohio where she won several awards, including for her enterprise reporting by the United Nations and the Associated Press. Her work has appeared in publications across the country, including the *Philadelphia Inquirer*, *Cleveland Magazine*, the *Miami Herald*, and the *San Jose Mercury News*. She graduated from Princeton University with a degree in English literature. Ethridge is known for getting sources to spill all: Cindy Crawford once confessed to her an addiction to blueberry Pop-Tarts. Currently, her biggest challenge is coming to terms with her teenager's nose piercing.



Lloyd Graff has had a love of writing since getting his first letter to the editor published by the *Chicago Daily News* when he was 12. In high school he wrote short pieces for *Reader's Digest*. He became Sports Editor of the University of Michigan's *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. He considers the development of the magazine to be the culmination of his business and creative careers.



Tom Clouse is a freelance writer who has been living in China since 2002. He writes about a number of Asia-related topics including economics, finance, travel, music and nightlife. A native of Tennessee, he likes hiking, drinking moonshine and eating bacon. Tom hopes to one day appear in cheesy karaoke videos around the world.



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

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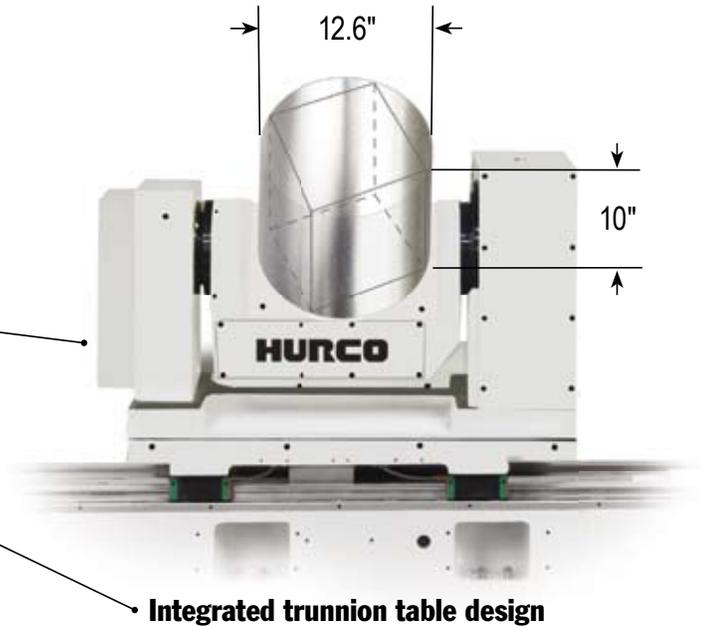
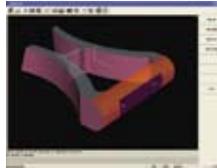
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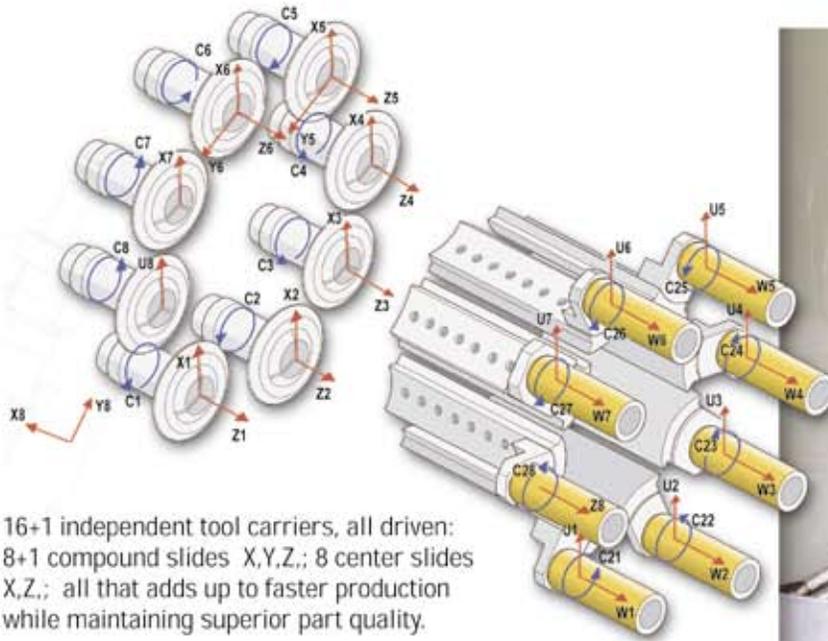
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Shop Doc Forum Question and Response

Visit www.shopdocforum.com to post a question, answer questions or read others' posts.

I work as an operator of CNC machines when I can, so I try to keep up with the industry as much as possible. I visit the various websites selling and advertising machines and notice that they usually have listed in the specifications the types of spindles that the machines have installed. They are always listed as a code number, such as A2-6 or A2-8. This has me wondering how the spindles are measured, or identified. Can someone tell me how they are differentiated, measured or identified? When I work on a vertical mill-drill, the boss usually just shows me the tool cart and tells me to use those tools. The holders look all the same to me; some may be larger or smaller than others. I see that the code is used for lathe spindles as well. Remember, I'm just an operator, with little set-up experience. I've mounted tools in holders before and set them on the Z-axis, and have used the edge finder for the X-and Y-axes. I've also done some tool setting on lathes, but this spindle nomenclature has me stymied. Thanks for the help.

-Silversteve

The spindle designations of A2-6, A2-8, etc. refer to the locating and fastening dimensions on the spindle face, used to mount a chuck, collet chuck, or other workholding devices.

From the designation you can usually make some safe assumptions about the spindle, such as bar capacity. But there are exceptions, so it's best to check the stated bar capacity with the machine tool builder.

-Dan Murphy

It might be helpful for you to know that the A2-6/8 designation is for turning machines. If you can get your hands on a Machinery Handbook, this will explain the design. In addition, you will find many other designations. When you are using milling/drilling machines, there will be other tool holding options such as CAT, BT, R-8, and many others. The standard is loose and you will eventually learn each through experience. Within each of these groups you also have collet designations—that will prove to be even more fun! I might suggest you find a tooling catalog (Kennametal, Sandvik, etc.) as they are typically full of great

information and pictures. Good luck with your search for knowledge, as this is a great industry despite what you might read!

-BigSkyCNC

Pride all Around

I read with interest, every publication of your magazine that arrives each month. I not only find your articles interesting, but also quite educational. In particular, I'm impressed with all the editorials and interviews from both within and outside the machining industry. Prior to joining the company where I'm currently employed, my experience was entirely on the cold-formed side of our business. I pay diligent attention to your articles and can admit that they've assisted me in my understanding of the screw machine side of our business. On a sales note, I must also admit that I take pride in recognizing the OEM's of some equipment shown in your magazine who happen to have their equipment assembled with the socket screw product that we manufacture domestically. The day I stop feeling that pride is the day I'm six feet under. Keep up the good work and keep those monthly editions coming my way!

Regards,

Rick Finau Sales Engineer
Kerr Lakeside Inc.
Euclid, Ohio



P.S. Although I could have emailed this correspondence to you, I instead prefer to use the U.S. mail service, at which fellow Americans are employed. I practice what I preach with regards to buying domestic!

Back to Our Roots (TMW April 2009 , page 34)

Noah,

Great interview with an old timer in our manufacturing machine trades industry. Enjoyed it much. Yes it was the MBA Weenies that screwed up most of America and it is why no one goes into manufacturing. Keep up the effort promoting manufacturing in America.

Roger Sustar

President

Fredon Corporation

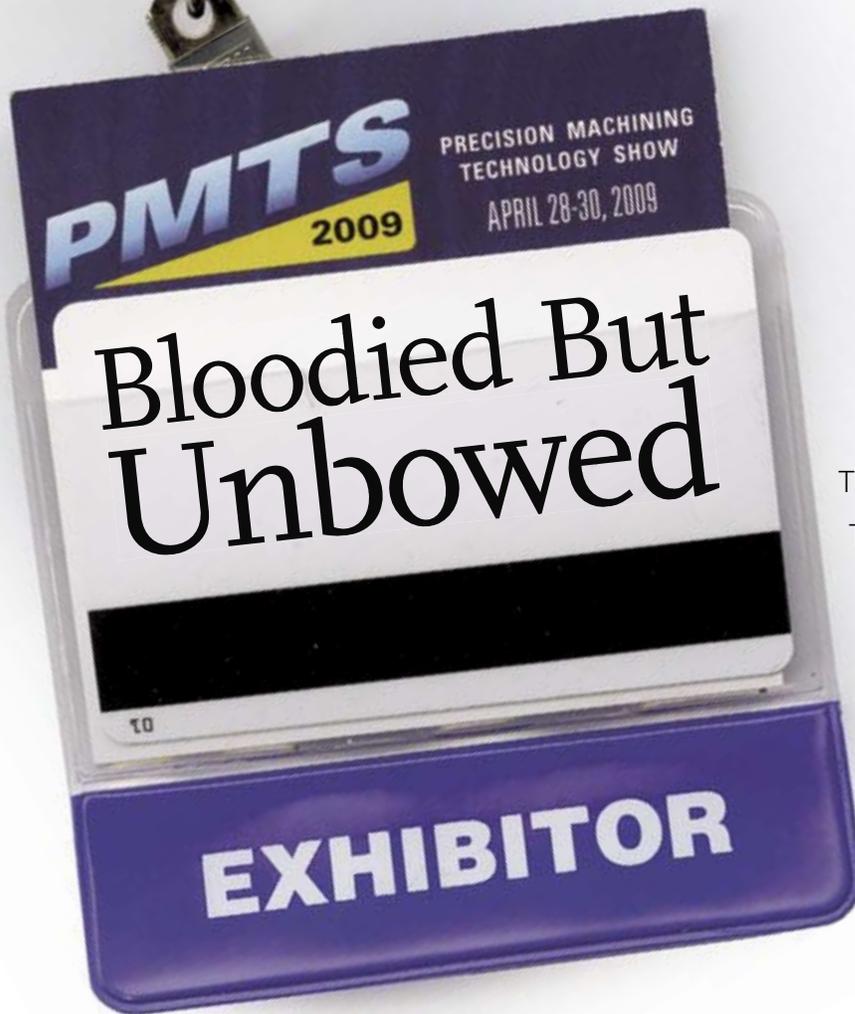
Something on your mind? We'd love to hear it.

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

Or email us at: emily@todaysmachiningworld.com or lloyd@todaysmachiningworld.com

BY LLOYD GRAFF

swarf



The Precision Machining Technology Show, held last week in Columbus, Ohio, gave me a glimpse into the current marketplace and the expectations people have for the next 12 months.

The crowd was thin all three days. The Technical Conference that preceded the Show had about 60 percent of the attendance of two years ago, yet the attendees I talked to were bloodied but unbowed. People talked about staying in the game with scared lenders and edgy customers who are blanketing them with requests for quotes.

I was surprised at how many manufacturers have gravitated into the small arms and rifle business. The gun boom shows no signs of abating and the PMTS attendees were all over it.

The mood regarding automotive was grim, especially with the Chrysler bankruptcy going down during the show. The almost universal opinion was that a General Motors

filing is coming so let's get it over with and move on. The current indecision on GM is killing the car market and making component parts ordering a nightmare.

I had a good talk with Jim Trunk of Schütte. He said the company was living off a nice backlog for now, with solid interest in several machines going forward. His clients are finding it hard to balance an expected increase in automotive ordering that they want to be ready to meet, with the skepticism of lenders and the shakiness of current demand. He believes the spoils will go to those who make the leap of faith now. The problem his clients have is knowing when, where and how far they must jump. Clarity was the one thing in short supply at PMTS.

This is the article I absolutely hate to write, because I do not believe in negativity. But I'm going to tell you how bad it is out there, so if your business stinks or you have lost your job—you are not alone.

The shops I talk to—and I talk to a lot of them—say business is down 30 percent to 60 percent from last year.

If they are automotive related it might be worse. Some machinery dealers haven't sold a used machine in months. New builders are off 70 percent in some cases. I hear Haas is producing around 600 machines a month, down from 1,200 a year ago and are faced with a big overhang of repos.

Arthur Machinery, one of the biggest distributors of new machines in Chicagoland, has fallen into bankruptcy.

Auction prices of excellent used machines have plummeted. For example a 2004, 4" Kaltenbach saw in perfect condition could not get an \$8,000 bid and was taken back by its owner. The saw sold for \$130,000 in 2004.

General Motors is going into Eleven with bumbling Fritz Henderson as the "leader."

Barack Obama is being a very Democratic president. The Republicans are in Limbaugh.

