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july 2007 volume 3 issue 7

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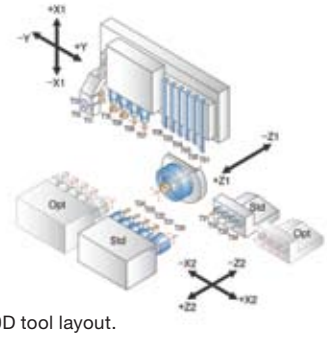

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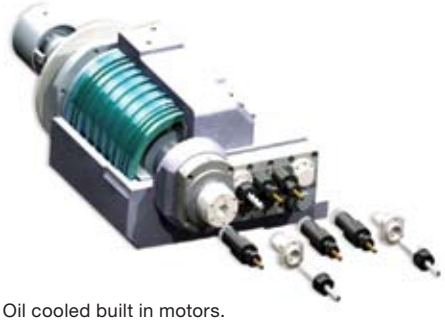

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BPA WORLDWIDE™

Business Bang

If a family business survives the second generation it's an upset – if it prospers through a third, it's a shock. Anything past that deserves a plaque in today's mood of get-rich-quick and transitory commitment.

But then there's Zildjian Company, which began in Constantinople in 1623 (the city's name changed to Istanbul in 1923) when Avedis, an Armenian alchemist, was fiddling around with pots of metals trying to create gold out of base materials. He created an alloy combining tin, copper and silver into a sheet metal that could make music without shattering. Voilà. He took his surname of Zildjian from the Turkish "zil+ci" (cymbal-maker/seller) and the Armenian suffix "yan" (son of) and began a business that has defined the instrument and the family that makes it for almost 400 years.

Zildjian has had its family intrigue and schisms, but it is still the symbol of cymbals that we recognize today.

Around 1908, Avedis III and Aran Zildjian emigrated to the United States and began manufacturing their unique discs in Quincy, Mass. They competed with the Zildjian branch of the firm in Turkey, but eventually absorbed them.

Their big breakout came with the popularity of jazz and their move into drum-set cymbals. Gene Krupa, Buddy Rich and Papa Jo Jones all used Avedis Zildjian cymbals. Then Ringo Starr of the Beatles really put them on the map. Avedis ended the practice of hand hammering the product and went to an automated finishing process to meet demand in 1964.

Today Zildjian manufactures the clangers in Norwell, Mass., but they are capitalizing on their brand with apparel sales from their Z store and website.

Zildjian is a family business which flourishes with a bang, while so many die with barely a whimper.

Lloyd Graff
Editor/Owner

Today's Machining World

July's talent pool.

contributors

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

John Grossmann is a freelance writer whose work has appeared in such diverse publications as *Air & Space/Smithsonian, Audubon, The New York Times Magazine, Inc., Reader's Digest, Smithsonian,* and *Sports Illustrated*. He's often happiest writing about food, chefs and restaurants, which he has done for such magazines as *Cigar Aficionado, Cooking Light, Diversion, Esquire, Food Arts, Gastronomica, Gourmet, Saveur,* and *SKY.* He has an undergraduate degree from Dartmouth College and a master's degree in journalism from Northwestern University.

Jerry Levine was the Director of Corporate Studies in his 35-year career with Amoco Oil Company. He was mainly involved with business planning and strategy as well as energy and environmental legislation and regulation before retiring in 1998. Mr. Levine was chairman of the American Petroleum Institute's Motor Fuels Committee and chaired the industry's representation at various state and federal regulatory negotiations. In 1997 he represented the oil industry at global warming negotiations at the White House. He also helped negotiate gasoline regulations for the Clean Air Act. A Chicago native, Jerry holds chemical engineering degrees from Purdue and Michigan.

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 who is training to become a wheelchair assistance dog.

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Back to the Future

Noah Graff's question in the April 2007 "Next" column (on skilled workers) stated that for the past few years, many companies have complained they cannot hire enough skilled workers to satisfy their production needs.

Phyllis Eisen of NAM responded that we already pay high salaries, an average of $66,000 a year. She must be quoting from data based on a different skill level or occupation. Page 79 of the same issue has two ads that list a total of 16 jobs for skilled workers; none of these jobs pay more than $30.00 per hour. The ad for machinists shows rates from $18.00 to $28.00 per hour.

The list of median salary by industry on the bottom right of page 44 is much closer to reality. The list also shows that the pay rates in the sub-contracting industry are considerably lower then what most OEM's offer. Melanie Holmes of Manpower provides your readers with a clear answer, but should have said employer involvement **must** include, not can include, doing their share to educate and maintain a highly skilled workforce.

I recently presented a NIMS accreditation plaque to Asnuntuck Community College in Enfield, Conn. While sitting with educators and industry reps, someone blamed the parents, high school educators and the media for discouraging young people from entering a metalworking program. I agreed somewhat, but I also pointed out that the industry itself is its worst enemy; out of 12 industry advisors, only three made it to this presentation.

There are many businesses extremely supportive of schools and organizations that educate our future skilled workers; unfortunately, they are a minority. SkillsUSA has over 250,000 students signed up in their Championship contest covering over 80 trades, yet no more then 10 percent of this nation's corporations support SkillsUSA. Where are the other 90 percent?

Every company complaining about the skilled worker shortage could rectify this if they supported educational institutions and educators to provide training to our workforce, as well as students, who ultimately will be the highly skilled workers we need to survive in this world's economy.

Paul H. Huber
IPCC
Bridgeport, CT

Alive and Well

Your article "How To High" (April 2007) by Robert Strauss, has a quote by George Taliadourous: "Machining may be a dying art, so much of it is going to China." Boy, oh boy, tell this fellow to learn to be smart and fight to live and grow. Those who can't do, teach. Do I want him to teach our folks? We have a small but good crew, creative and hardworking. I do not want his way of thinking around!

Barry Fulford
Production Metal Stampings
Milton, FL

Show of Art

In your June/July 2005 issue of *Today's Machining World* there was an article about an aspiring artist who was going to put "paint to container." You even had a photo of the then-unpainted container in the magazine. I was aware that there was an on-site unveiling of sorts after the art work was finished, but to my knowledge no follow up photos appeared in *TMW*. Seeing Lloyd at the M & S sale reminded me of this burning question that has kept me up nights. For the many of us who could not attend the gala unveiling but have a curiosity of the finished work, could you throw together a photo? I am sure that with this resolved, I will sleep better, although I still wonder where the two Ll's in Lloyd originated. Seriously, love *TMW's* articles and thanks for enduring my humor.

Craig L. Ward
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By Lloyd Graff

The Federal Reserve of Uncle Ben

has held interest rates fairly steady, despite wicked commodity inflation and mediocre growth. The U.S. dollar has weakened dramatically versus Europe and mineral-rich countries like Canada and Australia. (Continued on next page)

(Continued from previous page)

For companies which are nimble and can sliver through the competitive thicket, the weak dollar offers major opportunities. Ontario automotive suppliers, despite government assistance, now have an uphill ascent with a currency approaching parity with the American greenback. You may see Canadian metalworking firms like Magna eyeing more companies in the U.S. for acquisitions. According to news reports, they were second bid on Daimler Chrysler.

In the global marketplace for components, the husky euro makes an inviting target for American producers in medical, aerospace and high-tech. Chinese firms will want in on this opportunity with their politically engineered yuan kept absurdly cheap with the acquiescence of Washington. But China still cannot compete on sophisticated, high value-added product. Look for shrewd Chinese business people to accelerate purchases of North American companies with technical expertise and keen market connections.

For machinery dealers, the strong euro makes for an intriguing arbitrage opportunity. European machines bought in the used market for dollars, particularly those with less market visibility here than on the continent will be attractive to buyers across the pond. These windows of opportunity usually last less than a year, but they can be very juicy for the agile dealer. We saw French and Swiss dealers snapping up choice machinery like Tornos multi-spindles and Traub CNC lathes to take advantage of the gap.

This is a lovely time to take a European working vacation. Paris is beautiful in July, Milan is vibrant, and in Geneva you can peddle your Rolex. Au Revoir.

James Fallows wrote a terrific

article for the *Atlantic* (cover story, July 2007) about China and its trade relations with the United States.

I found myself underlining the piece like I was in a college textbook preparing for a final. There was so much meat in the pages.

Fallows focuses on the city of Shenzhen, which has a population the size of New York. It is in the manufacturing center of China, known as the Pearl River Delta of Guangdong province just north of Hong Kong. As many people work in this area in manufacturing as in the entire U.S. One facility, Foxconn, employs some 240,000 people. Foxconn's caterers kill 3,000 pigs a day to feed the workers. Hong Kong and Shenzhen harbors filled 40 million

swarf

containers with goods in 2006.

Besides putting the scale of the Chinese manufacturing colossus in perspective, Fallows gives a face to outsourcing. He interviewed Liam Casey, an Irish ex-pat who lives in a small apartment at the Sheraton in Shenzhen, navigating the factories of the area for American and European clients, hoping to unlock the code of the myriad of manufacturing plants which freckle the area.

Fallows argues persuasively in the *Atlantic* piece that at this point in history, the rise of China has been a win-win for China and the U.S. The economic boom has enabled millions of Chinese peasants to get a chance to escape rural poverty. Americans have gotten constantly falling prices on consumer electronics goods, textiles, and many other staples.

But we are also seeing the downside of air pollution, which is awful in China and threatens the entire world with the commissioning of a new, coal-fired power plant each week.

Fallows makes the point that China enables innovators to leverage the manufacturing supply chain to their advantage because of the depth of manufacturing skills around Shenzhen. They have the ability to turn things around quickly. Because the Chinese rely more on people than automation – and people are versatile manufacturing inputs – changes in design can be implemented faster than in the U.S.

When *TMW* interviewed the inventor of a new beer tap a couple of years ago, he told us this ability to implement innovation quickly was the primary reason he went to China.

Fallows quotes an American manager in a U.S.-owned plant in China about his workforce, who remarked "They're young. They're quick. There's none of this 'I have to pick up the kids' nonsense you get in the States."

Unlocking the supply chain around Shenzhen is the key intellectual property of China. At this point, the Chinese cannot innovate. They have no ability to develop brand identity. Unfortunately, for many of the people in the American machining community, the strength of Shenzhen is in making components for other companies. Fallows recounts the value in a $29.95 electronic connector purchased in Chicago via the internet. The Chinese

manufacturer ends up getting only $2.00 for the product. The rest goes to the retailer, the brand owner and Federal Express.

Unless American firms are in the sweet spots of innovation – branding, reaction speed and customer relationships – advantage Shenzhen. Adjustments in the currency will only affect the margins.

The clear message of the James Fallows article is that Chinese companies are really good at making things, and getting better. If you want to compete on price alone, you need to connect with their supply channel. But the real money in manufacturing is in positioning your company so your competition is not sailing in one of those 40 million containers leaving China.

Last May, *TMW* did a long piece

about Warsaw, Indiana, and the medical implant manufacturers clustered in that cute village.

One of the big players in Warsaw is the Biomet Corporation, which decided to put itself up for sale at around the same time the *TMW* piece came out. Biomet has been a fabulous success story, starting as a little job shop 30 years ago under the leadership of Dane Miller, to become a peer of giants Zimmer and DePuy.

I had figured a Johnson & Johnson or Smith & Nephew would pick up Biomet, but I underestimated the appetite of the private equity boys. Two private groups ultimately stepped up, pushing the price of the stock over $45, an $11 billion dollar plus valuation.

The sale will make Miller one of the richest men in America. It will bring even more wealth to the Warsaw economy as long-time employees cash out. But the company will inevitably change as the new investors look for the big cash-out.

The investment bankers behind the Biomet deal will do what buyout firms usually do. They will take out huge fees for themselves, trim other overheads and prepare the company for flipping to another consortium, or more likely, taking it public once again.

Biomet will be a nice company for a couple more years as it runs on the momentum of the last decade's investments in people and plant. But long-term for the financial guys is three to five years, and if they can turn it in 18 months, so much the better.

Today's American tax structure favors the private equity deals. This is how it works, in a nutshell: Well-connected investment bankers see an opportunity in a company like

swarf

Biomet. They shop the investment community for money by running numbers on future cash flow. They must convince the insurance companies, pension funds and banks that the company can generate enough cash to cover debt and banking fees. Showing a big profit is not terribly important for the equity groups because they do not want to pay taxes. This strategy, made famous by Michael Milken in the 1970s and '80s, makes a Biomet potentially more valuable to a private group than to a public entity whose stock price is dependent on taxable earnings.

The private equity guys use enormous financial leverage, which means fabulous upside potential coupled with big interest rate exposure. With rates rising, now it may take a little froth out of the market.

I find the acquisition mania going on now quite troubling. A Biomet will never be the same progressive supporter of the community again with the founding fathers of the firm gone (which I'm sure will happen almost immediately).

On the plus side is the money currently available to buy manufacturing companies. If you are in the mood to sell, the likely buyer will be a private holding company looking to stitch together a package of re-sellable companies. The Biomet model is not available for a job shop because going public is a long-shot for small manufacturing companies today, unless there is an imaginative story available for the company. But the bigger fool (I mean investor) approach is alive and well. In today's environment, the belief prevails that there will always be somebody around to take you out. Stay tuned.

Gasoline is at $3.00 a gallon.

Two percent of the homes in Los Angeles are in or near foreclosure. 10-year rates are rising like water in a clogged toilet. This is not a real pretty picture, yet the economy is growing, the stock market is buoyant and the Apple i-Phone has a million orders. What is going on here?

Lots of people are working. Unemployment is in the mid-four percent range, and it seems like every company is looking for people. Ultimately, some compromise on immigration will be made in Washington which will recognize the desperate need for talent and bodies in the

Art by "Starman"

American economy. Job confidence is the most important driver of economic optimism.

