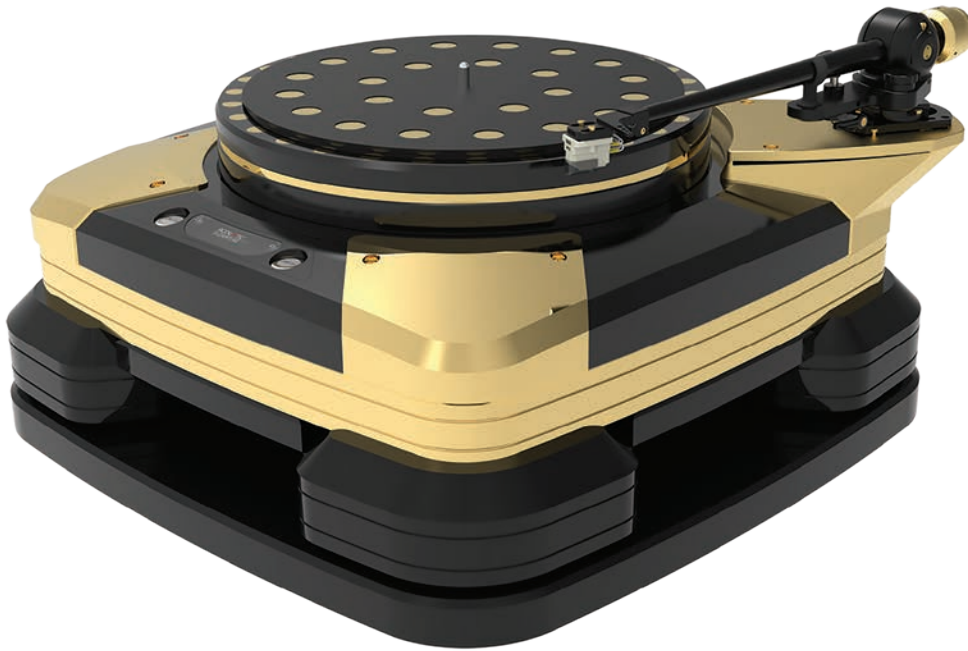


## Equipment Report



## Acoustic Signature Invictus Jr. Turntable and TA-9000 Tonearm

Oy, Gestalt!

Jonathan Valin

**A**bout three years ago I reviewed what was then the best record player I'd heard—the \$105k Acoustic Signature Invictus. As I wrote at the time, this 315-pound, FEA-engineered, CNC-milled, six-motor, dual-belt-driven, 2.6-foot-wide by 2.4-foot-deep, vaguely Mayan-looking *objet du son* from Gunther Frohnhofer of Germany was not only the largest record player I'd ever come across; it was also the most versatile (accepting up to four tonearms), the easiest to set up (once you and an army of your pals had lifted it onto an extremely sturdy stand), and, most importantly, the quietest. Seemingly immune to external noise because of its enormous, constrained-layer-damped mass, you simply couldn't make the Invictus feed back vibration, even by pounding on it with both fists while it was playing a record. It was also seemingly immune to what Robert Harley calls “self-noise”—the resonances of its constituent parts, both individually and as a system.

The Invictus' unparalleled resistance to feedback (and feed-forward) extended to its \$22k TA-9000 tonearm, an engineering marvel built up millimeter by millimeter via a selective-laser-melting process that takes 23 hours of processing on a 12-million-euro SLM machine. The internal structure of the TA-9000—a network of tiny tree-like “branches” that connects its inner tube to its outer one—channels vibrational energy like a grounding wire channels RF, making the 9000 more sonically inert than anything

else I've heard in a pivoted tonearm.

There were many other noise-cancelling strategies used in the Invictus—its six motors ran so smoothly that you could not tell, by touch, whether they were “on” or “off,” and its Timken aerospace-grade tonearm bearings were virtually jitter-free. The net result of all this quiet was a smoothness, power, and solidity that I'd only before heard via reel-to-reel tape machines. “The Invictus,” said I, was “detailed yet not aggressively so, quick on transients but never spitty or analytical, smooth but with no loss of pace or dynamic excitement, dense in timbre but not dark, neutral without being sterile, transparent without being colorless.” In short, the Invictus made records sound

like mastertapes (or dubs of same).

