

2005

VACUUM STATE *Level 4 SACD player Upgrades*

Unlocking the superb potential of the DSD/SACD format inherent in your player...

In 2004 we received two great reviews of a Level 4 Upgraded 9000ES



Richard Hardesty

'The SACD performance of the stock player was more than respectable. The modified player has vastly more detail and significantly higher resolution. The Sony can't equal the relaxed and virtually distortionless sound of the dCS Verdi/Delius when playing SACDs but the dCS stack costs nearly \$20K! The modified Sony 9000 compares favorably with anything else I've heard'

(Full review linked at the *Vacuum State* homepage)



'Zzzzaaaapp! The bloody VSEI 9000ES was astonishingly good!

The difference between the stock outputs and the VSEI XLRs was so obvious to my ears that I was taken aback. The stock SACD playback was... well, stock Sony; the VSEI playback of SACDs was a true quantum leap ahead!'

(<http://www.positive-feedback.com/Issue15/9000se.htm>)



David Robinson

And we won the 2004 PFbO Brutus Award for Best SACD modifications!

***Best SACD modifications:
Allen Wright of Vacuum State
Electronics, modified Sony DVP
9000ES (VSEI Level 4 mods, bal-
anced output)***



This is an unqualified rave, my friends...I have heard many very fine modifications developed by Richard Kern, Dan Wright and now, Allen Wright. Of them all, the Vacuum State Electronics Level 4 mods with balanced output come closest to the sound and virtues of my reference standard EMM Labs CDSD/DAC6 or DCC2 SACD playback systems. If you can't "get thee to a Meitner!" then do the next best thing: get thee to Sir Allen of VSEI!

"I get an uncanny feeling that I am listening to hi-end analog but without the surface noise"

Why SACD and why Upgrade?

Anytime a hot new product hits the market in a field where performance counts, the upgraders are right in there—be it HiFi, automobiles, or *extremo* espresso machines! They're all looking for exploitable potential that's been minimised by the corporate ruled design team, and/or compromises *enforced* by the ever present cost accountants. And they'll find it if it's there—some things are already on the raggy edge of their capabilities but others beg to go far beyond their imposed limits.

Back in 2000 I had the chance to compare pure DSD playback from a DSD hard disc master with the commercially released SACD on a professionally modified *SONY* SCD-1. Both systems using the same *Meitner* "DSD" DAC. They sounded equally stunning, which gave me real hope of SACD being the first viable domestic medium to equal, and hopefully go beyond the very best vinyl!

In 2001 I bought a *SONY* XB940QS for extended investigation, surgery, and (hopefully) enjoyment. After three months of innumerable listenings, changes & more listenings, I had proved that while such machines were not very good stock, with some careful modifications domestic SACD had huge potential—having reached a level equalling the best vinyl LP playback I could provide!

The modified 940 matched it for all the musically good things of vinyl—and bettered it for pitch stability, lower noise and to my misbelief: dynamics—both macro, micro and DDR (Downward Dynamic Range)! (*Since then I've a much better T/T and arm—and Level 4 SACD is still a match!*)

Hard to believe but it's clearly evident. What I suspect is happening is that we've gone beyond the differences in the playback chain, and are simply hearing the much wider dynamics the mastering engineers are able to transfer from the master tape onto the SACD itself—compared to what they can get onto the vinyl surface with it's multiple processing steps and mechanical limitations.

As an extra bonus, the upgrade greatly improves the sound on regular CD playback, which can now sound very good indeed—even if it still has a little PCM flavour... In contrast, SACD playback sounds superbly analog with a true master tape feeling!

Since these early tests, *Vacuum State* has developed it's Upgrade procedure through five Levels:

- *Level 0* used a hardwired tagboard, and was only offered to associates and friends.
- *Level 1* was the first commercial release using a PCB, looking very similar to the one shown on this page, that completely bypassed the DAC and *all* the opamps of the original player.
- *Level 2* used the same PCB & circuit, but added a number of *ultra low* inductance, non-magnetic bypass capacitors to the digital area's power supply rails—lowering the perceived noise level and tightening the location of instruments in the stereo image.
- *Level 3* kept the *Level 2* digital improvements, but changed the jfets used in the filter/buffer circuit to ultra linear bipolars for a dramatic increase in definition—but only a few were produced because we had already found an alternate circuit that provided a major sonic breakthrough:
- *Level 4* changed the filter/buffer circuit from a high negative feedback topology to one using zero negative feedback (as do our tube preamps and poweramps). This, along with the *Level 2* digital parts, maintained the extreme definition of *Level 3*, but made it much more musical sounding!

