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Landmark Achievement

Siltech SAGA System

Jonathan Valin

Though other folks (including some on this very magazine) seem to think that we've just been marking time in high-end audio lately, building and rebuilding the same old things only with better parts and calling them "breakthroughs," color me an optimist. I honestly believe that high fidelity, and the quality and inventiveness of the engineering behind it, has never been higher than it is today. Veils that we've taken for granted lo these many years (because they were so low in level and so omnipresent we didn't realize they were there—until they weren't) are being audibly lifted, distortions and colorations reduced. As a direct result, an abundance of new, previously unheard detail about music and music-makers (and the recording process itself) is being made clear, or clearer.

Siltech SAGA System

Of course, some folks (including, once again, some on this very magazine) seem to think that such fresh detail is a kind of false god—the product of either a hyped-up upper midrange and treble, or a hot vintage Neumann microphone (God save us from these, BTW, and the simply awful recordings from RCA, Mercury, and Decca that were made with them), or the propaganda of a numbskull like me who simply doesn't know any better than to delight in hearing things he's never heard before on recordings he's listened to scores and scores of times. It doesn't seem to be much use pointing out (as I have repeatedly) that I don't delight in hearing fresh details for their own sake, but rather because, collectively, they add up to a more convincing illusion of the real thing. Or to argue that such details can be considerably less trivial than the sounds of creaking chairs in the violin section or pages of scores being turned on piano music racks or subway cars running beneath recording venues (although there is an audiophile part of me that unquestionably delights in hearing these things, as well)—that hearing, for example, a Bartók pizzicato sound like a Bartók pizzicato not only makes a substantial difference in the realism with which the timbre, duration, and intensity of the note is being sounded, but an equally substantial difference in our understanding of the music it is punctuating and our appreciation of the skills of the performer playing that music.

The SAGA System is inarguably different enough to merit a lengthy explanation, both of what it is, and of why it is the way it is.

All of this, believe it or not, is by way of a preface to the review you're about to read of a product—actually a system of three products—that lifts veils, lowers distortions, reveals fresh details, and, yes, heightens the illusion of realism. This product, called the Siltech SAGA System, was designed by Edwin Rijnveld, the gifted Dutch engineer who's familiar to many of us from his pioneering work with cables and interconnects (including my current reference wires, the Crystal Cable Absolute Dreams). Turns out that Edwin, whom I visited not too long ago in Arnhem in The Netherlands (yes, *that* Arnhem—the bridge still stands, BTW) as a follow-up to my Crystal Cable review, is considerably more than a world-class metallurgist, although he is that, as well. He is a highly experienced EE with a penchant for building novel speakers (the glass-bodied Crystal Cable Arabesques are his latest), and equally novel electronics.

Several years ago Edwin authored the SETA, an 80W single-ended-triode monoblock amplifier that used custom-built tubes. The SETA and its companion preamplifier didn't make much of a dent in the worldwide electronics market (only 30 pairs of the amps were ever made), but they were, nonetheless, highly regarded and very well reviewed. *Not*, however, as highly regarded or as well reviewed as his current SAGA System electronics, which have already been raved about in several magazines and webzines, and will shortly be raved about again by me.

What is a SAGA System? It is a very expensive ($112,500), three-box, tube/transistor-hybrid electronics suite, comprising a linestage preamplifier and a 380Wpc (into 8 ohms) stereo amplifier of highly unusual design. Though there may be nothing new under the hi-fi sun, as some folks (including some on this very magazine) aver, the SAGA System is inarguably different enough to merit a lengthy explanation, both of what it is, and of why it is the way it is.

Let's take the why part first.

SAGA is the felicitous initialization of what Rijnveld calls Structural Amplifier Gain Architecture. And Structural Amplifier Gain Architecture is what his linestage preamplifier (the C1) and his two-box amplifier (the V1 and P1—the reason for the two boxes will be explained in a moment) exemplify. The SAGA components have been designed to electrically and mechanically revise and sonically improve upon what Rijnveld calls "the old habit" gain architecture of preamps and amps of the past, including just about every other preamp and amp on the market today.

