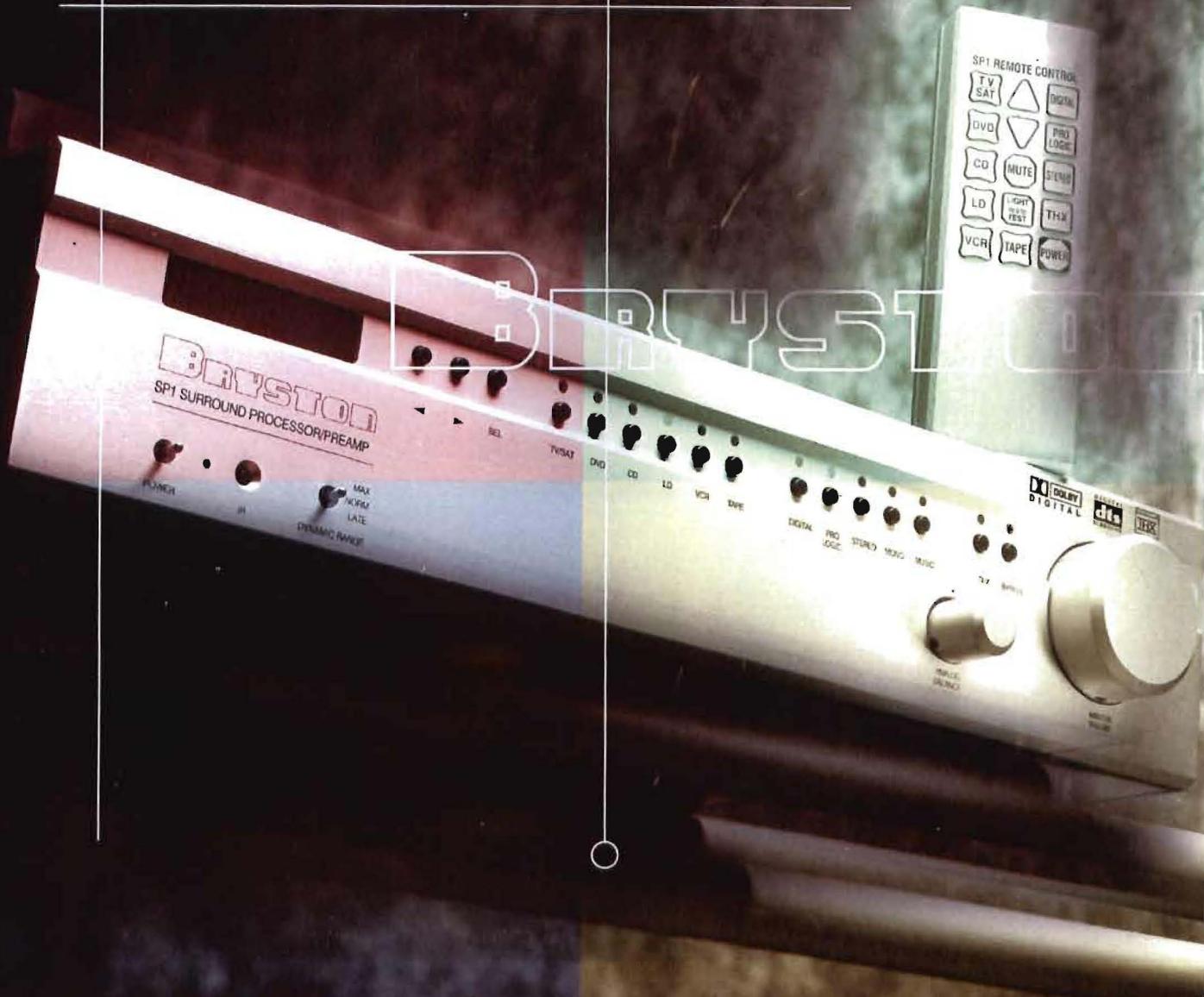
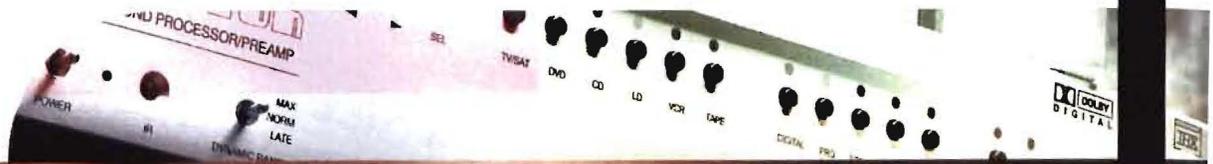


vol 5 ume

BRVSTON



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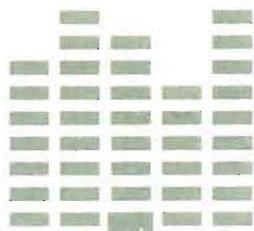
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SP-1

BRYSTON

the canadian challenge

There's really no need for us to re-introduce Bryston Limited, since we spoke at length about the Canadian company in a recent issue (number 7) when we reviewed their 9B amplifier. You may remember that we said that anyone looking for a high-quality home theatre system owed it to themselves to check out the 9B five-channel amplifier. At that time we had planned to run tests on the 9B's logical companion, the SP-1 surround sound preamplifier. However, since production models hadn't been released to the market, pending final adjustments to the processor, the Peterborough company politely asked us if we could rein in our journalistic horses until they fin-

ished beta-testing. Only a limited number of retailers had the latest pre-release version in their showrooms. This is normal procedure for manufacturers of high-end equipment since it allows them to evaluate new products in real-use environments. It's euphemistic to say that Bryston makes sure that its products are completely market ready — their 20-year warranty should be proof enough of that.

So, in spite of our curiosity (heightened because we were so smitten with the performance of the amplifier), we waited patiently until we could get our hands on one of the first production models (serial number 00033).

BRYSTON • Critical Acclaim

One of the features recently added to the SP-1 (and available on our test machine) is the option of displaying the operating and calibration settings in French. This kind of feature is rare in the (mostly English) audio world, especially in top-of-the-line components. Mr James Tanner of Bryston stated that the French-language version is available on demand at no additional cost. Any consumer can order a model with French-language menus. As well, the display language can be changed by simply replacing a chip. Your reseller can do this in a couple of minutes at no charge if they don't have the version you want in stock.

The Bryston SP-1 is the centrepiece of a high-performance surround sound system clearly aimed at a clientele of audiophiles who are in no way about to sacrifice musical quality on the altar of home theatre. One of the reasons for Bryston's relatively late entry into the surround sound dance is certainly due to the company's conservatism (in the best sense of the term). But, faced with a mature market (more and more music lovers are choosing this path but are unwilling to neglect sound quality), it was high time that the folks in Peterborough got on board.

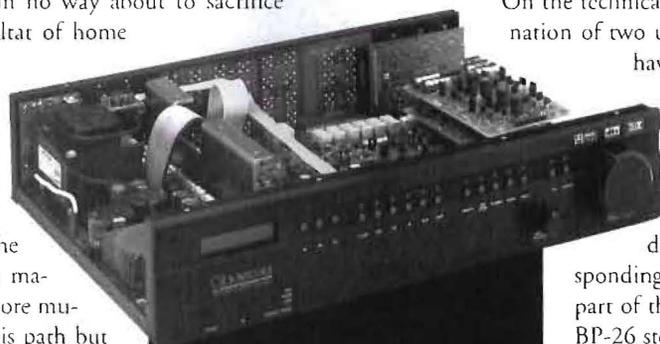
The SP-1 has a traditional, elegantly refined, front panel with a main volume control and a series of digital toggle buttons for input selection and for choosing operating modes. Each button has a corresponding LED. A small LCD allows initial setup and displays the type of input signal during normal operation. Two switches are located under the display window: one for power-on/off, the other limits the dynamic range so that you can listen to explosive sound tracks in the evening without infuriating the neighbours.

The back panel allows for hook-up of six different inputs, two of which have tape loops. The 4 others can

handle standard S/PDIF coaxial digital inputs. As well, there are two TOSLINK fibre optic inputs which may be assigned to either input. The six outputs are available in balanced and unbalanced versions each with a discrete output amplifier. A DB-9 connector lets you integrate the SP-1 into a household control system (e.g., Creston or Phast). Two 12-volt outputs, one of which can be programmed from the system menu, allow you to run accessories (amplifier, motorised screen, etc.) as needed. Right off the bat, the remote control was a winner: the keys light up automatically when you pick it up! As well, it's made of metal and feels solid, something lacking in the plastic remotes that we've gotten used to.

On the technical side, the SP-1 is a combination of two units in the same case. You have a surround sound processor which can decode type 5.1 channel digital audio formats such as Dolby Digital and DTS, plus Prologic type matrix encoding systems with the corresponding THX features. The audio part of the SP-1 is derived from the BP-26 stereo preamplifier which has been highly praised by the industry press. To listen to music programs in stereo, it's easy to separate the unit's digital and analogue sections and enjoy the pre-amp's Oscar-winning sound quality. In such case, even the volume control is identical to the BP-25 analogue. In surround sound mode, the same volume control transmits digital commands to multi-port converters which adjust the overall level of the sound signal for all the channels. Bryston has clearly gone to great pains to ensure

the best possible sound quality in any and all possible listening situations, whether in stereo mode coming from analogue or digital sources (including audio output from high-quality platinum CD's) or in surround sound mode for reproducing sound tracks from DTS or AC-3 films. In purest audiophile tradition, the audio planes are uncom-



The Bryston SP-1 is the centrepiece of a high-performance surround sound system clearly aimed at a clientele of audiophiles who are in no way about to sacrifice musical quality on the altar of home theatre.

promisingly put together with discrete components and no integrated circuits. When you choose the non-digital mode (as shown in the display window), the signal path is entirely analogue. Here the balance control on the front panel functions just like a stereo pre-amp, whereas in 5-channel mode, it is completely bypassed. In this case, the sound balance among the various speakers is determined by the settings in the initial calibration menu. Speaking of display, it's worth noticing that the words "muet" and "parlant" appear as you cancel the mute feature (only available on the French version of the SP-1). Also worth mentioning : Bryston decided not to incorporate a video switch. We find this a bit strange and are aware

of only one other home theatre system that does this : the Theater Master Signature, the high-end version of the Ovation model, which we tested about a year-and-a-half ago. This is not necessarily a major handicap since specialty video companies (e.g., Extron) can provide the necessary accessories. Of course, this adds an additional expense and, as well, can complicate the overall integration of the audio/video system. However, with new video formats appearing all the time, it's always possible that the serious amateur who is willing to invest in a high-end video system will want to devote the selection of the video source to a dedicated device, especially if he or she is working with composite signals (Y, Cr, Cb) or RGB. Personally, I would have preferred being given the choice.

The initial set-up is easy to carry out and the calibration menu will walk you through the various steps without useless complications. You start by choosing the number and type of enclosures you use (« big » or « small », with reference to the ability of the speaker to reproduce low frequencies). Then the SP-1 asks for the distance separating your listening position from the various speakers. Finally, you have to adjust the sound levels of the various channels to achieve overall system balance. If your speaker enclosures fall into the category « small », the configuration menu allows you to direct low bass frequencies to your subwoofer rather than to your speakers. Being able to choose different switching frequencies lets you optimise bandwidth for your columns as well as getting the best possible control over the

bass. And that's not all, a bass limiter sets an absolute ceiling for speakers classified as « big » and for the bass enclosure. As long as the unit functions in « processor » mode, nothing can go beyond limits you set. You will avoid blowing your speakers and protect your ears at the same

time, even from sonically violent sound tracks.

Initial installation and set-up of the SP-1 in our listening room took about half an hour, including the connections. Then we

spent several weeks getting familiar with all the features and carefully evaluating the performance before concluding that this home theatre pre-amplifier keeps its maker's promises to the letter.

Used as an analogue stereo preamp, it brings out all the minute detail in our sample recordings with exceptional neutrality. The stereophonic image is convincing and the depth perspective is entirely realistic. Our version of the Beethoven Emperor Concerto, recorded in the Vienna Musikverein (Deutsche Grammophon) lets us measure the hall dimensions by ear. You can hear the notes from the piano bounce back off the walls before they softly die away and the double bass sounds move through the speakers like successive waves of the incoming tide without the least sonic confusion. The famous silky sound of the Vienna Phil string section is faithfully reproduced and you can feel the live audience breathe along with the beat of the music – in fact, you find yourself doing the same. In the Tallis Scholars' recording of the Allegri Miserere, you can pick out the individual voices in the choir. Even in a an acoustic environment full of complex echoes coming from the many stone arches in the chapel, the voices blend together without confusion allowing the various solos to emerge clearly. The harmonic vocal lines in the Mozart Requiem are reproduced without the least trace of confusion or harshness as if the floated atop the orchestration. All is transparent, ordered and smooth. In a completely different style, Holly Cole's 6.28 CD, recorded live at the Théâtre Saint Denis, brings

Bryston has clearly gone to great pains to ensure the best possible sound quality in any and all possible listening situations, whether in stereo mode coming from analogue or digital sources or in surround sound mode for reproducing sound tracks from DTS or AC-3 films.

BRYSTON • III • Critical Acclaim

you back to the original performance : the double bass is deep and keeps an authoritative rhythm. The piano chords float in space and the singer's voice is full of emotion. The instruments are solid and spatially well-defined, the contours are clean and you hear a real flesh and blood singer.

