SOULUTION 717 POWER AMPLIFIER

WITH TIME ON YOUR SIDE

BY JONATHAN VALIN • PHOTOS BY MATT WRIGHT-STEEL


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LET'S START WITH A LITTLE HISTORY.

It was in 2010, 15 years ago, that I heard my first Soulution amplifier—the 710—and in many respects, it was a uniquely memorable experience. As I wrote back then, "I've listened to a lot of audio equipment over the years, but I can count on one hand (without using all my fingers) the number of times I've heard something that was fool-me realistic. The first time this happened—way back in the early 70s—was when I auditioned the Magneplanar I-U's with Audio Research electronics and got tricked into thinking I was hearing the actual grand piano that was in the apartment being played behind the 'decorative screens' at the far end of the room. (The screens were the Maggies, of course, but back then I didn't know they were loudspeakers.) The last time this happened to me was about a year ago when I listened to Steve Hoffman's remastering of Joni Mitchell's *Blue* [Warner] and heard the way her backup vocals had been potted into the mix with such clarity that I felt as if I were standing in the engineering booth alongside the recording engineer, listening to him mix the multi-track mastertape down to two-channel master. It wasn't the same experience as the Maggie/ARC of years past. I wasn't being fooled into thinking that an actual instrument was 'there' in the room with me; instead, I was being fooled into thinking that *I* was 'there' at the mastering sessions, listening to recorded instruments being played back and mixed from separate tracks. In neither case was I aware that I was listening to speakers and electronics. All sense of hi-fi simply vanished."

The amplifier that pulled this trick off was the aforementioned Soulution 710, the brainchild of Cyrill Hammer, the founder of the Swiss high-end audio firm Soulution, and the late Christoph Schürmann, formerly of the German company Audiolabor and at the time working for Cyrill. It took the pair better than half a decade to perfect their circuitry, but perfect it they did. The result was astounding. As I said at the time, "with a transparent-enough speaker and source, the Soulution 710 simply isn't audible in most of the usual ways that solid-state or tube amps are audible. It isn't dark, and it isn't light; it isn't warm, and it isn't cool; it isn't liquid, and it isn't dry; it isn't fat, and it isn't lean; it isn't sweet, and it isn't sour; it isn't great at the frequency extremes but less lifelike in the midband; it isn't flat or airless, and it isn't bloated or overly bloomy; it isn't terrific on starting transients and AWOL on stopping ones; it isn't too tightly focused, and it isn't too loosely defocused; it just isn't. And since it isn't, speakers (at least those capable of high levels of transparency and neutrality) aren't, either."

IT IS ALSO HOW THE SOULUTION 710 WAS ABLE TO REVEAL THINGS LIKE JONI MITCHELL'S OVERDUBBED HARMONIES WITH SUCH UNEXAMPLED CLARITY.

How Cyrill managed this disappearing act is a story I told in my first Soulution review and have re-told in subsequent ones. The secret was and is the use of ultra-high-bandwidth circuitry—in the case of the 710, a bandwidth of 2MHz. Why, you may wonder, is such absurdly high bandwidth necessary, when all we can hear, at least when we're young, lives between 20Hz and 20kHz? I'll let Cyrill answer the question:

"For a solid-state amplifier design, the speed (e.g., the bandwidth) of amplification is one of the most important criteria. This speed or bandwidth has nothing to do with the MHz-range frequencies that can be reproduced by such an amplifier; the bandwidth is required to make the 'feedback loops' of solid-state designs work properly. Feedback loops compare the amplified music signal at the output with the input signal. Due to the fact that the music signal is constantly changing, the time delay (propagation delay) of the amplifier must be zero; otherwise, applying feedback will add timing errors to the music signal. In other words, if the propagation delay is not zero or close to zero the feedback loop will be comparing apples at the output to oranges at the input.

"Big solid-state amplifiers can have propagation delays of 1–5 *micro*seconds (one millionth of a second). Now, the period of a 20kHz sine wave is 50 microseconds. Under these conditions, such timing delays are significant. The Soulution amplifiers work with an overall propagation delay of 5–10 *nano*seconds (one billionth of a second). This is up to 1000 times faster than other amplifiers. The voltage amplification stage—where we apply the most negative feedback—runs at 80MHz bandwidth and has a propagation delay of 1–2 nanoseconds. Since the timing errors of the Soulution amplifiers are negligible, this gives us the opportunity to apply as much negative feedback as we need wherever it is required in the amplifier without reducing sonic performance. This is how we can lower distortion to never-before-seen levels." It is also how the Soulution 710 was able to reveal things like Joni Mitchell's overdubbed harmonies with such unexampled clarity.

