



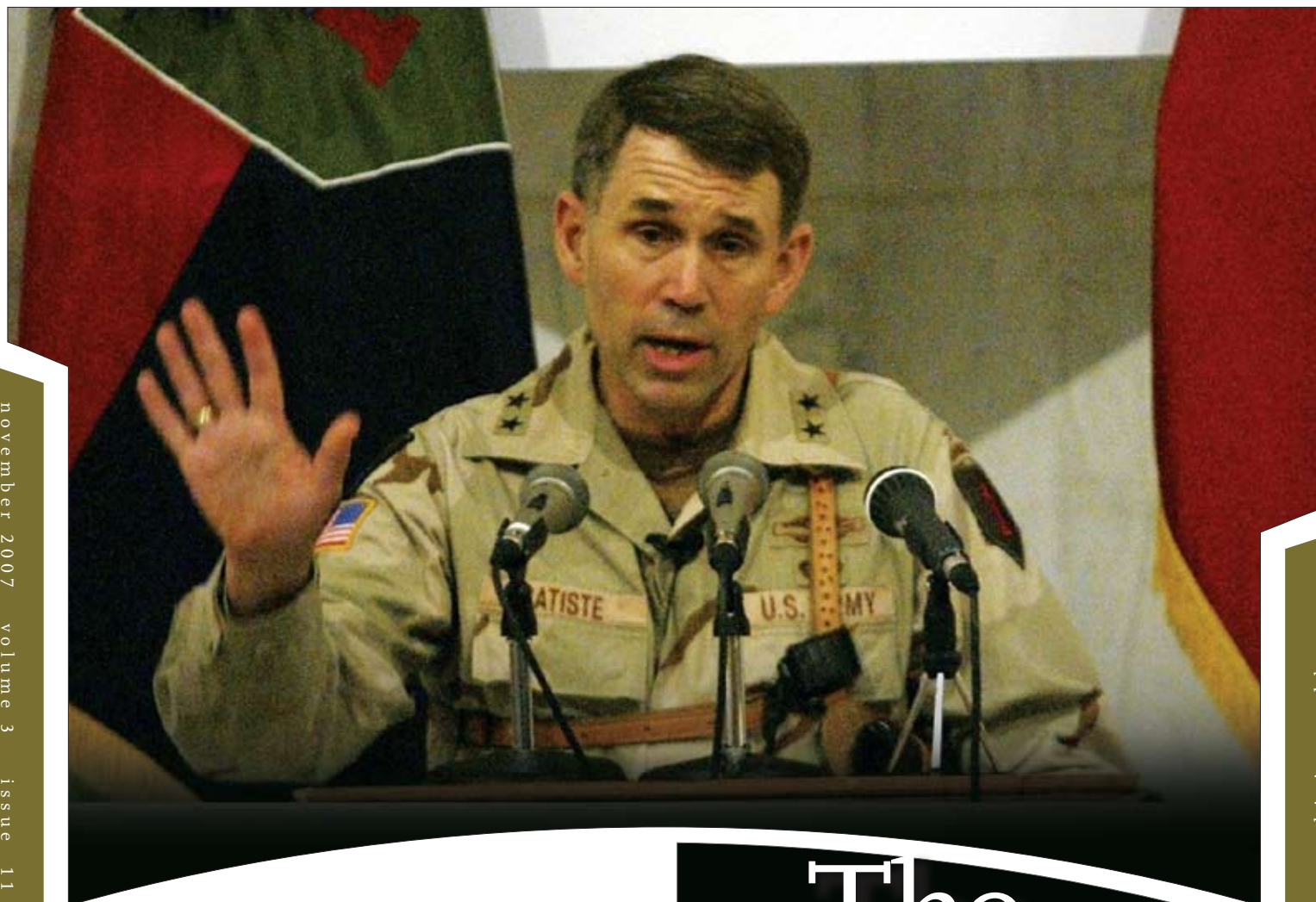
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Today's Machining World

THE MAGAZINE FOR THE PRECISION PARTS INDUSTRY



november 2007 volume 3 issue 11

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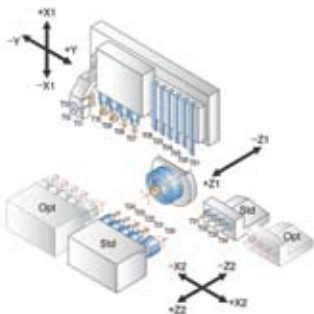
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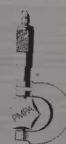
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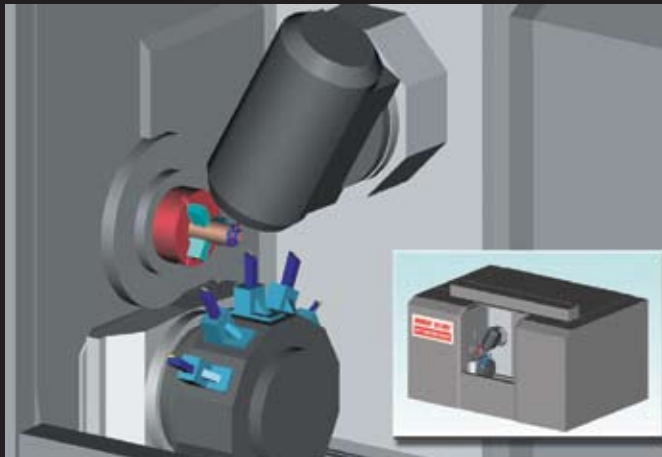
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editor's note

Pass the Lox

I read a sweet story in the *Chicago Tribune* of October 10, about Robert Shuffler and Arturo Venegas.

Shuffler, now 90, owned a successful little fish market on Devon Avenue in Chicago, catering to an Orthodox Jewish clientele. For 60 years he sold the best fresh fish on the street to generations of loyal customers. He understood the needs of his clientele. He could banter with them, throw in some Yiddish, and cut a mean filet.

Shuffler had two sons, both gastroenterologists (figure the odds on that), so he had nobody to pass on the skill of how to carry a whitefish (hold it by the head).

Enter Venegas, who at 14 walked into his shop looking for work. The kid was an illegal, ninth of 11 children from a migrant family, who had walked across the border three months earlier with less than \$20 in his pocket. Shuffler took a liking to the boy and hired him to sweep the floors and clean the refrigeration displays. They communicated at first with hand signals until Arturo learned a little English. Gradually the two developed a relationship. Venegas became a citizen. Shuffler eventually showed him how to keep the books and handle the billing. The two men became quasi-partners and in 2000, when Shuffler was 83, he sold his Robert's Kosher Fish Market to Arturo Venegas. But the story did not end with a handshake and a drive to the nursing home. Shuffler went to work for his protégé and at 90, still comes down to the shop every day to don his white apron and cut fish.

This story resonates for me and *TMW* on several notes. It's a commentary on the Mexican immigration story with all its nuances for American business people. It's a riff on how men communicate through their work. It's a variation on the business passage saga which confronts most owners.

It is our privilege to bring the human stories to you each month.
Pass the lox, please.

Lloyd Graff
Editor/Owner

editors note



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.



Mary Ethridge spent 18 years with the former Knight Ridder newspapers. She recently covered business news for the *Akron Beacon Journal* in Ohio where she won several awards, including her enterprise reporting by the United Nations and the Associated Press. Her work has appeared in the *Philadelphia Inquirer*, *Cleveland* magazine and the *Miami Herald*. She graduated from Princeton 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 an M.A. in journalism from the University of Michigan. Lloyd splits his time between buying and selling machinery, writing Swarf and swarfblog and playing Fantasy Baseball on Yahoo. He is married to Risa, a world champion in Tae Kwan Doe. He has three children and a granddaughter who are all above average. One of his life goals is to make 65 consecutive free throws on his 65th birthday.



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.



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Memory of Beverly

Thank you for the "Afterthought" column on Beverly Sills (August, 2007). Several years ago, I heard Beverly Sills speak at The Connecticut Forum (www.ctforum.org) on stage with Nicholas Peyton (jazz trumpeter), Trey Anastasio (Phish), and Bob Weir (Grateful Dead). The three guys jammed together in memorable fashion, and she listened. She said that she hadn't sung a note since the day she retired. She had given it her all and stopped at the top (not like [Roger] Clemens and others). She devoted the balance of her life to music education. She was articulate, as were the other three – well maybe not Trey (but he could sure play guitar!).

Scott Livingston
Horst Engineering
East Hartford, CT

World View

I was on a business trip in Korea last week attending a factory tour of Hwa Cheon, one of our CNC lines which my company represents. While chatting on a bus ride someone asked me what magazines and periodicals I subscribed to and actually read on a monthly basis – I named about 30 (15 being machining related). I was asked, "which is the best?"

I said three – the most important is *Modern Machine Shop* – it's the Bible. *Manufacturing Engineering* is the best technically written with the most technical take away information. And finally I said that *Today's Machining World* is hands down my favorite and the best written magazine in the industry – bar none."

I was surprised how many people on the bus agreed with me. Keep up the great job – your publication is truly a joy to read, and the only one I genuinely look forward to seeing in my "in box" each month.

Gregory J Knox
Knox Machinery, Inc.
Franklin, Ohio

Blast from the Past

We have received many positive comments concerning your article on us (February, 2005) and how we were presented. It is hard to believe that it was over two years ago. Since then, we have doubled the facility!

We continue to enjoy your magazine, reading cover to cover about all facets of this industry. Keep up the good work!

Rob Marr
C & A Tool
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Bad to the Bone

I see the Feds bagged some more bad dudes relating to the machining world. Zimmer, DePuy, Smith & Nephew, and Biomet owe \$311 million in fines to the Federal Government to settle criminal and civil penalties stemming from kickbacks paid to surgeons doing orthopedic implant procedures. That's a lot of bone screws.

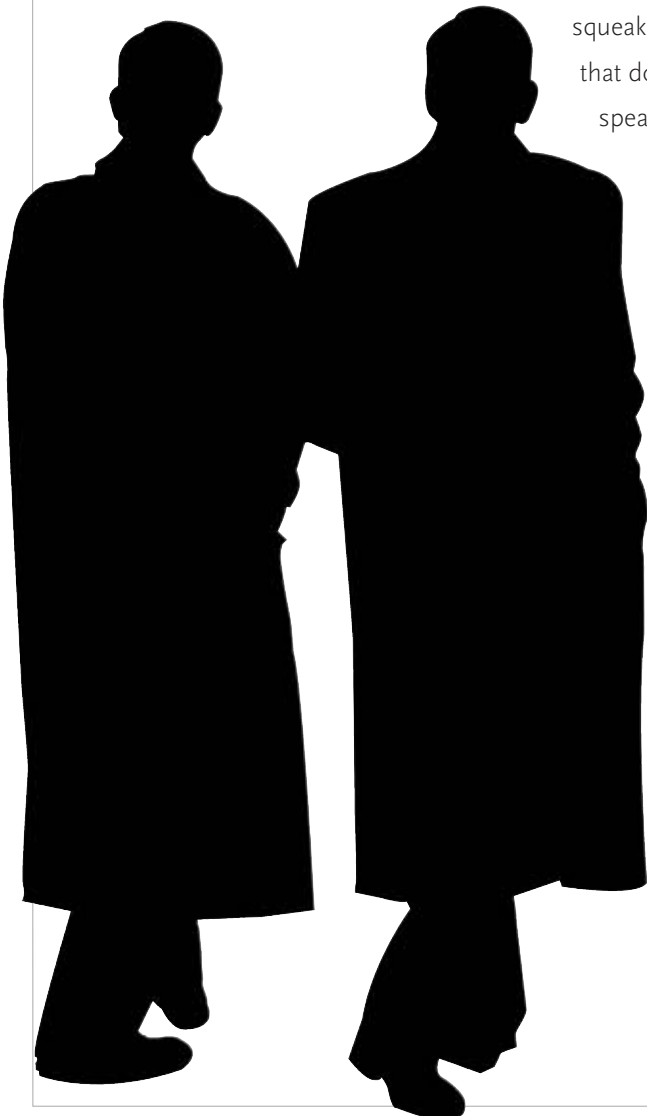
Zimmer Holdings alone is taking a \$169 million write-off in the coming financial quarter. Stryker of Kalamazoo flipped for the prosecution to seal the deal in this case.

Ex-Attorney General John Ashcroft will get in on the gravy train by being appointed the governance monitor for Zimmer. I find this case particularly seamy after doing a big cover piece on squeaky clean Warsaw, Indiana, in *Today's Machining World* last year. I know that doctors routinely take freebies from drug companies and do cheesy speaking engagements for juicy fees, but it appears that the bone cutters had graft down to a science. We all end up paying inflated insurance fees to cover the insider's chicanery.

We all know that waste is rampant in hospitals. One little tidbit related to the orthopedic racket is the bone screw packaging. Bone screws come in packages of six, which are opened in the operating room. Once the package is opened, any unused bone screws are discarded. The screws sell for \$50 to \$500 each. I would guess an enterprising scrap dealer might resell them to Russia or Serbia for a tidy profit. With our cockeyed medical payment system we invite this kind of waste.

But now we can all breathe easier, with Ashcroft nosing around the surgeons' scrubs. Hopefully with this messy case out of the way the corporate warriors of Warsaw can get back into buying more Citizens, Stars and Tsugamis and build their brands with product quality, not bribes.

(Swarf continued on next page)



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Pfizer is the biggest

pharmaceutical company in the United States today. It is hugely profitable. Pfizer is in desperate shape. Its flagship drug Lipitor, a cholesterol reducing drug that does \$10 billion a year with 92 percent gross margins, comes off patent in 2010. The company has no replacement for it. One investment analyst describes Pfizer as "coasting towards the abyss."

Pfizer threw a lot of money recently at Exubra, an inhalable insulin for diabetes, but the product has been a financial disaster for them, though it may ultimately be a useful innovation. The Pfizer board and management know the mess they are in. They brought in a new boss from the fast-food industry to kick butt. Unfortunately they have no new Lipitor in the pipeline. Ironically, Pfizer didn't develop Lipitor. It came to them in an acquisition of Warner-Lambert, which was known for Listerine. What does a company do when it's coasting for the abyss – and knows it? Punt?

One option is to put itself up for sale. Tribune Company and Knight-Ridder, two of the largest newspaper firms in the U.S. have done this recently because they had no good answer for online classified advertising. Another answer is to buy somebody else in a business with brighter prospects. This is what Pfizer tried with the bet on Exubra and eBay attempted buying Skype. Both were \$2 billion booboos.

Pfizer has had many years to stare at the post Lipitor void. But it is probably like taking a final exam in school. You tend to procrastinate until the night before the test, then you get down to the serious cramming.

The bottom line question all of us who own businesses must contemplate is: "are we coasting toward the abyss like Pfizer?" Is our process falling behind? Is our key person going to retire, leave, die? Will our leader get sick, bored, run over? Will our biggest customer dump us for a younger man? Will a fire, earthquake, flood rub us out?

My dad always told me to know where the exits are when you enter the theater. Pfizer is smelling smoke and just starting to cook.

Noah and I recently interviewed

economist Gary Shilling for an upcoming *TMW* issue. Shilling is a professional contrarian and has successfully predicted 10 out of the last two recessions. But he did call the Internet-telecom crash and the housing debacle, so he is a guy to take seriously even if he tells you what you really do not want to hear.

Shilling does not buy the theory that global growth will go on and on and lift all boats including America's. He believes

swarf

that China is headed soon for a Japan like downturn.

He thinks prevailing opinion that China will quickly become the planet's preeminent economic and political force is akin to the same belief so eloquently argued by Michael Crichton in *The Rising Sun*. That sun experienced a virtual eclipse for 16 years in Japan.

Other seers think that China's growth is already hugely overstated if you correct for the environmental degradation of the country and the world due to its acceptance of abysmal pollution practices.

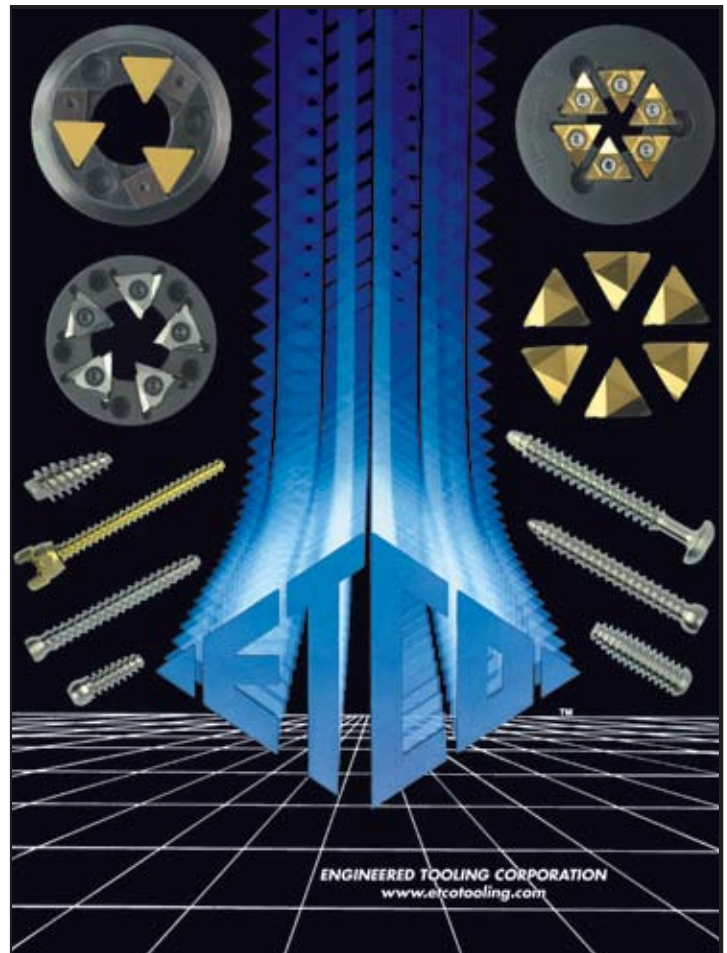
The following vignette illustrates today's China syndrome:

Two decades ago, a cashmere sweater was a soft symbol of wealth and status worn by pipe smoking duffers at the club. Eventually women also wanted to wear the wool from the shaggy goat. The boosted demand beyond the capability of shepherds filled in the production shortfall.