For home theatre use, you will appreciate the transparency of the sound stages which make the voices sound realistic and make the dialog understandable, even in the midst of the hurricane in *A Perfect Storm* and in spite of the tonnes of water which seem to really crash over the bridge of the fishing boat. Of course I know that much of the effect is due to technical wizardry in the sound studio; but isn't that real reason you invest in a good home theatre system ... you want to be swept into the heart of the on-screen action? In *Music of the Heart*, the sound environment of the streets of East Harlem and the noise from the kids playing in the schoolyard contrast strongly with the violin sounds from the heroine's students – even the wrong notes are true to life. When the group who are trying to save the music program – the film's central plot -- meet in the violin teacher's home, we literally dive into the middle of the discussion. The DVD version of the film *U-571* has both DTS and DolbyDigital sound tracks and both are well-engineered. Even if the spatial aspects are more evident in DTS, you really feel the « cooped up » and, at times, oppressive, interior of the submarine. You can't help shuddering on the edge of your seat wondering if you'll come out of this alive when the depth charges explode around you. Or ducking quickly when the torpedo glances off the hull and breathing a sigh of relief when it goes by without exploding. In *Gladiator*, which is also in both DTS and DolbyDigital, there's a scene where a herd of horses comes from behind, gallops past only inches away from you and then runs off into the screen. You can feel the impact of their hooves on the ground. And you'll find that you jump when, out of nowhere, a tiger appears in the arena ready to pounce on you. *Rules of Engagement* has one of the best sound tracks we've ever heard, even if the DVD is only available in Dolby 5.1. The war scenes in *Vietnam* are strikingly realistic and you'll be grateful that you didn't have to live through the real war. When the ambassador and his family are rescued from the American embassy in Yemen, viewers can really feel both

For home theatre use, you will appreciate the transparency of the sound stages which make the voices sound realistic and make the dialog understandable

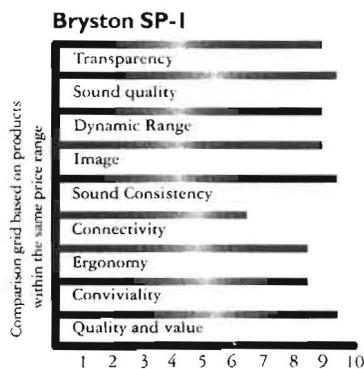
the growing hostility of the crowd demonstrating outside and the inevitable outbreak of violence. The bullets ricochet around you and you can hear the thud as they shatter the bricks and mortar.

After four or five weeks of daily use, our conclusion is that the Bryston SP-1 is not only friendly, but it also offers a very high performance level, whether as a conventional stereo preamp (outstanding neutrality) or as a competent surround sound decoder. My only qualm concerns the absence of a video section which would display the adjustments on screen.

But this is just my personal taste and in no way affects the superb sound quality which makes this a unit that you must seriously consider before purchasing an audio-video preamp. For the audiophile who wants to expand his or her horizons to take in the wonderful world of film, this unit is a must. At \$5,495, the SP-1 is one of the best values currently available.

Reinhard Goerner

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BRYSTON • IV • Critical Acclaim



The best of both worlds

Product Review / Home Theater
Bryston SP-1 Surround preamplifier/processor

By Éric Lavoie



The advent of DVD video and of the Dolby digital 5.1 format has already revolutionized the world of audio/video in many ways. In provoking the passage of home theater to the digital era, these technologies have favored the emergence of a category of surround sound systems wanting to be considered high-end, a label reserved until recently to the two channel audio domain. From the simple entertaining recreation essentially required by the amateurs of high sensations and deafening special effects, home theater thereby won, like stereo audio, its letters of nobility and its own purist clientele, demanding for precision and absolute. Besides the analogophilus (a variant of the audiophilus), an enthusiast of analog stereophony and cathode ray tube maniac, a new species has in effect developed: the digitmaniacus (a variant of the domocinephilus), a fan of the 48 kHz/24 bits sampling rate, an addict of surround sound micro details and numeric decoding. The first surround sound preamp-processor by the Canadian manufacturer Bryston foreshadows however the sudden emerging of a hybrid species which will explode this polarization of the purist clientele.

One must first know that the analogophilus and the digitmaniacus have many characteristics in common. Both species are dominated by an irresistible impulse towards perfection. Both also have a budget beyond the comprehension of the common specie (non-maniacus of any kind) because this impulse is summed up in tens of thousands of dollars. Besides, both agree to say that while listening to a film on DVD, the best way to reach an acoustical high is to have the signal treated by an excellent numeric preamp-processor.

Their likeness however stops here. Since the analogophilus leans towards musical lis-

tening and supports that a digital preamplifier is not capable of treating the analog signal from a CD reader with the respect and the virtue of an analog preamplifier. The other, more interested by home theater, thinks that this difference of quality in the music treatment is insignificant and considers that a digital processor amply does the job. Hence, most of the time, the first sacrifices a part of his pleasure and stays attached to his analog preamplifier and his two-channel system. As for the second, he accepts to go without the best musical reproduction in order to live to the maximum a home theater experience stemming from his surround sound system.

The arrival, in the summer of 2000, of the Bryston preamp-processor however put in place together the conditions, which created a genetic mutation of these two species. It is that the audacious SP1 combines, in one system, the best of the analog preamplifier of the company and a digital preamp-processor amongst the most performant. Since both function in a totally independent manner, the SP1 thereby allows exploiting to their extreme limits the possibilities offered by the best analog and digital technologies available. The new purists specie, which will be both, will therefore be one who will, from the same audio system, enjoy the best of both worlds, without any compromise.

The independence of the analog and digital sections

The autonomy of the analog and digital sections of the SP1 represents without a doubt the most fundamental characteristic of this ultra sophisticated system destined to occupy the function of the center core of the best surround sound systems. It is the result of a technological choice, which the designers of the SP1 made after a very lengthy experimentation period: it took no less than three years to develop.

You may be saying to yourself that the best preamp-processors presently on the market yet allow the optimal integration of the musical experience and home theater. The designers of the SP1 also believed it until just recently. In fact, the original design of the SP1 had been thought according to the same principle as of those of its competing rivals, which is to entrust to the digital section a portion, however minimal, of the analog signals preamplification tasks. The listening sessions of the prototype which the designers were working on brought them to conclude that any junction between the analog and the digital sections was an audible degradation source of the analog signal. Therefore, for them, the only means to obtain the same musical quality of an analog preamplifier was to separate entirely the analog section and the digital section. It was also the only way to allow the consumer to benefit from the best analog and digital performances without having to purchase two systems.

Topology-wise, the two sections are first spatially isolated and each possesses its own transformer. There is only one volume control however it leads to two distinct parts: the automatic detection of a digital signal allows the signal to be directed towards the digital circuit whereas, by default, it is directed towards the analog section. This way, a signal from an analog source (a CD reader, for example) follows a discrete analog path (without passing through a digital circuit or an integrated circuit) from input to output. This configuration is innovative in the measure where even the preamp-processors having a Bypass function use the converters to increase or lower the volume.

In stereo listening, this total separation between the analog and the digital ensures from the SP1 musical performances identical to those of a high-end preamplifier. In fact,

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the analog circuit of the SP1 is the same as that which is found in the best Bryston preamplifier: the BP25. "It's what pleased us right away from the SP1, indicates Mr. Nicola, manager of Audioville: it treats the music entirely in an analog way. It's really, really a preamplifier."

Like many informed audiophiles, Mr. Nicola maintains that an analog preamplification produced from an analog source, has a softer sound, purer and more natural than a digital preamplifier. "To those who are critical in terms of audio and who know high-end preamplifiers, we cannot give them a digital processor for musical listening. It does not have the same sound. I made a comparative test with systems twice as expensive and the SP1 has an analog sound more fluid, more rapid, more dynamic and less hard. The tone is more right, more respectful musically."

Now on the digital side, the PCM signal from a DVD reader is directed towards the digital section where it is treated before being converted to analog and moved towards the outputs. The Finnish company, Sample Rate System, who is specialized in the domain, has designed this digital circuit.

One finds no less than three Motorola 56009 chips that share the tasks of decoding, of digital management and composition. As for the conversion, it has been assigned to the most recent Crystal 24 bits semiconductors, one per channel, in order to ensure an optimal separation.

According to Steve Nicola, the quality of this digital management gives in home theater listening sessions results which once again distinguish themselves from the competition: "Bryston has paid more attention than others to the center channel, that of dialogues, where the majority of the acoustical information's stem from. The voices are more open and more natural."

Beyond being tied to the complete analog-digital separation, the quality of these performances would be due, according to Bryston, to another technical choice: that of not putting into the SP1 an internal video selector. During the experimentation process, the designers concluded that such a selector, with very high RF frequencies, could only negatively affect the audio signal.

Complete and ergonomic

The SP1 however combines most of the high-end functionalities allowing the best digital entertainment: Dolby Digital decoding, Dolby Pro Logic, DTS, as well as the digital THX treatment, dynamic range control, etc. I will spare you of the secondary functionalities, clearly described in the excellent user manual, unfortunately in English only, which is available on the



Web page of the company.

Externally, the SP1 offers the same mug and craftsmanship as that of its counterparts: a professional studio face which will not necessarily bow over the chrome and futuristic enthusiasts, on a solid metallic frame with a thick black brush aluminum front plate. Despite the large number of available functions, the configuration of these controls is not disconcerting. The display panel is perhaps a little small to be consulted at a distance, but it does supply the most useful information: the source as well as the number and type of channel. This way, you will not be misled by a digital two channel signal instead of a 5.1 Dolby Digital signal.

The SP1 also, of course, includes an infrared remote control. Rather than going for impressive and esthetic, Bryston chose it solid, very simple and easy to use. It is therefore made of metal, displays the main controls, lights up in the dark as soon as one touches it and displays information in large characters.

We must emphasize that even though the SP1 is complex, the configuration and the setting of the different listening parameters do not require a three-credit university course. Steve Nicola considers that this is another excellent point of comparison to other models: "The SP1 is much simpler to configure than other competing systems: all the initial settings take approximately 30 minutes, which is a minimum of three times less than others."

A Memento mori to forget

Knowing the frequency of technological innovations, should one worry about the lifetime of such a system? "Memento mori" ("Remember that one must die") is not necessarily inscribed at the entrance of old European churches. But, to calm our anxiety in front of such a faral eventuality, one must first tell himself that the SP1 has computer components allowing it to treat the format which is becoming more and more a home theater industry standard: the 48 kHz / 24 bits. Most of the experts consider that these standards will last for quite a while yet. It is that, for reasons of storage capacity, the DVD, which contains the sound and the image, cannot be

exploited at a higher sampling rate.

Now concerning audio, the audio DVD and SACD formats, which are emerging, are in the sampling rates going towards 192 kHz and the standards are far from being established. But most of the audio DVD and SACD readers offer but one analog output: the SP1 obsolescence problem is therefore not one.

Whatever the future of digital formats might be, just know that the SP1 has been designed in order to allow simple reception, as with your computer, of software updates and in a way, which easily permits the digital board to be adapted to new formats by the insertion of a new chip.

"And what if we go to the 7.1 channel format?" are you then asking yourself. There again, the SP1 can be easily adapted. Its connectivity also includes balanced and non-balanced outputs when, evidently, only one type is used. All one needs to do is to convert two of the unused inputs and dedicate them for the two supplementary channels that will then be necessary.

In the same frame of mind (that of the SP1 immortality), one must also remember the unequalled length of the Bryston warranty. As for all of its products, the company offers a transferable 20-year warranty. A promise of almost-eternity!

And, as to the subject of our very mortal purchase capacity, allow us to remind you that the SP1 is a Canadian product and that it is therefore less expensive than other comparable systems from Europe or the U.S.

Listening session

If you already know of the commercial agreement existing between Bryston and the British PMC manufacturer, you will have guessed as to which type of speaker system the SP1 was teamed up with in Audioville's audio/video room, where I spent a couple of listening hours. Two MB1 speakers to the right and left, one center MB1 speaker and two FB1 speakers to the back, sustained by a Velodyne HGS15 active subwoofer was the speaker system in place. The digital audio signal had for a source a Toshiba SB9100 progressive scan DVD reader (it accomplishes a task similar

BRYSTON • VI • Critical Acclaim

to that of a line doubler) whereas the analog audio signal task was given to the Conrad Johnson DF2 CD reader. For the amplification, Audioville chose five independent amplifiers: the 7BST (500 watts each). The listening room dimensions are comparable to that of any domestic living room and, during the length of the listening session, the sound level was fixed to the minimum recommended by DTS, which represents a level of reasonable and comfortable acoustical pressure even after many listening hours.

First in home theater session, at the reading of the DVD, it did not take long to recognize from the SP1 performances the signature of the best processors. These high-end digital performances can be appreciated in terms of: acoustical and audio image correspondence, smoothness in the passage of the acoustical message between speakers, in the precision of the objects spatial location, in the dynamic differences between scenes and the credibility of the surround sound impression

Notice that, in this range of products, it is not so much with the spectacular sonic effects that one can discover the sharpness of a processor (as any system can reproduce in a convincing manner gun shots, explosions and motor sounds), but it is with the ordinary scenes, those where living goes on in front of our eyes. Few systems can in effect correctly process the harmonic complexity that is found in the sound of a fall or in the sound of a human voice. This realism, this acoustical message integrity were remarkable during the listening of *The Haunting*, where I couldn't help but salute the grand virtuosity of the SP1. This one distinguishes itself from its high-end competitors most probably in its capacity to reproduce dialogues naturally, without ever giving the impression of "canned" or high-pitched voices. So in the realm of digital surround sound, the SP1 has everything to make us leave our living room and to transport us in a virtual world.

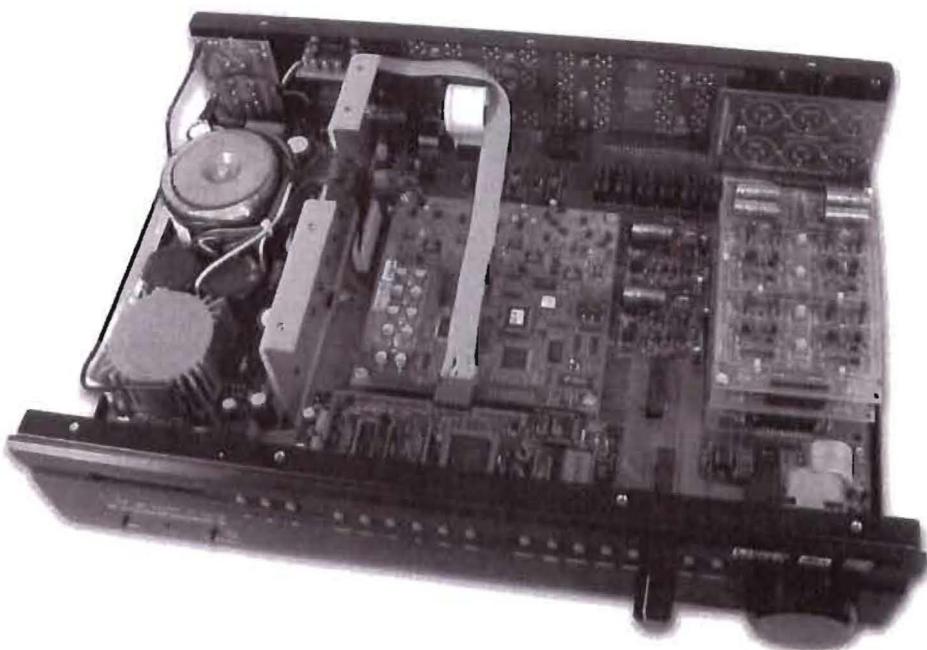
In pure stereophonic listening, the musical performances of the SP1 were also totally convincing. Its analytical capabilities can only be appreciated in all its fullness however when teamed up with a high-end CD reader. What appeared to me as being obvious is that the SP1 surpasses in capability of resolution that of the best DVD readers. Above all the SP1, like very few of systems of that kind, has really what it takes to bring out this difference. This was particularly striking while listening to a Doug Macleod disc (*Unmarked Road*).