That is the depressing news of Spring 2009.

I do not want to write this piece again.

The view from Europe is probably even more negative in the machining world than in North America. Many shops in the fertile metalworking hotbed of the Haute Savoie in France near Geneva closed for Christmas and then did not reopen for most of the winter. No business, no visibility, no work. Automotive is beaten up, though the quickly enacted "clunker" trade-in edicts spurred a flurry of sales in Germany.

The precipitous drop in manufacturing was more violent after the banking blow off because business had not slowed up earlier like it had in North America. The Europeans went from a "little soft" to crisis virtually overnight.

The machine tool builders have been in freefall. The price of used machinery has tanked because buyers have gone on strike.

My gut feeling is that the North American market is starting to bounce off the bottom. The misery continues but it is generally not getting worse. Many shop owners have told me that orders are slowly beginning to recover with monthly sales rising 5 percent to 10 percent from the panic of October to February. Quoting is extremely active in the U.S. as companies retreat from China and look to take advantage of

the "new normal" in the American market. The dollar is still relatively weak versus the euro and yen, which is a competitive advantage for North Americans. In Canada the currency has fallen 20 percent against the U.S. dollar, but Ontario is decimated by the GM and Chrysler debacles.

I recently attended the Court Valve Auction in Beamsville, Ontario. The prices were weak, but every machine found a buyer except the hydraulic presses. A Davenport chucker with a Noise Tamer brought \$1,500 and a Royal Master centerless grinder could not make \$1,000. People who had money to spend could have bought a Gildemeister Sprint CNC lathe for \$20,000.

With automotive land in a state of depression, Chrysler in bankruptcy and GM likely to follow, I asked myself if I should buy a car now to take advantage of the juicy deals.

I would be a good candidate. My wife and I both drive 6-year-old Toyota Avalons with 65,000 miles on them. They have been wonderful cars with virtually no down time. They are garaged and rarely driven more than 50 miles a day. They get mediocre mileage—about 20 miles per gallon. My wife Risa and I regard cars as comfortable transportation machines. Status and driving pleasure, which are extolled in car TV ads, do not connect with us.

So why should I buy a car? One of my sons drives a 1996 Avalon which we passed on to him. It has 160,000 miles on it and mounting maintenance bills. We could pass one car down to him so he would be 100,000 miles to the better. He hesitates to buy a new car because he shuns the payments. He would rather allocate his money to lifestyle improvements, which at this moment does not mean a new car. He will drive his 1996 Toyota until it dies, though the impending "clunker" trade-in might move him to do something sooner.

The plug-in hybrid, which would virtually liberate me from the gas station trip, would push me over to buy a new car. I know this bodes poorly for the car industry, but I think there are millions of people like me who see no compelling reason to go car shopping at this moment.

I talked to Olaf Tessarzyk of ZPS America recently, and he explained his strategy of building his infrastructure of sales and service engineers in order to sell the ZPS multi-spindle screw machine line.

ZPS has moved into a 20,000 square foot building in Indianapolis, Ind. Prior to going to work for ZPS Olaf had been head of the Index operation in the U.S. Olaf says he learned from his Index experience that a machine tool builder must have service and applications prowess baked in before customers will consider the product line a viable competitor in the U.S. The Gosigers in Dayton, Ohio had successfully developed the Euroturn line over 15 years based on the reliable



Contributed by Steven Capozzola, Communications Director of Alliance for American Manufacturing (AAM)

China's Toxic Harvest: Noxious Chinese drywall believed to contain smokestack contaminants

Above: ZPS America has opened its 20,000 square foot headquarters in Indianapolis, Ind., under the leadership of Olaf Tessarzyk, formerly head of Index in the U.S.

ZPS cam machine. The new ZPS operation in Indianapolis is focusing on the CNC multi. Olaf is very proud of his new staff and is bringing over three of the top service engineers from ZPS's headquarters in the Czech Republic. An interesting prerequisite for bringing the men from Czech to the States was that they be unmarried so they could devote their full energy to the company.

This substandard drywall can be found in as many as 250,000 homes in 13 states. As homes sustain corrosion in electrical wiring, HVAC units, and even jewelry, their owners experience a myriad of illnesses and symptoms. The effects are particularly hazardous to children, the elderly, pregnant women and those with pre-existing respiratory illness.

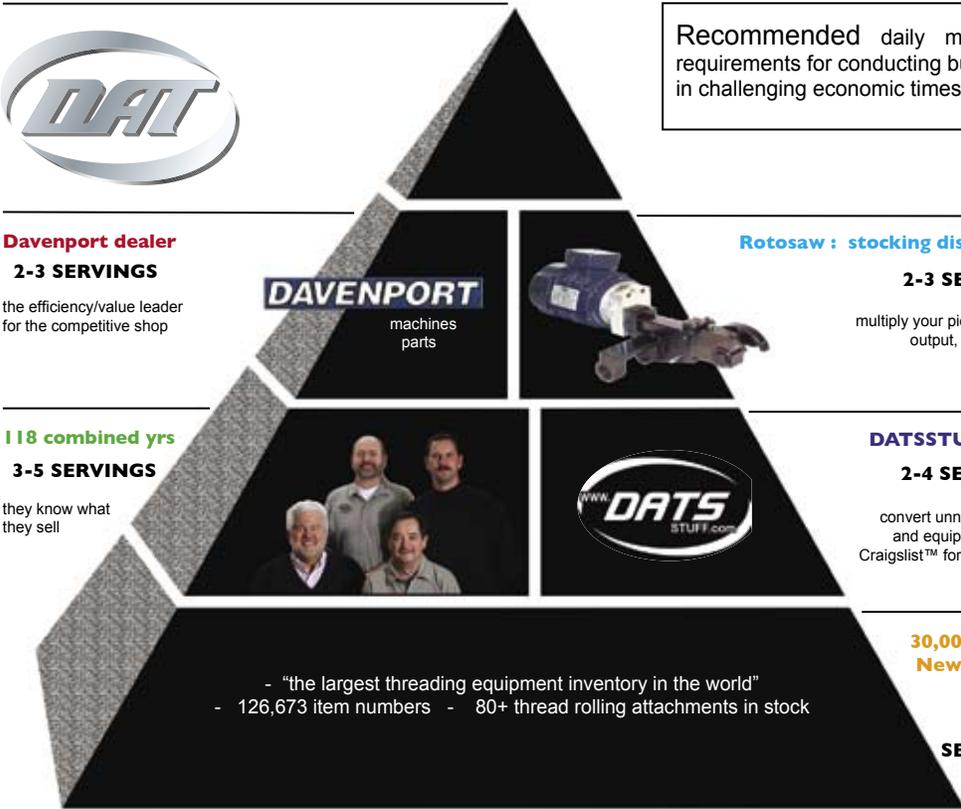
While Florida's Republican Governor Crist recently joined with Senator Ben Nelson (D-FL) and Rep. Robert Wexler (D-FL) to push both state and federal agencies to aggressively



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investigate the problem and pursue solutions, his own Lt. Governor, Jeff Kottkamp, moved his family out of their home in February as a result of drywall concerns.

According to AAM Senior Analyst Kerri Houston Toloczko, a Florida environmental consulting firm may have solved the mystery of what created toxic conditions in the drywall. "After analyzing the Chinese drywall, Intuitive Environmental Solutions believes that the gypsum used to manufacture the drywall was recycled from use as filtering material inside the smokestacks of China's notoriously polluting coal-based energy facilities," says Toloczko.

"In other words, to save the money required to produce clean drywall, the Chinese manufacturer took contaminated material from inside smokestacks, used it in the manufacture of exported drywall and sent it over here for Americans to use in their homes."

Toloczko further explains, "When this drywall meets

humidity, it emits sulfur dioxide, carbon disulfide and other 'ides' too numerous to mention. These particulates are acidic in nature, and immediately start rotting everything in their path as well as making people ill."

Each week there are new reports of homeowners leaving their homes to live in hotels, rental properties or with family to escape the leaching toxins. Many fear that replacing the drywall, in addition to materials in the home that have become corroded, could be a billion-dollar problem amidst a painful housing slump and a mortgage crisis.

"Homeowners are unsure whether repairs and alternate living arrangements will be covered by insurance. As numerous agencies failed to protect builders, contractors and homeowners from this dangerous product, in the short term, state and federal agencies should partner to assist these homeowners to find a safe place to live while long term solutions are identified," Toloczko concludes.



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BY ARI GRAFF

Kitchen Confidential: Adventures in the Culinary Underbelly

I'll admit it, I'm a little obsessed with Anthony Bourdain. This review is not exactly unbiased. My girlfriend and I love watching his television show, *No Reservations*, on the Travel Channel. In each episode, Tony visits a new exotic or not-so-exotic locale, from South Carolina to Cambodia and everywhere in-between. He finds the most authentic local food, sometimes in nice restaurants with world-renowned chefs. But usually he looks for the best street food, the local specialty. He loves to dine with the locals and will eat anything put in front of him from raw seal eyes to vintage absinthe and yak cheese. This is Tony—curious, fearless and with a profound respect for the culinary wisdom of every culture.

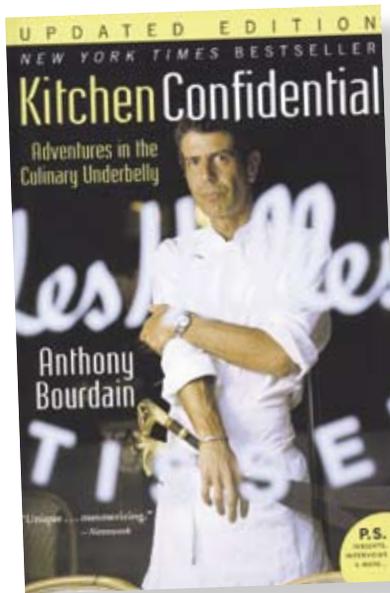
If you're a fan of *No Reservations* or you just love food—eating food, talking about food, dreaming about food, arguing about food—then you need to read *Kitchen Confidential*. This book put Tony on the map before he was ever on television. Tony didn't become famous from being a superstar chef. In fact, he was never a superstar chef. He spent 28 years going from one tragicomic kitchen disaster to another. Although he tasted moderate success at Brasserie Le Halle in New York City, in the years preceding his television career his chef career was mediocre at best. It doesn't matter, because Tony is a superstar of the English language and cuts through the pomp and pretension of celebrity chefdom with a butcher knife.

Kitchen Confidential is not a biography but a document of Tony's nearly life-long love affair with food. Although he intermittently touches on topics like his marriage and his battle with heroin addiction in the 1980s, those are mere detours from the meat of his story. He begins the book with his culinary birth—a realization in fourth grade that food could be more than nourishment or a greasy fix—it could be life changing. On a summer trip to France with his family he spent his time sneaking cigarettes, squabbling with his brother and eating a limited diet of steak-frites and Coca-cola. Fed up with their kids' behavior, Tony's parents left them in the car while they dined at *La Pyramide*, which Tony would later proclaim the “center of the culinary universe.”

Out of spite, Tony decided to try every strange French food he could get his hands on, from the most obscure organ meats to the stinkiest of cheeses. He realized that food had the power to “inspire, astonish, shock, excite, delight and impress.”

The rest of the book tells the story of Tony's adventures in the restaurant business. He has the observational powers of an anthropologist and describes in hilarious detail the characters that inhabit the restaurant universe—from the often-deluded owners to the dishwashers. He shares restaurant secrets—like what happens to the bread at your table you didn't finish and why you shouldn't eat the fish on the Sunday brunch menu. Eating out may never feel like an innocent experience again.

Tony is a complicated man and many readers will relate to him and his relationship to his profession. He is intensely proud and committed to his craft but has failed at one miserable job after another. He can be a nasty dictator in the kitchen but lie in bed at night worrying about his fry cook's financial problems. He is self-destructive with an addictive personality, constantly looking for the next high—drugs, food, sex—resulting in some truly low moments. But those same reckless personality traits are tempered by his deep belief in the importance of food. Spend some time in Tony's world and you will become a believer too.



Comments? You can email Ari Graff at LloydGraffTMW@yahoo.com.





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▲ Hardinge

The Hardinge Group has replaced the mechanical gearbox with an electronic servo motor and threading computer. This machine design configuration provides four times the power, 50 percent more torque and significantly more threading range. There's no need to purchase gears for different inch or metric threads, and left-hand threading is easier. Thread range is 0.10 mm to 6.50 mm (4.0 tpi to 250.0 tpi), and up to four multiple-start threads can be machined.

