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Fall 2004

Monuments

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Berntsen performs several manufacturing feats at once: they handcraft with high-tech, they mass produce custom products, and they please a client list that includes small shops and many of the world's governments. (All photos by Angus Stocking)

Berntsen:

Berntsen monuments leave the plant with the finish and detail of fine art, but resilient to harsh environmental conditions.

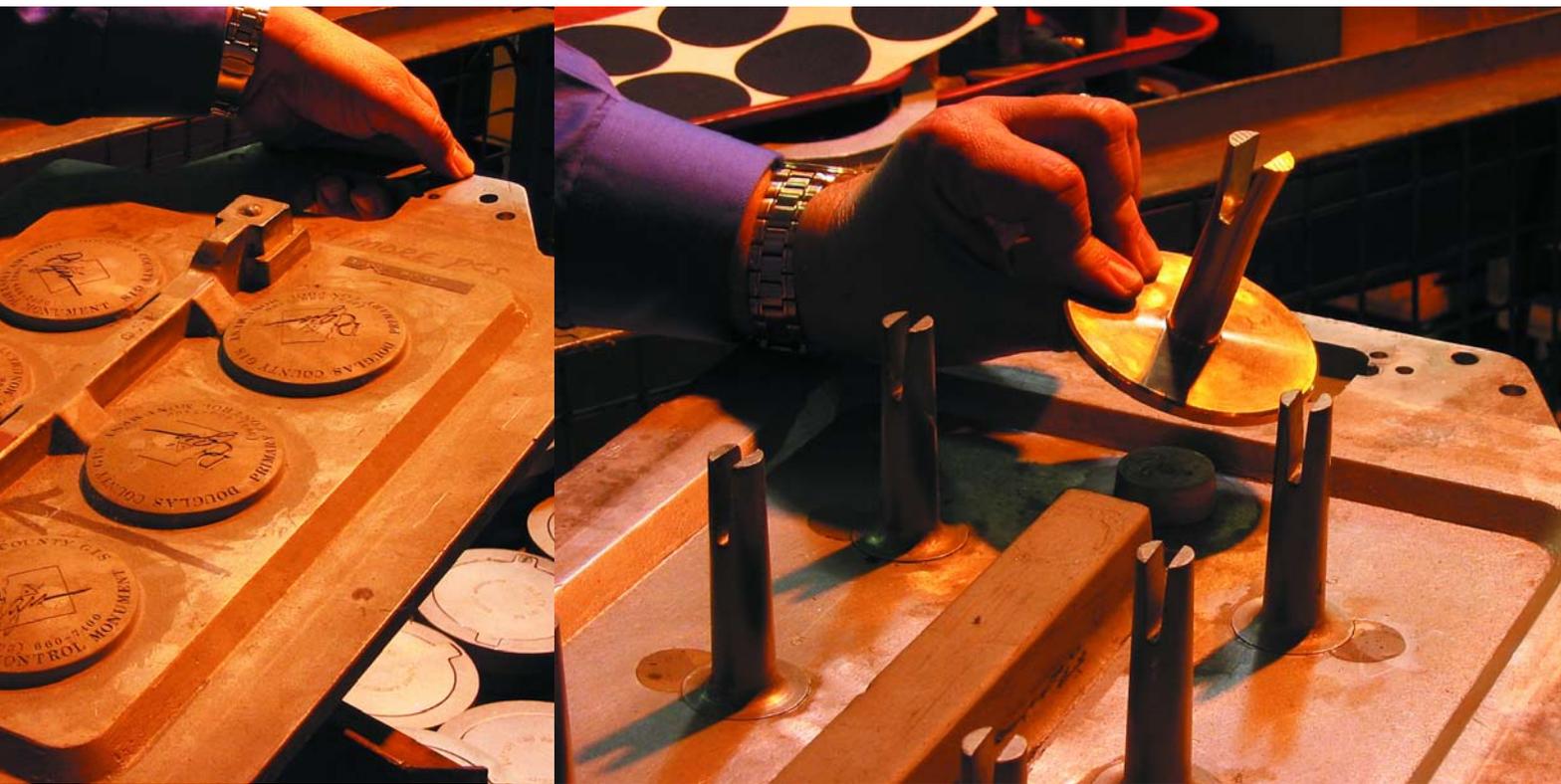
A Marked

I'm cynical about corporations, so every time I've ordered aluminum monuments from Berntsen International, Inc., I've sort of wondered . . . 'What's the deal?' Their products are of the highest possible quality—little sculptures really—they arrive in a couple of days and they cost a few bucks each. In other words, they're good, fast *and* cheap—and that's impossible, right?