Higher interest rates are a result of world bond traders finding greener pastures elsewhere. The Chinese are putting a few of their billions of dollars in hedge funds, but they have a strong incentive to keep their most important trading partner happy. With the U.S. headed for a balanced budget in 18 months unless the Democrats go crazy on tax policy, it seems unlikely that rates go much higher.

The most amazing thing is that prosperity is gaining on misery everywhere but Africa and Venezuela, and this is good for the American economy. Gas prices are high because more young people around the world are driving motorcycles and pickups and minicars.

The Iraq war has been a public relations disaster for George W. Bush. It has ruined his presidency, but it has not messed up the economy. Terrorism fears have eased in Main Street America for the moment, and the stock markets reflect a reduced terror discount. Often a new political regime will take a recession in its first 18 months, which means late 2009 for Hillary, which may coincide with a post-Olympic slowdown in China.

Commodity prices are high by recent standards, but oil prices have been relatively stable on a yearly basis and will probably stick unless we have a bad hurricane season in the gulf.

So don't sell out and move to Adelaide, Australia quite yet. Wait until the next election, although you might want to just check the Melbourne Craigslist for apartments.

The labor shortage of skilled

machinists is not a singular phenomenon. Heavy equipment operators who maneuver excavators, dozers, and cranes are also scarce. Power Equipment of Chattanooga, Tennessee, is doing something about it in its area. The company contributed $600,000 worth of Kubota machinery to Chattanooga State University to equip operator courses, according to Larry Moon of the company. He says that the classes have been oversubscribed every time they have been offered. This is a smart move for Power Equipment, which has several branches in the state.

On the machine tool front, Haas Automation has been the most aggressive in donating equipment to colleges and universities. This has had the double barreled effect of developing brand awareness for machinists and engineers while enriching the pool of operators in the field.

Several issues ago in *Today's*

Machining World, Robert Strauss wrote an in-depth story about Conserve School and its unusual relationship with steel distributing giant Central Steel & Wire of Company of Chicago.

James Lowenstine, son of the founder of the company, left this centi-million dollar estate to build an environmentalist's dream of a prep school in rural northern Wisconsin.

The trust, which funded the school, was endowed with Lowenstine's stock in Central Steel, a beautifully run company doing $750 million a year in sales. Several board members of Central Steel also sit on the Conserve School's trust board.

A clause in the Lowenstine will stated that if Conserve School failed to meet the educational goals Lowenstine had envisioned, the trust should move the assets to Culver Military Academy, Mr. Lowenstine's alma mater.

The possibility of attaching itself to a billion dollar corporation was overwhelming, and Culver decided to sue Conserve School and its trustees late in 2005.

Both sides were well along in the pretrial discovery process this spring when Culver decided to drop its lawsuit. The judge dismissed the case on May 25th, 2007.

I found this case fascinating for many reasons. Central Steel is the epitome of an old school company in the best sense. The people wear white shirts and don suits and ties. Most of the salesmen come out of Chicago Catholic high schools.

Its reputation for excellent service is impeccable. Some might call the company dull and gray, but it's brilliant at chopping up steel, delivering on time, and making money. We should all be so boring.

What James Lowenstine did so cleverly is try to preserve the company he loved and build a groundbreaking educational institution on the North Woods ground he adored.

The vast wealth of the trust was such a sweet carrot that it almost became the undoing of the will's grand plan.

It will be awfully interesting to see how a bunch of steel guys out of Irish Catholic Chicago high schools can steward a tree hugger school in the boonies of Wisconsin with almost unlimited assets behind them. It is a strange brew.

I was talking to John Grossmann,

who did the *TMW* interview with Elon Musk (see page 32).

John went to Dartmouth College and his two sons have also gone to the prestigious New Hampshire Ivy. Every year John receives a newsletter from his old fraternity that tells about its graduates' plans. Of the 23 seniors, 20 are headed for Wall Street.

I find this fascinating and troubling. Where are the

soldiers, the artists, the doctors, the wanderers? Is the lure of the hedge fund so strong that nobody is destined for the clergy, minor league baseball, or the family business in Dubuque? Are the best and brightest so hung up on Gordon Gekko that they shun the Space Program and NYPD? Are little kids growing up dreaming of slaving for Goldman Sachs and Lehman Brothers?

I smell a bubble here. It reminds me of 10 years ago when the Internet was so hot and everybody wanted to join a dot.com. When it seems like the world is getting rich in one place, it is time to avoid it like the plague. The sheep are usually headed to slaughter – as well as the pigs.

"Rube Goldberg" is alive and well

in Harry Potter's neighborhood. Three blokes in their mid-twenties, graduates of elite Cambridge University, have developed fantastic mechanical chains of devices, like sliding chess pieces, dropping hammers, and perfectly aimed darts that keep the crazy sequence going on video. They reckon four to five million people have watched their clever automation process on screen.

Their contraption videos are a brilliant effort to promote the young company of these clever mechanical engineers who specialize in manufacturing and design creativity. I urge every reader to go to their website, www.baynhamtyers.com to see their hard work.

I talked to Tom Baynham, one of the creative engineers, about the group's business plan, and how the popular videos fit into it. He says they are in the manufacturing and design creativity business. They are currently working on a project for a firm providing portable machine tools for the oil industry. They have spent time at the Mazak plant in Japan and see a future for their innovative approaches to making things.

He says that their videos have brought them notoriety and networking opportunities in manufacturing circles, but my sense is that they have not grasped the potential of the films.

They have a superb opportunity to turn their site into a huge social networking venue for people interested in mechanical things. This could lead to opportunities in toys, construction, even apparel. They also could try the citizen contest method, which could culminate in an interesting approach to exhibitions.

What these fellows have done is discover the latent interest in intricate mechanical contraptions. This implies big opportunities for machining companies to popularize and humanize their websites with similar creative efforts.

If I was looking for a company to make something, and found a group with the creative acumen of a Rube Goldberg master, I would definitely give them a shot at my work.

It is not a big leap to connect the dots from wacky contraption to perfect machined parts.

The age of YouTube is bringing video to everybody. The Cambridge guys are pointing the way for smart companies to bring fun to their websites and advertising strategies. The potential is vast and virtually untapped.

A letter to the lucky top suppliers

of AMETEK Corporation: "We want to take this opportunity to thank you for your attendance at AMETEK's first Supplier Conference. As presented by our Senior Executives, we are changing our procurement model to support and leverage our Global growth. Our strategy is to reduce our cost and improve on quality and services through the development of a Preferred Supplier Base. Those identified as a Preferred Supplier will be afforded the opportunity to grow with AMETEK as we reduce the size of our supplier base from a level in excess of 5,000 and double the size of the company from $2.0 billion to $5.0 billion.

Our message is clear – in order to be considered a Preferred Supplier you must reduce your current pricing by 8 percent and extend payment terms to a minimum of 60 days. Please communicate your response to Bob Choquette at bob.choquette@ametek.com no later than March 16, 2007. Also, please complete your electronic RFI by this Friday, March 9, 2007.

Again, we look forward to strengthening a long-term partnership that affords opportunities to you and AMETEK's shareholders."

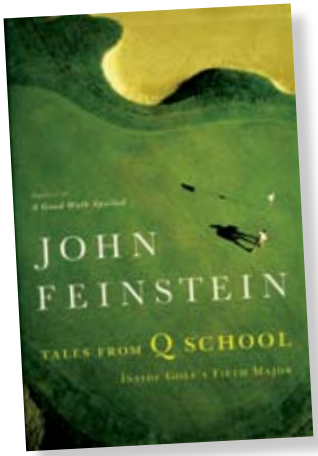
So kind of you to ask.

By Jerry Levine

Tales from Q School

John Feinstein's *Tales from Q School* is a book designed for the select audience of golf fanatics who thrive on late-night reruns on the *Golf Channel*, and can give an elaborate description of all the key shots in last year's Masters. The rest of us will probably find this book long-winded and boring.

The name Q (for qualifying) School is a misnomer. There is no longer any school; it's a series of three tournaments beginning in late November and running through late December, before the PGA Tour begins the next calendar year. In 2005, 1205 golfers paid the $4500 entrance fee and participated in Stage 1. Eventually, about 30 golfers (2.5 percent of those who started) emerged from the Stage 3 tournament with the coveted Tour Card.



Feinstein's book tells story after story of professional golfers struggling to win a coveted PGA Tour Card. There is a constant tension as we read of trials and near misses. There is no Hollywood ending. There are almost no winners. Because the odds are so stacked against them, most Q Schoolers lose, but you can identify with their love of the game and quest for glory.

Golf is a game of personal perfection, where players are mainly competing against themselves. In the Q School tournament, the object is to make "the number," which equals so many strokes below par that will qualify one for the PGA Tour. Professional golf ranking has an annual shuffling of the deck of Tour Cards, with some players moving up and others dropping down.

There are about 200 players on the PGA Tour. The top 125 on the money list return to the Tour the following year, along with any tournament winners who were not in the top 125. The rest are shuffled back to one of the three levels of Q School.

Those who fail at Stage 3, and even many from Stage 2, go on to the Nationwide Tour, a kind of minor league. The top 20 money winners on the Nationwide tour automatically get PGA Tour cards the following year.

The truth is, in Q School there are no bad golfers – all are superb – so frequently small differences, lucky or unlucky breaks, or mental lapses determine who makes the cut. If you miss the cut, though, that's it. You must wait 'til next year.

The book is filled with hard luck stories. Peter Tomasulo looked like he was going to make "the number," but landed his ball on top of a loose piece of sod that someone had not replaced near the end of his final round. He missed the shot, bogeyed the hole, seemed "shaken," and double-bogeyed the 17th to miss "the number" by one stroke. Joe Daley's two foot putt on 18 went into the bottom of the cup and somehow popped back out, as if it hit a trampoline. Daley also missed the cut by one stroke.

There are a few Cinderella stories thrown in. Brett Wetterich made it through the 2005 competition just on "the number," and then the next year, went on to finish 10th on the PGA money list and made the U.S. Ryder Cup team. There is a story that weaves through the book on Bill Haas, son of PGA Tour professional Jay Haas, and his multi-year quest to make the tour after missing by one stroke on his first try.

Finally, there is the story of Larry Mize, who is back at Q School even though he won the Masters in 1987, famously holing out a 130 yard chip shot for an eagle to defeat Greg Norman in the second hole of sudden death. Mize is one of the most loved players on (or more correctly, off) the Tour. Mize failed to make "the number" in 2005, but ended up with a couple of unopened bottles of champagne from the party after the tournament. He was the only non card-winning player upbeat enough to attend the party. Mize savored the moment, felt good that he hung in and competed, but ruefully commented, "In the end no one cares if you competed. They want to know if you succeeded."

No one who plays Q School ever forgets the experience, but only a few get to savor it. In 2005 there were 33 golfers who relished the memories; 32 who left the premises with PGA Tour Cards, and one who left with two bottles of champagne.

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

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Raise the Bar

LNS has introduced the new heavy-duty, compact LNS Hydrobar® 565 bar feeds. With all steel machined parts attached to the heavy-duty frame, improved stiffness to weight ratios. The model 552 accepts bar stock 1/4 inch to 2 inch. The model 565 accepts bar stock from ¼ inch to Sprint 552 and both models have diameters from 2 - 5/8 inch. Both units operate with fixed or sliding headstock machines and operate in either hydrodynamic or hydrostatic modes. Hydrostatic operation permits users to cut up to 12 bar stock at optimum spindle speeds without harmful vibrations. The Hydrodynamic principle allows for a wider range of bar stock diameters, fewer guiding elements, and 2–8-minute changeovers.

Detailed specifications are available online at www.lnsamerica.com.

Meet the PRO

Mitsubishi EDM has introduced the MD+PRO II. Its stacked-filter design reduces floor space by 20 percent. New auto-threading and wire drive systems have been simplified. The machine offers multi-axis and EDM automation capabilities. Integration of a B-axis enables indexing and turn-n-burn applications. The indexing technology eliminates operator intervention and preserves accuracy with guaranteed angle precision. The continuous rotation of the B-axis during turn-n-burn applications provides the ability to machine very narrow slots. The new machine comes standard with .004 inch –.012 inch wire capable automatic threading and all-axis absolute control.

For more information, contact MC Machinery Systems, Inc. at 630-616-5920 or visit www.mitsubishi-world.com.

fresh stuff

Master of Ceremonies

CNC Software, developer of Mastercam CAD/CAM software, announced that its Mastercam X2 CAD/CAM Software has been certified for Autodesk Inventor 2008 software by the Autodesk Inventor Certified Applications Program. To be certified, the product must meet certain guidelines and demonstrate a high level of quality as well as compatibility with Autodesk Inventor. Mastercam X2 has a direct add-in for Autodesk Inventor. Mastercam Direct enables users to open a model in Mastercam while in an Inventor session, and then update toolpaths to reflect changes to the model. Mastercam X2 is able to read in native Inventor files for design purposes and toolpath generation. Mastercam Direct for Inventor is available at no charge from www.mastercam.com or through your local Mastercam Reseller.

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

Sir Mix-A-Lot

UNIST, Inc. has announced production of a new series of mixing stations for blending and dispensing of cutting and forming fluids in manufacturing. The Manual Mixing Station (MM-S) and Central Supply Mixing Station (CSM-S) are designed to automate the mixing and supply of fluids and lubricants to one or more machining or metal-forming stations.

The mixing station can be automatic or manual and is scalable to supply a single work station or multiple stations. Standard features on the CSM-S include PLC control, adjustable outlet pressure, multiple alarm conditions, a 10 micron water filter and a removable enclosure. The CSM-S produces concentration ranges from 0.5-37 percent and delivers up to 3 gallons per minute. The MM-S has a maximum concentration of 17 percent and dispenses up to 7 gallons per minute.

