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MICHAEL FREMER

Acoustic Signature Montana NEO

TURNTABLE

You may be moving to Montana.

Acoustic Signature is not an overnight sensation, nor are its turntables driven by dental floss. If you're not a Frank Zappa fan, you probably have no idea what any of that means, so please Google it. I'll wait till you get back.

The German company is headquartered in picturesque Süssen not far from Stuttgart, one of the country's automobile capitals. Porsche and Mercedes-Benz are headquartered there. It has been around for 25 years, specializing in exquisitely machined, high-mass, nonsuspended turntable designs, manufactured in-house. With companies moving to electric cars, you can be sure that, should the company need any, there's no shortage of superskilled machinists in the picturesque valley known as the "Stuttgart Cauldron."

The Acoustic Signature turntable line has expanded over the years, bottom to top, from moderately priced high-performance turntables some can afford to luxury models only a few can afford. There's also a lineup of similarly priced tonearms. The company has long manufactured reasonably priced turntables—at least by high-performance standards—but none that fall into the "budget" category.

A few months before the pandemic shut down the world, I visited the tidy, well-organized factory. The company's loading dock/recycling area is cleaner than some factories I've been in. I came away mightily impressed by the operation, which includes state-of-the-art CNC machinery and cosmetic metal-lapping surface-finishing devices, all operated by a talented team of engineers, technicians, and skilled craftspeople. I saw engineers designing A-S's next product generation using the latest CAD software. The 21 employees work in the kind of well-organized factory you'd expect to find in Germany.

Also on the premises is a showroom/listening room sure to wow international distributors and members of the press. All the company's products are on display and can be auditioned. After the visit, I concluded that Acoustic Signature—a company that offers a 15-year warranty on all of its products—is one of the companies most likely to still be around in 15 years to honor that warranty. If you can take the factory tour here, you'll also see LEGO bricks used most ingeniously.[1]

More recently, Acoustic Signature launched an updated product lineup under the NEO umbrella, with turntable prices starting at $4595 for the Maximus NEO. Add the least costly arm in the line, the $2295 TA-1000 NEO, and you're looking at $6890 for the company's base offering. In other words, the company cedes the low-end market to others while reaching for the heights with a top tonearm price of $29,995 for the TA-9000 NEO and a top turntable price of $189,995 for the Invictus NEO.

The Acoustic Signature Ascona I reviewed some years ago—a stalwart on our Recommended Components list before it "aged out"—has been replaced in the A-S lineup by the $48,995 Ascona NEO.

I found the original Ascona overdamped to the point of sounding kind of dead, and that's what I reported. To his credit, Founder and Chief Engineer Gunther Frohnhöfer went back, made some modifications, and released a much more alive- and open-sounding Mk2 edition. That's one of the reasons I admire and respect him, unlike some other manufacturers who respond to criticism by pouting, screaming, or refusing to ever again provide products for review.

The Montana NEO and the $17,995 TA-7000 NEO tonearm

The Montana NEO ($30,995) is a new model; it was shown to me two years ago during that factory visit I made in preparation for the product launch and this review, but of course the pandemic interrupted both. The Montana is in the middle of Acoustic Signature's eight-turntable line, with three models priced higher and four priced lower. The TA-7000 NEO ($17,995) is second from the top of the five-tonearm lineup.

Montana is a compact, ingeniously designed, superbly machined, precision-built turntable that puts belts and motors out of

