Klartext

Helping People Help Themselves

Report on smarT.NC

Editorial

Dear Klartext Reader,

Do you know, by the way, how much support HEIDENHAIN offers TNC users? In this issue you'll find an extensive contribution on the subject of service. HEIDEN-HAIN provides TNC users free of charge with a large number of documents and software to make their daily work much easier.

At the METAV 2004 we introduced smarT.NC—the alternative user interface for iTNC 530 that make another step toward greater ease of use. This issue presents for the first time a report from a user on his experiences with the new interface. A second report on an unusual and remarkable clock clearly illustrates again the power of the new iTNC 530.

Enjoy your reading! And let us know what you think of it.

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Production

EUROMOLD

See us at the EUROMOLD
Hall 8 Booth K 172

Helping People Help Themselves
Service with a Capital S at HEIDENHAIN

HEIDENHAIN controls are made for the workshop. They are intuitive and self explanatory. If you do have questions, or if problems occur, the machine tool builder or dealer will help you with his know-how.

Then why do we need a Service Department at HEIDENHAIN? The individual machine builders and sales partners cannot be expected to have the detailed knowledge required for all of our product groups. This is the HEIDENHAIN Service Department's responsibility, and users of HEIDENHAIN products can depend on us for competent service. The Service Department is no profit center, no company within a company, but rather it provides genuine service to HEIDENHAIN customers and users.

Users have many avenues to receive assistance. They contact HEIDENHAIN Service digitally over the Internet, by telephone, fax and often by mail. Many users take advantage of personal contact at trade shows such as AMB, EUROMOLD or METAV to get answers to their questions.

There's also a brisk exchange of information among TNC users in numerous Internet forums such as the CNC Arena. Here the "insiders" help each other out by sharing their knowledge. (Read the contribution on page 7.)

## Help, programs and documentation per Internet

The newest HEIDENHAIN Service instrument, the FAQ database on the HEIDENHAIN Web site is showing a steadily growing number of hits and "performs first aid" in many cases. For many of the user problems, the service specialists on the telephone hot line can already refer users to the comprehensive digital self-help provided in the FAQ database, which is permanently available and is being constantly expanded.

Downloads

On the HEIDENHAIN web site, under the "Services and Documentation"/"Documentation portal" category, customers and users can find technical documentation such as User's Manuals for all the controls. One very helpful document is the description of the Ethernet interface. Here they find information on control configuration, on SMB connection and on the Cimco NFS-server software.

Under the "Services and Documentation"/"Software"/"PC Software," the TNCremoNT data transfer software is available for downloading free of charge. This software enables communication between a PC and HEIDENHAIN controls. The data is transmitted over the serial interface or the Ethernet network. Beside the convenient data transfer functions (from the PC or in server operation), this software offers a
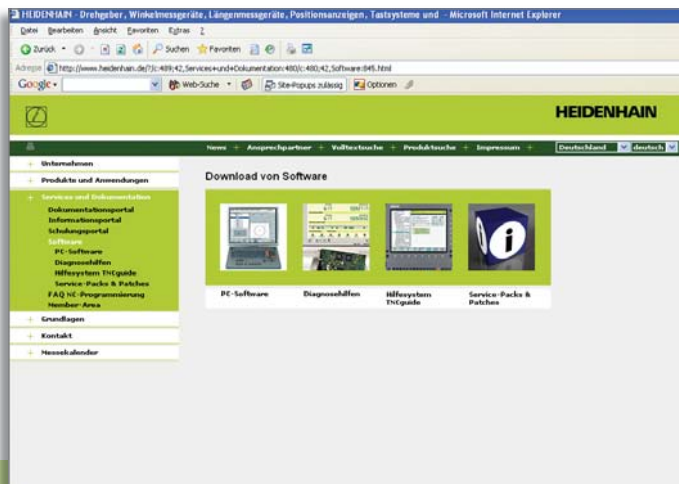
good many additional functions, such as screen dumping, control event logging or data backup and data restore.

"Services and Documentation"/ "Software"/"PC software" also contains the programming station software for HEIDENHAIN controls. The software can be used as a demo version without additional hardware (keyboard, dongle).

Competence instead of greed: the telephone hot line

The telephone hot line is in intensive use. Unlike the common practice of connecting you to a call center, HEIDENHAIN puts you through to an experienced technical specialist.

