

# the absolute sound

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## Solution 727 Preamplifier



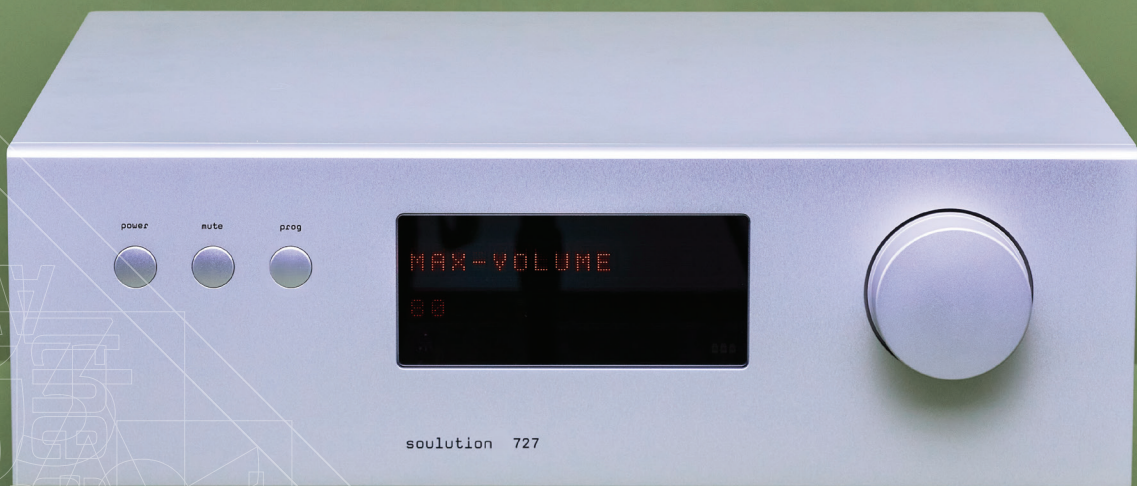
16 Pages of New Music Features and Reviews

## Solid-State Preamplifier of the Year

### Soulution 727

\$74,975 (optional mm/mc phono card \$11,975)

This amazingly improved (“amazingly” because its predecessor, the 725, was so good) third-generation linestage preamplifier from the ultra-high-end Swiss company Soulution was completely redesigned over an eight-year development period, coming to market in 2023 with a new input stage, a newly improved volume control, a new power supply, and a new output stage that boasts a bandwidth of 20MHz! The key design goal of all these changes was to reduce noise and phase shift (which are now claimed to be unmeasurably low). Sonically, the aim was (in the words of chief designer and CEO Cyrill Hammer) “higher resolution and more lifelike musicality.” Of course, almost everyone in the audio biz makes such claims about his newest component; moreover, it has been JV’s experience that record-low distortion and super-high resolution do not necessarily (or often) translate into “higher musicality.” Here, for once, they do. The Soulution 727 is the most “complete” and lifelike-sounding preamplifier that JV has heard (and he’s heard them all)—a model of gorgeous tone color, tremendous bass, sledgehammer dynamic weight, three-dimensional imaging, sensational soundstaging, and, yes, detail that sets a new standard of resolution without sounding the least bit analytical. A landmark achievement from a company that has long set the bar for technical innovation and highest fidelity, JV’s new reference, and TAS’ 2023 Solid-State Preamp of the Year. (Reviewed this issue)



# ANNEVE REFFEE

## Soulution 727 Preamplifier

By Jonathan Valin

Photos by Matt Wrightsteel

# W REFERENCE



## Soulution 727 Preamplifier

first heard about Soulution (the name is a concatenation of “soul” and “solution”) from solid-state amp/preamp maven and loudspeaker-designer Alon Wolf way back in 2008. At the time, I knew nothing about the brand, and when I looked it up on-line and discovered it was owned by another Swiss company called Spemot that specialized in building electrical motors and refrigeration units for the automotive industry, I was not enthralled. Shades of Crown, thought I. Then I chanced upon a rave review of a Soulution product—the 120Wpc dual-mono Soulution 710 stereo amp—in the tough-minded German hi-fi magazine *Stereo* and got more interested.

You see *Stereo* had pronounced the 710 a sonic and technological *wunderkind*. Indeed, the amp had tested so unprecedentedly low in distortion, so high in channel separation, so superbly well in S/N ratio that the magazine’s chief technician hung the test results in a gold frame above his bench.

Of course, some of us (at least some who go back that far) remembered those Japanese solid-state amps from Sansui and others that also boasted record-low THD figures—but sounded like crap. The trouble was that to achieve such stellar specs the Japanese engineers had to ladle on so much global negative feedback that their amps were virtual TIM (transient intermodulation distortion) and SID (slew-induced distortion) generators. Feeding back the signal from the output in order to compare it to the

signal at the input (and thus fix any errors that may have accrued as it made its way through the circuit) works fine if that feedback process is instantaneous, but feedback is a disaster if the amp takes too long to make its corrections. After all, the musical signal coming into the amplifier doesn’t hold still for a portrait; it is constantly changing; and if too much time elapses (and we’re talking nanoseconds here), the signal that the feedback circuit is comparing at the output is no longer the same signal that is being seen at the input. Ever since the “specs wars” of the late Sixties, the received wisdom about solid-state has been that negative feedback is a bad thing—only to be applied sparingly and locally—while shorter signal paths and fewer parts are good ones.