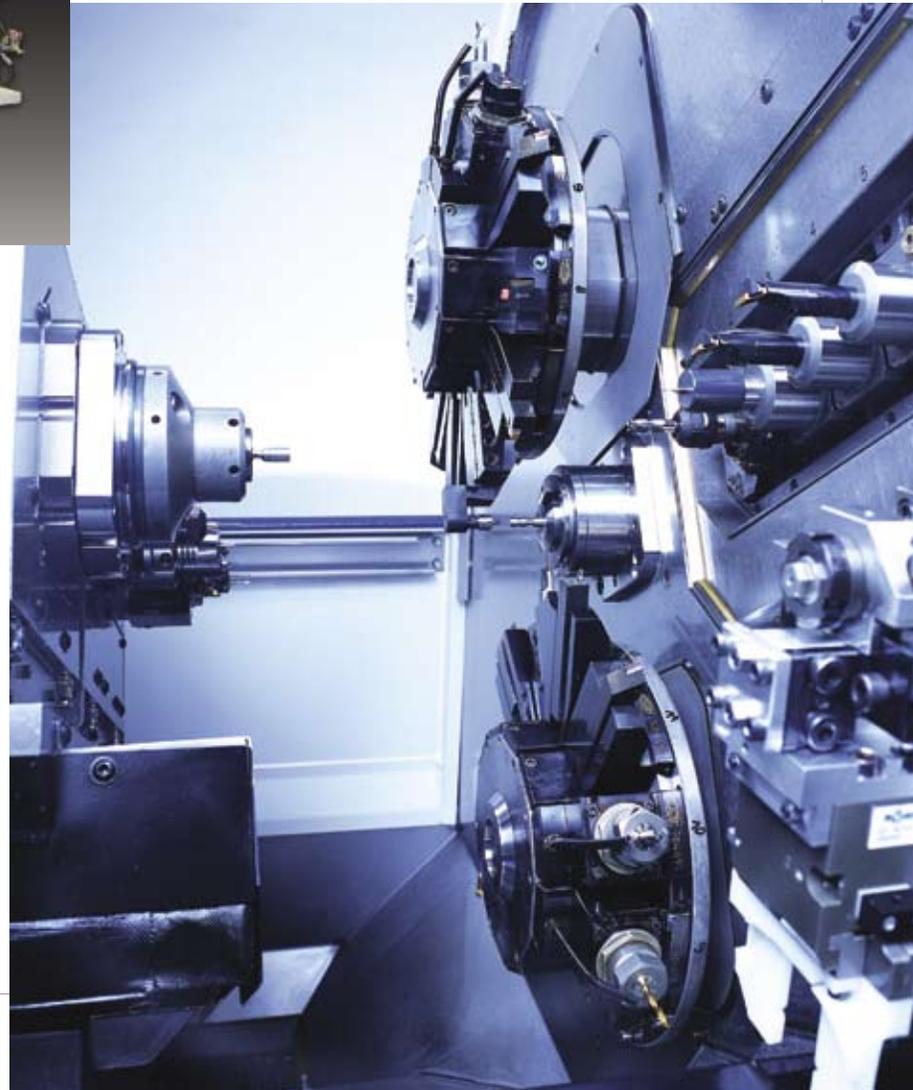
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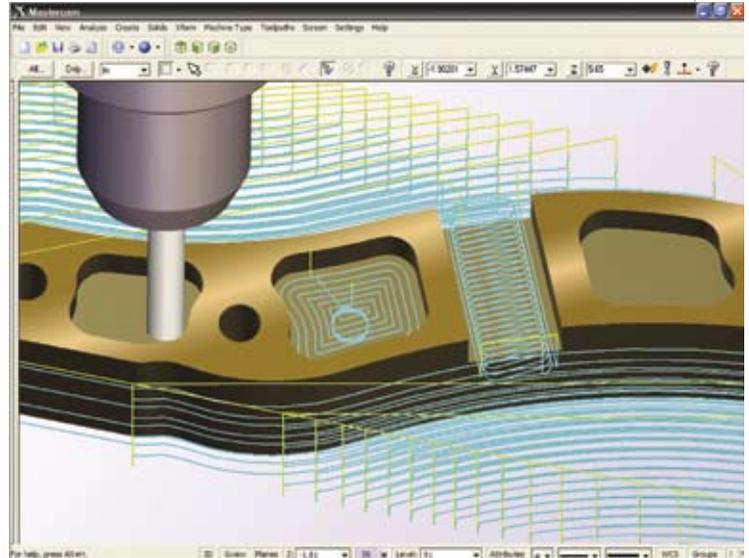
For more information, please contact Kennametal at 724-539-5000 or visit www.Kennametal.com.



Mitsui Seiki ▶

Mitsui Seiki recently introduced its new “HPX-63” 4-axis CNC horizontal machining center in North America. Some of the key design criteria include a large work size capacity featuring a swing diameter up to 1050 mm and a work height (Y-axis) up to 1050 mm. Axis stroke is 1000 mm in X-axis and 900 mm in Z-axis. The pallet size is 630 mm. The B-axis rotary table offers 12 rpm and high torque, high acceleration properties. The rapid travel rates are 32 m/min with 0.5G acceleration/deceleration. The cutting feed rate is 12 m/min.

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▲ Mastercam

Mastercam's new 2D High Speed Toolpaths aim to make your current processes more efficient and automated, while minimizing programming and cycle times. Benefits include peel milling, which peels away material layer by layer, delivering efficient constant climb milling with trochoidal-type motion and accelerated back feed moves when the tool is disengaged. Core milling cuts from the outside in, using high-speed transitions. Area milling is excellent for more complex shapes and also uses high-speed transitions, and rest milling evaluates all previous toolpaths and removes remaining material with high speed motion between cuts.

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▲ OSG Tap and Die

OSG Tap and Die, Inc. has introduced cutting edge technology for the oil and power industry with the new HYPRO®-HXL and HYPRO®-VXL taps. The HY-PRO®-HXL is designed for horizontal applications and breaks the chips into a manageable size that evacuates with normal coolant flow. The HY-PRO®-VXL, designed for vertical applications, produces longer, tightly wound chips that evacuate and break off away from the shank of the tap. These new taps effectively control chips to eliminate “bird-nesting,” while nearly doubling the tool life versus competitor taps, resulting in a cost-per-hole savings of over 55 percent.

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◀ Sumitomo

Sumitomo Electric Carbide, Inc. recently expanded the SMD replaceable carbide tip product line by adding an 8XD drill to their 3XD and 5XD lineup. The SMD nickel-plated body provides longer tool life than conventional replaceable tip drill bodies. A rigid serration coupling system affixes the replaceable carbide tips to the drill face, improving drill accuracy and repeatability.

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An X-ray of Mary Ethridge's wrist after fracturing it in five places. She required surgery to mount a contoured plate on the underside of the bone.

Photo courtesy of Mary Ethridge.

Who's Eating Off Mary's Plate?

I'd like to be able to say my health care adventure began when I was skiing in the Alps or rock climbing in Costa Rica, but the truth is not nearly as glamorous. I slipped on the ice while walking my dogs around the block on Christmas Eve day.

While I was falling everything went into that weird slow motion that precedes disaster, and I looked over at my left arm and saw it was awkwardly bent back. My hand was turned under, fingers pointing behind me and my palm up. I landed first on the top of my hand with the rest of me tumbling after.

Thus, like Alice down the rabbit hole, I was plunged instantly into the U.S. health care system bringing along a broken wrist, good insurance and much apprehension.

Fractures of the distal radius account for one-sixth of all emergency room visits, according to the American Hospital Association, but mine was an unusually

bad break. My wrist was in five pieces and an ordinary cast wasn't enough. The E.R. doctor told me I needed to see a specialist.

My insurance allows me to see any doctor I want, so I chose Akron-based Dr. John X. Biondi, said to be one of the best in northeast Ohio. I saw him the Monday after Christmas and spent that New Year's Eve marveling at my brand new body part while I waited for the surgery. It is a contoured plate that sits on the underside (or volar side) of the bone. With the help of angled screws it holds the pieces of bone together so they heal.

By Mary Ethridge

America's Broken System

With a broken wrist and lousy winter weather, I had a lot of time to watch television. Although I did see my share of Oprah and Dr. Phil, I found myself watching a lot about the efforts of politicians in Washington to reform our health care system. It is a system marked by ingenuity and skill, the kind that invented my plate and implanted it without complication. But it is also a system overrun with inefficiency and inequality, the sort that allowed me to have an operation out of reach of many others.

Total health care spending as a percentage of the GDP has nearly tripled in the last 40 years. There are more than 47 million people without health insurance in the country and millions more with inadequate coverage. As the recession drags on, the old employer-based system of health benefits is disintegrating faster than ever. Hospitals and doctors are already seeing a drop-off in patients as more people lose their insurance and put off elective procedures.

President Obama has promised to overhaul health care, but no one knows what form it will take. The uncertainty has almost fueled panic in the health care sector. The Dow Jones Medical Equipment Index fell 37 percent in 2008. Between November and December when the S&P 500 went down by about 9 percent the medical device index was down 18 percent.

What will be preserved and what will not? My broken wrist episode offered me an opportunity to take a closer look at the roles of the various stakeholders in health care. I found it akin to watching a parade through a fence, I could see it piece by piece but couldn't grasp how the whole thing moves or behaves. Health care is not known for transparency.

"You Want to Know, What?"

"Usually people don't take this much interest in their plates," a receptionist at the surgeon's office said when I asked if she knew where my plate had been made. She looked at me over the top of her reading glasses, just like my Dad used to when, as a teen, I'd pushed him too far. "I'll have to check with the doctor, tell me why again you want to know this?"

A dozen or more people would ask me that ques-



Above: RAM Precision in Dayton, Ohio, manufactures the distal radius plate in Mary Ethridge's wrist. It is one of several manufacturers across the country used by OrthoHelix to manufacture medical parts. The need to tightly control and monitor the manufacturing of medical devices like Mary's plate makes outsourcing jobs like this to China inadvisable.

tion during the course of my information gathering. Wariness and weariness seem to have replaced confidence and optimism in the health care industry. It's not really surprising given the current financial structure of health care in the United States. In the case of medical devices (such as my plate), selection, purchasing and reimbursement make their way from manufacturer to patient under the influence of various stakeholders, including hospital (or surgery center), supplier, physician, distributor, payer and patient. Each stakeholder has an agenda that is often in conflict with other stakeholders.

I began unraveling the story with the person who designed my plate. As it turned out, I didn't have to go far, just downstairs from my surgeon's office. The plate was designed by Dr. David B. Kay, a physician who, along with my surgeon and other doctors, owns the Crystal Clinic where I had my surgery.



Above: Dr. David B. Kay, a physician and part owner of the Crystal Clinic Ambulatory Center. Along with a biomedical engineering team, Dr. Kay used CAD software to develop the OrthoHelix DR Lock, now in Mary's wrist. The part comes in a tool kit, the parts needed are chosen, and everything else is sent back for sterilization and reuse.

Where My Plate Came From

I had stumbled by accident, literally, into one of many hot-button issues in health care—physician entrepreneurship. The United States has about 5,000 ambulatory service centers such as the Crystal Clinic. An ASC is a health care facility that specializes in providing surgery, including certain pain management and diagnostic services in an outpatient setting. They've seen steady growth since the first one opened in Phoenix in 1970. About 22 million procedures will be performed in the centers this year, up from 6 million in 1999, according to the Ambulatory Surgery Center Association, a trade group in Alexandria, Va. Doctors own at least part of more than 90 percent of such centers in the United States. Physician ownership accounts for two-thirds of doctor-owned centers while joint ownership with hospitals, corporations or a combination make up the rest.

Using hundreds of CT scans of wrist bones, Dr. Kay and his biomedical engineering team came up with a composite model of a wrist and used CAD software to develop the OrthoHelix DR Lock—my new body part. They created a tool kit that holds not only three sizes of plates (short, standard and long) for both left and right wrists, but also 2.4 mm screws, 2.0 mm pegs and 3.5 mm locking and non-locking screws. The screws are blunt-tipped and partially tapered at the top to prevent tendon irritation and add strength. They also include color-coded tools, such as an angled screwdriver, designed to make implanting the plate as straightforward as possible.

The plate itself is a roughly T-shaped piece of 316 LVM stainless steel, curved slightly and studded with screw and pinholes. Kay chose stainless steel instead of the titanium common in other plates because it's been shown to reduce the chances of irritation and tendon adhesion. "We had to accommodate a broad range of knowledge and surgical skills," said Kay. "No doctor has or wants to spend a lot of time struggling to master the procedure."