For more information, contact UNIST, Inc. at 800-253-5462 or visit www.unist.com. A product data sheet is available online.

fresh stuff

Multi-Tasking

Emuge Corp. has introduced the MULTI-Cut line of high-performance solid carbide roughing end mills. MULTI-Cut Tools are engineered for a wide variety of materials such as cast iron, titanium, titanium alloys, and steel materials up to 44Rc hardness. Due to the progressive edge profile and variable helix technology, MULTI-Cut is said to achieve material removal rates five to ten times that of conventional end mills. The chip-breaker technology provides chip evacuation, and a patented roughing profile enables short-duration chip contact.

Three MULTI-Cut tool configurations are offered, including a short design for stability in slotting operations and two long designs; one for extended flute lengths, the other for extended length shanks. Tools are available in 4-20 mm and 1/8-1 inch diameter sizes.

For more information contact Emuge at 800-323-3013 or visit www.emuge.com.

fresh stuff

Machining Lite

Datron's new excelsior®Lite machining center comes standard with a 1.2kW 30,000 RPM spindle, 20 inch x 20 inch machining area, 5-tool Automatic Tool Changer, Windows®-based 3D control software, C3 1GHz PC with 256 MB RAM, 15 inch CRT, keyboard & controller, Ethernet, CD-ROM & USB ports, remote monitoring capability, enclosure with safety lock-out and a six-month limited warranty (workmanship and materials).

The excelsiorLite's large machining table and full enclosure feature a solid steel base. X, Y, Z agility is facilitated by virtue of a hand-held controller. The excelsiorLite's compact design, protected precision ball screws and 30,000 RPM spindle gives it the durability and speed to machine non-ferrous metals like aluminum, copper and brass.

For more information, contact at 888-262-2833 or visit www.DatronDynamics.com.

fresh stuff

Dynamic Sinamic

Siemens' new SINUMERIK 840D solution line CNC system features the SINAMICS S120 drives design. It is available in both panel- and PC-based versions. The "Drive CLiQ" drive's communications system provides improved diagnostics and fast drive recognition via the electronic type plate. The SINUMERIK 840D features can be used for up to 31 axes. It is a distributed, scalable, open and inter-connecting system offering specialized functions for milling, drilling, turning, grinding and handling technologies.

SinuTrain XP, the software for training and programming on the SINUMERIK CNC system, is available on CD-ROM. It runs on a PC and is designed to generate and simulate NC programs based on the DIN 66025 programming language as well as the Siemens ShopMill, ShopTurn and ManualTurn products.

For more information, please contact Siemens at 800- 879-8079 or visit the company website at www.siemenscnc.com.

fresh stuff

Instant Attraction

Eriez' new XPL SafeHold® Permanent Lifting Magnets allow users to lift either round or flat materials using the same magnet. Constructed with Erium(3000 rare earth magnet material, the four new magnets in the SafeHolden® enables the user to lift flat materials up to 2,400 pounds and round materials up to 1,600 pounds.

With the XPL series, no electricity is required because the continuous rare earth magnet provides the power until the magnet is turned off. There isn't any costly DC power supply or hassles of charging or replacing batteries.

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For more information, call Eriez at 888-300-ERIEZ, or visit www.eriz.com.

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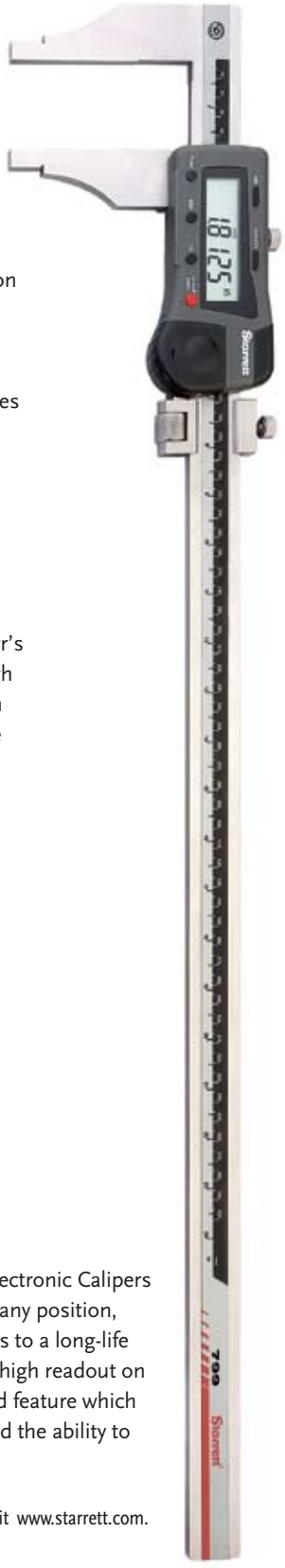
fresh stuff

Farr Gain (below)

Farr Air Pollution Control is now offering its "GOLD SERIES®" dust collector with a new explosion vent for applications involving the capture of explosive dusts. The multi-ribbed vent delivers a very high negative static operating pressure rating of -80" WC for enhanced performance, and is designed to open up at +1 psi (30" WC). Rated for 350 degrees F operating temperature, the X-vent is standard on all new Gold Series collectors that require explosion protection, and is also suitable for retrofit use.

Features of the Gold Series dust collector include rugged 10-gauge construction, reversible access doors, and a patented cambar system. The collector also comes equipped with Farr's "HemiPleat®" filter, which provides high efficiency (99.99 percent on 0.5 micron particles and larger) and high moisture resistance.

For general information, contact Farr Air Pollution Control at 800-479-6801 or visit www.farrapc.com.



Calibration Time (right)

L.S. Starrett Company announced they have expanded their No. 799 Series Electronic Calipers series with new extended range models up to 40 inches. They feature zero at any position, inch/mm conversion, a large, clear, highly visible LCD display, and easy access to a long-life battery. The new 24 inch and 40 inch extended range calipers have a .50 inch high readout on the LCD display, automatic shutoff after 30 minutes of inactivity, a preset/hold feature which lets the user enter a preset value or hold the reading after a measurement, and the ability to set minimum and maximum limits.

For more details and information, please contact The L.S. Starrett Company at 978-249-3551 or visit www.starrett.com.

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Dimention (LXWxH)	2,720x1,304x1,775mm

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Eye on the Prize

An interview with visionary entrepreneur Elon Musk

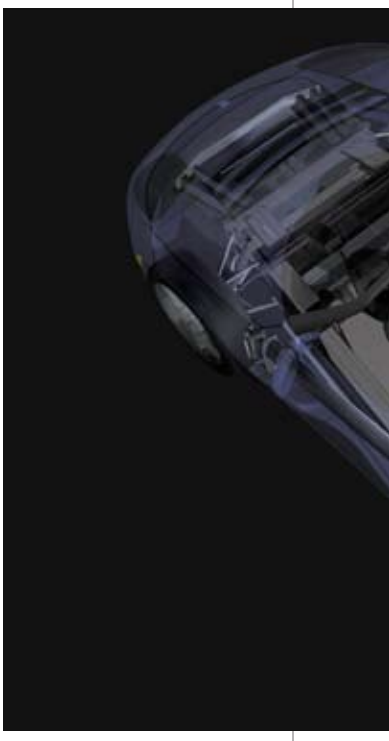
By John Grossmann

Falcon 1 Photo Courtesy of SpaceX

Eighty-eight years since a native Frenchman, New York hotelier, Raymond Orteig, offered a $25,000 prize to spur aviation, and 80 years since Charles Lindbergh claimed it for his historic New York-to-Paris flight in the Spirit of St. Louis, goal-oriented prizes are very much with us again. Of course, the stakes are a lot higher these days. $10 million seems a reasonable carrot. For a bit of a window on the motivating power of a competition pointed towards very specific and lofty goals, we buttonholed Elon Musk, wunderkind co-founder of PayPal and its largest shareholder when it was acquired by eBay in 2002 for $1.5 billion. Since then, Musk has given birth to two fast-rising companies; an aerospace venture called SpaceX, and an electric car company dubbed Tesla Motors, honoring electrical engineering pioneer Nikola Tesla. Somehow, the 36-year-old Musk finds time to serve as a trustee of the X PRIZE Foundation, which, having awarded its first $10 million prize for space flight, is now encouraging quantum leaps in medicine and automotive technology.

Photo Courtesy of SpaceX

elon musk



John Grossman: In Congressional testimony you said this: "Few things stoke the fires of creativity and ingenuity more than competing for a prize in fair and open competition." Why is this?
Elon Musk: I just think the evidence suggests this is so. Why do people compete for the Super Bowl? Why do they compete for the NBA championship? Why do they compete in the Olympics? Look at the space competition between Russia and United States. If there wasn't a Russian competitive threat, I don't think we'd have gone from nothing to being on the moon in eight years.

John: You've pointed to a kind of Darwinian aspect of prize competitions.
Elon: It just means that the best person or company wins – the one that's best able to compete.

John: Like JFK's goal of a man on the moon, do you think a national imperative can just as easily spark significant and perhaps urgent technological leaps?
Elon: Yeah, but why was there that imperative? It didn't come from nowhere. It came because we were competing with the Russians. It already was a competition; he just decided the United States was going to try to win.

John: Is that what he did? Put a spotlight on the competition?
Elon: There's no question about that. It rattled everyone. The competition was very clear, but JFK's contribution was to say that we're going to compete and we're going to win. Compete in a real way, as opposed to a half-assed way.

John: I believe in your Senate testimony you proposed a kind of parallel prize universe to the traditional world of NASA contracts, suggesting a prize valued at one tenth of the contract to anyone achieving all the project goals. Has there been any traction to this notion, anything come of your suggestion?

"The common thread is that I want to get involved in things that will change the world."

Elon: Not really. I don't believe NASA has done anything in that respect, although they have done something called the Commercial Orbital Transportation Services Contract. We won that competition.

John: Which came first, the announcement of that competition, seeking private sector partners to help

Electric Car interior & exterior photos courtesy of Telsa Motors

deliver astronauts to the International Space Station, or your commercial venture SpaceX?
Elon: SpaceX was founded in 2002. The NASA competition was announced a couple years after that and the contract was awarded last year.

John: Apparently you don't necessarily need the creative jumpstart of a prize. SpaceX preceded the NASA competition, and, indeed, your first two businesses, Zip2 Corp and PayPal weren't prize-chasing ventures. Tell us about them – how and why you started those two companies.
Elon: Zip2 and PayPal were both Internet ventures. When I was in college there were three things I wanted to pursue – problems that I thought would dramatically affect the future of humanity. One was the Internet, another was clean energy, and the third was space exploration. I did the first two companies because the timing was right to do something for the Internet. Zip2 was an Internet software company I started in 1995. I had finished a business degree from Wharton and was working on a Ph.D. at Stanford in high energy density capacitor physics and materials science, but put that on hold to start Zip2, which I sold for over $300 million.

John: And plowed some of that money into PayPal, which you and others started. We know about PayPal now, but at the time there was nothing like it?
Elon: No, other Internet payment companies had preceded PayPal, but they just didn't do it right.

John: Could it be that a common thread, efficiency, runs through all of your ventures?
Elon: I certainly believe efficiency is a good thing, but that's not the common thread. The common thread is that I want to get involved in things that will change the world. That's why I got involved with the Internet and why I'm involved in space today and why I've got an electric car company.

John: Rockets and electric cars – serious hardware ventures – that's quite a leap from high-tech software and cyberspace service businesses, a leap most entrepreneurs wouldn't dare fathom. Was that a daunting leap for you? How did you steel yourself for the task and limit the possibility of failure?
Elon: It was daunting, definitely. Before I started SpaceX, I met with a particular group of engineers, current and retired engineers from the industry, over a series of Saturdays to discuss whether it was possible to make a revolutionary improvement. I concluded after a number of those meetings that it was possible and then started SpaceX, so I guess I wanted to make sure I wasn't being foolish about our goals in space.

John: So it was entrepreneurial due diligence but seemingly of a much higher order, because the words you just used were "revolutionary improvement." You weren't seeking incremental change or small improvements, but big leaps – both in space and with your electric car venture. Can you tell us where these two ventures stand at the present?
Elon: At SpaceX, we've just completed our second test launch, which we felt was very successful. We're moving into the operational phase of the Falcon 1 launch vehicle later this year, launching a U.S. military satellite and a satellite for the Malaysian space agency. We have 11 more launches after that, and we expect to sell many more in the near future. So, I think SpaceX is well on its way to becoming the leader in space launch and we'll be there in no more than four years, maybe three years.

We're nearing completion of development of our Falcon 9 rocket, which is a very large rocket. In fact, Falcon 9 in its largest form, Falcon 9 Heavy, will carry more payload to orbit than any other rocket in the world. The aircraft analog of Falcon 1 is a 747. There is no aircraft analog of Falcon 9

Heavy. It would be the equivalent of three 747s.

John: You've gone from zero to well beyond 60 in very few years. What secrets can you point to? What's really made this possible?
Elon: Well, I think I have some advantages in that I'm a very technical person. My father was a very prominent engineer in South Africa, where I'm from, originally. And I think I inherited some engineering ability, which is many standard deviations from the norm. So, unlike most people who run a company, who tend to be sort of businesspeople – I can do business things, too, which I think are relatively straight forward, actually – I'm also the chief engineer of the company. So there's no inefficiency in communication between the head technical person and the head businessperson, because they're the same person. It allows me to make decisions very quickly, and although mistakes are made, for the most part, the decisions are correct. I'm also the primary funder of the company, so that means when capital is needed, I can provide it. That's also helpful. I don't have to spend my time raising capital. And spending most of my career in Silicon Valley I think I understand how to run a technology development company very well. I think the Silicon Valley mode of operation is the most powerful in the world. Lastly, I'm very dedicated to the task. Night and day I'm thinking about it.

