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The Naim Statement

MARTIN COLLOMS GETS A TOUCH OF INDIGESTION WHEN TRYING TO GET HIS HEAD AND HEART AROUND THE *NAC-S1* PRE-AMPLIFIER AND *NAP-S1* POWER AMPS

Wearing hearts on sleeves, Naim's designers have given their all to this hugely ambitious project. Getting the numbers right for an international flagship amplifier, such as great looks, very high power and low distortion, is still no guarantee of sonic excellence, and many such 'ultra luxury' projects from other makers have been announced with a great fanfare, only to pass swiftly into history. The number of 'super amps' around is quite surprising, as indeed are similarly ambitious loudspeaker designs; fashionable contenders might well include Soulution, Dartzeel, Constellation, Burmester and Vitus, but that's just for starters.

Massive Power

However, the numbers quoted for Naim's *Statement* are simply astounding: an increase of more than 6dB of loudness from the current *NAP500* flagship (rated at 140W/channel) is massive in audio terms. Achieving this objective numerically would have required increasing rated power to 560W, but in fact there's rather more, achieving the quaintly specified one British horsepower (otherwise known as 746W per channel, 8ohm loading). Furthermore this amplifier can deliver rather more than this on program material and this has been verified with equivalent test pulses, the claim securely backed by the inclusion of a 4,000W power transformer for each monoblock channel, and very high current transistor arrays at its output.

Anticipate therefore something like 800W/ch into 8ohms, together with a very good tolerance for difficult loading. The specification claims nearly 1,500W into 4ohms under continuous power, while an increase to a massive momentary 9,000W (short-term with 1ohm loading) is provided for music-related impulse signals. Copious internal supply reservoirs and regulators will easily meet that short term burst power demand. While it may be argued whether or not such a situation should occur in practice, flagship loudspeakers exist on the market with electrically complex impedances that may impose an effective loading for an amplifier that's as low as 1.5ohms. The Naim team was determined to ensure that its *Statement* creation would never trip up when driving such examples to full level on music programme. Some speakers need 50amps peak at full power, and the *Statement* power amplifier would be able to deliver as much as 95amps peak for an admittedly very brief 0.1mS transient into a 1ohm load.

Two amplifier design schools of thought come to mind. One contends that small is better: that power supplies draw less current; electrical noise and vibration levels are lower; and the design is less complex with shorter signal paths. These examples demand high sensitivity loudspeakers with higher impedance, which tend not have particularly good low frequency extension unless they are very large. Certainly exquisite and communicative sound reproduction is possible by this route, especially with some of the specialist single-ended triode (SET) valve amplification.

However, an alternative school of thought recognises that big speakers with powerful deep bass need a good measure of both voltage and current in order to deliver a thrilling, dynamic, thundering and body-shaking performance. Some of these loudspeakers will also be of true audiophile quality and will therefore justify the use of an exceptional amplifier. Around 25 loudspeaker brands on the international market create high end designs of related quality and size, priced from $150,000 to $300,000. These include Avalon Acoustics, Focal, Magico, Gryphon, Dynaudio, Martin Logan, Marten, Nola, TAD, Estelon, Kharma, Backes & Muller, Tidal, Perfect 8, Avante Garde, MBL, Wilson Audio Systems and Sonus Faber.

Many of these luxury speaker designs are potential candidates for use with a Naim *Statement*, and its extreme load tolerance will help to maintain its sound quality even when confronted by complex and demanding electrical loading. Experience has also tended to indicate that the greater the reserve available, the better the sound, even at cruising levels where the reserve is barely called upon. This is because the relative stress level with the amplifier in respect of peak current, power, thermal and magnetic behaviour is a smaller proportion of the reserve, so the internal operating points are more stable and work at lower noise levels.

Powerful dynamics are the province of big amplifiers, and sometimes the largest amplifier

MARTIN COLLOMS

model in a range does not play *that* much louder, but nevertheless delivers music with greater ease and authority. Circuit theory tells us that the reservoir capacitors in the power supply are in the loop for current delivered to the loudspeaker at the limit, and these need to be huge to deliver extended uncompressed low frequencies to large, current hungry loudspeakers. Correspondingly, the power transformer also needs to be massive since it must readily provide the instantaneous power to keep the capacitors charged in time for the next musical demand. Given the rated 8ohm power of 800W/ch, the 4kW rating for the mains transformer is certainly appropriate. However, when it comes to amplifiers, power is not everything and for this to be considered a 'statement' in both sound quality and power, ultra careful design is required to attain and then hold everything as a revealing and rewarding musical entity.

In the Beginning

First conceived back in 2002, then mulled over for several subsequent years before finally being given the green light in 2010, a price-no-object approach was permitted, for good or ill. The design team, headed by electronics guru Steve Sells, was instructed to take as long as required but told to get it right! While use as individual audio components is not impossible – we had already tried out a *NAC-S1* pre-amplifier alongside an active Naim *DBL* speaker system powered by a 'Six-pack' of *NAP 135* monoblocks (see HIFICRITIC Vol9 No1) – it seems more likely that the *Statement* components will be used as a stereo set.

The complex sculpted forms are milled from solid, aircraft grade aluminium, and are designed to interleave sinuously. Naim has truly joined the international High End with this design, delivering a product with the kind of connectivity and performance profile that will create great interest and ready acceptance. The company is also prepared to create special finishes for this product to help integrate with luxury interior design schemes (on request and at extra cost).