According to Mijnheer Rijnveld, all these preamplifiers and amplifiers are caught in a bit of a time warp, using a gain architecture that made sense when analog was king but that does not make as much sense in the Digital Age. You see, back in the LP days, the job of a preamplifier was to boost the relatively weak signal of the phonostage (typically 1V or less) to line level so that it could be passed on to the amp for further boosting. Today, the output voltage of a CD player or a DAC is high enough (typically 2V) to cause that same amp to be overdriven or to overload if the signal sent to it by the preamp isn't


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attenuated (i.e., if the amplification applied by the preamp isn't lower than unity gain). And, indeed, attenuating the input signal is precisely what preamps do nowadays with digital sources, via op-amps, discrete circuitry, or passive attenuators. The trouble is that reducing the voltage of the input signal so that it won't overload the amplifier's input stage also reduces the dynamic range of that signal—typically by 10dB referenced to a line level of 1.5V—and as dynamic range is lowered the audibility of noise is increased since the signal-to-noise ratio has also been reduced. Once that dynamic range is lost, it can never be restored—no matter how much amplification is applied after attenuation.

Eliminating this inevitable reduction of dynamic range and the consequent increase in noise is the entire *raison d'être* of the SAGA System, every part of whose gain architecture has been designed to accommodate Digital Age realities. The C1 preamp applies no attenuation to the input signal, and the V1/P1 two-stage amplifier is engineered to handle the increased voltage of a digital (or analog, for that matter) source without overload or clipping, thereby preserving that lost 10dB of dynamic range while also roughly doubling perceived loudness and halving perceived noise. As Siltech points out, it is this noise that masks the low-level (and high-) details of timbres, textures, and transients that are almost universally regarded as keys to sonic realism—save by some folks (including some on this magazine).

Rijnveld's elegant soluton was to divide his amp in two, physically separating the input/driver stage (V1) from the output stage (P1).

There is an issue with Rijnveld's strategy, however. When dynamic range is raised and loudness virtually doubled, the audibility of "external noise" (in the form of RFI, EMI, and power-line hash) is also increased. Since AC power supplies are the chief sources of such external noise, Rijnveld reasoned that eliminating them and using (rechargeable) lead-acid-gel-battery power supplies instead would solve the problem. Unfortunately, this decision led to another problem. Though a battery power supply is eminently do-able in a low-current preamp (Edge, Nagra, Veloce, Sutherland, and many others have been using them for years), it is a much trickier proposition in a power amplifier.

The trouble is that power amps typically have three gain stages—an input stage, a driver stage, and an output stage—each with different power-supply requirements. Because the amount of current they use is relatively small, the input and driver stages of a power amp can be fed adequately by batteries (with a few added fillips). The output stage, on the other hand, uses large amounts of current that would quickly drain a battery power supply; hence it needs to be powered by AC.

Since the input, driver, and output stages of a power amplifier are typically housed in one box, the question becomes how do you handle their power supply needs while still holding the introduction of external noise to a minimum? Though I don't know this for a fact, I'd guess that Rijnveld toyed with the idea of using dual outboard power supplies (one battery and one AC) for his amplifier, although I imagine it would be tough to feed part of a circuit from an AC power supply without potentially contaminating the rest of the circuit with noise. In the end, Edwin came up with a much more elegant, effective, and original solution—one that I've never seen implemented before (though I understand it has been tried once or twice in the past).

Instead of dividing the power supplies in two, he divided his amp in two, physically separating the input/driver stage (the voltage amplifier or V1 unit) from the output stage (the current amplifier or P1 unit) by housing each in its own separate, massive, heavily damped, beautifully made chassis. This not only allowed the voltage amplifier to be independently powered by batteries; it also insulated and galvanically isolated the low-level signals processed by the V1 (and those of the also separately-housed, battery-powered linestage preamplifier, the C1) from any AC power-supply noise in the current amplifier.

If this were the end of Rijnveld's SAGA System innovations, it would suffice us. But 't'isn't.

All things being equal Rijnveld prefers the sound of triode tubes to transistors—and, as noted, has had experience designing triode amplifiers and preamps of the highest quality. However there are issues associated with using tubes in a battery-powered preamp and amp (or half of an amp) that wouldn't crop up with AC power supplies. For example, typical twin-triode preamplifier tubes such as 12AX7s or 6922s require considerable voltage to operate as designed, and the voltage demands of high-output power tubes such as 6550s or KT120s simply put them out of the question.

To get what he wanted sonically Rijnveld had to make a series of interesting choices—and a compromise.

First, he picked an unusual tube for his C1 preamp, the dual-triode ECC86, designed in 1958 (by Philips and Telefunken) for use in low-voltage environments such as car radios. Not only was this tube ideal for a battery-powered preamplifier—necessarily low in microphony, long-lived, and very rugged, in addition to having the right voltage requirements—Rijnveld also (and most importantly) considers it a sonic gem. Four of them are installed in the C1 preamp in a "minimalist," zero-feedback Class A circuit.

