I.D. ANNUAL DESIGN REVIEW 2002 : EQUIPMENT
1. SONOLINE ANTARES MEDICAL ULTRASOUND SYSTEM

CLIENT Siemens Medical Solutions, Ultrasound Group, Issaquah, Wash.
DESIGN designafairs USA, Mountain View, Calif., and Issaquah, Wash. (in-house design consultancy for Siemens): Stephen Hooper, manager of industrial design; Dean Bidwell, senior industrial designer, lead project designer; Andrew Walston and Kathi Mcleod Kuebler, industrial designers

MATERIALS|FABRICATION monitor, keyboard, control panel: injection-molded PC|ABS; electronics covers: pressure-formed Kydex thermoplastic; external structure: painted cast and extruded aluminum; transducer holders: injection-molded PC|ABS structure with Santoprene liner; wristrest: cast urethane with soft-touch surface application; OEM top mat: cast elastomeric urethane; bumpers: Santoprene

HARDWARE|SOFTWARE Windows PC, ProEngineer, Alias|Wavefront Studio, Adobe Photoshop, Macromedia FreeHand
Medical ultrasound procedures require a dynamic interplay among patient, practitioner and machine. And yet, the hulking masses of medical equipment are often daunting to patients and difficult for clinical staffs to maneuver. Enter Siemens’ SONOLINE Antares system, which jurors praised for its lithe functionality and nonthreatening demeanor. The system’s main electronic box is rotated 45 degrees, giving way to a more open, free-flowing interaction zone. And, weighing in at a mere 406 pounds (fully loaded), the astute, orthorhombic configuration gives the Antares a footprint that’s considerably smaller than that of its predecessors.

Not only is the design more humane, it’s also cost-efficient. Whereas previous ultrasound models have slapped on ergonomic features as an afterthought, Antares was developed with usability as a prerequisite. “We took the approach that if the system could be more compact, smaller and lighter, and the interaction zones properly placed to begin with, then costly and unreliable articulation features could be minimized,” lead project designer Dean Bidwell explains. As a result, Antares’ monitor tilts and swivels; its front legs double as a footrest; and the wristrest slides back and forth during use. Adding stability, a central foot pedal brakes the sturdy front casters. Only height adjustment is necessary to accommodate users in a seated or standing position. Rounded with an almost droid-like countenance, Antares earned praise from the judges for both its utility and personality. “Balanced” and “logical” were among jurors’ comments. “It’s obvious that a lot of ergonomic study went into it,” Staufenberg noted.

>> WHAT KIND OF RESEARCH PREFACED THIS DESIGN?
The design group initiated a worldwide environment study to document how and where ultrasound is used in different cultures and markets. The results helped explain why our preceding product had issues. In some markets, such as Japan, the scanning environment may be no bigger than a walk-in closet.

>> WHAT TRIGGERED YOUR TEAM’S ABILITY TO THINK DIFFERENTLY?
People don’t conduct their lives in an orthogonal manner, yet products and systems are typically designed with a distinct front, left side, right side, etc., which forces the user to interact with each side independently. During our architectural study phase, we positioned foam-core representations of system components in 3D space. While trying to figure out how to access the variety of user features, Walston found himself standing at the corner of [a model] and easily accessing everything. This led to the 45-degree angled body and sector-shaped control panel. It was one of those wonderful “eureka” events you’re always searching for.

>> HOW WILL THIS DESIGN LEAD TO COST EFFICIENCIES?
The components of a mechanical system most prone to failure are moving parts. Reduce the number of moving parts, and you reduce the likelihood of mechanical failure.

>> HOW WILL ANTARES ULTIMATELY BENEFIT PATIENTS?
The compact, easy-to-access design of Antares allows sonographers to operate with more comfort and less fatigue, producing higher-quality diagnostic results that ultimately benefit patients.

designafairs usa is a design consultancy with studios in Mountain View, Calif., and Issaquah, Wash. In the 10 years prior to designafairs’ November 2001 opening, the design team was an in-house department of Siemens Medical Solutions that focused on ultrasound products. Kuebler studied industrial design at the University of Washington while Hooper, Bidwell and Walston studied industrial design at Western Washington University. designafairs usa is part of the global design network designafairs, which also has studios in Germany.
2. IBM NETVISTA X41

This integrated PC reportedly takes up 75 percent less desk space than a traditional desktop computer by incorporating a flat-panel display. Research Triangle Park, N.C.-based IBM Corp.'s NetVista's unique configuration, by the in-house design team, effectively hides the computer by placing electronics behind the display and integrating them in the base. With the touch of a button, the CD or DVD drive, concealed within the cantilevered stand, slowly descends into position. Speakers are integrated into the display, and a swing-out handle on top allows for easy transportation. Both judges appreciated the handle detail and simple design. "I like that everything is wireless," Staufenberg said. "It looks professional and very understated as a business performance machine."