There are no computer voices to exasperate the caller. Except for the normal telephone

charges, your calls to HEIDENHAIN are always cost free. HEIDENHAIN users appreciate this personal service. For some callers, the voice on the HEIDENHAIN hot line is that of an old "acquaintance," because most of the service technicians and engineers are employees of long standing. Year-long experience within the company is always beneficial. Providing support for the 20-year-old HEIDENHAIN TNC 155 is no problem for our service employees.

Immediate exchange guarantees machine availability

The "exchange-unit program" represents a significant contribution to machine availability. Do you need an exchange unit? No HEIDENHAIN customer has to wait for repair work on defective parts. Nor does he have to buy or rent an exchange unit. Instead he receives a unit that is new or in new condition in exchange for his defective part. And what's most important: He has no machine downtime while his own unit is in repair. He only needs to install the exchange unit and bear the cost of repair of his own unit.

How to get expert advice fast:
HEIDENHAIN service employees need only a few facts to be able to help:

- *Which control is affected here?*

- *Which NC software level is installed?*

- *What is the exact number and text of the error message?*

The user should have the answers to these three questions when calling the HEIDENHAIN service hot line. Also, the experience of service employees has shown that it cannot hurt to refer to the manual or consult the FAQ Internet database first. Both are "open around the clock" to provide answers to very many questions.

From handymen to service specialists

Twenty years ago, all service employees were responsible for all products. Now, specialization has long become indispensable. The HEIDENHAIN Service Department is therefore divided into five areas:

- TNC support

- NC programming

- PLC programming

- Encoder support

- Lathe support

TNC support
The TNC support group sees itself as a field service agency for problems on the machine. The TNC service specialists can be compared with the shop manager of an auto repair shop, who doesn't do the repairs himself but diagnoses the problem and says what should be tested. HEIDENHAIN specialists offer this service even though it is primarily the machine manufacturer who is responsible for proper machine function.

NC programming
Here the users of HEIDENHAIN NC controls can find help on all questions and problems regarding programming, but also data transfer or connecting the control in a company's network. The users could answer many of these questions themselves, however, if they would look into the contents of the manuals before calling out for help.

PLC programming
This is the right address for specialists with the machine manufacturers and retrofitters, for PLC programmers, electrical designers and machine project planners. These people are basically occupied with achieving the best possible "marriage" of the TNC control to the various machine tools.

Encoder support
Problems can also occur if the mounting and operating instructions shipped with HEIDENHAIN encoders are not followed. Here, too, the motto is "We support everything from the first LS 500 sealed linear encoder all the way to the latest LC series absolute linear encoders and their interfaces," and in this spirit, rotational encoders, digital displays and interpolation electronics are supported as well.

Lathe support
Lathe manufacturers and users can find answers and help on everything having to do with HEIDENHAIN controls for lathes.

Quick advice, rapid delivery of replacement parts

Service during usual working hours is a matter of course. HEIDENHAIN also offers on-call service in the early evening during shift work to help solve serious problems such as machine breakdown. This on-call service not only helps with essential know-how—it also provides needed replacement parts immediately. They have access to the parts stock and can get parts out and on the way straight to the customer—and by taxi, if required.

Rapid service guaranteed worldwide

Because the distributors on site stock the most important replacement parts and

exchange units, HEIDENHAIN users need not put up with overextended supply lines!

One of HEIDENHAIN's most important concerns is to ensure that service standards are comparable all over the world. Our sponsoring program was established to contribute to this goal. Every regional agency has an individual sponsor in Traunreut. This sponsor takes care of the training and advanced training of the service employees in his specific regional agencies. This guaranties first-hand knowledge transfer. This organizational structure and the constant exchange of information at home and abroad ensure the high service quality familiar to HEIDENHAIN customers. This applies regardless of whether the distributor is a wholly-owned subsidiary or part of the HEIDENHAIN network of sales and service agencies.

Comprehensive training program

Professional qualification and advanced training are indispensable conditions for the continuing development and confidence in the future of the individual and the company. HEIDENHAIN therefore offers training to fit the participant's real requirements. These courses efficiently teach the professional knowledge needed to solve customers' problems. Year for year, more that 1000 professionals go back to school at HEIDENHAIN. TNC courses as well as courses for PLC interfacing, commissioning, optimization and service are offered.

But the courses are not only offered in Traunreut. On request, HEIDENHAIN also offers customized courses at a site desired by the employer.