Second, he used a high-frequency DC-to-DC converter to up the voltage of his battery power supply in the V1 voltage amp, which, among other things, allowed him to deploy two completely separate, switch-selectable amplifier-input/driver-stage circuits—both tube-powered. One of these circuits uses an E80CC triode, running in Class A, for lower-gain (28dB) applications (i.e., higher-sensitivity loudspeakers); the other uses a 18042 pentode for higher-gain (34dB) applications (i.e., lower-sensitivity loudspeakers). The working assumption is that most listeners will prefer the sound of the Class A triode tube (provided their speakers have a sensitivity of about 87dB or higher); I certainly do with the Raidho C 4.1s (though the pentode has its merits, too, for which see the sidebar on using the SAGA System). Both the triode and the pentode are, again, installed in zero-feedback "minimalist" circuits.

This patent-pending bit of engineering brilliance futher isolates the power supply from the gain stage by turning DC into light.

Third, for his AC-powered P1 current amplifier Rijnveld decided to use discrete transistors because driving current is precisely where transistors are at their best. This doesn't mean that the P1 is a conventional solid-state gain stage, however. As I hope you can see by now, very little about the SAGA System is conventional.

Though the P1 gets its power directly from a wall outlet in your listening room, it does not use a typical AC power supply. Since the whole object of the SAGA is to preserve dynamic range and avoid the introduction of noise, internal or external,

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Edwin chose to use a 160kHz switching power supply with smaller transformers rather than a standard supply with larger E-core or toroidal transformers, thereby sidestepping the problem of noise leaking from the transformer's primary to its secondary windings and thence into the SAGA System ground plane. Previous experience with today's highly sophisticated switching power supplies (see my review of the superb Soulution 500 Series electronics in Issue 236) suggests that this was a smart choice with a profound sonic upside (particularly when it comes to bottom-end grip, definition, and speed—areas where even the best tube amps can use a bit of help).

In the past, the knock against switching power supplies was that they radiated "switching noise" into the audio circuit—the very thing that Rijnveld was trying to guard against. But to judge by the Soulution 501 monoblock amps (and the Siltech SAGA, for that matter), today's far-more-sophisticated, higher-frequency switch-mode PSUs no longer have this problem. At least, I can't hear any trace of it—in either the Soulution gear or the Siltech. [*Or in the Rowland 725 amplifiers.—RH*]

However, partly out of an abundance of caution and partly out of sheer technical hubris, Rijnveld took a further step to keep external noise out of his current-stage power amp—what he calls the Apollo LightDrive. This patent-pending bit of engineering brilliance further isolates the power supply from the gain-stage transistors by converting DC into light. An extremely powerful LED (developed for automobile headlights) turns the switch-mode supply's output into an intense beam of light (so powerful that the LightDrive has to be encased in a light-proof box lest its radiance blind you). This intense beam of light is directed at high-efficiency photocells (developed for use in satellites), which convert it into the current that biases the P1's bipolar transistors. Like every other part of the SAGA System, those transistors are installed in a zero-feedback circuit that runs in full Class A, even at the 1200W levels the amp is capable of into 2-ohm loads. (The standard strategy for Class A is to prevent the power transistors from ever switching off via bias current that is higher than the peak levels the amplifier is capable of generating. This results is an efficiency of about 10–20 percent, i.e, 80–90 percent of the amp's output is dissipated as heat. The P1 uses its light-coupled current source to bias the output transistors independent of power demands via the following equation: The P1's dissipation equals output power plus roughly 50W. Siltech claims that this more conservative biasing strategy prevents the power transistors from switching off, keeps the amp in Class A under all loads, even those under 1 ohm, and allows the amp to run considerably cooler—about 100°F on the outside of the P1's chassis—than conventional Class A amps.)

> The SAGA System combines the timbral naturalness of tubes with the dynamic naturalness of transistors.

In all fairness, using light to bias transistors (and to galvanically isolate the power supply) is not an entirely new idea. The American firm Edge, for one, used a variation of this strategy in its top-line amplifiers back in the late 90s (and I believe that Jürgen Reis of MBL uses opto-couplers in his 9011 monoblocks, which I reviewed several years ago). Nonetheless, when you take all of the innovations in the SAGA System as a whole, even skeptics (including some on this magazine) would have to grant that this is not "the same old thing" spiffed up with new parts. (For that matter, neither are the other innovations we've seen over the last few years in speaker and driver design and source components. But that's another story.)