On the following pages, the original *SONY* models that we have focussed on are shown upgraded—and as their internal digital signal path is balanced, we can provide XLR balanced audio outputs on *all* these machines, even when they didn't offer it from the factory. And why do we continue to focus on these machines? Because they were optimised for SACD playback—and all newer machines from *SONY* (or other manufacturers) are to some degree a compromise in comparison.

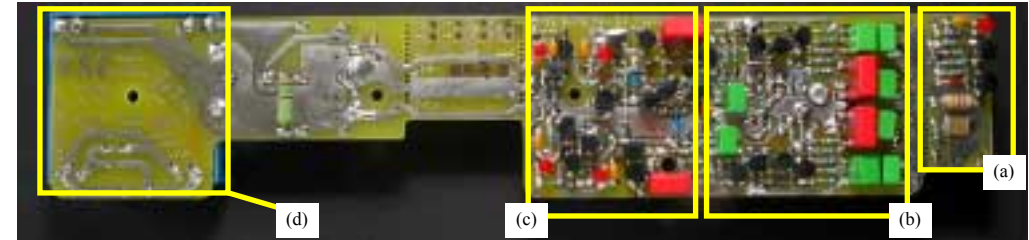
VACUUM STATE SACD player Level 4 Upgrades Page 2

The upgrade comprises:

0/ A full test of your player to ensure it's working correctly *before* we start in on it!

1/ Fitting a completely new *Vacuum State* designed and manufactured module that contains:

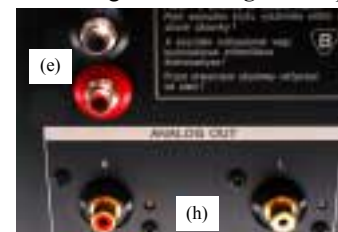
- a very low jitter mil spec *TENT* clock to replace the stock clock—shown to the right at (a)



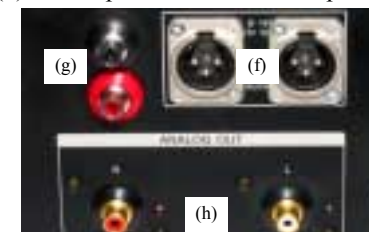
- a discrete component (op-amp free) analog filter/buffer circuit (b)
- it's own power supply with very advanced regulation (c & d)

This module completely bypasses the original op-amp *laden* audio board. It taps into the *digital* signal path after the VC24 digital filter but *before* the "current pulse" DACs. Extreme isolation from AC line interference & unwanted internal digital nasties is provided by the module's own on board transformer (d) and three of *Vacuum State's* unique *SuperReg* current sourced shunt regulators (c)

2/ New RCA sockets (e) are mounted on the rear panel for the upgraded signal in the unbalanced version, with new XLRs (f) and RCAs (g) in the balanced version. The *unmodified* signal is still available unchanged at the *original* output sockets (h) & headphone socket for comparison.

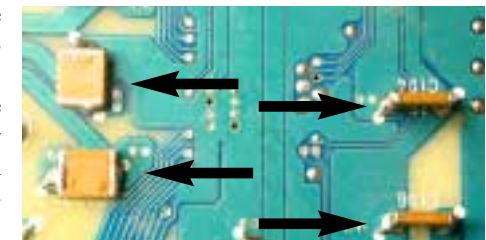


Unbalanced



Balanced

3/ While the module handles the *analog* side of the Upgrade, it doesn't help the preceding *digital* circuits, so we developed an upgrade for them as well. This started at *Level 2* and involves bypassing the existing *digital* power supply caps with carefully selected *surface mount* parts intended for such work. The sonic results are outstanding, and it's surprising to us why they are not fitted as standard!



4/ Last is a four day burn in/listening test period to ensure it's making beautiful music with zero anomalies before shipping it back to you.

Worldwide models suitable for upgrading ...



SCD-1



SCD-777ES

These two *heavyweight* machines are essentially the same electronically and mechanically, and it's unlikely that anything of their build quality will ever be available again, at even four times the price. However, due to their engineer (rather than audiophile) oriented circuit design, their sonic qualities do not come close to their potential. But a full *Level 4 Upgrade* in either Balanced or Unbalanced topology takes full advantage of what they offer, and the results are simply stunning.



A balanced installation in a (previously unbalanced) SCD-777ES showing the twin modules (above) and the new XLR connectors below.



Unbalanced installation in a SCD-777ES, showing the single module (above) and it's separated power supply below.