Surgeons pay only for the plate and screws they use from the kit and the rest is sent back to OrthoHelix for re-sterilization and re-use.

Derek Lewis, vice president of research and development for OrthoHelix, said the plate is about

\$1 worth of steel but estimates that they pay the manufacturer about \$300 per plate.

“It’s easy for people to look at this and say it’s just a piece of metal. They don’t realize the millions of dollars that went into its development—the seven engineers who spent months working on it, the machine time it takes to produce it,” he said. “Then there are patents and liability issues that add to the cost. That’s what you’re paying for.”

“We need to tightly control and monitor the manufacturing of our devices. That would be a lot harder to do if it’s manufactured in China,” said Dr. Kay.

Manufacturing Medical, Not an Easy Task

Once OrthoHelix came up with the design for the distal radius plate, they went seeking someone to produce it. The manufacturer had to be certified by the Food and Drug Administration and have sophisticated enough equipment to machine the intricate design. A microscopic flaw could mean surgical failure, complications and potentially, fines and lawsuits.

They considered manufacturers in China but found that not only were there quality and turnaround concerns, but the price wasn’t much different.

“We need to tightly control and monitor the manufacturing of our devices. That would be a lot harder to do if it’s manufactured in China,” said Dr. Kay. “Any cost savings just aren’t worth it.”

OrthoHelix uses several manufacturers across the country for its various hand and foot implants. The distal radius lock plate is machined at RAM Medical Solutions LLC, a division of RAM Precision, a second-generation family business in Dayton, Ohio.

President Rick Mount is the son of the company’s founder who started the business 35 years ago in the family garage. The company’s traditional base was food and beverage container manufacturing, but Mount felt that business was reaching its maturity and there wasn’t much room for growth. In contrast,



Above: A distal radius plate manufactured by RAM Precision in Dayton, Ohio. A plate and screws are estimated to cost between \$800 and \$1,800.

Photo courtesy of OrthoHelix.

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sales of orthopedic implants rose an average of 9 percent annually over the past five years and are expected to reach more than \$15 billion this year according to a study by the Freedonia Group, a Cleveland-based research company.

Mount started RAM Medical in 2002. It's not an easy segment to enter, Mount said. First he had to earn FDA certification, a time and money consuming process.

He expanded his production capabilities with nearly \$2 million in new machines. They include several Makino model S-56, 5-axis vertical machining centers with wireless touch probe and laser tool settings, 8- and 14-axis Swiss screw machines including a Citizen L20 Type VII 8-axis Swiss Screw machine with high pressure coolant and magazine bar feeder and Citizen M32 Y 24-axis Swiss with high pressure coolant and magazine bar feeder, and an Anca TX7 CNC tool and cutter grinder. He also enhanced his

CMM capabilities with a Sheffield Endeavor CNC CMM, and a Micro-Vu Vertex Optical CNC video and touch probe measuring system. He bought two Vibra-Hone FSV-025 tumblers, new jig and rotary grinders and a 3-5-station nitric passivation system.

"What made this kind of investment sensible for us is that our employees already had the precision skills necessary to do medical machining," he said. "The container side of our business is even more precise than the medical, so we already had the talent to handle it."

Because the OrthoHelix distal radius plate is contoured and the holes are angled, machining them is a complex process with a cycle time of nearly two hours. Mount said it would take 12 different setups per side just to do the holes if it weren't for his 5-axis CNC machines.

He said his company produces "hundreds if not thousands" of distal radius plates for OrthoHelix at

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a time. The number of machines used in a run depends on how quickly they need them.

Mount said it's hard to say whether his profit margin has improved since he took on the medical business.

"Everything we make gets plowed back into the business. We're always investing," he said. But since the launch of RAM Medical, Mount has been able to add 10 new employees and a second shift. Medical contracts now account for 25 percent of his business.

So What's the Bottom Line?

Neither Mount nor OrthoHelix was willing to reveal how much RAM Precision is paid for manufacturing the DR Lock plate. No one at the clinic was either able or willing to tell me what they paid for the plate, but Lewis of OrthoHelix said it usually runs between \$800 and \$1,800, depending on the size of the plate and screws.

Finding out what I was charged was a bit easier.

The Crystal Clinic billed my insurance company \$3,850 for the surgery, \$1,727 of which was the cost of the implant. The rest was the surgeon's fee, anesthesiology, operating room fee and medications. Insurance paid the clinic 63 percent of what it asked: \$2,457 for the entire, of which \$1,088.01 was for the implant.

My insurance company wouldn't talk about how it negotiates with suppliers, but I asked a former colleague of mine in the industry if this was standard reimbursement. He declined to talk specifics, but offered me some insights.

"There is no such thing," he said. "We negotiate differently with different providers. Some of them want to play hardball and others accept what we give. What we pay just depends partly on that."

Reporter's note: My wrist and I are well; our health-care system remains broken.



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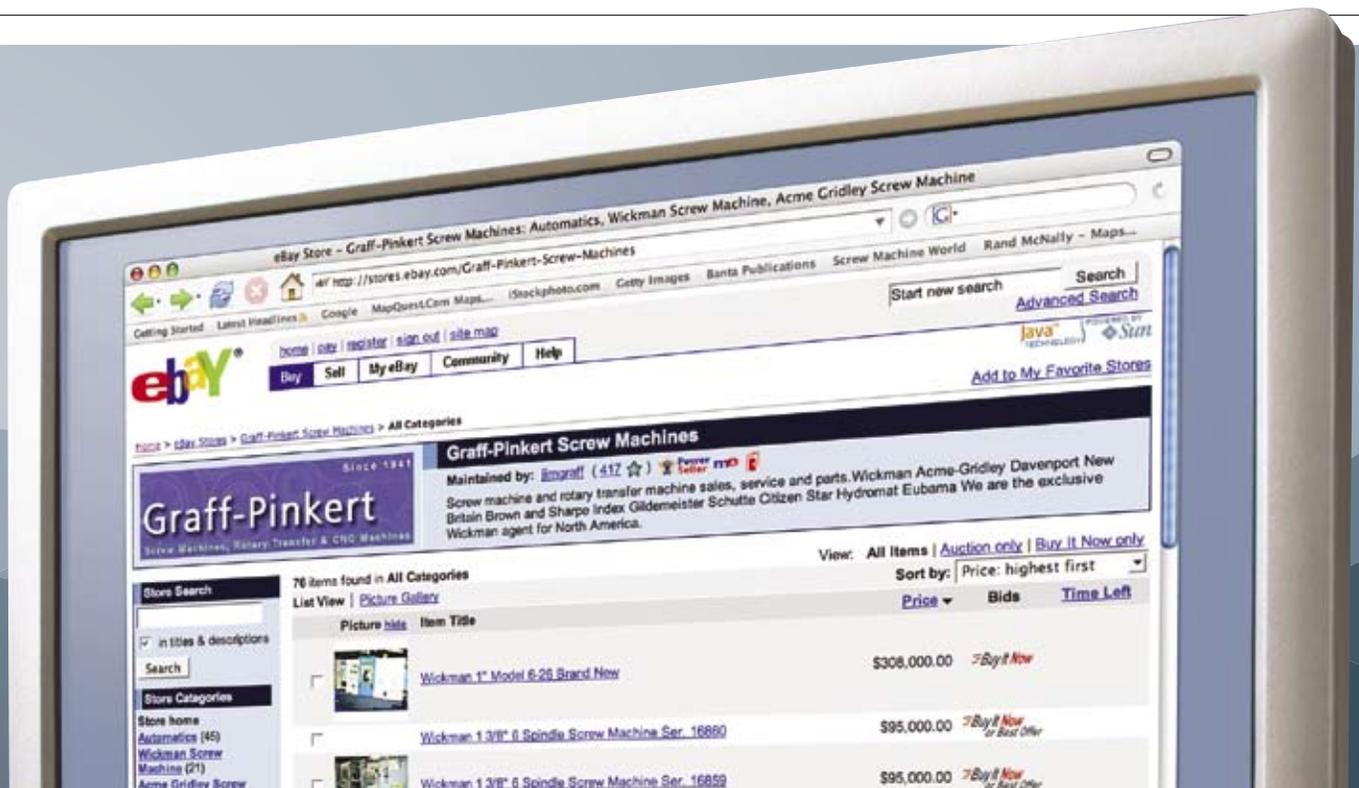
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Dear Shop Doc,

I have an older CNC Swiss with a Fanuc control that doesn't support rigid tapping. We have trouble holding consistent thread depths and also have had trouble with breaking taps when the operator forgets to set the feed rate override switch to 100 percent or if they don't pay attention when running in single block mode. Is there a better tap holder available or some other solution this problem?

Dear Holding on,

Change the way you program the tap. If the operators are able to break taps in single block or with the feed rate override setting, then you must be using G01 mode to program the tapping cycle. Instead, use a G32, which most people only consider for single point threading. Using G32 for tapping has several advantages; the feed rate override is disabled, the feed rate is more closely synchronized to the spindle rotation and the single block function is disabled while in G32 mode.

Use either a floating tap holder (tension only), or a tension/compression holder. A tension/compression holder will compress toward the shank as well as pull out away from the shank. In most applications a simple tension only or floating tap holder will give the best repeatability for tap depth.

For example, take a 20-pitch thread that is 5/8" deep. If you are not using a compression holder, you don't want to jam the tap into the work because you could cause the tap to chip or break. Instead, use a feed rate that is 90-95 percent of the pitch. To calculate the inch per revolution feed rate use the following formula: $(1/\text{pitch}) \times 0.95 = \text{IPR}$ feed rate. In this case $0.05 (1/20) \times .95 = 0.0475$ IPR. You also need to calculate your tapping depth at 95 percent since the tap will float out by 5 percent: $0.625 (5/8") \times 0.95 = 0.5938"$.

Your program should look like this:

- T2121; (Call up tool and offset)
- G97 M03 S500; (Direct rpm mode, spindle on clockwise at 500 RPM)
- G00 X0 Z-.1; (Rapid traverse tap to spindle centerline and 0.100" away from part face)
- G32 Z0.5938 F0.0475 M05; (Threading mode on, feed to a Z depth of .5938, spindle off)
- G04 P250 (Dwell for 1/4 second)
- M04 Z-.1 F0.05; (Spindle on counter-clockwise, feed at 100 percent of thread lead)
- G04 P500 (Dwell for 1/2 second)
- G00 X3.15 T0 M5 (Rapid traverse mode, "X" to 3.15", cancel offset, stop spindle)

The M05 on the first G32 line takes effect after the programmed "Z" depth is reached. Make sure you start far enough away from the face of the part to allow the Z-axis to accelerate up to speed and to accommodate any offset.