According to all criteria by which one appreciates the best analog preamplifiers, I cannot do otherwise but to give the SP1 an A+. The acoustical message is of an exem-

plary suaveness, smoothness, and clarity; the stereophonic image becomes wide, articulate and steady in all circumstances. The SP1 never seems to be overwhelmed by the difficulties and possesses the quality of making itself unnoticed, of becoming completely transparent, to the profit of the music.

This too brief listening session has evidently been insufficient to allow the exploration of the entire musical and surround sound qualities of the SP1. However, it allowed me to realize the extreme care towards perfection of the very serious Bryston firm in matters of acoustical reproduction, as much in digital as in analog modes. In combining, in this high-end system, its best preamplifier and a surround sound processor, Bryston thereby brings the integration of musical reproduction and home theater to heights probably never attained before and makes liars out of those who believed that this integration would be done only for the non-purist. As it pushes back almost indefinitely the moment of its outdatedness, the evolutionary design of the SP1 has rendered it a sure value. This is why this makes me believe that if the SP1 had been in Sydney, it would probably have won Canada its fourth gold medal.

Thanks: Québec Audio would like to thank the team of Audioville on Saint-Lawrence Boulevard in Montreal, who has kindly put to our use one of its audiolvideo rooms and all the necessary equipment allowing us to carry out our product review.



"One must remember the unequalled Bryston warranty. As for all its products, the company offers a transferable warranty period of 20 years. A promise of almost eternity!"

Manufacturer' specifications:

- Digital listening modes: Dolby Digital, Dolby Pro Logic, DTS, PCM, THX and 4 DSP modes.
- Inputs: 6 inputs, which 4 have digital possibilities.
- Digital connector types: 4 coaxial and 2 TOSLINK (optical)
- Price: 5,495.00 \$
- Warranty: 20 years, transferable — parts and labour.

Distributor: Bryston Ltd.

Web page: <http://www.bryston.ca>

Discography:

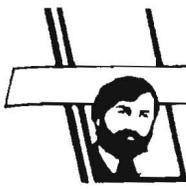
DVD:

- *The Haunting*, Dreamworks, no 84820.
- *The Matrix*, Warner Bros., no 17737.

CD:

- *Samedi soir sur la Terre*, Francis Cabrel, Chandelle, no CHANDC801.
- *Also sprach Zarathoustra*, Richard Strauss, Decca, no 466 3882.
- *Unmarked Road*, Doug Macleod, AudioQuest Musics, no AQCD1046.

BRYSTON • VII • Critical Acclaim



Bryston SP1

Bryston SP 1 A/V Processor
Sugg. Retail: \$5500
Manufacturer: Bryston Ltd.,
P.O. Box 2170, 677 Neal Drive,
Peterborough, ON K9J 7Y4
(800) 632-8217 FAX (705) 742-0882
www.bryston.ca



These days movies get made in 6 months, often in 6 weeks, and the phrase, "years in the making" hardly applies any more. However, it can refer to the design and manufacture of today's digital home theatre processors, or, at least, the high end ones. For the past 3 years my first question to at least three Canadian electronics manufacturers has been, "How's your A/V piece coming along, eh?"

I've been getting lots of different answers, for example, "Well, the Dolby Digital and DTS bass management specs require completely opposite approaches", or, "The chips we started with have been replaced, and so we have to redesign the board", or, "We're upgrading the DSP to accommodate the newest [whatever]". The stories never end, but the product has to get to market at some point. You can't just keep waiting for the HT Godot or the newest *Motorola* 8-gigabyte chip to show up.

So I never expected to really get my hands on an *SP 1*, *Bryston* being back-ordered by the hundreds at year's end. However, early in February on a dreary Saturday morning genial James Tanner turned up at my door with not only an *SP 1* to plug into the home theatre room, but also a *14B ST* power amplifier to liven up the listening room with its 500-wpc (but that's another story for another space: see *Separate Components*). "You say it's your birthday..." well, it was two days ahead of mine, and at this particular coming of age, I definitely needed cheering up. "Happy birthday to ya..."

Now, I've done my due diligence with a great many home theatre processors and receivers with too goddam many buttons, knobs, levers, flip-down panels, inputs, outputs, GUI menus, and other useless features and outright annoyances. DSP me, Daddy, 8 to the bar, or more accurately, to the rear panel totally covered in RCAs, Toslinks, and binding posts. The *SP 1* is a refreshing exception. First of all, it doesn't handle video, and *Bryston* offers several separate video switchers from other manufacturers that can be linked to work with the *SP 1*. It also includes a separate analog audio path that is claimed to be at least as good sonically as the *BP-25* preamplifier.

There are 4 coaxial digital inputs coupled with the 4 analog A/V-source ones, LD, CD, DVD, and TV/SAT, plus 2 assignable Toslinks. And there are actually 4 tape loops, 2 for VCR, and 2 for audio Tape. Thus the *SP 1* accommodates a system very much like my pure video one, with a pair of VCRs (Super Beta and Super VHS) in addition to DVD/LD player, satellite dish, and off-air video. However, in my system we have two dishes (*Bell ExpressVu* and *Star Choice*), as well as 8mm VCR on

top of the other formats, so additional audio and video switching is required.

I suspect this situation will prevail in many A/V systems the *SP 1* finds itself in, the solution an upstream preamp or switcher. This will be especially true in systems where audio and video are combined, the solution being to keep your existing audio preamp and perhaps designate one of the tape ins for it.

As far as video switching is concerned, here is what *Bryston* had to say in a white paper on the *SP 1*: "...like amplifiers, video switchers have different quality levels, and I think allowing the quality of the video switcher to match the rest of the system is better served with an outboard video switcher. The video switcher we currently recommend is the *EXTRON YCS SW6 MX*. It has the same number of inputs as the *SP1* and the *SP1* has the software protocol already installed to allow simultaneous selection of source with video through the *R232* port. The other option available is to switch video at the TV or projector as most TVs [sic] and projectors now have plenty of video connections provided internally. There are also no Digital Power Supplies [in the *SP1*, (but rather) (2 toroides [sic] - 1 for analog circuit and 1 for digital circuit) as the Digital switching supplies are also RF generators." In sum, the *Bryston* design team did not feel that they could provide a clean, quiet analog circuit path with both digital and video frequencies inhabiting the same box.

One of the sore points of many A/V processors and receivers is the remote control. Whether it's rows of identical black buttons on a black background, no backlighting, 5 button presses to make anything happen (GUI Menus), on-screen displays for picture settings that block out the whole screen, whatever....some manufacturers must have special departments who think up these things. "Uh, Charlie, let's give this one to the User-Unfriendly-Technology Office."

Not *Bryston*, however. Their remote is small, though quite heavy at just over half-a-pound (typical; the preamp and *B-60* ones are similar in size and weight), machined from a solid block of aluminum. It has only 15 buttons, and these are all back lit, in fact, automatically so when programmed; this is the first remote I've seen to incorporate both a light sensor and a *motion sensor*, so all you

have to do is lurch at it in the dark and it lights up. Way cool!

I used to get frustrated at my *Rotel* and *Sunfire* touch-light remotes because half the time when I wanted Mute I'd turn things off completely because the Mute and On/Off buttons were so close together. Eventually I solved the problem by finding a spot in the opposite corner of the touchpad that didn't do anything else but turn on the backlight before I tried to find Mute. The motion-sensing backlight on the *Bryston* is the best idea since the *Clapper*.

But back to the buttons, all 15 of them. On the left side are input selectors, in the centre row Level Up/Down, Mute, Light/Hold for Test (to activate cycling level signals from the listening position), and Tape, while at right we find Digital, Pro Logic, Stereo, THX, and at bottom right corner, Power. Simple, elegant, and easy to use.

Setup is done using the front panel buttons and LCD display, and is a pretty simple process. The speakers have to be programmed large or small, centre channel on/off, and delays have to be set. In the latter process, the *SP 1* prompts you to set the distance for all speakers, and references all set delays to those distances. That helps make the delays accurate when the rear speakers are closer than the front, a frequent situation.

Digital signals are sensed automatically at any coax input, and at either Toslink, once these latter are assigned to particular inputs. That makes playing Dolby Digital or DTS sources very simple, and, if necessary, the digital format can be manually selected on the front panel or remote. A THX button allows adding THX processing, which includes Re-equalization to tame bright soundtracks mixed for speakers firing through theatre screens, Timbre Matching for all speakers, and Adaptive Decorrelation to make the Dolby rear channels mono signal less centred. Also, Bass Peak Level Manager and Loudspeaker Position Time Synchronization (see above) are THX features provided in initial setup. The former allows you to set a threshold so that your subwoofer cannot get any nasty surprises, that is, it cannot be overdriven under any circumstances. "Honey, I blew up the sub!"

The *SP 1* also has digital music modes, which they do not refer to as DSP. These are Party (Dude), Natural, Stadium, Club, and DTS Music. The Party mode puts the front channels into the four corner speakers, while the others approximate the spaces described. I'll say more about these in the listening notes below, but I do wonder about the *Natural* setting. Is the implication here that any other setting is *un-natural*? Must ask James about that.

Another interesting surround feature is the ability to use Dolby Pro Logic with analog, and, especially, analog music sources. Why does this matter? Well, anyone like me with dozens of older laserdiscs with analog-only Dolby Surround are out of luck with the ubiquitous Pro Logic that operates only in the digital domain. With analog Pro Logic, I can still enjoy older discs like *Top Gun* and *Star Wars* with full surround. I can also use it for music to provide a natural surround ambience.

As I discovered when I turned to listening to the various surround options, the music modes are also available with analog sources, unlike the DSP in most receivers and processors. However, only Pro Logic can be switched on or off from the remote; since it would be easy to make either the Pro Logic or Stereo button on the remote scroll through the music modes (as can be done on the front panel), I highly recommend this upgrade to the *Bryston* engineers. It would, if nothing else, make it easier to compare them sonically without having to leave the listening seat.

I did have a serious listen to all of them, and was struck by a number of things. First, they operate only on the rear

channels, the front ones left unaltered. Therefore, their effects can be altered simply by raising or lowering rear level (which should be easier to do, and may well be in a future upgrade; currently the menu must be accessed, involving several button pushes, though this can be done while viewing or listening; it's a little too GUI). Even Stadium was listenable with a normal rear balance, and happily, Natural was pure out-of-phase at rear, for those with long memories, a simple L-R *DynaQuad*-style circuit. It sounded best with classical music and will please those with lots of vinyl. Only Club seemed a little intrusive, the sound from the rear too loud.

One anomaly I found curious was the lack of subwoofer operation in any music mode or with analog Pro Logic. However, I'm assured by genial James that this has been addressed in current production with a software update called Extra Bass, ours being a relatively early sample.

Another departure from other surround processors found in the *SP 1* is the front panel 3-position toggle switch for dynamic range, the positions marked *Loud*, *Really Loud*, and *THX Torture*. Just kidding...they're really labeled *Max*, *Norm*, and *Late*. Usually, you have just 2 choices, and, in a way you do here, too, because *Late* is, like, reeeeeeally compressed. My advice is leave it on *Max* (even if *Max* complains).

Continuing on the subject of dynamics and sound quality, there's no question that the *SP 1* is a great analog preamplifier in the *Bryston* tradition, and this pretty much justifies at least half the cost for audiophiles who have to have a single A/V system. It is open, transparent, and very nicely passes the 96/24 sound from my music DVDs, which leads me to another surprise finding in light of other recently reviewed A/V processors and receivers. The *SP 1* does not decode (or even downsample) 96/24 discs, but simply mutes, but since most DVD players these days do have the requisite DACs built in, it's no big deal. It does do DTS, and very well, its transparency making the format almost tolerable for music. However, I still find DTS CDs lacking in resolution, orchestral textures in particular losing their inner detail. This is not something one worries about as much when viewing a picture while listening, a psychoacoustic phenomenon that deserves more research.

I watched all of the IMAX DVDs I've been reviewing while listening through the *SP 1*, and was consistently impressed by the creative and effective use of surround sound by the mixing engineers, as well as the very high quality of location surround effects. I also watched quite a bit of college and Raptors basketball and golf off air, using Pro Logic and Natural mostly to create a realistic surround ambience, and I have to comment that off-air matrix surround has gotten better and better over the past couple of years, and sounds exceptional through this *Bryston* processor. That can also be said for film soundtracks from DVDs and laserdiscs, the Pro Logic performance pretty much the best I've heard from a processor.

Dolby Digital and DTS have a liveliness and clarity that is also heard only from the best surround units. In listening I found more than ever the virtue of having lots of power (somewhat to the distress of my wife), cranking the *Sunfire Cinema Grand s* 405 watts per channel to a greater degree than before. I guess it's the old saying, if it's cleaner play it louder.

And that pretty well sums up the *Bryston SP 1*. It is, to a greater extent than I've heard before, the true audiophile's surround processor. First the remote lights up, and then your face. Bravo *Bryston*!

(Andrew Marshall)

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BRYSTON • IX • Critical Acclaim

Separate Components

Bryston 14B ST Stereo Power Amplifier
Sugg. Retail: \$7000
Manufacturer: Bryston Ltd., PO Box 2170, 677 Neal Drive, Peterborough, ON K9J 7Y4 (800) 632-8217
FAX 742-0882 www.bryston.ca

If power corrupts, and absolute power corrupts absolutely, then I guess I'd better watch myself as long as I have the *14B ST* in my system. The traditional *Bryston* spec sheet (measured specs) shows on the left channel 573 watts at 8 ohms and 560 on the right, all distortion figures under .005%, and noise at 114 and 112 dB, left and right, respectively. And all this power is in one 85-pound chassis with a bright silver faceplate.

And I don't even have the most powerful version of the *14B ST*! For that you have to have a 20-amp breaker available in order to draw 30.7 amps at full power into both channels with a 4-ohm load. The manual doesn't talk about the amps going out of the amplifier in this circumstance, but it's got to be a lot of current. And that's the difference, the same power drawn by my 15-amp version almost sure to trigger both the circuit breaker in the amplifier and the one in the breaker box.