But the sharp folk in Bentonville Arkansas who run Wal-Mart believed that cashmere was not the exclusive wool for the rich, and decided cashmere sweaters should be brought to the masses. It was the perfect Christmas present. They asked the disintermediating question, "Why not sell a \$49 cashmere women's sweater, or a \$39 or even a \$29 one?"

And the shepherds in China and Mongolia heard them. A herder with 30 goats living in a tent soon had 300 grazing goats. He did what capitalists everywhere do – expand to meet the demand. And shepherds reaped the reward of Wal-Mart's audacious bet on the desires of its customers to have buttery sweaters for \$30 to \$40. And soon the Asian shepherds had small homes and televisions and toilets and life was good.

Except 10 times more goats ate all the green grass, and the bigger herds needed to move to greener pastures. The old land turned to dust and the wind blew. Huge clouds of dirt miles long and wide lifted off the ground, browning the local air and ultimately circling the earth. The shepherds had to leave their newly built homes to search for new grass, and China and the world was a dirtier grittier place. But Wal-Mart got their cheaper wool, and you and I got our comfy cardigans.



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The net gain for the Chinese economy was real in this case. New sweater factories were built. Girls got jobs sewing after fleeing the poverty of rural China. The sewing machine firms sold product and the machine guys sold them components for bobbins and stitches. The shepherds tasted prosperity. But the gains were diminished by the communal degradation of the air pollution. That is not in the Chinese growth statistics, but the people on the ground know it's real. This is the yin and yang of "Wild East" growth. Eventually the Chinese people won't take it.

Growth will slow and the markets will no longer fawn over the Chinese stocks. Wal-Mart will still sell cashmere sweaters. I don't know if they'll cost more or less than they do today.

loonie is over parity with the American greenback.

Caterpillar in its last quarterly report made it clear. Business in the U.S. stinks but elsewhere it is smoking. The dollar reflects this disparity in near term prospects so there is a wide open window to jump for a piece of the foreign business. It is also likely that you won't have to schlep to Europe to nibble the business. European companies who routinely shop for machine components will come looking for you because of the weak dollar. A Toyota or Honda will be outsourcing more in Ohio than Osaka, and Mercedes will look to Michigan more than Munich.

Global trade is always a two way street. Always look both ways before you cross.

This is a terrible time to be in the

French foie grass business. Same for Danish butter and Swedish crystal. The euro is king – north of \$1.40 in value – it's biting the Europeans in the tuchas.

For American manufacturers this may be the opportunity of a decade to steal market share. Look for European reps, go to trade shows like Turntec in Frankfurt, Germany. Peruse the Internet for opportunities in Canada where the

Over the past month I've spent

a lot of time in Toronto and the Bay Area. I was surprised by the environmental consciousness in both locations. Then I received the Parker Hannifin annual report, which had cover photos, front and back, of solar collecting devices in the Nevada desert in which actuators made by Parker moved the mirrors to maximize the heat production more efficiently to produce electricity.

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swarf

Bob Sarna of Pride Machinery of

Folks, with Toyota's plug-in hybrid coming in 2009, GM's in 2010, and a new administration in '09, inconvenient or not, green is going to mean green and it won't be just the toy of the effete elites. I am almost sure that the composite shell, plug-in hybrid getting 100 miles to the gallon on average will be the dominant car bought in America within 10 years, and maybe seven. A lot of gas stations are going to turn into Starbucks and McDonalds.

The actuators on those solar collectors installed by Solargenix Energy, made by Parker Hannifin, is the kind of product that precision machining firms will be bidding on in the greening world.

Power transmission, water processing, and infrastructure's repair and build-out are going to be huge markets in coming years. Oil and natural gas will still have value to make plastics and aircraft fuel, but I am convinced that the green movement has gone mainstream.

Anaheim California, is making the move that many people consider but few have the courage and get-up and go-to to do. He is cashing out of overvalued Los Angeles real estate and moving his business and his body to beautiful Kansas City.

Sarna is an old National Acme guy who worked on the floor of the giant Cleveland plant until the handwriting on the wall was so clear even a monkey could read it. Bob moved to L.A., started a machinery business focusing on screw machines and eventually put in a production shop. He now has a deal with the Lake City arsenal which was too attractive to pass up. Bob's son stayed behind in earthquake prone, wildfire threatened Southern California to fight the traffic in the O.C.

California's state taxes and absurd housing costs have sent previous migrations to Nevada, Idaho and Colorado. We're starting to see the out migration from Florida too, as

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hurricanes and humungous mortgages push out economically sensitive residents. Tennessee and the Carolinas beckon the Florida refugees who reject million dollar shipping container dwellings in Naples and Boca.

Kansas City. It ain't no Santa Monica, but it will do for Bob Sarna.

Meanwhile, his furniture is in storage and his kids are out of school. His spacious apartment in the Chicago suburbs is empty, and his American dream is on hold.

What a country.

The immigration pickle we are in

is supposedly being debated in the preprimary beanbag in Iowa and New Hampshire. But all I'm hearing is lowest denominator crap about keeping out nasty Mexicans.

Lost in the mush mongering is the diminishing magnetism of America to the best and brightest in the world who are getting the fuzzy message that they are welcome to come as tourists or students but if they expect to stay for a career they'll have to beat a system that is rigged against the honest and successful would-be immigrant.

I have witnessed this messed up system first hand as Graff-Pinkert has tried to get Martin Whitfield, a talented Wickman rebuilder, a solid immigration status.

When we first started the process to get Martin legal status, we were told by everybody we asked that it was impossible unless he won the immigration lottery (the U.S. actually runs a lottery and admits 55,000 people a year who get lucky) Martin would have to wiggle in as a worker who was unobtainable in the American labor pool or as a trainee for a job in which he had unique qualifications. As a Wickman specialist he really had those rare credentials, but we felt the need to hire an immigration attorney who understood the red tape and could navigate Martin through the morass.

The attorney did manage to guide Martin into an 18-month stay at G-P where he proved to be a valuable addition, but then he had to go back to England for three months in order to jump through the next immigration hoop. Graff-Pinkert paid the lawyer's bill and Martin's living expenses in Britain while he waited for another window to open.

We were dancing the immigration cha cha cha – three steps forward, three steps back – and each step cost a pretty penny to the legals.

This year we decided to devote fewer resources to Wickman rebuilding and were reluctant to pay many thousands of dollars to the legalists. We gave Martin several months advanced knowledge of our decision so he could find another position in the U.S., but he was unable to find anybody to hire him with his immigration baggage. He could have found 20 willing employers without the visa issue.

Now Martin is headed back to England to start his quest once again to get to America. If he can find a company in England with an American manufacturing arm, he has a lever to reenter the country. He has a few possibilities.

I attended the Canadian

Manufacturing Technology Show in mid-October to see how the market was holding up in Ontario in the time of parity between Canadian dollar and U.S. dollar. The sense I got was that business was decent, but trending down because of stagnant automotive orders.

One item of note, Hurco, Hardinge, and Mag (Fadal and friends) are all going direct with their Canada distribution. Canadian machine tool sales is a clubby little world. If you do not have a blue chipper, my gut is that you aren't going to get much done. I talked to Jim Yamaguchi of Hurco who is spearheading this rainmaking effort. He seemed confident that they were going to make it work. He says they are looking to go direct in Mexico and seeking the right base of operations now for a 2008 startup.

Half of the Canadian machine tool business is in Ontario, so proximity simplifies the distribution process. But from past experience, there will be musical chairs over the next few years.

See you in '08.

Managing Editor Jill Sevelow

attended Hydromat's Open House in early October. The facility was swarming with what Marketing Director Kevin Shults called "an excellent mix of long-time customers and new potential customers." Kevin spoke at length about their Advanced Product Group, where project engineers, software designers and customers build and support total systems for customers. Epic machines, the new Patriot barloader and the Dürr Ecoclean were on display.

Tom Grasson, Editor in Chief of *Today's Medical Developments*, spoke at length on the growth of the U.S. medical device manufacturing industry. Tom stated the U.S. now has a 42 percent share of the world market, with 450,000 knee and 208,000 hip replacements performed daily. He spoke of titanium but also of super-elastic nitinol, a metal with properties that closely mimic human tissue and bone. This physiological similarity has led to development of products such as hip implants, bone spacers, bone staples, bone anchors, and skull plates. When Jill asked him to elaborate on the recent scandal involving Zimmer, DuPuy, Biomet, etc., Mr. Grasson had no comment.

The CNC swiss lathe market is a

very crowded market segment. Citizen and Star dominate the North American market with Tsugami, Hanwha, and NexTurn holding significant positions and rising. It is difficult for other brands to break out of the pack, but Maier, an independent manufacturer from Germany, is starting to attract attention.

Maier showed at the recent EMO Exhibition, and they have the powerful Methods marketing muscle behind them in the United States. Until recently, Methods Machine Tools has sold it quietly as a complimentary line in its stable of heavy duty Japanese machines like Nakamura-Tome and Matsuura, but this appears to be changing. Methods' Chairman Scott McIver thinks that Maier can play in the big leagues in the U.S., and is positioning Maier as a national competitor. With Tornos continuing its stealth marketing approach and the medical and electronics markets on the ascent, they have a chance to be a player if they sustain their efforts.

On the less expensive end of the spectrum, Ganesh's machine made in Taiwan continues to make inroads for applications where a bushing is not necessary for long skinny parts. Marubeni-Citizen now holds a 29.9 percent stake in Miyano so it will be interesting to see if Miyano pushes into the Swiss-type arena with other entries besides its no-bushing entry.

Hoff-Hilk, the Minneapolis based

industrial auctioneer, has quietly emerged as a formidable competitor in the liquidation business in the Midwest. They have distinguished themselves from others in the competitive field in two ways. They do primarily web auctions rather than the on-site-web combination, which is still the norm. And they develop a healthy marketing campaign for their sales.

They conducted a sale for Bystrom Brothers in mid-October, an old screw machine firm in the Twin Cities. For a deal that brought in around \$2 million dollars, Hoff-Hilk sent out a beautifully photographed brochure and spent significantly more than their peers do on trade magazine advertising. They were rewarded by a loud buzz in the industry and significantly higher prices on National

Acme screw machines than we have seen recently. For instance, a 1 1/4" RA6 in the 1960s with threading and reaming brought in the low \$20s, and one with threading and pickoff nudged the \$30,000 level. The star pieces in the sale were Tsugami CNC Swiss lathes. A 38mm 2004 machine brought \$160,000, a 32mm hit \$40,000, and 20mm machines seven years old sold for approximately \$180,000 each.

It's fascinating to observe the investments that shrewd, forward thinking machine tool builders are making in the American market.

It's fascinating to observe the

investments that shrewd, forward thinking machine tool builders are making in the American market.

Mori-Seiki has started Mori-Seiki University, which I saw demonstrated at the Toronto CMTS show by Lionel Maron. They hired Oxygen of Indianapolis to develop an online teaching program which seemed extremely well done in the demo I saw. They also have obtained a new 12,000 square foot facility in Chicago dedicated to hands-on training.

Okuma has its Partners in THINC now in operation in Charlotte offering a supermarket of ideas and products in one location.

Doosan has just opened a facility in Memphis focusing on medical technology manufacturing to go with their oil and gas tech center in Houston and their automotive oriented center in Detroit.

Morris Co. just opened and celebrated its grand opening in Windsor, Conn., of a \$6 million, 50,000 square foot facility with a large technical/education center to help manufacturers find solutions within its product lines, which include Tsugami and Okuma.

Mazak has technical facilities dotting North America.

These firms realize that if manufacturing stays in America – and it will – they need to build the expertise necessary to run the sophisticated machine tools they have available. If they provide high grade education and useful ideas to their customers they will get the new business over competitors who simply offer nice hardware.



By JERRY LEVINE

book review

Where have All the Leaders Gone?

When I was a kid there was a newspaper column that I loved reading called “Things I learned While Looking up Something Else.” It was a compilation of little gems the writer had discovered serendipitously.

Lee Iococca’s new book, *Where Have All the Leaders Gone* belongs in that category. He ostensibly wrote a book on leadership based on his personal experience. I picked it up looking for some pertinent business and political advice. The book has strengths and weaknesses, but by and large the book, like Iococca, is dated. He’s become an old man “shooting from the lip” easily and recklessly, but sadly, slightly out of tune.

However, buried back at the end (Chapter 20) is the little gem, “the thing I learned while looking up something else.” The Chapter is entitled, “Get off the golf course and DO something!” It’s a wonderful guide for retirement. I retired a few years ago and identified with much of it. Read this one chapter if you are contemplating retirement or are already retired and want to enrich your life.

Iococca looks at life as having three stages: learning, earning and returning. Retiring is not the end, but a new beginning. It should be a time of returning, of giving something back to society. Being retired frees a person from their rigid work schedule, but it doesn’t mean fritter your time away! As Iococca says, “Live the hell out of life. You’ve got all eternity to rest.”

First, he says you must have a plan for retirement. And that plan must include a sound understanding of your financial situation. Then ease in. If you’ve lived in a town for 20, 30 or more years, you’ve got a whole infrastructure of support. Don’t uproot yourself and abandon all that. You’ve already had enough change by stopping work. Recognize that work is what makes life matter. Even though one’s family is crucial, and hobbies and outside activities are important, we still identify ourselves by our jobs. What we do is who we are.

From my observation, people always worry about deciding when to retire. That’s easy – you will know when. It’s when you just don’t enjoy what you’ve been doing. If you like what you’re doing, that’s wonderful, stay with it. Don’t retire. The key is to figure out what gives you satisfaction and do exactly that. Don’t

be afraid to experiment and change.

After retiring, many people go back and consult. Often an individual has a lot of knowledge and experience, and this is a good way to transition. I did that for a few years, but I also realized why I retired – I was tired of what I had been doing. So, I quit consulting.

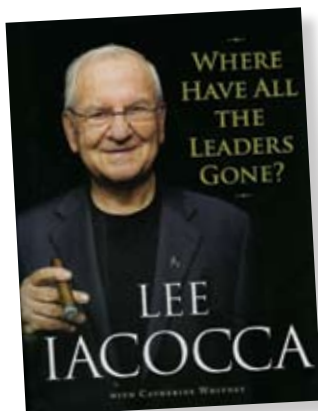
From my experience, your retirement plan should focus on giving something back. VOLUNTEER! It can transform your life. There is nothing more satisfying than helping someone else just for the sheer pleasure of doing it. For years before retiring I had volunteered in a homeless shelter. After retiring, I became Board President and expanded my time there to about 20 hours a week. I never had as much satisfaction from my old job in the oil industry.

There are so many meaningful volunteer opportunities. Tutoring and mentoring are some of the best. I’ve also found there is nothing better than spending time with your grandchildren, and no one better than grandparents to help them grow. Hanging around young

people keeps you focused on the future.

Keep learning. There has been a huge proliferation of adult education programs. I participate in a self led program at Northwestern University. We students get together, determine the curriculum, organize the classes and take turns leading the discussions. The courses range from poetry to science and from history to current events. The participants all have a lifetime of experience to share.

Finally, to be happily retired you must be physically active. Life is about having a strong body and a sound mind. I play tennis, golf and bike ride. I just came back from a bike trip in the French Pyrenees. Iococca says count your blessings. You won the lottery just being born in the USA. If you are really lucky you have your health and are surrounded by family and friends. So be thankful and say your prayers. Daily gratitude helps a lot.



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

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More from Mori (left)

Mori Seiki has announced the inclusion of a 20-station tool turret on two new models in its NL Series of CNC lathes, available on the NL1500 and NL2000 machines. The new models of the NL1500 and NL2000 feature a milling motor inside the turret directly coupled to the milling tool. This design uses a series of gears and belts to provide a milling feature. The direct-coupled milling motor reduces tool spindle acceleration time by $\frac{2}{3}$ and diminishes vibration and noise by $\frac{1}{2}$.

Machines in the NL Series employ a rigid triangle structure in the bed, spindle and tailstock. The box way construction further reduces vibration and increases rigidity. The machines feature a digital tailstock in which a servo drive provides all movement. This allows position and thrust to be controlled from the operation screen rather than manually setting them. Additionally, by adjusting the tailstock from within the part program, setup time can be reduced by up to 50 percent.

For more about Mori Seiki, please call 847-593-5400 or visit www.moriseiki.com.