So my expectations were pretty high as I walked into the Berntsen office and factory in the outskirts of Madison, Wisconsin. The building itself is blue and pleasantly modest—

only a smallish sign announces that here is the headquarters of the world's largest manufacturer of durable boundary markers, the source of millions of monuments that can be found marking the corners of every state and more than 90 countries around the world. Berntsen monuments are also standard for non-boundary markers, those that are valued chiefly for their stability—and men have gone to a lot of trouble in their quest to keep things absolutely still. There is a Berntsen monument on Mt. McKinley—made of a rare aluminum-bronze alloy, it is, at 19,320 feet one of the highest durable marks ever established—and, just to cover North America's other extreme,

>> By Angus W. Stocking, LS



Berntsen monuments have been used in Death Valley as well. Berntsen monuments were used in the Temple Valley of Luxor, and in the Salt Lake City Olympics, as reference points to measure events glacially slow and nearly instantaneous. In Japan they are used to monitor earthquakes and armies have used them in wartime for various martial purposes.

They are, in other words, nearly ubiquitous. If they could be somehow lit from within and viewed from space, they would look like a string of millions of stars outlining the

Difference

world's nations and states, highlighting the planet's high spots and low spots, and pinpointing all the battles and victories and buildings and speeches that have meant so much to men. It would not be random, like scattered bits of light, it would be a pattern reflecting the intelligence of millions of men, of collective humanity, each point set with care and effort.

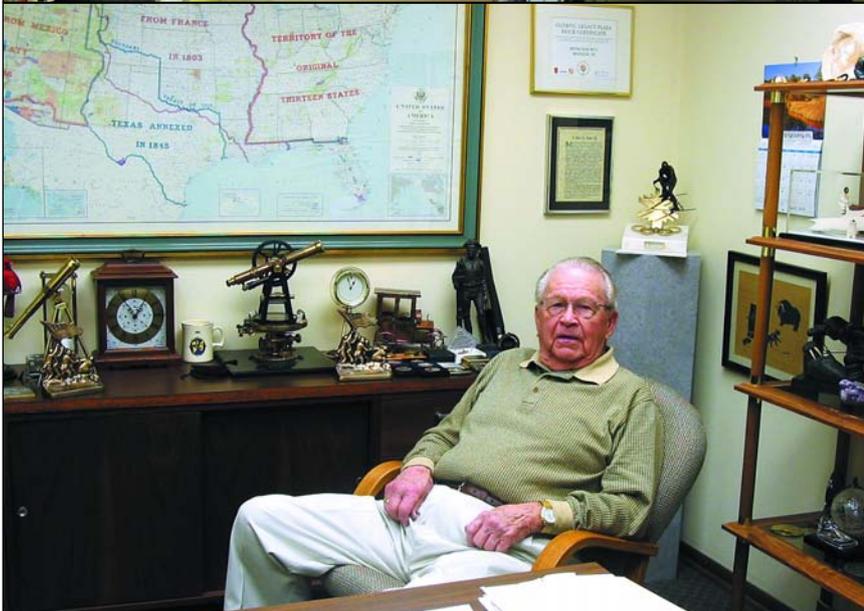
But I digress . . . it was with rather high expectations that I walked into Berntsen International, and I was not disappointed. I met wonderful people who have a passion for their product, and who continually challenge themselves (for really, there are few competitors to challenge them) to make better markers and deliver them faster, who have a gift for technological and business innovation, and who probably go home from work most days with a smile, proud of what they're accomplishing. Really, it's enough to convert even the most hardened cynic.