John: Most people would be, if not overwhelmed, at least fully satisfied with a challenge such as you've put before yourself with SpaceX, and yet, you've got Tesla Motors, your electric car startup, going on simultaneously?
Elon: Yes, it does stretch me a little bit. I probably devote about 10 percent of my time to Tesla.

John: Where do things stand now? Are you on the cusp of introducing a high performance electric car?
Elon: Yes, we expect to have the first production cars hit the road around the end of summer. Meanwhile, we're testing many prototypes. Our roadster is a fully DOT-certified car – all the crash tests. In fact, I think we'll have destroyed two-dozen cars, which is a tragedy, but that's what it takes. And that's being really efficient, doing things like reusing the same car for both a front and a back test.

John: How did the idea for Tesla Motors come about?
Elon: I've been very interested in electric cars for a long time, from my undergraduate years at the University of Pennsylvania. In fact, the reason I was going to do graduate studies at Stanford was to develop capacitors for use in electric vehicles as an alternative to batteries. There are many reasons for my interest. Even if global warming didn't exist and we owned all the oil, eventually it would run out and we would need an alternative. So that puts a long-term boundary on things. Then, there are things that make it a much more pressing issue, such as the fact that we're putting an enormous amount of carbon into the atmosphere, and we're also dependent upon countries that do not have our best interests in mind. Those are two very bad things. The most pressing one really is the global warming issue. To be more precise, because global warming can be a contentious phrase, the thing we should be concerned about is that an unprecedented CO_2 concentration in the atmosphere will do something, and that thing will probably not be good.

> "I think SpaceX is well on its way to becoming the leader in space launch."

And not just the atmosphere; the CO_2 content of the oceans is also rising.

It's changing the acidity or alkalinity of the oceans, and the oceans are slightly alkaline, and if they stop being slightly alkaline it will erode the coral and the bone structure of a lot of the aquatic creatures, because calcium carbonate is eroded by an acid.

John: So what will 100 or so electric cars on the road by the end of 2007 accomplish? Is this something of a symbolic gesture? How does this begin to scale up past this introduction?
Elon: The sports car is really just the beginning. We'll produce about 1,000 units a year, maybe a little more than that, but it's really there as the first version of the technology. It's got better acceleration than any Ferrari currently in production. An electric motor generates roughly twice as much effective torque over time as a gasoline engine does on the same horsepower. As we're able to optimize the technology, make it cheaper, work better, last longer, we'll be able to make more cars at a lower price. When it's first introduced, new technology is expensive and not nearly as good as it will be by version three or four.

John: Can I get one? I hear you're sold out.
Elon: You could get one, but it would be about a one-year wait. The car sells for $92,000 and there's a minimum deposit of $30,000.

John: What will your next electric car model look like?
Elon: The next car will be a four-door, five-passenger sedan, fairly large – the size of a 5 Series BMW. It will go 0 to 60 in under six seconds, which is great for a sedan. It will be in the market probably late 2009, earlier 2010. $50,000 starting price. That's without any tax credits or rebates, and I think there will be some of those available.

John: These are fully electric, not hybrids, and I plug them in the garage?
Elon: You'll have a little over a 200-mile range. We will warranty the pack for 100,000 miles. The charge time depends on the power source, but we believe over time we can get the charge time to under an hour. Initially, for the roadster, it will be about three-and-a-half hours.

A lot of people think: Why are we doing the sports car, don't we care about making mass-market vehicles? Frankly, they have the wrong impression. We want to get to mass-market vehicles as soon as humanly possible. It's just not possible now. It takes years to get this technology right. It's very, very difficult. No one's even close to being as advanced as Tesla. So Tesla's on the absolute cutting edge. And driving that cutting edge fast is very hard. We're hopeful that within four to five years we'll have Model 3 out. Model 3 would be a $30,000 to $35,000 car.

John: The sports car, two seats, high price, makes sense because you can't introduce an electric car cheaply to begin with. It has to be an expensive vehicle, right?
Elon: It's an inherently expensive thing right now. There's no way for us currently to make a mass-market, inexpensive car, without spending at least four more years on optimization.

John: Are you at liberty to name some of the folks who'll be receiving the first couple dozen cars off the assembly line?
Elon: Sure. George Clooney. David Duchovny. Michael Dell. The founders of Google, Larry Page and Sergey Brin.

John: You're on the board of trustees of the X PRIZE-Foundation. Were you aboard for the $10 million Ansari X PRIZE won by the team headed by Burt Rutan and Paul Allen that lead to the successful flight of SpaceShipOne?

Elon: I joined right around that time, I think just after that, but I was closely affiliated with that X PRIZE and actually contributed to it, as one of the people who funded it.

John: These are now the granddaddy of prize competitions. Tell us about some of the other still unclaimed X PRIZES and what's in the works.
Elon: There's a Genomics X PRIZE. I'm not sure of the exact details, but it's for being able to decode a genome very quickly and at low cost. That prize is funded by Craig Venter, who is also an X PRIZE trustee.

John: I think I've read that for that contest you must be the first team to sequence 100 genomes in 10 days.
Elon: You know more about it than I do. I'm not a biotech guy.

John: There's also an Automotive X PRIZE, correct?
Elon: It's not funded yet, but they've released the rules. In basic terms, it's being able to build a car with a greater than 100 mile per gallon equivalent, meet all U.S. safety standards, and being capable of selling 10,000 units a year if it hits the market. In other words, you've got to prove you can actually make it at an affordable price. I've been sort of sequestered from that because of my involvement with Tesla. We didn't want to have conflict there, so I was excluded from the prize discussion.

"Tesla's on the absolute cutting edge. And driving that cutting edge fast is very hard."

John: Have you made suggestions for other X PRIZES?
Elon: I've made many suggestions, but I think those are still confidential. There are a number of prizes that the foundation is considering, but until they are announced I wouldn't want to pre-empt the discussion of them.

John: If years from now there was a Musk Prize, what would you like it to reward?
Elon: No one's ever asked me that before. What would I like most done? The Musk prize would be for a pill that allows you to lose weight effortlessly with no ill effects. That would be great.

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2-1/4" 6-spindle, 1962, 1973-79 (3)
3-1/4" 6-spindle, 1982
5-5/8" 6-spindle, 1979
6-5/8" 6-spindle, 1979

ACMES
1-1/4" RA6, , 1994, thdg., pickoff
1-5/8" RBN8
1-5/8" RBN8 '81 (2)
1-5/8" RB8, 1980, rebuilt 1996. pickoff
2" RB6, 1979, Direct Drive Rebuild (2)
2" RB6 collet chucker, 1980
2-5/8" RB6- pickoff4" RB6, 1975

GILDEMEISTER
GM-16 AC '97-2000 (4) w/Iemca
GM-20, 1993
GS-20 1986 (2)

SWISS-CNC SLIDING HEADSTOCK
Citizen M-20, 1996 (2)
Citizen L-20, Type VII, 1996-98 (2)
Citizen L-32, 1999

NEW BRITAIN
Model 52, 1-1/4" 6sp., 1979 (3) pickoff
Model 62 2-1/4" 6sp., 1975, heavy thdg
Model 62 2-1/4" 1960, $5750

INDEX
42 mm ABC Index 1997 (3)
MS 36E, 1993
MS 25 6-spindle, 1990

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

CNC MACHINES / CNC LATHE
Citizen L-25, 1998
Index 42mm ABC, '97 (3)
Index GFG, 1987 (3)

MISCELLANEOUS
Goss DeLeeuw 7-sp., 1-2-3
Davenport slotting, 1950
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HW25-12 1986 (3)
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Photos: John wilkens

moezilla

Moezilla Grabs Cheerleader

Robotics Competition Sweeps U.S. High Schools

By Robert Strauss

The photograph is taped up on a metal cabinet, tucked away in the corner of an office in a building on the vast DuPont Corporation campus. The photograph seems an afterthought, especially as the teenagers in the photo fly by it with all sorts of electronic and mechanical paraphernalia flowing from their arms.

The couple dozen teens in the photograph have fluorescent green T-shirts typical of any sports team which has just won some championship or other. In the center is a smiling gent known around the world – President George W. Bush. The kids in the green T-shirts are the MOE 365 robotics team, the winners of the 2007 FIRST Robotics Competition, the sort-of high school Super Bowl for techno-philes. And while President Bush glories in greeting college basketball Final Four winners and World Series champs, he didn't hesitate to have the savvy robot-builders from Wilmington come down to the White House grand foyer for a meet-and-greet, too.

But that was a month before and now the MOE 365 team members were on to another challenge. They had to fix up Moezilla, the robot that got them that White House visit, and glorying over the photo of them with the President had its place, albeit an obscure one.

"We almost broke the chandelier when we put Moezilla up to its full height, so I don't know whether he would invite us back," said Matthew Grusenmeyer, one of the MOE 365 mechanical engineers. "Yeah, it was fun being there, but the real fun is doing this," he said as he started tinkering with what seemed like an endless amount of little wires inside the 8-foot-high robot. "It's a great thing to be part of a team that can do something like this."

The MOE 365 team is one of about 1,300 around the country that have become part of the FIRST annual competitions. Dean Kamen, the inventor of the Segway Human Transporter and many medical devices, started FIRST, which stands for For Inspiration and Recognition of Science and Technology, in 1989 to promote awareness of what he saw as an abandonment of mechanical and

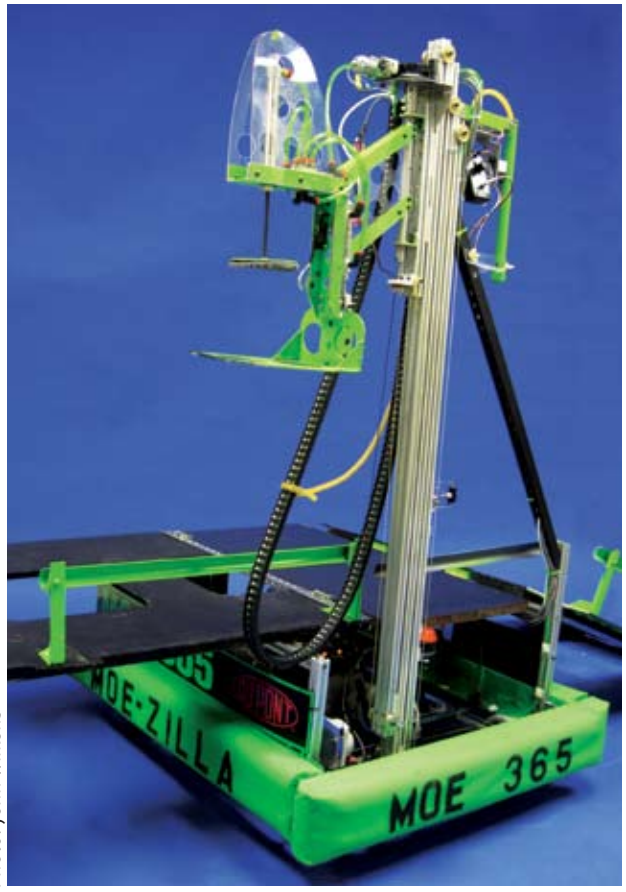

Photo: John wilkens

engineering education in secondary and elementary school in the United States.

"Dean was concerned that in this country we have a high standard of living based on inventions and technology leadership, yet as a culture we are sending the wrong messages to young people," said Paul Gudonis, the current president of FIRST. "We say they ought to be spending time bouncing a ball to get into the NBA instead of solving the world's problems. Clean water and improved medical care – they are going to be solved by technology. He set out to change of the culture of U.S. youth."

He went around to corporate executives he knew in corporations like Baxter Labs, General Motors, Johnson & Johnson, Motorola and Hewlett-Packard, trying to interest them in supporting some type of business based programs, but watching Michael Jordan and seeing how kids idolized him, he came up with the idea of a competition for teams of brainiacs.

Well, actually Kamen did not want it to be merely brainiacs. He wanted people like Shannon Smith, too.

"I got a phone call one day and somebody asked me if I wanted to be involved with a robotics team," said Smith, a perky junior who has been a cheerleader at Hodgson Vocational-Technical High School in Newark, Delaware. "I almost said no, because, well, you know, I was a cheerleader. But now that I'm here and I've worked with all of this, I know there can be college in the future and careers in mechanical engineering for someone like me."

The rudiments of the FIRST competitions are simple. In January, each team that signs up pays for the basic parts toward making a robot, which FIRST sends from its headquarters in Manchester, New Hampshire. Each team then has to construct a robot that will do a specific challenge in a regional competition, usually held six weeks later in early-to-mid-March.

"We have our own version of March Madness," said Gudonis. "This year we had 37 regional high school tournaments across the United States, mostly on college campuses. More than 1,300 teams and a whole lot of good robots, I have to say.

"We started out with 28 teams in a high school gym in Manchester in 1992 and this past year it was 10,000 kids all-told, with 350 teams in the finals at the Georgia Dome in Atlanta," Gudonis said. "I think that should prove that kids are not turned off to engineering and technology here, so long as we make it fun and challenging for them."

> "Kids are not turned off to engineering and technology here, so long as we make it fun and challenging for them."

They have certainly made it fun for Rai Hannaford, one of the website masters for the MOE 365 team, otherwise she would clearly not schlep to meetings from Newark, about 45 minutes away. Though her parents are science teachers, Rai is a junior communications major at the Cab Calloway School of the Arts. Her body movements are more theatrical than the rest of the MOE 365 crew, but her mindset is focused on the goal.

"We come from 18 different schools, from inner city to prep schools to where I go," she said. "I'm the only

person who comes from an arts school, and when my classmates there hear I am doing robots, they look at me a little funny. But here I am."

While the engineering kids are fixing Moezilla, Rai and Eric Enslen, a senior from the Charter School of Wilmington, go to work on the extensive Web site (www.moe365.org) in a cramped computer room in the DuPont complex.