The chief problem with the Invictus was never sonic; it was ergonomic. Almost everyone with the means to purchase it loved the way it sounded, but was stopped short by the amount of space required to house it. To help resolve this issue, roughly two years ago Frohnhofer and his design team began planning for a new version of Invictus. In addition to downsizing the beast, the Acoustic Signature team had fresh design ideas about both 'table and 'arm. After all, the original was created five years ago, and a lot has changed technologically in the past five years. Using more sophisticated computer programs, CAD analysis, and CLD (constrained-layer-damping) technology, the AS team aimed to build a sonically improved turntable of much smaller size and lower (though still substantial) weight.

Of course, there had to be some trade-offs in making Invictus into Invictus Jr. For instance, while the smaller 'table still uses AS's hand-adjusted, self-lubricating Tidoflaron turntable bearing (with zero slack), it runs on four motors rather than Sr.'s six. And though scarcely insubstantial, Jr. *has* shed about a hundred and seventeen pounds (going from a Sumo-wrestler-like 315 to a cruiserweight 198, and from a picnic-blanket-size 6.24 square feet to a large dinner-napkin 2.9).

The parts of Jr. are smaller, improved versions of much the same “building-blocks” found in Sr.—an elaborately milled, 31-pound, aluminum subchassis/plinth, optimized for stiffness and low vibration

# Equipment Report Acoustic Signature Invictus Jr. Turntable

and equipped with “floating” magnetic feet; a milled-aluminum, 126-pound main chassis, with underhung motor, cone bearing housing, four pulleys, and four tonearm mounts (one at each corner), that sits atop the plinth and magnetic feet; a 42-pound, bronze-and-aluminum-sandwich, constrained-layer-damped platter embedded with 54 of Acoustic Signature’s proprietary brass “silencers” (more CLD devices), which slips over the motor’s Tidoefloron-bearing housing after belts have been attached to the motor’s pulleys; and an improved version (with internal, 3D-printed tweaks) of the CAD-designed TA-9000 tonearm, machined via SLM from a single piece of aluminum and then fitted with those astronautical-grade horizontal and vertical Timken bearings. Power to the motor is supplied via redesigned outboard digital electronics, though all controls (on/off, rotational speed) are accessed via pushbuttons on the turntable’s main chassis.

In theory, assembly of Jr.’s constituent parts is relatively simple—one building block is simply set atop the other. In practice, however, the individual parts are heavy enough to require considerable manpower to manipulate, especially when the height of a suitable stand is taken into consideration. (Acoustic Signature makes a pricey, dedicated stand of its own.) I should note that AS has added an ergonomic improvement to Jr.’s arm mount. Whereas you had to completely remove the tonearm from the mount to plug in/out the supplied silver-wire DIN tonearm cable on Sr., you do not have to do so with Jr., which has an

opening built into the bottom of the mount that makes plugging the cable in and out a snap.

Frankly, I did not know quite what to expect from Jr. sonically. After all, tremendous constrained-layer-damped mass (distributed over an unparalleled area) was

key to Sr.’s unusually natural, tape-like presentation. There was this, though. Considerable mass has, in the past, somewhat “deadened” the sound of certain other tables (including Acoustic Signature’s own first-gen Ascona and the original TW Acoustic Raven, though not subsequent ver-

sions of either). With these other tables the cost paid in dynamic “liveliness” and the consequent recovery of low-level transient-related detail was counterbalanced by the utter smoothness of the sonics and the sheer density of tone color, but there was a cost.

## Specs & Pricing

### Acoustic Signature Invictus Jr. Turntable

**Type:** Unsuspended, belt-driven turntable

**Dimensions:** 526mm x 262mm x 526mm

**Weight:** 90kg (power supply, 4kg)

**Price:** \$84,999

### Acoustic Signature TA-9000 Tonearm

**Type:** 3D-printed, gimbal tonearm with Timken aerospace bearings

**Size:** 9", 12"

**Price:** \$22,000

### FIDELIS (U.S. Distributor)

460 Amherst St.  
(Route 101A)  
Nashua, NH 03063  
(603) 880-4434  
fidelisav.com

### JV’s Reference System

**Loudspeakers:** MBL 101 X-treme, Magico M3, Voxativ 9.87, Avantgarde Acoustic Zero 1, MartinLogan CLX, Magnepan 1.7

**Subwoofers:** JL Audio Gotham (pair), Magico QSub 15 (pair)

**Linestage preamplifiers:** Soulution 725, Constellation Audio Altair II, Siltech SAGA System

C1, Air Tight ATE-2001 Reference, MBL 6010 D, Aavik Acoustics C-300

### Phonostage preamplifiers:

Soulution 755, Walker Proscenium V, Constellation Audio Perseus

### Power amplifiers:

Soulution 711, Constellation Audio Hercules II Stereo, MBL 9008 A, Aavik Acoustics M-300, Siltech SAGA System V1/P1, Odyssey Audio Stratos, Voxativ Integrated 805