The volume control is the most important device on any amplifier, and the consistent sound quality and operability of this vital function can make or break confidence in a design. Not only has special attention been paid to the technologies behind the sound quality of this vital facility, but also to the way it operates, the resolution steps, the control rate, the stability of channel balance and the stability of sound quality over its operating range. Microprocessor managed, a smooth-as-silk illuminated control is mounted on the pre-amplifier top panel. Volume and channel balance is also available via a superbly engineered, illuminated milled alloy remote control, which also controls a Naim CD drive and provides file/track select for a streamer. The pre-amp may also be conveniently controlled *via* a wired link, for example from an *NDS* streamer (whereby the corresponding function on the Naim App is invoked).

Naim explains in detail how its audio components should ideally be sited, supported and interconnected, and this is part of a comprehensive approach to controlling the real world set up variations that can affect sound quality. Laudable though such an approach is, the wider world of high end hi-fi 'mix'n'match' components demands greater flexibility, so the Naim team had to find alternative solutions to meet this challenge for the *Statement*, while still holding true to established company standards. Much classic Naim technology therefore remains embedded in the designs, but the team has also succeeded in creating separate audio components that also provide universal connectivity for the wider audio world beyond Naim. However, when linked together as a trio they will continue to meet the enduring in-house design standard for graded audio bandwidth, unit-to-unit matching, and hierarchical electrical grounding. In any case, these really heavy *Statement* amplifiers will probably be delivered to the customer by piano movers, followed by proper installation and set up optimisation carried out by a trained Naim dealer.

The Pre-amplifier

The pre-amp handles line level inputs only. Input labels may be assigned from a selection that includes Stream, CD, Phono (using an external equaliser), Auxiliary, and a straight-through unity gain is also available for AV use. Sensitivity and channel balance are programmable for each of the eight stereo input sockets, which comprise three DINs, three RCA/phono pairs, and two balanced XLRs. The balanced pre-amp output to the *NAP-1* monoblocks is via a

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pair of XLR sockets (and suitable balanced cables), and two Naim-style stereo outputs via 4-pin DIN sockets (with an eye towards active crossovers and alternative Naim power amplifiers) are also provided. Output impedance is a low 50ohms, so it will drive long cable runs if required. The input impedances are a moderate 20kohm single-ended, 40kohm balanced (which may not be quite so well suited to higher impedance valve signal sources, such as some phono preamplifiers). The nominal line gain is 15.5dB, so a 0.5V input will raise a 3V output (but gain is of course programmable).

Operation can be handled by an infra-red RC5-programmed remote handset. (There's also a 3.5mm jack socket to control other related components via wired links.) The amplifier trio can be powered up and synchronised in a system automation arrangement, with optional link cables 'daisy-chaining' the units. The remote handset may also control RC5-compatible CD players, and wired interactive music and track selection on streamers *via* the popular CAN (controller area network) bus interface.

To help match input sensitivities to sources and thus not have awkward jumps in volume, a programmable gain offset of up to ±7dB in 1dB steps is provided. This *NAC S1* weighs no less than 61.5kg and stands almost a metre tall.

The Power Amplifier

Each power amplifier has one set of heavy duty binding post speaker cable connections, with a facility for 4mm plugs. RJ45 system control connection cables can be omitted by those really keen on wringing out that last fraction. A 13A IEC socket supplies mains power, and signal inputs are XLR balanced only (at 2x30kohm impedance). However, suitably wired unbalanced-to-XLR balanced cables may also be used for single-ended output pre-amplifiers. A mini USB input is also provided for loading control software updates.

The 30dB gain needs to be higher than the usual 24 or 26dB because the output power is so high. The speaker terminals are shrouded as it could deliver a mild electric shock (in the unlikely event of a full power signal being present and if both terminals are inadvertently touched). When the shrouds are temporarily removed, a spanner may make reliable, vibration-resistant high pressure, low resistance connections for the cables. Naim's 4mm paired contact connectors are also compatible (and are themselves shrouded once in place).

Top panel buttons adjust the amount of illumination, and two more handle individual powering-up (if the auto link connection is not installed). Weighing 101kg each, these power amplifiers are designed to flank the preamp to form a free standing group of distinctive design, the flowing, full height asymmetric heat-sink fins completing a handsome piece of precision audio engineering.

Installation

A section of *FRAIM* audio stand was shifted to make space for this amplifier set, and each Naim amplifier section had direct mains connection to a wall strip fed from a 60amp dedicated mains spur. The units were levelled and mounted with heavy duty spikes onto stainless steel couplers tuned for hardwood floors. Once the units were up and running, we retired for lunch, partly to assess how it would change in the first few hours. It might have been the effect of lunch, but we swore that the amplifier sounded clearer and better defined after an hour or two. We then settled into a longer term evaluation, charting progress over some weeks.

Perhaps more than most, Naim electronics are susceptible to set up, levelling, fine tuning of the supports and not least the choice of connection format (DIN, RCA or XLR), the cables, and their physical arrangement behind the rack. As the equipment settled down physically and electronically, the cables relaxed mechanically from the stresses of manufacture and packing for transit, and the system slowly came to life.

Sound Quality

One concern was how to stretch fully the performance of an amplifier of such potential. However, the manufacturer's specification of 1,200W peak programme power handling for a 4ohm load and a 25Hz to 40kHz -3dB frequency response for my Magico *S5* loudspeakers meant that they were not a bad match for the *Statement* after all. But I would still have to proceed with caution, as most manufacturers routinely exaggerate loudspeaker power handling, and the numeric figure depends on both the quality of programme used and how peak power is assessed. The *S5* could in theory draw a 1,200W/4ohm peak from a 600W/8ohm rated power amplifier, but the Naim's peak output of 1,500W/4ohm could potentially just about break the bank.

We initially ran the amplifier at moderate levels, using mixed material from a playlist configured in the Naim streamer App, intending to take particular care thereafter as it settled in. The sound was checked from the beginning of the process and, frankly, was very promising from the off. Regular notes were kept as the running in process continued. It went through phases of subtle change, easily audible due to the remarkable transparency.