"We have a few news updates every meeting," said Eric. "And doing a Web site is part of the FIRST competition. The purpose is to get across what we are doing with the robot, but also how we are contributing to the community. We have a further mission, too."

That "contributing to the community" means that MOE 365 intends to get a team in every high school in Delaware if it can. The team members often go to other schools, both high schools and lower grades, with the robots to show students how cool working with science and technology can be.

While that may seem incongruous – creating its own competition – that is also part of the FIRST ethos. For each contest in the FIRST competitions, schools are randomly paired. Thus, your team may be good at the wiring, but the other team may be better at steering the robot toward its task (This past year it was loading tires on various places around a tiered structure). There is offense and defense, too. Though one team can't destroy the other team's robot, it can try to block it from the goal though cagey maneuverings and non-destructive interference.

"It is one of the most exciting things I have ever seen," said Jeff Richlin, who runs Omni-Turn, a computerized lathe manufacturer in Farmingdale, New York. Richlin went to a FIRST competition near his business on Long Island at a friend's suggestion. "I'm a Rube Goldberg tinkerer and have made it into a profession. That is what is good here. It is great to see kids work together. It is more than just a simple goal. It is how the world works.

"There they are in a pit, like in a NASCAR race, with one kid being good at wiring and another at mechanics and learning that cooperation skill," he said. "It just inspires you to get involved."

That is how it worked for Carol Kauffman, who is now the FIRST regional director for the Mid-Atlantic states around Philadelphia. Her husband, a federal judge, was asked to help judge a regional competition ten years ago at Rutgers University in New Brunswick, New Jersey, by a friend.

"I was standing around and watching and saw these two girls working on one of the robots," said

Photo: John Wilkens

Kauffman. "They were interacting with adults, explaining things like electrical systems. It turns out they were twin daughters of a firefighter from Connecticut who had never dreamed about going to college before getting involved in a robotics team.

"I thought that if something like this could inspire regular girls like this to read about electronics on their own and learn all of this, then it should be encouraged everywhere," said Kauffman. Though she had recently retired, having sold her public relations and advertising agency, and was looking forward to a life of golf and tennis, she found Kaman and signed on to find schools and sponsors and put on regional competitions. It was Kauffman who originally got DuPont and MOE 365 together nine years ago. "Now these kids have been to the White House. What more can you ask from a program."

FIRST makes no secret that its competitions aren't inexpensive. John A. Larock, a staffing coordinator for DuPont in the daytime in addition to what seems like his fulltime job as team coordinator for MOE 365, said it takes about $15,000 a year between paying for materials and going to competitions and its community outreach. Some of that money comes from DuPont, but the rest is the usual fund-raisers that parents and boosters may do for other sports teams, including car washes.

The corporate sponsorships, though, are also part of the FIRST deal. Gudonis said it is vital that robotics teams have mentors who are teachers and people in business, so they know what real life in technology and engineering is.

That is what inspired Rich Kressley to get involved. He was an English teacher in semi-rural upper Bucks County, Pennsylvania, more or less midway between New York and Philadelphia, but unlike either in its exurban feel. He was a big jock growing up and was hired to coach JV basketball and teach English at Palisades High School in 2000. There was a married duo of art teachers there who ran the robotics team who asked him if he would help their kids write their newsletter.

"They were just reeling me in," said Kressley with a laugh. "By the time I saw my first competition, I was hooked. These kids were getting advice from CEOs and high-level engineers. Suddenly, basketball seemed like nothing."

Kressley eventually moved to Lower Merion High School, perhaps the most prestigious public high school in eastern Pennsylvania, where there was already an engineering and technology club. When he asked to start a robotics team, half the kids were ready to sign on. He recruited several local businesses to donate money or equipment and he has engineering students from nearby St. Joseph's University as mentors. He said the robotics team concept has inspired the school board to start a course at the high school called "Innovation and Invention."

"I may still be an English teacher, but I know what I do with the team is important as well," Kressley said.

"These kids were getting advice from CEOs and high-level engineers. Suddenly, basketball seemed like nothing."

"There should be inspiration and opportunities in all fields."

For Simon Dekleva, for instance, the MOE 365 team is becoming a life-long commitment. He was on the team early on, well before its national championship, having graduated from high school in 2002. He graduated from Rutgers University with a marketing degree in 2006 and comes back to Wilmington for many monthly meetings, just to turn screws and bend wires with the current team.

"I know I wouldn't have been so successful if someone hadn't gotten me to get involved with the robots back then," said Dekleva. He said he is going into marketing, not engineering, but he will grow up appreciating that world, which is all FIRST asks. "It's just fun to invent things and do this. Each year, you make something new. Each year, you have to be thinking. It's what improves our way of life, and I like to just hang out with kids who will make those things happen."

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

BY NOAH GRAFF

next

Will family run businesses in the United States be competitive in the coming years?

In the next five years, 30 percent of American family-owned firms will experience a change in leadership due to retirement or semi-retirement, according to a study by University of North Carolina at Ashville.

Family run businesses are never out of date from the standpoint of a parent's desire to pass on wealth, power and opportunity to the next generation. Whether talking about monarchies or today's more "nuts and bolts" businesses, keeping a business in the family is still an innate goal of many.

What is not in vogue today is simply passing on a family business without first developing a carefully conceived plan for succession within the business. If the family is to continue successfully running its business in succeeding generations, passing of the "torch" needs to be part of the process, not merely an event. This is the accepted practice for non-family businesses, and family-run businesses should embrace this practice as well. Indeed, many families now reach out to consultants to help them develop their succession plans and coach next-generation leaders. Many families also work with university-based family business programs to gain perspective from their peers.

Barry Cain
Blackman Kallick: CPAs and Consultants

Family businesses are thriving today, more than ever. Recent research shows that family businesses perform better than other types. Reasons for this include a longer term perspective, family commitment even in times when the business is in trouble, greater unity of management, and values-based management which reduces need for managerial oversight and thus costs. Family businesses have patient capital, which means they can make more investments in less risky projects without needing to make a "killing." They tend to spend less and be more stable all around. Lastly, there is a wide variety of customers who prefer the relationship orientation of the typical family business, where people stay longer and where the name above the door means something. Family businesses are not all good – horror stories abound – but on the whole, when people's wealth and reputations are at stake, sometimes even reputations of entire families, they tend to be less prone to mismanaging.

Joseph H. Astrachan, Ph.D.
Coles College of Business

I believe family businesses will become less competitive. As today's business founders are retiring, the next generation just isn't educated or driven enough to continue the dream, and the business becomes just a source of income. I just don't believe that the family members have the same drive and entrepreneurship that the original founders do and did. I don't believe they'll grow and be as competitive without that drive. The next generation just walks into an income stream; it's a job from daddy, and it wasn't a dream or a passion to grow a business from the beginning. I don't know if the businesses will fall – they could survive for another 20 years, but they may never really be the icons that they once were when they were run by the original founders.

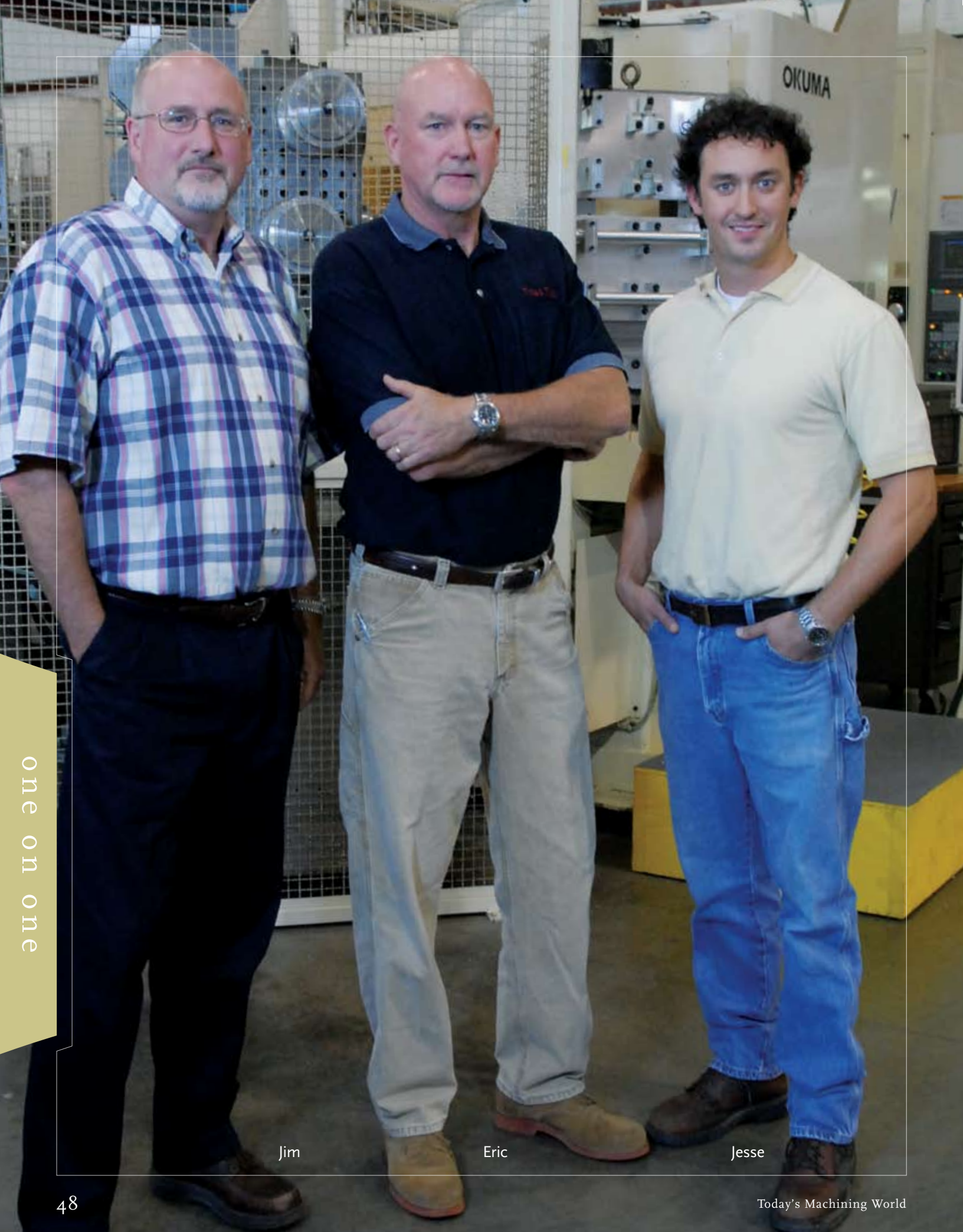
Ron Motsay
President, General Screw Products Corp.

the facts:

Approximately 30 percent of all family-owned businesses survive into the second Generation. 12 percent will be viable into the third generation. Only 3 percent of all family businesses operate at the fourth generation and beyond.
Family Business Forum, University of North Carolina at Ashville
www.unca.edu/fbf/

The oldest family business in the world is 1,423-year-old construction company Kongo Gumi, based in Osaka, Japan. Thirty-nine generations of the Kongo family have worked in the business. Kongo Gumi's first job was building a Buddhist temple, and today about 80 percent of the firm's $100 million annual revenue continues to involve building and repairing Buddhist temples.
Family Business Magazine www.familybusinessmagazine.com

A study by Marquette University's Center for Family Business found that one in four family firms planed to name a non-family member as their next CEO. The study also found that 60 percent of family business owners who planned on retiring in the next five years had not identified a successor. Family Business Magazine E-Newsletter, April 5, 2004 www.familybusinessinstitute.com



Jim Eric Jesse

one on one

Interviewed by Noah Graff

Eric Wichelhaus

is the third generation president of Triad Tool Inc., a machine shop in New Jersey started in 1933 by his grandfather, a German immigrant. Eric runs the business alongside his brother and sister, and five years ago his son came to work for Triad as well. We sat down with him to find out what it's like working in a successful fourth-generation business.

NG: Had you always thought you were going into your family business?

EW: No, when I graduated college in '74, the job market was a little light. My intent was that I was going to work at Triad temporarily until I found something in more of "traditional "corporate America. And here I am more than 30 years later. I always had an interest in the company when I was young, and I had fairly strong mechanical inclinations. I used to go with my grandfather and my father on Saturdays and putz around and create all kinds of havoc in there.

NG: Were other employees receptive to you when you came in?

EW: I got along pretty well with them. I think they kind of respected my work ethic, while I continued to learn about fixturing and machining techniques.

NG: What was the most difficult part of joining the business?

EW: I think the most difficult thing was that the company was so antiquated. I looked at our competition and it became clear to me that they were doing things on a faster, more aggressive track than we were.

NG: How well did you get along with your father when you came in?

EW: Real well. My father was a very easygoing guy. I often said he gave me enough rope to wrap around my neck and hang myself with. There were moments that he would question, and I'd have to say, "Dad, let's go out and buy another piece of equipment," but working with him was easy.

NG: When did your son come in?

EW: Well, the next step was my brother. He had gotten out of prep school and went to work here, and he is still working here. My sister does the bookkeeping and office managing. So you had my grandfather, my father, three siblings, and now my son, the fourth generation. He graduated college and has been at Triad now for about five years. Time flies.

NG: What were your son's intentions going into the business? What has his role been?

EW: I think Jessie's intentions were slightly different than mine. There's a lot of infrastructure here now. Today 40 people work here [Compared to 20 when I joined] so he's under more of a microscope, where as I was basically on my own. [Like me] he had some pretty strong mechanical aptitude, even though his major was in business. I've tried to mirror his path to what I had to do. He's very involved on the floor. We've put some wire EDM technology in. Shortly after he came in, he took sort of semi-technical ownership of that.

NG: What do you think is the secret to running a successful small business?