Now, it is a fact that some listeners do not want to hear this much information this clearly. It's not that it makes the presentation overly "analytical"—or not exactly—but rather that it reveals artifacts (like mike preamp clips and overdubs, as well as every mechanical noise that a musical instrument is capable of making when played close by the diaphragm of a microphone) that other, less transparent amps and preamps gloss over, and that the musicians and recording and mastering engineers probably didn't want or intend for you to hear this plainly. While I reveled in this wealth of detail for all the previously unheard subtleties of music, performance, and recording that were revealed, some members of my little listening panel weren't so sanguine. A few of them felt the 710 was just a bit *too* revealing.

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Listening through the 710 did require a sonic adjustment. It was not an amp you would have ever called warm—or cold, for that matter. It just didn't have a color of its own; like glass or water it had the color of what you saw through it or reflected by it. If a recording was "highly manipulated," "hot," "dull," "dry," or "gorgeous," it would tell you with the added bonus of telling you *why* this was the case (by revealing everything that a piece of vinyl or polycarbonate can retain of the recording/mastering process). It was like a laboratory instrument for audiophiles who wanted to hear all that could be heard—ideal for fidelity-to-source listeners, nearly as good for the absolute-sound crowd, but probably not the right, uh, solution for the musicality-first group.

Enter the Soulution 711. It took Cyrill (Christoph Schürmann no longer worked for the company) five years to improve upon the 710, and quite appropriately the only way to gauge the difference between the 711 and the 710 was to listen to both. You certainly couldn't tell what had been changed from the outside—the two amps were identical in looks and functionality. On the inside, however, there was a big change. The transformer-based power supplies of the 710—unusually complex in design even for an amplifier in which everything was complexly designed (the 710 had more than 3000 individual parts)—were replaced with fully shielded and regulated switch mode power supplies (SPMSes), just as they had been in Soulution's previously introduced 501 amplifier and for the same reason—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 (permitting it to create higher voltage), Soulution was able to omit the 710's noisy cooling fans in the 711. 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 do, improving the performance of the amp itself and of ancillary electronics that are 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 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 the wall proved to be a problem in most homes).

What this translated to sonically was an amplifier 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 then heard from solid-state. What had been an exceedingly neutral, exceptionally detailed, but borderline clinical sound became an exceedingly musical one, with only slight losses in the

UNLIKE THE 711, WHICH WAS ESSENTIALLY A 710 WITH DUAL SMPSES (RATHER THAN THE ORIGINAL LINEAR POWER SUPPLIES), THE 717 IS A GROUND-UP REDESIGN.

astounding resolution and transparency to sources that had made its progenitor so special. No, the 711 was no longer as neutral in tonal balance as the 710; it was markedly darker (more bottom-up) sounding, thanks largely to its simply phenomenal bass reach, timbre, and clout. But with its richer tonal palette and added sonic heft, it was more 3-D in imaging than the 710. Though not the equal in this regard to a great tube amplifier, it was still the first solid-state amp I'd heard that more than hinted at the volume of sonic images, giving voices and instrumentals a bas-relief dimensionality that brought them closer to what the real things sound like in concert. If the 710 had been about the many different parts that make up the sonic picture, the 711 was more about the wholes that comprise those parts. This veritable sea-change in sonic presentation turned Soulution's 7 Series flagships from partly recommendable to fully recommendable—this was a sound that was detailed and transparent enough to please fidelity-to-source listeners, lifelike enough to satisfy the absolute-sound contingent, and beautiful and powerful enough to thrill the musicality-first majority.

It has now been 10 years since the 711 was introduced (unlike many marques, Soulution does not change its offerings with the seasons). So, its new amplifier, the 717, is a welcome arrival.

By the way, when I used the word "new" in the last sentence, I didn't mean "latest." Unlike the 711, which was essentially a 710 with dual SMPSes (rather than the original linear power supplies), the 717 is a ground-up redesign—so "new" that, as Cyrill points out in the sidebar interview, you would be hard put to find the same two component parts in both amplifiers.