Not that I even got close. I've never been able to put the red clipping LEDs on with my *3B ST* driving the *Veritas v1.8* speakers because they're pretty much a 4-ohm load, making this smaller amp able to put out close to 300 wpc, if I could ever stand to listen that loud. Given wall amperage limits and power supply capabilities, the *14B* is rated at 800 wpc into 4 ohms in both versions.

Inputs are the standard balanced *Neutrik XLR*/1/4" phono jack combination with a new switching option. Normally you toggle between balanced and unbalanced, with levels matched to THX spec, but here the additional 6-dB higher position for professional use is in the middle of the 3-position slide switch.

For anyone using this amp in a high-powered home theatre system, there are both auto-on selection, external trigger settings for staggered power-up, and 12-volt output triggers for screens and other components. The main on-off switch is on the rear panel, but a front panel button labeled *ST Power* contains a relay to power up

the amp.

Bryston engineering staff were being a bit coy when I talked to them about how the *14B ST* is different from the previous monoblock powerhouse *7B*, the first of the *ST* series designed by Stuart Taylor. The most I could get out of engineering director Chris Russell was that the



new *Motorola* output devices are able to handle more current, and have better performance at high frequencies. He felt that sonic improvement was "evolutionary", a part of the ongoing *ST* process.

I was curious about the role of specifications in this evolution, so I dug into the archives for the *3B ST* sheet, which goes back 6 years. The smaller amplifier bettered the new one in all categories except power output (151 wpc), distortion marginally lower, and noise equal at -114 dB. However, the *14B* uses at least twice as many output devices, so its numbers are more than exceptional for a superamp.

But what matters is the sound, and in the company of the extraordinary *Chord* the *Bryston* certainly held its own. Very open and sweet in the upper octaves, the *14B* also has an effortless quality that separates it from most other amplifiers. It also delivers a level of detail and depth of image that I've never heard before from an amp this powerful. It also images outside the speakers to a greater extent than the *Chord*, which comes very close in most other aspects of performance; and some may prefer its slightly richer, more liquid presentation.

When I finally went back to the *3B ST* I had the sense that it was a little more veiled (even though it has slightly lower measured distortion), but with the same soundstaging qualities. With my speakers more than triple the price gets you a subtle improvement, but that extra refinement makes the *Bryston 14B ST* just about the best power amplifier I've yet heard.



BRYSTON • x • Critical Acclaim

MEGA TEST

LUXURY AMPS

Home Entertainment
MAGAZINE
BEST BUY



BRYSTON SP1/9BST

£7,100

VERDICT ★★☆☆☆

MOVIES ○○○○○

MUSIC ○○○○○

FEATURES ○○○○

VALUE ○○○○○

→ **BRYSTON IS A** Canadian specialist manufacturer of primarily professional but also domestic electronics. The company recently expanded into home cinema territory with models based on its existing hi-fi components. The processor and power amplifier tested here are both THX certified, which has a number of consequences – in particular it ensures the system

should sound more consistent. The preamp has professional balanced outputs, and the power amp has matching balanced connections, which means there should be less electrical interference. However, unusually, other components that are equipped with balanced outputs, like CD players, cannot be connected which is a significant inconsistency. Balanced operation from a source (ie, CD player) all the way through to the loudspeakers could have ensured a significantly better sound quality for relatively little extra investment.

Setting up the Bryston SP1 processor is trauma-free thanks to the solid, aluminium handset that has a small number of large, backlit and clearly understandable control buttons.

There is something a bit special about the Bryston, not least because of the 20-year transferable maker's guarantee. With stereo CDs, the sound is high-fidelity of the highest order.

eclipsing most of the competition in this test. With disc after disc, the Bryston extracts layers of expression and subtlety from the music that most of the others in this group didn't even hint were present. The sound of the piano in Bach's Goldberg Variations from Rosalyn Tureck is percussive yet beautifully controlled.

In some ways the Bryston combination's multi-channel performance is even more impressive. The basic character of the sound remains true to the Bryston's purist stereo persona, with the same expressiveness and easy sense of power no matter what the volume level. High volumes are enjoyable – in fact, they're so easy on the ear that we occasionally pushed the control up to antisocial levels without even realising. The dts version of *Saving Private Ryan* is as difficult to listen to ever: the sound of bullets ricocheting off the stonework becomes little short of terrifying. Also, the THX processing helps the Bryston sound even more focused.

By any standards this is an exceptional pairing. The refined sound with CD is almost matched in 5.1-channel mode, and the THX processing, plus the lack of video signal processing, give the sound an atmospheric quality. This combination is so good we would suggest that other manufacturers should study and learn from it. The performance easily justifies the high price.

PROFESSIONAL MONITOR COMPANY 0870 4441044

XTRA INFO

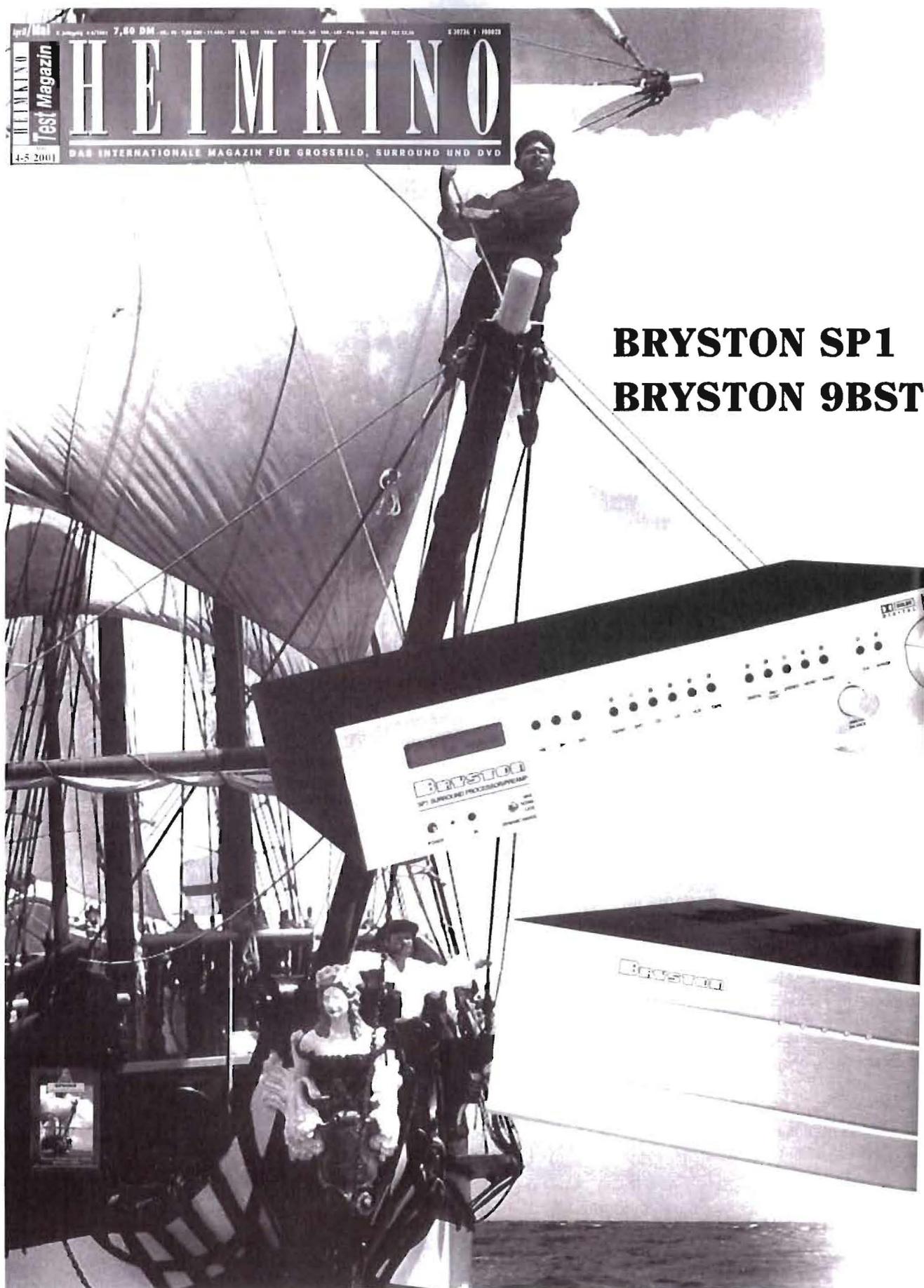
The Bryston has no video circuits at all, limiting itself to analogue and digital audio signals. Omitting video circuits should not be a problem to most UK users, who have the benefit of a video interface in the shape of Scart which is not available on the US market. However, there is no six-channel input either, unfortunately. With the digital circuits bypassed, which is possible when working in stereo, the SP1 is electrically identical to one of Bryston's top-end component preamplifiers.

TECH SPEC

Bryston SP1 processor £3,800; dts, Dolby Digital, Dolby Pro-Logic, various DSP acoustics; 6x line analogue audio inputs, balanced (XLR) and unbalanced outputs; 6x digital inputs (4x electrical, 2x optical); remote control; trigger and computer interfaces for centrally controlled multi-room systems; 9BST 5-channel power amp £3,300; claimed 120Watts/channel; THX certified; remote switching



THE BRYSTON
EXTRACTS LAYERS OF
EXPRESSION AND
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MUSIC THAT MOST OF
THE OTHERS IN THIS
GROUP DIDN'T EVEN
HINT WERE PRESENT



BRYSTON SP1
BRYSTON 9BST

BRYSTON • XII • Critical Acclaim

On Heights

to new

This Canadian Amplifier Specialty Company has expanded its line with its SP1 Processor/Preamplifier. This new unit is the ideal partner for the 9BST Five Channel Amplifier. In no way can this combination be considered the underdog from a visual perspective, rather the ears of viewers should be opened. Do these two units as a composite reach a new form of synergy?

Times were great when music listeners who had come of age were still among themselves. Then no one discussed the number of channels and picture quality was taboo. In conspiring circles all night diligent comparisons were conducted between different components, with the goal of discovering the finest sounding unit. Once a year one held a classroom meeting in a Frankfurt (Germany) hotel. Yes, that had allure. But then! Someone had the glorious idea to build a DVD Player. At that time no one foresaw that two channel Armageddon was coming. From not on everything was in motion because suddenly the source delivered, including software, six channels in order to support a visual signal. It is

the same feeling as if one is being transported from the first to the last row. Consequently the manufacturers of quality sound equipment now has two alternatives: First, he sticks to his ideals of two channel reproduction and thus stands aside out of the mainstream. Or, secondly, he develops multi-channel components, which are of such high quality that they convince music music lovers, and amaze the people who are use to what is

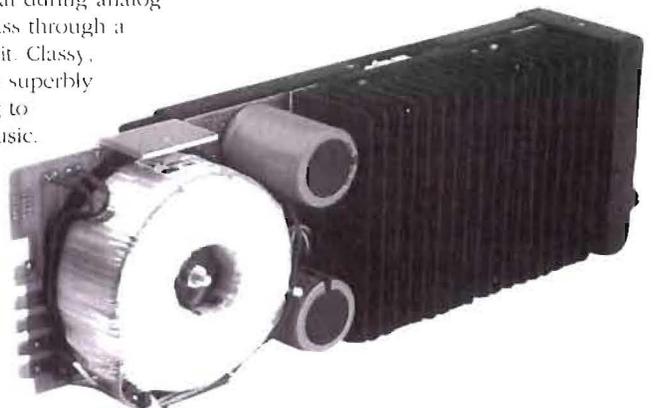
normally heard from their TV screen, so they will be glad to invest a few more marks (dollars) in order to obtain the superior sound quality. Because after all they have to fork over 21.000 Marks (\$9,545 US) for this duo. Are they worth this amount?

The Processor. They thought about it for a long time in the design engineering department at Bryston How does an ideal Processor Preamplifier look? Who will buy it, because we only enjoy an excellent reputation in audiophile and professional circles? Is there only one approach or the other? No! Already the first glance "under the hood" of the SP1 creates amazement. What is the analog Alps pot doing there? Very simple. For conventional two channel reproduction the SP1 transforms itself into a "super clean" audiophile Preamplifier. The signal during analog operation does not pass through a single integrated circuit. Classy, because thus it is also superbly equipped for listening to prevailing kinds of music. After the selected potentiometer is a

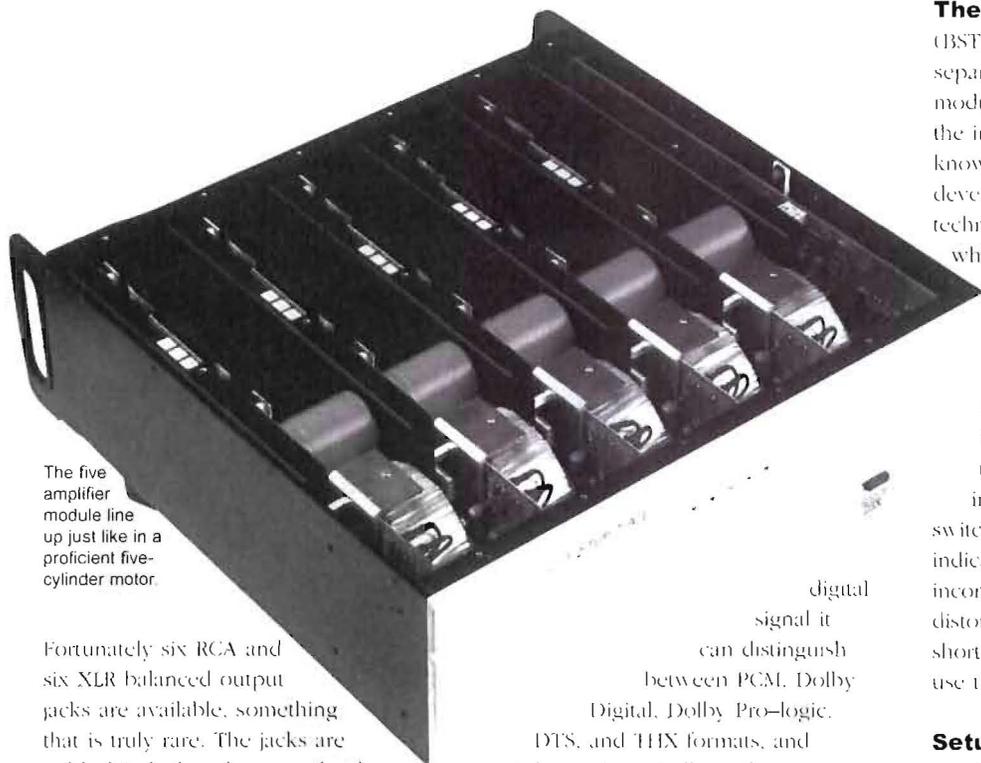


The supplied massive remote control contains only commands relevant for everyday usage. The built-in motion sensor, which activated the internal lights as soon as one holds the remote control, is ingenious

small converter, which during digital use of the processor simply converts the set volume. "Thus killing two bird with one stone." Logically there are also two transformers, one for the digital domain, and one for the analog domain. Bryston also chose the safe side for the circuit board layout, and thus the main digital circuit board is removable and can be readily exchanged. And by means of the "building block construction" another circuit board can be added. The electrical components are superb – massive, not diminutive, was the order of the day. The circuitry is designed complementary symmetrical and maintained all the way to the XLR output jacks



Just to be sure: Each of the five amplifier modules has its own 250 watt power supply.