Of course, the proof of the pudding is in the tasting. No matter how ingeniously contrived Edwin's Structural Amplifier Gain Architecture is—and no matter how sound the reasoning behind it—the SAGA System would simply be another brilliant flash-in-the-pan if it didn't deliver the sonic goods.

As you can guess, since I would hardly have wasted all this space on something that didn't sound great; it *does* deliver the sonic goods, sounding just a smidgeon more realistic

(in the midrange) than its closest solid-state competitors from Soulution and Constellation and more than a smidgeon quicker and better defined (particularly at the frequency extremes) than its closest tube competitors from ARC or c-j.

Indeed, the sound of this Class A hybrid system falls almost exactly in-between that of the highest-fidelity solid-state and the highest-fidelity tubes I've heard. Ofttimes in the past this has not been the case with tube/transistor satyrs, which instead of melding the sonic best of both gain strategies seem to highlight their defects and compromise their virtues. Not so here.

You can hear what I'm talking about by putting on virtually any good recording of voice, such as Keb' Mo' singing "Am I Wrong" and accompanying himself on guitar (with hand-clap and kick-drum accents) from his eponymous first album. If you listen to this cut with a great all-tube setup (say the ARC Reference 10 linestage and Reference 250 power amps), you will be struck immediately by the lifelike timbre of KM's voice, which simply sounds "right" in a way that nothing else—tube, solid-state, or in this case hybrid—quite equals. Of course, ARC tubes are famously wonderful at getting steady-state tone just-so, particularly in the heart of the midrange, and also at capturing much of the natural dimensionality and bloom of the real thing.

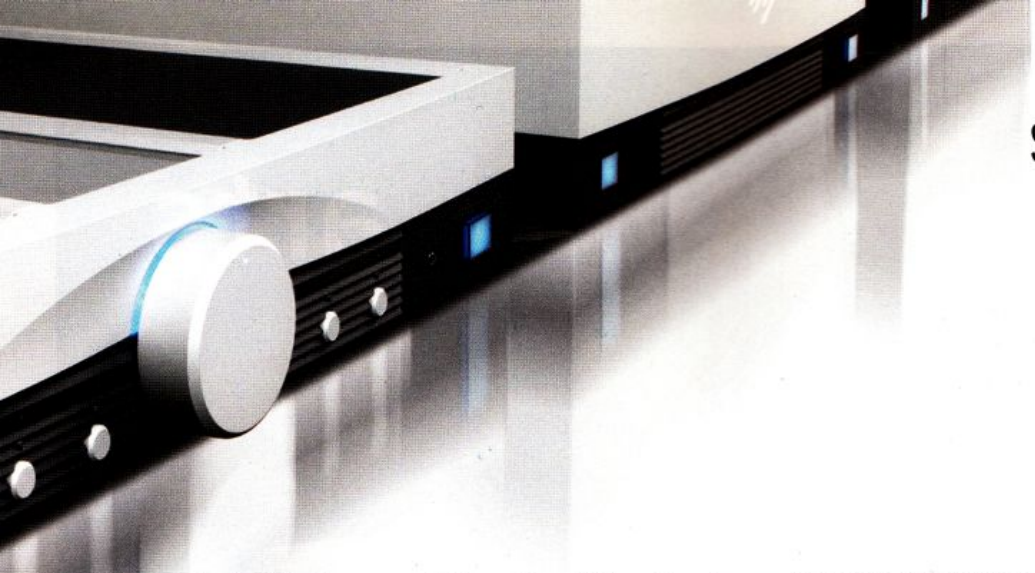
If you were to compare this all-tube presentation to the sound of a great all-transistor setup (my reference Soulution 500 Series electronics, for example), you would hear the timbre of KM's voice darken a bit. The Soulution's tonal palette is a little more "bottom-up"—e.g., weighted slightly more toward the bass than that of the more dead-center-neutral ARC gear. KM's voice would also be a little more flattened in aspect than it is through the ARC gear (though it wouldn't come close to losing all of its dimensionality and bloom, qualities that the Soulution gear is better at reproducing than any other solid-state electronics I'm familiar with). At the same time, the tiny transient details that go such a long way toward recreating the way a real singer is singing—the way he is shepherding his breath, the way he is employing his mouth, nose, throat, and chest to modulate timbre and dynamic, and the way these changes in his delivery contribute to the dramatic effect—would be somewhat more clearly reproduced, making Keb' Mo' sound just as "there" but for slightly different reasons.