Dan Murphy
Tsunami REM Sales

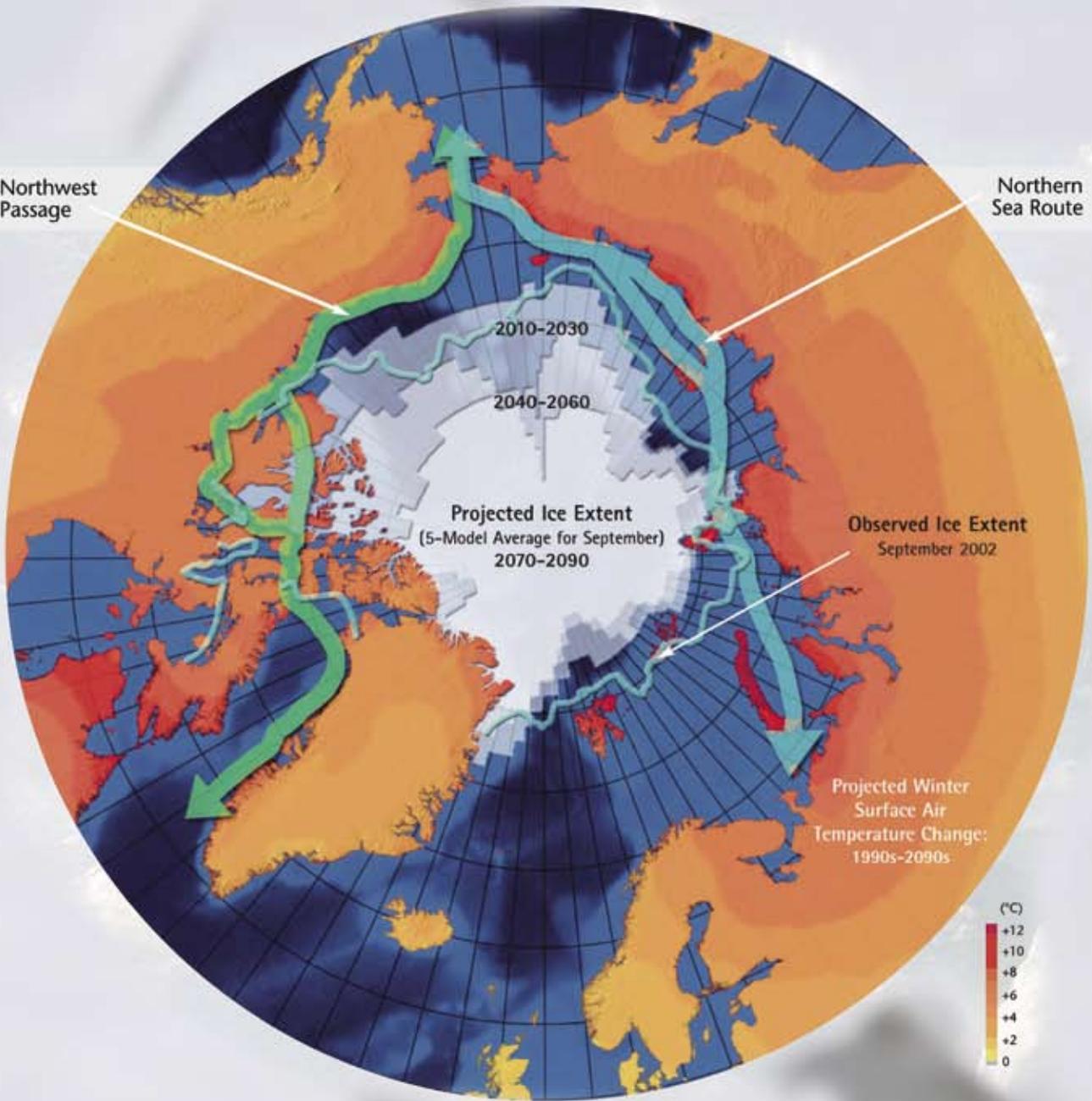
Dan Murphy is a regional sales manager for Rem Sales LLC., a U.S. Tsugami distributor. He can be reached at dmurphy@remsales.com.

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

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.

Northwest Passage

Northern Sea Route



Projected Ice Extent
(5-Model Average for September)
2070-2090

Observed Ice Extent
September 2002

Projected Winter
Surface Air
Temperature Change:
1990s-2090s



Paths of Northwest passage and
Northern sea route.

Global climate change is rapidly melting the Arctic icecap, enabling some ships to finally travel over continents, both through the legendary Northwest Passage over North America and a Northeast Passage over Eurasia. We interviewed **Dr. Rockford Weitz**, who leads the Arctic Futures Initiative, a consulting group advising businesses on how to capitalize on the effects of the melting Arctic icecap.

How viable is the Northwest Passage for shipping today?

RW: Today's Northwest Passage is not that viable. The real action is actually going to be over the Northeast Passage or Northern Sea Route (see map). The Northwest Passage could also be interesting, but it's full of islands. Ice predicting models suggest that the Northeast Passage is going to open first. If current trends continue, some scientists in the United States say that the entire Arctic Ocean could be ice-free during the summer by 2013.

If the ocean does become ice-free could shipping times be reduced?

RW: Say you're sailing from the Nagoya Port in Japan, exporting automobiles to Rotterdam, the biggest port in Europe. Your current route heads south past Taiwan through the South China Sea, around Singapore into the Malacca Strait, across the Indian Ocean, through the Red Sea, then the Gulf of Aden, around Somalia, through the Suez Canal, across the Mediterranean, through the Strait of Gibraltar, north into the Atlantic and then to Rotterdam via the English Channel. You could save more than 40 percent of that journey if you sail straight across the Arctic. And, you're not going through the Strait of Malacca or Somalia where piracy has been a problem.

How will this impact manufacturers?

RW: Think about it from a global supply chain perspective. If you have a long supply chain, you require your customers to carry more inventory in ships. Say it takes 30 days right now to go from Japan to Rotterdam, you cut that by 40 percent and reduce it 12 days. That's 12 days of inventory that your customers don't have to purchase in advance if they have a just-in-time supply chain.

An opening Arctic will also present a lot of new opportunities for manufacturers. Suppliers of components for ice-class

vessels or oil rigs, such as heating coils and de-icing equipment could see a lot of growth opportunities as the melting icecap opens the way for increased Arctic commerce.

Which countries claim to have the rights to these routes, and which ones dominate?

RW: Russia, Canada, the United States, Denmark (via Greenland), and Norway are the main Arctic players. Russia has over half of the Arctic coast, so it certainly dominates from a geographic point of view. As far as resources, a U.S. Geological Survey report suggests that over 20 percent of the world's "undiscovered oil reserves" lie north of the Arctic Circle. So far, the Russians have done more drilling than anybody else in the Arctic and they've found a lot of natural gas.

Some ships are already traveling through the Arctic passages today, correct?

RW: That's right. A few have even completed Trans-Arctic transits—they've gone across the entire Arctic. There's a lot of activity north of Russia and Norway in the Arctic, in the oil and gas industry. The world's largest nickel mine is in northern Russia, and the nickel is exported via the Arctic on ice-class vessels. Red Dog Mine, the world's largest zinc mine, is in Alaska and exports its ore by sea. Fishing is another area, and don't forget tourism. People want to see the Arctic icecap before it melts.

Are you most interested in the new shipping paths or the natural resources?

RW: I think that both have the potential to dramatically change the level of commercial operations in the Arctic. The natural resources will likely be developed first, but you can't completely separate them, because transportation of resources will most likely be maritime.



Botek Type 43A drill head. This is a BTA solid drill head with indexable inserts and guide pads. It is available in diameters from 150 to 350 mm (about 6" to 14"). Illustration courtesy of Botek USA, Inc.

Illustration courtesy of Botek USA Inc.

how it works

BY BARBARA DONAHUE

Drilling Deep

To dig a 35-foot-deep hole, you need a 35-foot drill.

You're probably accustomed to drilling holes with depths up to, say, five times their diameter, or maybe, with the latest special drills, up to 15 or even 20 times diameter. But what if you have a customer who gives you a print for a foot-long part with a quarter-inch hole all the way through 48 diameters? Then you're getting into deep-hole drilling.



A deep hole has a depth-to-diameter ratio of more than 20. It could be 1 mm in diameter and 2" deep, or a 6" hole that's 35 feet deep. One hundred times diameter is commonly done. Depths of 200 to 300 diameters are achievable, said Ed Kays, president, Kays Engineering, Marshall, Mo., manufacturer of DeHoff and Eldorado deep drilling machines. It takes some effort, but is not unheard of; it's just paying attention to details, he said.

A pull counterbore tool.

Illustration courtesy of BTA Heller Inc.

Though many consider it a mysterious process, deep-hole drilling is still metal cutting. But it poses unique challenges. It requires special tools and in many cases, special, dedicated machines.

drilling deep

how it works

Gun Drilling

For a smaller diameter hole like a quarter-inch hole a foot deep, you should use a “gun drill.”

A common type of gun drill consists of a shaft with a V-shaped groove, or flute. The cutting oil or fluid is fed through the tool to the cutting edge and exits through the V-groove, carrying the chips with it. Gun drilling is commonly used for holes in the range of 0.5 mm (about 0.020") to two inches diameter. To help keep the drill straight, you would use a drill bushing to guide it into the part, or provide a pilot hole.

Gun drilling was invented more than a hundred years ago to provide straight, precise gun barrels. It is suitable for holes from about half a millimeter (about 0.02") to 2" in diameter. Hole depths can be 100 diameters or more.

A gun drill, by its geometry, limits the area available for cutting fluid flow and chip evacuation. Typically the cutting fluid passes through one or two holes in the shaft of the drill. It exits through the V-groove, which is usually 20 – 28 percent of the cross-sectional area of the drill, says Tom Swansiger, vice president, Technidrill Systems Inc., Kent, Ohio, manufacturer of deep drilling machines. You might need 1 horsepower (hp) for cutting, but perhaps 5 hp to pump the fluid at pressures in the range of 300 psi to 2000 psi.

Dedicated gun drilling machines are available, but gun drills can also be used on conventional machines, as long as the cutting fluid pressure and flow rate are sufficient. For example, Swiss type automatic screw machines can easily incorporate gun drilling. Typical applications include hydraulic system components and medical devices, such as bone screws, said George Bursac, general manager, Star CNC Machine Tool Corp., Roslyn Heights, N.Y., manufacturer of CNC Swiss type automatic lathes. Though gun drilling tends to be a slow process, a Swiss machine can

Below: Gun drills.

Illustration courtesy of Botek USA Inc.



perform other operations while the gun drilling is going on. It's a very efficient way to get the job done, he said.

Gun drilling is perfect for some applications, but to handle larger diameter holes and provide faster cutting speeds, you'll need a different type of drilling system.

BTA or Single Tube System

In the 1930s in Germany, a new technology was developed for deep-hole drilling to handle larger sized holes, called a “single tube system” (STS) or BTA system (for “Boring and Trepanning Association”—see also “trepanning,” below).

The BTA drill consists of a drill head, a drill tube, a fluid induction unit and associated fittings and supports. The drill head has cutting edges (often indexable inserts) and passages for the cutting fluid to flow through. In addition, the head has guide pads, which ride on the newly cut ID of the hole and help keep the drill going straight. The drill head is mounted to a drill tube, which acts as both the shaft of the drill and a return conduit for the cutting fluid and chips.



Above: Star 12-axis Swiss type automatic lathe, with three turrets, allowing three tools to cut simultaneously.

Illustration courtesy of Star CNC Machine Tool Corp.



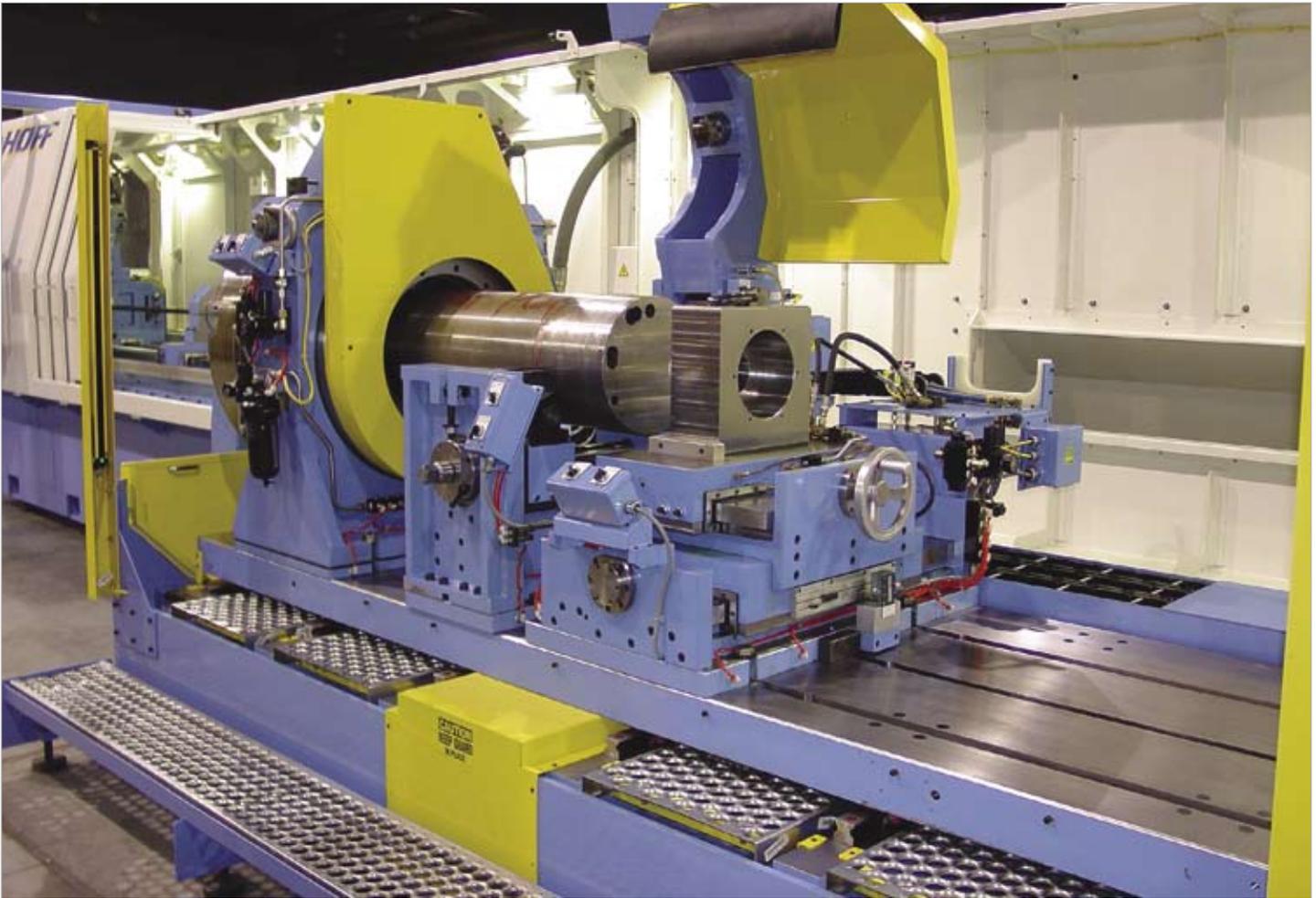
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Above: Deep drilling machine with covers retracted to show workpiece. To make oval-shaped holes, first one hole is drilled, then it is filled with a piece of bar stock and the second hole is drilled. This allows an uninterrupted cut on the second hole.