"The SCD-1 arrived in perfect condition and really sounds fantastic. The retrieval of information has greatly increased as well as the size and placement of the soundstage in space. I get an uncanny feel that I am listening to hi-end analog but without the surface noise. Thanks for the calls and follow-up but most of all thanks for a great sounding modification at a fair price!" A.D. USA

VACUUM STATE Level 4 Upgrade Page 3

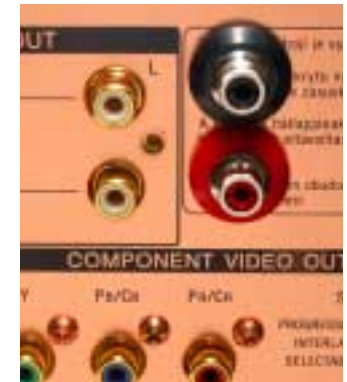


DVP-S9000ES

This *elegant* looking slimline device is an extremely very good DVD player, and when upgraded to *Level 4* specification offers audio performance that some clients say is the best they have ever heard! While it's transport is not a match for the engineering masterpiece in the SCD-1/SCD-777ES, and therefore seems to lose a little in terms of *stability*, it has one less large scale digital chip in it's signal path, and this simplicity brings a really *alive* sonic stage. A winner!



Above is a balanced upgrade, with the two modules on the right side of the chassis, and the new XLR sockets to the left rear. This fills the rear panel, so we use the upper pair of original RCAs for the upgraded signal—but for an unbalanced upgrade we add new sockets, as shown to the right.



"In your mod you have a stunningly affordable breakthrough improvement in digital audio reproduction. While I haven't heard everything out there, I've owned lots of the various attempts to improve CD sound since the Eighties, including outboard DACs connected to dedicated transports with glass digital cables, and later added various versions of little jitter-killing/resolution enhancing boxes or up-samplers in between. Nothing has equalled the astonishing detail, bottomless noise floor and the non-fatiguing, grain-free sound of my new modified Sony 9000ES!

The SACD sound is thrilling, with a presence and a fullness to the sound that leaves the old transfers in the dust. But I was really floored with the improvement to Redbook CDs that I've owned for decades. Tiny nuances in song fade-outs were clearly revealed, and new details in players techniques were unveiled for the first time. It was, and continues to be, great fun to play old favourites and be shocked by things I've never heard before. Your modification is quite a tremendous advancement, and is clearly the best value I've yet found in audio. Thank you and your team!

Only in 230VAC areas...

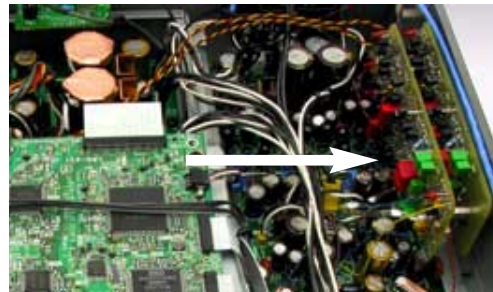


SCD-555ES

This Europe/Asia only model uses essentially the same digital and analog electronics as in the SCD-1/777ES, but has it's own unique front loading transport. While less extremely built than these two monsters—it still weighs in at 15kg and provides a superb basis for upgrading.



An unbal installation showing the single module fitting neatly on the *internal* side panel, which means there are no visible holes/screws!



A balanced installation showing stacked modules mounted above *SONY's* Audio Board—bypassing 7 opamps and lots of nasty caps!

"As promised I'll try to describe what I've heard so far with the Level 4 mods:

My 555 needed an additional 48 hour burn-in period. Only after that I felt the real improvement. On Saturday, after turning the player on, I felt the sound being different with more revealed details but was not quite sure whether "different" meant better or worse. On Sunday already better; but not quite what I heard yesterday (Monday) evening. Kept me awake listening until 2:30 AM. AWESOME!

Please note that I'm trying to avoid using the terms like "microdynamics", "sovereignty" & all that jazz. The soundstage has got somewhat bigger & deeper, with rock solid stability and more accurate positioning of the vocals and instruments. Improved dynamics with more "speed" to the sound, the tempo is felt more exactly than before. The overall sound picture has a much greater sense of effortlessness, something that my wife called being much more "noble sounding". Even CD sounds very ANALOGish. The voices have got quite a bit warmer, more clearly understandable. The improved details are clearly audible e.g. subtle articulations of the singer's voice that passed unnoticed before. Also pertains to all the instruments recorded. All that without straining oneself to hear the details, they are simply there. Did not pay attention to the bass at all, will check later. The highs/mids were so amazing that I forgot about the bass! Even the old recordings on cheapo CDs sound good [yes, occasionally I listen to that too], something that I did not notice before with any players I owned. Always sounded a bit harsh & nauseating. Not any more.