The Patriot Gain (right)

The Edge Technologies' Patriot Series is an economical 12-foot magazine bar feeder which automatically feeds round, square and hexagonal bar stock in lengths up to 12.5 feet into CNC lathes. The Patriot 338 feeds stock in a diameter range of 3 to 38 mm and the Patriot 551 in a range of 5 to 51 mm. The Patriot bar feeders feature an easy-to-use, hand held remote pendant. Memory storage for up to 36 jobs speeds changeovers. The Patriot's diagnostics and troubleshooting are all run from this same control screen. A Mitsubishi controller and servo drive provide the Patriot's motion control and functionality.

During cutting operations the bar stock rotates in polyurethane guide channels that are flooded with oil to create a hydrodynamic effect. The Swiss Package includes a synchronization device and telescopic nose. The synchronization device employs an electromagnetic coupling, mechanically linking the lathe headstock's z-axis travel to the bar feeder's pusher to ensure synchronous movement and no loss of connection between the bar stock and collet-pusher.

For more information, please contact Edge Technologies at 314-692-8388 or visit www.edgetechnologies.com.



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The Multus Faction (above)

The Multus B300/B400 series from Okuma are multi-function machines that consolidate turning, milling and material handling operations into a single machine. The Okuma Multus B300/B400 features the industry's first Collision Avoidance System software. Combined with Okuma's THINC-OSP Control, this software can run the entire machining simulation and catch potential collisions before they create scrap. With a powerful yet compact turret, the Okuma PREX motor provides high output while reducing roller heat. Thermal-Friendly Construction assures high accuracy, even in the most complex applications. Options include an equally powered sub-spindle or tailstock. It is designed to hand the part from one spindle to the other to complete milling and turning operations without changing the part. Thermal deformation over time is less than 10 mm while contouring accuracy (roundness) is 2.8mm (actual data).

For more information or to locate a dealer nearest you, please visit www.okuma.com.

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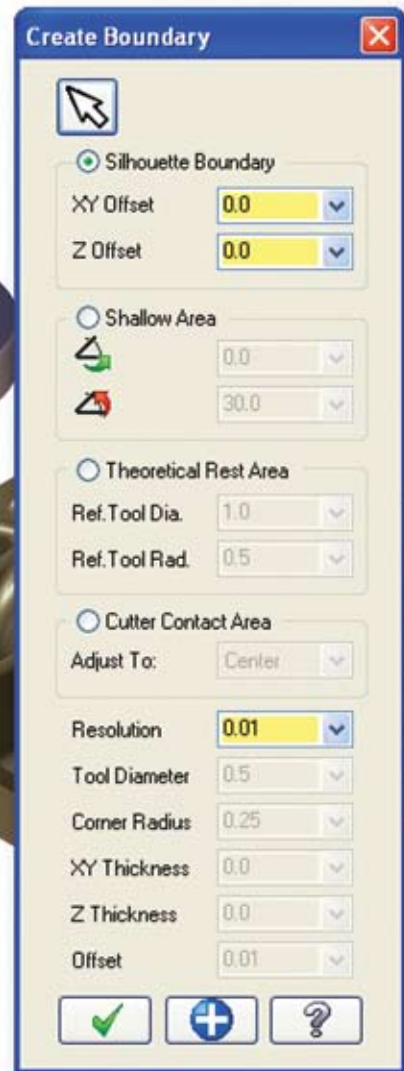


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Master X

CNC Software announces the release of Mastercam X2's Maintenance Release (MR2). This release introduces new and improved toolpaths for high speed machining, multiaxis enhancements, and more. Delivering powerful high speed cutting to 2D projects, this new toolpath moves the tool in and "peels" away material, layer by layer. It supports efficient constant climb milling by using a trochoidal type of motion with accelerated "back" feed moves when the tool is not engaged in material. The Operations Manager pane can now float to a different area of the graphics window or to a separate screen when you are working with dual monitors. You can now calculate the boundary using shallow areas, theoretical rest areas, cutter contact areas, and enhanced silhouette boundary controls.

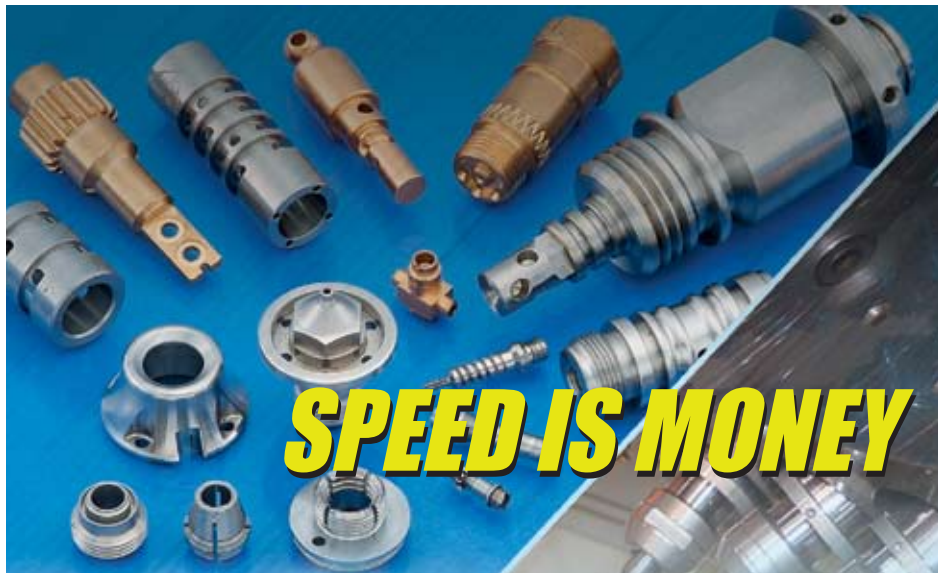
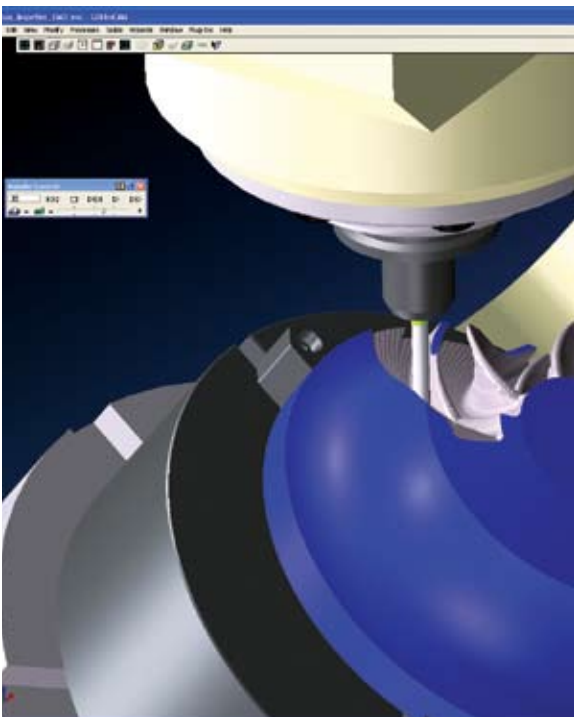
For more information, contact CNC Software, Inc. at 800-228-2877 or visit www.mastercam.com.

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Gibb or Take 5

Gibbs and Associates has released a new option which supports 5-axis simultaneous milling. The new 5-axis module introduces the following capabilities: multi-surface 5-axis roughing and finishing; multi-surface 5-axis flowline machining; surface edge 5-axis swarf cutting (trimming vacuum-formed parts); adaptable interface, based on part type strategy, shows only what is needed; advanced gouge checking ensures safe cuts in even the most complex operations and complete control over entry/exit, cut-to-cut, and between cut moves.

For more information, please contact GibbsCAM at 800-654-9399 or visit www.GibbsCAM.com.



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Mold Me

DP Technology announced the release of ESPRIT Mold Version 9 (v9). This release's advancements include a new geometric kernel that provides support for a variety of solid and surface part geometry, enhanced 3-axis machining cycles for increased performance, improved user interface, improvements to the existing 5-axis machining cycles, and a new 5-axis "AutoTilt" machining cycle that automatically creates a collision free 5-axis machining cycle from existing 3-axis toolpath. ESPRIT Mold is designed to run on both Microsoft Windows XP and Microsoft Vista operating systems.

New for ESPRIT Mold v9 is the AutoTilt machining cycle that transforms any 3-axis toolpath (roughing, re-machining or finishing) into an optimized, collision free, continuous 5-axis toolpath. The automatic continuous 5-axis machining capability of AutoTilt will reduce the number of setups required to machine a part, allow the use of shorter, more rigid tooling and higher cutting speeds, and ultimately result in shorter machining times and improved part quality.

For more information, please contact ESPRIT at 805-388-6000 or visit www.dpotechnology.com.

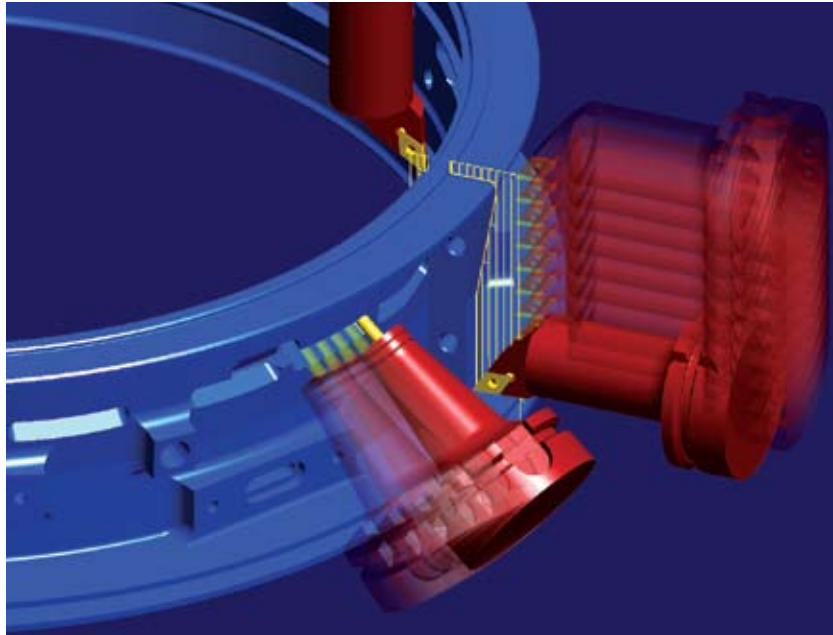
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Have an Open Mind

With the release of hyperMILL® V9.6, OPEN MIND Technologies AG is presenting an integrated milling and turning module. hyperMILL® millTurn facilitates complete workpiece machining on mill/turn machines with all milling and turning strategies being provided in a single CAM user interface.

hyperMILL's comprehensive range of 2D, 3D, HSC and 5-axis machining strategies is being joined by a set of turning strategies courtesy of the new millTURN module – all within the same intuitive user interface. Users can generate all their milling and turning jobs within one unified CAM application, and the machining operations only need a single set-up. The new millTURN module included with hyperMILL Version 9.6 offers machining strategies for turn roughing, turn finishing, grooving and thread turning.

For more information, please visit www.openmind-tech.com.



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Need to Lein

LMC Workholding introduces the new Neidlein Ultra Live Centers, suited for high thrust operations with face drivers and other workholding devices, heavier depth of cut lathes, larger workpieces and high precision grinders. These new live centers feature the tightest run-out tolerances and are the longest lasting on the market. The Ultra Live Centers are available in carbide or half carbide and are equipped for high axial and radial forces and for high revolutions per minute. The centers offer .00020" TIR for lathe work and a guaranteed .00012" TIR for grinding. A new HQ model offers .00008" for grinding.

Other features include a better tool clearance between the workpiece and housing and a maintenance-free design, due to permanently sealed and lubricated bodies and bearings. A full size frontcap protects the high speed seals, which in turn protect the centers from contaminants and coolant. The frontcap also protects the seal-systems against chips and other particles, offering a better performance for vertical applications.

For more information, please contact LMC Workholding at 574-735-0225 or visit www.logan-mm.com.

So Sumi

Sumitomo's new SumiEdge Mill is an 88° tangential style milling cutter, designed for gray and ductile cast iron applications. The SumiEdge Mill allows for the use of all 8 cutting edges. By rotating the LNMX insert within the pocket, the use of a total of 4 cutting edges is achieved. Four more indexes can then be added by switching the insert from one cutter to the next (using both left and right hand cutters).

The ACK200 grade features Super FF coating with an ultra fine TiCN layer for anti-adhesion and wear resistance during general purpose machining. The ACK300 grade uses a multi-layered Super ZX coating, consisting of nanometer thick TiAlN and AlCrN layers, coupled with fine-grained super tough substrate.

The SumiEdge Mill is available in 3" – 6" diameters for both left and right milling cutters.

For more information, contact Sumitomo Electric Carbide at 800-950-5202 or visit www.sumicarbide.com



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Stroke	320mm
O. D Tool	5
Front Tool	5
Back Tool(Driven)	4(2)
Off-Center(Driven)	2(2)
Cross Tool(Driven)	4(4)
Power	Main 5.5/7.5kW Sub 2.2/5.5kW
Weight	4,050kg
Dimension (LXWxH)	2,730 x 1,304 x 1,775mm



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The General Recycled

How John Batiste went from ordering soldiers to ordering steel.

john batiste



1st Infantry Division's welcome home, May, 2005, Kitzengin, Germany. Photos courtesy of John Batiste.



Klein Steel senior staff (L to R): sales manager Jane Elliot, CFO David Feinstein, President John Batiste, owner and CEO Joe Klein, purchasing manager Pauline Malone and chief operating officer Al Mangiamale.

WITH LLOYD & NOAH GRAFF

LG: Do you prefer to be called General Batiste?

JB: John. I retired two years ago.

LG: Was that an adjustment to be called John?

JB: It was a little bit, because for 31 years I was “sir” to everybody. But when I came to Klein Steel, I introduced myself as John, and it’s been that from day one.

LG: Can you tell us about the transition from managing 22,000 men in the First Infantry Division in Iraq in combat, to running a small-to-middle sized steel processor in Rochester, New York?

JB: I retired in November of 2005. I had worked in the defense industry, and there were options and opportunities that I could have elected to do if I’d gone to work for the big defense firms as an army lobbyist.

LG: Why didn’t you do that?

JB: I wanted to get to do the private, non-defense, for-profit kind of work, and I also knew I was going to speak out against the administration.

LG: You couldn’t do that as a lobbyist for the defense industry?

JB: I didn’t want to be encumbered with all that. So how did [this path] happen? There’s an organization in New York City called Leader to Leader [Institute]. Consultant Peter Drucker started it. One of the things they do is link retiring generals with the private non-defense, not-for-profit industry. Joe Klein, the CEO and owner of Klein Steel, had been looking for a president for about a year. He was at a retreat and ran into Peter’s No. 2, a wonderful lady by the name of Frances Hesselbein, and said, “Look, I’ve got this problem; I can’t find the right president.” She said, “I can help,” and within three days I was up in Rochester interviewing with Joe. I brought my wife up. We fell in love with the place. This company has everything I was looking for: integrity, high standards, and a focus on people.

NG: What was it like moving from an army base to the outside world of Rochester?

JB: You can live on-base or off-base in the Army, so we had bought homes in a civilian community in the past. But the people in Rochester received us really well. It was an almost seamless transition. It was easy. The family fell right into

the city, right into Rochester, and everybody’s doing well.

LG: What are you involved in at Klein Steel?

JB: As the president, I’m involved with everything – buying; selling; operations, that is inventory control – taking the inventory, loading it. Processing is a big part of our business. We have burning tables, laser, water jet saws, angle masters, a whole range of processing capability.

LG: Did you know anything about the steel industry before you came in?

JB: I served for 31 years in an armored division, so I knew about artillery and a whole lot about steel but a different facet of the business.

LG: Hot steel.

JB: Yeah, in 2004, early 2004, when the 1st Infantry Division arrived in Iraq, we didn’t have very many armored vehicles. The thousands of Humvees and

“History books are replete with problems and examples of the challenges of this region.”

trucks needed to be protected, so I sent my guys out to Kurdish and Arab job shops to find steel and then get it cut, crudely but into the right shapes so we could bolt it on the sides of our trucks.

LG: So there are job shops in Iraq.

JB: Oh sure, mom and pop shops. You’d be surprised at how much steel you find. It’s all junk; I didn’t realize it at the time, but we picked the stuff up. It was a half inch thick of whatever chemistry, who knows. But they pull out their torch and cut it.

NG: They sent the Humvees down there unprotected?

JB: They were all unprotected with canvas doors or plastic doors, so we solved the problem ourselves.

LG: Which goes to the question of preparedness for the war. You were involved in some of the planning as an aide to Paul Wolfowitz.

JB: I was, early on. I left him in June of 2002, and the



Photo: The staff at Klein Steel, Rochester New York. Photo courtesy of John Batiste, Klein Steel.

Iraq War started March of 2003. But I've been very vocal about this debacle for the past 18 months. I've testified five times in Washington. I've written many Op-Eds. I've spoke to many groups. We went about this totally wrong.

LG: Why was the intelligence so bad?

JB: I think this administration had a preconceived agenda to take on Saddam Hussein before they were even elected.

LG: So that overrode any intelligence that they may have had.

JB: Sure, it overrode all reason.

NG: Even before September 11?