If, in turn, you were to listen to this same cut via the Siltech SAGA System, you would hear vocal and guitar timbre that are much closer to the utter naturalness and neutrality of the ARC electronics (though not quite as fool-ya "right" as the ARC), but you would also hear textures, transient details, decays that are much closer to the utter naturalness and higher resolution of the Soulution electronics (although, perhaps, not quite as "quick" and explosive as the Solution is on the picking of that resonator guitar). To put this plainly, you would hear slightly more of the things that make Keb' Mo' sound "real" via both of these different gain strategies, along with a *very* slight reduction in the signal virtues at which each excels. Though the differences between these three presentations are subtle, they are quite clearly audible and their effect on perceived "realism" is marked, with the Siltech SAGA System holding a bit of an edge overall.

Of course the Keb' Mo' cut is a piece of music that lives almost entirely in the midrange—and lives there without making great demands on a preamp/amp's dynamic prowess. If we turn to something more challenging—such as George Crumb's duo for violin and piano, *Four Nocturnes*, on Mainstream—the picture changes a bit. In this piece, highly percussive moments filled with staccato raps on the violin's upper bout and the piano's case, as well as explosive Bartók pizzicatos on both violin and open piano strings, alternate with more lyrical passages (wraith-like harmonics on violin and "prepared" piano, glissandos on both instruments that spill colors like prisms). Here, in a piece that is largely composed around mysterious and lovely nocturnal noises, the Soulution 500 Series electronics' advantage in transient speed pays dividends in perceived realism. The 500s are simply quicker off the mark and more unstintingly explosive than the Audio Research gear. And yet...*Four Nocturnes* is also built around the evanescent bursts of tone colors that attend these transients and the way they die off into the nighttime silences that play such a large role in the structure of these miniatures. In timbre the ARC electronics holds the same advantages that it had with the Keb' Mo' piece. Even though the ARC components are not as quick or as complete on starting and stopping transients as the Soulution gear, they still hold a slight edge in naturalness of tone color, bloom, and dimensionality.

With its unique blend of tube-like timbre and solid-state speed, the SAGA System sounds like nothing else—or at least nothing else I've heard.

Once again, the sound of the Siltech SAGA System falls almost exactly in-between these two paradigmatic examples of solid-state and tube electronics, with nearly the same speed on transients, the same resolution of very-low-level textural details, and the same wonderful preservation of decays that make the Soulution gear sound so exciting and realistically "present," and nearly the same naturalness of tone color and three-dimensional body and bloom of the ARC gear. Plus the nighttime silences between notes and phrases really are deeper, more silent than through any other gear I have heard in my system. Though the Crumb recording is an LP, the greater dynamic range that the Siltech is capable of—and that Rijnveld sought so cleverly to preserve—is clearly there, as are the lower noise and higher resolution that are its side benefits. Indeed, I've never before heard electronics



which use tubes in their gain stages exhibit this kind of transient speed and ultra-low-level transient detail; nor have I heard any solid-state amplifier with quite this level of neutrality and naturalness of timbre (though the Soulution and Constellation come very close).

How about large-scale music? Well, the story is more or less the same. On the new Acoustic Sounds' reissue of *Lieutenant Kije* [LSC-1950], the Siltech matches the Soulution in extension and resolution on those big, floor-shaking bass drum strikes in "Kije's Birth," while at the same time very nearly matching the ARC's peak-free loveliness on those sometimes piercing piccolos and flutes at the playfully martial start of the same movement. The SAGA has almost the same dark rich density of tone color and sheer weight as the Soulution on the marvelously sluggard passages for bassoons, tenor saxophone, and low-pitched brass in "[Kije's] Romance," and much (if not all) of the sheer silken gorgeousness of the ARC on massed strings. In short it has the same unique blend of tube and transistor virtues it has on other music. And this plays out in its staging and imaging, as well, with a mix of tube-like expansiveness and transistor focus that makes full orchestras sound both big and densely populated.