When everything from the traces on the (now 14-layer) PC boards to the nuts-and-bolts componentry soldered onto those boards to the design of the circuits themselves has been changed, it is hard to know where to begin. Perhaps it's best to start with what hasn't changed, which is Soulution's fanatical commitment to the undiminished and unaugmented preservation of the input signal—in Soulution's case, through the application of global and local negative feedback via ultra-high-bandwidth (i.e., incredibly fast and accurate) feedback loops.

In its new attempt to build an amplifier that offers highest fidelity to sources, Soulution began by revising the circuit layout. In the 717, the left and right channels have their own (14-layer) PC boards and are thus completely separated from each other, resulting in much better channel separation (>120dB) than previous models. The 717's input stage has also been made anew. As in the company's 757 and 727 preamps, the 717 uses parallelized instrumentation amplifiers (rather than the customary

buffered differential amps) for wider bandwidth (20MHz), lower noise, and optimal common-mode rejection (CMMR >105dB), ensuring that even the faintest musical signals will be amplified. With a bandwidth of more than 2MHz, a loop gain greater than 120dB (DC), and an ultra-linear feedback network, the 717's voltage stage sets a new benchmark in phase coherence (<0.2° shift at 20kHz) and low distortion (<–165dBV input-related noise density). The 717's current amplifier stage now features 16 power transistors per channel working in Class AB (mostly in Class A). A smart bias-current control circuit measures the instantaneous current of each transistor and controls its idle current to provide optimal operating conditions. Four ultra-high-peak-power (2100W for 5 seconds) switch mode power supply modules provide the rail voltages of the output stage. Soulution claims that with these new SMPSes short current pulses of 400A and more are readily attainable, though for safety's sake, continuous current output is limited to 32A per channel. Distributed local power supplies, with highly efficient DC-to-DC converters and extremely fast, low-noise linear regulators seated right next to the active devices, power the small signal section of the 717, ensuring lowest noise and shortest signal paths. (For considerably more technical details about what all has changed in the 717 rebuild, I refer you to the sidebar, where Cyrill Hammer and Fabian Morant discuss what they've done.)

The 717 is not just a completely different critter on the inside. Even though it's housed in precisely the same Bauhaus-handsome aluminum chassis as its predecessors, the new amp functions differently than previous Soulution offerings. For one thing, Soulution has added a Mute button on the front panel in place of the Mode button. It has also replaced the Program button with an Input button for switching between the two XLR inputs. These changes make it much easier to engage with the most needed functions, but they mean that switching among Stereo, Dual (bi-amp), and Mono modes requires using the included remote control. In what is perhaps the most significant change, the 717 is now designed to function as both a stereo amp and a monoblock. (Unlike its previous 7 Series lineups, Soulution no longer offers separate mono and stereo amplifiers.) In addition, the 717's two output channels can be used separately to bi-amplify a loudspeaker, making it rather a jack of all amplification trades. Because it is biased so far into Class A (and the transistors are sited beneath the top edges of the chassis), Soulution's new statement amplifier runs extremely hot—too hot to touch, actually, if it's been on for a while. (This was not the case with previous Soulution amps, mono or stereo, so keep it in mind if you're trying the 717 out.)

With new records set in terms of noise, phase errors, common mode rejection, and distortion, the 717 is a technical *tour de force*. The question becomes: How does this ground-up redesign sound? Does this greatly-improved-on-paper amplifier outdo its outstanding forebears? I'll give you a hint: Yes, it does and not by a little bit, though not always in the ways you might think.

The first thing I listened to (through the 727 linestage, the 757 de-emphasis preamp, and two 717s operating as monoblocks in bi-amp mode) was an old-favorite cut of vinyl, Dean Martin's

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HOWEVER, IT QUICKLY (AND HAPPILY) BECAME APPARENT THAT THE 717 WASN'T ABOUT THE ISOLATION OF DETAIL VIA AN EMPHASIS ON STARTING TRANSIENTS.