1 See youtu.be/XS7fh4lnLa4.

SPECIFICATIONS

Description Montana NEO: Nonsuspended, mass-loaded, triple-belt-driven turntable. Speeds: 33.3rpm, 45rpm. Platter: 12.2" (310mm) diameter, 1.97" (50mm) thick. 3 AC synchronous motors. Wow and flutter: not specified. TA-7000 NEO: Ball-race bearing, carbon fiber, pivoted tonearm. Effective length: 239.9mm; pivot-to-spindle distance: 222mm; overhang: 17.3mm; offset angle: 23.9°. Effective mass: 10gm. Weight: 683gm.
Dimensions Montana NEO: 16.8" (426mm) × 16.8" (426mm) × 6.77" (172mm).
Weight: 79lb (36kg).
Finish Black or silver anodized or bicolor.
Serial number of unit reviewed Montana NEO: A21-05-020; TA-7000: TA-2450. Manufactured in Germany.
Price Montana NEO: $30,995. TA-7000 NEO: $17,995. Approximate number of dealers: 15. Warranty: 15 years.
Manufacturer
Acoustic-Signature
Made by AS-Distribution GmbH Hillenbrandstrasse 10, D-73079 Süssen, Germany.
Web: acoustic-signature.com.
US distributor:
Rutherford Audio
14 Inverness Drive East, Unit G-108
Englewood, CO 80112.
Tel: (888) 279-6765.
Email: info@rutherfordaudio.com.
Web: rutherfordaudio.com.

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ERIC SWANSON

sight and touch, leaving visible only the spinning platter, the tonearm, and the outboard power supply that connects to the plinth via red and blue Ethernet-type cables. While the appearance is that of a classic "four-poster," the approximately 17" × 17" × 2.5", constrained-layer damped, 55lb aluminum-alloy chassis sits on three hefty, knurled, height-adjustable, gel-damped feet, bringing the chassis height to approximately 4".

The 12.2"-diameter, anodized-aluminum platter is festooned with 24 of Acoustic Signature's polished-brass, vibration-absorbing "silencers," which may look like buttons or wafers but in fact run the full depth of the platter; the platter adds 24lb to the assemblage's weight and 3" to its height. That's 79lb concentrated in a relatively small footprint. The efficacy of those silencers is detailed in measurements found on the company's website.

In addition to the constrained layer–damped chassis and brass silencers, A-S innovated another vibration-canceling system it calls Automatic Vibration Control (AVC), which combines hardware and software to control the Montana's three 24-pole, two-coil AC motors.

Conventional wisdom (mine) says that, compared to a single motor drive, three motors equals three times the noise and vibration produced by a single motor, exacerbated because motors, pulleys, and belts are manufactured to tolerances too high to produce 100%-synced performance. A-S counters by acknowledging the motor-to-motor production tolerance problem: "Unfortunately all AC synchronous motors show production-related tolerances that prevent the poles and coils from being positioned one hundred percent correctly—a key reason for unwanted vibrations. In order to effectively minimize or even avoid these, all production tolerances must be compensated by other means."

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"Other means" means AVC. Acoustic Signature avers that AVC measures those distortions in real time and adjusts intra-motor phase shifts to cancel them out. In A-S's words, these measures "ensure a drastic reduction of the vibrations." Can't do that with just one motor, and can't do it as well with just two. The Montana incorporates level-3 AVC, the company's most sophisticated, which in addition to the software-based correction includes specially selected and paired motors. The speed (33.3rpm and 45rpm) is adjustable via the outboard motor controller.



Putting it together

Efficiently and logically packed, the Montana can be unpacked and assembled by one person with relative ease—at least if you're at all experienced doing this, can follow good instructions, and are not a wimp. (You *can* be elderly, at least as defined by time.)

Once the chassis is in place, you remove a series of small bolts securing a top plate. Under that you'll see the three motors and the bearing opening; into that, you insert the massive subplatter/spindle-bearing assembly. The latter is diamond coated (Dura Turn Diamond Bearing, acronym DTD). A trio of precision-ground, small-diameter belts go around the motor pulleys and subplatter in a specified order, with each belt going around two motor pulleys. The job is made easier by full-color instructions (although the belts of course are black). Replace and bolt the cover plate, and you won't need to see or touch belts or pulleys for many years, and the belts will not get fouled by dirt, dust, or oily fingers.

Next, you *carefully* lower the platter onto the subplatter, making sure it doesn't drop in place. Put the thin leather mat in place and arrange it so that the silencers line up with the mat's holes. Level the chassis, and you're ready to install the tonearm.