EW: I think one of the keys to being successful and growing a small business is to really have grassroots experience from the ground up. You've got to put your time in. My confidence I have in running the business – whether it's talking to customers, implementing [new ideas], or looking at [adopting] new technology – that comes from the fact that I've been there and done it. You can't substitute that.

NG: Thanks, Eric.

how it works

By Barbara Donohue

Photo: Toolholders and inserts used in Reynolda's Datum Line Tooling system.

Photo courtesy of Reynolda Manufacturing Solutions

Presetting Tools

Taking tool setting off the machine can mean a big increase in spindle uptime.

How do you make your money? By keeping the spindles turning, right? But when do they stop? Sometimes when you're out of material, sometimes when you break a tool, but mostly they're stopped during setup. To reduce setup time is to increase spindle time. What would happen to your setup time if you could take tool setting out of the machine and do it offline?

The program needs to know where the cutting tool is with respect to program zero. If all toolholders and tools were exactly the same and dimensioned exactly according to their specifications, you could just install the tool in the holder, put it in the machine and run. In the real world, of course, everything has a tolerance. One tool's tip may be a few thousandths lower or higher than its nominal location, but once the CNC program knows how large this offset is, it compensates. So when you're setting up a new job on a CNC machining center, no problem. You just touch off each tool to teach the program what the offset needs to be.

Touching off a tool doesn't take all that long. Maybe a minute or two. But multiply that by all the tools for a job and it can add up to an hour or more – per setup. And time is money. Think about it: Maybe it would be worthwhile to look into setting those tools out of the machine.

Preset, offset, setup

Since CNC machines can compensate for that offset, when you "preset" your tools outside the machine, you're not really setting them. You're really measuring them to be able to tell the CNC program what the offset is going to be for each tool.

Install the tool in a toolholder. Then fixture it somehow and measure. The process is something you could do with a surface plate, some parallel blocks and a dial indicator. But you probably wouldn't want to do that more than once or twice. That's why there are lots of companies making equipment that will help you do the job.

The simplest presetters work like that dial indicator setup, but are more convenient. Place the toolholder (upside down) in a fixture, and then use a dial or digital indicator to find the tool tip location. You read the projection length dimension, and need to write it down next to the tool number and later transfer the offset information to the program.

The next echelon of presetters use an optical-comparator-type shadow image to home in on the tool tip. Again, place the toolholder in a fixture, and turn an adjustment knob to place crosshairs on the tool tip. This type of presetter often has a digital output, from which you read the dimensions. In addition to determining the offset, you can also measure runout on these presetters by aligning the vertical crosshair with the part and rotating the toolholder in the fixture.

Photo Above: Parlec Parsetter 1500 TMM presetter.
Photo courtesy of Parlec, Inc.

how it works

Speroni STP46 Esperia CNC Tool Presetter, available from BIG Kaiser. Shown with optional CNC-controlled 3-axis movement for automatic and operator-independent operation.

Photo courtesy of BIG Kaiser Precision Tooling Inc.

Speroni STP34 Basic Tool Presetter with optical projector and digital display output, available from BIG Kaiser.

Photo courtesy of BIG Kaiser Precision Tooling Inc.

Speroni STP34 EzVision Tool Presetter with video and computer screen output, available from BIG Kaiser.

Photo courtesy of BIG Kaiser Precision Tooling Inc.)

The shape of things to come

Medium and high-end presetters use video to locate and examine the tool tip. Besides measuring length (offset) and runout, these systems have the ability to measure the shape of the tool profile – dimensions, radius, angles.

Why would you care about the tool geometry? Sometimes your tools may not be what you expect. Tom Smith, operations manager, EverFab, Inc., East Aurora, N.Y., told about a time before his company had a presetter, when they could have used this geometry feature. They were machining a large radius on an aerospace part with a ball end mill, and the radius of the part kept coming out wrong. They laser calibrated the machine. They laser calibrated the CMM (coordinate measuring machine), and both came out OK. The only thing left was the tool. It turned out, Smith said, "the radius of the tool wasn't really spherical." By trying ball end mills from different manufacturers, they found one that was the correct shape and would do the job. Now, however, with a video-based presetter in house, it would be easy to check the tool shape. "The Parlec allows us to inspect that . . . you can verify the geometry," he said.

Presetters vary in how they retain the toolholder in the fixture during measurement. The more basic units use gravity. You place the toolholder in the fixture and that's that. Higher-end presetters pull a vacuum to hold the tool in place. The most sophisticated presetting systems clamp the tool in the same way it will be held in the machine.

Communications

With the lower-end presetters, dial-based or digital readout, you need to write down the measurement data and transfer it yourself to the CNC control. Some digital readout versions will print out a report and/or a tool label.

The computer-based units can send the tool number and measurement data to be stored on your plant's computer network. Then, when the tool will be run, the controller can download the necessary information.

All this data is good, but it's only useful when the correct data is tied to the right tool. Some of the computer-based presetters will print a barcode label for the tool. Then, at setup time, you use a handheld barcode scanner to read the tool number from the label. The control can look on the network for offset data for that tool.

The latest identity technology is radio-frequency identification (RFID), now available on some high-end presetters. The RFID chip (similar to the chips used to identify pet dogs) is attached to the toolholder and the presetter programs it with the data about the tool. An RFID reader in the machine reads the information from the chip.

The Easy

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How?

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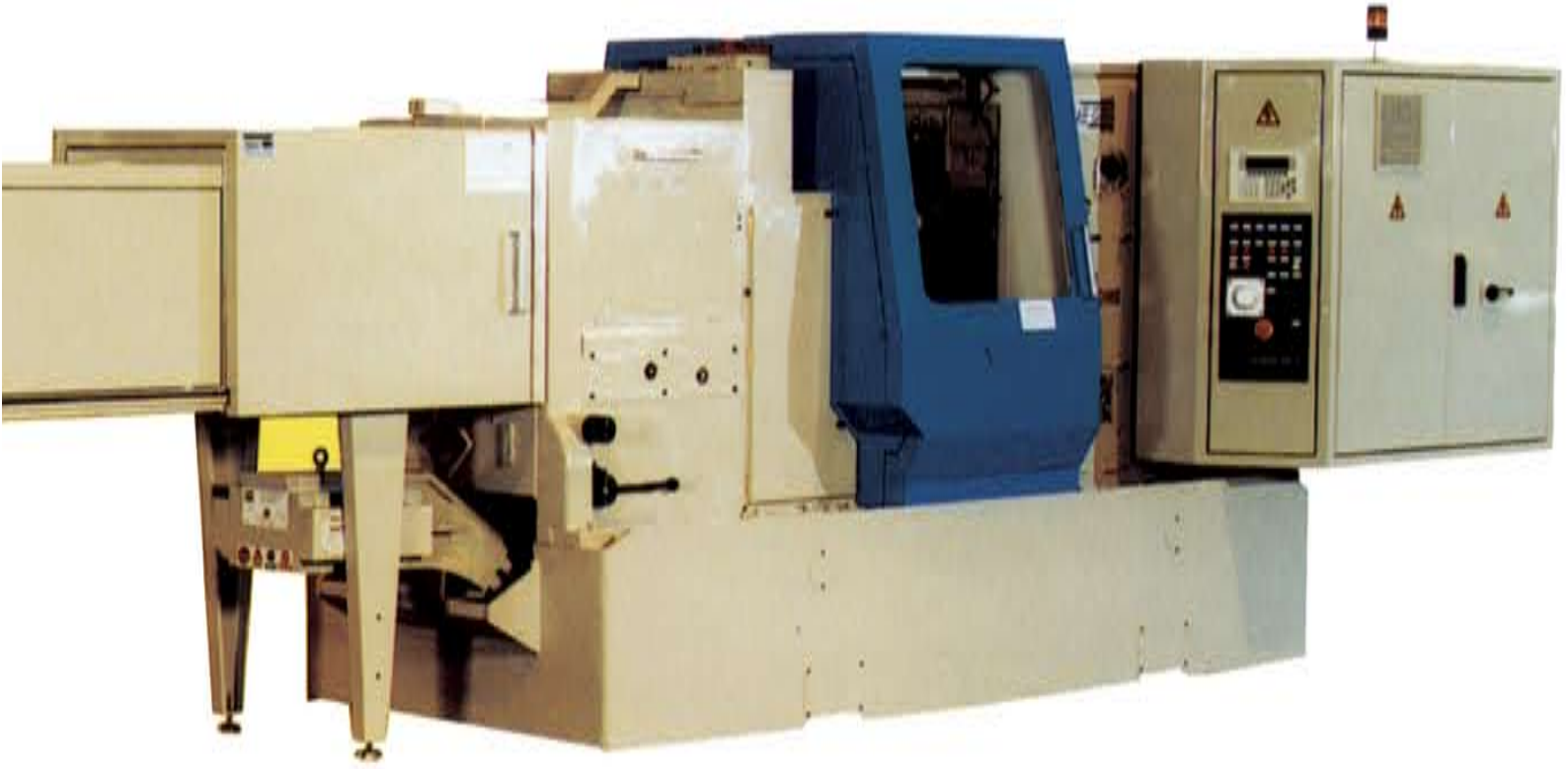

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gpc

And see for yourself why we believe Wickman is your best choice for your precision parts!

Hydromat's new EPIC scan bar coding system. **Photo courtesy of Hydromat, Inc.**

All that, automatically

The highest-end presetters, have all those machine vision and computerized features. In addition, they make the measurements automatically. Place the tool/toolholder in the fixture, press a button, and the presetter measures the tool dimensions according to a program, uploads the data to the network, and maybe programs an RFID chip for the tool. Suppliers recommend these large units for shops that plan to preset a hundred or more tools per day.

You have to spend money to save money

Presetters of any kind are not cheap. Prices vary across the many types of presetters, from indicator type to middle-of-the-line to fully automatic, and among the different vendors. A very basic dial presetter might be around $2000, and a simple unit with backlit viewing and a digital readout around $10,000. Video-based systems start near $20,000 and go up from there, depending on capability and options. The large, fully automatic CNC presetting systems can run to $75,000 - $100,000, or more.

How could you possibly justify spending $100,000 or even $20,000 on a piece of equipment that just hangs out in the toolroom and doesn't produce any parts? Just take a look at how much spindle time you lose by setting up the machine. Suppose you have 15 machining centers. On average you change jobs daily, and on average you have 30 tools per job. If it takes one minute per tool to touch off during every setup, this leaves each spindle idle for an extra 30 minutes everyday. Fifteen spindles x 30 minutes = 450 minutes per day. That's 7.5 hours.

If your machine rate is $50 per hour, those 7.5 hours cost you $375 per day in lost time, $1,875 per 5-day work-week, $93,750 for a 50-week year. Cut that in half for realism, and it is still money.

Getting started with presetting

Convincing management to spend the money for a presetter is just part of the process of changing over to tool setting outside the machine. Employees must learn the new system and learn to trust it.

EverFab, Inc., East Aurora, N.Y., has been using a Parlec Series 2500 CNC presetter for several months now. Setting tools on the machines (5-axis Mazaks) had been taking about two minutes per tool, so the company was looking to reduce spindle downtime, said operations manager Tom Smith.

When you start doing offline tool setting, it's important "to gain the confidence . . . of the machinists on the floor who would be getting the tooling together," said Smith. "The big thing is to be sure of your numbers. If you gave them erroneous data it could cause a crash. You need a good, sound, robust process."

To help build confidence on the floor, one of EverFab's head machinists has been working on presetting the tools, along with staff in the tool kitting area. "This was a good thing to do, to involve the guy who usually does setup," Smith said. It was important for staff to understand "This is what we do, this is how we do it, and this is why." Setup times are down and now the company is finding that it can use its scheduling software to help make sure the next job is ready to go when the machine is. The process of changing over to presetting has gone very smoothly, he said.

Part of the solution

Presetting your tools can reduce setup time on the machine and free up that much more machining time.

As you consider presetting, also notice the other activities that may be unnecessarily extending setup time and think about how you can streamline the process even more. Do you have setup sheets? Does the setup person have to search for a wrench? Does the setup require making multiple trips to the toolroom? You have control over these things, too. You can write setup sheets for each job, have the toolroom kit the tools, and make sure hand tools are close at hand. It's common sense. It's also called "lean manufacturing." Call it what you like, but it's all about making your shop more efficient and profitable. And presetting can be an important part of creating that kind of success.