Origins

The story of Berntsen International, Inc., begins in 1971 when Peter Berntsen, a foundry man, was approached by a friend who worked for the Wisconsin Department of Transportation. It seems that setting high-order control in those days required "a tractor-mounted backhoe, a truck and a trailer, and three men to set a concrete monument." There had to be a better way. Berntsen thought about it, and eventually invented and patented the W-1-B monument, the first of its kind, a lightweight but stable monument that could be set without special tools. It created an industry.

A few years later, Phillip Peterson bought a half interest in the firm, and proved to be equally inventive in the marketing of the new product. There was no doubt in his mind that the market was government—specifically, large federal agencies. As he puts it, "There were no standards for government surveyors; they were sometimes setting glass bottles or quarts of charcoal . . . BLM was the worst; they were using iron pipes with brass caps . . . metallurgically this was the worst thing they could put in the ground. It took them awhile to realize that. They were using dissimilar metals, and when they put them in the ground they would self-destruct."

Peterson began traveling around the United States, setting Berntsen monuments in extreme environments in states like Florida, Arizona, Utah and elsewhere. He took more than 20 trips just to Alaska. The travel was at his expense, and the sweat was his own. There were no grants ever and no help at first. But it paid off. The partnership of Peter Berntsen and Phillip Peterson became the first firm to sell survey monuments nationally and then internationally. Berntsen now sells hundreds of thousands of monuments annually.



Top: In the sales area—designed by the people who use it—every customer file is instantly accessible.

Bottom: Phillip Peterson kicks back in his office.

A Family Business

Berntsen is still a privately-held family business. Phillip Peterson is still active with the firm; his daughter, Rhonda Rushing, has been president since 1992. Her husband, Bill Rushing, is a vice-president. The lean management team also includes Vice President Tom Wildgen, Marketing Manager Shari Hettinga, Materials and IS Manager Troy Balling, and Manufacturing Group Leader Todd Koberle.

It *feels* like a family business. When I arrived, I was met in the lobby by Rhonda Rushing, who then proceeded

to introduce me to every member of the office staff and management. One of the things I was most curious about was answered right away when she took me into the area where sales calls are taken. When I order from Berntsen, I've always wondered how they pull up my information so fast—in just a couple of seconds they know everything I've ever ordered and where I like it shipped. I assumed it was a computer system of some kind, but the people I was talking to always seemed remarkably assured compared to other vendors. Turns out it's a paper system, and it's as amazingly simple as it is

efficient. All the files—*all* the files—are kept in one monolithic set of shelves and the sales staff can just spin around and grab anything needed. They can also, in about thirty seconds, talk face to face with just about anyone in the plant if a customer has some unusual question.

Eventually I was introduced to everyone working that day, and had the distinct sensation that people were happy to see me. There were no grouches. I learned later that Berntsen employees (and even their subcontractors) tend to have been around for awhile—turnover is extremely low. Things were clean and pleasant, not too loud, and even the manufacturing floor was oddly peaceful. Workers moved almost gracefully, and I had the feeling one sometimes gets when watching professional sports—everything was being done so well, it looked easy.

Business Innovators

My tour proper began when the Rushings, Wildgen and Peterson took me to the break room and pointed to a couple of large whiteboards as proudly as parents. These boards are the focal point of a meeting held every single workday morning, attended by every single employee. It is limited religiously to no more than seven minutes, adheres to a standard agenda, and is led in rotation by every employee. Every employee speaks briefly and reports. If it sounds easy, it's not. It took *eight years* for the morning meetings to really catch fire, but when they did they transformed the company. They allow for company-wide coordination of *everything*, from the grittiest details of production to the artiest flights of marketing fancy. The management team considers the meeting to be the heartbeat of Berntsen, well worth the effort it took to get established. Wildgen says, "If you're trying to do this, keep at it. It's hard work, but it's worth it if you don't give up."

The energy that was latent in the break room and the passion of this team began to answer another question I had about Berntsen—why are they so much better than they have to be? After all, it's not as if there's a lot of competition in the custom, high-quality survey monument market. Berntsen created the market, and they still have the lion's share of it. So why aren't they making mediocre products and selling them for high prices, like the Big Three did with cars in the '70s before the Japanese started eating their

lunch? How have they managed to evolve in the absence of challenge?