The five amplifier module line up just like in a proficient five-cylinder motor.

Fortunately six RCA and six XLR balanced output jacks are available, something that is truly rare. The jacks are gold plated silver, because that has proven to be an audible advantage. Six analog inputs, four of which have digital coaxial capability, are provided. Additionally one can choose between two less recommended Toslink inputs or the perfect AES EBU interface. When the SP1 receives a



The Man Behind the Product:

Stuart Taylor and Bryston, is a partnership that stands for a

maximum of profound knowledge of outstanding audio amplifiers. This so very prolific liaison started in 1972. At that time Taylor was working on setting up a sound studio. After many meticulous listening tests his choice was firmly determined, for the first time he used a Bryston PRO-3 amplifier. Finally in the year 1984 Taylor joined Bryston full time. He developed the excellent BP-25 Pre-amplifier, and created the line of power amplifiers which carries his initials. Today he is fully responsible for the Bryston analog production line.

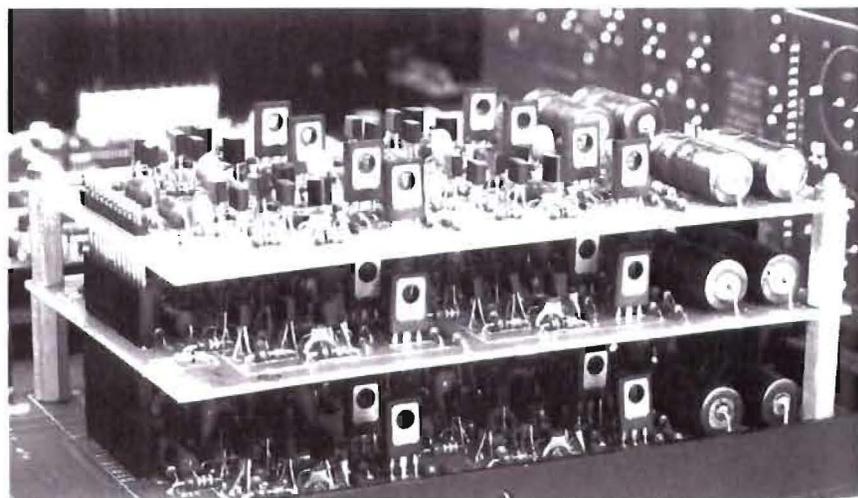
digital

signal it can distinguish between PCM, Dolby Digital, Dolby Pro-logic,

DTS, and THX formats, and switches automatically to the correct format. Although the unit does not incorporate direct video signal switching, it can be operated by an external source through an RS-232 connection. With the assistance of two so called "trigger outputs" the output stage can be automatically turned on, or, for example, a motor driven screen can be activated.

The Power Plant. The matching CBST amplifier incorporates five separate symmetrical amplifier modules. The abbreviation "ST" are the initials of Stuart Taylor whose know-how plays a leading role in the development of Bryston's amplifier technology. Each module delivers a whopping 215 watts into four ohms, which means that even inefficient speakers can readily be driven. Connections to the speakers are made by means from the Processor through a balanced XLR type jack, or an unbalanced faceplate incorporates, besides an On Off switch, five green LEDs, which indicate proper operation, but if the incoming signal contains too much distortion they will switch to red for a short time. However during normal use this will hardly ever happen.

Setup and Connections. This combination proves that complicated technology does not automatically imply difficult installation. Nevertheless a few items should be observed: The components should be placed on a stable surface, for example a shelf from "Phonosophie" (a German manufacturer). The supplied, phrase marked, line cords deserve an equally good power outlet, so that even here no audible potential is lost.



Double Decker. All six of the SP1 outputs are driven by discretely built, symmetrical, stages



Rarely seen: Noise free balanced outputs for all six channels.

We made the digital connection between the Proceed DVD reference player and the SP1 Processor coaxially. Based on listening experience, the connections to the amplifier were chosen to be symmetrical. The setup of the JM Lab loudspeaker surround system was very simple with a sound level meter. Now there was no obstacle to the performance.

comparison with smaller amplifiers and processors could hardly be greater, and the words "dissimilar sound" do not do justice to the differences. The Bryston combination naturalness of the sound picture, and also in the ease with which it handles the transition between delicate acoustic details and massive passages. Truly every Mark (dollar) here is sensibly invested.

Summary. With this combination Bryston effortlessly reaches new multi-channel heights! Therefore our verdict is: Reference Class. He or she who believes that a good picture is enough, should learn from this combination. The authentic combination of picture and sound leads to the desirable synergy. The audible portion is covered 100% by the SP1 and 9BST combination, at least for 20 years!

Olaf Sturm

translated by Peter Hullman



Live operating instructions: Sun Audio Sales Manager Thomas Bernhard explains the fine points of the SP1 Processor to the editorial staff.

Sound. We started the session with the comedy "The Bride, Who Lacks Confidence." During normal volume level picture and sound merged into a "movie like" harmony with not the least bit of stress, the first sign of perfect teamwork. The voice reproduction was natural, and as soon as the pictures were accompanied by music, one could literally feel one's own relaxation. That is exactly the way it should be! The Canadian duo dealt quite differently with Stallone's "Cliffhanger." Naturally we turned the volume level up to "Action." Now the muscles of the 9BST amplifier flexed vigorously, but astonishingly, even at this volume level no nervousness or misbehavior occurred. The

Measurements	
Stereo Output	2 x 142 watts (8 ohms)
5-Channel Dolby Digital Output:	5 x 142 watts (8 ohms)
	5 x 215 watts (4 ohms)
Signal to Noise Ratio PCM-Stereo:	81 dB (A)
Signal to Noise Ratio Dolby Digital, Front:	81 dB (A)
Signal to Noise Ratio Dolby Digital, Center:	82 dB (A)
Signal to Noise Ratio Dolby Digital, Surround:	81 dB (A)
Distortion PCM-Stereo:	0.0090%
Distortion DD, Front:	0.0097%
Distortion DTS, Front:	0.0091%
Crosstalk DD, Front-Front:	69 dB
Crosstalk DD, Front-Center:	89 dB
Crosstalk DD, Front-Rear:	89 dB
Damping Factor:	approx. 115 (8 ohms)
Power Consumption (Standby):	3.7 watts
Power consumption (at 5 x 1 watt):	275 watts

BRYSTON SP1/BRYSTON 9BST

PROFILE

- Bryston SP1 Processor: 12.000 DM (\$5.455)
- Bryston 9BST Five Channel Amp: 9.000 DM (\$4.091)
- Distributor: Sun Audio 81675 Munich
- Hotline: 0 89 47 94 43
- Internet: www.sunaudio.de

Laboratory Report

The distortion factor for DTS and PCM is identical.

Evaluation

- + 20 Year Warranty!!!
- + "Future Proof"
- + THX-Ultra Licensed

Grading

Sound	50%	1+	■■■■■■■
Laboratory Values	10%	1,2	■■■■■■■
Usage	20%	1,2	■■■■■■■
Appearance	20%	2,0	■■■■■■■

Measurements

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5-Channel Dolby Digital Output:	5 x 142 watts (8 ohms)
	5 x 215 watts (4 ohms)
Signal to Noise Ratio PCM-Stereo:	81 dB (A)
Signal to Noise Ratio Dolby Digital, Front:	81 dB (A)

The **Bryston 9B THX** amplifier

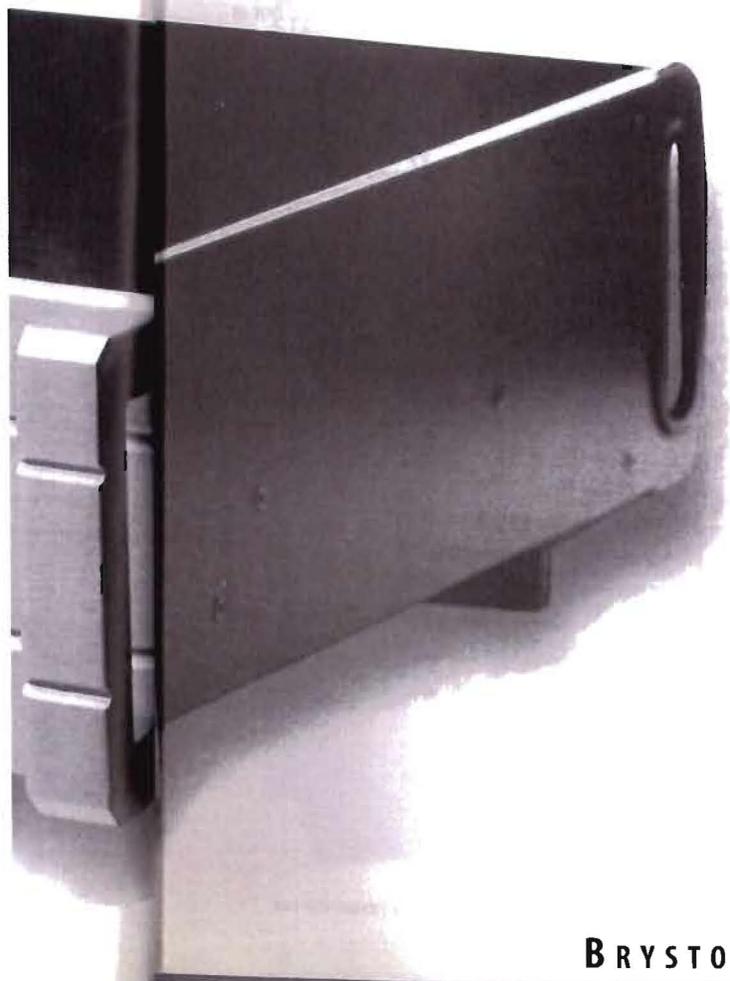


Reprinted from Le Magazine Son & Image - Sep/Oct 2000

B R Y S T O N • x v i • Critical Acclaim

X

In today's professional audio world, Bryston audiophile products are seen as THE benchmark. They are the norm, the standard, in many recording studios throughout the world. This enviable position is due to unimpeachable construction, legendary reliability and a level of sound fidelity that engineers trust as self-evident. The Bryston reputation is also the result the Canadian company's quarter-century of hard work that has made it the envy of other audio equipment manufacturers wherever Bryston products are installed.



For years now, discerning music lovers have selected Bryston products and many audio magazines use them as a benchmark system, especially since engineer Stuart Taylor has become involved in their design. In fact, the ST series of amplifiers is one of his creations.

The build quality of the Bryston 9B is beyond reproach. The extra handles on the rear of the case are justified by the 30-kilo weight, but they also act as bumpers to protect the connectors. The speaker binding posts take both bare wire and banana jacks. Spades can pose a problem if they are too wide or thick, so it's better to try them first before fitting them to the wires. However, the ones on our cables worked just fine. There is a varied assortment of inputs: RCA jacks for the unbalanced connectors, XLR connectors, bantam or three-contact telephone style jacks for those who prefer a differential (or balanced) signal. A three-way switch allows you to choose the type of signal you want, with a +6 dB position for increased sensitivity in the balanced input versus the unbalanced. The separate 14-gauge power cord demonstrates once again the quality specs of the Bryston 9B with its 120 watt output per channel into 8 Ohms and 200 watts into 4 Ohms.

The 9B is more like five amplifiers in one case than it is a five-channel amplifier. In fact, as opposed to almost all other 5-channel amps powered by one transformer for all five channels, this product incorporates five complete amplifiers, each with its own power circuit including the transformer and all the audio circuitry mounted on the output stage. What we have is five totally independent modules. They share only a power cord and a chassis. Of course, this increases production cost, but, in the view of the Bryston engineers, the advantage of completely separate circuits for each of the channels is total elimination of all sources of signal noise, and this alone makes it well worth the price.

This uncompromising approach is the hallmark of all Bryston products, as is the twenty-year guarantee which comes with them. The front panel design is the same as for all Bryston amplifiers: quarter-inch thick brushed aluminum with two raised horizontal lines and massive handles. Five LEDs indicate power on for each module and glow green under normal operation. If the music lover gets a bit carried away and goes beyond the power limit, the LEDs show red. The warning lights operate precisely and allow for a comfortable safety zone; clipping is only noticeable when the particular channel LED remains red for a prolonged period. Occasional peaks (the LED flashes red instantly) won't have any serious consequences.

In the case of overheating or a short circuit, the protection features of the 9B kick in and cut power to the module until the situation returns to normal, thus avoiding costly damage due to cooling or electrical system failure. It is strongly recommended to leave enough space above the chassis to ensure adequate ventilation and to ensure heat dissipation through the cooling vents. Even if all Bryston amplifiers undergo a 100-hour full-throttle burn-in

BRYSTON • xvii • Critical Acclaim

before leaving the factory, we let our model run for a week before we began listening. Right from the first notes, the 9B seemed to give the lie to the posted specs and we got the impression that we were listening to a much more powerful amplifier.

In fact, it was hard to push the 9B to the limit. (The only reason we did it was to satisfy our curiosity about the overload LEDs). What we got was a colossal sound volume far beyond normal listening with reasonably efficient speakers, even for people who like to watch *Demolition Derby*. The dynamic capabilities of the 9B are such that the most intense passages and the most infernal crescendos (for example, the opening of the *Sibelius Third Symphony*) come across without the least bit of confusion or hardening of the sound. Each instrument of the orchestra was acoustically in its place and separate from the others.



The sound space appears very airy with an extraordinary stage depth characterized by a black backdrop on which each successive layer is given a clear and realistic perspective. Each instrumental sound is reproduced in its appropriate space without stepping on another's toes. You can almost see the instruments and place them realistically. The timbre of each instrument is respected and the detail is so lifelike that we felt as if we had been whisked away to the recording venue. This was especially evident listening to the *Emperor Concerto* recorded in the great Salle de Musikverein in Vienna, acoustically one of the world's greatest halls. You can feel the notes from the piano as they embrace the walls and the experienced listener can immediately recognise the silky sounds of the Vienna string section which has made the orchestras of the « City of Music » world famous.