"I'm Confessin'" from Acoustic Sound's celebrated 45rpm remastering of *Dream with Dean*. While this LP has always sounded great regardless of ancillary gear, this time around it sounded magical. No, Dean didn't have quite the same in-the-room-with you presence he had with ARC's marvelous tubed REF 330Ms, but his voice was considerably more three-dimensional than I'd heard it sound in the past through solid-state amplifiers, Class A or AB. The 717's imaging was life-sized (not reduced) and softly rounded, as in bas-relief, and its tone color was extremely voluptuous, darker and richer than the ARC's dead-center neutral presentation but just as lifelike and even more seductive. In fact, all the instruments—from Ken Lane's piano to Barney Kessel's guitar to Red Mitchell's standup bass and Irv Cottler's drum kit—were imaged with this same three-dimensionality and lifelike density of color, without any losses (in fact, with noticeable gains) in the continuousness that makes them sound less like independently recorded voices and more like a small jazz combo playing together in the same space at the same time.

You might expect that an amp that is considerably lower in virtually every kind of distortion would sound a great deal more finely detailed. However, that is not exactly the case. Oh, all the familiar little details are there—such as Dean swallowing a few words of the lyrics at the close of "Confessin'" or Frank very occasionally landing a bit off-pitch on the highly affective, must-buy Blue Note reissue of *In The Wee Small Hours*. (On "I'll Buy that Dream," I still smile when Dino takes that auto-gyro to honeymoon in Cairo or when he and his new missus settle down in Dallas "in that little cuckoo palace." I guess you can take the boy out of the Rat Pack, but you can't take the Rat Pack out of the boy.) However, it quickly (and happily) became apparent that the 717 wasn't about the isolation of detail via an emphasis on starting transients (the bane of many solid-state amplifiers). It was about incorporating the little things into the bigger picture. It was about the melding of parts into lifelike wholes.

Take Red Mitchell's double bass, for example. On "I'm Confessin'," his contributions were certainly clearer than they'd been in the past. But, importantly and unusually, they were also more musically complete. With the superb Vitus SM-103 Mk.II or the JMF HQS 7001 monoblocks (or Soulution's 711, for that matter), plucked bass notes aren't always fully "rounded off" at the finish, the way they are in life. Typically, you hear the transient pluck, followed by the pitch, timbre, and intensity of the sounded note, and then, usually, a slightly amorphous decay. It's as if the fabric of the dynamic/harmonic envelope were frayed at its trailing edge, like the fringe of a scarf or a shawl.

With the 717, this is not the case. The sound of the note finishes with the three-dimensional solidity of an ebony carving. Development and decay aren't slightly curtailed or condensed. The duration of the dynamic/harmonic envelope is fully complete, as it is in life.

When I first heard this highly realistic effect, I was shocked. Truth is I'd never heard it quite as clearly before on a stereo system, even with Soulution gear, which was my reference standard for the bottom octaves. Such durational completeness is, in my experience, unique. Not only does it realistically (and literally) sustain the last of the development phase and the entire decay of a low bass note; it also adds lifelike body, temporal structure, and three dimensionality to the instrument that is sounding it. You hear the whole of the double bass—not just the strings and neck but also the upper, lower, and C bouts, the bridge, the soundpost, the bass bar, and the volume of wood-colored air inside the instrument—and you hear the contributions of these parts with correct timing, as the note starts, develops, and finishes at an uncannily natural pace.

Such remarkable durational accuracy and completeness aren't confined to the low end. On something like Hans Theessink's slide and acoustic guitars, mandolins, and mandocellos from my oft-played CD of *Jedermann Remixed—The Soundtrack* [Blue Groove], I noted something else I hadn't heard so clearly before (if at all). Once again, these details didn't stand out as if spotlit or isolated, but at the start of a note the transient sound of thumb and fingertips brushing the strings and during the development and decay phases the rather beautiful harmonics of the slide glissandos and fingerpicked melodies of Theessink's instruments were suddenly there to be savored in their entirety, albeit at an appropriately reduced intensity, part and parcel of the sonic event. It made the instruments and instrumentalist seem ever so much more lifelike and "there."