Photo courtesy of Kays Engineering.

In a BTA system, cutting fluid comes in through a fluid induction unit that seals against the face of the part. This unit also functions as a drill bushing to support and align the drill. The fluid flows in through the space between drill tube and the ID of the hole. In the cutting area the fluid picks up the chips and then flows back out through openings in the face of the drill, exiting through the inside of the drill tube.

BTA drills are used on dedicated deep-hole-drilling machines, which provide the necessary spindle horsepower and high-pressure/high-volume fluid flow. BTA systems are typically used to drill deep holes from about 5/8" to about 20" in diameter, said Jim Rose, president of Botek USA Inc., Roselle, Ill., a tool manufacturer.

This type of system will drill five to six times faster than gun drilling, said Mark Sollich, president, BTA Heller Inc., Troy, Mich., a tool manufacturer.

Ejector, or Two Tube System

The "ejector," or two-tube system, was developed by Sandvik. It does not require a dedicated deep-hole machine and can be installed on a lathe or other horizontal machine, such

as a boring mill or machining center. Two concentric tubes carry the cutting fluid and act as the drill's shaft. The cutting fluid flows into the part between the inner and outer tubes. At the cutting area, it picks up the chips, and then carries them out through the inner tube. A unique feature of an ejector system is that some of the incoming fluid flows out through a venturi arrangement, which produces a suction effect to help evacuate chips and cutting fluid from the drill.

Because an ejector system can be retrofitted onto an existing machine, it offers a relatively low cost way to provide deep-hole drilling.

Trepanning

Instead of making a hole by cutting all the metal into chips, trepanning (pronounced TREE-panning or treh-PAN-ing) removes a solid core of material by cutting around it. This is an advantage when cutting expensive alloys, as the solid core can be used to make other parts, or, if it is recycled, is more valuable than chips. The trepanning head is completely hollow, and the cutting process is similar to the BTA/single tube system, but it requires less spindle power, as it cuts less material at each revolution. Trepanning is

how it works

more common for drilling larger holes, 6" in diameter and up, said Jeff Price, sales manager, Entrust Tool & Design Co., Inc., Menomonee Falls, Wis., manufacturer of Unisig deep drilling machines.

A Black Art?

Deep hole drilling has a reputation of being a mysterious process. It is cutting metal, the same as any other machining process, but it poses plenty of challenges. The cutting is going on where you can't see it—it could be 10 feet or more inside the workpiece. Experienced operators can detect problems or changes in the process from subtle changes in sound. Load monitoring is widely used to quickly alert operators to problems.

"We've been doing deep hole drilling for a long time," said Ron Klas, plant manager, Carlson Tool & Manufacturing Corp., Cedarburg, Wis., a shop specializing in deep hole drilling. "And there are a lot of tricks to it, like grinding

our own gun drills to get them to do what we want."

Deep-hole drilling is not a black art. It's not different from any other machining. "People just don't know a lot about it," said Kays. It's the same combination of man, machine and equipment as other processes. You need to have "good equipment, good tools and pay attention to details," Kays said.

"The machines and the tooling go a long way toward making the process work," said Sollich, but "it is an art, and a good operator can make or break your process."

Price pointed out that there is no place to learn how to do deep drilling except on the job. "If we could ship an operator with each machine, we could sell a lot more of them," he said.

Chip Control

It comes down to chip control, said Klas. Cutting metal is cutting metal, even if you can't see the tool or the chip. The critical part of deep hole drilling is getting the chips out of there. Different technologies have been developed to take care of accurately cutting the metal and effectively evacuating the chips. If you don't get the chips out of there you'll ruin the tool and the part.

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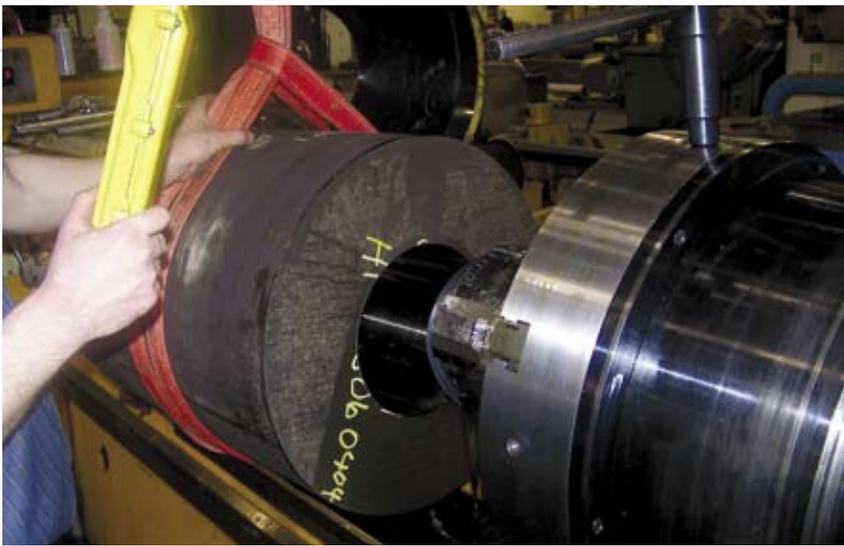
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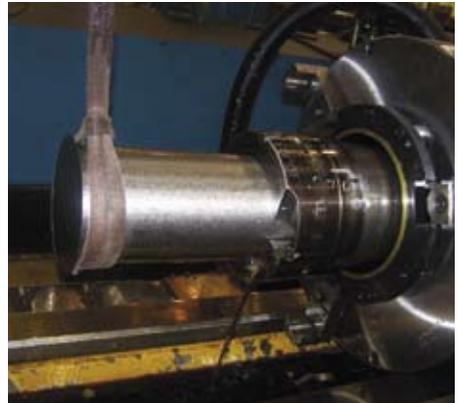
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Above: Removing a workpiece after trepanning.

Photo courtesy of Carlson Tool & Manufacturing Corp.



Above: After trepanning, the core is inside the drill. Here it is being removed.

Photo courtesy of Carlson Tool & Manufacturing Corp.



Above: The trepanning tool.

Photo courtesy of Carlson Tool & Manufacturing Corp.



Above: The trepanned workpiece and its core. The core can be used to make other parts, or it can be used for metallurgical analysis. The workpiece is 22" in diameter, the hole is 10.125" and the core is 6.84" diameter. Photo courtesy of Carlson Tool & Manufacturing Corp.

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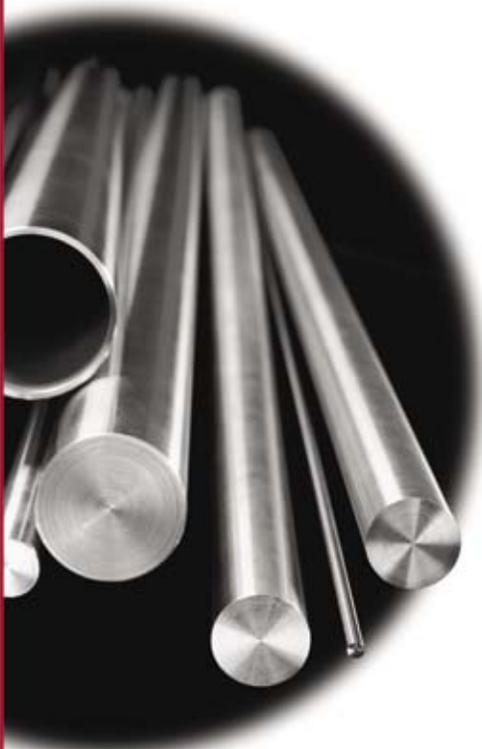
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At startup on a new part, or even a new piece, said Sollich, the operator will start with the recommended feed and speed. Meanwhile, a helper stationed by the chip exhaust port catches chips in a strainer. Depending on what the chips look like the operator makes small adjustments to produce chips that will flow well, increase feed or reduce rpm if the chips are too long, or increase the rpm to thin out the chip.

If even one chip gets stuck in the drill throat or elsewhere, it can cause a logjam of chips. The drill heats up, the piece is ruined and you have to take out the drill and dig out the chips.

So chip control is critical, and for every part you have to dial in the feed and speed to make the chips the right size and shape. Small changes in feed and speed can mean the difference between success and disaster.

Holding Tolerances

When drilling normal holes, drill wander is not usually an issue. However when you are drilling deep holes, even a little bit of deviation adds up. You can expect to hold tolerances like these for the hole's variation from centerline:

- Rotating tool/stationary part: 0.001"/inch
- Stationary tool/rotating workpiece: 0.003" – 0.005"/foot
- Tool and workpiece rotating in opposite directions: 0.001" – 0.003"/foot

If the dimensions and location of the deep hole are critical, as they often are, you have to make accommodations. One approach is to drill a slightly undersized hole halfway from one side of the part, and halfway from the other, and then use a special counterboring tool designed to be pulled through the part. If the hole location tolerance is extremely tight, you can drill the hole in the raw stock and then machine the rest of the part based on the hole location.

Drill vibration may harm tolerances and surface finish, so it is important to support the long drill to minimize this effect. The rule of thumb, Kays said, is you need to support the tool every 40 diameters, so for a 0.25" tool, you'll need a support every 10 inches, or closer for higher feed rates.

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Applications

Of course, gun drilling and the other deep-hole technologies are still used for making barrels for weapons, from small firearms to the giant guns mounted on battle-ships. And from there, the applications for deep holes diverge in every direction. Some examples:

- **Aerospace:** hydraulics, landing gear components
- **Automotive:** crankshafts, other components—lubrication holes
- **Oil drilling:** long drill tubes, other parts for downhole applications
- **Earthmoving equipment:** wheels, hydraulics
- **Marine:** large propeller shafts, drilled out to save weight
- **Medical:** bone screws, dental and surgical instruments
- **Metal processing:** heavy-wall or non-standard tubing made from bar stock, custom diameters reamed in standard tubing.
- **Plastic molding:** machines and molds—heating/cooling liquid passages
- **Power generation:** heat exchangers, boilers

Bringing Deep Hole Drilling In-house

You can always subcontract out deep drilling to a shop that specializes in it. If you find you are getting a lot of requests for deep holes, or think the capability will benefit your business, consider making the investment for in-house production.

The ability to drill deep holes can add value to your offerings and make your shop unique, said Price. “Regardless of the region of the country, there is a need for deep hole drilling. If you can fill that niche, it’ll generate work for the rest of your machining operation.”

“We’ve had more than one person buy these machines to generate work for their turning machines,” said Price. Doing your own deep drilling can shorten delivery time, he said, as turnaround time for sending out parts for drilling might be three to four weeks turnaround at a busy specialty shop.

Even a smaller machine capable of drilling a 2.5" hole 60" deep could do the trick, Price said. Bear in mind that the cost is much more than a lathe because there’s a lot more horse power, he said, and the necessary high coolant pressure and flow rate add cost.

An ejector, or two-tube system, can be retrofitted on a lathe, horizontal boring mill or other horizontal machine. This is not a simple or inexpensive process,

how it works

as the system requires a high-horsepower spindle and its own high-pressure/high-flow coolant system in addition to the drill tooling. However, installing a retrofit ejector system would be far less costly than acquiring a dedicated deep drilling machine, said Curtis Cole, drilling product specialist at Sandvik Coromant U.S., Fair Lawn, N.J., a tool manufacturer.