At first its character was a little forceful and bright, with crisply illuminated treble – almost a solarised sharpening of transients and timbre. Timing, particularly for the pre-amp, was promising, supported by an exceptionally dynamic, tuneful and powerful bass. Midrange timbres were already reference class and piano sounded particularly clear and open, with amazing dynamics and an obviously squeak-free orchestral string tone, albeit with some extra brilliance. After 12 hours use the amplifier's sound (with the new cables) had mellowed to a greater richness, but now also had still more clarity and better timbre and texture resolution, not just in the midrange but in the bass and treble too. The combination also lost a little pace in this period, somehow sounding more relaxed than urgent.

Towards the end of the second week opinion began to split, as the pre-amp was making good headway while the power amps seemed to be holding back a little. We then revisited our experience of using the pre-amp alone (on that first occasion with Jon Honeyball's 6-pack active Naim *DBL* setup), but here driving a *NAP 300*, and results were very good indeed. In particular my *NDS* took off in this arrangement, clearly benefiting from the very fine sounding *Super Lumina* DIN-to-DIN connection to the *NAC S1*. With its complementary philosophy, the *NDS* also clearly showed the superiority of its grounded switch setting when used alongside the Naim *NAC S1* pre-amp. This session also showed just how good the classic *NAC A5* loudspeaker cable can be when used with the *NAP 300*; the known minor colorations of this pairing was now rendered rather less obvious, as this truly exceptional pre-amp drove right through the combination, revealing greater depth, detail, rhythm, and involvement than hitherto experienced.

At this stage the power amplifier showed many strengths, particularly in its amazingly deep, tuneful and powerful deep bass, which at times almost seemed to take the Magicos by surprise. Massive bass drum transients were handled with consummate ease, were dynamic and had startling visceral and percussive impact. The sound was all of a piece, natural in timbre and consistent in quality, at all frequencies and sound levels. Material which had previously been considered thin or harsh at high levels was now playing with ease, showing that lesser amplifiers (even big ones) often suffer from a timbre variation that hardens up with increasing power and loudness, and then becomes more forward in the soundstage.

Associated with this exceptional dynamic presentation was a significant lack of listener fatigue. The *Statement* combination delivered world class stereo image focus, that was held notably stable over the whole audible range, with truly exceptional width, depth, detail and soundstage scale. Quite frankly, these aspects of its performance, including the very natural timbres, were beyond my experience. Note here that all the cables were matching *Super Lumina* types. A 4mm-to-spade version of the speaker cable was initially supplied, subsequently supplemented by the better contact quality spade-to-spade version (with a small difference), in 7m lengths. These cost about £7,000 the pair with terminations, while the interconnect cable 'pairs' are about £2,000 each depending on length and terminations (note that the pre-to-power interconnect, the link connections and all Powerline mains cables are included with the amplifier combo).

By around the third week the power amplifier began to pick up some pace, but some painstaking experiments also showed that the power amplifier seemed to be affecting the other components, particularly in respect of the last nuance of rhythm and timing, even with our use of a single 60A audio quality spur. I have a little used second matching spur, and while this might be against Naim teaching, I tried using the power amplifier alone on the second spur supply. This seemed to address the rhythm and timing issue, as the overall system sound was clearly much better, and the sense of drive, crispness and rhythmic clarity was much improved (still using *NAC A5*).

Before jumping to any conclusions, it cannot be said at this point whether the power amplifier had 'sped up', or the supporting system had itself gained speed when its power feed was relieved of the power amplifier's connection. All we can say is that the power amplifier rhythm and timing performance was now closing in on the superb pre-amp. We were also better able to hear the amazing quality of the pre-amplifier, which several experiences now suggest is truly state of the art. With the benefit of hundreds of hours of listening, it was clear that the *NAC S1* managed to deliver the best sounds, the best exposition, and the best involvement we had yet experienced, over all the varied sources and music tracks played. Incidentally and fortunately, the Magico *S5*s had no problem at all in keeping up with the party.

I used the top of the line Linn *LP12* player fitted with a Naim *ARO* arm feeding a *DR*-supplied *SuperLine* phono stage, and had never heard it sound so good. We commenced with the Koetsu *Urushi Vermilion* with great results, and fine stability in the face of the freely available high sound levels. A review Lyra *Delos* was also at hand and this relatively inexpensive played really well into this high end system, its fine detail, spaciousness and upbeat nature suiting our review system remarkably well despite the price mismatch.

Reverting from *NAC A5* to *Super Lumina*

Section of the output stage of the Power Amp

"the system sound was now becoming seductive, that dangerous moment when one cannot resist playing more music, and each track is heard as if it was a new and more accurate transfer from the original"

speaker cable (which admittedly needed more use), coloration was further reduced while focus and layered depth were both improved, the latter extending subjectively well beyond the system front wall. The sense of spatial dimensionality on great classical recordings was quite exceptional, with amazing low level detail deep into the decay. At this point we still felt that most of the time *NAC-A5* offered somewhat better rhythmic performance, even if it was not as detailed or natural.

However, the system sound was now becoming seductive, that dangerous moment when one cannot resist playing more music, and each track is heard as if it was a new and more accurate transfer from the original. The *Statement* amp combo can be played at any conceivable loudness without any hardness, timbre change, bass limiting or fatigue, save from one's own sensory limitations. I did manage to clip the amplifier briefly, and heard little change during overload, suggesting very good recovery from high power transients. (We are talking here about some highly realistic 114dB peak sound levels for a stereo pair of powerful 88dB/W loudspeakers in a 120 cubic metre room.)