Many regional agencies also have courses in their local language. In addition,

• Argentina	• Croatia	• Hungary	• Mexico	• Singapore	• Turkey
• Australia	• Czech Republic	• India	• Netherlands	• Slovakia	• Ukraine
• Austria	• Denmark	• Indonesia	• Norway	• Slovenia	• USA
• Belgium	• Finland	• Israel	• Philippines	• South Africa	• Venezuela
• Brazil	• France	• Italy	• Poland	• Spain	• Vietnam
• Bulgaria	• Germany	• Japan	• Portugal	• Sweden	
• Byelorussia	• Great Britain	• Korea	• Russia	• Switzerland	
• Canada	• Greece	• Macedonia	• Serbia	• Taiwan	
• China	• Hong Kong	• Malaysia	& Montenegro	• Thailand	

HEIDENHAIN cooperates in the TNC programming courses with authorized training partners in Germany and several neighboring countries.

You will find the entire training program with available dates, an interactive online course in NC fundamentals, and a worldwide course search on the Internet under *www.heidenhain.de/schulung*

CNC Arena Visits HEIDENHAIN

The 4th member conference of the CNC Arena took place this year at HEIDENHAIN in Traunreut on October 20. Here the 5th anniversary of the organization's founding was celebrated. The TNC also has a landmark birthday this year, by the way. They have been in use in the field for 30 years now, and TNC user courses have been available for 25 years.

The 60 participants—some of whom had driven over 800 km to attend the conference—were offered a varied program. After the welcoming remarks by the CNC Arena administrative crew, the conference kicked off with presentations on the historical development of the HEIDENHAIN company and the more than 30 years of R&D invested in the TNC family of controls. This was followed by descriptions of the HEIDENHAIN training techniques and, of course, the very latest features of the iTNC 530. The participants also learned valuable information on linear and angular measurement technology on machine tools, which drew many an "aha." Many were not aware of the precision behind the manufacture of HEIDENHAIN encoders. However, after a one-hour guided tour of the mechanical and electrical production areas they were fully convinced. The tour demonstrated HEIDENHAIN's unusually deep vertical range of production, which unfortunately has become very rare in this age of outsourcing.

After a hearty lunch in the HEIDENHAIN company cafeteria, the conference went to business. In four workshops using various TNC controlled machined the visitors were able to learn more about smarT.NC, the use of a preset table with and without 3-D touch probes, the PLANE functions for tilting the working plane, and machining multiple workpieces tool-by-tool in one setup.

At 5 p.m. HEIDENHAIN ended its part of the event and handed the microphone to Frank Nolden, the CNC Arena's webmaster, who moderated the part directed by the CNC Arena. This part included the honoring of members for special service and reporting on present and future web projects.

This year the CNC Arena Award 2006 went to Mr. Peter Krammer, who offered and moderated an on-line parameter course for members of the CNC Arena. Mr. Hans B. Kief (author of the NC/'CNC Handbook) was recognized for extraordinary service to the advancement of CNC technology. He was presented with an honorary award and honorary membership in the CNC Arena.

At 6:15 p.m., after this day's very informative event, all participants were taken with a bus to the automobile museum in nearby Amerang. It was in this impressive atmosphere with over 200 antique cars that everyone enjoyed an excellent dinner to celebrate this fifth anniversary of the CNC Arena.

CNC Arena
For those who are not yet familiar with the CNC Arena: this fast-growing on-line platform at www.cnc-arena.de with about 24,000 registered users is available for all who want to exchange information on all questions regarding CNC technology. Lively discussions are held in 142 forums where CAD and CAM systems, CAD/CAM coupling, metal-cutting technology, machine tools, and automation technology are as important topics as CNC control technology, which includes the HEIDENHAIN forum. We are proud and glad of course that the HEIDENHAIN forum with its present approx. 7,500 contributions is by far the most widely used forum—a fact that reflects the wide distribution of the TNC.

Time-Saving Surprise
smarT.NC makes things go faster at Rittal

Rome wasn't built in a day, they say, meaning good things take time—and experience shows that this applies especially to new software. The Windows-oriented smarT.NC user interface of the latest and most powerful iTNC 530 from HEIDENHAIN was introduced to the market two and a half years ago. Now the first field reports are beginning to come in. One case is the Rittal RGS GmbH from Eschenburg, Germany, where an experienced HEIDENHAIN conversational user easily switched to smarT.NC and has (once again) increased his programming speed.