A bull's eye, just make sure it plays for at least 48hrs before critical listening. Big THanX" (NM De)



SCD-XB940QS

At 7kg, this is the lightest of the original stereo SACD players from *SONY*, but using the same (expensive?) VC24 chipset it has much more upgrade potential than the newer low priced multi-channel players—and hence can be raised to a sound quality far beyond it's modest price.



A balanced 940 upgrade (with the help of a *big* shoehorn) showing the modules on the back panel, and the new XLR & RCA's in closeup to the right. Now you'll understand why the PCB needs to be this odd shape...



*"I had a chance to compare, head-to-head on a *very* hi-end, rock-solid system, the VSE-Modified XB940 with the latest Gryphon CD player, which, if I am not mistaken, is one of the very best commercially available cd players (it costs more than the EMCI, less than the Linn). I was genuinely amazed at the performance of that cd player; I didn't think CD could do that. But it did not quite match the modified 940; this was agreed by those present, and the overall opinion was: effusive praise to both machines. And then you compare the price..." (GK UK)*

"Congratulations! To my surprise the CD sound is as good as the SACD. Better than my Sonic Frontiers SCD1, that was and of course is, terrific. The sound is subtle and holographic. Thank you very much! (JM Spain)

"We implemented the Level 4.5 upgrade in one 940 and compared it with the other. The difference was shocking! We used the 'Waltz for Debby' sacd; Evans' piano has MUCH more freedom, we could now SEE the notes decay! The room is more palpable as are the players. Track 4 (solo violin) from the Red Rose sacd; the violin also has MUCH more freedom, is more open, we could see more of the movement of the violin and the violin sounds more like a real one. Music was definitive more real with the upgrade, the 'you are there' factor has increased a lot! Thanks very much, (HH NI)

"Regarding the balanced u/grade to my XB940. The first record I listened to was Horowitz (SS6371). I was really shocked (best positive sense) about what I heard, it was so realistic that I couldn't stop prior to the end of the disc - applause, standing ovation! It's not only the excellent "sound", it's especially the room and details I never heard before from a recording. The illusion sitting in a concert was never higher with any other equipment I heard, and I heard a lot in the last 30+ years! Now let me go back to enjoy other records." (JW De)

Only in 115VAC areas...



SCD-C333ES

In a *strange* marketing move, *SONY* released this USA only model that uses digital and analog electronics similar to those in the European XB940, mounts them in a ES style heavy chassis—but teams them with a multi-disk *changer* transport! Bizarre to the *max* for a stereo SACD player—but with the VC24 chipset it tunes up just as well as the others, and will then play you *varied* state of the art quality music *all day long!*



All the electronic *doodah* enclosed in the yellow box becomes redundant when this player is upgraded—being completely replaced by the small, hi precision *listening test* proven *Vacuum State* module. This is typical of the signal path minimisation in *all* these featured players—but because of it's layout, it's easier to show it in the pix of this model.

A single module for unbalanced, or two modules for balanced, can easily fit in all this empty real estate! It also allows us to separate the power supply section from the signal processing section and orient them for optimum results.

"Here is your competition - a McIntosh MCD 7008 connected via it's coaxial digital output to a MSB Nelson external DAC. The Sony unit as modified by you was a hands down winner right out of the box and by a large margin. I am sure it will get better when completely burned in" Rick (USA)

When the LEVEL II parts were added to my previously upgraded (module only) SCD-C333ES, the sound quality was twice as good as before (No hype. 2X as good!) Made the changer better than the 9000ES, SCD-1 or any other machine I have heard with any other modification installed. And also better than my expensive vinyl rig! WG (USA)

New machines—and some Universal players...

Almost all machines more recently released than the *SONY*'s shown on the previous pages are multichannel, and most of the non-*SONY*'s also play DVD-A. While none of them use our beloved bitstream *optimised for stereo SACD* VC24 chipset—and hence do not allow us to bypass the DAC chip—*Vacuum State*'s technology still allows them to be upgraded to produce stunning results.

We are in the process of developing production upgrade modules for these new players, and the ones shown on this page are what we are currently focussing on.

With new models coming out almost daily, there are too many to list, so if your player of choice isn't shown it doesn't mean we can't help it. Please ask us for our recommendations—and then we can also tell you about some well reviewed machines that do not meet our requirements for upgradeable performance or reliability. This could be good to know before you spend a bunch of hard earned money on a machine known to have some sonic limitations, or actual technical problems.