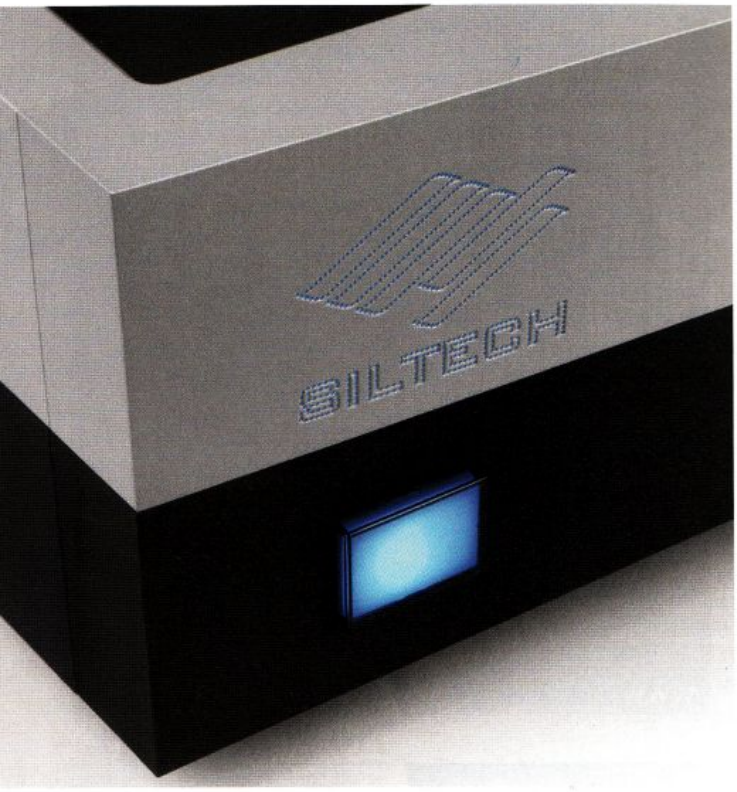
Can the Siltech SAGA System rock? Well, it doesn't have quite the phenomenal bass at very loud levels that the Soulution 500 Series monoblocks do, but then, as I noted in my review of the Soulutions in Issue 236, neither does anything else. That said, the SAGA System comes mighty close and outdoes the slightly (albeit beguilingly) softer-sounding Soulution in the treble on the timbre and dynamics of rhythm-marking instruments like cymbals and drumsticks (or, for that matter, the colorful accents of the tambourine and orchestral bells on Chad Kassem's great new reissue of Debussy's *Iberia* [LSC-2222]). No, the Siltech cannot fully match the Soulution's bottom end on powerhouse rock—such as the Puget Sound two-track, 15ips reel-to-reel tapes of *Sgt. Pepper* and *L.A. Woman,* where the drum kit and Fender bass don't have all of the thunderous, you-are-there impact and definition of the all-solid-state Soulution. Not that the SAGA is at all muddy or anemic sounding. From the midbass through the power range the Siltech gear has color, clarity, resolution, and dynamics galore (just listen to the lifelike sock and thrilling tonal weight of the rhythm section on Janis' "Try" from *I Got Dem Ol' Kozmic Blues Again Mama!*); and the SAGA amp goes low (as low as the Soulution gear). It just doesn't do these things with quite the same iron grip and punch-in-the-chest slam that the Soulution combo, with its damping factor of greater than 10,000 and much higher current capabilities, does. (Of course, the Siltech come far, far closer to the Soulution in these regards than the ARC electronics, but then tubes, even great ones, aren't killers in the bottom octaves when it comes to grip.)

The SAGA System's low noise, higher resolution, and astonishing dynamic range pay benefits in sheer clarity of line.

On the other hand, if you want to hear what the SAGA does extraordinarily well, listen to the incomparable Karajan performance (with the Berlin Phil) of Bartók's Music for Strings, Percussion and Celesta [Columbia SAX]. The Siltech's lower noise, higher resolution, exceptionally natural and beautiful tone color, and astonishing dynamic range and discernment really pay benefits here in sheer clarity of line. For instance, I don't think I've ever before heard as clearly the way that Bartók expands the tight chromatic intervals of his main theme in the first movement into wider, more tonal intervals when he repeats the same theme in the dance-like final movement. *This* is resolution that serves a purpose. (My thanks to our incredibly knowledgeable Music Editor, Mr. Lehman, for helping me to phrase this correctly.)

To sum up, the Siltech SAGA System is not only engineered like nothing else; it sounds like nothing else—or at least nothing else I've heard. With its unique blend of tube-like bloom, three-dimensionality, and naturalness of timbre, and solid-state-like transient speed, resolution, bass-range extension and clarity, and extremely low noise, it truly does bridge the gap between these two gain strategies in ways that will delight both tube-o-philes and solid-state mavens, combining the most salient virtues of each device with a satisfying completeness that has never before been achieved in a single package. For this alone, it is a landmark piece of audio engineering. That it also raises the bar in the realistic reproduction of music of all kinds, particularly in the midband, makes it a no-brainer highest recommendation—and my new and, uh, one-and-only tube/transistor-hybrid reference.