The TA-7000 NEO tonearm

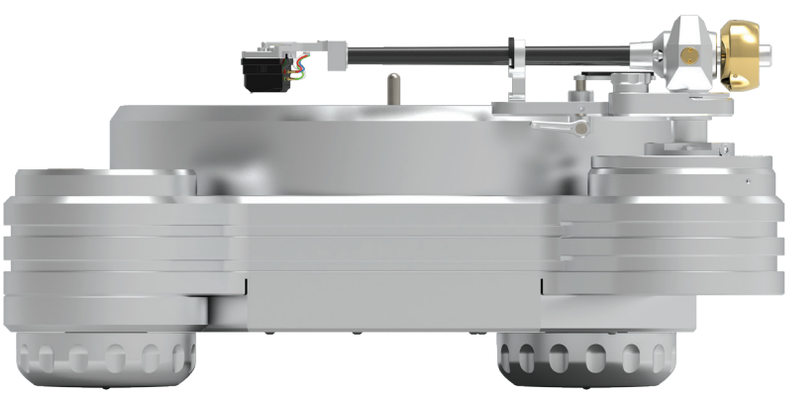
Two arms up to 12" long can be fitted to the Montana, which feature a pair of sliding, integrated arm mounts. Going from the standard 9" to the 12" mount requires loosening a pair of chassis-mounted set screws on the underside and then sliding out the mount to the extended position. Simple.

A-S supplies an armboard cut for your arm of choice as part of the purchase price. The second rear mount comes as a solid disc that the company will replace (for a fee) with an armboard cut to accommodate your chosen arm's mounting system.

A-S supplies the TA-7000 NEO with either an SME or Rega-type mount. The supplied SME mount is the familiar oval opening into which is bolted a cylindrical collar, set to the correct pivot-to-spindle distance, which accepts the arm's pillar. The TA-7000 is available in 9" and 12" versions. A-S supplied the 9" model, which conforms to the standard Rega geometry: 222mm pivot-to-spindle distance and 239.3mm effective length.

The hall caressed but never enveloped or buried the piano.

Locking and unlocking the collar-fixing screw and manually raising or lowering the pillar, which is unmarked for height, sets VTA/SRA. It's basic but super-rigid and the machining tolerances feel extremely precise: The pillar goes, in a hair-turn of the grub screw, from rock-solid secure to dropping like a pound and a half rock, so it pays to be cautious. (The extremely detailed, well-written manual says, "Be aware, that when opening the VTA locking screw, the arm might fall down." "Might"? Like London Bridge, it will!)



Azimuth can be adjusted by loosening a locking screw in the bearing collar and rotating the arm-tube—but again there are no reference marks, which makes repeatable settings difficult.

The arm's gimbaled ball/race bearing system is secured within a high-mass collar into which fits a uniform-diameter carbon fiber tube damped with a 3D-printed insert (though it was still "lively" to the tap and transmitted more "tap" to the speakers than

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expected).

The gold-plated brass counterweight rotates on a fine-pitch–threaded stub and locks to it via a trio of set screws. If it's needed, A-S supplies an auxiliary bolt-on counterweight that allows the arm to handle cartridges weighing 4–16gm.

Silver internal arm wire terminates in a DIN jack at the base of the arm pillar. A-S supplies AudioQuest's entry-level "Wildcat" "Perfect Surface" copper DIN-to-RCA cable ($119.95)—which makes sense since people will want to be able to play the Montana immediately, and yet most end-users will want to make their own, more costly choice. Also supplied is a rigid, precise alignment jig set to Löfgren A geometry (66mm and 121mm null points; my fave), though it's not identified as such in the instructions, which, like the careful packaging, are well organized and commensurate with the arm's price.

Measuring

If you read this month's Analog Corner column, you might skip this section or briefly peruse it and chuckle. If measurements are the guide, just get a CD player and be done with it. To reiterate what I wrote in the column, these measurements are mainly for entertainment purposes, although I think they are still "baseline" useful.

Using the Platterspeed app, the Montana's *absolute* raw-frequency deviation (right) was bettered by the direct drive turntables (the SAT XD1 and the OMA K3), but the Montana NEO bettered *both* of the far more costly direct drives on the low-pass–filtered measurements, though by infinitesimal amounts.