JB: Absolutely, and I'm a Republican. It breaks my heart to say this. They were bound and determined to take down the regime of Saddam Hussein before they were elected into office.

LG: Wolfowitz certainly knew the background of Saddam Hussein and how he, through his tyrannical rule, was able to run Iraq with all the various factions. Yet you have the invasion and you have seemingly no expectations of what's going to happen after Saddam is toppled. In retrospect, this is hard to believe.

JB: It is. The administration completely ignored the lessons of history. History books are replete with problems and

examples of the challenges of this region called Mesopotamia. The British Empire had had a mess on their hands in the last century. It's amazing they went back in with us. This region is so divided. It's defined by Arabs and Kurds and Sunnis, and tribes against tribes. They hate each other. There's also an element of criminal activity that really resembles Mafia, gang warfare.

LG: At what point did you see it degenerating into a civil war?

JB: Our 1st Infantry Division was there in January of 2004. By March of 2004, we knew we had a budding insurgency on our hands that was rapidly metastasizing. The turning point for me was probably the elections of January 2005, where it became clear to those of us on the ground the high voter turnout rate had nothing to do with an appreciation for democracy. It was all about protecting turf. It was all about the Shia block voting one way, the Sunni block not voting in those days, and the Kurds who were deliberately changing the demographics around Kirkuk so they would own the oil for the future breakup of Iraq; it was important to them to have all that treasure.

LG: Do you see any chance of putting Humpty Dumpty back together again?

JB: Here's the problem that we're in now: I often equate a comprehensive national strategy to a four-legged stool.

One leg is diplomacy, regional/global diplomacy to pull things together. Another leg is the political reconciliation work that has to happen, and that again is regional. It goes well beyond Iraq, and it's global to some extent. Another leg is the economic reconstruction of this unbelievably poor country. Again, that is more than Iraq; it's regional; it's global. The fourth leg is the military. A strategy without all four legs will not succeed. The seat on this stool is what's called "The mobilization of the United States of America" behind the important work to defeat worldwide Islamic extremism. That's what it's all about. This is not about Al-Qaeda in Iraq. Al-Qaeda-like organizations are in over 60 countries of the world and they're gaining in strength every day. The problem is we have a failed strategy. It is dependent almost entirely on the military because the other three legs are ineffective and poorly managed with no leadership, and the country's not mobilized in any way, shape or form. So I don't know what the hell we think we're doing.

NG: Is there any way to apply diplomacy with Al-Qaeda?

JB: It isn't diplomacy with Al-Qaeda; it's diplomacy with the rest of the region and the world. The fact that we don't have a diplomatic mission in Tehran is unbelievable. The fact that we haven't reopened our embassy in Syria is unforgivable. The fact that we haven't designated a special envoy to pull together the moderate Arab nations in the region to be part of a solution is a tragic mistake. This administration doesn't understand diplomacy. We haven't done the work to politically reconcile the country. We haven't done the work to economically rebuild it that needed to be done. There's no indication in Iraq that they're going to reconcile, and the Shia government in power is absolutely incompetent. Our guys are right in the middle of this and nothing good is going to come out of it.

LG: Do you think we are retracing the steps of Iraq now with Iran?

JB: Don't know. But we need to proceed very cautiously. Iran is not Iraq. It's a much bigger country, more people. It is homogenous; it's all Persian. Most importantly, our military right now is in trouble. I was down at Fort Hood Texas last weekend, and what I saw was an army in decay. We can't keep this up much longer. This is serious when you consider that there are problems out there in the world that we cannot respond to right now. We have no strategic reserve.

LG: I read a piece where you drew a parallel between the salesmanship that you had to use in Iraq with regional sheiks and local heads of clans, and the salesmanship that you have to use in the U.S. at Klein Steel.

JB: The selling skills with respect to steel as I'm learning them are not dissimilar to selling ideas that we sold in Iraq to political and military leaders.

NG: What ideas were you selling to people in Iraq?

JB: The notion that they needed to come together as one, that they needed to think of themselves as Iraqis first, not as an Arab or a Kurd or a Sunni or Shiite or a member of one tribe versus another tribe. They needed to figure out how to take their pain away, and it was something that they needed to do for themselves.

NG: Were you able to do that?

JB: To some extent. I used the power of persuasion lots of times in convincing them there was a way out of this morass they were in. In early 2004 there were examples where we were being successful.

"This administration doesn't understand diplomacy. We haven't done the work to reconcile the country."

LG: With General Petraeus and Ambassador Crocker, do we have the right leadership in place at this point?

JB: Dave Petraeus is a wonderful Army General; I've known him for years. I have a great respect for him. But there is no military solution in Iraq. Remember, he is just but one leg of this four-legged stool in this administration that has utterly dropped the ball in developing a regional strategy to combat worldwide Islamic extremism. Until this administration or the next develops that strategy, we're in trouble.

LG: I'd like to go back to being in business versus being in the Army. One of the great catch words in American manufacturing is lean manufacturing. Do you think the Army is lean?

JB: I think that the First Infantry Division that I knew in 2003 to 2005 was about as lean an organization as

you could get.

LG: In what respect?

JB: I was in Kosovo for 14 months, Turkey for four months, and Iraq for 13 months in that period working hard. There could be no wasted effort. There was no room for inefficiency because we were too busy.

LG: Tell me about the chain of command in the military versus the chain of command as it's practiced today by you and the company you work for.

JB: There was a misconception at Klein Steel before I got here that I would be all about command and control, be very centralized and domineering and be very dictatorial. Nothing could be further from the truth. In the Army, the good units are very decentralized. There's lots of input from subordinates. Great units are decentralized and leaders are not afraid of subordinates making mistakes because that's how they learn. So my techniques today are precisely the same as they were when I was the Commanding General of the 1st Infantry Division. I value input. I want dissent. At some point there's a decision made and then we all go do it, but up until that point there's a freewheeling discussion, and during the execution of a mission it's always decentralized to the lowest level. You give your subordinates what they need to accomplish the mission and you get out of the way.

NG: What's the difference between the Army and civilian business?

JB: The biggest difference, and this is something that's getting better and better at Klein Steel, is the element of discipline. That is to say, once a decision is made people proceed in that direction whether they agree with it or not. In private business that's not always true. Talking to my peers in business in Rochester, there's a tendency far beyond the decision point for passive aggressive behavior. The challenge of leaders is to figure out where this is going on, who the resisters are, and get rid of them.

LG: It strikes me that in the military, at least out in the field, you have to have built-in redundancies because people get hurt; they get killed; they leave. In lean manufacturing, one of the problems is lack of redundancy.

JB: You're exactly right. There were multiple levels of redundancy in the military where you could plug them in all very quickly. In lean manufacturing, one person could

make a huge difference if he or she is sick. Klein Steel is a very lean organization. As a Commanding Officer, I had a personal staff and another dozen consultants, from security people to cooks to take care of things. I don't have any of that right now. It's a lean organization in every respect. That was something I had to get used to.

LG: Do you think that's necessarily good?

JB: It's not bad.

LG: There's a guru I've listened to a lot who always said, "Frank Sinatra didn't move pianos." The idea is that you should do what you do well and let other people fill in the holes.

JB: I certainly delegate as much as I can. At the moment I'm doing my own schedule, my own calendar, and answer my own phone. I think that's okay; that communicates to people that Klein Steel still has an entrepreneurial ethos. It's not extravagant. It's not spending money where it doesn't need to.

"You give your subordinates what they need to accomplish the mission and you get out of the way."

LG: Political question: Do we really want to find Osama bin Laden and kill him?

JB: Gosh, it would've been nice to get him in Tora Bora back in 2003.

LG: What I'm really getting at is, isn't he a convenient symbol of terrorism?

JB: Sure, he's nothing but a symbol, and he would be replaced multi-times over. You've got to remember, Al-Qaeda is a very decentralized organization. There are plenty of Osama bin Ladens out there. His legacy is going to live on whether he's alive or dead.

NG: Is he a uniter for terrorists?

JB: Sure he is. But again, he's going to unite whether he's alive or dead. Do I think we need to get him? Yes, and I think that we diluted the main effort when we went into Iraq.

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LG: Do you use the term “war on terrorism”? To me it’s a term that has lost its meaning.

JB: I don’t like that term at all. I prefer to describe it in terms of a struggle against worldwide Islamic extremism.

LG: I agree, and I think that this is a significant error that this administration has made, as well as most politicians. It has become a meaningless code to me.

JB: It’s meaningless, and on top of that, the nation is not mobilized behind it. So what are we doing? Yesterday I was at the Mittal mill in Conshohocken, outside of Philadelphia. Here’s this great mill that’s pumping out armored plate for the military. They produce a lot of steel, but a big chunk of what they do is armored plate for the MRAP program. But Mittal has no idea what the requirements are next year. It’s a big guessing game, and these MRAPs should’ve been built two years ago.

LG: What is MRAP?

JB: MRAP is the Mine Resistant, Ambush Protected vehicle the Army and Marine Corps are buying to protect soldiers. The industrial base is in no way mobilized; there’s no leadership at the national level to provide our soldiers what they need. There are something like seven companies now competing for the design of the MRAP, and what may very well happen is they’ll all get a piece, so there will be seven different designs and an unbelievable array of chemistries and thicknesses of armored plate that our mills have to produce, and that’s not very efficient.

LG: It’s very interesting talking to somebody who’s living in both worlds. It seems like you still spend a lot of time on military-related affairs.

JB: It’s difficult to escape. I find myself doing that kind of work at night and on weekends, 60 hours a week or more is Klein Steel.

LG: When you talk to clients, are they primarily interested in steel or do they want to talk to you about the war?

JB: It’s a combination of both.

LG: Did you expect that?

JB: Not when it comes out of left-field. I’m focused on selling steel and on relationships with customers.

NG: Does it get annoying?

JB: No, it’s not annoying. Part of this is educating the American people on what’s going on.

LG: Is the Army in decay or simply stretched farther than its real resilience enables it to be stretched?

JB: The two go hand-in-hand. I joined the Army after Vietnam in 1974 out of West Point, and my comrades and I spent 10 years rebuilding a broken Army. That’s what we’re facing now.

NG: From what I’ve read, you don’t think we should have a precipitous withdrawal.

JB: No, we can’t. It’s kind of funny, I’m a Republican and based on my campaign for 18 months, all of the Democrats think I’m on their side. It isn’t black and white. We cannot allow Iraq to fall into some huge humanitarian crisis. We can’t allow Iraq to be dominated by Iran. There’s strategic interest that we have out there. It starts with a regional strategy that we don’t have now, and from that there’ll be military tasks that make sense. For example, we may want to station troops in Kuwait for a while. We will have to protect whatever diplomatic mission we have in Iraq. We’ll want to go after Al-Qaeda-like organizations wherever they are. Now that doesn’t mean that we have to put troops in Baghdad. But we have strategic interests in the world so we can’t just walk away. The other thing is, to leave Iraq will take at least a year of deliberate withdrawal. It ain’t going to happen over night.

LG: Do you think over the next year to 18 months this is going to all be decided?

JB: Or, it’ll be punted down to the next administration – which is really criminal, because more of the same equates to losing another 80 to 90 Americans every month, and hundreds wounded every month for no reason.

LG: Could you see yourself running for office?

JB: At the moment, no.

LG: Thank you so much, John.



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Outsourcing Revealed

BY MARY ETHRIDGE



AP photo courtesy of caycompass.com.

Andrew Sweeney, the senior manufacturing engineer at a furniture company in Wisconsin, is a master of Chinese translation, although he doesn't speak more than a few words of any foreign language.

"In China, when I hear, 'everything's OK. No problem' from a supplier, that's when I know we definitely have a problem," he laughed. It's just one of many lessons Sweeney has learned in the eight years he's been traveling to Asia for KI, an employee-owned company in Green Bay. Despite these occasional rough spots, KI recently expanded its Chinese connections. In February of this year, it opened a global sourcing office in China's Guangdong Province – staffed by production managers, auditors and engineers – to oversee the operations of its many suppliers in the region, some of whom KI has been using for years.

Small and medium-sized companies such as KI, flying below most radar, have led the charge in China. Intentionally or not, they've also positioned themselves to serve a newly flush Chinese society. Some have already taken that step. The success abroad of these companies suggests a future for the U.S.

economy that is more complex – and likely brighter – than most business outsiders realize.

Sweeney talks of outsourcing to China in terms of dollar amounts and percentages; he said KI outsources a project if the savings of doing so are greater than 30 percent or at least \$30,000. Often, it's much more. But much of America sees the issue in far fuzzier

terms. Some talk of the “Chinese Threat” and the crumbling of the very foundation on which the United States was built. Meaningful debate about China involves currency valuations, trade imbalances, geopolitics and other subjects known to heighten the urge in most of us to nap. When something more simple and potent can be used to illustrate the “Chinese Threat,” the media grab on and the public goes for a ride. The ensuing dialogue is predictably circumscribed.

This year’s recalls of Chinese-manufactured goods – tainted pet food, poisoned toothpaste and lead-painted toys, among them – certainly made headlines. They also served as “gotchas” for the contingent of Americans who believe the Chinese are taking jobs better performed by higher paid Americans.

Indeed, there was so much chatter about Chinese outsourcing this year, you may not have realized one group was decidedly quiet – the hundreds of U.S. businesses like KI that have made outsourcing in China work for them.

The reason so many Americans establish operations in China are simple enough: it’s profitable. It’s so profitable that they endure the headaches and complications of setting up shop in a distant Communist country with ambiguous laws and an alien culture. It’s so profitable they’re willing to risk being maligned in their home country by those who see their actions as bordering on traitorous. It’s so profitable that they’re willing to spend weeks at a time getting to and living in a place about as far from home as one can get. And as more companies move into China, those who supply them feel they need to follow.

“More and more of our customers were moving there, and we felt we had to be there in order to be a world-class manufacturer,” said Mark Miller, chief executive of Prince Industries in Carol Stream, Ill., which opened a factory outside Shanghai in 2001. His company makes parts for the construction and medical industries, among others.

Getting numbers from private businesses – particularly about a subject as volatile as outsourcing – is close to impossible. But according to a survey last year by CFO Research Services, nearly three-quarters of all executives said their outsourcing operations met or exceeded their expectations. Although no one claims to have precise fig-

ures, some estimate U.S. manufacturers save on average 40 percent of a job’s cost by outsourcing work to China.

The primary reason for this is simple – cheap labor. The average Chinese factory worker makes about \$115 to \$150 a month. That’s about one-tenth of the average wage of a U.S. factory worker. And the supply of human capital is plentiful. The Guangdong Province alone has an estimated manufacturing workforce of more than 18 million compared to 14 million in the whole of the United States.

But before you pack a bag and hop on a fast plane to China, take a breath. Doing business in China is not only complicated, the pace of change can be disorienting. Think of shifting government policies as the rocks; huge sociological and demographic changes are the hard places. You’re in the middle, and the move that made sense yesterday could be a disaster tomorrow.

“A good rule of thumb in China is to never assume anything. The potential for miscommunication is enormous.”

The potential pitfalls in China are numerous and include miscommunication, intellectual property risks, con artists, an unpredictable legal system and the bureaucratic maze of a Communist government. Just registering a company in China is a 25-step process. When you throw in vast cultural differences and the language barrier, the prospect of entering the China game can be daunting.

So how does anyone possibly make it work?

“A good rule of thumb in China is to never assume anything,” said Andrew Cousin, chief executive officer of Amersham Corp., a Denver-area precision parts manufacturer who has been sourcing in Asia for 20 years. “The potential for miscommunication there is enormous.”

Large multinationals have the money to throw at any problems that crop up, but smaller businesses just might find themselves in a mess, said Oded Shankar, professor of management at Ohio State University’s Fisher College of Business. Even the big dogs get

burned. Toymaker Mattel had worked with its supplier for 15 years and had many costly checkpoints in place before this summer's recall.

"If the big players with very big pockets get into trouble, what does that mean for smaller companies who can't afford trouble?" said Shankar "It's all far more complicated than people think."

Dan Harris, a Mandarin-speaking attorney in the Seattle law firm of Harris & Moure, said horror stories are legion. Harris has helped hundreds of businesses form Chinese ventures; he's also helped many companies clean up from the missteps they made going it alone.

"The biggest mistake [outsourcers] make is thinking it will be easy and they can do it just like someone else did it. Other mistakes include not accounting for hidden costs and believing the Chinese manufacturer is their friend," he said. Harris tells stories of businesses that found manufacturers on the Internet, had brief e-mail exchanges with them and then just shipped over designs and money. Those stories, as you can imagine, don't end well.

"They want it to work so badly, they don't think things through. It isn't like doing a deal with a guy down the street you've known for years," he said.

Cousin thinks of his company as a risk management firm for those interested in, but afraid of, plunging into China. One of Cousin's guiding principles is to keep intricate jobs in the United States at one of his four U.S. facilities. Simpler, mass-manufacturing projects are sent abroad. Because labor cost is by far the largest advantage of China, outsourcing highly specialized work doesn't make sense on any level, he said.

Also, Cousin advises companies check the backgrounds carefully of every partner they consider. He said he's looked at several hundred companies, used 50 of them and considers only half of those to be core partners.

The answer to the China question for Miller of Prince Industries was under his nose – or at least across his desk. A Chinese-born man, whose work for a competitor Miller admired, decided to form his own consulting company. Miller asked him to travel to China to assess Prince's possibilities for outsourcing. When they found a

good location just outside of Shanghai to open their own factory in 2001, Miller asked the man to run it.