Using the Siltech SAGA System



As soon as you lift the SAGA units out of their cartons—those of you who are lucky enough to be able to afford them—you will see that your money was well spent. Even in the rarefied world of ultra-high-end audio, the build-quality of these hand-made Siltech SAGA System components is outstanding. The SAGA's three incredibly solid and well-damped chassis (you can actually do a knuckle-rap test on them, as if they were the side-panels of a Magico loudspeaker) were designed using a COMSOL Multiphysics finite-element-analysis program; its RCA I/Os are all top-line WBT Nextgens; its XLR I/Os are gold-plated Neutriks. Though you will need an extra set of balanced interconnects to go from the V1 voltage amplifier to the P1 current amplifier—and be sure to select a very, very good set (such as Crystal Cable Absolute Dreams, Synergistic Research's fabulous new Galileo LE, or Siltech's own top-line Royal Signature silver-monocrystal wire, which is what is used inside the SAGAs)—you will quickly find that setting up the SAGA system and operating it are a snap, thanks in part to the logical simplicity of its controls, inputs, and outputs.

The C1 preamplifier, for example, only has three adjustments on its front panel: a large, lighted (the light can be dimmed via the remote control), smoothly operating, centrally located dial for setting volume level—with a blue LED set like a pointer at its circumference to show you where you are on in the dial's arc of travel—a row of six pushbuttons below the volume dial to select your source from one of six inputs, and two buttons which light up when you press them, one to turn the unit on and off, and the other to put it into "forced charging" mode (for more about which, see below). On the C1's rear panel you'll find six inputs (five RCA and one XLR) plus two pairs of outputs (one RCA and one XLR). As Siltech's manual points out, the first inputs you should try are Numbers 5 and 6, as they have shorter paths to the circuit board and sound better. A system power-on switch is also located in the right rear corner of the back panel.

The V1 voltage amplifier has only two pushbuttons on its front panel, which also light up when pressed and serve the same functions as the two pushbuttons on the C1—turning the amplifier on and off and engaging its "forced charging" function. On its rear panel, the V1 has two pairs of XLR outputs, plus two stereo inputs (one RCA and one XLR). The two pairs of stereo outputs are there in case you decide to bi-amp your loudspeakers by buying a second P1 unit. As with the C1, a system power-on switch is located in the right rear corner of the back panel.

On the bottom of the V1 chassis, near the front panel, is another switch that allows you to choose between the two completely independent triode and pentode circuits built into the unit (only one at a time is active). Your choice of circuit will, to some extent, be dictated by the sensitivity of your loudspeakers. But all other things being equal, the sound of the SAGA System is sweeter, richer, and more finely textured when the V1 is played in triode mode, although you may prefer the greater dynamism and leaner tonal palette of the pentode mode on certain kinds of music.

The P1 current amplifier has two pushbuttons on its front panel—one to turn the unit on and off, and one to mute the amp's output. Each lights up when depressed. On its rear panel are one set of balanced stereo inputs, loudspeaker binding posts (the very best, gold-plated, high-current WBTs, of course), and an IEC inlet for an AC power cord—the only IEC inlet on any of the chassis, as the P1 is the only unit that plugs directly into the wall.

Both the battery-powered C1 and battery-powered V1 come with "charging units" with long cords that plug and lock (via a rotating collar) into the DC-In jacks on the rear panels of each component. The chargers have multi-color LEDs built into them, which glow green when the batteries in the V1 and P1 are fully charged, and the chargers are no longer functioning. As these chargers require low voltage to operate, they can be plugged into a power strip rather than occupying a wall socket that could be used for something that's directly powered by AC (such as the P1).

A word about battery operation. The batteries in the C1 and V1 need about eight hours to fully charge (twelve hours when the units are initially plugged in). Once charged, the batteries will have sufficient current to power the units for twelve to fifteen hours of play. When the batteries near exhaustion (or the C1 and V1 are turned off for the evening), the chargers will automatically re-charge the batteries. (The SAGA System can be played *while* the batteries are charging—at very first turn-on, for

instance—by pressing the "forced charging" buttons on the C1 and V1. The sound is excellent, BTW, if not quite as sophisticated as it becomes when the units are being fully powered by their batteries.) The life of the batteries in the C1 and V1 is said to be 5–10 years (with replacement recommended every five years for best sound). The life of the tubes in each of these units is said to be 10,000 hours, with best sound for the first 5000–8000 hours.