All this finesse takes nothing away from the low tones which come through with absolute authority and control. The sound of the band accompanying Holly Cole in a recording made at the St-Denis, is noteworthy because of the prominent place given to the double bass, the « foundation » of the musical architecture. In spite of this, Cole's voice is never obscured by the arrangements and her emotion comes across without any problem. For home theatre, the sound quality is so good that you want to say "Stop already. Enough is enough!" Using an amplification system of this quality gives an unrivalled realism and credibility to the often complex piles of sound in the sound tracks of certain films. What you get is a panoramic sound spectrum with no holes showing up between the various speakers. It is always apparent where the

sound effects come from and the dialogues are clearly understandable even in the busiest of scenes. The 9B gives the film director a helping hand by letting the spectator get carried along by the flow of the story. This is especially clear in a film like *Desperado*. During the shootout scene in the bar, the bullets seem to whistle past your ears.

Films that are not quite as rowdy, such as *The Green Mile* or *The Red Violin* are even more blessed by the five-star treatment that this amplifier gives them. Thanks to the heightened realism from the 9B, the botched electrocution in *The Green Mile* is even harder to take and John Corigliano's award-winning score for *The Red Violin* gets the performance it deserves. Given the dynamic and musical qualities of this amplifier, we can hardly wait until recordings made using the famous 5.1 channel technology become widely available. Of course, the other condition is that you will need a decoder that is « sonically » on par with the Bryston 9B.

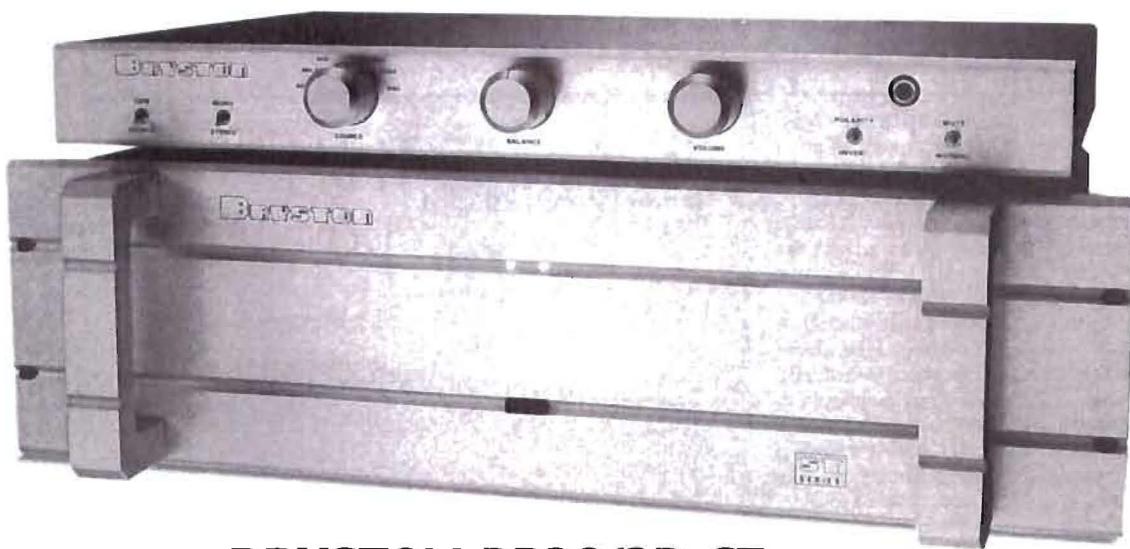
Conclusion

The Bryston 9B amplifier is characterised by an absolute neutrality which gives the entire stage to the sound of the instruments – nothing added, nothing cut. At every level it equals or surpasses better-known and far more costly audiophile products. It is not at all surprising that Bryston amplifiers have earned their status as benchmarks in professional studios and have become uncommonly popular among lovers of music and home theatre.

Reinhard Goemer

Grille d'évaluation établie par rapport aux produits de même catégorie de prix.

Bryston 9B	
Transparence	10
Qualité des timbres	10
Dynamique	10
Image stéréo	10
Équilibre tonal	10
Rapport qualité/prix	10



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HI-FI CHOICE RECOMMENDED

"THERE'S A 'SO WHEN DOES IT START TO GET DIFFICULT?' ATTITUDE THAT CERTAINLY ENCOURAGES THE LISTENER TO PLAY JUST ONE MORE TRACK BEFORE BEDTIME."

These base units in the Bryston range offer build quality that should last a lifetime.



Bryston is one of those manufacturers that straddle the pro/domestic divide with ease, and apparently little in the way of compromise to either camp. Like any rack-mounted kit, the power amp looks a bit industrial, but its modest depth makes it quite lounge-friendly. The preamp is very smart and the controls very business-like.

No studio power amp will get far with limited power, and the 3B-ST (the smallest in the range, mind) is rated at 120W per channel. In practice I got a comfortable 140W out of it and a rather scary 500W when running it as a bridged mono unit. It has unbalanced and balanced inputs, and output terminals that will accept two sets of cables if you want to do some bi-wiring. The preamp has eight line inputs (two of them balanced) and three outputs (one balanced) plus tape out. It also features switchable mono operation and polarity reversal, and a balance control, and employs relatively high-power output stages capable of delivering about half a watt – a few yards of cable will present it no problems at all. The pre-amp's power supply is in an external box.

Everything is very solidly constructed: Bryston offers a 20-year guarantee on its amplifiers, evidently no empty boast since the company has been around for nearly twice that long. From an engineering point of view these are very fine amplifiers, a fact confirmed by their almost unmeasurably good performance – for instance, the 3B-ST has a flat

frequency response from practically DC to Radio 4 or Long Wave and exceptionally low distortion.

SOUND QUALITY

For all that, the Brystons wear their engineering lightly. Some studio amps of past decades were renowned for their ability to deliver vast power while leaving the listener musically unmoved. But your average studio owner is a lot more discerning these days, and amps such as these have risen to the challenge with a clarity and subtlety which is fully at home in high resolution domestic hi-fi. With practically any music, there's an air of quiet competence, a sort of 'so when does it start to get difficult?' attitude that certainly encourages the listener to play just one more track before bedtime.

The key to this trick seems to be largely in the way the Bryston siblings combine a very even tonal balance with plenty of detail, from the quietest passages to the loudest. The delivery of detail, though, is so unassuming, self-effacing even, that one doesn't always notice it consciously. What gives it away is when one suddenly starts humming along with an instrumental line that previously wasn't even audible with most amplifiers. For instance, I happened to be editing a new recording while reviewing this group, so I listened to a few bits of it through each amp pairing. Only with the Bryston was I convinced that the pianist had actually played all the notes in a particularly dense and rapid passage. Clearly that kind of ability is as welcome in the home as it is in the studio.

Also group-leading is the bass, which has effortless depth and copes equally with the quiet heartbeats at the start of *Dark Side of the Moon* and some of the more extrovert moments later in the same famous album.

CONCLUSION

It's hard to identify limitations in these amps, and I had to haul out some much more expensive units for comparison to find any. They aren't cheap, but for the performance they offer they aren't expensive either, and can be warmly Recommended for pretty much any demanding application.

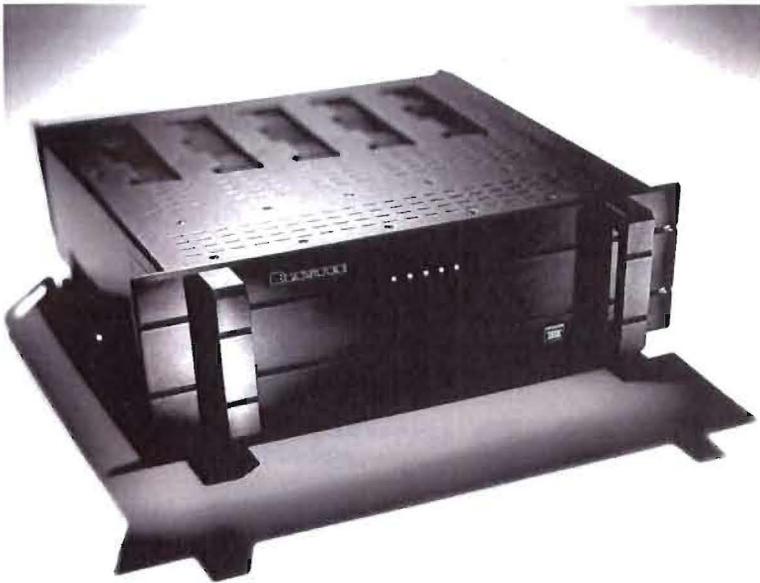
Bryston 9B-THX five-channel power amplifier

Bright April Sunday sunshine beams through the bay window of my listening room. The light catches four loudspeakers on stands, two stacks of electronic equipment, a small video monitor, black cables strung behind furniture, and a pile of freshly opened DVDs. I sit in the center in a large, overstuffed chair covered in blue velvet, listening to an array of six loudspeakers and a TV monitor playing *The Haunting's* DTS soundtrack. The floor rumbles as the sounds of creaking timbers come up from below.

Now it's late June and I'm looking back on my metamorphosis. Like other middle-aged American males, I have reinvented myself. I have shed my skin and tried not to look back.

Big words, right? No, I hadn't taken up bungee jumping, hang-gliding, or racing a BMW 2001-series M3 (not that I'll turn down any offers). What had been tempting me more and more was the thought of being engulfed by the sound of a DVD-based multichannel audio/video system. Auditioning the Bryston 9B-THX—a hot new five-channel, solid-state A/V power amplifier—seemed like an easy entry to this brand-new technology. Or so I thought.

The transformation took some doing. I had to learn a new audio language, tear down my two-channel system, install new speaker cables and interconnects, run onscreen system configurations on DVD decks and A/V processors, and realize that my expensive built-in wall



Bryston 9B-THX five-channel power amplifier

shelves were woefully lacking in space for gear. No more Rutter *Requiem*—I now use a brand-new set of DVD source material (see sidebar, "Welcome to the Real World"). Armed with a copy of Len Schneider's superb *Guide to Better Hi-Fi and Home Theater* and leaning on Denon's David Birch-Jones and Lexicon's Bart Lo Piccolo for A/V technology phone support, I dove in.

How did I feel? Not too bad—say, like the moment after Neo takes the red

pill and is disconnected from the Matrix in the film of the same name.

But I'm getting ahead of myself. This is a review of the Bryston 9B-THX. I asked to review this product because the word on the street was that it might be the best Bryston amplifier since the 7B-ST monoblock. The 9B-THX arrived well before I completed the surround-sound installation, so it started its audition in two-channel mode. I really liked what I heard, but the best was yet to come.

Description: Five-channel, solid-state, power amplifier. Output power into 8 ohms: 120Wpc (21dBW), 20Hz–20kHz, $\leq 0.5\%$ THD (FTC). Output power into 4 ohms: 200W minimum continuous (23dBW). Frequency response: not rated. THD+noise: 0.007%, 20Hz–20kHz, ± 0.1 dB. Intermodulation distortion: 0.002%, 60Hz+7kHz mixed 4:1. Noise: -107 dB, input shorted, dB below rated output, 20Hz–20kHz bandpass. Input impedance: 15k ohms, balanced or single-ended. Input sensitiv-

ity: balanced input regular, 2V in for 100W into 8 ohms; balanced input in +6dB switch position, 1V in for 100W into 8 ohms, unbalanced input, 1V in for 100W into 8 ohms. Output impedance: not given. Damping factor: not given. Power consumption: typically 100VA, all channels idle; 900VA, all channels at full power into 8 ohms; 1600VA, all channels at full power into 4 ohms.

Dimensions: 17" (425mm) W by 5.25" (131.25mm) H by 17" (425mm) D. Weight: 75 lbs (33.8kg).

Serial number of unit reviewed: 900407 (listening); 900858 (measuring).

Price: \$3695. Approximate number of dealers: 200. Warranty: 20 years.

Manufacturer: Bryston Limited, P.O. Box 2170, 677 Neal Drive, Peterborough, Ontario K9J 7Y4, Canada. Tel: (705) 742-5325. Fax: (705) 742-0882. US: Bryston Service U.S.A., 30 Coventry Street, Newport, VT 05855. Tel: (802) 334-1201. Fax: (802) 334-6658. Web: www.bryston.ca.

BRYSTON • xx • Critical Acclaim

Beefy Construction

The 9B-THX is a massive solid-state amplifier, much of its heavy iron coming from five large toroidal transformers and a stiff, rigid, reinforced-steel chassis that would seem to make the product reliable enough to last twice as long as its 20-year warranty. The model is designed to last in professional audio installations, where ruggedness is a main virtue.

Thermal pathways had to be carefully laid out. It's not unusual for a 9B-THX to be mounted by its front panel in a rack and transported in a truck for hours over rough dirt roads to the next gig. While removable, the plug-in channels are clamped down by capping plates to prevent anything from getting loose

inside the chassis. Should a module fail, the bad channel can be repaired by simply removing the old module —

The 9B-THX is designed to last in professional audio installations, where ruggedness is a main virtue.

transformer/circuitry/output stage/heat-sink — and plugging in a replacement. The 9B-THX's 75 lbs make it the second-heaviest Bryston amplifier in pro-

duction, outweighed only by the very new, 600Wpc 14B-ST.

A Roscoe S-1 Square recess screwdriver is required to loosen the 30 countersunk Robertson machine screws that fasten the 9B-THX's top panel to its chassis. These screws fit snugly into the chassis' threaded steel inserts by means of a locking thread-sealer that lowers vibration and increases structural stability.

The 9B-THX is the most densely packed Bryston product I've seen. Five large modular amplifier-channel motherboards consume all available interior space. These line up vertically, like plug-in computer cards, fitted into gold-plated edge connectors. Each channel module's large toroidal power transformer is

Measurements

The five-channel Bryston 9B-THX is the first multichannel amplifier I've measured for *Stereophile*, so I had to scramble a little to get five identical dummy loads. Even then, the Audio Precision System One I use can measure only two channels at a time, so I generally looked at just one channel. However, for the power testing I did drive all five channels for the 8 ohm measurement, and two for the 4 ohm result. Although the 9B has a tip-ring-sleeve balanced input connector for each channel, I tested it only using its single-ended RCA inputs. I also didn't measure channel separation — *mea culpa* — but, given the amplifier's independent-module construction, I would be astonished to find any significant crosstalk present.