**Analog sources:** Acoustic Signature Invictus Jr./TA-9000, Clearaudio Master Innovation/TT-1, Walker Audio Proscenium Black Diamond Mk V, TW Acoustic Black Night/TW Raven 10.5, AMG Viella 12

**Tape deck:** United Home Audio Ultimate 1 OPS

**Phono cartridges:** Clearaudio Goldfinger Statement, Air Tight Opus 1, Ortofon MC Anna, Ortofon MC A90

**Digital sources:** MSB Reference DAC, Berkeley Alpha DAC 2

### Cables and interconnects:

Crystal Cable Ultimate Dream, Synergistic Research Galileo UEF, Ansuz Acoustics Diamond

**Power cords:** Crystal Cable Ultimate Dream, Synergistic Research Galileo UEF, Ansuz Acoustics Diamond

### Power conditioners:

AudioQuest Niagara 5000 (two), Synergistic Research Galileo UEF

**Support systems:** Critical Mass Systems MAXXUM and QXK equipment racks and amp stands

**Room treatments:** Stein Music H2 Harmonizer system, Synergistic Research UEF Acoustic Panels/Atmosphere XL4/UEF Acoustic Dot system, Synergistic Research ART system, Shakti Hallographs (6), Zanden Acoustic panels, A/V Room Services Metu acoustic panels and traps, ASC Tube Traps

**Accessories:** Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Walker Prologue Reference equipment and amp stands, Walker Valid Points and Resonance Control discs, Clearaudio Double Matrix Professional Sonic record cleaner, Synergistic Research RED Quantum fuses, HiFi-Tuning silver/gold fuses

# Equipment Report

## Acoustic Signature Invictus Jr. Turntable

I did not sense this trade-off with the original Invictus, which, in direct comparisons, made LPs sound more like 15ips dubs of mastertapes of the same source material than any other table I'd heard—reproducing dynamics as a ramp-like continuum (à la reel-to-reel machines) rather than as steps in a staircase (like virtually all other record players—or at least record players with pivoted 'arms), and seemingly not sacrificing inner detail for an increase in lifelike smoothness and, to quote the late great HP, continuousness. Without all of Sr.'s tremendous mass at its command, I wondered if Jr. would live up to Dad's legacy.

Well, I am happy to report, Jr. does. Indeed, I would go so far as to say that Jr. exceeds Sr. (and other turntables I've heard) in certain key areas, including, most especially, noise floor, dynamics, and resolution. Does this then mean that Sr. was, in fact, overly damping the sound?

I don't think so. What I do think is that Jr., which (of course) is still a pretty damn large and heavy record player, has not benefitted from the reduction of mass but from the advances in CLD technology that have been made since Sr. was introduced. Invictus Jr.'s more effective CLD construction (which involves two extra layers of damping) have increased resonance control, resulting in the deeper silences, better dynamics, and greater detail that I just noted. With select sources, it has also resulted in an uncanny sense of realism—of being in the presence of an actual singer or instrumentalist.

Though I've struggled for decades with explaining which sonic qualities make

for a “real” or lifelike presentation (beyond, of course, superior LP engineering and mastering), I keep coming back to the fact that I know “real” when I hear it. Indeed, I know it instantly without rational analysis or reflection (which is part of what makes subsequent rational analysis so difficult). Though I distrust the concept (because it is hard to explain), it has come to me that perceiving a recorded copy as the real thing isn't merely a matter of superior parts but of what psychologists call the *gestalt grouping* of those parts, wherein the many variables that we reviewers (and you readers) ascribe to real and recorded sound (i.e., true-to-life timbre, pitch, dynamics, duration, soundstaging, imaging, bloom, dimensionality, etc.) are no longer perceived as separable (or even as outstandingly well-reproduced) ingredients but as a collectively realistic representation of a whole.

What triggers this switch between observing and evaluating exemplary parts and perceiving lifelike wholes remains a bit mysterious to me. As in one of those famous gestalt puzzles where a drawing of two vases is suddenly perceived as two human faces, it just happens, because the mind is somehow permitted to “re-group” what it observes.