With both the mains spurs in use, two issues arose connected with its now outstanding resolution and timing. Whenever the source, connections, programme, or any combination of these was of doubtful quality, any shortcomings were ruthlessly exposed, and this was made worse by the astonishing quality possible when all was correctly in place. The *Statement* amplifier really was a powerful microscope, dissecting installations and reading any and all errors and deficiencies that would (and have) passed unnoticed in lesser systems. It would be all too easy to misjudge the *Statement*, through ignorance of matching system components, but a process of painstaking trial and error (including elimination), supported by a significant degree of progress with the running in, all who have heard it have judged its performance as quite remarkable.

It effortlessly sets new standards for image width, depth and focus, the latter readily maintained in depth and across the soundstage. Instrumental timbre simply reflected the sources and the origination, and my analogue LP system had never sounded anything like this good before. Dynamics are simply stunning, aided by the almost unlimited dynamic range and associated peak levels. Pace and rhythm do not lag either: it sounds impressively upbeat with class leading syncopation, and is very well timed, not just for the crystal clear and majestically deep bass lines that stay perfectly in step with the midrange, but also for the micro analysis of expression and counterpoint throughout the midrange (a rather subtle aspect of great timing). Above all, reproduced music sounded just like great performances, capturing much of the scale, pace and excitement of the live experience, and powerfully holding one's attention.

Conclusions

Some might consider this a bonkers product in size complexity and price. Naim have aimed very high indeed, and then some, to take on the world's best. We could not anticipate their expertise in this field, nor whether the varied virtues offered by the likes of Dartzeel, Vitus, Constellation or Soulution, a giant MBL, a D'Agostino, a Burmester or a Gamut would find the Naim *Statement* wanting. Having experienced many of these, my group of listeners and I felt that Naim had indeed hit the required target, even after just a few weeks of use.

When properly set up with (for me) the best possible mains arrangements, the sense of swing and tight timing for the combination was judged exemplary, and was reinforced by very low coloration, huge and wonderfully focused stereo images, packed with detail that also remains consistent even with the loudest and most complex music. Tracks which on other amplifiers had previously seemed edgy and too forward were rendered highly musical, with fantastic detail and nuance, while more laid back tracks were brought to life with sparkle, transparency and fine resolution. The sheer musicality enthralled for hours on end. Such an exalted performance is found all too infrequently, but evaluating this amplifier has been a joy.

The Naim *Statement* is an indisputable *HIFICRITIC* Audio Excellence product, as it should be at the price. But it does rely on really good setting up and installation, particularly to wring the most out of the power amplifiers in particular. Now speakers to match such a performance will be needed, and I suspect only a few candidates will be suitable.

Tech Story

The NAC S1 Pre-amplifier.

Following the same vertical format used for the power amplifiers, a clear, illuminated inset acrylic block is arranged to separate the lower power sections from the upper amplifier proper. This will block any eddy current coupling of mains fields from the power transformer to the critical upper sections, where the audio circuitry is housed.

The pre-amp as a whole is mounted on vibration inhibiting adjustable spiked supports, while inside

a fully floating, spring suspended, brass-loaded sub-chassis is tuned to a low 12Hz to minimise microphony. This practice is a well known technique used by Naim on earlier components in order to maximise timing, transparency and dynamics.

Both the pre and power amplifiers use an instrumentation input configuration of symmetrical balanced input stages, to condition both single-ended and balanced line level signals, and while the power amp topology remains balanced throughout, the pre-amp reverts to traditional Naim single-ended circuitry for system gain and for the critical control of volume. To overcome the known limitations of physical contacts wiping on a resistive track namely a conventional rotary control Naim uses a coded resistor array that provides a high dynamic range, very low distortion and low microphony. It actually measures 16dB quieter than the volume IC that is momentarily invoked and incorporated for housekeeping, even though the latter is likely to be barely audible in practice. (Many competing preamps simply use such an IC and do not take the matter further.)

Here the volume array switches use selected reed relays with very low voltage offset contacts, and the actuator coils run at a very low noise from constant current supplies. A microprocessor housekeeps the volume function, with data provided by an optical shaft encoder on the control knob. That temporarily acting auxiliary IC volume control which is run in step is only invoked during volume alterations, in order to make the operation free from clicks. Once the control function has settled, the master control is seamlessly re-engaged (in a fraction of a second). This microprocessor control of volume also allows adjustable settings for the input sensitivity to be coded in as a volume offset.

Both the pre-amp and power amplifier circuits use dozens of Naim's proprietary super low noise discrete regulators (DR) – 41 for the pre-amplifier alone. These are working to a still higher standard here, since the protection circuitry required for their DR-equipped standalone external power supplies can be discarded.

Input switching uses long life, corrosion proof, sealed reed relays, and both the signal and ground connections are switched to maximise performance, so that unused input sources are totally isolated from the selected input and cannot introduce noise. As with other Naim units, unused outputs can also be disabled to help minimise noise levels. A CAN network control bus provides for power-up synchronisation, opto-coupled to prevent unwanted, noise inducing, ground loops.

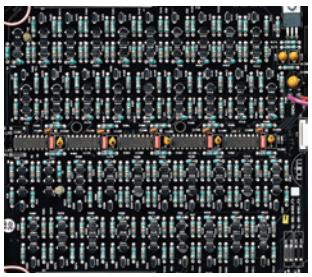
The attention to detail is impressive: the power switch and mains input socket block vibrations, for example. The main pre-amplifier section is built on six stacked printed circuit boards with very short interconnections. These are massively braced to the substantial sub-chassis to avoid mutual vibration. No surface mount or integrated circuit components are used in the critical audio sections: higher power high performance selected parts for audio are used throughout, including Naim's preferred tantalum and polystyrene capacitors, chosen for their subjective speed and for low energy storage dielectrics. (These components are all technologies which need some use to run in.) However, it is clear that nothing has been left to chance within the experience and resources available. The core single-ended section is buffered by discrete unity gain balanced and unbalanced output amplifiers in order to drive the power amplifiers optimally.

