



BY EDWIN BLACK

Several years ago, when I began covering the field of CAD/CAM foot orthoses, a shortsighted doctor told me the idea would never catch on. That wrong prediction was based on the fact that practitioners are often set in their ways and don't relish new ideas about old customs.

But the idea did catch on. Today, virtually every custom foot orthoses lab is making a decision about adopting computer aided design-computer aided manufacture technology or expanding systems it already has on line. Automated orthoses currently are fabricated by more than 15 labs, some as part of a quiet, gradual conversion, and some as part of a high tech marketing approach. The fact is that many of the fully automated labs have created their own niche—the so-called "automated lab." And they are some of the fastest growing labs in the country. But until they adopted CAD/CAM technology and the market reach it enables, many of them were veritable unknowns.

The Founding Fathers

Who is behind the automated orthoses revolution?

The three most important people are Michael Grumbine of American Digital Technology, Tony Tadin of Amfit, and John Bergmann, DPM, of Bergmann Orthotic Labs. These are the medical technology entrepreneurs who pioneered the software, adapted the hardware, and created the networks. A fourth and less known figure is Alex

Shang, Ph.D. of Sharp Shape. What these four people do commercially and technologically affects the entire field.

To avoid confusion, remember this: Grumbine and Bergmann have dual roles. They both operate labs and have proliferated the technology for other labs to consider. That's why we'll mention them twice. Tadin and Shang don't operate labs. They are developers.

Amfit. To understand the history, start with the quiet giant of the business, Tadin, an engineer who was the first to introduce a mechanized concept of orthotic fabrication in 1976. Currently, Amfit's Footfax contact digitizer measures the foot via pin pressure, analyzes the data, and mills an accommodative orthosis. Tadin has enabled a slew of practitioners to create Footfax mini-networks, mainly in the physical therapy, podiatric, and orthopedist realms. He also operates a central fabrication facility for those who haven't purchased the miller.

This year, Tadin rapidly expanded single-user stations with a free digitizer installation. Now, automated labs that were previously captive to polypro, such as Bloch Orthotic Labs, have installed the Amfit system and acquired an accommodative capability. Amfit—directly and via licensees—currently produces about 150,000 pairs annually throughout the world.

ADT. The big bang in automated foot orthoses was ignited by inventor Grumbine. It's natural that Michael Grumbine would have revolutionized the field; his back-

Adopting CAD/CAM technology has helped small local labs become some of the fastest growing labs in the country.

ground is in both foot orthoses and programming. Grumbine's father ran a private no-name orthotic lab in the '50s and '60s.

"I was making orthoses when I was in grammar school," remembers Grumbine. "I cut my teeth on plaster." Grumbine headed up Paragon Podiatry Lab, which in 1992, evolved into Paragon Plus, and Grumbine lost control. Litigation claiming fraud has since returned control to him and the lab is in for some important changes, which will be reported in the next issue of *BioMechanics*.

Grumbine's most important contribution, however, was co-founding the entity that became American Digital Technology. Remember, ADT is Grumbine's technology company. Paragon née Plus is the lab. ADT developed Ortho-Cam technology, which allows labs to scan a negative cast with a digitizing wand, analyze the data, and then mill the orthosis. Paragon was the initial test site, but then ADT licensed the technology to small unknown labs that grew into nationally known entities after they adopted Grumbine's scanning and milling system. Currently, ADT is the driving technologic force behind eight labs: Bloch, Piedmont, Creative, Gatorthotic, Rocky Mountain, a new entity called Miller Labs, a Northern Irish service lab called Liam McCartney Labs, and, of course, Plus (formerly Paragon).

ADT is now emerging from a rough period. Former management antagonized many of its best customer labs with its pricing policies and other negative incentives, which stunted growth for the labs' offerings to the professions. Grumbine, however, has regained control of ADT as well. He recognizes ADT's problems and has openly committed to restoring lab confidence in the company. From preliminary reports, he is beginning to do just that—with pricing cuts and a better company attitude.

The network of eight ADT-licensed labs collectively mill in excess of 45,000 pairs annually, according to lab owner estimates. Most of them are milled by the labs themselves if they have installed ADT's Ortho-Cam milling system. A minority of datacasts are transmitted by modem from the four so-called "hub labs" (Rocky Mountain, Gatorthotic, Miller, and McCartney) to ADT's California facility for central fabrication and shipment. That adds time to the process for those four labs. But the fact that a California milling operation is efficiently supplying devices to a lab in Northern Ireland is a testament to the global prospect for automated orthoses. Even with one-way, international shipping, McCartney's turnaround time is

about half that of his in-country competition, according to ADT.

Bergmann. Dr. Bergmann is the elite visionary of the business. He created Bergmann Orthotic Laboratory's state-of-the-art optical laser scanning and milling system, which forced many labs to choose between his product and ADT's. Aggressive marketing tactics by ADT won out. ADT became the system selected by labs such as Bloch and Piedmont. Dr. Bergmann's high end technology continues to improve but never got off the ground in terms of installations at other labs. Today, the Bergmann system is utilized at Bergmann's lab and approximately 20 other locations, mostly private practitioner offices and several school sites. Bergmann is determined to restrict full access to his technology to podiatrists only. The competition has understandably surpassed Bergmann in installed lab base, even if they have not surpassed his technology. Poor marketing is too often found among talented computer developers and Dr. Bergmann is no exception.

Shang. The least known figure in the business is Shang, a computer whiz who bucked the ADT-Bergmann dueling match and quietly created his own alternative system, which has received little attention from practitioners but high marks from labs who employ it. Shang has helped develop the systems of ProLab, Burns, and Solo Labs—none of which advertise automated orthoses as marketing hype. In a soon-to-be-announced commercial alliance with Bloch, Shang will team his computer wizardry with Bloch's marketing and business savvy and in-house milling capability, to create an alternative system that will fire up the market. ADT and Bergmann should take note.