With its original 7 Series electronics, Soulution turned this conventional thinking on its ear. In concert with the company’s owner, chief engineer, and CEO, Cyrill Hammer, Soulution’s design team decided that it wasn’t feedback itself but the speed at which the feedback loop operated that was the problem.

To eliminate the time-related distortion—the blur, graininess, and edginess that feedback engenders—you had to make those feedback loops correct errors instantaneously. This meant that circuits and power supplies had to operate at incredibly high speeds (which translates into incredibly high bandwidths) and with very high precision. Forgetting about shorter signal paths and fewer parts (the 710 amplifier used over 3000 discrete components!), Soulution found ways to do this very thing, reducing propagation delay times (the amount of elapsed time it takes to





correct a signal via feedback) to 5–10 *nanoseconds* (billionths of a second), where solid-state amps and preamps typically had propagation delay times of 1–5 *microseconds* (millionths of a second). This thousand-fold increase in speed allowed for a huge increase in local negative feedback (and a drastic lowering of THD levels), without the usual price paid in time-domain errors.

The measured results of Soudation's ingenious, high-speed, high-local-feedback circuit were phenomenal. In the 710 stereo amp, for example, THD was well below 0.0006%, signal-to-noise ratio well above 108dB, damping factor greater than 10,000, slew rate 330V/ns, while power bandwidth went from DC to 1MHz. (The 700 monoblock amps measured substantially better!)

The sonic results were just as astounding. Suddenly you could hear... *everything*, and hear it with unprecedented clarity, speed, and neutrality.

I will never forget my first listen to the Soudation 710 stereo amplifier and 720 preamp. It just so happened that, at the time, I was using most finely detailed transducer I'd reviewed, the then brand-new (now defunct) MartinLogan CLX electrostats. In concert, that amp and preamp and those speakers set a standard of transparency and resolution that had never before been approached and has never since been equaled in my system. The sheer number of previously inaudible details about the performance, the music, the venue, and the engineering they brought to light on record after record—and these were records I thought I knew by heart—was simply mind-boggling.

Hearing exactly how, oh, Joni Mitchell's vocal harmonies on *Blue* had been separately recorded in a sound booth and then potted into the mix to create a plethora of Jonis in the background (backing up Joni in the foreground) simply thrilled the "fidelity-to-sources" listener in me, for whom the experience was like peering over the shoulder of the recording engineer and ob-

serving how he'd mixed the various tracks down to two-channel work parts. However, I could also see where so much "non-musical" detail might be off-putting to a listener for whom the color and drama of music comes first. After all, not everyone wants to watch the man behind the curtain twiddling dials and adjusting sliders each time he sits down to enjoy his favorite tunes.

Indeed for some listeners (not me, mind you) the 710's presentation *was* overly "analytical"—dread word—in that it revealed artifices (like tape splices, mike preamp clipping, and overdubs, as well as every mechanical noise that a musical instrument is capable of making when it is played close by the diaphragm of a microphone) that other, less neutral and transparent amps and preamps glossed over and that the musicians and recording and mastering engineers probably didn't want or intend you to hear so plainly. While I reveled in this wealth of detail for all the previously unheard subtleties it revealed and for the greater sense of realism such completeness brought to well-recorded sources, some members of my little listening panel weren't so sanguine. A few of them felt that the 710 and 720—particularly in combination with the CLXes—were just a bit *too* revealing.

Moreover, it could be argued (and was in other mags) that the 710 and 720's super-high resolution was being purchased at a cost in lifelike density of tone color. Even a fan like me had to admit that listening through it did require a bit of a sonic adjustment. The 710 and 720 were not electronics one would ever call warm and inviting—or cold and off-putting, for that matter. They just didn't have a color of their own; like glass or water they had the color of what you saw through them or reflected by them, be that the source or the speakers. Some critics (and some on my listening panel) chose to view this colorlessness as the *absence* of tone color, and by tube or tube-hybrid amplifier standards, the amp and preamp were lean in the all-important midbass and power range, where so much of music's drive, body, and tonal warmth originate.

My bottom-line conclusion about the 710 and 720 was that if you were "absolute sound" or "fidelity-to-source" listeners, the duo was a no-brainer must-hear. However, if you preferred an inherently warmer, richer, more *gemütlich* sound, then Soudation's 7 Series products probably wouldn't be your cup of resistors and capacitors.