The shaknspin measurements show significantly more average speed deviation for the Montana (0.34%) than in either the OMA (0.08%) or SAT (0.07%) 'tables. The other numbers were mostly a wash, with differences in the 0.001% range one way or the other.

What counts most is how the Acoustic Signature turntable *sounds* and not how it *measures*—right? Louder! I can't hear you!

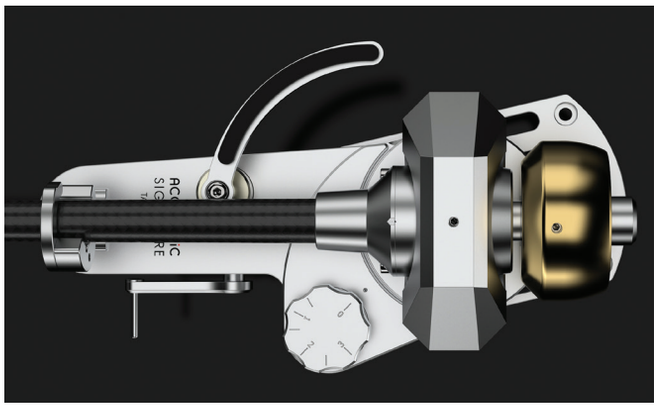
Listening

I set up an Ortofon A95 phono cartridge and ran it, alternately, into the transformer-coupled Ypsilon VPS-100S phono preamp, via the MC-20L SUT and one of the CH Precision P1/X1 combo's two transimpedance inputs. Both phono preamps cost more than the turntable/arm combo does—not that the A-S is cheap!

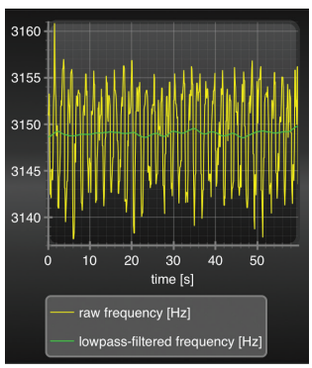
I chose the low-coloration A95 to hear how it would mate with what I was expecting to be a well-damped, perhaps austere-sounding turntable. Both the lateral and vertical resonant frequencies of the arm-cartridge combo measured ideally, approximately 10Hz, using the *Hi-Fi News & Record Review Test Record* (HFN001).

First up, I tried a 3-LP set, *Liszt Complete Works for Piano and Orchestra* (EMI Electrola SLS 5207), performed by pianist Michel Béroff—a late–19th/early–20th-century specialist with a major in Messiaen—with Kurt Masur conducting the Leipzig Gewandhaus Orchestra. I've never before played this 1980 release—it's on eBay for $130—so why not start now? I'm tired of playing the same old, same old. It matters not that you've probably never heard this record.

The Leipzig Gewandhaus Orchestra's first musical director was Felix Mendelssohn—no slouch he—and among later conductors were Wilhelm Furtwängler and Bruno Walter, one a Nazi sympathizer, the other a Jew who exited in 1933: what a world! The orchestra's home, built in 1885, was bombed in 1944. It moved to a new home in 1981. I don't know where in the German Democratic Republic this 1980 release was recorded. But the hall sounds magnificent—not like a small studio with added artificial reverb, though I'm okay with being embarrassed to find out it was.



General
mean frequency
3149.0 Hz
Raw Frequency
max deviation (relative)
-0.36% / +0.38%
max deviation (absolute)
-11.3 Hz / +11.8 Hz
Lowpass-filtered Frequency
max deviation (relative)
-0.01% / +0.02%
max deviation (absolute)
-0.5 Hz / +0.7 Hz