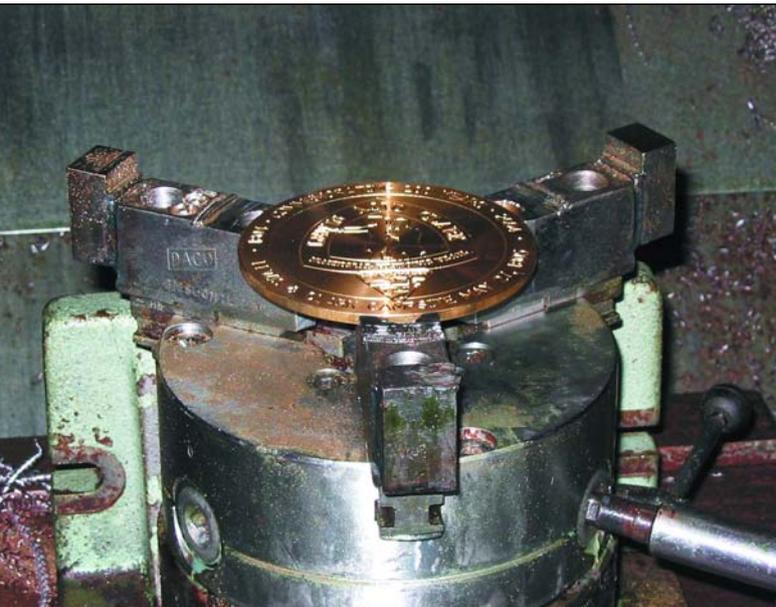
By challenging themselves. In 1991, Berntsen was the smallest firm to attend a four-day seminar conducted by the legendary Dr. Edward Deming. Rhonda and Bill came back determined to fix something that wasn't broken—and they succeeded. Quantum leaps have been made in every area of the firm, from manufacturing to sales, even when doing so meant reinventing something as basic as foundry work.

Consider delivery time: since monuments are primarily cast products, special orders used to take as long as 45 days—and this wasn't considered a problem. But to reach their quality and delivery goals, things had to be done differently. So Berntsen was one of the first three firms in the nation to purchase an orbital former. There are still only a few dozen stateside . . . and none of the others are being used to make markers. It was a half-million dollar bet on an unproven machine the size of a garden shed and it turned out a winner. The orbital former concentrates great force into an orbital motion that massages and kneads metal into the desired shape. And it's fast. I watched Bart Probst, forge operator, for just a few minutes during which he processed several finished blanks without seeming to be in a hurry. Quality is also improved. Formed monuments have no air pockets and the metal ends up with a grain, like wood. The result is a less brittle monument, one that lasts longer and is even better looking.

Rather than casting, lettering and designs are now engraved by a program-mable CNC Mill. Not only is this fast in itself, the setup time is also greatly reduced compared to casting. Berntsen regularly converts customer sketches into finished metal monuments in a couple of days. And the crispness of the engraving makes for more detailed and legible monuments. Casting, incidentally, is still done when specially requested, but it costs more (and takes longer).

Top: The whiteboard monitors the company "heartbeat" on Monday mornings. **Middle:** The orbital forge, operated here by Bart Probst, has largely replaced casting at Berntsen. **Bottom:** (L-R) Co-founder Phillip Peterson, President Rhonda Rushing, and Vice-president Tom Wildgen.





The heart of the CNC Milling machine



A bank of blanks

These and other manufacturing breakthroughs have helped reduce Berntsen's turnaround time on special orders from a month to just two days in most cases.

But it's not all about machines. Berntsen didn't buy a better business off the shelf. They built it from good ideas harvested from employees, customers and outside sources. It was employees, for instance, who decided that every floor worker should be trained to operate every machine, and it was employees who implemented the file access scheme described above. Client feedback has contributed to product design; one example comes from Thibodaux, Louisiana where surveyors on the National Geodetic Monument noticed that the rod series of monuments tended to vibrate apart. Their comments led to the patented rotating sectional rod concept that now appears in a wide variety of Berntsen products.