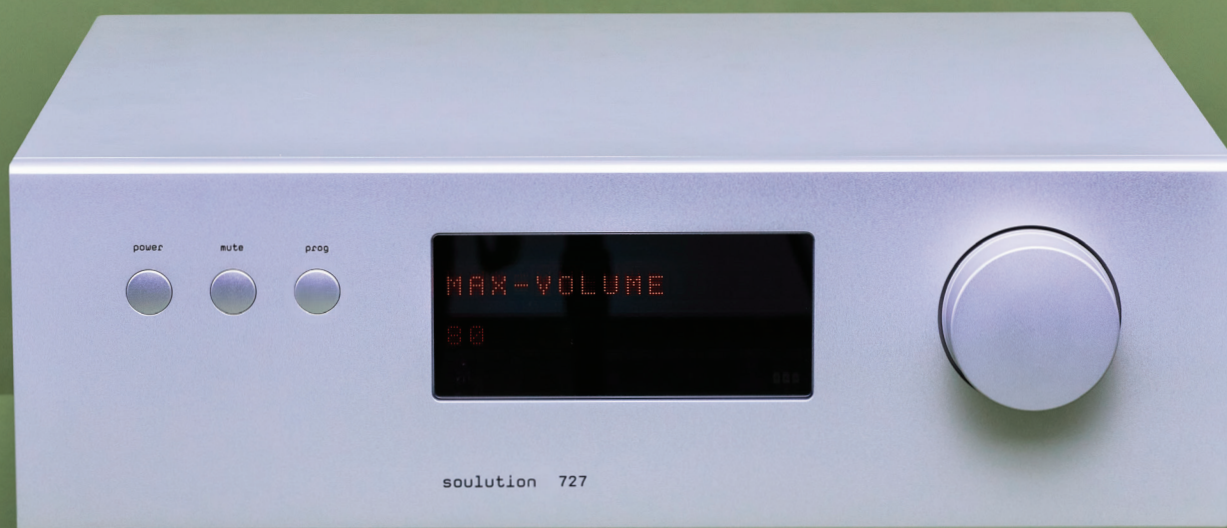
That's where things stood until 2014, when Cyrill Hammer introduced his second-generation Soudation 7 Series components—the 701 monoblocks, 711 stereo amplifier, and 725 pre-amplifier.

I will never forget

my first listen to the

Soudation 710 stereo amplifier

and 720 preamp.



Though identical to their forebears on the outside—both were housed in the same gun-metal grey, Bauhaus-style chassis that Soulution used for the 710 amp and 720 preamp, with the same little rectangular windows inset in their faceplates for the LED readout screen that allowed you, via the remote or control knobs on the units themselves, to select various options—inside, there was one big difference. Oh, the 711 and 725 used the exact same high-speed, high-negative-feedback circuits found in their 7 Series predecessors, but the 711's power supply was completely new.

Like Soulution's 501 monoblocks which preceded it to market, the 711 dual-mono stereo amplifier used two, fully regulated, switched-mode power supplies (as well as several linear supplies for certain sub-systems), and it used these SMPSes for the same reasons they were employed in Soulution's 501 amp—to keep “the voltage to the amplifier channels perfectly constant irrespective of the music signals.”

The use of these SMPSes had certain beneficial side benefits beyond providing cleaner, nearly inexhaustible power. For instance, because an SMPS runs cooler (which permits it to create higher voltages), Soulution was able to omit the 710's noisy cooling fans. In addition, since SMPSes allow for much more efficient power-factor correction (PFC), the supplies no longer polluted the mains with harmonics and current spikes, as linear supplies could and do, improving the performance of the amp itself and of ancillary electronics that were also plugged into the wall.

Furthermore, the smaller size of the SMPSes allowed a more efficient arrangement of parts and boards inside the amp, reducing the lengths of cable that had to be used between and among them, thus making for shorter signal paths. Finally, when these much more stable and efficient, lower-noise, higher-output SMPSes were paired with 1,000,000 microfarads of custom-made ultra-low-ESR capacitors (as they were in the 711), current peaks, particularly in the bass, could be reproduced with greater ease and fidelity, and current delivery could be raised from 60A to 120A (although pulling that much current from wall outlets was impossible in most homes).

What this translated to sonically was almost exactly the same thing that it had translated to in the 501 monoblocks and 520 preamp—electronics with simply unparalleled bass-range power, color, and impact, a power range and midrange of exceptional warmth and tonal beauty, and a treble that was as liquid, edgeless, and delicately detailed as any I'd heard from solid-state. The 711 stereo amplifier and 725 preamp were every bit as gorgeous, thrillingly dynamic, startlingly lifelike (given the right sources), and seemingly inexhaustible as the superb 501 and 520. Indeed, they might have been just a shade more inexhaustible (if that isn't a solecism), in that they didn't ultimately give up the ghost and shut down, no matter how loudly you played them. In addition to their inexhaustibility, the 711 and 725 had much the same marvelous (and extremely lifelike) sonic stability as the 5 Series mono-

## The sound of the 711 and 725

was gorgeous,

thrillingly dynamic, and

very lifelike.

blocks and preamp—sounding virtually the same at very low levels as they did at ear-splittingly high ones.