CLIENT|DESIGN IBM Corp. Design Team, Research Triangle Park, N.C.: David Hill, director of design; John Swansey and Brian Leonard, industrial design; Joel Collins, human factors; Richard Sapper, Milan, Italy

MATERIALS|FABRICATION housing: formed sheet metal, injection-molded thermoplastic parts and die-casting; keyboard: elastomeric rubber dome key array and laser marking on key tops

HARDWARE|SOFTWARE IBM Intellistation and IBM RS 6000 workstations, ProEngineer, Catia, Corel Draw
3. TERABEAM WINDOW ATTENUATION METER

The Terabeam Window Attenuation Meter (WAM), designed by Redmond, Wash.-based Teague for locally based Terabeam Communications, measures optical window attenuation, which is important during the installation of free-space optical lasers. The manufacturer describes it as “fiberoptic cable without the cable.” The WAM is placed indoors near a window and aligned with a unit in a building across town. When the transceiver sends a laser signal through an office window, some of its energy is absorbed or reflected by the glass, causing a loss, or attenuation, of signal strength. To minimize this loss, the WAM measures attenuation without access to both sides of a window, using a battery-powered laser and photo-detectors oriented at 45 degrees to the window and 90 degrees to each other. Polinsky lauded the design as “daring, not too playful, but fun.” Staufenberg added that the product “could’ve been a disc or anything else, but they took the next step and made it functional and whimsical.”
4. COBOTICS IAD (INTELLIGENT ASSIST DEVICE)

Evanston, Ill.-based Cobotics' IAD (Intelligent Assist Device) is a line of ergonomic lifting devices for the material-handling industry that includes iLift, iTrolley, a hub and multiple handles. According to Chicago-based Design Integrity Inc., the system acts almost like a body extension rather than a separate tool, responding intuitively to the operator's commands. Unlike previous devices, IAD is an ergonomic way for operators to guide motion, line tracking and semi-automation, using microcontrollers, servo-motors and a sense/ process/actuate control concept that facilitates a quick response time. Polinsky commented that the system wasn't overly stylized and would fit in well with a warehouse atmosphere. Staufenberg remarked, "It looks like it could take abuse," but added that the buttons were a bit small in scale.

**CLIENT** Cobotics, Evanston, Ill.: Steve Klostermeyer, vice president of marketing  
**DESIGN** Design Integrity Inc., Chicago: Phil Anthony, president; Aaron Eiger, principal; Beyond Design Inc., Chicago: Mike Prince, president; Mark Kurth Industrial Design, Chicago: Mark Kurth, president  
**MATERIALS|FABRICATION** hub housing: investment cast with aluminum; swivel joint: alloy steel; load cell: stainless steel  
**HARDWARE|SOFTWARE** SolidWorks, Adobe Photoshop, Adobe Illustrator
5. EXOFIT SAFETY HARNESS

Designed for Red Wing, Minn.-based DBI/SALA as a general-use safety harness for on-the-job fall-protection and rescue systems, Exofit blends comfort and safety with aesthetics. According to Getpezz Design of San Francisco, the harness is intuitive to don and remove, comfortable, breathable and easy to adjust. Design influences came from many industries: Drilex aerospace mesh from the footwear industry; padded components and backpacks from the outdoor industry; and heavy-duty custom buckles from the scuba and paragliding industries. Jurors loved Exofit's upscale, sporty look, breathability and detailing. "It's refreshing to see a design driven by human factors, rather than microchips," Polinsky noted. "It's nice how they integrated the instructions and inspections log."

CLIENT  DBI/SALA, Red Wing, Minn.
DESIGN  Getpezz Design, San Francisco: Luke Pezzimenti, president; Urban Rags, San Francisco: Violet Watson, president; All Ways Sewing, San Francisco: Lydia Lam, owner; Oscar Lee, San Francisco

MATERIALS|FABRICATION  Drilex aerospace mesh, heavy-duty custom buckles, padding
6. EN-BLOC BIOPSY SYSTEM

The en-bloc Biopsy System facilitates a quick, minimally invasive procedure by requiring only a small incision to capture a great volume of intact tissue with reduced trauma and risk to the patient. Designed by Westlake Village, Calif.-based Hauser Inc. for Neothermia Corp., the ergonomic system allows for left- and right-hand operation and gives users two handle styles: doughnut and pistol grip. Tube-management features are integrated into the handle-support rails and end cap, and the color scheme and form are designed to make the product appear less threatening to patients. Polinsky noted that en-bloc was "appropriately medical-looking" and lauded the successful integration of graphics.

DESIGN Hauser Inc., Westlake Village, Calif.: John von Buelow, industrial-design studio lead; Peter Wyatt Brandenburg, project manager; Andre de Salis, industrial designer; Colin Greenidge and Vijendra Nalwad, mechanical engineers
MATERIALS|FABRICATION injection-molded ABS-ultrasonic welded, pad printed
HARDWARE|SOFTWARE Alias|Wavefront Studio, ProEngineer
7. DISCUS ZOOM LAMP

Jurors loved the Discus Zoom Lamp’s intuitive, elegant design. The teeth-whitening system uses direct UV light as a catalyst for the whitening paste, thereby eliminating energy loss—a common problem with other systems—and ensuring a predictable result. Designed by Thousand Oaks, Calif.-based RKS Design for Discus Dental to alleviate patients’ fears, the Zoom Lamp’s friendly aesthetic is achieved by separating the power-supply pod from the lamp, making it less intrusive and bulky. Additionally, its ergonomic design keeps the light on the treatment area and away from the patient’s eyes, while multiple shields and filters ensure patient safety and comfort.