What was producing these musical revelations? A combination of things, I think. For one, in its new amplifier (see the sidebar below), Soulution put great emphasis on eliminating phase shifts, which essentially are timing errors that cause artificial lags or leads at specific frequencies or in specific frequency bands, resulting in the unnatural diminution or amplification of certain phases of the dynamic/harmonic envelope on affected notes. For another, Soulution has, as I've said, biased its output stage heavily into Class A—so heavily that when I first started listening to the 717, I immediately thought of the Class A Vitus monoblocks I reviewed last year. (Fully warmed up, the 717 has much—not all—of the liquidity and every bit of the same gorgeous timbre of the Vitus SM-103s.) Coupled with its unique phase accuracy and standard-settingly low noise, the 717's Class A liquidity allows considerably more musical detail to be folded into the mix, rather than standing apart from it. Much greater detail is there, all right, but thanks to the 717's unique alignment in time and frequency, it only exists in the context of the whole it makes up. This is what I meant when I wrote that the 717 sounds better than its forebears but not always in the ways you might think. For a nominal Class AB transistor amplifier, the 717 demonstrates a completeness and organicism that are unparalleled in my experience.

When it comes to large ensembles—such as the Cleveland Symphony under Szell performing Janáček's thrilling *Sinfonietta* on Columbia LP or Eliades Ochoa, Compay Segundo, Ibrahim Ferrer, et al.'s irresistible "Chan Chan" on the 15ips Acoustic Sounds' Ultra Tape version of *Buena Vista Social Club*—several of the other improvements Soulution has engineered into the 717 come into play. With channel separation that is now greater than 120dB, a damping factor greater than 10,000, pulse power greater than 6000W, and an SNR of 120dB, you had better believe that the 717 lights up a stage, actual or ersatz, with tremendous width, depth, height, air, energy, and three-dimensionality. As Dave Denyer of *The Reel-to-Reel Rambler* (a site that I highly recommend) wrote about the selfsame Acoustic Sounds' *Buena Vista Social Club* Ultra Tape I listened to: "Whereas all the other versions [of this music] portray the wonderful space, the air, the venue, the acoustic, the tape really takes you there. Man, you can pretty much smell the dust, the sweet cigar smoke. You can feel the early morning sun baking the dry earth, burning away the dew." This may sound like hyperbole, but I assure you that—through the 717s, the 727 linestage, the 757 deemphasis preamp, and the Metaxas & Sins Papillon tape deck—it is not. In fact, I had virtually the same reaction Dave did upon auditioning it: The soundstage just seemed to come alive, as if you'd been transported in time and space to the recording session.

I could go on (well, actually, since I've written close to 7000 words at this point, I couldn't) with musical example after musical example from every genre. But the bottom line would stay the same: The 717 is the most lifelike solid-state amplifier I've yet heard—and I've heard some truly great ones. Its sensationally complete and accurate way with the durations of notes, its remarkably solid and three-dimensional imaging, its seemingly limitless speed and power, its gorgeous tone color, its phenomenal bass and midbass, its holistic handling of detail, its superb staging make it (alongside the ARC REF 300M, which has its own nonpareil set of tube-like virtues) one of the three or four best amplifiers I've heard in a lifetime of listening. Obviously, you should try to audition it (preferably with its companion linestage and de-emphasis preamp). I assure you you're in for a uniquely musical treat.

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JV TALKS ABOUT THE 717 AMPLIFIER WITH SOULUTION CEO AND CHIEF ENGINEER CYRILL HAMMER AND SOULUTION R&D DIRECTOR FABIAN MORANT

The first thing that struck me about the 717s was how much better they were than the (already outstanding) 711s I'd been using, even in the bass, which was a shock, given Soulution's nearly unparalleled excellence in the bottom octaves. What all have you done to get so much more resolution from this amplifier and get it without losing Soulution's trademark continuousness and organicism (where parts and the wholes they comprise are given equal sonic weight)?

Cyrill Hammer: Whereas the 711 was an evolution of the original 710, this new 717 amplifier is a clean-sheet effort from the ground up. While our core philosophies remained unchanged, we questioned every element of the 711's design, and there are most likely not even two of the same components used in both amplifiers. In short, we started from scratch and changed everything.

Following our credo of "no additions, no deletions," the most important design goal was always to preserve signal integrity along the entire signal path. By using everything we had learned in 20 years of development and at the same discarding all the limitations of our legacy designs, we were once again able to push the limits of what is possible. The 717 is an amplifier with a significantly lower noise floor, less harmonic distortion, and greater signal integrity than what we achieved with our previous designs.

Fabian Morant: "No additions, no deletions" sounds simple in concept, but implementing it in an electronic component requires a great deal of fresh thinking vis-à-vis previous designs. What is the best topology? Can we benefit from new components with even better performance? Do we benefit from adding components in one place or reducing them in another? Investigating these questions led us to several areas of improvements.