The 9B-THX was preconditioned by being driven (all five channels) at one-third power for one hour. This maximally stresses an amplifier with a class-B output stage, and, after the hour, the exposed edges of the Bryston's internal heatsinks were too hot to keep my hand on, implying a temperature higher than 60°C (140°F). The chassis, however, while hot, was not too hot to be touched, implying sensibly arranged heatsinking.

The amplifier was non-inverting via its single-ended input. The voltage gain measured 29.2dB into 8 ohms, a 100mV input resulting in a power delivery of just over 1W into 8 ohms. The input impedance was suitably high at 47.6k ohms from the bass through the mid-treble, this dropping to 41.5k ohms at 20kHz. (On the suggestion of a reader, we are now measuring input impedance across the audioband rather than just at 1kHz, as we used to.) The output impedance was a very low

0.04 ohms except at 20kHz, where it rose to a still impressive 0.07 ohms.

As a result, there will be hardly any resistive divider interaction between the amplifier and the speakers it drives. This can be seen in fig.1, where the small-signal frequency response was hardly affected by the simulated loudspeaker load. The bass is extended to the 10Hz lower limit of the graph, while the highs roll off above the audioband, reaching their 3dB-down point around 180kHz. Not surprisingly, the small-signal 10kHz squarewave response (fig.2) was essentially perfect.

As can be seen in fig.3, the 9B offered very low distortion, except at higher frequencies into 2 ohms. What distortion was present was primarily the innocuous second harmonic (fig.4), but observe the very high power required to lift the distortion waveform out of the residual noise. Both the low level of the distortion and its second-harmonic nature are confirmed by fig.5, while fig.6 shows that intermodulation distortion products are conspicuous almost by their absence, even at the very high power used to gen-

erate this graph (just below visible clipping with this demanding signal). Note,

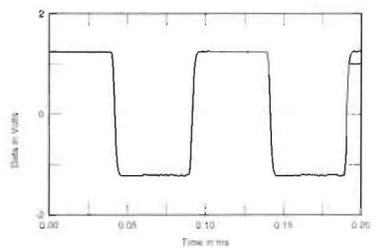


Fig.2 Bryston 9B-THX, small-signal 10kHz squarewave into 8 ohms.

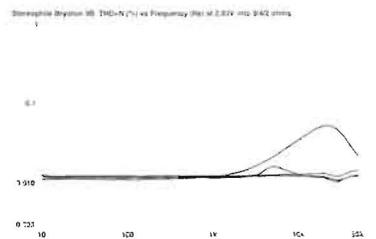


Fig.3 Bryston 9B-THX, THD+noise (%) vs frequency at 4kHz: 4W into 2 ohms; 2.83V into simulated loudspeaker load; 2W into 4 ohms; and 1W into 8 ohms.

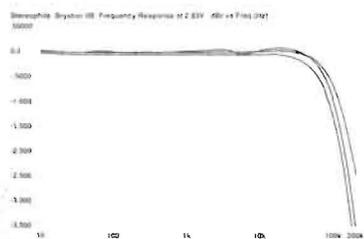


Fig.1 Bryston 9B-THX, frequency response at (from top to bottom at 20kHz): 1W into 8 ohms, 2W into 4 ohms, and 2.83V into dummy loudspeaker load (0.5dB/vertical div.).

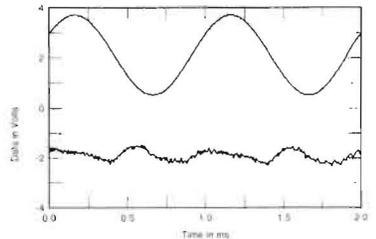


Fig.4 Bryston 9B-THX, 1kHz waveform at 200W into 4 ohms (top), distortion and noise waveform with fundamental notch out (bottom, not to scale).

mounted on edge just behind the front panel: except for the common AC cord, the 9B-THX is a collection of completely separate amplifiers in one chassis.

The circuit boards are very-high-quality double-sided glass epoxy with component-designator screening. Soldering is done by hand to avoid damaging the PCBs with the 800° necessary for automated wave soldering. Soldered and other gas-tight mechanical connections are used for signal circuits, while the power supply uses high-quality push-on connectors.

The 9B-THX is derived from Bryston's 3B-ST, reviewed positively in these pages in October 1996 (Vol.19 No.10). The modules' design was further devel-

oped, in Bryston's PowerPac series, as a 120W (\$795) amplifier mounted on a flat plate that could be attached to the back of a speaker to make it a powered monitor. For the 9B-THX, this single-channel amp was transformed into a thin, 17"-long computer plug-in card. The card's length keeps the front power supply a good distance from the rear input stages, to minimize hum.

But Bryston's Stuart Taylor decided that the 9B-THX required more than a reshaped circuit board. For example, the grounding is far more complex than the schemes found in Bryston's two-channel amps. All five amplifiers are first grounded separately; then connected through a large bridge rectifier. Dual 25-

amp diodes keep differences between channels to less than 1V.

Besides electrical hum, five toroidal power transformers squeezed into a single chassis can generate a bit of physical noise. To combat this, a special grade of steel was selected for each toroid's core. Furthermore, the filter capacitors are mounted to the PCBs using 5-pin rather than 3-pin connectors, so that no torsion of the amplifier will easily twist the filter cap off the board. The filter capacitors, selected for longest life, are guaranteed to run at 105° for 5000 hours. The 9B-THX is designed to shut down if it reaches a temperature that would make the filter caps exceed 70°F. This extends their mean time between

however, the suspicious rise in the spectral noise floor around the peaks that represent the 19kHz and 20kHz tones. I have no idea what this will mean subjectively, but I'd prefer that it wasn't there.

Even with all five channels driven, the 9B-THX more than met its 120Wpc output power specification, the left-hand trace in fig.7 revealing that it put out approximately 160W (22dBW) into 8 ohms at our standard 1% THD+N clipping point. I didn't have enough high-power resistors to simultaneously test all five channels into 4 ohms, but with two channels driven, 260W (21.1dBW) was available (right-hand trace). (Ignore the sawtooth effect in this graph. With the very low distortion and noise offered by the Bryston, these discontinuities in the traces are due to the Audio Precision's automatic range-changing.)

To test the 9B's ultimate power, I used the Miller Audio Research Amplifier Profiler, which drives one channel of the amplifier under test with a low-duty-cycle 1kHz toneburst (10 cycles on, 400 cycles off). This more closely approximates how the amplifier will behave with a music sig-

nal. Fig.8 reveals that, under these dynamic conditions, 227W was available for 1% THD (horizontal magenta line) into 8 ohms (black trace), 410W into 4 ohms (red), 680.5W into 2 ohms (blue), and

967W into 1 ohm (green). The latter is equivalent to a current delivery of 31.1A!

This excellent set of measurements indicates solid, reliable engineering.

—John Atkinson

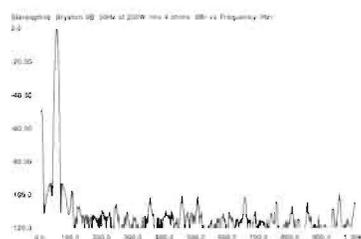


Fig.5 Bryston 9B-THX, spectrum of 50Hz sine wave, DC-1kHz, at 200W into 4 ohms (linear frequency scale).

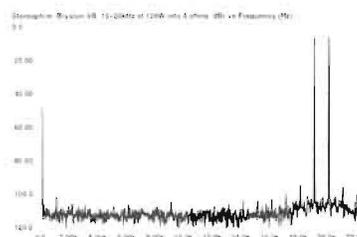


Fig.6 Bryston 9B-THX, HF intermodulation spectrum, DC-22kHz, 19+20kHz at 128W into 4 ohms (linear frequency scale).

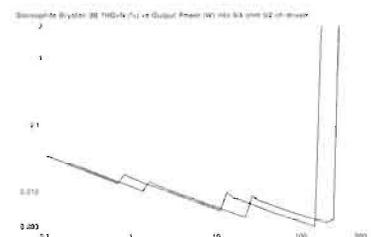


Fig.7 Bryston 9B-THX, distortion (%) vs. continuous output power into (from bottom to top at 2kHz) 8 ohms and 2 ohms.

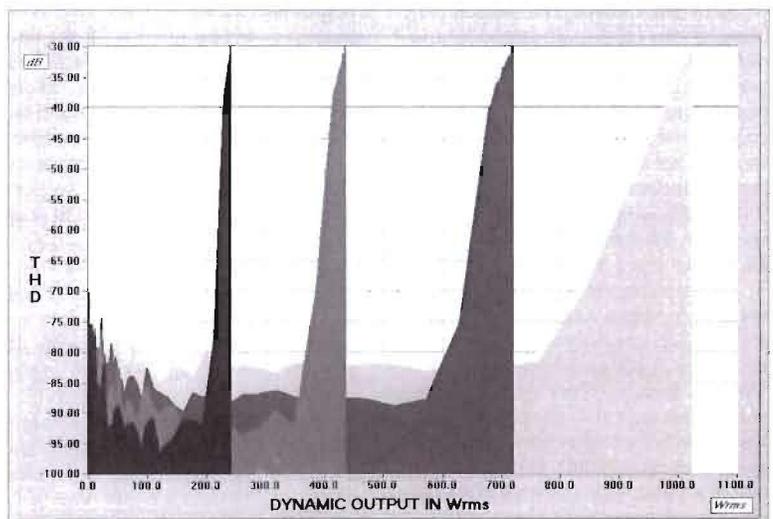


Fig.8 Bryston 9B-THX, distortion (%) vs. 1kHz burst output power into 8 ohms (black trace), 4 ohms (red), 2 ohms (blue), and 1 ohm (green).

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Welcome to the Real World

Watching *The Matrix* on the home-theater system I used to review the Bryston 9B-THX was a kick. The sound was highly dynamic, extended, and effortless, and the visual action was non-stop. Laurence Fishburne, who plays the prophetic leader, Morpheus, says, "Welcome to the real world" after the hero, played by Keanu Reeves, undergoes a rigorous education that teaches him a new way of thinking. Neo was re-educated the Hollywood way: kicked, stomped, tossed against walls, shot at, and thrown off buildings. While not as vigorous, my multichannel education got my attention just as firmly.

Although I've uncrated and positioned huge 250-lb loudspeakers and wrestled sharp-finned 100-lb amplifiers up my stairs, their installation always followed one simple rule. Like Noah's Ark, everything came in pairs: two channels, two main loudspeakers, two interconnects, two pairs of speaker cables. With the advent of the CD player, all non-speaker components for two-channel stereo can be stacked, if necessary, in a single, central column. With monoblocks like the Bryston 7B-ST, the amplifiers can be placed on the floor behind the two loudspeakers, so the large speaker cables are run out of sight behind the equipment stack to behind the loudspeakers. One can minimize the clutter of speaker cables and interconnects by running them behind the speakers and the equipment stack without major renovations of one's living-room walls or floors.

This is not the case with multichannel. Six-channel systems obviously can't follow the Rule of Pairs. Furthermore, there is much more equipment in the simplest multichannel system than is found in a component stereo system, even if one owns monoblocks. Where to put it all?

I found I couldn't stack a large television monitor, a five-channel amplifier, a video processor, a subwoofer, and a central-channel loudspeaker in one neat array. As they say in the counseling business, who goes on top? The amplifier and TV monitor are both heavy, and should go on the bottom. Yet the amplifier runs hot and can't be stuck under all those

other boxes. I could put it on the floor... but the system's six 1m interconnects keep the amplifier closely tethered to the Lexicon MC-1 processor. The size of these boxes differ greatly, so one can't make a neat little tower of Hanoi. On a visit to Sony's cavernous retail store in Manhattan, I learned that they install their home-theater control centers in huge credenzas. I didn't have room for a huge credenza and all the loudspeakers necessary!

The Matrix's Neo was re-educated the Hollywood way: kicked, stomped, tossed against walls... While not as vigorous, my multichannel education got my attention just as firmly.

So I made two stacks, starting with the Velodyne HGS-18 subwoofer on the bottom. Then came a Mark Levinson No.334, for using Revel Salons as my two front-channel speakers when I needed a huge bass response (no more than three times a day!). Then came the Mirage HDT FCH-1 center-channel unit, the Theta Carmen DVD player, and the Lexicon MC-1 digital controller. Finally, atop everything, I perched — like a cherry on an ice-cream sundae — a very lightweight Panasonic 13" video monitor. (The stack wouldn't accommodate the weight or width of my 27" Sony Trinitron.) The Bryston went in a second stack, sitting by itself on a piano bench next to the subwoofer. That gave it good ventilation and easy accessibility for wiring loudspeaker cables. But it wasn't pretty.

After the electronics were installed, I followed Bart Lo Piccolo's advice and made certain that the front-, center-, and rear-channel speakers all came from the same manufacturer. I temporarily replaced the Revel Salons and B&W 805 Nautiluses with Mirage HDT-FCH-1 front-channel loudspeakers 11' apart and 10" from the listening chair, 1' from the rear wall, and about 3' to each side of the

HDT-FCH-1 used for the center channel. The rear-channel speakers were placed on stands next to the side walls and 5' 6" behind my listening chair. On Lo Piccolo's advice, the Velodyne HGS-18 remained as my powered subwoofer.

Then there were the speaker cables. I prefer very-high-quality audiophile speaker cable sourced from such manufacturers as PSC, Audioliink, and Coincident Speaker Technology, but their heavy spade lugs were thicker than the 1/4" slots in the plastic shrouds of the 9B-THX's binding posts. Of the cables in my cable box, only Sumiko OCOS cable's spade lugs were thin enough for the rear-channel speakers, and only Mark Levinson HF-10 for the front channels. Bryston's Chris Russell says this problem has been corrected in current-production 9B-THXs: the shroud slots have been enlarged to 5/16" wide.

Finding the optimal video outputs of the Theta Carmen required me to RTFM (read the factory manual). I hadn't initially, and so got to enjoy *Rim Lola Run* in pure black and white. Setting the Theta Carmen's composite video outputs to Component turned my color monitor into a black-and-white TV. Toggling to Composite returned color to the screen. I then had to decide on the digital audio output: "PCM Only" or "PCM/AC-3/DTS"? The latter position was the only one that let me listen to my DTS demo disc.