Pioneer DV-563/565



Pioneer DV-653/656



Pioneer DV-757



Denon 2900



SONY XA-9000ES



Denon 2910



Marantz DV-8300



Denon 3910

Self contained modules incorporating state of the art DAC/filter/buffer circuits intended to completely replace these sections in commercial domestic & professional Hi-Rez digital players. Their purpose is to seriously improve the audio quality of such machines. One is specifically for SONY VC24 based SACD 'bitstream' players, the other for those using multibit DAC technologies.

- Single stage, *ultra* low distortion, wide band & low noise discrete component unity gain amp
- Opamp free—bypassing between 4 & 9 opamps per channel in the original signal path...
- Special power supply on the PCB: toroidal transformer, schottky diodes, filter cap and twin *SuperRegs*—*Vacuum State's* exclusive current sourced shunt regulators
- Very low jitter *TENT* clock with it's own +5V *SuperReg* on the PCB

- 18dB/oct low pass filter (-3dB @ 100kHz) to take maximum sonic advantage of the wide band SACD signal—with 70dB attenuation at 1.5MHz to minimise out of band noise
- Capacitor-less direct coupled output for optimum bass accuracy & tonality
- Output DC offset (~1mV) controlled by a *very* low frequency servo control loop
- Measurement based design verified/corrected/enhanced by *extensive* listening tests!

Vacuum State installation into your own player

Level 4 Unbalanced: €795

The *zero risk* option, send your player to us or one of our agents, and we'll do the full *Level 4* upgrade, burn it in for 4 days, and validate it with a personal listening test. The upgrade components and work carry a 5 year warranty. Shipping costs are not included in this price.

Level 4 Balanced: €1450

Again the *zero risk* option, this not only brings your player up to the latest *Level 4* performance but it provides fully balanced outputs on XLR connectors for players that were never available balanced—and offers superior balanced outputs for those already balanced. Other details as above.

These prices are in Euro and are what we charge here in Europe—but your local agent will quote in your currency, and due to recent fluctuations in exchange rates, his price may well be different (better or worse) than the Euro equivalent. Blame the politicians and not us—OK?

The prices for both the *Bitstream* and *Multibit* modules are the same. *N.B. Balanced upgrades are effectively two unbalanced modules, so the price is appreciably higher*

Install it yourself—but only if you're a hot tech

Unbalanced module with Instructions Level 4: €645

This is a fully assembled and tested module, with all installation parts and instructions on how to fit & wire it into the player. These modules carries a 5 year warranty and as it is fully factory tested, you should only need a basic multimeter to to verify the connections.

Balanced double Module with Instructions Level 4: €1200

As above, except that this is a fully assembled and tested *double* module package, to perform a fully balanced conversion and upgrade. All installation parts provided including *Neutrik* silver XLR sockets, and instructions on how to fit & wire it into the player.

These self install modules are ONLY available directly from VSEI in Europe—the regional agents do not supply self install modules under any circumstances. These modules can be ordered from the "Goodies" page of our Secure Order Pages on our site, or directly from Vacuum State.

Worldwide agents:

USA (west) Warren Gregoire, 229 El Pueblo Place Clayton, CA 94517

Toll free Ph: 1-800-634-0094 email: wga@warregregoire.com

USA (east) Bill Thalmann, *Music Technology, Inc*, 5418 Port Royal Road, Springfield, VA 22151

Ph: 703-764-7005, email: bill@musictechnology.com

Australia Joe Rasmussen, 303 Dalmeny Drive, Prestons 2170 NSW, Australia

Ph: +61 2 9607 4650 Mobile: 0412 203382 email: joe@vacuumstate.com

Malaysia TT Yap, *Octave Electronics*, 11, Jin Timor, 46000 PJ, Malaysia.

Ph: +60 3 79555755 email: info@octave-electronics.com

Holland Louis Raatjes, *Art Speak*, Achterstraat 1, 4032 NN Ommeren, Netherlands

Ph: +31 34 46 02636 Fax 34 46 03173 email: artspeak@planet.nl

UK Colin Yallop, *Chevin Audio Developments*

27 Station Rd, Little Eaton, Derby, DE21 5DN. +44 (0)1332 833158

email: colin@chevinAudio.co.uk www.chevinAudio.co.uk

Rest of Europe & all other areas Please contact Allen at the *Vacuum State* address below.

VACUUM STATE ELECTRONICS INC

European Design Office: Bahnhofstrasse 21, 8212 Neuhausen am Rheinfeld, Switzerland

aw@vacuumstate.com

www.vacuumstate.com

Phone/fax TBA