Let me say another word about batteries and hi-fi components. Past experience with gear powered by battery supplies led me to expect mixed results from the SAGA System. In the past, such battery-powered systems have been quiet, yes, and high in resolution, but they have also been dynamically hamstrung, sounding overly polite on transients and big dynamic swings, and also rather whitish in timbre. The SAGA System is the first battery-powered preamp and amp I've heard that has none of these issues. On the contrary (and as noted in the review), the SAGA is almost as fast and powerful as the fastest and most powerful solid-state amp I've heard, and very nearly (if not completely on some instruments like strings) as voluptuously beautiful in timbre as the most beautiful and realistic tube amp I've heard. Clearly, huge strides have been made in the design of battery-powered high-end components.

The SAGA comes with a cool-looking, touchscreen Logitech Harmony remote control and handsome cradle-like charger. This remote repeats the functions found on the C1 preamp—allowing you to change volume and choose sources from a distance. It also allows you to mute the system, to put the C1 into "forced charging" mode, and to dim the C1s front-panel lights. What it does not do—what the SAGA System itself does not do—is, well, anything else. There are no tone controls, no loudness controls, no stereo/mono or polarity-reversal buttons on the remote, because none of these functions are built into the preamp.

While there are some listeners (including some on this magazine) who would positively tear their hair out because of these omissions, I applaud them. Putting aside the fact that I have little hair of my own to tear, most of these functions (the stereo/mono switch would be my sole exception) are not only unnecessary; they also add active circuitry—and with that circuitry, conduits of external noise and distortion—to devices that, in this instance, were expressly and elaborately designed to eliminate all sources of noise and distortion. There was a reason why these silly, imprecise, noisy controls fell out of favor at the beginning of the high-end era. In every way conceivable (including this one), the SAGA System is a return to the purist ideal that got the high-end ball rolling in the first place. In the SAGA System, all that needs to be there for highest-fidelity reproduction *is* there; anything else isn't.

Do note that each of the SAGA System components should be wired up to sources and to each other *before* you power anything up. This is simply good practice, but violating this dictum may also void the warranty. tas

SPECS & PRICING

SAGA C1 Control Amplifier
Type: Class A triode-tube linestage preamplifier with battery power supply
Bandwidth: 1Hz–3.5MHz, -3dB
Gain: 9-10dB dependent on tube brand
S/N ratio IHF-A: 112–115dB
Dynamic range: 128dB
Dimensions: 480 x 80 x 340mm
Weight:
Price: $37,500

SAGA V1 Voltage Amplifier
Type: Class A triode-tube voltage amplifier with battery power supply and user-switchable higher-gain pentode-tube circuit
Bandwidth: 1Hz–110kHz, -1dB
Voltage gain: 28dB (triode mode), 34dB (pentode mode)
S/N ratio IHF-A: 128dB (triode)
Dynamic range: 130dB (triode)
Dimensions: 480 x 120 x 340mm
Weight:
Price: $37,500

SAGA P1 Current Amplifier
Type: Class A solid-state current amplifier with optical biasing
Bandwidth: DC–110kHz, -1dB
Voltage gain: 0dB
S/N ratio: 138dB
Dynamic range: 145dB
Damping factor: 100@10Hz–20kHz
Power output: 380W (8 ohms), 760W (4 ohms), 1250W (2 ohms)
Dimensions: 480 x 160 x 340mm
Weight:
Price: $37,500

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JV'S REFERENCE SYSTEM
Loudspeakers: Raidho C 4.1, Raidho C1.1, Raidho D1, Estelon X Diamond, MartinLogan CLX, Magnepan 1.7, Magnepan 3.7, Magnepan 20.7
Linestage preamps: Soulution 520, Constellation Virgo, Audio Research Reference 10, Siltech SAGA System C1
Phonostage preamps: Audio Research Corporation Reference Phono 10, Innovative Cohesion Engineering Raptor, Soulution 520
Power amplifiers: Soulution 501, Siltech SAGA System V1/P1, Constellation Centaur, Audio Research Reference 250, Lamm ML2.2
Analog source: Walker Audio Proscenium Black Diamond Mk V record player, AMG Viella 12
Phono cartridges: Clearaudio Goldfinger Statement, Ortofon MC A90, Ortofon MC Anna, Benz LP S-MR
Digital source: Berkeley Alpha DAC 2
Cable and interconnect: Synergistic Research Galileo and Galileo LE, Crystal Cable Absolute Dream
Power Cords: Synergistic Research Galileo LE, Crystal Cable Absolute Dream
Power Conditioner: Synergistics Research Galileo LE, Technical Brain
Accessories: Synergistic ART system, Shakti Hallographs (6), A/V Room Services Metu panels and traps, ASC Tube Traps, Critical Mass MAXXUM equipment and amp stands, 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 SE record cleaner, HiFi-Tuning silver/gold fuses