The tower construction positions the power transformer low down, well away from the line amplifier circuits. As for the power amplifiers, unwanted vibration is led away *via* the strong aluminium alloy base construction and the floor coupling spikes.

The NAP S1 Power Amplifier

Unusually in the hi-fi business, Naim designs and commissions its own special power transistors in cooperation with UK's Semelab. Their high power rating allows some smaller amplifiers to use just two devices per channel, and a reduced number than usual for the larger designs. This is likely to be particularly useful as the pair matching can be exceptionally close, improving dynamic tracking and thus musical dynamics from the transistor groups.

Many details of the *NAP S1* are worth consideration, not least those arrays of custom designed *NA009CN* and *NA009CP* power transistors. Manufacturers often try and match output transistors in batches, so that any variations in gain and bandwidth are minimised. When employed in a parallel array, well distributed load-sharing to handle the output current demand accurately is important. Naim hand-selects the active transistor elements at the die level, even before the transistors are assembled, ensuring exceptional parameter matching. These are then allotted sequential serial numbers to be used as adjacent pairs in production. Furthermore, by including copper heat spreaders and copper lead out wires, the topology of the transistor array geometry has been optimised on the silicon die for thermal stability under load. The casing is also non-magnetic. To couple energy efficiently to the heatsinks, the ultra-high thermal conductivity of diamond is exploited by using nano diamond loaded thermal compound. Naim also uses special



Pre-Amp board pattern

ceramic insulators to the heatsinks for the power transistors, whose low capacitance serves to improve the high frequency performance of the amplifier by reducing stray coupling to the alloy heatsinks. In this product we see some new research additional to the fundamental building bocks of technology, rather than the mere refining of existing practice. Consequently there should be quite a significant spin off for Naim's future designs.

The vertical architecture of the tall external form arises from the need to maximise heatsink efficiency, which is improved dramatically over the traditional horizontal shape of a power amplifier. The monoblock tower construction allows the heaviest component (the 4,000VA transformer, which approaches 30kg on its mountings), to be located in the base for better stability. It's vertically mounted here *via* electrical insulators to massive trunnions and thence to the machined alloy base plate, thence coupled closely to the floor spikes. Vibration from this source is therefore led away from the amplifier proper. The power supply is electronically referenced from the central ground, and this vital element is defined by an ultra low impedance precision star component, CNC machined from solid copper, where the ideal current paths and densities have been mathematically modelled. Even here the negative effects of electro potentials present for differing metals in contact has been considered: selected interposed alloy washers offer a galvanic gradient to the heavy duty aluminium connections on the reservoir capacitors. These tiny galvanic electro potential offsets are considered to have a small effect on low level resolution, and research by Hawksford had previously explored the DC biasing of contacts to combat this effect. Evidently some seriously subtle thinking has been applied to this amplifier design.

Meeting the EU directive for standby power, all three components (pre-amp and power amp together) draw less than 1W in standby. This is achieved with auxiliary, high efficiency, low power, low noise switch-mode power supplies. These supplies housekeep the amplifier ready for switch on, managing the incoming currents to sensible levels during start up, and are then disengaged and powered off. (Otherwise, switching on the power amplifier would probably trip the house supply circuit breakers!) A component of that incoming current would be defined by the massive reservoir capacitors, which are rated at 2x47,000uF here, compared to the usual Naim values of 2x10,000uf.

When compared with the usual amplifier designs on the market, the *NAP S1* follows Naim's established practice for its top of the line models in fully regulating the power supplies. This multiplies the effective size of the reservoirs by a factor of 100 or more, and has a serious impact on bass definition and timing, even when driving the most demanding loudspeaker loads.

With output power approaching 1kW per channel, a bridged design is essential, since transistors of the required quality don't come with both a voltage and a linear current capacity to provide such an output otherwise. Naim has considerable experience here, gained from the long lived *NAP 500*, where in particular these differential methods also resulted in exceptionally low levels of power supply noise at the output. Naim's proprietary *DR* regulators have been further improved and these latest implementations use still lower noise Zener references of the subsurface type.

The input section is universal, beginning with a fully balanced instrumentation amplifier that offers accurately matched plus and minus phases for high common mode rejection. The circuit topology is novel, leaving the output stage out of the feedback loop of the main amplifier and trimming the stable output impedance at 0.1ohms *via* a selected a power resistor. (Instead of Naim's usual 0.2 ohms, as a nod to the very high power available.) A fast, local current feedback loop runs the output stage, making the preceding voltage gain drive circuit immune to loudspeaker load variations. Thus the output section is held stable and helps to deliver vanishingly low 0.0005% distortion at 1kHz (-116dB, even at 500W/ch into 8ohms). The separation of voltage and current feedback has resulted in an internal rise time ten times faster than any existing Naim amplifier, providing an extraordinary bandwidth.

With special linearising circuitry and non-invasive temperature compensation, the power stage runs cool in a low current Class A/B condition, together with a particularly high level of bias current stability in the face of its varying transient power history and frequency. Gross over-current protection, if invoked, employs non-invasive opto-couplers which don't affect performance in the normal operating condition at all. The excellent output transistor matching enables exceptionally low distortion from the array of 16 power transistors per channel. These are arranged as four bridged amplifiers, parallel connected (each one capable of 200W/8ohms, 400W/4ohms in non-bridged operation).

Transfer function errors in amplifier operation generally lead to signal modulation effects in respect of bandwidth and distortion, these varying with output current or with voltage level and frequency, and also with complex loudspeaker loading. Any of these factors are able to generate more subtle music related distortion artefacts, which can affect clarity,

dynamics, timbre (particularly at higher powers), bass slam and not least musical timing. Naim has addressed these issues at source by avoiding overall negative feedback, and therefore minimising the amplifier's signature on the sound, regardless of loudness or the complexity of loudspeaker loading.