CLIENT: Discus Dental, Culver City, Calif.
DESIGN: RKS Design Inc., Thousand Oaks, Calif.: Ravi Sawhney, president and CEO; Lance Hussey, vice president, design director; Kurt Botsai, vice president, product development; Craig Steele, designer; Juan Cilia, vice president, prototyping; Steve Miczak and Bill Debley, model-makers
MATERIALS|FABRICATION: outer shell: injection-molded, high-impact polycarbonate with internal sheet-metal heat shields and brackets; stand: extruded aluminum with polycarbonate fittings; power-supply pod: sheet metal with a polycarbonate bezel
HARDWARE|SOFTWARE: CoCreate’s SolidDesigner, ProEngineer, Alias|Wavefront Studio, Surfcam CNC software
8. JOEY CLAMP AND CUTTER

"It's hard to do cute without going overboard," Polinsky said of Maternus Inc.'s Joey Clamp. "This design takes an inexpensive piece of plastic and creates an experience." Austin, Texas-based Design Edge Inc. decided to replace the three separate instruments used in the umbilical-cord clamping procedure with a single, self-contained package, creating a simple, easy-to-use system that allows doctors to have a clean clamp and a sterile cut every time. To accommodate different-sized umbilical cords, which range in diameter and shrink after being cut, designers used a wave pattern that handles small cords and adapts to other changes that occur. The design also provides a memorable brand image—a friendly bear—and keepsake that enhances the birthing experience. Staufenberg noted, "It's kind of cool. It celebrates the experience of birth with playfulness, yet adds a special touch."
9. PHILIPS BV LIBRA X-RAY SYSTEM

The Philips BV Libra X-Ray System, designed by Eindhoven, Netherlands-based Philips Design, takes X-Rays during surgery and provides on-the-spot fluoroscopy. Small and mobile, the Libra forms the basis of a new surgery-product line that shares product components and parts, which helps reduce production costs. It’s built with an intuitive steering concept that balances weight and minimizes dimensions, and the c-arm has a low lateral height that’s comfortable for surgeons. Controls are also logically positioned and color-coded, making the machine user-friendly. Jurors lauded many of its qualities, especially the clean interface and color selection. Staufenberg noted, "It’s very well done. Ergonomically, it looks very correct."

CLIENT|DESIGN Philips Design, Eindhoven, Netherlands: Christiane English, project leader/senior product designer; Jeroen Raijmakers, Lara Mazzoni, Jacco Eerden and Matthias Hamann, senior product designers; Theo van het Hof, senior graphic designer; Dick Dijkkamp, surgery development

MATERIALS|FABRICATION vacuum forming, aluminum sand casting, steel sheet-bending/welding

HARDWARE|SOFTWARE Rhino 3D, real-size models
10. TOPSETTER P/PF

Designed by Heidelberg, Germany-based Heidelberger Druckmaschinen as a fully automated image-setting system, Topsetter is a computer-to-plate printer for large industrial print shops. A total of 64 laser diodes allow up to 20 printing plates to be imaged per hour. Smooth lines mark the design, which features components embossed with a mica-silver finish. Both jurors gave Topsetter’s clean design high marks, noting that hardware and fasteners were invisible, components were accessible and the detailing created an elegant corporate design language. Staufenberg added, "The fit and finish is very tight and precise."
11. BRITESMILE 3000PB

The redesigned BriteSmile 3000PB dental device offers a reduced footprint, easier payment processing (via a keypad card) and an improved client experience. Previously, patients had to remain as still as possible for the hour-long teeth-whitening procedure. With a light head mounted on a counter-balanced articulating arm with 5 degrees of freedom, this free-floating device, designed by IDEO Boston of Lexington, Mass., can track side-to-side and up-and-down movements as the patient shifts position during the treatment. An LED display on the top of the light head indicates time remaining, so the patient knows exactly how much longer the treatment will last. Further, the machine’s lighter weight makes it more maneuverable. Staufenberg praised the design as “mobile and friendly.”

CLIENT  BriteSmile, Walnut Creek, Calif.
DESIGN  IDEO Boston, Lexington, Mass.: Tim Brown, principal; Gordon Row, Bill Stewart, Daniel Schwartz, Tim Proulx, Bob McCaffrey, Lisa Dutra and Jason Robinson, design team
MATERIALS|FABRICATION  injection-molded PC/ABS, structural foam, aluminum (die-cast, extruded, machined), sheet metal
HARDWARE|SOFTWARE  Windows NT, ProEngineer
AVALO CART (MEDICATION CART)

S-CLASS TANNING BED

DELL POWERDEGE / POWERVAULT SYSTEM

COMPAQ TOWER UPS XR

VIRGIN TRAINS PENDOLINO