"We were really lucky to have someone who knew the country. He still has family there and still has connections. He watches over everything," he said.

W.L. Scheller, professor of industrial and manufacturing engineering at Kettering University in Flint, Mich., agreed that having a trusted person on the ground in China shouldn't be considered a luxury.



Photo courtesy of nakedcapitalism.com.

"Anybody who isn't over there babysitting their projects is asking for some big problems," he said. "You don't want to cede control to someone else."

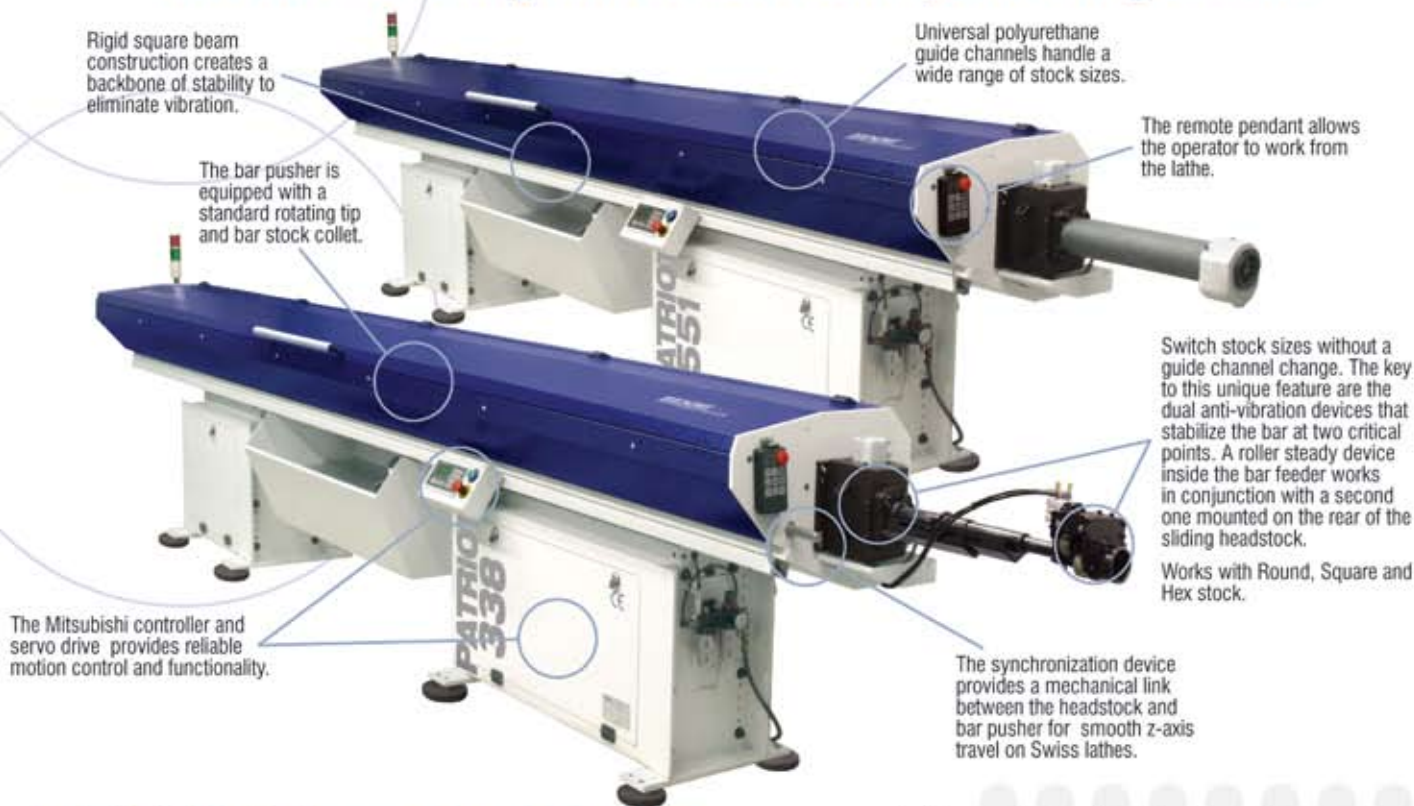
Watching your own operations closely isn't enough. China is undergoing enormous demographic, economic and social changes – the hallmarks of any emerging market. But these changes are happening to the largest country on Earth and in the relatively new age of instant communication. They're huge, historic and happening at an unprecedented pace. You'd be advised to do more than read your local paper, experts say.

Over the summer, the global business world buzzed with the news that the Chinese government was doing away with preferential income tax treatment for foreign companies. It took the measure to help cool off an economy they fear is overheating. It also vowed to aim its efforts at attracting more high-tech and service-based businesses and fewer simple manufacturers.

But attorney Harris believes these will have negligible

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effects for individual companies.

“Investments that really make sense will happen no matter what,” said Harris, who splits his time between offices in the U.S. and China.

Cousin believes other factors have more potential for shaping the future of China. At the top of the list is the value of the Renminbi (RMB), the currency of the People’s Republic of China. (Colloquially, it’s called the Yuan.) The United States and European Union have pressured China to increase the value of the RMB to encourage imports and decrease exports. Some argue such a policy would preserve manufacturing jobs in the United States. But the Chinese government has resisted out of concern that Chinese jobs would disappear and domestic banks would be put in jeopardy. For those who depend on China for low-cost goods – manufacturers, mass retailers and American consumers, among them – increasing the value of China’s currency would undoubtedly raise prices of those goods.

Another factor of concern to Cousin is the growth of

“The United States and the European Union have pressured China to increase the value of the RMB.”

Guangdong and the other so-called top-tier regions that drew pioneers of the outsourcing movement. As these cities have grown, the costs of doing business – including worker salaries and real estate rent – have risen significantly. Though Beijing, Shanghai, Guangzhou, and a handful of other seaboard hubs remain the destinations of choice for most foreign companies, they may not be the best locales for businesses on a budget. “If you can’t leverage the labor costs, the advantage of China is gone,” Cousin said.

China has close to 100 cities with a population topping 1 million, nearly all of which are actively trying to attract foreign investment. By choosing a city in the so-called second tier, businesses can often save and take advantage of government incentives. But many predict that the same phenomenon will reach those second-tier cities, pushing development into the nation’s third tier, and so on.

This fluid nature of today’s Chinese economy is why

Cousin has chosen to have only a representative sourcing office in China rather than a wholly-owned enterprise.

“There are dramatic regional differences in costs in China and across Asia. With a representative office, we can contract with partners wherever it makes the most sense,” he said. Sometimes that means going outside China to Vietnam or other countries emerging as new outsourcing options.

“In China, just when you think you have the picture, it changes,” said Scheller of Kettering in Flint.

If all of this doesn’t scare you off, the thought of being a piranha in your home country might. Outsourcing, particularly to China, has seen new life recently as a popular target of U.S. labor groups and others. They blame the phenomenon for U.S. unemployment and cite a Forrester Research study that 3.3 million U.S. jobs will be moved offshore by 2015.

Miller of Prince Industries told his employees five years ago that he was setting up an operation in China; the reaction among them was swift and predictably negative. But at the same time, Prince invested in upgrading his U.S. facilities, and the talk quieted down. Still, he’s careful when talks about his China operations. “Even if my customers understand, the people who work for them might not,” he said.

Anthony Manna, an Ohio lawyer with manufacturing and real estate concerns in China, doesn’t talk much about his operations in China either, but when he does, he explains that he believes offshore outsourcing is not only inevitable, it’s actually healthy for the U.S. economy.

“Look, it’s something we adapt to or perish. You can either choose to put your head in the sand or outline a strategy to deal with it,” said Manna. “At the end of the day, this is a good thing.”

In a recent issue of *The Atlantic*, author James Fallows, who has written about China’s economy extensively, makes the argument that China’s rise is America’s gain.

Fallows illustrates his point with something called “the smiley curve,” after the bright yellow happy face seen everywhere in the 1970s. The curve, like the icon’s mouth, is U-shaped and represents levels of profitability from a product’s creation through its sales and service.

China’s position on the curve is in the middle, at the bottom of the smile. That’s where the manufacturing and assembly take place. But America, he argues, has the two, far more profitable ends. The curve starts high for

branding and concept, dips for manufacturing and rises again in the retail and servicing stages. The vast majority of the money stays in the United States.

The Chinese are well aware of their current position on the smiley curve, Fallows said. "These low wage jobs have been wonderful in terms of getting peasants out of rural poverty, but they're not really a way ahead

"These low wage jobs have been wonderful in terms of getting peasants out of rural poverty."

for the country," Fallows told *Today's Machining World* recently. "So China collectively and many Chinese firms would certainly like to move up the value chain. The two operational questions are: Will they be able to? And, will American firms let themselves be overtaken?"

The outcome is not fated, he said, but depends on the way the companies and countries involved behave.

Many have already taken action. Cousin said the majority of his Chinese-based manufacturing is now done for the Chinese market. Manna said his business has also shifted focus from outsourcing to fulfilling Chinese orders. As more Chinese move from lives of rural poverty to relatively well paying jobs in the cities, the demand for consumer goods continues to rise

"They're hungry for things. They want American products," Manna said. The cities themselves have to cope with the influx of new residents, another potential market for Manna, who owns a company that supplies construction companies in China. "We've decided this is where the future is."

"As more Chinese move from lives of rural poverty to relatively well paying jobs, the demand for consumer goods continues to rise."



China: The Facts

In recent years, China has earned the reputation as the factory floor to the world. With China's 2001 entry into the World Trade Organization and mounting global pressure on Beijing to level the playing field for international investors, long-standing restrictions on foreign companies disappeared. The result has been an extreme makeover of the Chinese economy that continues to surprise even its participants.

- The Chinese economy as measure by the Gross Domestic Product has grown an average of 10 percent annually since 1990, according to its government. In the second quarter of 2007 alone, it grew nearly 12 percent, according to the World Bank.
- In 2006, China approved more than 41,000 foreign projects, the majority of which were in manufacturing.
- In the first half of 2007, exports of foreign-funded enterprises accounted for 57 percent of the country's total exports.
- China's global trade surplus soared from \$32 billion in 2004 to \$177.5 billion in 2006.
- In 2006, foreigners invested \$63 billion in China's economy directly, up 4.5 percent from 2005, according to China's Ministry of Commerce.
- U.S. businesses as a group were China's fifth investor in 2005 with a totaling of more than \$12 billion in new investments
- Currently, more than 28 million people work in foreign enterprise in China, or about 10 percent of the non-rural population.

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Tornos DECO 10mm, 2001

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Model 52, 1981, thdg.
Model 62 2-1/4" 6sp., 1975, heavy thdg.
Model 62 2-1/4" 1967

DAVENPORT

3/4 Davenport, 2006
3/4" thdg., pickoff, longbed (4)
3/4" chucker, 1991 (4) Tamer
3/4" with Tamer & Logan clutches,
'91, long bed
3/4" thdg., pickup, 1977-66 (8)

MISCELLANEOUS

Davenport slotting
Hydromat flanges for HW25-12
Reed B-18 thread roll attachment
Winter 125 thread roller
Davenport chucking package **\$1250**
Mectron laser measuring machine mfd. 2000
Trion air cleaner (10)

Ring-type for chucking for 1-1/4" RA6 (2)
\$1,950 ea
Smog Hog Air Cleaners (4)
Davenport cross drill, pos. 3 or 4

HYDROMATS

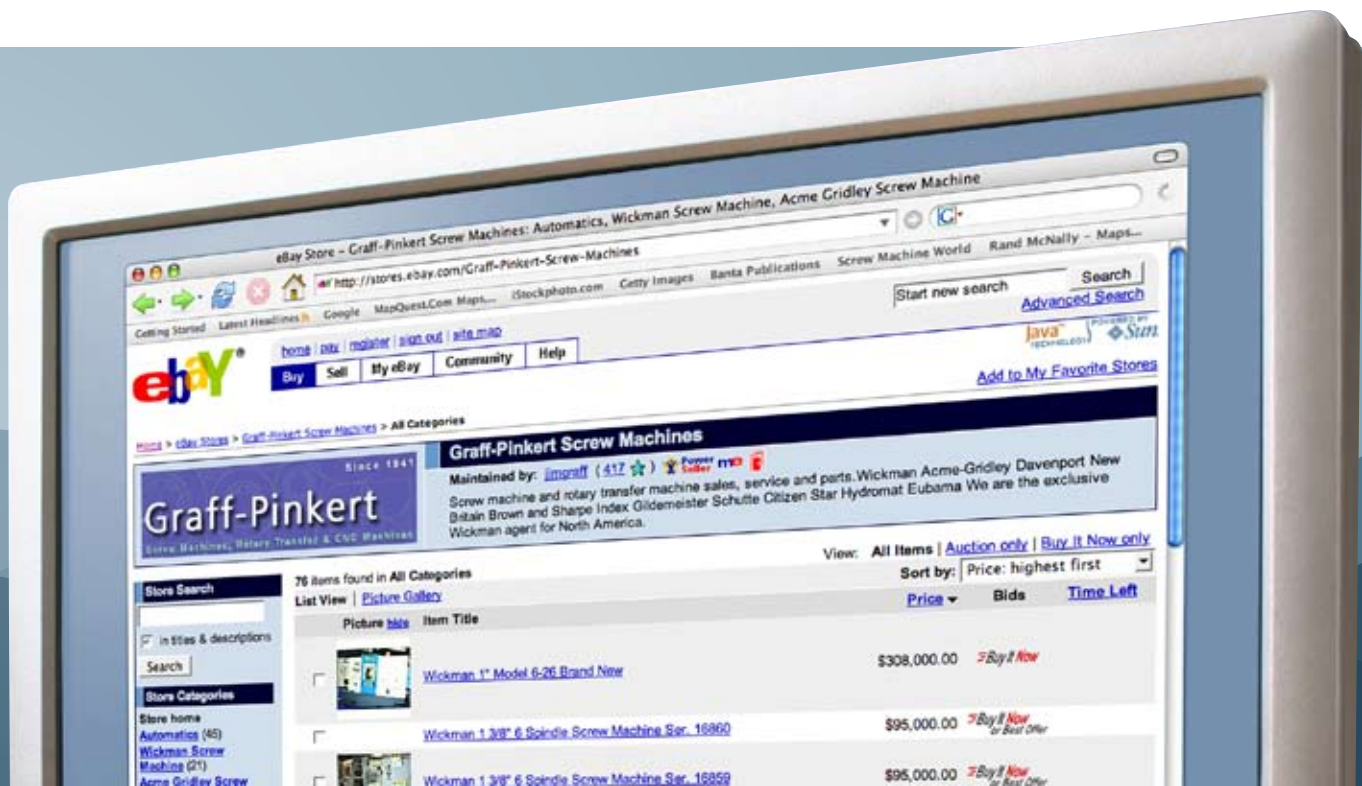
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WITH NOAH GRAFF

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. You should also check out the TMW online forum at www.todaysmachiningworld.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.

Dear Shop Doc,

We are having a problem with a small part we are trying to make on our CNC Swiss-type lathe. Because this part is so small and delicate, we have to machine all of it on the main side (we have a sub-spindle). One side of the part has intricate detail on the face and the other side is a single diameter with a radius. We know how to program a radius; however the result doesn't look like much of one. What we see is the beginning of a radius from the diameter but as it gets closer to the centerline of the part, we see a step and then the continuation of the radius. We are using the sub-spindle to support the part during the radius cutoff operation. We've dialed in the sub-spindle to get it exactly on center with the guide bushing. We've tried everything we can think of, but it's just not working that well. Please help!

Step Radius

Dear Step:

I know exactly what you are going through. Sometimes making miniature parts on CNC Swiss machines can be quite challenging. What you are encountering is deflection of the cutoff tool. What's happening is that the cutoff tool starts the radius with no interference from the raw material that is coming out of the guide bushing. Then, as it's generating the radius, the cutoff tool is coming into contact with the raw material. Now you are loading up the back side of the cutoff tool. As the back side of the tool loads up, it causes the tool to deflect and push into the radius, which creates a step.

Considering that I don't know the diameters you are trying to machine, I'll use a theoretical example. Say the pin diameter of your part is .030", the cutoff tool is .040" wide and the length of the part is .100". With the turning tool that is making the .030" diameter, instead of stopping the z-axis

at .100", keep turning until you get to .140" in length. This will give the back side of your cutoff tool additional clearance. Now when your cutoff tool finishes the radius, it will not come in contact with the raw material.

Here are few important things to remember. The quality of your cutoff tool is very important. Make sure you have all the appropriate angles ground into the geometry of the tool. When you are setting up the machine, make sure the center height of your cutoff tool is right on. And hopefully you are using material that is of high quality and/or is centerless ground. Obviously, with any sliding headstock machine, your guide bushing must be appropriately adjusted.

If you use this programming example and the other tips, you should have a nice clean radius at the end of your part. Good luck.

David Cogswell

Bal Seal Engineering, Medical Products Group

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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

Is a large U.S. trade deficit better for Americans than a trade balance?

The U.S. trade deficit has been declining since 2005 as a result of a significant rise of exports and slowing growth of imports.

The U.S. can live with small trade deficits; however, current ones are not small. The past decade has seen the worst-case: large and ever-growing trade deficits.