With the C&M pickoff and backfinish combination,

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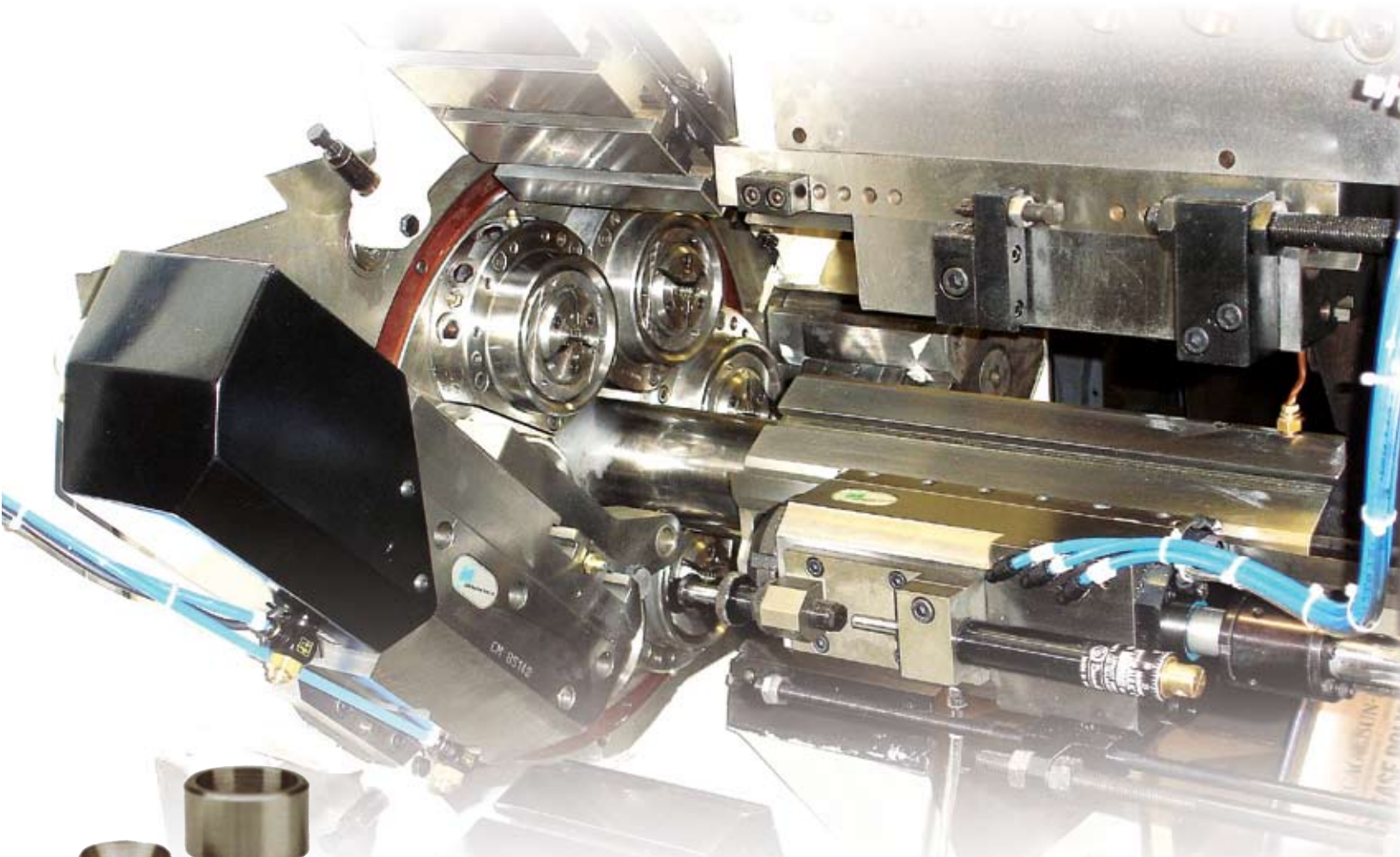

Graff-Pinkert is now the exclusive agent for the advanced and robust C&M pickoff and backfinish attachment.

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No more wimpy backfinish chamfers.

Other presetting applications

Non-CNC machines can use presetting, too, but the process is a little more involved. Presetting, in its original meaning, was to precisely set the tool projection length and other parameters before installing it in the machine. And that's what needs to be done if there's no CNC capability to compensate for offsets.

For screw machines, there are many quick-change tooling options, where the toolholder is fixed in the machine and inserts or removable tool holding adapters can be changed out easily.

One system for screw machines, Datum Line Tooling from Reynolda Manufacturing Solutions, Lewisville, N.C., is designed for families of parts. So you can set up a dedicated machine to produce similar parts without having to completely set it up each time. Selecting a datum line, usually relating to the cutoff tool, Reynolda designs the system so that toolholders are installed in the machine and stay there, but you change out the inserts and anvils for each different part, said Andrew Egbert, one of the partners at the company.

The toolholders really do stay put, he said, illustrating with a story about a Reynolda customer. At this customer, Datum Line Tooling was installed and the operators were instructed how to use it, including the fact that the toolholders never needed to be moved or adjusted. However, someone kept adjusting the toolholders. To keep this from happening any more, one of the managers welded the toolholders in place. And, eight years later, Egbert said, the toolholders haven't moved and the machines are still making that same family of parts.

Hydromat 250 presetter with Quol-Set Vision System.

Photo courtesy of Hydromat, Inc.

For a very complex machine like the Hydromat EPIC R/T rotary transfer system (Hydromat, Inc., St. Louis, Mo.), setup can be a very time-consuming process, with multiple tools at each of 12 or more stations. Hydromat offers a presetter that can set up each head outside the machine, including tool center height, said Max Bebie, vice president of sales technical services for Tornos and Hydromat. In fact, for extremely precise work, offline presetting is really necessary, he says. The CNC capability of the machine can also be used to compensate for measured offset, but the presetter is still necessary to make the measurements.

Without a presetter, "you could spend half an hour setting a head," said John Riley, manufacturing engineer at MKM Machine Tool Company, Jeffersonville, Ind. With the presetter, "you can have your tool heads preset and waiting, ready to go into the machine." Riley said his company has more than 20 Hydromats and has been using a Hydromat presetter for a long time. In addition to saving time on setup, he has found that using the presetter has additional benefits, such as helping with recovery after a crash. It's much easier to put a head back together when you have all the settings documented from the presetter, Riley said.

shop doc

With Noah Graff

Dear Shop Doc,

We are in a bind. We have a 1,500 piece job that has to be delivered by the end of next week and we have yet to get the job to run to the surface finish we need. The part is about 0.750 inches long and formed up to 0.250 inches deep in some places. The material is gummy and is welding to the edges of our tooling. We have tried different rake angles with little luck and are looking for a quick and economical solution.

Gummy Bind

Dear Gummy Bind,

Carbide is the best option for forming in screw machines, but sometimes carbide isn't an option based on the high cost and long delivery times. There are a variety of coatings that are an affordable option. For this job I would recommend you send your form tool out for a tin (titanium nitride) coating. It is one of the most flexible, affordable and commonly used tool coatings available. This will bring up the surface hardness of the cutting edges and increase the lubricity and wear resistance of your tool. By increasing the lubricity, the material you are cutting will be less likely to weld to the edges of your tool. Tin is readily available, while you could wait weeks for the delivery of high cost custom carbide tooling. In many cases carbide just isn't economical enough for small-run screw machine jobs. Tin coating is an excellent option for improving the finish and keeping the cost down on short run fast delivery jobs.

There is one downside to the tin. Once a tool is ground, the coating is ground off the top and finishes won't be quite as good. The best tool life will be achieved before the top is ground. It is a good idea to make sure that the form tool is ground before sending it out so that it does not have to be ground right away. If your job is small, the tool may not need to be ground at all. Tin will improve finishes for any size job, but I would recommend carbide if the size of the job is large enough to justify the cost of custom carbide tooling. This should help solve your problem.

Weston Szpondowski
Wyandotte Industries Inc.

Today's Machining World's "Shop Doc" column taps into our vast contact base of machining experts to help you find solutions to your problems. We invite our readers to contribute suggestions and comments on the Shop Doc's advice. If you consider yourself a Shop Doc or know a potential Shop Doc, please let us know.

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

product focus

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

Preset inspection equipment, preset tooling, and heat-shrink holders can dramatically increase efficiency and rigidity of screw machines, CNC lathes, rotary transfer machines, machining centers, horizontal boring machines, and milling machines by decreasing changeover time and increasing tool life. The following companies provided information on preset and heat-shrink workholding products available.

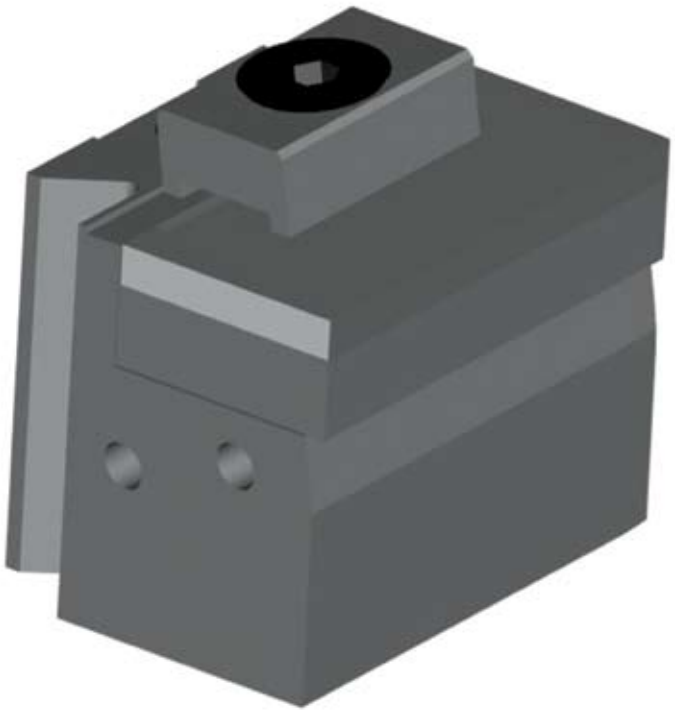
Hardinge

Hardinge Inc. offers precision CNC tool holders (CAT-V and BT flange) to fit most vertical and horizontal machining centers. The shank taper accuracy of AT-3 or better exceeds ANSI standards by a minimum of 35 percent.

ER and TG collet-style holders will hold drills, end mills, reamers, taps and boring bars. Collet-style holders are available in stub, standard, extended, extra-extended and the massive S&R (strong and rugged) configuration. Solid style holders include end mill, hydraulic end mill, shell mill, semi-flush slitting saw, stub arbor, tapping (floating and rigid), boring heads, Jacobs taper, Morse taper and blanks.

For more information, contact Hardinge at 800-843-8801 or order online at www.hardingetooling.com.

workholding



Somma Tool

Somma Tool Company has developed a series of Preset Quick Change Form Tool Holders that use throw-away style inserts. The holders use throw-away inserts with a simple, rugged, back up anvil. They are available in dovetail style and circular style holders and are ideal for Datum Point applications.

Holders have either 0 degree or 5 degree top rake angles and can accommodate part forms up to 1-1/4 inch wide and 1/2 inch depth of cut (3/8 inch depth of cut for Davenports). The Somma "STA" holders can be used on Acme, Davenport, New Britain, and CNC machines, and sell for $89.00 to $110.00 each. Somma supplies both throw-away insert blanks ready for EDMing or formed inserts made to customer's print. Trial orders are welcome.

For more information contact Somma Tool Company at 203-753-2114 or visit www.sommatool.com.

Hydromat

The Hydromat Presetter with the Quick-Set Vision System is a productivity tool for transfer machines, machining centers, horizontal boring, milling and turning machines. The measuring range of the Hydromat Presetter is: length Z-axis – 248mm, radius X-axis – 248mm, swivel diameter – 238mm. Key features include single-hand operation for linear axis movement, a 20X magnification camera system with in-screen measurement optics, and a tool holding fixture with a power-operated clamping function, spindle brake and 4X90° indexing capability, with concentricity of 0.002mm or 0.00008".

The Quick-Set Vision System, with presetter control software, offers automatic cutting edge detection with tool angle and tool radius measurements, and is displayed along with the tools position.

For more information, contact Hydromat, Inc. at 314-432-4644 or visit www.hydromat.com.

ITI Tooling

ITI Tooling offers EWS-Varia Unicam, a universal modular tool holding system in three sizes for most CNC turning centers. Varia Unicam's single-point clamp requires just a simple half turn to the left to unclamp and release the used tool, a half turn to the right to secure a new one. Exchanges take just seconds. The system's safety detent orients the locking clamp towards the machine's operator each time the spindle stops. Tool exchanges can begin immediately and safely. Varia is used on both live and stationary tooling. Its compact design provides as much as 20 percent more working room than comparable modular systems.

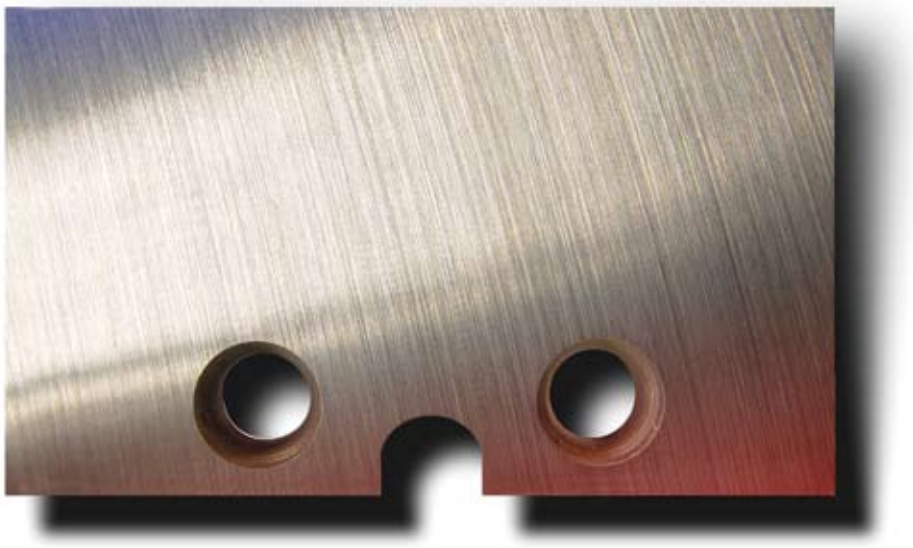
For more information, please contact ITI Tooling at 201-934-6333 or visit www.ititooling.com.

Schlitter Tool

Schlitter Tool has developed a Direct Mount™ Insert technology that works hand-in-hand with datum point tooling strategies to support the lean effort.

Datum point tooling reduces or eliminates the need to alter cams and machine setups for cross slide tooling by designing tools around an agreed preset. Schlitter's Direct Mount™ Inserts mount to dovetail adapters, stick tools and even directly to its Advanced G-Series™ Shaving Systems. Schlitter has no minimum order quantity. Typical delivery times are under 10 days, and under three days with its Tooling Now!™ program. Inserts are available in HSS and carbide.

For more information please contact Schlitter Tool at 800-521-1743 or visit www.schlittertool.com.



product focus

Genevieve Swiss

Genevieve Swiss Industries offers a line of Preset Tools with its Quick Change Collet Systems for Swiss Turning Centers, VMC and Rotary Transfer Machines. The QC systems are available for machines equipped with the ER Collet system. Preset tool holders are available from ER 11 up to ER 40. The Preset QC Collet Systems can also be used to extend tooling closer to the workpiece for increased rigidity or extend micro tools closer to the workpiece.