So much available power needs some supervising control, and this is handled by an ARM microprocessor. It looks after potential short-circuits, thermal management, start up and idle, monitoring output offset, 'over-current', excess temperature and rapidly incoming current during start-up. Basic protection remains in place even if the control chip fails. A tiny switch-mode supply begins the start up sequence, controlling incoming currents, and is then entirely disconnected at both input and output so that it has absolutely no effect on the sound.

Test Results (pre-amplifier)

Although the Audio Precision test equipment has outstanding distortion performance, it could not reliably explore the amazing linearity and low noise of this Naim pre-amplifier. The numeric readings needed amplification by reference to spectrum analysis. For example, in assessing midband harmonic distortion at 1kHz, the analyser nulled the fundamental to a very low -140dB and no harmonics were identifiable above the -128dB noise floor right up to 20kHz. Likewise for high frequency intermodulation (19.5/20.5kHz), the excellent upper sidebands were held to -96dB, while the 1k difference tone was lost in noise at better than -115dB (0.0006%). Midband output impedance was a low 10ohms, rising to about 200ohms at 20Hz due to the usual Naim output capacitor (intentionally fitted to remove infrasonic and possible DC components).

The frequency response was very flat through the midband, registering -0.05dB at 20Hz and -0.51dB at 20kHz, the latter an intentional filter for unwanted high frequency signals. While intrinsic channel separation was very high, it was set by design to a constant 80dB, 20Hz - 20kHz.

Signal-to-noise ratios were excellent at the 0.5V IHF level, registering -90dB unweighted including hum (what hum!), and the powerful output could deliver up to 11V+11V RMS into balanced 600ohm loads, this from a low 12ohm output impedance per phase. DC offset was understandably zero at the outputs, while the input impedance per phase was a moderate 20kohm shunted by 470pF of capacitance (the latter to help keep out unwanted interference). That costly dual-mode volume control performed excellently: the stereo channel tracking was held within

PRE-AMPLIFIER TEST RESULTS

Make		Naim Audio		
Date		19/5/2015		
Model		NAC S1	Ser. No.390177	
Distortion, THD inc noise		20Hz	1kHz	20kHz
At IHF 0.5V out, 0.5V line in L/R		-81/81 dB	-81/81 dB	-77/77 dB
At IHF 2.0V out, 2.0V line in		-91/91 dB	-89/89 dB	-68/68 dB
Channel separation				
IHF. 0.5V	Single-ended	80 dB	80 dB	79 dB
Frequency response				
IHF. 0.5V	Aux Single-ended	-0.05 dB	0 dB	-0.51 dB
Intermodulation Distortion				
19.5kHz/20.5kHz 1:1		0.5V output		1kHz difference tone
	Aux Single-ended		-105 dB	
Signal to noise ratio		CCIR Weighted	20Hz-22kHz	A Weighted
IHF. 0.5V Aux	Single-ended	-84 dB	-88 dB	-90 dB
	Balanced	-82 dB	-90 dB	-92 dB
Channel Balance over volume range			Single-ended	Bal
R ch is reference	at 0dB		0 dB	-0.008dB
	at –20dB		+0.01 dB	+0.018 dB
	at –40dB		0 dB	+0.005 dB
	at –60dB		0 dB	+0.01 dB
Maximum output level (1% clip)				
100k Ohm load			7.6 V Single-ended	14.6V Balanced
600 Ohm load			6.5 V Single-ended	11.1V Balanced
Output impedance			12ohms Single-ended	25ohms Balanced
Input Data		Socket	Sensitivity	Loading
Aux input single ended		Phono/RCA	340mV For 2V	30 kohms 470 pF
DC offset		Left 0 mV	Right 0 mV	
Size (WxHxD, mm)		270	940	412
Weight		61.5kg		
Price	£57,000 (pre-to-power amp connection and mains cables included)			

AMPLIFIER TEST RESULTS

Make	Naim		
Date	19/5/2015		
Model	NAP S1 Mono Power Amplifier		Ser. No.880755
POWER OUTPUT	20Hz	1kHz	20kHz
Continuous 8 ohm @0.1%	794 W	794 W (Rated = 746W)	794 W
Continuous 4 ohm @0.1%	1500 W	1500 W (Rated = 1440W)	1500 W
Pulsed 2/1 ohm (15kHz 30:1 for 2R)	2700/4400 W		(1:10 duty cycle 1kHz)
Output impedance	0.11 ohms	0.11 ohms	0.13 ohms
Peak Current (2 ohm pulsed)	52 A (10kHz , 1 cycle 98A for 1 ohm)		
Distortion, THD inc. noise (1W) (80kHz BW)	-87 dB	-87 dB	-80 dB
Distortion, THD inc. noise (2/3rd rated power) (80kHz BW) (@ 497W)	-105 dB	-105 dB	-86 dB (3rd harmonic)
Intermodulation Distortion 19.5kHz/20.5kHz 1:1 rated power, 8 ohms			>-105 dB
Intermodulation Distortion 19.5kHz/20.5kHz 1:1 1W, 8 ohms			>-105 dB
Signal to noise ratio (ref. 1W)	CCIR Weighted	Unweighted	A-weighted
	n/a dB	-84.8 dB	-92.5 dB (-123dB ref 746W)
Channel Balance	< 0.1dB	<0.1dB	<0.1dB
Frequency Response: 8 ohm	-0.04dB @ 10Hz, -0.12dB @20kHz		-3dB @ 100kHz
Absolute Phase	correct		
Input Data (gain 30dB)	Socket	Sensitivity	Loading (per phase) cap via 3k3
single ended (full power)	XLR	1220+1220 mV	30k ohms 470 pF
DC offset	n/a mV	Right -49 mV	
Size (WxHxD, mm)	256mm	94mm	383mm
Weight	101kg (each)		
Price	£98,000 per pair (at 20/05/2015)		