So far, I described an amp and preamp that had the same virtues as less expensive ones. But the truth was that the 711 and the 725 had a leg up on the 501 and 520 in every area in which the less-pricey amp and preamp excelled; plus, the second-gen 7 Series compo-

nents did certain things more than a leg better than the 5 Series gear. First, there was the sheer amount of information about performers and performance that the 711 and 725 delivered. While the 501 and 520 were extremely detailed, they were no Soulution 710 or 720 when it came to low- and high-level resolution. The 711 and 725 nearly were. To hear the effortless way this amp and preamp sorted out strings, winds, brass, and percussion (and individual players within each section) even on the most floor-shaking *fortissimos* of a terrifically busy and dynamic piece like the *Feria* of Ravel's *Rapsodie espagnole* was to hear a huge symphony orchestra reproduced with so much of the limitless ease and air, dense and variegated tone color, and thrilling acoustical power of a real orchestra in a real hall that it sent chills down your spine and goosebumps up your arms.

Prior to the second-generation 7 Series products, I thought the Soulution 501 and 520 were unbeatable in the low end. But in all my life I'd never heard Fender bass lines, kickdrums, and toms reproduced by an amplifier with as much lifelike speed, color, power, authority, and effortless ease as they were through the 711 and 725. Listeners literally came out of their chairs when they heard the tremendous impact of Chris Frantz's sledgehammer drumming at the end of "Life During Wartime" or Tina Weymouth's fat, throbbing, incredibly powerful bass intro to "Take Me to The River" from Talking

Head's *Stop Making Sense* (recently re-released by Sire in a two-LP set with much improved sonics). Outside of an actual rock, big jazz band, or symphonic concert, I'd never heard anything like this amp and preamp in the bottom octaves. If nothing else, they were benchmarks in the bass and power range, capable of unrivaled slam, inexhaustible dynamic range, and ravishing tonal color.

So, what did the 711 and 725 not do? Well, they weren't as colorlessly neutral as the 710 and 720. Like the 501, the 711 and 725 had a big, dark, tremendously authoritative, bottom-up sound. They were also a bit softer than life in the top octaves. Nor were they as high in resolution as the 710 and 720. While very detailed and superb on transients, the 711 and 725 were not the sonic vacuum cleaners that the originals were. Though they had an astonishing measure of the three-dimensional bloom that I associated with tube amps (Soulution amps are almost unique among solid-state components in this regard), they didn't have quite the same lifelike midband presence of glass bottles; nor did they have the pitch-perfect steady-state tone that tubes can generate in the midrange. When it came to soundstaging and imaging, the 711 and 725 were also a bit reminiscent of tube amps and preamps, in that the stage was wall-to-wall vast, while instrumental images within that stage were less razor-cut and more life-sized than they were through most other solid-state amplifiers. (Once again, this larger, more natural, more tube-like imaging was characteristic of Soulution.) Finally, because of their tremendous energy and dense, lifelike color from the bottom bass right through the power range, the 711 and 725 might have driven your speakers and your room a little nuts on certain midbass notes in big tuttis. Of course, once you'd heard all that horripilating speed and slam and color, you wouldn't have cared.

Comes now the third generation of Soulution's 7 Series electronics, and while the new (as yet undesignated) monoblock and stereo amplifiers and the unique \$79,975 757 de-emphasis preamp (which equalizes and boosts to line level the signals of every analog source you've got, from mm/mc/mi magnetic cartridges to DS Audio optical transducers to IEC or NAB R2R tapes) won't be available until next year, the all-new \$74,975 727 linestage preamp (the optional phonostage card is an additional \$11,975) hits the market in the fourth quarter of 2023—and made it into my listening room (along with a prototype 757) about six weeks before I began writing this review.





I'm not Robert Harley, I don't fully understand all the heroic engineering that went into the 727. Rather than pretending that I do by parroting Cyrill Hammer's detailed explanations, I refer the more scientific among you to the sidebar, wherein Cyrill specifies all that has changed in the 727 vis-à-vis the 725.)

Though the precise meaning of the many technical changes in the 727 may elude me, the way they've changed its sound has not. From the start, it was clear from listening to the new preamp (in combination with the soon-to-be-updated 711 amplifier and a prototype 757 deemphasis unit) that the 727's noise floor, which was already plenty low, is even lower, its resolution considerably increased, and its bandwidth more extended than that of the 725, without much of a change (if any) to the second-gen preamp's lush, beguiling tonal balance. The 727 now offers the incredible detail of the

original 720 (maybe even in a greater amount), without the 720's somewhat leaned-down, more analytic presentation.

To my ear, the 727 also has higher definition than the 725 (or 720). Focus is tighter and more concentrated with individual instruments and vocalists, while the stage remains vast (on recordings with vast stages), and three-dimensionally tube-like body and presence are enhanced. This tightened focus produces clearer delineation and greater "isolation" of instrumentalists within large or small groups vis-à-vis each other and the acoustic space around them, which may simply be a confirmation of Hammer's claims "of more air around instruments and performers."