As of early this year, the deep-hole-drilling machine manufacturers interviewed said their business was good. Deep holes require special equipment and expertise, but the capability for drilling them could give you another value-added service to offer customers in industries that are still showing growth in these difficult times.



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Star CNC Machine Tool Corp.: www.starcnc.com

Technidrill Systems Inc.: www.technidrillsystems.com

For more information:

Deep hole drilling catalog:

www.coromant.sandvik.com/us, Click on Products > Drilling > Deep Hole Drilling > Deep hole drilling catalog

Internal profiling video:

www.btahellerinc.com/internalprofiling.php

Single-flute gun drill video:

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Today's Machining World

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I must cut off 260 mm of 3 mm spring steel generated from coil stock. The tensile strength of the steel is 200,000 lbs. per square inch. The straightness requirement is 0.005" per inch. I must make a groove at the end of the part. Quantity: 20,000 per week.

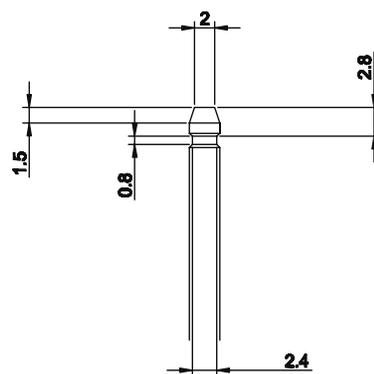
I have been told by some sources that the part can be run on an Escomatic, but others say that the part would be problematic because of its length and straightness, and it would be difficult to get tools that would last. Others say that the part should be cut off on one operation and the groove should be put on with a second machine.

I am looking to run the part on one machine but I will settle for a two-machine solution if I must. Tool life is an issue with this material so I need an optimal tooling package.

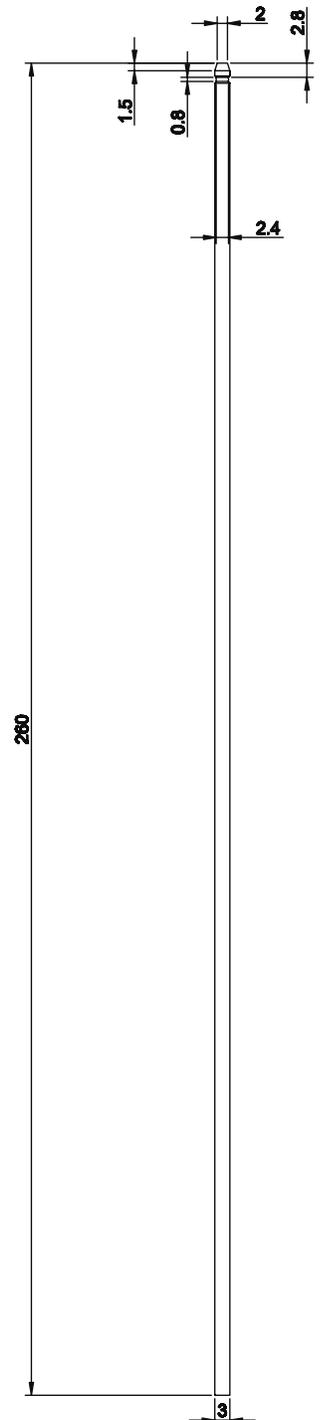
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China Bets on a Hard Eight

China's leaders have a seemingly crazy goal for their country's economic growth this year: eight percent. The goal is ambitious to say the least. The country's real estate and capital markets were cooling off months before the global financial crisis went into high gear last September, and growth slowed to 6.8 percent in the fourth quarter of 2008. Policy makers have a plan, though, which involves 4 trillion Yuan (US\$ 585 billion) in stimulus spending. But with the World Bank forecasting a global economic contraction of 1.7 percent this year, one might wonder why China's leaders are aiming so high. The answer is simple: the absolute necessity for jobs.

The explanation for China's high growth goals relates to China's development model. The Chinese economy relies on capital-intensive industries, especially those involving large state-owned enterprises and export-related production companies. These industries require big investments in facilities and machinery, leaving less money for higher wages and new employees. Thus, much of the country's economic gain winds up in physical assets rather than employee pockets. China needs growth of around eight percent, most policy makers and economists say, just to keep people employed.

“Policy makers are trying to keep financial channels open for the private companies, but their options are limited.”

The government's stimulus plan, with its emphasis on infrastructure investment, will put many people to work directly on infrastructure projects and in related industries such as steel, concrete and raw materials. With this added boost, the government may reach its eight percent goal, or at

least come close. But the investment in infrastructure, even if it provides eight percent growth, will do little to address the underlying weakness in the Chinese growth model, namely, its dependence on capital-intensive industries.

The government's plan for financing the stimulus greatly complicates the situation. The central government has budgeted only about a quarter, around 1.2 trillion Yuan (US\$ 175 billion) of the stimulus money needed. The rest of the financing must come from local governments and bank lending. But local governments are facing severe budget constraints due to the struggling property markets, which serve as their major funding sources. This leaves bank lending as the primary source for funding the country's stimulus package.

China's banking sector has undergone ambitious reform in recent years, and many banks are now listed on international stock markets. The government is now asking the country's banks, in their new market-oriented incarnations, to fund policy initiatives. They responded with a record-breaking 1.87 trillion Yuan (US\$ 188 billion) in new loans in March. For the banks, the loans are sensible because infrastructure-related industries are dominated by large state-owned enterprises (SOEs), which enjoy the implicit backing of the government. Banks can make loans to such companies with limited risk assessment procedures and expect those loans to be repaid, either by the SOEs or by the government.

Private companies, which tend to be more labor intensive, are riskier clients. The stimulus plan could then crowd out some of the funding for those companies. Policy makers are trying to keep financial channels open for the private companies, but their options are limited. Ironically, if they want the banks to maintain their market focus, government projects and SOEs are still the safest bets.

“The government is taking advantage on some fronts, investing more heavily in education, health care and pension reform.”

China's banks are in healthy shape, especially when compared to their counterparts around the world, and there may be enough funding to keep all of them afloat. But the government needs to reduce its dependence on banks as vehicles for its policy objectives. The process obscures the costs of the stimulus plan and complicates any evaluation of its progress. More importantly, the bias toward capital-intensive industries props up an economic model that is reaching the limits of its effectiveness.

The current crisis offers China an opportunity to move to a more sustainable model, one in which lower overall growth can provide new jobs. The government is taking advantage on some fronts, investing more heavily in education, health care and pension reform. Such investments will offer some employment opportunities and, more importantly, will free up personal savings to stimulate domestic demand. But to effectively address the issue, the government needs to reduce its reliance on financing from the country's banks and allow these banks to continue evolving toward their ultimate function, efficiently financing the country's private sector.



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How it Works by Barbara Donahue Broaching

Product Focus Cutting Tools

Into the World of Spare Parts by Daniel Margolis

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product focus

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GF AgieCharmilles

Eastec Booth# 1253

GF AgieCharmilles will showcase the FO 350 S, a diesinking EDM from the company's "Speed Edition" range. The FO 350 S allows users to increase productivity and enables fine, shiny surface finishes ($\leq 0.4 \mu\text{m}$) of unmatched homogeneity. With the movement speed of the Z-axis multiplied by two

(295 inch/min) and acceleration increased by five (197 in/s²), the FO350S excels in "blade" type applications and pre-roughed 3D cavities.

For more information, please visit GF AgieCharmilles at Booth 1253.



product focus



◀ The Hardinge Group

Eastec Booth #1333

Hardinge will introduce their new Super-Precision Quest CHNC turning center. Offered with a 27 mm 5C collet-ready spindle or a 42 mm 16C collet-ready spindle, the machine is designed for high accuracy and quick job changeover to meet the increasing demands of the medical, aerospace, defense and computer/electronics industries. This next generation design configuration allows the use of top plates and tooling used on thousands of previous generation CHNC machine installations worldwide.

For more information, please visit Hardinge at Booth #1333.

Toyoda Machinery ▶

Eastec Booth #1351

Toyoda Machinery will showcase technology from its horizontal and vertical machining center lines inside the Eastec booth of regional distributor, Yamazen. Toyoda's FH400J is its smallest and most economical HMC yet. Designed with a 15,000 rpm spindle, the machine is well-suited for high-speed applications. The 2.4 second chip-to-chip time delivers improved production. Its compact footprint makes the FH400J ideal for job shops and companies with limited floor space.

For more information, please visit Toyoda Machinery at Booth #1351.



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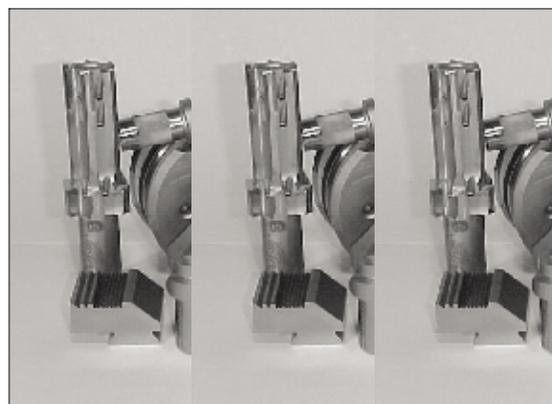


▲ BIG Kaiser Precision Tooling Inc. Eastec Booth #5244

Kaiser is introducing the new CKN modular connection—a tool connection available for large tools with lightweight aluminum components. CKN utilizes a high clamping force, three-screw connection between steel connectors and aluminum couplings, which allows for high torque transmission on large, modular tool assemblies. This new system offers weight reductions up to 50 percent with equal cutting performance compared to tool combinations made solely of steel.

For more information, please visit BIG Kaiser Precision Tooling at Booth #5244.

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product focus



FANUC

Eastec Booth #1205

The new FANUC iMed wire EDM machine is configured for continuous-duty production of parts such as aerospace components, medical instruments, and implants. The iMed is a workhorse EDM that combines high performance, low operating costs, and ease of maintenance. It uses economical brass wire (0.004" – 0.012" standard) and comes with many standard features that are options on competitive machines, including a heavy-duty anti-electrolysis power supply, an energy-saving inverter-controlled DI chiller, AC servo-controlled water level for the work tank, and state-of-the-art FANUC 310i-WA CNC.

For more information, please visit FANUC at Booth #1205.

REGO-FIX

Eastec Booth #5449

REGO-FIX® will display a lineup of Swiss quality toolholding solutions including the company's revolutionary powRgrip PG system which uses a toolholder and collet to generate the highest clamping force in the industry while still maintaining a T.I.R. of less than 0.0001".

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For more information, please visit REGO-FIX's at Booth #5449.

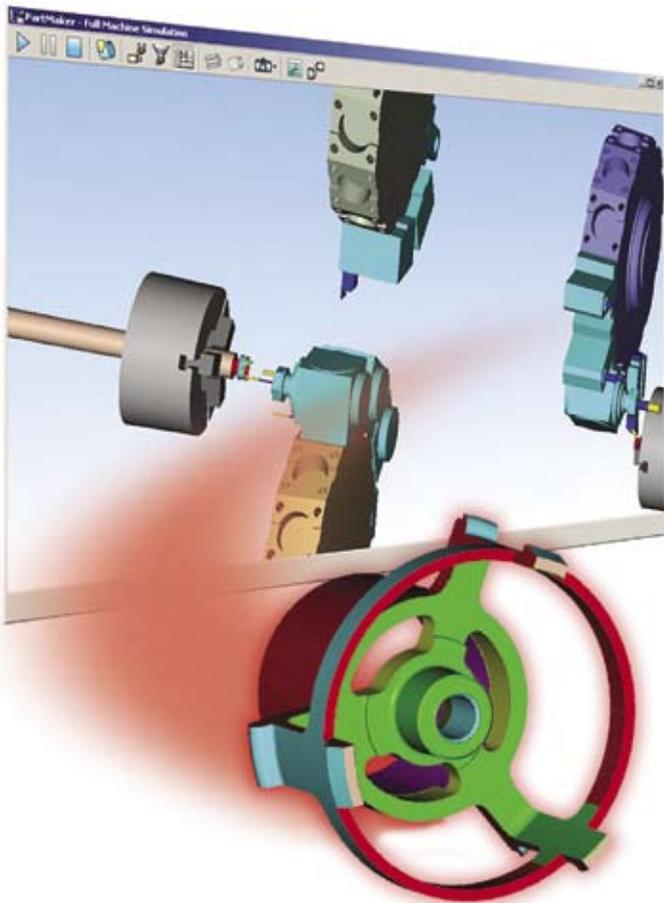


ALMCO KleanTec, Inc.