This said, with recorded music I have noted that such a gestalt regrouping is invariably accompanied by the reproduction of markedly higher (across the board) amounts of information—not only about the tone color of a voice or an instrument (although this is essential), but also about the dynamically expressive way it is being used or played and, for lack of a better word, the mechanics of the way it makes sound in the space it was recorded. Just as essentially, this higher amount of information *must* be delivered in a neutral way, without undue emphasis on any frequency band or any segment of the dynamic/harmonic envelope, and with a blurless clarity and completeness that themselves make for greater presence and immediacy. The moment a transducer starts to *overemphasize* any one quality, we start to hear that added emphasis as a departure from realism, a coloration or distortion that makes the gestalt regrouping of parts into a lifelike whole more difficult or impossible for the ear/mind to accomplish. At its best, this overemphasis on certain parts can make recorded music sound quite beautiful; at its worst it can make recorded music difficult to enjoy.

All this digressing is only meant to illustrate what I think makes Invictus Jr. such a remarkable piece of audio gear: It not only provides markedly higher amounts of information; it also does so with a neutrality—an absence of timbral and temporal overemphasis, coloration, or distortion I attribute to its more effective CLD damping and resonance control—that permits the ear/mind to perceive, collectively, the constituent sonic “parts”





# Equipment Report

## Acoustic Signature Invictus Jr. Turntable

of exceptionally well-recorded LPs as lifelike wholes, to “mistake” (at least briefly) recorded for real.

To illustrate the differences I hear with Jr., consider the sound of St. Vincent’s newest album, *MassEducation* [Loma Vista], an acoustic version—mainly Thomas “Doveman” Bartlett’s grand piano and Annie Clark’s (i.e., St. Vincent’s) voice, recorded live over two nights in Electric Ladyland Studios in Greenwich Village—of the same songs on St. Vincent’s next-to-last album, the electrified and electrifying *Masseduction*.

I’ve listened to *MassEducation* on four different turntables in my home—and on several others at shows and in other people’s homes—and it has sounded very enjoyably intimate and musical on all, although there is (as I’ve just noted in detail) a difference between sounding enjoyable/musical and sounding like the actual thing. Pitted against even the very best competition—and I have some outstanding turntables and tonearms in-house—the Invictus Jr. simply reveals more information about, say, “Doveman” Bartlett’s touch and pedal work on the grand piano, and does so with *far* greater clarity than anything else I’ve got. This is not a little difference, folks. It is the difference between sounding “good” or even sounding “great” and sounding “real.”

Of course, a fair amount of this eye-blinking, head-slapping illusion of hearing a real

piano (and, with Annie Clark’s singing, a real female voice) is owed to the other components that the Invictus Jr. is being fed by and is feeding its signal to. But in the right chain of reproduction—say the Voxativ 9.87 fed by Zanden’s Classic electronics and wired with Voxativ’s own cables or the Magico M3 fed by Constellation, Soullution, or ARC electronics and wired with Synergistic Research or Crystal Cable—the illusion of hearing a real piano is so profound that you could almost literally draw a diagram of how a piano’s keys and pedals work, both mechanically and sonically, on the basis of what you’re hearing, and write a detailed essay about how Doveman Bartlett’s touch on keys and pedals with fingers and feet vary the prominence and expressiveness of his accompaniment (and the effects that accompaniment have on the emotional weight of the words being sung). Via the Air Tight Opus 1 or the Clearaudio Goldfinger Statement cartridges, the Invictus Jr. retrieves such an abundance of information, delivered with such profound neutrality, that the piano and the way it works and is being played are not just present sonically but very nearly physically.

Now I should note that a piano recorded close up is not the same sonic entity as an un-mic’d piano heard at a greater distance. Closely mic’d recordings generally pick up more “mechanical” detail than our ears do when we’re

sitting in a recital hall. (Having literally just heard the immortal Leon Fleisher playing Bach, Mozart, and Chopin in concert, I can avow that from where I was sitting in Werner Hall his Steinway concert grand did not sound like Bartlett’s piano in Electric Ladyland Studio.) The point here being that “recorded realism” is almost always a bit different than “concert-hall realism.” And yet, allowing for the microphones and their placement and the differences in venues, when a component is still able to deliver the recorded “parts” it is reproducing in a way that allows for the ear/mind’s magical gestalt shift or regrouping of those parts into a realistic whole, it is doing something extraordinary. Indeed, being fooled momentarily by a stereophonic illusion while still hearing the differences between mic’d and purely acoustic, between recital hall and recording studio, just means you’re not only experiencing the gestalt shift that generates the illusion of the absolute sound; you’re also hearing the way a venue and a recording technique augments or diminishes the purely acoustic sound of instruments (i.e., you’re also hearing what I’ve called “fidelity to sources”).