Most immediately, large trade deficits mean that the U.S. economy has too few manufacturing jobs and too many construction jobs. When this deficit inevitably reverses, 3-5 million workers will need to move between these sectors. Achieving this without a recession will be a trick, requiring some luck and some good macro-economic management.

In the long-run, large trade deficits mean we're financing current consumption and investment by selling off claims to future income flows, leading to ever-mounting foreign debt. At this point, the linchpin to U.S. (and global) re-balancing is the U.S./China exchange rate. A weaker dollar vis-à-vis the Chinese yuan will lead to a healthier global economy for these countries, and for all others relying on a strong U.S. economy.

Josh Bivens, Ph.D.
Economic Policy Institute

Comparing the decade of the 1990s with the most recent seven years, the U.S. has moved from a good trade deficit to a bad trade deficit. In a good trade deficit, foreign and domestic financial capital are being invested in innovation, new production and desirable products, which increase the capacity of the U.S. economy to grow, and thereby repay the obligations undertaken.

In a bad trade deficit, domestic households, businesses, and governments are spending beyond their own incomes, earnings, and taxes; overall, the economy is consuming rather than investing in new ideas or products. Under these circumstances, the trade deficit today may make us feel like we are wealthy; but our future earnings will go to repay what we've borrowed. And, the adjustment to a smaller trade deficit will make us feel, and be, poorer.

Dr. Catherine L. Mann
Brandeis University

Top Trading Partners- Total Trade, Exports, Imports Year-to-Date August 2007

Source: U.S. Census Bureau

Country	Exports	Imports	Total All Trade	Rank	Percent of Total Trade
Total, All Countries	753.4	1,272.6	2,026.0		100.0%
Total, Top Countries	442.2	829.1	1,246.5		61.5%
Canada	161.7	206.5	368.3	1	18.2%
China	41.2	205.1	246.3	2	12.2%
Mexico	90.5	136.9	227.5	3	11.2%
Japan	41.4	96.3	137.8	4	6.8%
Germany	32.4	62.4	94.8	5	4.7%
United Kingdom	33.9	37.1	70.9	6	3.5%
Korea, South	22.9	32.4	55.3	7	2.7%
France	18.2	27.3	45.6	8	2.2%

A nation's trade balance is determined by the sum total of investment and savings decisions in the domestic economy. America runs a big trade deficit because, year after year, we create more investment opportunities than we can fund with domestic savings alone. Without the inflow of foreign capital that the trade deficit accommodates, domestic interest rates would be higher, fewer start ups and business expansions would be financed, and equity, bond and real estate prices would be lower. Our economy would be less productive over the long run. Of course, we could fully fund domestic investment AND eliminate the trade deficit if we dramatically increased our domestic rate of savings, both in the private and public sectors. But absent more domestic savings, Americans are better off today because we can tap into global capital markets to fully fund domestic investment, even if that means we run a big trade deficit.

Daniel Griswold
Cato Institute

the facts:

In the second quarter of 2007, the current-account deficit measured \$191 billion, or more than \$760 billion on an annualized basis. To pay for those imports, the U.S. has to attract \$2.1 billion in foreign investments every day.

The Wall Street Journal

Trade Deficit: An economic measure of a **negative balance of trade** in which a country's imports exceeds its exports. **A trade deficit represents an outflow of domestic currency to foreign markets.**

www.investopedia.com (a Forbes media company)

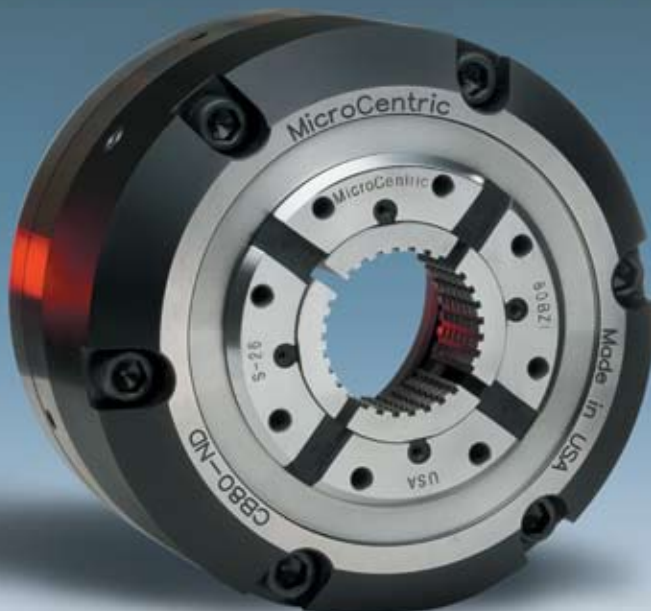
U.S. manufactured goods exports [in May, 2007] were 10 percent higher than [May, 2006], while manufactured goods imports were up only 4 percent over the year-earlier period.

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one on one

David on vacation in the Parry Sound region, 235 km north of Toronto.

David Collison is president of SMS Machine Tools Limited, a machine tool distributor located in Toronto, Canada. We sat down with him to get a Canadian's view on the rising Canadian dollar and the machine tool business in Canada.

NG: Are you happy about the Canadian dollar's recent superior value versus the American dollar?

DC: I don't know if happy is the word. In the business I'm in, no, I'm not happy. We've been selling [machine tools] in U.S. dollars for years because of the fluctuation of the currency value, and basically all builders who are selling in North America price their machines in U.S. dollars. We used to sell a Fadal for 100,000 U.S. dollars, and for me that was really a 150,000 dollar sale in Canadian dollars.

NG: Was the suddenness of the shift in the currency's value a big issue?

DC: The biggest problem with the exchange rates that we're facing right now is not the fact that they went to par, but the fact that they went to par so quickly. We're only talking probably 30 months that this all happened. In our manufacturing company it was very difficult to adjust to that kind of change. If it had happened over 10 years, you could sort of be working along the way to adjust to it, like reducing wages, getting more efficient equipment, etc.

NG: How often do you come to the U.S.?

DC: Probably once a month on average. But the big problem that we're having in Canada is that the Canadian automotive companies are struggling to take that margin that has accumulated because of the strengthening [Canadian] dollar. So there's all kinds of people trying to shop in Buffalo and bring cars back, bring anything back across the border because the retail prices are not changing in Canada to reflect the exchange rate. Porsche just the other day ran an ad here in Toronto to say they were dropping all their prices 10 percent.

NG: Are the prices now equal to those in the U.S.?

DC: No, they're still more. The Porsche up here at \$170,000 was something like \$130,000 in the States. Across the country we have a 6 percent Goods and Services Tax (GST), then the various provinces have provincial sales tax rates. Here in Ontario it's 8 percent, so they add 14 percent on the price of what you buy.

NG: How does the size of Canada's automotive industry compare to that of the U.S.?

DC: Ontario is [now] the biggest automotive manufacturing center in North America. If you take all the automotive business such as the parts manufacturing and car assembly and how much it totals, it's bigger than Michigan now.

NG: Why is the Canadian dollar called the loonie? Is there a story behind the name?

DC: [Canadians] don't have any paper money at the \$1 and \$2 levels -- we used to (prior to 1987). The loonie is a brass colored coin, and on the back there's a loon. Instead of calling it a loon we call it a loonie.

NG: What's a loon?

DC: It's a beautiful bird that comes up north here in the summer and has a very haunting, lonely call that you hear at night and in the daytime. The original drawing was not going to be a loon, but it got lost in transit somewhere. To prevent counterfeiting they changed the design to the loon.

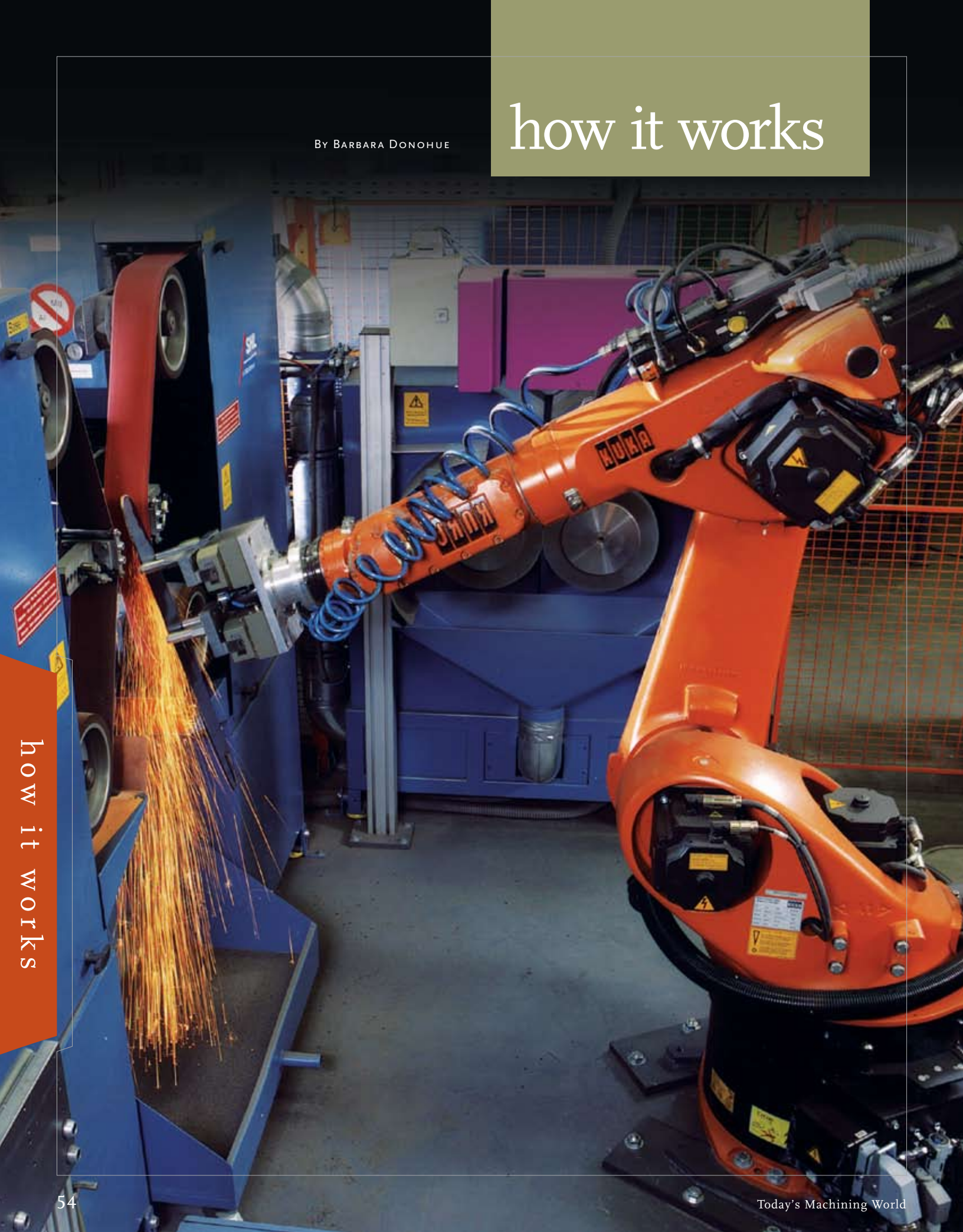
NG: Interesting. What's on the back of the \$2 coin?


DC: A polar bear.

how it works

BY BARBARA DONOHUE

how it works





Even a single robot in your shop
can help make you more competitive.

Robots in the Shop

Robots can perform many tasks that are done by humans, and they can keep on performing these tasks, shift after shift, without getting tired or taking a break. The type of robot commonly used for shop floor applications is the familiar “articulated robot,” which has jointed arms.

(Continued on next page)

Left Photo: KUKA robot holds a chain-saw component for grinding tracks. Photo courtesy of KUKA Robotics Corp.



Above:
KUKA KR 30 robot.
Photo courtesy of KUKA Robotics Corp.

Right Center:
A FANUC R-2000iB/165F intelligent robot loads a part into the FANUC aT14iEL ROBODRILL for processing, and unloads finished parts and places them in an output bin.
Photo courtesy of FANUC Robotics America, Inc.

What a robot can do for you

Robots are really good at repetitive tasks. Loading and unloading parts from a machine, for instance, or deburring or polishing the same type of part over and over again. They don't get bored or tired. They don't get repetitive strain injuries. And, once programmed properly, they don't make mistakes. They can take over routine tasks, and allow your skilled staff to do more demanding work.



How to get started

A common first use for a robot in a machine shop is machine tending – loading and unloading parts. Where employees have to handle heavy parts, you may want to provide a robot to do the job and help prevent workers from injuring themselves.

“Typically where robots are coming into use is in material handling applications,” said Tom Rohlwing, vice president of sales, Dane Systems LLC, Stevensville, Mich., an automation systems integrator. “The most justifiable payback is on repetitive runs of like parts.”

A shop's first robot might be something like the FANUC LR Mate. It's about the size of a human arm and handles a payload of up to 5 kg (11 lb), said Mike Cicco, account manager, FANUC Robotics America Inc., Rochester Hills, Mich. The robot is lightweight and portable. It can be mounted on a stand with wheels or forklift pockets for easily transport.

Families of similar parts are ideal for robot load/unload. You

how it works

Right Photo: A FANUC R-2000iA transfers a part for machining. Photo courtesy of FANUC Robotics America, Inc.

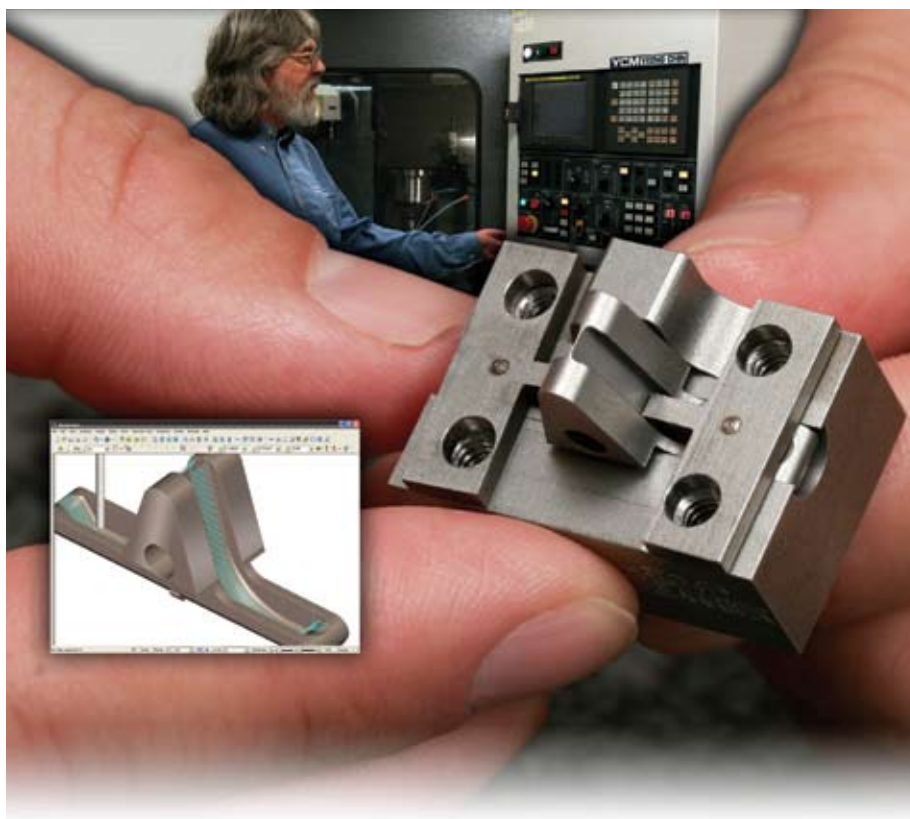


can simply change the end-of-arm tool on the robot for each part number. Operators who can change the jaws on a chuck can also easily change the jaws on a robot's gripper.

The pieces to be machined can be arranged in a plastic, machined pallet or tray, so they are located and oriented properly. The trays can hold different numbers of parts, 10 or 100. When you program the robot, you teach it where the first part is, and it can figure out where the rest are from the grid layout you enter. The parts don't have to be very precisely located, only within about a quarter of an inch, said Cicco, since the robot's gripper will automatically center the part when it grasps the part.

You'll probably want to work with a system integrator to design and install your robot system, especially your first one. An integrator will understand and evaluate your needs, and design and build a complete robot cell for you, including robot, mounting, controller, guarding and any additional functionality you want, and then train you and members of your staff to program and operate the robot. In a job shop, you'll want to be able to use the robot for different parts, so be sure the integrator knows the heaviest part the robot needs to handle. A number of manufacturers offer product lines of robots rated for payloads of up to 700 kg (1540 lb) and more.

Once the owner and staff understand how to use and program a robot, they can figure out how to redeploy it for another application. "It's a pretty simple concept, and once you've got the concept down it's pretty easy to apply it to something else," said Cicco.



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– Dan Powers, Intrinsic Therapeutics, Woburn, MA

“As an integrator, we give them the recipe, the instructions. We can do it for them or they can do it themselves,” said Rohlwing.