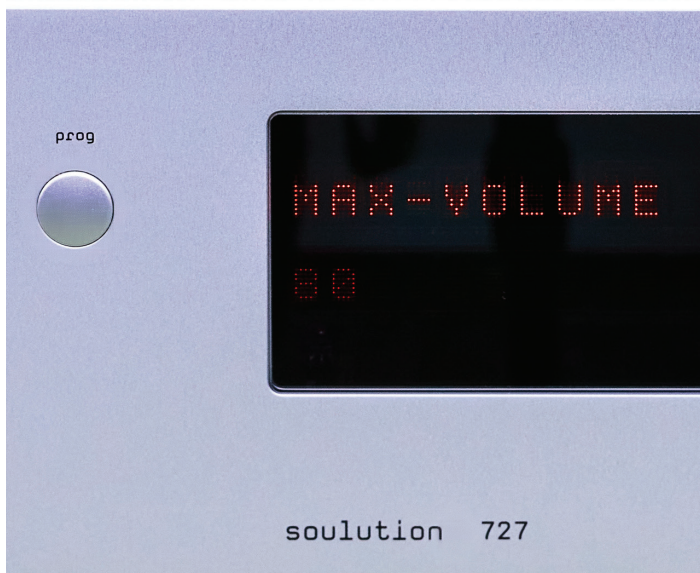
In a way, I have already talked about the 727's new sonic virtues in my review of the remarkable Kalista DreamPlay XC (Issue 344). When I spoke about the superior presentation of the Kalista's CD/SACD player, pointing to the more "complete" and realistic way it parsed the dynamic/harmonic envelopes of individual instruments—the burnished brassiness and mellow roundedness of actual trumpets, trombones, and saxes—I was also talking about the 727, through which the solid, three-dimensional body, the dense tone color, and the dynamic sparkle and effervescence of these brasses and winds were fully reproduced without any blurring of the performers' embouchure (their use of lips, tongue, teeth, and facial muscles) or any veiling of the acoustic (real or artificial) of the recording venue.

This ability to more completely define the nexus of instrument, instrumentalist, recording space, and engineering is, without doubt, a step forward for Soulution and a confirmation of the "higher resolution combined with more lifelike musicality" that Hammer claims for his new preamp. It is also a nifty technological accomplishment. In my experience, increased speed and resolution, greater extension and clarity in the treble, and tighter overall image focus are generally accompanied by a reduction in density of timbre (i.e., a leaning down of tone color as in the original 720) and an accentuation of the starting transient phase of the dynamic/harmonic envelope—e.g., a move toward a quicker,

Considering the sterling specs and sound of the 725, Soulution's claims for its new preamp, in which every circuit has been updated or outright redesigned, are bold: noise reduced by roughly 20dB; bandwidth pushed from 2MHz to 20MHz (!), thus virtually eliminating phase errors in the audio band; common-mode rejection increased by 20dB; channel separation increased by 30dB; and distortion no longer measurable. "The sonic performance of the 727 preamplifier," says Cyrill Hammer, "[has been] pushed to yet another level. The soundstage gets wider and deeper with more air around instruments and performers. [There is] higher resolution combined with more lifelike musicality. There is even more heft and authority in the bass, while smallest details get resolved with greater delicacy."

As was the case with the second-generation Soulution 7 gear, the 727 preamp is housed in the same gun-metal grey chassis as the 720 and 725. The controls are a little different (e.g., there is only one multi-purpose knob now, which is rotated for volume adjustment and, when the unit is put in program mode, for sequencing through and selecting—by pressing the knob with a finger—optional settings displayed on the small, rectangular, front-panel LED screen). It is on the inside that the major improvements have been made.

These changes can be summarized as follows: the input stage, for both unbalanced and balanced inputs, is now controlled by "instrumentation amps" rather than by buffers and differential amps—the payoff being lower noise and higher common-mode rejection; the impedance of the volume control's resistor networks has been reduced to push its thermal noise below the noise level of the input stage, preserving even more low-level detail; the bandwidth of the output stage has been increased to 20MHz, reducing phase shift in the audio band and, thereby, increasing focus and definition (rather as if what would be called parallax in a rangefinder camera had been fully corrected); and the power supply is now a dual-mono SMPS with lower noise, lower distortion, and greatly shortened signal paths. (Let's be honest: As



right in the mid-distance, with almost every voice distinct) in fullest color and dimensions, while David Byrne, also in full color and three dimensions, does his incomparable thing (right down to sign language and Big Suits) at centerstage. It's not just a sonic feast—it's a near-visual, emotional, and intellectual thrill ride. To hear the way the 727 and 757 distinguish Weymouth's Fender Jazz bass lines from the ongoing patter and 40Hz pedal-and-beater thump of Chris Frantz's Rogers toms and kickdrum and the swooping aerial dives of Bernie Worrell's Prophet 5 synth and Minimoog is to hear richly patterned music made from what were

once less distinctly and fully characterized sounds.