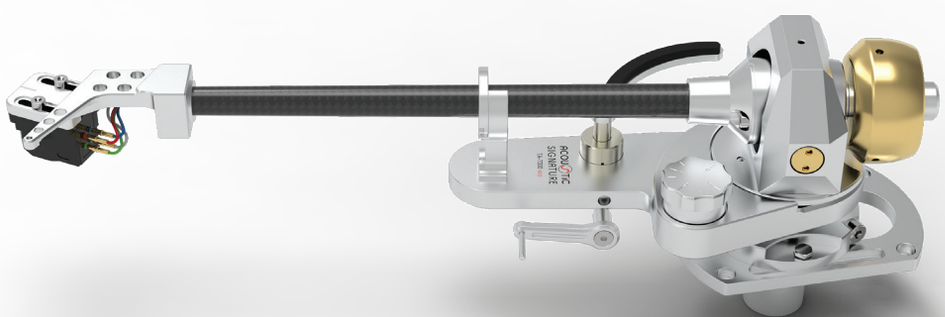


Pressed by Pallas during its glory days—not that they're not pressing great records now—this is six sides of pressing perfection of a sonically honest and spectacularly natural recording of a dazzling performance captured from a midhall perspective. It's best heard at midvolume.

Played back on the Montana NEO, there was nothing austere about the timbral, spatial, or dynamic presentation, which was warm and inviting and intensely three-dimensional.

Concentrating on side 4's *Fantasy on Hungarian Folk Tunes for Piano and Orchestra*, the picture produced by the A95/Montana combo, with either phono preamp, was visually deep and physically gripping. The illusion, well-established from the first note, was of a hall with a warm-sounding orchestra laid out three-dimensionally in a spatial cushion. In front, stage left, sat the pianist (and of course the piano). Both preamps delivered this, but the sound clicked magically in the mids with the Ypsilon's tube-based circuitry.

The timbral and transient *physical* piano apparition was pinpoint-



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stable, naturally focused, and believable both when played solo and within the orchestral picture. The hall caressed but never enveloped or buried the piano. When Béroff went for the keyboard's top octaves, whether pianissimo or mezzo-forte, the image and timbral authenticity held firm. The balance of attack and soundboard sustain, in the context of an orchestra and hall that can easily swamp the balance, was a tribute to both Tonmeister Eberhard Richter (with whom I was previously unfamiliar) and the turntable/arm combo.

I had no point of reference whatsoever, which is what made the listen so fascinating. The presentation's attack was concise and solid, the sustain reasonably generous. The music decayed into a very black backdrop. It was convincing—not the overdamped, drop-too-quickly-into-black presentation I remember from the original Ascona. (Some people love that sound.)

The well-damped but not *over*damped, fully controlled, supremely well-focused, rock-solid *stable* presentation produced a memorable 3D picture; clearly the Acoustic Signature "sound" based on the engineering scheme. As I played this same side several times, I was not able to imagine what might be added by the far more expensive direct-drive next-door neighbors.

Want to confuse yourself big time? Head next door! Enjoy some music with the wealthy neighbors, drink some wine, light up a fat one. The SAT XD-1/CF1-09ti setup with the Lyra Etna λ Lambda SL delivered a closer-to-the-stage perspective with more reflected hall sound due to more generous sustain, greater harmonic generosity and color, and more string sheen and emphasis on the low end produced by the big strings' majesty—all in what sounded like a bigger space, with more side- and rear-wall reflections. The piano produced more rear-stage reflections, too.

Yet, even if they didn't know the huge price difference, those more interested in detail, clarity, nimble, supertight, locked-in, pinpoint-precise imaging and separation of individual notes without hyperanalytical, unnatural etchiness—qualities particularly noticeable when the pianist unleashes long strings of rapid-fire glissandos—might prefer the Montana's superorganized conciseness and find the SAT (or the similar-sounding OMA) sounded somewhat diffuse or blurry. On the other hand, when it came to generosity of dynamic contrast, orchestral breath, and the creation of a supple living-music bubble, it was a no-contest win by the bigger, more costly 'tables. As it should be. I'd expect a direct Montana–Invictus comparison to yield similar results.

I swapped the two cartridges. It was time consuming but useful. It made clear that the A95's sonic personality—its image focus, detailed 3D presentation, tight, muscular bass, and honest but less-than-lush midrange—reinforced the Montana's similar sonic personality, helping to produce the vivid, 3D excitement I described above. The Etna λ Lambda SL on the TA-7000/Montana produced a more generous, rich, full midrange and midbass, a presentation that added spatial context and richness to vocals and acoustic instruments.