Lest you think the Invictus Jr.’s magic act is restricted to one closely mic’d recording, let me assure you that is not the case. Its amazingly abundant recovery, and uncannily neutral delivery, of sonic information can make virtually any instrument or combo of instruments on very-well-recorded LPs sound “there.” From Gene Ammons’ sax on *Boss Tenor* [Prestige] to Chet Baker’s whistery tenor (or counter-tenor) on *Chet Baker Sings* [Blue Note] to David Abel’s Guarnerius and Julie Steinberg’s Hamburg Steinway D on the Debussy Sonata [Wilson Audiophile] to Belafonte and his terrific horn section on *Belafonte at Carnegie Hall* [Analogue Productions], to The Band’s Richard Manuel’s vocal and piano on “The Shape I’m In,” the Invictus Jr. is able to gestalt-shift you into an alternate universe where recorded artists sound “real,” and do so without losing a great turntable’s ability to tell you how well or poorly an LP was recorded.

I have any number of terrific record players in-house at the moment—some of which are in the process of being significantly upgraded—and have heard any number of others at trade shows. Without disparaging any of them, I can honestly say that, as of this writing, I haven’t heard another that is higher in resolution or more neutral in the delivery of timbral, temporal, spatial, and dynamic details than Invictus Jr.

The word is thrown around too freely in this business, but to my ear Invictus Jr. with the TA-9000 tonearm is Gunther Frohnhoefer’s masterpiece—certainly the best turntable/tonearm Acoustic Signature has made and certainly one of the best analog source components you can buy. If you purchased Sr. in part because of my TAS review, well, you still have a great source component—no question. But, to be completely frank, you don’t have Jr. **tas**

## JV Visits Acoustic Signature

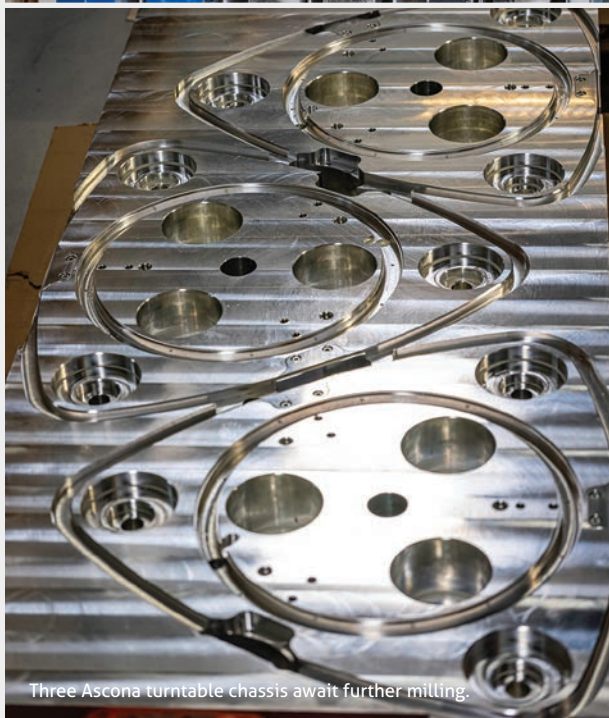
Located for the past two years in a purpose-rebuilt facility in the picturesque little town of Suessen in Baden-Württemberg, Germany, Acoustic Signature (AS) now enjoys four times the space it had in its former factory in Göppingen (about five miles distant). This should give you an idea of how much the firm has grown over the last decade.

With the rise in business Acoustic Signature needed to find solutions to increase production and to secure greater room for assembly. So two years ago Gunther Frohnhoefer, owner and head engineer of AS, and his wife and CFO Jacky Frohnhoefer started looking for a new facility in the Stuttgart area, where the interest rates were low. The investment in concrete was more profitable than banking the money; moreover, the region was rich in other firms (Stuttgart is a center of car manufacturing) that could and do supply mechanical parts and tools on an as-needed basis. Acoustic Signature now has its own CNC machines and milling/lathing machines on site, with parts availability unbelievably abundant.