Marc Wehnert first became familiar with HEIDENHAIN conversational programming 15 years ago during his apprenticeship and has been working with it continuously ever since. While one could hardly call him an old hand at the tender age of 32, he's certainly about as experienced as they come. "I'm very familiar with conversational programming and have used it to write the programs for just about all the parts that we've had." Marc is the operator of a recently installed knee mill from HERMLE that was built with the most powerful HEIDENHAIN control now available—the iTNC 530, which works alternatively with conversational programming or the new smarT.NC user interface.

When Marc Wehnert heard of the new acquisition he decided (long before the new milling machine actually arrived) to load a demo version of smarT.NC on his company PC and test it. "It was very easy to get started," he praises, "and anyone who gets involved with it and already has the basic PC know-how can learn enough about smarT.NC in half an hour to begin programming parts," and continues. "Now I just about always program with smarT.NC, and the easy programming speeded me up by another 20° over conversational programming. I was very surprised by smarT.NC—and still am," and adds, "and I never even needed the course they offered me." Well that certainly speaks well for Marc—but also for smarT.NC.

Situated in Eschenburg, this smallest Rittal plant in the Friedhelm Loh Group employs 350 people, 160 of whom are trainees for all German Rittal plants, according to Group Manager Roland Müller. "And 35 employees here develop, design, manufacture and assemble products in our department for special machines and fixtures that are either not commercially available or that we want to protect as know-how—and we build them for all Rittal plants worldwide, be they in Germany, the USA, China or wherever." In other words, this relatively small team has to be just as versatile as flexible, and Roland Müller adds proudly, "and it's highly motivated—as Marc Wehnert's initiative shows in independently organizing and working through the smarT.NC demo version."

The seven machine tools for milling, boring and drilling now in the plant will be supplemented before the end of the year by a machining center from DECKEL MAHO—and of course it, too, will be integrated with the iTNC 530 from HEIDENHAIN with the combination of conversational programming and smarT.NC.

Roland Müller makes it very clear. "For 15 years we've been milling, drilling and boring exclusively with the TNC controls from HEIDENHAIN. We generate all our programs right in the workshop on the machine, and with every new machine tool we've ordered the latest TNC version—as we did on the machining center from HERMLE and the traveling column machining center from DECKEL MAHO." But what makes smarT.NC so attractive even for a died-in-the-wool HEIDENHAIN conversational expert? Marc Wehnert answers, "Well, it's a real relief for me that the program builds on itself, so to speak, because all global data remain saved, although I can change them anytime I want. When a cycle is called, the "spindle on" setting, for example, is part of it—and I don't have to make a special entry." He continues, "Another advantage is, after setting the datum and preset I don't have to take care of the absolute or incremental dimensioning—smarT.NC does that for me, and faster and more reliably than I can."