Accepting automation

How do employees respond to robots coming in and taking over some of their work? “What we’ve heard people tell their employees,” said Cicco, “is it’s a growth opportunity for them; they can get trained on a new product.” Many employees respond well. And “most employees realize if the company is not profitable, everybody is out of a job,” said Cicco. To be competitive, the idea is to take the labor out of the product. The reality of the situation is that a shop may end up reducing head count by people who are not open to the new technology,

Safety

Most industrial robots don’t know when they collide with something and they can potentially do damage. For safe robot operation, workers and passersby should be protected from robots by guards, fences and interlocking doors or gates. Your system integrator should be knowledgeable about safety requirements and can provide you with the necessary guarding. Also, careful programming, and perhaps computer simulation of the robot’s path, can prevent the robot from crashing into the machining center or other obstacles.

Return on investment and payback

As with most equipment in the machining business, robots don’t come cheap. A standard machine-loading cell can cost nearly \$50,000, according to a robot manufacturer interviewed at the Robotics Show in Chicago last June.

Can robots really pay for themselves? Typical payback is less than two years, Cicco said, and often is just over a year.

Cicco told about one shop owner he worked with who had gotten to the point of sometimes needing a third shift, and sometimes not. After installing two robot load/unload cells, he could set up the cells with a supply of pieces at the end of the second shift, turn the lights out and leave it to run unattended. This way, he got four additional hours on one machine and two on another, without having to put on a third shift or pay overtime. Payback for these cells was less than a year, Cicco said.

Used robots are widely available, and you may be able to keep your costs down by buying used instead of new.



The Robocoaster amusement ride from KUKA Robotics. (Illustration courtesy of KUKA Robotics Corp.)



Robot grinding the spoiler for a car. This gives added flexibility and higher accuracy to the manufacturing process. (Photo courtesy of Georgia Institute of Technology, Robotics and Intelligent Machines department.)

how it works

Make sure it is rebuilt and certified by the rebuilder. You can also ask your system integrator to find you a used unit.

More advanced uses

Once you have installed and started using one robot, it's likely you will come up with additional robot applications. More load/unload cells, or maybe a single robot mounted on rails to service several machines. Robots these days can be fitted with sophisticated vision systems so the robot can pick up randomly oriented parts from a conveyor or bin, eliminating the need for pallets or trays for pieces to be loaded.

When you automate parts handling, you can add automatic inspection processes, said Rohlwing. Then, "every part you pass through the system can be a good part," he said. While the robot is handling a part, sensors or a vision inspection unit can easily check inside and outside diameters and other dimensions, as well as the presence of features such as threads or holes. Robots can also deburr, grind and polish. Robots are also commonly used for drilling.

Robots can even do milling. Some robot, software and accessory manufacturers have formed partnerships to create systems that enable a robot to wield an end mill or other cutter. Specially designed cutting heads are available for mounting on the end of a robot arm. Software is available that translates a computer-aided manufacturing (CAM) program into robot motion to follow a contour and to do complex, 5-axis machining – without a machining center.

Most of the robot-milling systems available today are intended to cut soft materials, such as the foam or clay used for design models. Of course, a robot system lacks the rigidity and strength of a machining center, and, so far, most robot-milling systems are unable to generate the higher forces and accuracy required to cut metals to typical machining tolerances. As time goes on, however, robot manufacturers and their partners will likely develop robot mills that can take on more and more of the metal cutting tasks now performed on traditional machining centers.



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A KUKA robot mills a component to CAD specifications.
(Photo courtesy of KUKA Robotics Corp.)

Out of the shop and into the future

As robots become more capable and easier to “train,” they will be able to provide helping hands for many tasks in the shop. Check out the video on www.smerobot.com (see sidebar) for a look at a futuristic robotic assistant.

As they increase in capabilities and ease of use, robots will move beyond the manufacturing environment and perform tasks in the service sector to improve productivity there, said professor Henrik Christensen, director of robotics and intelligent machines, Georgia Institute of Technology, Atlanta, Ga. A hospital nurse, for example, typically spends 10 to 15 percent of a shift running errands, walking up to five or six miles per day, he said. A robot could perform many of the errands, such as taking specimens to the lab. The nurse could then use that time and energy for patient care. This type of application could be available in three to five years, Christensen said.

As the large population of baby-boomers ages and needs assistance with everyday tasks, robots may be able to provide dignified, always-available assistance. Potentially robots could help a person get out of bed, get dressed and prepare a meal, Christensen said. A robot to provide this kind of in-home help might be available as soon as 10 years from now, he said.

It's widely accepted that the only way to keep manufacturing in the U.S. is to remove the labor content of manufacturing processes. The same machine would cost about the same here as elsewhere, and energy cost may be about the same. If the only major difference is the hourly rate of the workers, and robots can cut the hours, there's much less reason for work to go offshore.

how it works

More about Robots

Where does the word robot come from?

The word robot was popularized from a play written in 1920 by Czech writer Karel Capek, “Rossum’s Universal Robots.” According to some sources, the playwright’s brother, also a writer, coined the word based on a Czech word “robotnik” that means drudgery or servitude. Previously, machines that could do the work of humans were called automatons.

Robot-guided surgery

Instead of performing total-knee replacements, surgeons can now place small titanium implants to replace diseased bone. Before surgery, imaging techniques are used to define the area to be removed (the pocket) and to create an implant to fit. During surgery a robot can provide guidance to the surgeon to create the pocket. Meanwhile, the surgeon, who is actually doing the cutting, can judge the condition of the bone and the progress of the surgery by the feel of the cutting process. The U.S. Food and Drug Administration has approved a robot built by Barrett Technology, Inc. to perform this guidance. See www.barrett.com/robot/applications-surgical-article1.htm.

Riding a robot

KUKA manufactures a robot-based amusement ride, the Robocoaster. It holds two people in seats at the end of the arm and takes them through motions not possible on any other ride. Passengers can select a mild ride or a wild one. For videos, see www.robocoaster.com/english/galerie.html#.

For more information:

Resources:

Barrett Technology: www.barrett.com

Dane Systems LLC: www.danesys.com

FANUC Robotics America Inc.: www.fanucrobotics.com;

Videos: www.fanucrobotics.com/1,1296,Videos.html Georgia Institute of Technology, Robotics and Intelligent

Machines: www.robotics.gatech.edu

KUKA Robotics Corp.: www.kukarobotics.com

Nachi Robotic Systems Inc.: www.nachirobotics.com

Milling with a robot: www.directcontrols.net/trupathdemo.htm

New user information: www.roboticsonline.com click on “Beginners Guide”

Future robot: a helping hand: www.smerobot.org click on “Download,” and click on “Video”





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Answers.com gives the rundown on the field of robotics: Engineering concerned with the development and application of robots, and computer systems for their control, sensory feedback, and information processing.

Robotics includes research and engineering activities involving the design and development of robotic systems. This breadth of usage arises from the interdisciplinary nature of robotics, a field involving mechanisms, computers, control systems, actuators, and software.

Robots produce mechanical motion that, in most cases, results in manipulation or locomotion. Mechanical characteristics for robotic mechanisms include degrees of freedom of movement, size and shape of the operating space, stiffness and strength of the structure, lifting capacity, velocity, and acceleration under load. Performance measures include repeatability and accuracy of positioning, speed, and freedom from vibration.

A robot control system directs the motion and sensory processing of a robot or system of cooperating robots. The controller may consist of only a sequencing device for simple robots, although most multi-axis industrial robots today employ servo-controlled positioning of their joints by a microprocessor-based system.

The robot sensory system gathers specific information needed by the control system and, in more advanced systems, maintains an internal model of the environment to enable prediction and decision making. The joint position transducers on industrial robots provide a minimal sensory system for many industrial applications, but other sensors are needed to gather data about the external environment.

We just think robots are cool.

The following companies have automatically given information on their robotic lines:





FANUC

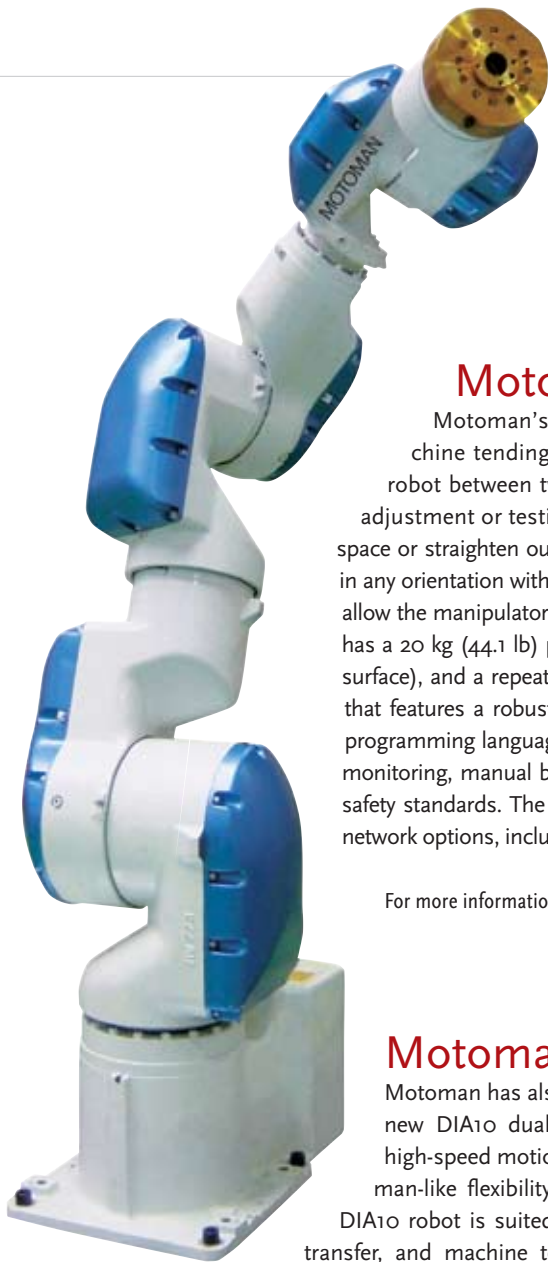
FANUC Robotics America, Inc., has introduced its new LR Mate 200iC, a six-axis mini-robot offering performance in a LEAN package. The LR Mate 200iC is designed to meet the needs of a variety of industries including metals, packaged and consumer goods and medical devices. Ideal for high-speed part handling, machine tending, assembly and material removal, the robot can be mounted in a variety of positions.

The LR Mate 200iC robot has high wrist load capacity; higher rigidity for smooth motion; slim arm to allow operation in narrow spaces; enhanced motion performance for speed; and supports a variety of intelligent functions including an internal programmable controller (PMC), Ethernet, iRVision (built-in), and force sensing. The FANUC iRVision system is a ready-to-use robotic vision package, requiring only a camera and cable – no additional processing hardware. It has a 2D robot guidance tool to accomplish part location, error proofing, and other operations that normally require special sensors or custom fixtures.

FANUC Robotics America, Inc., has also introduced the ARC Mate 100iC intelligent welding robot equipped with iRVision. The six-axis ARC Mate 100iC's internal routing allows the dress package to follow the motion range of the robot. The ARC Mate 100iC and R-30iA Controller can be integrated in a welding system that includes the weld torch cable, wire feeder, and welding power supply. Design enhancements include: Integrated wire feed control cable, with shielding gas hose and welding power cables; A 15 percent increase in acceleration for higher motion performance; a 10 kg payload; slimmer forearm and a 15 percent size reduction of the robot base.

The ARC Mate 100iC also supports a wide range of intelligent functions such as iRVision, a ready-to-use built-in robotic vision package; ROBOGUIDE-Weld-PRO simulation package; and Collision Guard to detect robot collisions with external objects. The R-30iA Controller uses high-performance hardware and the latest advances in network, integrated iRVision, and motion control functions, providing a level of intelligence never offered before, including the ability to control 40 axes with one controller (4 robots plus other equipment).

For more information, please contact FANUC Robotics at 248-377-7000 or visit www.fanucrobotics.com.



Motoman IA20 (left)

Motoman's new IA20 robot features a 7-axis actuator-driven design, ideal for assembly, machine tending, insert molding, inspection, and a host of other operations. Mounting the IA20 robot between two machine tools provides open access to the machines for fixture maintenance, adjustment or testing. The IA20 robot can straighten out vertically to take up only one square foot of floor-space or straighten out horizontally at a height of about two feet above the floor. The robot can be mounted in any orientation without limiting the motion range of any axis. Its minimized footprint and motion flexibility allow the manipulator to be positioned between machines or out of the normal working area. The IA20 robot has a 20 kg (44.1 lb) payload, a 1,140 mm (44.88") reach (from centerline of base rotation to tool mounting surface), and a repeatability of ± 0.1 mm (0.004"). It is controlled by the Motoman NX100 robot controller that features a robust PC architecture, Windows® CE programming pendant, and easy-to-use INFORM III programming language. Dual-channel safety features include enhanced E-stop functionality, integrated speed monitoring, manual brake release switches, and compliance with both ANSI/RIA R1506-1999 and Canadian safety standards. The NX100 controller offers unmatched connectivity through standard Ethernet and other network options, including: DeviceNet, ControlNet, Profibus-DP, and EtherNet/IP.

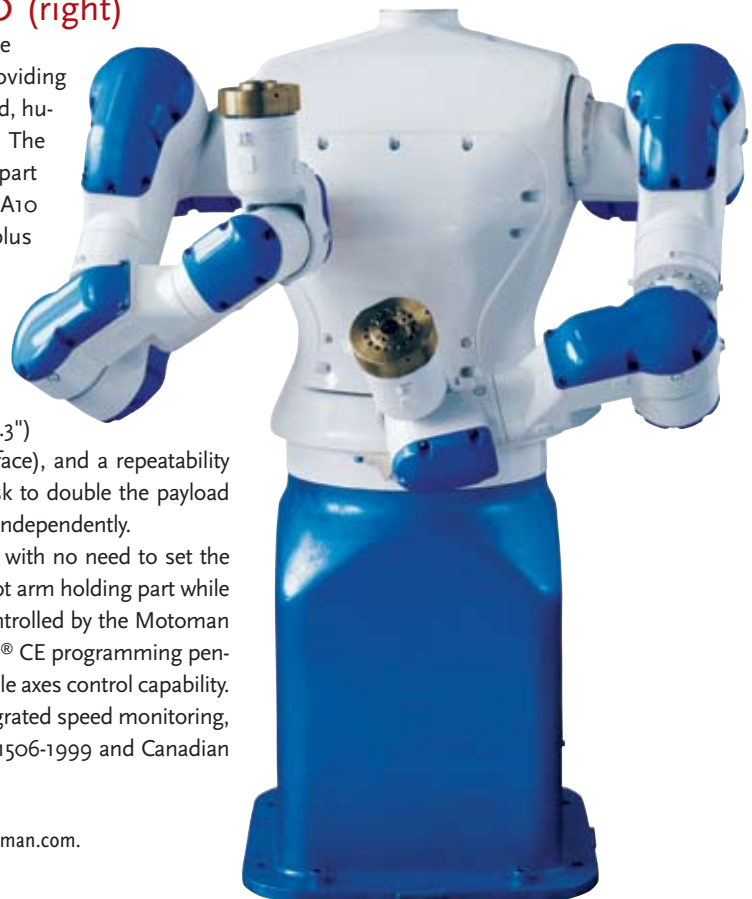
For more information, please contact Motoman at 937-847-6200 or visit www.motoman.com

Motoman DIA10 (right)

Motoman has also introduced the new DIA10 dual-arm robot, providing high-speed motion with enhanced, human-like flexibility of movement. The DIA10 robot is suited for assembly, part transfer, and machine tending. The DIA10 features 15 axes of motion (7 axes per arm, plus a single axis for base rotation). The DIA10 robot's actuator-based design means that the motor, encoder, reducer and brake for each robot axis are combined in one small package. Advantages include a slim arm profile, lightweight robot body and high wrist moment and inertia ratings.

The DIA10 robot has a 10 kg (22.1 lb) payload per arm, a 1,100 mm (43.3") reach per arm (from centerline of base rotation to tool mounting surface), and a repeatability of ± 0.1 mm (0.004"). Both robot arms can work together on one task to double the payload or handle awkward products. The two manipulators can also be used independently. The DIA10 robot can transfer a part from one of its arms to the other with no need to set the part down temporarily. It also provides "jigless" operation with one robot arm holding part while the other performs operations on the held part. The DIA10 robot is controlled by the Motoman NX100 robot controller that features a robust PC architecture, Windows® CE programming pendant, and INFORM III programming language. The NX100 offers multiple axes control capability. Dual-channel safety features include enhanced E-stop functionality, integrated speed monitoring, manual brake release switches, and compliance with both ANSI/RIA R1506-1999 and Canadian safety standards.

For more information, please contact Motoman at 937-847-6200 or visit www.motoman.com.



product focus



ABB Robotics

ABB Robotics now offers a smaller, more flexible robot – the IRB 6620, ideal for spot welding, machine tool tending, cutting, injection molding and core handling. The compactness of the 6-axis IRB 6620 make it possible to mount the robot in four positions – floor, tilted, inverted or shelf. The robot's flexibility allows it to be installed on different levels, providing faster runs through production lines. Weighing 900 kg, the IRB 6620 provides an advantage in machine tending applications where the robot can be placed on top of a machine. The robot can also work bending backwards and has a large downward working area. The IRB 6620 can handle payloads up to 150 kg with a reach of 2.2 m, and can work with heavy and large parts, making it ideal for the automotive, foundry, plastics and machine tooling industries.

For more information on the IRB 6620, please visit www.abb.com.