HIFICRITIC
AUDIO EXCELLENCE

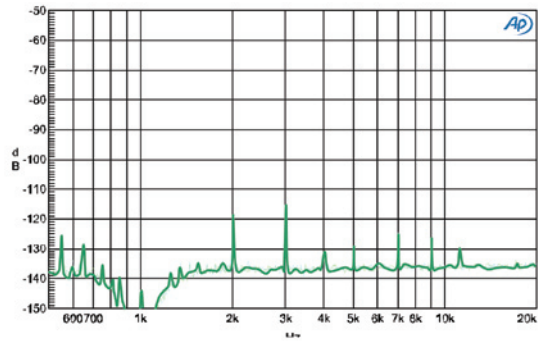
The Review System
Audio Research *REFERENCE 5 SE,* Aurorasound *Preda,* Townshend *Allegri* control units; Vitus *SIA-025*, Naim *NAP300* and Krell *Duo300* power amplifiers; Naim *UnitiServe* network server and S/PDIF, Naim *NDS* (Streamer-DAC)/*555 PS*, Chord *Hugo* DAC, Linn *LP12* (*Radikal/Keel)*, Naim *ARO*, Koetsu *Urushi Vermilion,* Naim *SuperLine/XPS* sources; Wilson Audio *Sasha Series-II*, Magico *S-5*, Quad *ESL 63* speakers; Naim *FRAIM* racks; Naim *Super Lumina* interconnect and speaker cables, *NACA5* speaker cable, Transparent *MM2* and Van Den Hul *The First Ultimate* interconnect cables.

POST SCRIPTUM

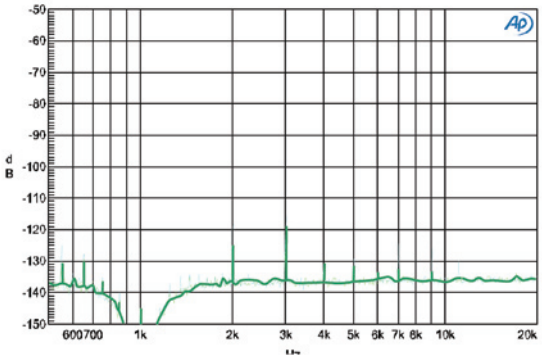
As we were going to press, I tried a custom mains set built from four Naim Powerlines, feeding the NDS and the three Statement components via a star supply from a single Naim mains plug. This delivered abundant pace rhythm and timing, with first class stereo, indicating that my wall socket strip was clearly wanting.

Contact:
Naim Audio
Tel: 01722 426600
www.naimaudio.com

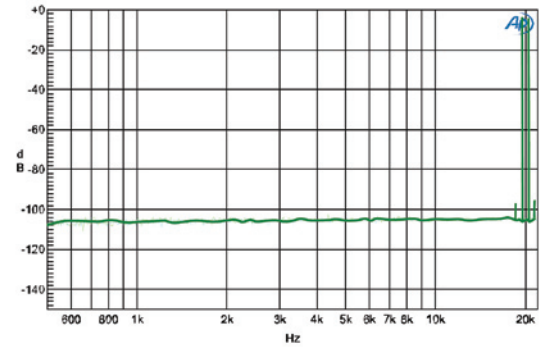
Statement Power 20W 1kHz harmonics 8 0hms



Statement Power 1W 1kHz harmonics 8 0hms



StatementPower IM distortion 19-20k 500W 8 0hms



0.01dB over a 60dB range in balanced mode, and the volume steps themselves were also typically accurate to 0.01dB. While I might have preferred a somewhat higher pre-amplifier input impedance (50 - 100kohm, to reduce loading on signal sources), the 20kohm + 20kohm registered here is fine for most sources.

Test Results (power amp)

The headline power output was 810W per channel, and 794W for a tightened 0.1% distortion criterion. For 4ohms it almost doubles to 1500W at 0.1% 20Hz – 20kHz and will do 1600W short term for 1% (which would quickly smoke my load box if left running, so I got some help from Naim here). In contrast to many high power bridged amplifiers, which begin to limit below 4ohms, adverse loads were no problem. (Note that many larger speakers are 4ohms rated and drop below 2ohms equivalent reactive loading under real life peak power conditions.) With program equivalent pulses, this amplifier can deliver 2,700W into 2ohms and a simply huge 4,400W into 1ohm, with an all-out current maximum of 98A for a single cycle duration. Despite this bashing, distortion did not exceed 0.05% at 1kW output, even with 2ohm loading. This is one heck of an amplifier, with genuinely high power, massive current and very, very low distortion. The output impedance remains steady at 0.11ohms (largely defined by Naim's practice of fitting a stabilising series output resistor of this value). Very little impedance rise is seen at 20kHz, indicative of a very wide open loop bandwidth for the output stage.

The total harmonic distortion data essentially describes the noise floor, with distortion only visible well into the noise floor *via* spectrum analysis. At two-thirds of rated power THD is better than -105 dB to 1kHz. Noting a touch of third harmonic arising at higher frequencies, it still gives an excellent -86dB (0.005%) by 20kHz. High frequency intermodulation is quite excellent throughout, better than -105dB (0.0006%) right up to full power. (Note that channel separation figures are not applicable to monoblock amplifiers.)