And his praise continues. "And of course the possibility of entering the cutting speed for the feed is a big help, too—with smarT.NC the control calculates the necessary parameters and sets them, and I don't have to do anything. Also, smarT.NC has more programming aids like hole patterns that let you just click the unneeded holes out of the pattern—you don't have to build an individual hole pattern." Another of the programming aids
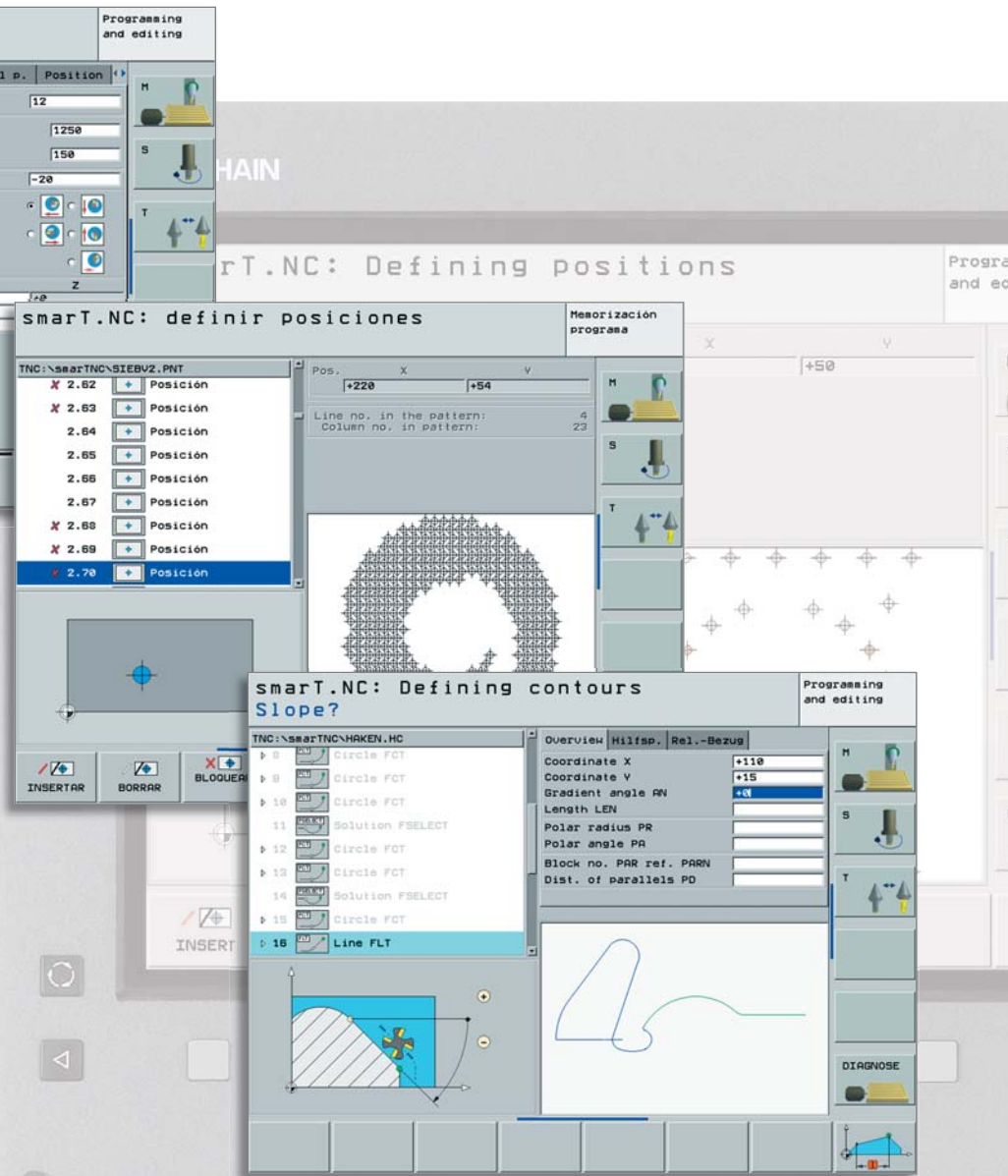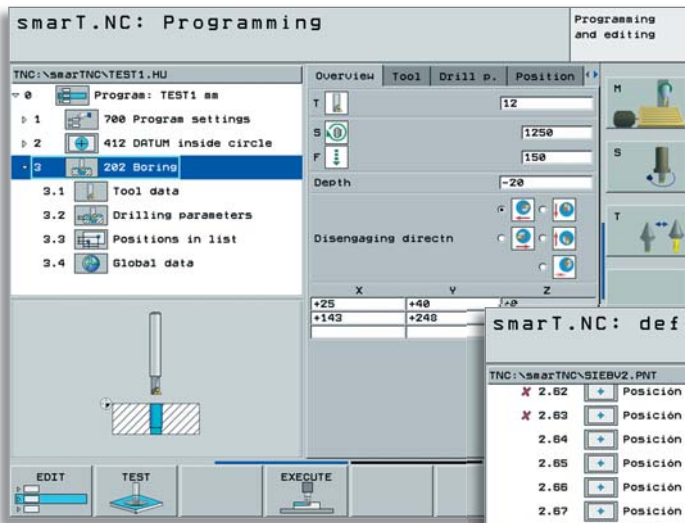
with smarT.NC is transferring CAD files in DXF format, which eliminates having to program the geometry in the workshop on the iTNC 530. "That feature will be installed next week as an upgrade", And Marc Wehnert seemed to look forward to it when we spoke with him. "It eliminates repetition in my work and makes us even more productive." And that, for companies like Rittal who live from single-part and small-batch production for special machines and fixtures, is most likely particularly important.