The double LP *Carole King & James Taylor Live at the Troubador* (Craft CR00209)—a Boomer delight—arrived midreview. This LP was recorded during the duo's 2007 appearance backed by The Section (Danny Kortchmar, Leland Sklar, and Russ Kunkel). Bernie Grundman clearly cut from files (air-brake cymbals, one-note sibilants) that were mastered by the late Doug Sax and Sangwook "Sunny" Nam at The Mastering Lab with QRP plating and pressing.

With the Etna, I heard more of the small, wide, not-particularly-deep West Hollywood 500 seater—I played there once!—than I heard through the A95. King and Taylor were reproduced with more three-dimensionality and solidity. The Etna put me in the first few rows in front of the stage. The comparison demonstrated that the Montana's designers met their goal of producing a neutral, well-damped cartridge-carrier that lets through varied transducer personalities without limiting them in any way.

ASSOCIATED EQUIPMENT

Analog sources OMA K3, SAT XD-1 turntables; SAT CF1-09, CF1Ti-09, Schröder K3 tonearms; Lyra Etna λ Lambda SL, Ortofon A95 cartridges.
Digital sources dCS Vivaldi One SACD player/DAC; Lynx Hilo A/D-D/A converter; Roon Nucleus server; Pure Vinyl and Vinyl Studio software.
Preamplification Line: darTZeel NHB-18S. Phono: MC-20L step-up transformer, Ypsilon VPS-100 phono preamp, CH Precision P1 with X1 PSU.
Power amplifiers darTZeel NHB 468 monoblocks.
Cables Interconnect: TARA Labs Zero Gold, Zero Evolution, Zero and Air Evolution, Analysis Plus Silver Apex, Stealth Sakra & Indra, Luminous Audio Technology Silver Reference, interconnect. Speaker: AudioQuest Dragon, TARA Labs Omega EvolutionSP. AC: AudioQuest Dragon, Dynamic Design Neutron GS Digital power cord.
Accessories AudioQuest Niagara 7000, CAD GC1 and GC3 Ground Controls; AudioQuest NRG Edison AC wall box & receptacles; RSX Industries Power8 box, ASC Tube Traps; RPG BAD, Skyline & Abffusor panels, Stillpoints Aperture II Room panels, Synergistic Research UEF products (various), Symposium Ultra platform; HRS XVR turntable stand, Signature SXR and 2 Stillpoints ESS stands, Thixar and Stillpoints amplifier stands; Audiodharma Cable Cooker; Furutech record demagnetizer; Orb DF-01iA Disc Flattener, Furutech deStat; Loricraft PRC4 Deluxe Audiodesksysteme Gläss Pro, and Kirmuss Audio KA-RC-1 record-cleaning machines.—**Michael Fremer**

Conclusion

Though the arm/'table combo will set you back nearly $50,000, my experience was that every time I put a record on the platter, pressed "on"—even the push buttons delivered precise authority—and lowered the stylus into the lead-in groove, I had no doubt about where the money went, especially because, having set up the turntable myself, I hear the 'table's well-hidden, ingeniously designed, skillfully executed guts in every play.

A neutral and revealing carrier like the Montana NEO/TA-7000 NEO combo means your final satisfaction with it will depend on the cartridge you pair it with—more so than on a less precise turntable. The combo exhibited plenty of warmth when the recording produced it, even with a cool customer like the A95. If you care to warm it up further, there are many cartridges and/or phono preamps that can do that. I imagine the Analog Relax 1000 on this combo would be spectacular, and the Lyra Etna λ Lambda SL definitely is.

If you prefer to emphasize the sonic precision, superior spatial performance, background quiet, and solid imaging? Many phono preamps and cartridges can do that including the CH Precision P1/Xi and the big Boulder 2108 combined with the new Ortofon Verismo or Anna Diamond.

Wherever you wish to go sonically, the Montana NEO/TA-7000 NEO combo can reliably take you there. The pair makes the choosing so much easier because it so clearly self-defines its performance. Once it's packed up and shipped back, I'll surely miss it.

Someday, if I decide to downsize—who knows?—I can see myself moving to Montana. ■

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