The 1W signal-to-noise ratio is an excellent 84.8dB unweighted and 92.1dBA weighted, corresponding to a state of the art -123dB relative to full power, so no hiss or hum should be audible from the speaker drive units. Channel balance is better than 0.1dB, while the frequency response on load extends from -0.04dB at 10 Hz to -0.12dB at 20kHz, with the 100kHz point coming in at a fine -3dB. DC offset was under 50mV and the input impedance was a reasonable 30kohm/470pF per phase. The amplifier idles at about 80W per channel, and consumes less than 1W in standby.

While Naim amplifiers generally have a low idle power, allowing them to stay powered up and ready for immediate use, some owners may wish to leave this pair on standby to avoid some heating of the room in summer. At an ambient temperature of 21 degrees, an idling *NAP S1* added a further three degrees. The likely owner may well have air conditioning, though this needs to be an ultra quiet studio-grade installation in order to hear everything that the amplifier can resolve. In summary, the huge power and quite exemplary laboratory performance promised a successful audition. Given that pair of 4kW power transformers I'd recommended a 90amp electric shower grade spur specially for its installation. (I had to make do with 60amps!)

Rafael Joins the Statement Party

PROVIDING THIS EXTENDED REVIEW WITH A SECOND OPINION, RAFAEL TODES WRITES:

I had the good fortune to hear the Naim *Statement* amplifier twice, once when it was newly arrived at Colloms', and then two weeks later, when it had been further broken in and the mains supply reorganised.

My reaction to the first audition was one of surprise. Listening to Colloms' vinyl source (a Linn *Sondek*, with a Koetsu *Urushi* cartridge) on Delibes *Pas des Éthiopiens* from the ballet *Sylvia* on Decca, I was astonished to hear a degree of timing mis-match between the pizzicato cellos and basses and the upper strings. The amplifier clearly had slam and an exceptional effortlessness, but for me it was not yet firing on all cylinders.

Two weeks later, however, the *Statement* gave a completely different view. Listening to the same piece of music, this time with only the *Statement* power amps wired on one mains spur and the other components on a second, results were completely different. The timing was now immaculate between the two groups in the orchestra, probably the best I've heard in this respect. There was a huge and solid soundstage, and an enormous sense of authority that had been lacking two weeks before.

Turning to a digital source, I did not get on that well with Colloms' *NDS* streamer set up, and tried a personal favourite of mine, an Astell and Kern *120* portable player optically feeding a battery-driven Chord *Hugo*. I listened to a recording of the great pianist, Arthur Rubenstein playing Chopin, on RCA. I have never heard a system reproduce so well the sheer poetry and lyrical timing that was Rubenstein's hallmark. I was fortunate enough to have heard the great man three times in my life, and always found his recordings a pale imitation of the live event. Not so here: this Naim amplifier had the skill and finesse, combined with the extraordinary timing, here revealed with the *Hugo* DAC, to create something really special.

I was left with the impression that the *Statement* had now finally found its feet, and was saying much more about the skill of its fellow components than itself – often a characteristic of a great hi-fi component. It was spotlighting the *Hugo*'s exceptional micro-dynamics and its ability to create seemingly non-digital musical poetry, but also showing the battery-powered DAC's lack of absolute slam. I left, highly impressed by the sheer power and involving musicality of the *Statement*.

Martin Colloms at Jon Honeyball's

While I had heard the Naim *Statement* amplifier combo at several shows driving Focal *Utopia* loudspeakers, in acoustics that varied widely both for reverberation and noise levels, this run-in dealer-loan *NAC S1* pre-amplifier was temporarily resident near Cambridge in near silent domestic conditions.

This brief report has two contexts. One is my view on how much the system is altered by substituting a *NAC S1* for the normally resident *NAC 52* pre-amp. The other, and perhaps the more relevant view concerns the fidelity of the entire system configured with the *NAC S1* pre-amp, on both CD and LP sources and using programme that I know well.

Having spent many hours listening to this system, introducing the *NAC S1* wrought a transformation; from a classic late 1990s Naim sound – authoritative, expressive, exciting, and at times menacing – to something with an audibly greater dynamic range, superior clarity and a more precise and sharper focus with layered depth. With the improved clarity came a substantial reduction in system coloration, which is not a usual characterisation of a *NAC 52* – perhaps the *NAC S1* was better able to drive those multiple active filters.

This was the best of several *NAC S1* demonstrations I've yet heard, and by quite a margin. While the *Six-Pack* driven *DBL* still wears its thunderously dynamic character on its sleeve, the *NAC S1* somehow imposes its own authority on the result. I had never heard the like from this speaker before. It now sounded so agile, with such heart-stopping moments, such menacing, visceral bass percussion, deeper than before and with much clearer bass tune playing.

More detail was audible throughout the frequency range. Every note, every line seemed more clearly focused and expressed, and it was an effort to remains dispassionate in order to continue to analyse what was happening. The *DBL*s now focused very well and showed significant image depth, with deep extended reverberant decays that were rich in tonality, pitch-accurate and detailed. The musical impact was so exceptional and exciting, I soon gave up the struggle. A succession of known discs, silver and black, showed new insights into the rhythm, power, dynamics, and inner clarity, with razor sharp fast transients whose blazing immediacy did not blur the inner tune playing.

Vocals sounded live and compelling, as if from a fine stage PA rig, and the sense of communication was thoroughly beguiling. Astonishing when played loud, neither did it disappoint when working quietly, as the sound remained imbued with micro-detail, clear vocal articulation and exciting dynamic expression. How a line stage can do all this is one of the mysteries of high end audio, but such results have been recorded before, when an experienced design team reaches for the stars and consequently manages to get rather closer to the state of the art. In part it has to do with perception, where relatively small but important differences can have a subjective impact out of proportion to their apparent size. But if you too had heard the *DBL*s singing over those two days, I would hope that you might well find some agreement with these very positive musings.