The Major On-Line Labs

The story of most labs that identify themselves as "automated" is generally the story of an obscure local lab suddenly going on line and handling many times its normal capacity from practitioners across the country. It's a big jump for most, and not all of them have handled it smoothly.

Bloch Orthotic Labs. One lab that has deftly handled the transition is Bloch Orthotic Labs, the most successful automated lab in the country, competing digit to digit with the big manual labs. Bloch's success came about precisely because it used automation to fulfill the perceived promise of automation: discount prices. Often called "the Kmart of orthotic labs," Bloch reports that nearly 100 percent of its prescriptions come from

the podiatric field, which has become fiercely cost-conscious.

Bloch, which has supplied the local Austin, Texas community since 1972, went on line as a major national lab in 1989 and has recently purchased an Amfit system for accommodative devices. Doctors report that Bloch is easy to do business with. Its new Shang-designed system will round out its scanning capability and make Bloch a player in the computerization of other labs.

Piedmont Orthotic Lab. Piedmont Orthotic Lab now represents the considerable biomechanical expertise of the original Piedmont lab, plus Korbelik Orthotic Labs, which merged with it earlier this year. The new larger Piedmont is owned and operated by the McAnich family, which includes several podiatrists in South Carolina and Ronald Korbelik, DPM, of Nebraska. The McAnichs formerly operated a small manual lab, which meant switching from the old craftsman image to the sci-fi image in a single giant step. Today, it mills its own orthoses on site. Piedmont is not a discount house, and its staff currently works weekends to catch up with growing demand.

Rocky Mountain Orthotics Laboratory. Rocky Mountain Orthotics Laboratory is a private biomechanical success story. Its owner, Howard Hillman, an ortho-tech and bicyclist, was unable to find relief for his own foot aches. He received pedorthic training through a correspondence course, and ultimately opened Denver-based Rocky Mountain Orthotics Lab as a local facility. When Rocky Mountain joined the ADT network, the associated advertising and marketing practices, plus the production time savings, made it a regional Mountain States lab. Yet less than half its output is CAD/CAM (which is milled through ADT's central facility). As you might expect from its cycling heritage, Hillman's lab has developed a unique "cycling orthosis" that provides rigid control under the metatarsal heads. Hillman hopes to expand Rocky Mountain's reach from the Pacific to the Mississippi. By the way, did we mention that Hillman is training for the Anglican priesthood? He leads prayers every Friday night at a nursing home.

Gatorthotic. Perhaps the smallest of the ADT labs is Gatorthotic, which is just emerging from a management change. Gatorthotic is located in Florida and has endless fun with the terms "gait," "gator," and "orthotic." Gatorthotic, get it? Owned by Eric Shultz, DPM, and Donald Stran, DPM, Gatorthotic prides itself on being a "family operation," according to Jeanne Shultz, who has just joined the operation. This lab was the quintessential "back shed shop" that so many prac-

tioners operate for themselves and a small circle of colleagues. Eventually, volume forced the business out of the backyard and into its current facility.

Gatorthotic's client list is small, some 20 podiatrists and an orthopedic rehabilitation facility. But because volume is low, Dr. Shultz personally "builds" each device in the computer before it is routed through production. Gatorthotic is the proverbial "little shop" some practitioners are looking for.

Creative Labs. Creative Labs is the automated version of the long-established Valley West Orthotics. The lab changed its name several years ago after owner Mark Gorman, DPM, read an article I had written on the subject and adopted ADT's technology. Creative caters mostly to podiatrists, as well as some orthopedic surgeons and physical therapists. An important segment of its business is the Arizona sports physician community, consisting of internists and other practitioners who identify themselves with sports medicine.

About 30 percent of Creative's volume is for sports orthoses, according to Dr. Gorman, including a so-called Aerobics Orthosis, and another 30 percent is for geriatric devices. Given Phoenix's substantial senior population, Creative has managed to produce an extremely thin polypro-lined plastizote device for geriatric patients. The lab is also participating in a project to cut out the first ray of the device. By removing this layer of bracing, a more accurate range of motion is possible, says Dr. Gorman. Not yet possessing a miller, Creative modems its datacasts to ADT for central fabrication. Creative has stated that it will soon commit to an accommodative system, such as Amfit's, to augment its polypro capability.

Plus Laboratories. Plus Laboratories, the successor to the Paragon organization, is of course linked with ADT itself. Remember, Plus is the Grumbine-controlled lab that uses Grumbine's Ortho-Cam technology. According to Grumbine, Plus is the most automated orthotic lab in the world—and the automation goes far beyond milling. Not only does Plus possess ADT's state-of-the-art system, it also employs artificial intelligence technology that analyzes and routes orders. Plus' AI system makes decisions about each device by evaluating the order, writing a design for the orthosis, and then routing the order to the appropriate segment of the system. Quality control is fully integrated, according to Grumbine. Plus' AI system will soon be downstreamed to ADT licensees as well. Because it is the granddaddy of CAD/CAM labs, Plus Laboratories is arguably the most experienced automated lab in the nation.

Bergmann Orthotic Labs. One of the most respected automated labs in the nation is Bergmann Orthotic Labs, which has a long tradition of biomechanical expertise headed by Dr. Bergmann personally. However, Bergmann refused to reply to any *BioMechanics* inquiries about its current technology, materials, or device offerings.

The automated landscape is dotted with companies and networks, but behind each of them are people. Some are motivated by commercial success, some by biomechanical principles, most by both. Getting to know these labs better helps you take advantage of their technology. And that helps your practice and your patients benefit from that technology. ●