Reservations and further thoughts? Well, first, for old Soulution hands like me, the new layout of buttons and knobs takes some getting used to. It's not that it's more complicated; it's just different. Second, the bass in the MBL X-Treme MKII system I'm using was optimized for the four superb MBL 9008 A monoblock amplifiers I originally had in place. The two Soulution 711 dual-mono stereo amps that I've recently installed in their stead—to equally fine effect—require slightly different volume and Q settings than the MBL amps. Dialing in these crossover variables on my own (without the assistance of Jürgen Reis or Jeremy Bryan) has made optimization of the low end also a bit of a moving target, though even without just-so fine-adjustments the Soulution bass is outstanding. (This will *not* be an issue for the vast majority of you.) Third, initially I was of two minds when it came to the 727's undeniably superior imaging. Frankly, I liked the larger, looser images of the 725, which to my ear were quite naturally sized. However, I soon came to think that the 727's almost pinpoint ability to clearly render individual members in a trio or quintet of backup singers or to separate each of the brasses and winds in a rhythm section (or each of the strings of a solo guitar, when it comes down to it) without (and this is essential) sacrificing the softer, more natural edge definition of the 725, was even more realistic—and enjoyable. Fourth, the 727's staging is also a bit different than (and superior to) that of the 725. Where the earlier preamp tended to isolate big, soft-edged centered images by projecting them forward in the mix (like a planar speaker), the 727's more focused but still soft-edged centered images are more completely embedded in the recorded acoustic. With recordings made in real halls or great studios, they aren't being “thrown back” so much as they are being conjoined with the other instruments in a common ambient space. The sense of performers playing in a shared acoustic that is different than that of your room (particularly pronounced when a recording is auditioned with an omni like the X-Treme MKII), is remarkable, as is the sense of the three-dimensionality of images and of the stage itself. Fifth, note that, for the moment, I haven't heard the 727 phono card, though I have no reason to think that Soulution's optional phono stage will disappoint. I've used Soulution preamps with built-in phono cards as my references for a decade and a half, and they've never let me

more minutely detailed “fidelity to sources” balance. In this instance, that is not the case.

Oh, the minutiae and the speed are there, all right. In abundance. Just give a listen to Hans Theessink's *Jedermann Remixed: The Soundtrack* [Blue Groove] on stream or (preferably) disc. The detailing of Theessink's masterful guitar work—the sweet *portamento*-like glissandos of the slide and the sharp *staccato*-like pluck of the fingerpicks—is so sensorially realistic that one can effortlessly visualize the artist and the instrument at play. Not just one or the other—instrument or performer—but both in combination making music (in this case, in an ORF studio through what appear to be closely situated AKG condenser and dynamic mics).

Just for fun (and to test the 727's low end), I revisited *Stop Making Sense* (one of the albums that had so wowed me with the original Soulution electronics two decades ago). Of course, I was using a far better version of the album with the 727 and the 711 than I was with the 720 preamp and the 710 amp 20 years past—Sire's superb 2023 reissue of the soundtrack, re-engineered by Mark Wolfson and Joel Moss in honor of the re-release of the film. It's a sonic blockbuster and a must-own if you're a Talking Heads fan.

Since the sound of the new two-disc LP set is inherently superior—much richer in color and detail and less flat, denatured, and digital (this was among the first digitally recorded albums)—than that of the original Sire release, it is not fair to attribute its virtues solely to the 727 (and the terrific 757 deemphasis preamp). Nonetheless, what I heard on this album in the low end (and everywhere else) is what I heard on LPs, CD/SACDs, streams, and tapes that had not been visited by the Good Vinyl Fairy.

Recorded live at The Pantages Theater in December 1983, *Stop Making Sense* has always been a special treat. How the band managed to perform such complexly scored and staged music *live* is still a wonderment, made even more wondrous through the Soulution 727 (and 757 and 711). All those myriad little musical crosscurrents you *thought* you were hearing back in 1984 are now plainly revealed. It's really a kind of magic to be able to effortlessly follow Tina Weymouth's bass ostinatos, Bernie Worrell's keyboard fills, Jerry Harrison's guitar riffs, Chris Frantz's kickdrum, toms, and crash cymbals, Lynn Mabry, Ednah Holt, Alex Weir, Jerry Harrison, and Frantz and Weymouth's backup vocals (on “Once In A Lifetime,” the ensemble stretches from stage left to

or the music down. Sixth and last, I'm loath to pronounce final judgment on the 727 preamp without hearing it mated with Soulution's newest, completely updated amplifiers, which (alas) won't be available until next year. It is often claimed by TAS reviewers that sterling preamps are more or less colorless conduits to amplifiers of every sort and that what we hear is more the amp than the preamplifier. While I agree that amplifiers often have a stronger sonic stamp than preamps, I don't agree that the best preamplifiers are wholly and colorlessly autonomous. There is, IMO, an undeniable synergy in specific amp/preamp combinations (especially when the duo comes from the same manufacturer), wherein both components show their best in tandem. Though the 711 is scarcely chopped liver (I've never understood this phrase, as I love chopped liver), it may be—in fact, it will be—outdone by the 702 or 712 (or whatever designations Soulution decides on). Which

means, despite its clear superiority to the 725 with the 711 stereo amp, I may not yet be hearing the 727 at its very best.

Final thoughts? This is the most “complete,” the most lifelike preamp I've heard, fully living up to the sonic claims of its designer. Its ability to unearth musical and performance detail, correct “parallax”-like distortion, smoothly though not aggressively extend bandwidth, and better delineate sonic images without upsetting the timbral appletart or sacrificing a jot of three-dimensional body is quite an engineering feat. In fact, as noted, adding this much lifelike musical detail without steering, even slightly, toward the shoals of the analytical is a unique accomplishment in my experience. Naturally, the 727 gets my highest recommendation. The folks at TAS editorial agreed, naming it Solid-State Preamplifier of the Year (see page 62). It is an honor that is well deserved; this is a landmark design.