Even though the work area has been greatly expanded in Suessen, the amount of business that AS is doing means that space is still at a premium. As a result, the workflow and the areas in which tasks are performed have to be tightly regulated. Happily, Acoustic Signature is a German company, and the Germans have an almost in-born sense of organization. From the incoming goods/loading dock—the place where all raw materials are trucked in and finished products are trucked out—to the storage areas by the dock where raw stock (bars of aluminum) are kept, to the actual work floor with its CNC machines and lathes, to the clean rooms



One of the areas where raw aluminum stock is stored. Note the color coding.



Three Ascona turntable chassis await further milling.



A CNC machine working on Ascona chassis.



CEO Gunther Frohnhoefer at the door of Acoustic Signature's new factory in Suessen.

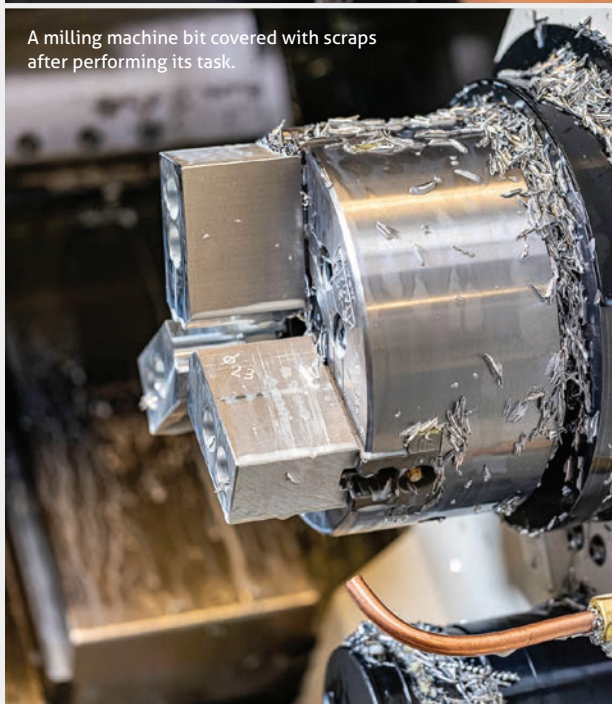


# Equipment Report

## Acoustic Signature Factory Tour



Silencers being polished by hand in preparation for insertion into pre-drilled turntable platters.



A milling machine bit covered with scraps after performing its task.



The "old-fashioned" lathe that Gunther learned his craft on.

A partly assembled Ascona turntable awaiting final assembly and testing.



for assembly, finishing work, and testing, the AS factory runs with clockwork-like precision and regularity.

Aluminum stock is ordered on an as-needed-for-production basis, and the colors with which they are labeled have meanings. Blue, for instance, is stock that is easily anodized; black is for producing chips. Chassis are organized by numbers so the finishers know where to find other materials to complete them.

Raw materials are loaded by crane into the CNC machines, clamped down, and then milled for roughly three hours. The photo on the previous page of the three Ancona turntable bodies shows you part of the process. In the past, these 'tables could only be produced one at a time. Now, they can be done in multiples; moreover, the operator can program the next parts, including tool changes, for milling while the first parts are being finished. Parts are then assembled and bolted together automatically.

The brass silencer platter-insets are made ten at a time on a separate machine, polished by hand to a mirror surface, and then chamfered for smoothness with a diamond bit. Even the turntable displays are milled in-house out of solid blocks of acrylic held down by an 8000W vacuum. This CNC machine allows the operator to mill around the entire block with no clamps getting in the way of the milling tools. Investment: 700k euros!

Another CNC device is a lathing/sub-spindle machine that loads and turns round parts, and also mills them to shape. Gunther even keeps one, old, hand-operated lathe around—the machine that he learned on—that is still used occasionally for drilling.

The CNC machines see a lot of hard use, and Acoustic Signature sells and replaces them about every five years. (The machines are also used for some OEM production to help amortize their staggering cost.)

Acoustic Signature's incredibly precise, highly mechanized production lines are designed for unfailing exactitude, constant multi-use, and error-free and blemish-free production on an on-demand basis. I've been to other CNC shops around the world, but none has been more logically organized and impressively run than this one in the little south German town of Suessen! **tas**