And didn't Marc Wehnert have any critical remarks on smarT.NC at all? Sure he did. He misses the pocket calculator function he used so long in the conversational interface, and it isn't as easy to walk through the individual program units as before. "I'd like at least to be able to scroll the mouse now and then," he proposes. Well—HEIDENHAIN is known for taking such reactions from end users very seriously (which helps explain the success of HEIDENHAIN conversational programming), and so for smarT.NC users, too, one can expect one user-oriented improvement to follow the other.

Jürgen Kromberg, free-lance journalist
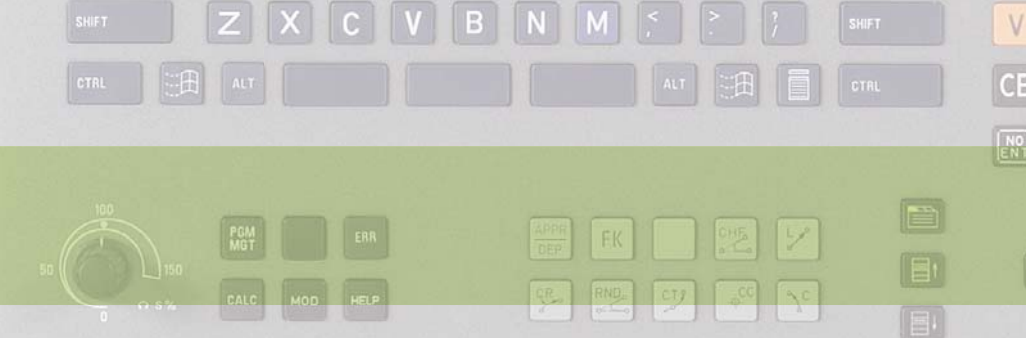
iTNC 530 for Clocks Never Built Before

Why do clock dial faces have to be so boring? Why can't you have a clock in three dimensions to hang in a corner?

For Gottfried Wolf, an engineer who for years has been technical manager of the research and machine design company "AXA-Entwicklungs- und Maschinenbau" in Schöppingen, Germany, finding the answer to this question became a passionate pursuit. He began his 40 years of work as a mechanical engineer designing packaging and special machines with sophisticated kinematic transmissions. This experience helped him particularly in this project. In 1977 Gottfried Wolf began working at the AXA Entwicklungs- und Maschinenbau GmbH and has since been responsible for research, development and manufacture of CNC controlled machine tools.

His professional career has been distinguished by numerous patents and new developments. But in his view, the peak of his efforts has been the conception and development of the first-ever room corner clock, named TRIACHRON. He invested more than 2,000 hours of his personal free time in this chronometer. Gottfried Wolf emphasizes, "This was not just a pleasant hobby to pass the time—this was serious design engineering work."

TRIACHRON inventor Gottfried Wolf in front of one of his room corner clocks

3-D control cam with tilting and rotating technique
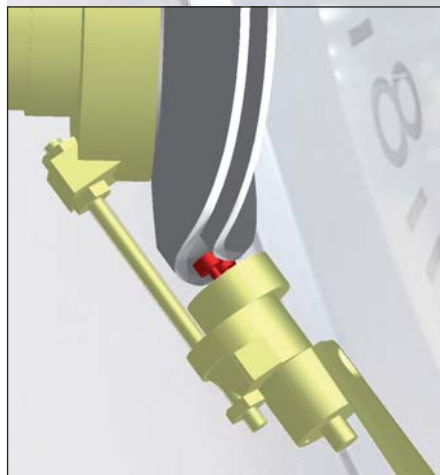
Detail illustration of the control cam with hands on the dial face

Starting with the first prototype, the corner clock underwent steady development. At first it needed two cam disks—one for rotating the hand about its longitudinal axis, and the other for keeping a constant clearance from its face. Now it only needs one cam disk in combination with a gear drive.

The hand's fascinating motion seems to exercise a magical attraction on its observers. Controlled by one cam disk, the hands not only rotate about their axis, they also move at a constant distance from and parallel to the "folded" clock face—in the third dimension. The TRIACHRON's quickly moving second hand immediately and clearly demonstrates the hand's unusual path.

In its form, the TRIACHRON combines conservative elements with innovative clock systems, but also with the respective architecture of the environment for which it is planned. After all, we definitely expect radio-controlled time synchronization or also infrared or radio remote control for setting the hands. The individual adaptation of the clock's size, material and dial-face design to the interior architecture is a matter of course.