- **More Feedback**: Gain stages built from active devices like FETs, BJTs, and tubes are all non-linear in performance. The most powerful methods for improving linearity and load stability are global and local negative feedback. Fundamental principles of electronics prove that when it comes to adding global and local feedback more is better. The 710 and 711 demonstrated that when applied correctly increased global and local negative feedback reduces distortion and increases musical realism. Building on this success, we improved the feedback loop gain, resulting in a wider bandwidth and lower noise floor. Additionally, by carefully selecting the most precise components, we achieved a sound that is finer, smoother, and more precise.

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- **New Final Gain Stage**: We also changed the last stage of the forward gain block, from a pure current gain (as in 710 and 711) to a push-pull design that increases both current *and* voltage. This reduces the demands on the previous gain stages and allows the amplifier to be less affected by whatever loads are put on the input and output.

- **Heavier Class A Bias:** This new power output stage is biased heavily into Class A and managed by a completely new bias-current control circuit. The actual amount of bias current on each transistor is constantly measured and adjusted individually in a control loop. The bias current thus remains independent of temperature, and the transition point from Class A to B is precisely controlled. Although higher bias current was not an intentional design goal, it was necessary for the chosen transistors, enabling the 717 to deliver the majority of music within Class A. Of course, this heavy Class A bias is easy to notice through the higher temperatures of the 717's heat sinks.

- **Improved Power Supply Design:** Using switch mode power supplies provides many advantages over large toroidal transformers as they eliminate the largest source of AC power hum and other noise in the audio band. Each amp channel of the 717's dual-mono design is supported by two new low-impedance power supplies, which can provide immediate access to as much as four times their rated power. Direct coupling them to the amplifier circuit boards further reduces impedance of the voltage supply lines. This allows faster access to power with smaller filter capacitors which can be situated even closer to where they are needed. Ultimately, it's the rapid access to power, not just the sheer nominal power rating, that enhances sonic clarity.

- **Carefully Selected Components:** We thoroughly tested every potential 717 component to find the best choice for lowest noise and highest linearity, regardless of conditions. With many common components, we found that variations in current, voltage, or temperature could alter their performance by as much as 50%. Any deviation from ideal means that part will introduce some form of noise or distortion. So, we spent a substantial amount of time testing and selecting the highest-grade components to deliver clean and consistent performance over a lifetime of use regardless of temperature and load.

- **Circuit Layout:** Due to the complexity of the 717's design and the need for higher power handling on certain signal traces, we decided to use a very advanced 14-layer circuit board. This allowed us to carefully arrange components and design the traces in between components to have the lowest impedance and to best maintain signal integrity from input to output.

"TO VALIDATE THESE NEW FEATURES, WE WERE FORCED TO MAKE THE 717 THE MOST THOROUGHLY TESTED PRODUCT IN OUR HISTORY."

For the 717, there is no one aspect of the new design that accounts for the improvement in performance. The result is the sum of all these new parts and circuits.

CH: Adding to what Fabian has said, there was another set of challenges we had to consider with the 717. Because the amp has such a large instantaneous power capacity and wide output bandwidth, there was a much greater potential that it could damage itself or connected speakers under adverse operating conditions, such as clipping, DC, or high-frequency noise. Previously, our 701 and 711 amplifiers monitored their outputs for certain harmful conditions, but we wanted to go much further with protections on the 717.

For example, most amplifiers will continue to play louder if driven past the point of clipping, even though this is the most common cause of speaker damage. For the 717, we decided to add protection against clipping by monitoring the input signal and "muting" it if the input voltage reached a level that would result in clipping. This allowed the 717 to react to and prevent clipping before the excess output could damage the speakers.

Another common cause for speaker damage is sharp impulses that come from the DC-offset changes that are typically induced by hot plugging (connecting or disconnecting a component while a system is running). The 717 monitors its inputs and outputs and will quickly "mute" the signal path if the DC voltage is too high at either end.

Another challenge we had to overcome is a consequence of certain new digital components. Increasingly, we are finding DACs and digital source components which output a significant amount of noise at harmonics of their sampling rates such as 384kHz, 768kHz, or even higher. Since the 717 provides linear output up to 2MHz, whatever high-frequency noise comes in will be amplified. This inaudible noise is usually no problem for the speakers, but depending on their amplitude, the amplifier could overheat quickly. So, we created another advanced monitoring circuit that will "mute" the signal path if there is a rise in noise above 300kHz.