## Specs & Pricing

### Balanced inputs (XLR): 3

### Unbalanced inputs (RCA): 2

**Optional phono input:** Moving-magnet/moving-coil, RIAA, 40–80dB gain, impedance adjustable

### Balanced outputs: 2

### Unbalanced output: 1

### Frequency response (–3dB):

DC–20MHz

### Phase shift (@20kHz): 0.2 degrees

### Common-mode rejection ratio

(DC–20kHz): >100dB

### Input noise density (20–20kHz):

<–160dBV/√Hz

### Channel separation (@20kHz):

127dB

### Dimensions: 480 x 167 x 450mm

### Weight: approx. 30kg (66 lbs.)

**Price:** \$74,975 (optional mm/mc phono card \$11,975)

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### Distributor)

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### JV's Reference System

**Loudspeakers:** MBL 101 X-Treme MKII, Magico S3, Stenheim Alumine Five SE, Estelon X Diamond Mk II, Magnepan LRS+, MG 1.7, and MG 30.7

**Subwoofers:** JL Audio Gotham (pair), Magico S-Sub (pair)

**Linestage preamps:** Soulution 727, MBL 6010 D, Siltech SAGA System C1

**Phonostage preamps:** Soulution 757, DS Audio Grand Master EQ unit

**Power amplifiers:** Soulution 711 (two), MBL 9008 A (four), Siltech SAGA System V1/P1, Odyssey Audio Stratos

**Analog source:** Acoustic Signature Invictus Neo/T-9000 Neo, Clearaudio Master Innovation, TW Acoustic Black Knight/TW Raven 10.5

**Tape deck:** Metaxas & Sins Tourbillon T-RX, United Home Audio Ultima5 OPS-DC

**Phono cartridges:** DS Audio Grand Master, DS Audio Master1, DS Audio DS-W3, Clearaudio Goldfinger Statement II, Air Tight Opus 1, Ortofon MC Anna, Ortofon MC A90

**Digital source:** MSB Reference DAC, Soulution 760, Kalista DreamPlay XC

**Cable and interconnect:** Synergistic Research SRX Revised, Crystal Cable Art Series Da Vinci, Crystal Cable Ultimate Dream

**Power cords:** Synergistic Research SRX Revised, Crystal Cable Art Series Da Vinci, Crystal Cable Ultimate Dream

**Power conditioner:** Synergistic Research Galileo PowerCell SX (two), AudioQuest Niagara 5000 (two), Technical Brain

**Support systems:** Critical Mass Systems MAXXUM and QXK equipment racks and amp stands and Center Stage<sup>2M</sup> footers

**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:** DS Audio ES-001, DS Audio ION-001, SteinMusic Pi Carbon Signature record mat, Synergistic Research Vibratron SX, Synergistic Research Atmosphere Satellite Mini (two), Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Clearaudio Double Matrix Professional Sonic record cleaner, Synergistic Research RED Quantum fuses, HiFi-Tuning silver/gold fuses

## Cyrril Hammer on the Differences Between the 727 and the 725 Linestage Preamplifiers

### What were the design goals in the 727 preamp?

The key design goals for the 727 preamplifier were: a) to further reduce noise generated by the unit; b) to further increase common-mode rejection of the balanced inputs; and c) to further reduce phase errors in the audio band by increasing the bandwidth. All the stages (input, volume control, and output) as well as the power supply in the 727 preamplifier had to comply with these target goals.

### How does the input stage of the 727 differ from that of the 725?

The 725 had separate stages for the balanced and unbalanced inputs. The unbalanced input featured a low-noise voltage buffer; the balanced input used a standard differential amplifier, which provided common-mode rejection but added slightly more noise than the voltage buffer of the unbalanced input. (This is a major drawback of differential-amplifier design: Either you can optimize it for lowest noise and compromise on common-mode rejection or vice versa, but there is no way to optimize both parameters.)