Eastec Booth #2028

ALMCO KleanTec, Inc. has expanded its line to include a spiral-bottom round bowl unit with a unique full-circle baffle that keeps parts in the media mass constantly for faster, more precise processing. The Model SBB-12, to be demonstrated at the Eastec exhibit of ALMCO's northeast representative, New England Sales, has a 12-cubic-foot, urethane-lined tub for parts protection. Other spiral-bottom models available have tub capacities of 8 and 15 cubic feet; custom-designed models can have capacities up to 100 cubic feet.

For more information, please visit ALMCO KleanTec, Inc. at Booth #2028.



PartMaker Inc.

Eastec Booth #5322

PartMaker Inc. will demonstrate the most recent version PartMaker® CAD/CAM software for CNC Mills, Lathes, WireEDM, Turn-Mill Centers and Swiss-type lathes. The improvements in PartMaker technology from Eastec 2008 to 2009 represent the single largest leap in PartMaker technology in one year since the launch of PartMaker in 1994. The latest version of PartMaker gives users the ability to carry out programming directly on a solid model. In PartMaker, a solid model can now be directly integrated into the programming window and tool paths can be assigned directly to the solid model.

For more information, please visit PartMaker Inc. at Booth #5322.

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product focus



Siemens Energy and Automation, Inc. Eastec Booth #2041

Siemens will focus on turnkey solutions for the job shop and aerospace market segments and will exhibit its newest innovations in CNC motor and drive technology as well as a new and innovative solution for CNC training. The featured SINUMERIK 840D solution line is a universal and flexible CNC system featuring the innovative SINAMICS S120 drives that can be used for up to 31 axes. It is a distributed, scalable, open and inter-connecting system offering a wide range of specialized functions for milling, drilling, turning, grinding and handling technologies.

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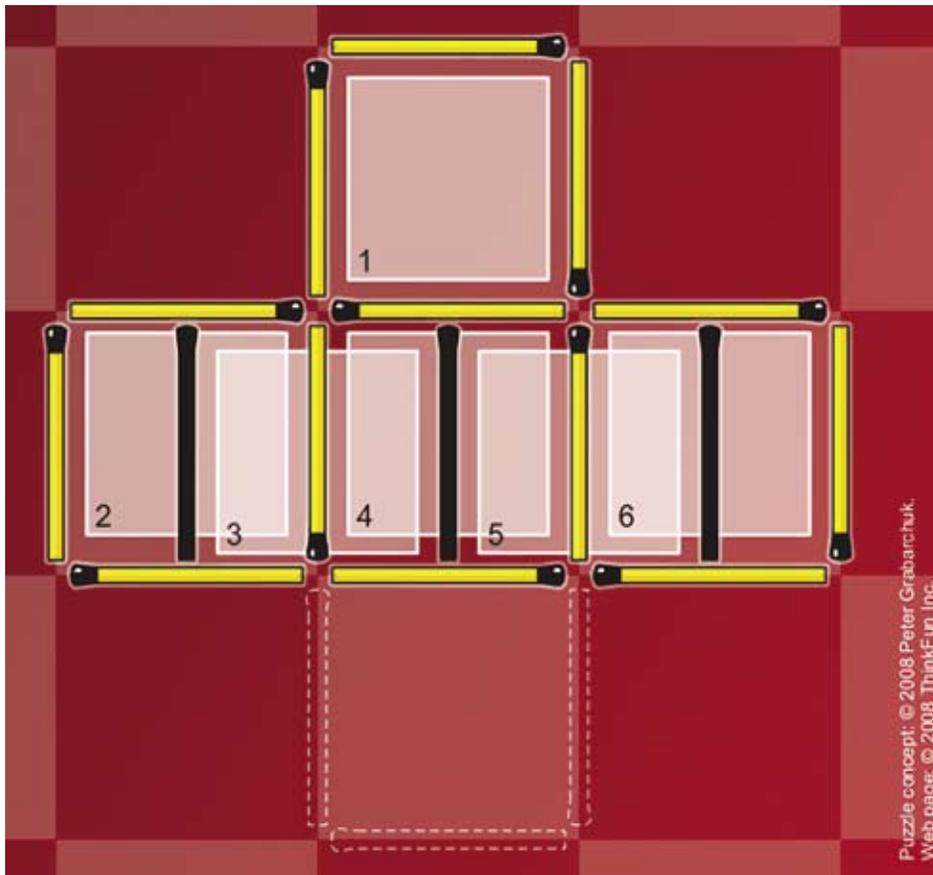
think tank



Worm Trip

A worm crawls along the edges of a box measuring 2 by 2 by 3 centimeters. What is the longest distance the worm can travel without retracing any of its steps?

Match Cross Answer



Who's on Fire?

Jimmy Hunt of Global Shop Solutions in The Woodlands, TX; **Richard M. Hanus** of Lockrey Manufacturing in Toledo, OH; **Greg Tetric** of Cass Screw Machine Products in Minneapolis, Minnesota; **Roger Stillman** of Metric & Multistandard Components Corp. in Hawthorne, NY; **Francois Cottet** of F.C. Swiss Revision in Big Bear City, CA; **George Zabele** in Elernon Center, NY; **Greg Murray** of Rhinestahl Corp. in Cincinnati, OH; **Tanner Mayhew** of Vektek, Inc. in Emporia, KS.

Puzzle found in the March 2009 issue

postings



Noteable and newsworthy information and events for upcoming months.

Manufacturing Education Transformation

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June
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www.sme.org

Precision
Machine Design

Revere MA USA
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www.sme.org

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Design &
Manufacturing Show

June 9th thru 11th

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www.devicelink.com/expo/at109/

Green
Manufacturing
Expo

Charlotte,
North Carolina

June
9th & 10th

www.devicelink.com/expo/at109/

Six Sigma
Conference

June 16th
to the 19th

Scottsdale, AZ

www.issp.com/lc2009.asp

The Game
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June 30, 1933



Happy Birthday
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July 30, 1863

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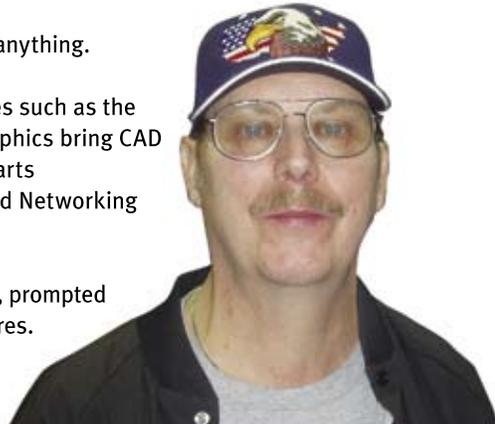
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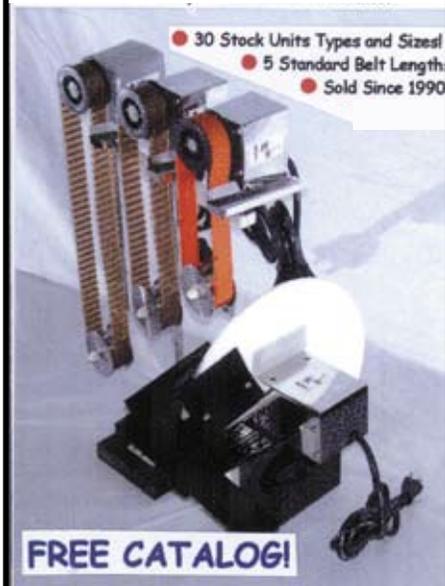


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Stay in the Game

I talk to owners of manufacturing firms and the companies who service them and most people are singing the blues. Big news. The mood is sober at best and often profoundly depressed.

I find myself getting caught up in sadness and negativity, knowing in my cognitive brain it is unproductive. But unfortunately, my gut does not think. Pain is contagious. When I talk to negative, depressed folks all day, I fall into the trapdoor of sleepless nights and joyless days. Self-doubt is easily reinforced by the newspapers that reflect their own failing businesses in their headlines.

“When I’ve been hot I’ve been more connected to positive people than when I’ve been cold.”

I feel like I am bouncing on an emotional trampoline every week. A glimpse of good news lifts me 10 feet high, only to quickly fall to the elastic cords. I know that everybody has their moods, but I not only experience them, I monitor and assess them. My ups and downs are constant companions living like organs in my body.

As I look back on my business career and my creativity paths I see constants during my growth spurts. When I’ve been hot I’ve been more connected to positive people than when I’ve been cold.

For close to 20 years I had a friend and mentor named Bel Small. Bel was a contemporary of my father’s, starting up in the machinery business after World War II. He built a successful used machine tool operation capitalizing on his brilliant analytical talents. In the early 1980s he had a big fire at his warehouse in Chicago and decided to exit the inventory business to do consulting, appraisals and investment counseling. He was a self-taught investing guru and was able to sustain his lifestyle without the machinery business.

Bel and I became very close friends. I met him for lunch once a week and talked to him on the phone often. After he moved to Florida we conversed by phone at least twice a week. Talking to Bel was business therapy. We discussed the problems of the day, and he helped me through the friction that heats up the life of most family businesses.

I know my father was jealous of the close bond I developed with Bel, but he was smart enough not to disrupt a relationship which was obviously helping our business. I used Bel to forge consensus between my Dad, my brother Jim and myself. His clarity always helped clear the fog of doubt.

Bel Small died about 10 years ago at 80. I’ll never forget the moment he told me on the phone that he was terminal. I was devastated, though not shocked because the sounds of lung cancer had been evident.

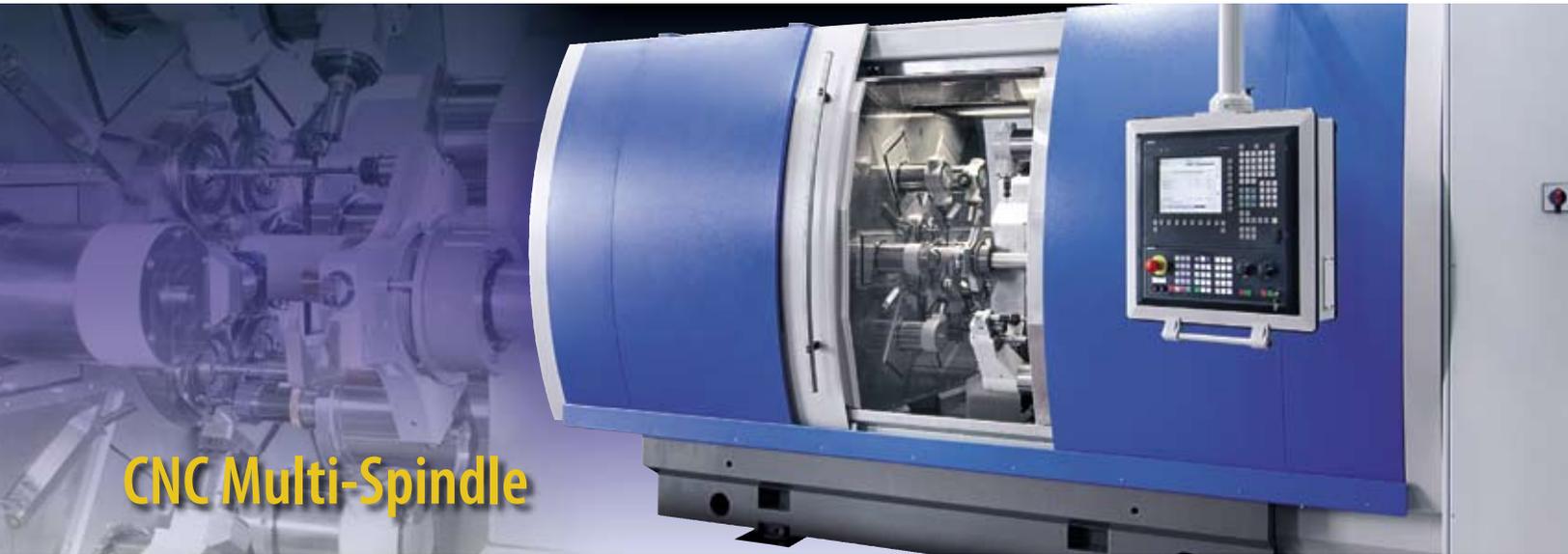
Bel’s voice has stayed in my head even though we cannot talk anymore. In times of self-doubt I often ask myself what Bel would say. And the beauty is that I can hear his answer clear as day.

“Stay in the game, Lloyd,” he would say. “Things will get better. Do what you have to, just stay in the game.”

Thanks, Bel. I still need that.

Lloyd Graff

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