All these advanced protections require more logic and control than we have ever considered in an amplifier design. To validate these new features, we were forced to make the 717 the most thoroughly tested product in our history. On the downside, though, waking the 717 from standby requires a longer boot process, but we feel that is a small price to pay for this level of performance and advanced protection. Also, if the client's setup has any grounding issues, DC offset, or high-frequency noise, the 717 will unmistakably let you know something needs attention.

Your preamps and amplifiers were the first solid-state components I'd heard that preserved the three-dimensional body and

bloom of sonic images. Though not the equal of great tube amps in this regard, the 717s are even better at this essential task than your previous offerings. In your literature, you put an emphasis on broadband phase coherence. Is this the reason for the 3-D solidity of the 717's imaging? Are other factors also playing a part?

CH: Yes, phase response is the key parameter in achieving a solid 3-D representation of a music recording. If we polled audiophiles about what they consider important for a power amplifier, the results would probably look like this: 1) power rating; 2) low harmonic distortion; 3) low noise; 4) frequency response. Phase response would surely not be on their lists, when it really should be near the top.

Engineering theories state that any electronic system can be measured and defined by both time-domain and frequency-domain analysis. These two domains are not independent of each other; they are simply two different ways to measure or define an electronics system. Optimizing electronics for frequency response is very important, of course, but it is only one-half of the goal. It is equally important to optimize the phase response of a system, or else the output signal will not be accurate in the time domain. In analog electronics, it is challenging to deliver both linear phase and linear frequency response across all frequencies, but this is essential to recreate the 3-D image contained within a musical recording.

As we listen to music, our hearing is rather forgiving of small differences in a signal's amplitude at various frequencies. However, even tiny errors of phase and timing at those same frequencies are immediately heard as unnatural. Our foundational belief at Soulution is that electronics should not change a music signal in any way other than amplifying it by the desired gain factor. To accomplish this, our products must accurately preserve both the frequency and phase content of the recorded music signal. Otherwise, it is not possible to recreate the relaxed, natural sound of real music.

FM: As Cyrill pointed out, the strictest criterion for accurate signal transmission is that the output must be an exact replica of the input, only enlarged in its amplitude. This means that the system must maintain a phase response that is as linear as possible under all conditions and that cannot vary due to changes in the signal's frequency, current, or other factors such as temperature.So, how could we construct an amplifier to achieve this?

Due to parasitic capacitance and inductance, every electronic circuit has an upper-frequency limit beyond which the signal becomes attenuated. Unfortunately, this low-pass behavior exhibits a non-linear phase response. However, at lower frequencies, well away from the roll-off point, such non-linearity is minimal. So, to achieve the most linear phase response for an audio signal, we wanted this roll-off frequency to be as high as possible. Listening to prototypes proved that each increase in bandwidth made the reproduced sound more natural and pleasant, reinforcing our pursuit of wider bandwidth.

What distinguishes the 717 design from its predecessors is its ability to maintain a stable phase response across all signals and power levels. In earlier designs, the amplifier would slightly change its roll-off frequency in sync with the rhythm of the music, dynamically varying the delay for different frequency components. This phase modulation compromised perceived coherence.

We therefore carefully selected components that were stable across varying temperatures and power levels and chose a circuit topology that minimized the remaining non-linearities.

With the advent of tariffs, the price of imported goods has risen. This is particularly true of Swiss gear, where tariffs were initially set at 39% (recently reduced to 15%). How are you (and your distributors) planning to handle this penalty without pricing yourselves out of the market?

CH: Certainly, this has been a challenge. In late November, we finally got good news of a U.S.-Swiss trade deal that brought tariffs down to 15%. However, when you factor in the exchange rate of the U.S. dollar to Swiss francs, U.S. import costs on Swiss products are still up more than 30% since early 2025. That is an enormous cost increase in such a short amount of time. Fortunately, we have a great North American partner in AXISS Audio, and together we have been able to work out a plan to minimize this cost impact as much as possible.

Most importantly, we did not want to react impulsively to the ups and downs of U.S. trade negotiations. If buyers see a large price increase when tariffs go up, should they expect a price decrease when tariffs go down? If they do expect tariffs and prices to go back down soon, why would they consider buying today? Most importantly, we must have price stability so that our customers and dealers can be certain that the price they see today is not going to change tomorrow just because tariffs or exchange rates might go up or down.