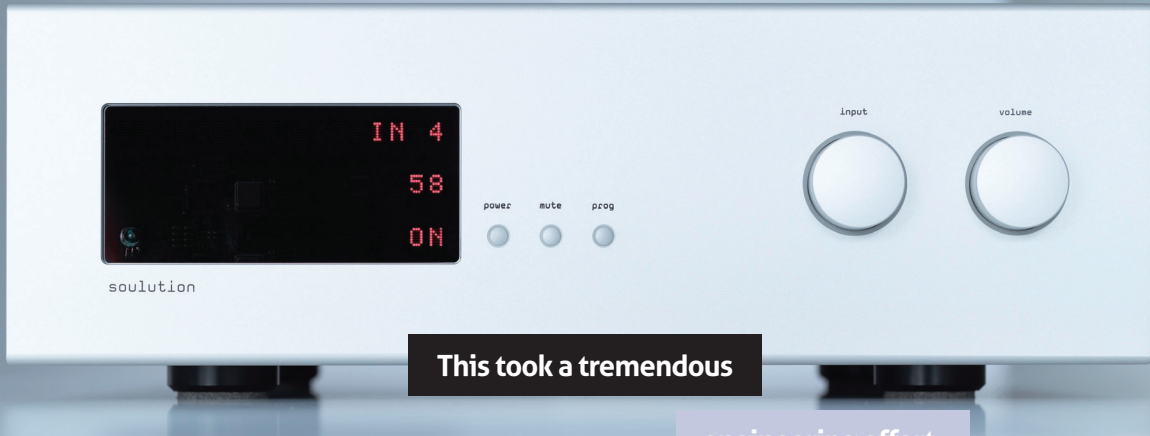
The input stage of the 727 uses a more complex structure called an instrumentation amplifier, which allows optimization for both lowest noise and best common-mode rejection. The drawback to this structure is that it requires at least three op-amps, instead of just the one required for a standard differential amplifier. (So, higher-priced components and more PCB space are required.)

The input stage of the new 727 preamplifier is made of eight instrumentation amplifiers (with four op-amp structures in each), working in parallel and thus further reducing the noise of the input stage. In order to achieve a bandwidth of 20MHz and lowest input noise, off-the-shelf instrumentation amplifiers were, of course, not an option. The input stage of the 727 preamplifier is

built from 32 ultra-low-noise, audio-grade, Burr-Brown op-amps and ultra-precise metal-film-resistor networks for lowest noise and best possible common-mode rejection. This took a tremendous engineering effort, but it paid off in sonic performance. In the 727, the new input stage is used for *both* the balanced and unbalanced inputs.

### And the volume control?

The basic structure of the 727's volume control is very similar to the structure used in the 725. As in the 725, it features two volume-control paths: a high-quality path, which is active when playing music; and a click-free path, which is only active when altering the volume. Though the device is similar to what we had in the 725, the impedance of the respective resistor networks in the 727 volume control has been reduced considerably in order to push the thermal noise of the resistor network well below the noise level of the input stage. No details should be lost in the volume-control stage. The click-free path is conceptionally the same as that of the 725, based on the integrated circuit PGA2320 from



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Texas Instruments—a chip that is often used in high-quality products as the main volume control.

#### What has changed in the output stage?

The bandwidth of the output stage was increased from 2MHz in the 725 to 20MHz in the 727. This has a significant impact on the phase response of the unit. The lower bandwidth of the 725 does shift the phase between DC and 20kHz by approximately 2°; the higher bandwidth of the 727's output stage brings this phase shift closer to zero (< 0.1°).

#### Finally, what has changed in the power supply of the 727?

The 725 featured one "stereo" power supply used for both channels. A centralized "linear" power supply with a big toroidal transformer, rectifiers, filter capacitors, and a linear regulation stage generated the required voltages. It often goes unnoticed, but the rectifiers in so-called "linear" power supplies are switching devices. The switching frequency is 50 or 60Hz, depending on the mains supply. These rectifiers will, of course, generate a lot of harmonics, which widely propagate across the audio band. Subsequent filter and regulation stages are required to bring this noise down to minimal levels. In the 725 we used more than 500,000uF of capacitance and two regulation stages to filter this noise to acceptable levels.

The supply voltages were then distributed locally via cables to the audio sections of the left and right channel. Cables and long traces on PCBs introduce inductance into the supply rails, which limits the supply of high-frequency current to the sinks (op-amps, transistors). To offset this inductance, local storage capacitors were placed close to the sinks. These capacitors had to be rather large to do their job; therefore, they usually could not be placed as ideally close to the current sinks as the engineers would prefer.

The 727 power supply has a completely different structure.

First of all, it is a dual-mono design, which features a separate power supply for each channel. Part of each power supply is still centralized in a well-shielded compartment so that there will be no interference with the analog section. This is where all the switching takes place. The final regulation stage, which provides the current to the sinks, uses multiple local voltage regulators.

The centralized switched-mode power supply (SMPS, switching at 60kHz) converts the mains AC voltage to an intermediary DC voltage. The following DC-to-DC converter (switching at 400kHz) brings the supply voltage close to the required level for the analog sections and filters most of the switching noise generated by the SMPS. The DC-to-DC converter is followed by a low-noise (spot-noise <4uV/rtHz), wideband (>1MHz), low-dropout linear regulator (LDO). This low-noise and stable supply voltage gets distributed via copper planes throughout the PCB.

Next to each current sink (op-amp, transistor) there is a local, ultra-low-noise (spot-noise <2nV/rtHz), low drop-out regulator (LDO), which brings the voltage down to the required level. These high-performing integrated circuits are very small (3mm x 3mm) and can therefore be placed very close to the active current-sinking device. In the 727 preamplifier, the local regulators sit on the bottom side of the PCB right underneath the active devices. With this layout the traces from the final regulation stage to the sink are very short (<2mm). Apart from providing an ultra-low-noise supply voltage, this also ensures shortest signal paths. There are more than 40 local regulators per channel. **tas**