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Photo courtesy of Arthur Machinery

Stäubli Robotics

Stäubli Robotics has announced the development of new Robotic systems for Machine Tool Automation. Stäubli provides companies with robotic solutions capable of performing secondary operations, parallel operations and by part traceability management or quality control. Stäubli robots may be integrated inside or outside machine-tools and may work in atmospheres containing soluble oil or straight oil. All models may be subjected to pressure. A brake release system means that robots may be removed by hand in the event of a problem occurring on the machine. Programming is simplified with the integration of cell On/Off modes – no extra programming required – automatic cycle restart after stop on trajectory, with low-speed start-up. An event log for the installation is available for consultation at any time.

Stäubli benefits from great experience in machine tool automation and works with companies who offer full robot integration. Numerous applications have been developed in conjunction with various manufacturers and systems integrators, on all types of machine: single-spindle lathes, twin-spindle lathes, multi-spindle lathes, rotary transfer machines, linear transfer machines, machining centers, tapping centers, grinding machines, honing machines, boring machines, cutting machines, super finish machines, and more.

For more information, please contact Stäubli Robotics at 864-433-1980 or visit www.staubli.com

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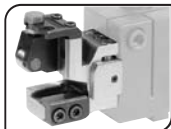
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product focus

SCHUNK Inc.

SCHUNK Inc. has introduced additional sizes of its sealed 3-finger centric grippers, DPZ-plus. The DPZ-plus sizes 40 and 50 are designed for the automated handling of small, round components under extreme environmental conditions. This sealed 3-finger centric gripper is sealed to meet IP 67 requirements against the penetration of contaminants. The base jaws of the sealed 3-finger centric grippers consist of two sections: a circular guide with wiper seal for a permanent, reliable seal, and a sturdy multi-tooth guide for the precise handling of rough and/or dirty workpieces. The DPZ-plus offers high bearing load capacities which allow for mounting of longer gripper fingers. A vent part prevents differences in pressure, which can draw debris through the seals into the gripper. This ensures that the gripper remains completely sealed, even under water.

The circular piston drive adopted from the PZN-plus has a gripping force of 230 (51 lbf) in the DPZ-plus 40 and 290 N (65 lbf) in the DPZ-plus 50, on strokes of 2.5 or 4 mm per finger. The combination of internal multi-tooth guide and external circular guide is extremely stable and ensures that the DPZ-plus 40/50 performs its task with sustained precision. The air supply can also be connected directly without hoses, and the gripper can be fastened on one side in two screw-directions.

For more information, please contact SCHUNK Inc. at 919-572-2705 or visit www.schunk.com.



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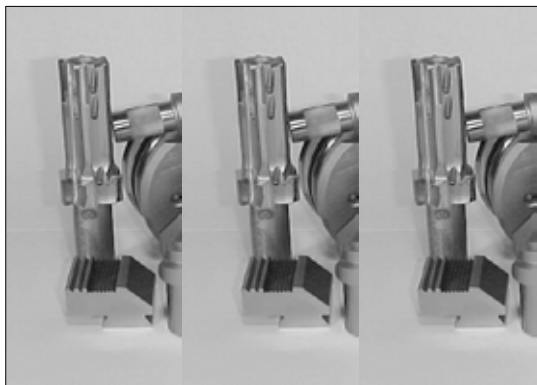
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KMT Robotic Solutions Inc.

KMT Robotic Solutions introduces CamPro™ - new PC-based offline programming software that enables manufacturers to convert CAM trimming and milling paths into complete 6-axis robot programs. "The CamPro solution allows manufacturers to make the most of their previous CAM investment dollars because personnel trained on Mastercam®, SURFCAM®, Delcam and other common CAD/CAM tools can automatically use CamPro," said Chuck Abrams, KMT Robotic Solutions Inc. technical manager.

CamPro makes robotic milling feasible by managing large files through the robot memory and enabling it to mill solid blocks of foam, wood and REN board. CamPro simulates the robot path offline, allowing programmers to check interference and arm configuration while the actual system is still in production. CamPro software is also designed for use with KMT's RoboTrim® robotic routing systems, Jet-Tool® waterjet trimming systems and RoboKnife™ ultrasonic knife trimming systems.

For more information, please visit <http://www.kmtgroup.com/robotic>.

product focus

Lincoln Electric

The Lincoln Electric Company offers its eCell™ dual fixed table robotic cell. The eCell pre-engineered system is designed to provide a flexible automation layout and is particularly suited for smaller shops seeking a low cost automation alternative to labor intensive arc welding. The eCell is capable of MIG (short arc and spray), synergic MIG and MIG pulse welding or flux-cored arc welding procedures on parts which can be welded without re-orientation. It can be used to weld a variety of materials, including steel, stainless steel and aluminum.

An exceptional reach/stroke ratio and high-axis speeds are at the core of eCell's Fanuc ArcMate 100iBe robot. The eCell includes Collision Guard torch protection software with password protection. Manufactured to ISO 9001 Standards, the eCell is compliant to ANSI/RIA 15.06-99, and includes ergonomic placement of operator panels, and controls. The eCell's 90-inch x 52-inch footprint minimizes floor space, and its forklift compatible base allows for portability for flexible manufacturing layouts. The cell arrives with a complete metal surround flash and safety barrier and only requires power, compressed air and welding wire to be production ready.

For more information, please contact Lincoln Electric at 888-355-3213 or visit www.lincolnelectric.com.



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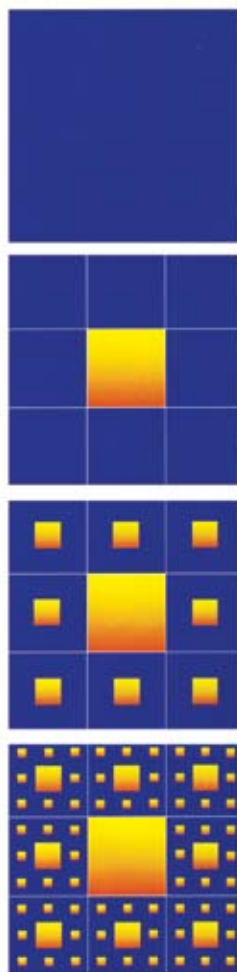
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think tank



A blue square is divided into nine smaller squares, and the middle one is painted gold. The eight remaining blue squares are divided into nine, and the middle square of those is painted gold. If this process continues, indefinitely, can you work out the eventual area of the gold areas in relation to the original blue square?

Medians of a Triangle

How many different possible orientations can one sitting dodecahedraon have?

There can be 60 different ways a dodecahedron can be placed on a table.



Who counted it up?

John M Weber Sr. of Weber Systems, Inc. in Menomonee Falls, WI; **Jim Riddell** of Baker College in Flint, MI; **Todd Sterlitz** of Strobel Machine, Inc. in Worthington, PA; **Bill Niro** of Standard Machine in Cleveland, OH; **Greg Roan** of BLP Products in Orlando, FL; and **Rocco Sarro** of MAHLE, Inc. in Trumbull, CT.

postings



Noteable and newsworthy
information and events for
the month of December.

Performance

Racing
Industry
(PRI) Show

Orlando, FL

December 8

www.performance-racing.com/trade-show/index/general_info.html

CONEXPO, ASIA,

Guangzhou,
China

December
4th - 7th

www.conexpoasia.com

Defense Manufacturing Conference

Las Vegas, NV

www.dmcutedayton.com

Dec. 3rd
thru
Dec. 7th

EuroMold 2007

www.eromold.com

Frankfurt,
Germany

Dec. 5th
thru
Dec. 8th

Intl. Symposium
on Nanotechnology
in Environmental
Protection and
Pollution

Fort Lauderdale, FL

Dec. 11-13

www.isnepp.org

IMC 2007-
22nd International
Maintenance
Conference

Dec. 4 - 7

Daytona Beach, FL

www.maintenance-conference.com/imc/

Shutdowns Superconference

2007 Dec. 3-6
Calgary, AB, Canada

www.canadianinstitute.com/Manufacturing-Industrial/shutdowns.htm

Birthday

Sandy Koufax

Dec. 30, 1935

www.wikipedia.org

FM Radio
is
patented

Dec. 26, 1933

www.wikipedia.org

China
joins WTO

December 11, 2001

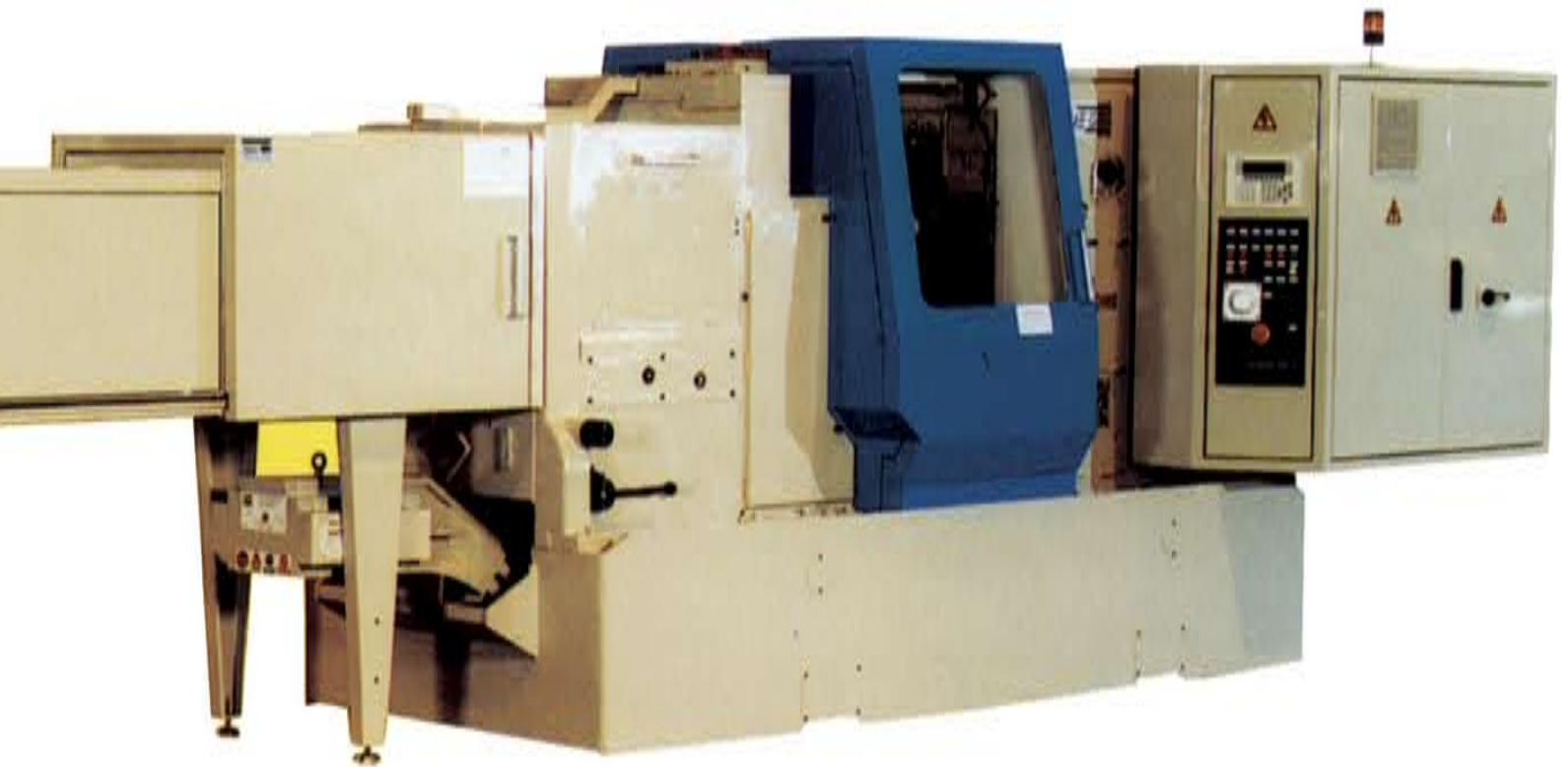
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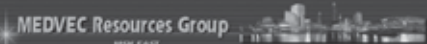
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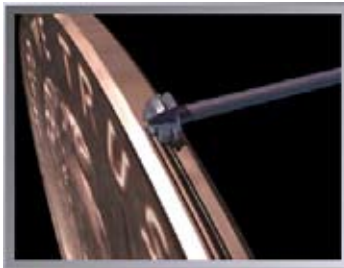
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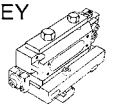
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afterthought

Leaving the Dark Side

I've made the difficult decision to come out from the dark side. The choice has been several years in the making, but like many such decisions, it eventually made itself.

I'm no longer coloring my hair!

For 15 years, through four beauty salons, I've professionally dyed my once-naturally brown follicles, attempting to retain one of the trappings of my youth. I've had misgivings about my tonsorial vanity, but I was comfortable with brown. It seemed to fit me. . Everybody was used to seeing me in my brown period, so I endured the monthly trysts with Liz and Laurel, who administered the sepia slop to my locks with a friendly flair.

For many years I also went to a barber to cut my hair, because I didn't want to be seen in the salon, that bastion of women's catty chatter, but I eventually succumbed to the convenience of getting all the hair crap done at one time. I'm

"That was when I made the decision to go natural, even if I was going to look like a big white rabbit."

ashamed to admit I even started chatting with Laurel, the pleasant lady who's done my hair for seven years – but it was mainly about the weather.

Coming out from the dark side is really a significant event for me. I recently had a large basal cell skin cancer removed from my scalp after having a couple of smaller ones taken off two years ago. I know most of the medical studies say that there is no clear connection between regularly pouring industrial-strength chemical dyes on your head and getting skin cancer, but knowing that my mother had a melanoma and using my brilliant deductive reasoning skills, I figured that hair color just might be a health risk.

But I also had a philosophical awakening, which pushed me toward organic hair in the autumn of life. In September, Jews celebrated the High Holy Days, which I actually take quite seriously as a period of contemplation, contrition and self-reflection. No, God did not appear in a cloud and say, "Lloyd, enough with that hair stuff," but a saying attributed to the ancient teacher Hillel kept popping up in my psyche. "If not now – when?"

This phrase is part of a longer dictum, "If I am not for myself, who will be? If I am only for myself, what am I? And if not now, when?" But it was the last four words which sung to me – over and over.

After the skin surgeon said, "no melanoma" and dug a big crater into my scalp to extract the non-life-threatening lesion, "If not now, when" became a loud and recurrent chorus in my brain.

That was when I made the decision to go natural, even if I was going to look like a big white rabbit. The gray hair on my head would be a daily reminder of the imperative to act on my goals and attend to my relationships.

In an odd way, this small personal act of recognition and acceptance of who I am has been liberating. I knew about the recurring lump on my noggin for awhile, but I didn't want to face another body probe and surgery. My new hair is a gesture toward being more authentic to myself. I've found that being straight with myself saves an enormous amount of energy. Energy, always precious, gets more valuable by the day.

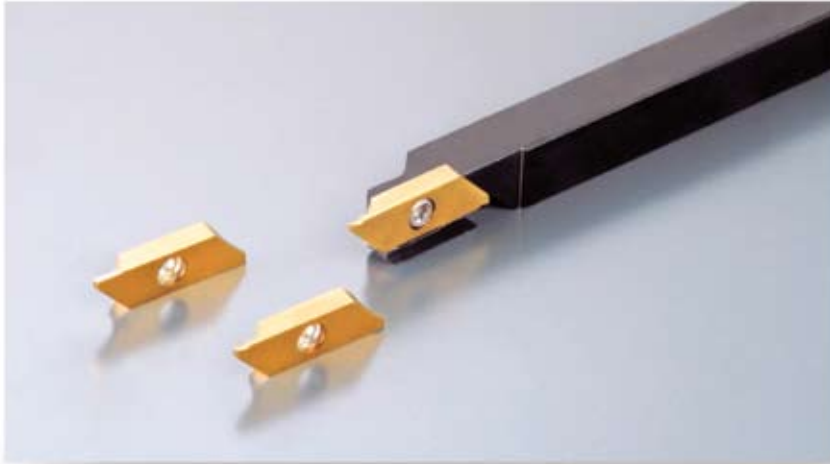
Leaving the dark side has been far less traumatic than I feared. It has prompted me to do Weight Watchers again, because if I'm going to look old, I don't want to look both fat and old. I've stepped up my exercise and yoga regimen to pooh-pooh the hair goblins. Nobody has been uncouth enough to greet me with, "Wow, Lloyd, you look 10 years older." Yet.

But it probably will happen.

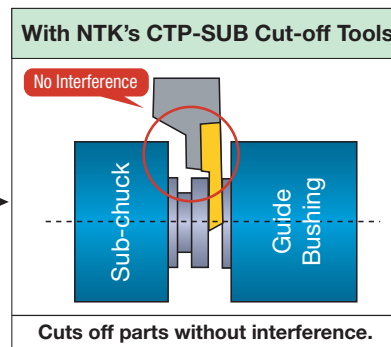
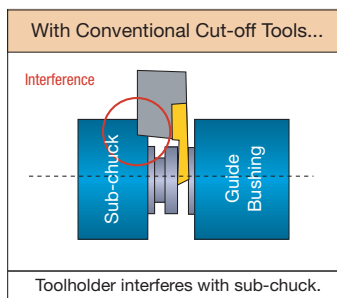
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