So, we worked with AXISS Audio to reduce costs where we could but held firm on prices until we had clarity on long-term tariff rates. We have seen some brands that raised their prices by 20%, 30%, or more when the high retaliatory tariffs were first announced. However, once a permanent 15% tariff was put in place, have any of these brands reduced their prices? For some marques, the tariffs created an opportunity to expand their margins, but that is not a concept we accept. So, Soulution and AXISS made a firm commitment to not change prices until we knew what the long-term Swiss tariff rate would be. tas

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SOULUTION 717 AMPLIFIER

SPECS & PRICING

Power consumption: < 0.5W standby, 300W idle, 1600W max
Inputs: 2x balanced (XLR)
Input impedance: 4.4M ohms balanced
Outputs: Two pairs Cu-terminal, gold-plated
Gain: +26dB
Power output (Stereo/Dual): 150Wpc @ 8 ohms, 300Wpc @ 4 ohms, 600Wpc @ 2 ohms
Power output (Mono): 600Wpc @ 8 ohms, 1200Wpc @ 4 ohms, 2400Wpc @ 2 ohms (Input AC Power Dependent)
Pulse power: >6000W
Frequency response (– 3 dB): 0–2MHz
Phase shift (@20kHz): <0.2°
THD + N: <0.0001% at 50W @ 4 ohms (20Hz–20kHz)
Signal-to-noise ratio: >120dB (150W @ 8 ohms, 20Hz–20kHz)
Spot noise (input-related): <–165dBV/sqrt(Hz), 20Hz–20kHz
Channel separation: >120dB @ 1kHz
Damping factor: >10,000
Output current max: 32A (limited)
Dimensions: 480 x 350 x 505mm
Weight: approx. 50 kg
Price: $129,975

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Nashville, TN 37211
(866) 295-4133
axissaudio.com

JV's Reference System
Loudspeakers: MBL 101 X-Treme MKII, Magico S5 2024, Metaxas & Sins Emperor, Magnepan LRS+, 1.7i, and 30.7
Subwoofers: JL Audio Gotham (pair), Magico S Sub (pair)
Linestage preamps: Soulution 727, Audio Research Corporation Reference 10, MBL 6010 D, Siltech SAGA System C1, Vitus Audio SL-103, JMF Audio PRS 1.5
Phonostage preamps: Soulution 757, DS Audio Grand Master EQ
Power amplifiers: Audio Research Corporation 330M, Soulution 717, Vitus Audio SM-103 Mk.II, JMF Audio HQS 7001, Soulution 711, MBL 9008 A, Siltech SAGA System V1/P1, Odyssey Audio Stratos
Analog source: Clearaudio Master Innovation, Acoustic Signature Invictus Neo/T-10000 Neo, TW Acustic Black Knight/TW Raven 10.5
Tape deck: United Home Audio Ultima Apollo, Metaxas & Sins Tourbillon and Papillon, Analog Audio Design TP-1000
Phono cartridge: DS Audio Grand Master EX, DS Audio Grand Master, DS Audio DS-W3, Clearaudio Goldfinger Statement v2.1, Air Tight Opus 1, Ortofon MC Anna, Ortofon MC A90
Digital source: Kalista Mantax and DreamPlay XC, MBL C41, MSB Reference DAC, Soulution 760, Berkeley Alpha DAC 2
Cable and interconnect: Synergistic Research Galileo SRX (2023), Crystal Cable Art Series da Vinci, Crystal Cable Ultimate Dream
Power cords: Crystal Cable Art Series da Vinci, Crystal Cable Ultimate Dream, Synergistic Research Galileo SRX 2023
Power conditioner: AudioQuest Niagara 5000 (two), Synergistic Research Galileo SX
Support systems: Critical Mass Systems MAXXUM and QXK equipment racks and stands
Room Treatments: Synergistic Research Vibratron SX, Stein Music H2 Harmonizer system, Synergistic Research UEF Acoustic Panels/Atmosphere XL4/UEF Acoustic Dot 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, Stein Music Pi Carbon Signature record mat, Symposium Isis and Ultra equipment platforms, Symposium Rollerblocks and Fat Padz, Clearaudio Double Matrix Professional Sonic record cleaner