But, what does all that have to do with HEIDENHAIN? AXA has been depending on CNC technology since as early as 1977. With the development of its DBZ-700 machining center in the beginning of the 80s, AXA was one of the very first manufacturers to use the moving-column technology so widespread today to build a

dual station machining center with central tool changer. While in the beginning the machines were controlled hydraulically or pneumatically, with the advent of microprocessors these inflexible methods were very quickly replaced by PLCs and increasingly powerful NC controls.

### Eighty out of 100 AXA machine tools with HEIDENHAIN

Eighty out of 100 AXA machine tools are shipped with TNC controls. Why? "This control is very user friendly and goes a long way toward meeting the programming requirements of our typical users—and this is what our customers want. The iTNCs do not need any complex process layout planning. Also, here at AXA we program right at the machine, because all the products are designed for specific customers. We have very small batch sizes, practically individualized manufacturing. And on top of that, HEIDENHAIN controls have a good cost/performance ratio."

TRIACHRON cam disks manufactured with iTNC 530

No wonder that the key mechanical component of the TRIACHRON clocks, the 3-D control cams, are manufactured on a 5-axis AXA VHC 3/50 XTS machining center with the HEIDENHAIN iTNC 530. The CAD data are generated in an external program and downloaded to the iTNC 530. Depending on the clock's size, it mills in steel or aluminum with production tolerances of at least 1/100 mm.

Participants in technical courses at HEIDENHAIN's main facility can convince themselves of the accuracy of the TRIACHRON when they visit the cafeteria. After all, HEIDENHAIN is part of
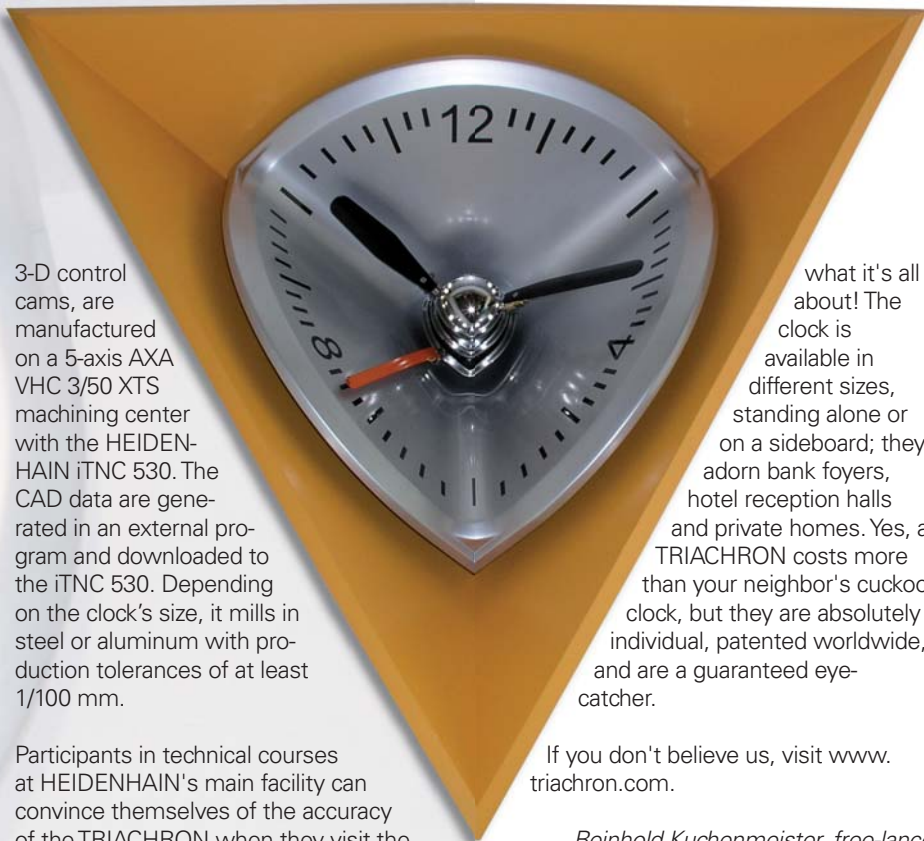
what it's all about! The clock is available in different sizes, standing alone or on a sideboard; they adorn bank foyers, hotel reception halls and private homes. Yes, a TRIACHRON costs more than your neighbor's cuckoo clock, but they are absolutely individual, patented worldwide, and are a guaranteed eye-catcher.

If you don't believe us, visit www.triachron.com.

Reinhold Kuchenmeister, free-lance journalist

Machining the control cam

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