Outside sources also play a big role. In their quest to be a cutting edge company (in several senses of the phrase) Berntsen attends 15-20 trade shows a year, monitors several technologies for possible adoption, and consults with the University of Wisconsin's Metallurgy Department.

The Manufacturing Floor

After being shown the break room, I was given safety glasses and taken to the manufacturing floor. As mentioned above, it is relatively quiet for a place where metal is being pummeled. And it is remarkably clean—for the record, I would have been happy to eat off the

floor, unless soup was being served. They certainly didn't clean up on my account; it's always like this. Before a recent visit by Senator Herb Kohl of Wisconsin, employees *tried* to clean up special, but realized that once you have a plant perfectly in order there's not much left to do, even for a Senator. (But they did make him a special medallion).

While walking the floor, I had the sense that metal is an altogether livelier element at Berntsen. It arrives as ingots and slabs and 15 foot billets but then for its brief stay turns into something quick and flexible, responsive. It can be kneaded, polished, whittled, colored, played with . . . for Berntsen's machinists, metal is like modeling clay. I'm serious when I refer to their products as little sculptures. Monuments leave the plant with the finish and detail of fine art, and the fact that they're made by the millions doesn't make them common.

Aside from the orbital former, machines are not necessarily high-tech, but they're always the right tech. Machines are renovated as needed; for example, one older lathe has been fitted with a digital readout to allow for more precise work. They're also arranged in 'work cells', so that workers can turn from one task to another.

Maintenance is obviously obsessive—when a machine might cost a million dollars to replace, it is going to be taken care of. "You know that old saying, 'If it ain't broke, don't fix it?'" asks Rhonda Rushing, wryly; "Well, that doesn't work around here." Maintenance strategies include super-filtered oil systems, fanatical cleanli-

ness and a detail I found interesting—specialists visit occasionally with stethoscopes; they're able to *hear* bearings that are *about* to go bad, so that they can be replaced before a costly breakdown occurs.

Managing Contacts

Most customers will interact with Berntsen in one of three ways: phone, catalog, or Internet. These are all consciously managed for excellence. The phone system, for example, is *not* a queue system; you will nearly always get a live person who knows what they're talking about—even if the company president has to take a call.

The catalogs—"SurveyLogs"—are also designed with the customer in mind, and to honor the surveying profession. Rushing says that, "We wanted to do something that wasn't all about us." Every catalog contains a few items not related to monuments and that are not Berntsen products. The survey-related murder mysteries of Norman Van Valkenburgh are a good example. And there is often an excellent cover article, such as recent pieces covering the Lewis and Clark Bicentennial or the history of the Compass Rose. It's not unusual to find old SurveyLogs stored as carefully as old magazine issues in many survey shops.

The website is also beautifully done. It was revamped in October of 2003 and has since become an important source of sales. In addition to a very complete and convenient catalog, quite a bit of useful material is maintained including a specials page, a cal-

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Peterson holds an original W-1-B monument

endar of events that Berntsen will be attending, installation instructions and past SurveyLogs. It's also rather snazzy technologically—all in all, the site is a nice picture of Berntsen and does far more than the average corporate website.

And, as I can attest, they're also pretty nice if you just walk in the door.

A Marked Difference

So there you have it, my no holds barred, hard-hitting investigative report on the seamy underside of the monument making racket . . .

Actually, I was bowled over by excellence. Berntsen is an important firm to our profession, almost literally its backbone. That they are so excellent, and so determined to get even better, is hopeful and encouraging. I found myself rather optimistic about surveying, corpora-

tions, even the country after touring their plant.

On the day I was there, an interesting order was being completed. It seems that the Smithsonian Institution has its own surveying and GIS departments—who knew?—and required 150 brass alloy markers, numbered sequentially. It seemed rather an iconic order; a great American institution, a custom product, something beautiful and useful, the hint of high technology . . . it was all these things.

And for Berntsen it was just the latest shipment of a totally distinctive product. In every way, they really do seem to be a company with a marked difference. *AS*

Angus Stocking is a survey manager at MSA Professional Services in Beaver Dam, Wisconsin.