For more information, please contact Genevieve Swiss Industries at 413-562-4800 or visit www.genswiss.com.

product focus

Schunk

Schunk's "CELSIO" toolholder bodies are manufactured using special steel to ensure maximum toolholder life without temperature distortion. Mounting tapers are ground to grade AT3, Form A and high-temperature as well as special hardening procedures that help avoid any material distortion due to heating and cooling. A high frequency induction coil with 10 kW power delivers fast shrinking for 3 – 32mm diameter carbide tools and 6 – 32 mm diameter HSS toolholders. Rapid tooling, within 30 seconds, minimizes excessive heating of the taper resulting in non-warping due to this heat treatment process. Adapters can also be used in cooling units to facilitate the cooling of extensions and non-standard heat shrinking toolholders.

For more information, please contact Schunk at 919-572.2705 or visit www.schunk.com.

product focus

Lyndex-Nikken

Lyndex-Nikken's new E-450 presetter by Elbo Controlli features a ground granite column and base, a spindle body assembled on spring roller cages and optical scales. The spindle body on the E-450's machine base limits run-out error to less than 2µm. A radial rotation spindle brake eliminates the error of rotational axis misalignment. The optical scales of the E-450 detect interference produced by part movement through the use of a glass ruler attached to the fixed part of the machine. Each optical scale has a resolution of 1µm.

The E-450 incorporates a double system of prismatic rails for X-axis movement with three double re-circulating ball bearing sliding blocks and a monorail with one sliding block for the Z-axis. Axis movements for the E-450 include manual rapid and manual micrometric adjustments.

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

Parlec

Parlec, Inc.'s 3200 Heat Shrink System with its new built-in cooling system shrinks an average size tool in 4 seconds, and cools the whole tool assembly to room temperature in less than 30 seconds.

Combined with the ParleVision® CNC control system, the Series 2500 Parsetters® are constructed for the most demanding automated or manual applications where micron repeatability is required. Series 2500 Parsetters provide a maximum measuring capability of 950mm x 1000mm. Series 2500 presetters combine symmetrical design methodology with cast iron materials ensuring a thermally stable platform.

For more information visit www.parlec.com.

product focus

Command Tooling Systems

Command Tooling Systems' new Digiset 6 presetter features digital camera imaging that shows measuring results almost instantly on the on-board color display. Operators can manage up to 1,000 tools simultaneously and choose from programs that perform axial and radial runout inspection, cutting edge inspection, zero point monitoring and measurement of multi-bladed tools. Two models are available: Digiset 6 Model 400 with 15.75" x 15.75" (400mm x 400mm) measuring range and Digiset 6 Model 600 with large 15.75" x 23.62" (400mm x 600mm) measuring range. Both models offer a complete package including cutting edge inspection, table, printer and download capability with CNC machine controller.

For more information, please contact Command Tooling Systems at 763-576-6910 or visit www.commandtool.com.

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

think tank

Sharing Cakes

At a birthday party, three cakes are cut as shown and divided between two groups. One group gets the red pieces, while the other gets the yellow.

Cake 1 is cut through the center three times, making six 60-degree angles.

Cake 2 is also cut three times, but through an off-center point. Again, the cuts make six 60-degree angles.

Cake 3 is cut through the same off-center point, but now four times, making eight 45-degree angles.

Did each group get identical shares of the three cakes?

Fruit Baskets

Since the nine bananas, nine oranges and nine apples in the three fruit baskets together costs $4.05, the cost of one of each fruit should cost just one-tenth of that, or $0.45.

Who added it all up?

Gail Kadrich of Tip-Top Screw Manufacturing in Oscoda, MI; **Pete Russell** of Fulton Tool Co. in Fulton, NY; **Ron Dore** of Haas Automation in Oxnard, CA; **Adam Doughty** of Wave Armstrong Venture in Aberdeen, MD; **Nelo Dimaculangan** of Dahl Brothers in Mississauga, Ontario Canada; **Tina McKean** of Ameritherm Inc. in Scottsville, NY; **Terry Donovan** of Alco Manufacturing in Elyria, OH; **John Kloida** of Precision Manufacturing in Menominee, MI; **Samantha Hybben** of Lake Elmo, MN; **Doug Pav** of A.M.S. in Clinton Township, MI; **John Weber Sr.** of Weber Systems, Inc. in Menomonee Falls, WI; **Abdul Khatri** of Kamet Manufacturing Solutions in Sunnyvale, CA; **Val Zanchuk** of Graphicast of Gaffrey, NH; **Bill Nyborg** of Southwestern Machine Products in Odessa, TX; **Mark Serbu** of Serbu Firearms, Inc. in Tampa, FL; **Steve Gredell** of Empire Machine Works in Raytown, MO; **Pat Muscarella** of PLM Teknologies, Inc. in Penfield, NY; **Greg Roan** of BLP Products in Orlando, FL; **Tom Edge** of Quality Manufacturing, Inc. at Marysville, WA; **Jason Tepp** of S & S Cycle in Viola, WI; **Bill Priest** of HK Screw Machine Products in Oceanside, CA; **Uli Kuster** of Blaser Swisslube in Rohnert Park, CA; **Ron Smith,** formerly of Kaddis Mfg. in Rochester, NY; **Matthew Ecker** of Hunter Engineering in St. Louis, MO; **Jim Herrington** of Rim Country Manufacturing in Payson, AZ; **Jason Kurtz** of Hard Metal Solutions in Marysville, WA; **Randy Miller** of Vallorbs Jewel Company in Bird-in-Hand, PA; **Roger Stillman** of Metric & Multistandard in Hawthorne, NY; **David Gray** of Sun Machinery Co. in Lexington, SC; **Marc Dagata** of DP Machining in La Verne, CA; **Rick Stein** of Key Products in Milwaukee, WI; **Steve Richards** of Yamazen in Milwaukee, WI; **Shelley Hocking** in Whitmore Lake, MI; **Joe Manfreda** of PICO Chemical in Chicago Heights, IL; **Alan De Los Santos** of Protomatic Inc. in Dexter, MI; **Jeff Young** of Component Tool & Mfg. in Crete, IL; **Joel Wineberg** of Industrial Market Place in Skokie, IL; and **Gary Sewell & Lynne Weixel** of G S Design & Machine in Tallassee, Alabama.

postings

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

EMO Hannover (Germany)

Sept. 17 ~ 22

www.emo-hannover.de

Machinery Vibration Analysis

Willowbrook, Il

July 31 ~ Aug. 3

www.vibinst.org

Rotor Dynamics and Balancing (RDB)

Willowbrook, Il

www.vibinst.org

July. 31st thru Aug. 3rd

Machinery Lubrication 1 Conference

Nashville, TN

www.noria.com

Aug. 21 ~ 23

Annual Conference of Metallurgists COM 2007

Toronto, Canada

Aug. 25-30

www.metsoc.org/com2007/

Street Rod Nationals

More than 11,000 pre-'49 vehicles

Aug. 2-5

Louisville, KY

www.nsra-usa.com/

Crisco was developed by P&G

Aug. 15, 1911

www.butlerwebs.com

MLB Trade deadline

July 31, 4p.m. ET

MLB.com

Lou Piniella (Baseball Manager)

Aug. 28, 1943

Wikipedia.org

Toyota Motors became an independent company

Aug. 28, 1937

Wikipedia.org

An ongoing "ethical compass" column
By Russell Ethridge

business ethics

Coiled Up

I'm a salesman for a steel brokerage firm. We sell what we can buy in the market based on what our customers will typically require, but we also buy when we see a deal. We sell to a tube mill that makes tube stock for dunnage racks. Following their rack customers' requirements, they always want a certain hardness and elongation factor of coil steel. Sometimes we have it, and sometimes we don't. Recently, we got a chance to buy some nice coils at a great price, but they are slightly softer with a little different metallurgy. I called the customer and explained that these were a little different but that maybe they had a use for them. I wasn't really thinking about the rack jobs because they run other jobs. The price was right. The mill's general manager said he could use them for his rack customer even though they were not as hard as the specifications called for. He said the racks are never stacked more than four high, and this steel wouldn't deform under this application. He also liked them because they would run more easily in the mill, resulting in less breakdowns and downtime. Did I mention the price was right? I know this is not what these racks are supposed to be made of, but is it really my business if he's using something outside of spec? It's not like I'm recommending it, but I can't see where there's any harm either. Do I say anything? We both stand to make some decent money.

What's the old adage: "the customer is always right"? Here, all you're doing is selling the customer what the customer wants. There would be no ethical issue if you didn't know that his customer requires harder steel. Now that you know, however, you wonder if you're part of some "conspiracy" to defraud his customer. What if this was a safety-related application where the hardness really mattered? Would that make any difference? It might, but how are you to judge? Your customer's a sophisticated buyer. He didn't ask for a recommendation, and you don't build dunnage racks. Maybe the mill already asked its customer, and they are sharing the savings because the customer realized he didn't need such hard steel. You are not required to be the guardian angel. You haven't been asked to be, and no one expects it here. You are selling a commodity, not advice. If the mill manager asked you for a recommendation or wanted your opinion on this steel's durability, your role would be different. You'd have a duty to describe candidly the steel's characteristics, and it would be appropriate to point out how it differs from what you know he usually orders. Here, however, all you need do is fully and accurately disclose the steel's characteristics and make sure you have a record to prove that what was delivered was what was ordered. Certainly, I don't need to remind you not to dummy up the invoices if your customer should suggest it to show something the steel's not. That's not an ethical dilemma. That's fraud.

TMW will explore business ethics bi-monthly. Have an ethics question? email jill@todaysmachiningworld.com.

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help wanted

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SCREW MACHINE ENGINEER
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(contract shop, growing, great benefits, plant expansion, tool, layout, estimate) up to $80K – Western NY

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(div. of OEM, production machining, Lean, operations, weld, assembly, screw machine, cnc turn) up to $120K – N.E. OH

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(Acme, lead, manage, problem solve, layouts, train) up to $65K – S.W. PA

ENGINERING MANAGER
(electronics OEM, precision machining, high volume, project management, planning, leadership) up to $100K – AZ

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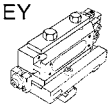

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I've watched the golf movie *Tin Cup* a dozen times, and every time I view it I love it more. Kevin Costner plays Roy McAvoy, a broken-down golf pro relegated to giving lessons at a driving range in armadillo-infested Salome, Texas.

McAvoy has every shot in the game. He can shoot par using only a seven iron, but his confidence is shot and his life and his game are in shambles. Then Rene Russo comes to town. She plays a psychologist. She is also dating Costner's nemesis Don Johnson, a prominent tour player who is as obnoxious as he is successful.

Costner falls painfully in love with Russo, who he meets when she is trying to learn how to play golf. He commits to turning his life around by attempting to qualify for the U.S. Open.

"The greatness of the movie is in how it plays off the desire for success and winning against the purity of going for perfection."

Naturally, he does pass the test and goes on to play in the ultimate tournament with his caddie Cheech Marin and Russo as his sports shrink and semi-girlfriend.

The greatness of the movie is in the ending scenes when Costner rebounds from a terrible first round to challenge for the championship. The dramatic setup for the movie is the difficult par 5 18th hole which is surrounded by water. The rational play is to lay up on the second shot for a fairly easy par and possible birdie. But Costner, the ultimate golf romantic or idiot, attempts to hit a 240-yard three wood in each of the first three rounds, failing each time.

The climax of the movie occurs when Costner attempts the virtually impossible shot in the last round when a par will get him to a playoff. He hits a virtually perfect shot, only to see it trickle over the green into the water hazard. Costner then plays the next ball from the same spot and again knocks it into the water. He proceeds to play Don Quixote on the next six shots until he is down to the last ball in his bag. If he misses the green he is disqualified and loses the chance to finish in the top 15 and qualify for other major tour events.

The commentators and fans are beside themselves with anguish as they see Costner self-destruct in his desperate quest for the perfect shot. On his last attempt he not only rolls it on to the green, but watches it fall in the cup.

He loses the tournament but wins the girl with his heroic choice.

The greatness of the movie is in how it plays off the desire for success and winning against the purity of going for perfection and defying the golf gods. We revel in Costner's romantic lunacy, but we hate him for throwing away his chance of a lifetime to win the Open.

Costner's moment of clarity comes after his elation in killing the dragon and sinking the miracle shot. He realizes he has just blown the U.S. Open because of his grandiosity and ego. But then Rene Russo tells him that the shot will immortalize him, and she loves him for it. This is the moment that makes this movie worth watching again and again and again for me – the tension between going for broke and playing to win. I saw Phil Mickelson go for it all in the 2006 Open and blow the tournament, but I love him for the effort. The golf philosophers have pilloried him for his brazen stupidity. He banished himself from the tour for many weeks trying to recover from the shame of trying the amazing shot and failing to hit it.

In business most of us play it safe. We lay up. We are prudent stewards of assets. The joy of watching *Tin Cup* for the tenth time is being thrilled by the purity of Roy McAvoy's quest for perfection and fulfillment – and wishing they were ours for the grasping.

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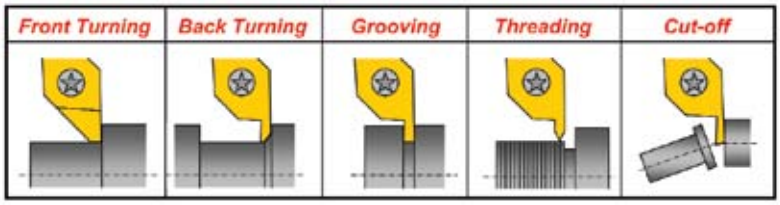

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