The next lesson was simple: Hook up the center channel and ask questions later. As an aging two-channel man, I hadn't hooked up the center channel at first. Impulsive and eager to hear what my DTS demo DVDs sounded like, I'd connected the front-channel speakers, fired everything up, and put on track 3 of the DTS demo disc — a scene from *The Haunting*. I heard lots of smashing glass, creaking doors, blowing wind, and rumbling thunder — everything but Catherine Zeta-Jones' voice. I had transformed Hollywood's technological masterpiece into a silent movie! Wiring up the center channel uncorked the missing dialogue.

To fully test the Bryston 9B-THX, I needed brand-new source material. None of my "Records To Die For" were going to give me discrete channels and video signals, so I bought a

selection of DVDs and DTS-encoded CDs featuring wide-ranging special effects or music. Among the former, I found many that were revealing and enjoyable: *The Bone Collector* (Universal DVD 20716), *Kiss the Girls* (Paramount 331887), *The Long Kiss Goodbye* (New Line N4446), *Godzilla* (TriStar 231129), *Saving Private Ryan* (DreamWorks 84433), *Rim Lola Rim* (Sony Picture Classics 04014), *The Fifth Element* (Columbia Pictures 82409), *The Matrix* (Warner Bros. 17737), and *Blade Runner* (Warner Bros. 12682). For DVDs with strong musical content, I turned again to *Rim Lola Rim*, then *Digital DTS Surround Demonstration DVD 4* (DTS DVD 99121). For DTS-only source material I listened to Holst's *The Planets* (Telarc 20CD-80466) and Don Henley's *The End of Innocence* (Geffen 69286-01062-2).

Finally, I learned that listener participation differs greatly between multichannel and two-channel systems. A surround-sound home-theater setup had me involved every minute. I find two-channel audio at its best to be a more meditative experience in which I literally sit back to savor the intricacies of the stereo soundfield: its depth, breadth, three-dimensionality, transparency, and effortlessness. With no visual signal, I close my eyes and become gradually more and more involved with the music. To enjoy the experience, I have to bring more to it.

Surround sound was dramatically different. I had to be more active, as it took two remotes to control the system: one each for the Theta Carmen and Lexicon MC-1. I sat forward and was pulled into the action instantaneously, because all my senses were activated. Paradoxically, in another way, I had to do less work to get into this very active experience. The sound, instead of being the main component, is only a part of the experience. The soundstaging was around me instead of in front, and that enhanced the involvement. All these factors made the multichannel, multimodal experience exciting and different, but not necessarily better than two-channel audio. —Larry Greenhill

failures to 400,000 hours. Such overdesigning is necessary to justify Bryston's 20-year warranty.

The 9B-THX's five 60V rails could really pull down the AC voltage on startup when large amounts of current are needed to initially charge the electrolytics. Bryston uses a sophisticated soft-start circuit to prevent the 9B-THX from tripping your home's circuit breakers. The startup components and circuit are placed on the sixth board, at the far right of the chassis.

The 9B-THX resembles other Bryston amplifiers in sporting pairs of handles fore and aft. The front panel is of $\frac{1}{4}$ "-thick sculpted aluminum with two narrow horizontal grooves; the two front handles are similarly grooved. Because the faceplate is buff-finished with a fine abrasive like jeweler's rouge, its surface is very smooth to the touch. Besides the company name, the only lettering on my review sample's face were two logos: "THX" and "ST." The former is self-evident; the latter are the initials of Bryston's circuit designer, Stuart Taylor.

Amplifier functions are addressed by a square pushbutton power switch and five bicolor power-indicator LEDs. These glow green while the unit is powered, turning red only when the amplifier is clipping or suffering an internal fault. The clip-sensing circuit uses a comparator to detect signal distortion, clipping, short circuits in cabling, excessive DC, or supersonic signals.

The rear panel is laid out in simple fashion. At extreme left sits the detachable AC connector and the remote turn-on input. The remainder of the rear panel is divided into five narrow, identical panels, each with clearly printed instructions in white lacquer that make it possible to set up the 9B-THX without having to consult the written instruction sheet. There is a switch to set the channel to an unbalanced RCA input, or to balanced or balanced +6dB inputs. The balanced input uses a dual-function connector by Neutrik that takes a balanced XLR plug (pin 2 positive) or a TRS ("tip-ring-sleeve") balanced $\frac{1}{4}$ " phone plug (tip positive).

Each amplifier's output uses a new speaker binding post (rated at 60 amps) that allows you to insert one banana plug in the back while screwing another into the same post from the top. These binding posts have been designed to meet the rigorous CE standard, which changed the spacing of speaker binding posts from 19mm to 25mm or more. The posts themselves are plastic-shrouded so fingers can't get to the contacts when

the amplifier is playing. The first 9B-THXs came with slots in the plastic shrouds to allow for $\frac{1}{4}$ "-thick spade-lug connectors. Speaker-cable manufacturers quietly exceeded that thickness—as I found out (see sidebar, "Welcome to the Real World"). Current-production 9B-THXs have $\frac{3}{16}$ "-wide slots for their speaker binding terminals.

The ST logo signifies that the 9B-THX has the latest Bryston circuit innovations. These include lower power-supply impedance, a distortion-lowering input buffer amplifier, 28% more energy storage, improved power-transformer

Following a steady stream of massive two-channel audiophile amplifiers, the relatively compact Bryston 9B-THX spelled relief.

layout, shorter lead lengths, and improved signal isolation. Compensation for capacitive loads is provided by a single loop of wire in the output stage. The new toroidals are precision-wound, each with exactly the same length of double wire.

After bench-testing, the 9B-THX gets a grueling 100-hour factory burn-in consisting of a squarewave input signal clipping the amp into a capacitive load. In theory, this load draws an infinite amount of current on the rising leg of the squarewave, stressing the power supply to the max. Unlike a resistive load, which dissipates all the energy as heat, a capacitive load feeds back the entire signal into the amplifier, which puts maximal stress on the output stages. The driving signal is gated one hour on and one hour off, this cycle repeated many times. This heats up the amplifier, cools it, and heats it again, the resulting expansion and contraction exposing any loose connectors and shaking out any devices subject to early failure. After burn-in, each 9B-THX is again bench-tested, and the results are shipped with the amplifier.

The ground trembles with its force

Following a steady stream of massive two-channel audiophile amplifiers, the relatively compact Bryston 9B-THX spelled relief for this reviewer. During my auditioning, I placed it atop a Mark Levinson No.334 stereo power amplifier. Rated at approximately the same

power, the Levinson was 1.6 times as expensive, almost 1.5 times as heavy, just as deep, twice as tall, and yet had three fewer channels! For someone used to doing the audiophile amplifier-lift—deep breath, bend at the knees, lift straight up to protect the back—moving the 9B-THX's 75 lbs around was downright easy.

It might be compact, but the 9B-THX packs plenty of punch—my notes on first hearing the Bryston through the Dynaudio Evidences I reviewed last May testify to its speed and power. Like the 4B-ST and the 3B-ST I wrote about several years ago, the 9B-THX's strength is in the power region of the audio spectrum: the midbass and bass. The 9B-THX delivers fast, powerful, well-defined midbass, and low bass with depth, extension, and solidity. It combines snap and slam, allowing the listener to perceive both the low-frequency energy and the tightness and definition of the leading edge of the bass pulse. Playing back two-channel audio through the Evidence towers, it excelled in its focused imaging, absence of midrange grain, and extended, transparent highs.

As a multichannel amplifier, the 9B-THX was superb. DVD recordings of live concerts benefited from its speed, punch, slam, and rhythmic drive. For half the listening test, I set the Lexicon to treat the Mirage front- and rear-channel speakers as "Large" (ie, driven full-range). After 45 minutes of *Godzilla's* thunderous footfalls and the pound-

ing techno beat of *Run Lola Run*, the Bryston's internal heatsinks were quite hot. But the sound remained open, transparent, clean, and revealing of detail, as made evident by concert DVDs. The opening drum beat of the Eagles' *Hotel California* (DTS DVD 99121) made my room shudder. Similarly, the extremely deep bass-guitar

louder, it didn't become brittle, analytic, hard, or distorted.

The midrange was excellent. The pace'n'rhythm of *Run Lola Run's* throbbing techno score became an integral part of the movie, its brush strokes on synthesized drums driving Franka Potente's tireless running. I heard the individual notes from the several guitars in *Hotel California* more clearly and distinctly than ever before; they refused to be homogenized by the conga drums in the selection's opening.

To hear subtle amplifier differences, it was necessary to replace the front Mirage speakers with 250-lb Revel Salons, driving them alternately with the Mark Levinson No.334 or with two 9B-THX channels. This revealed differences in the uppermost ranges. While the Bryston 9B-THX sounded clean, fast, and very dynamic, it was not as transparent as the much more expensive No.334 driving these exquisite \$15,000/pair loudspeakers. The Levinson was also more defined and etched playing the guitar accompaniment to Roy Orbison's "Pretty Woman" on DTS's *Demo Disc IV*.

Conclusions

My listening revealed the Bryston 9B-THX to be not only a surprisingly powerful amplifier with strong dynamics, but also the equal of more expensive solid-state amplifiers in its ability to deliver powerful midbass, wide dynamic contrasts, and involving vocal reproduction.

Bryston's 9B-THX is a beefy, rugged, reliable home-theater amplifier whose 20-year warranty and midpoint price make it a real value. It's powerful, built to last, and appears to be very easy to service. Sonically, it resembles the other ST Brystons, particularly the 3B-ST's midbass punch and solidity, and equals top two-channel audiophile amplifiers like the Bryston 4B-ST and 7B-ST. While these two-channel stereo amplifiers have slight edges in transparency, high-end openness, and soundstage depth, they can't deliver the Bryston 9B-THX's ultra-clean power to five separate loudspeakers. Such pristine power makes it a perfect choice for someone who wants to have a home-theater system, yet have a basic amplifier for multichannel music-only recordings.

So sit forward and join the action: Put on a DVD and enter the new world of multichannel home-theater sound. The 9B-THX five-channel amplifier took me there on that bright spring day in April. It could take you there, too. ☒

The Bryston 9B-THX is a surprisingly powerful amplifier with strong dynamics.

chords dominated the opening of Sheryl Crow's *Am I Getting Through* concert DVD (DTS DVD 99121).

The multichannel experience placed me in the center of the action. The surround activity in Chapter 12 of *Godzilla* made the front-to-back action—as when the dinosaur approaches from the front channels, passes over the hero, and leaves via the rear loudspeakers—completely convincing. A similar front-back fly-by gripped me as the attack helicopters chased *Godzilla* through the streets of New York.

After several hours of listening, I pushed the 9B-THX until the front panel's LEDs occasionally flashed red. While the sound exhibited the expected compression, refusing to get

Velodyne HGS-18 powered subwoofer.

Cables: Interconnects: Bryston, Krell Cogelco Yellow, PSC Pristine R30 silver-alloy (all three balanced); Coincident Speaker Technology CST-IC, Randall Research, Ultralink Performance, Mark Levinson HFC (with Camac connectors) single-ended; 75 ohm Silver Starlight and Ultralink Digital Pro digital coax. Video: Ultralink Videophile Pro Composite, Ultralink Videophile Pro Silver S-video. Speaker: Levinson HFC-10, Sumiko OCOS, Ultralink Excelsior, Coincident Speaker Technology CST1, PSC Pristine R-50 biwired double ribbons.

—Larry Greenhill

Associated Equipment

Digital source: Krell MD-1 CD transport, Theta Carmen and Denon DVM-3700 DVD/CD players, Lexicon MC-1 Controller.

Tuners: Day-Sequeria FM Reference Classic; Rotel RH-10; Magnum Dynalab MD-102, 205 Sleuth RF amplifier.

Preamplification: Krell KBL preamplifier, Mark Levinson ML-7A preamplifier with L-2 phono section, Duntech MX-10 moving-coil preamplifier.

Power amplifiers: Mark Levinson No.334, Bryston 7B-ST monoblocks, Denon A/VR-4800.

Loudspeakers: Mirage HDT-FCH-1, HDT-RB-1, Dynaudio Contour 3.0, Dynaudio Evidence, Revel Salon, B&W 805 Nautilus,



INNER EAR REPORT

Bryston 14B ST

Reprinted from July/Aug/Sep 2001



Bryston doesn't need an elaborate introduction. The company has been around since 1962 catering to the professional sound industry, as well as the home electronics field. Known to be a relatively conservative company which doesn't jump quickly to change the "tried and true" Bryston, nevertheless, has introduced a number of new components over the past few years. These include a number of multi-channel amplifiers and their recently introduced home theatre processor/preamplifier, the SP1. In the audio-only category, Bryston's designs have focussed on power pack amplifiers which are mounted on or in loudspeakers such as the PMC line, distributed by Bryston in North America.

The amplifier under review, which was under development for over one year, is Bryston's flag ship component. Though a prototype unit was shown about one year ago and auditioned a short time later, a production model was not available until now. However, we believe that it was well worth waiting for.

Appearance:

This is a massive component, finished in the, now traditional, flat black. The front panel sports—as in Bryston's other power amps—two tricolour LEDs which indicate standby (yellow), clipping (red) and operating (green). The on/off switch is located on the front centre and is a "soft touch" switch—or one could call it a "smooth touch" feature that activates with a gentle stoke, rather than a firm push, of the finger.

Having looked at this amplifier for some time now, we noticed that the 14B ST is considerably higher than other models. Thus, we have an 85 pound amplifier which measures 7 inches high, 19 1/2 inches wide and 17 inches deep (19 inches with handles).

The rear panel accommodates left and right channel speaker terminals, gold-plated RCA and XLR (single-ended and balanced) inputs, a circuit breaker/power switch, the switches for balanced or unbalanced operation, a balance regulator (gain from 0 to -14 dB) and the well

Source:
Bryston Ltd.

Price:
\$7,000.00 Cdn
\$5,500.00 US

Rating: ◆◆◆◆

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for the (detachable) power cord which also houses the main fuse. A "trigger" allows remote switching from an external source such as a preamplifier.

Despite its bulk, the 14B ST is a sleek, handsome component which is intended to blend with existing decor and communicate its presence and style with its function as an important electronic component. While a lot of amplifiers may have embraced similar styling, few have a similar degree of sonic finesse, as we shall see later on; first, however, the unit's...

Technology:

There isn't a lot of information available regarding the amplifier's topology. We know, however, that Bryston's designer, Stuart Taylor, employed brand new output devices made by Motorola and placed almost the entire circuitry in atypical sites on the elaborate chassis. This allowed a more effective heat sink coupling, thereby keeping the operating temperature to a minimal level while operating at maximum efficiency. The amplifier is available in two versions with identical specifications—other than current capacity—both a 15 amp and a 20 amp version are available in North America (a 230 volt, 10 amp version is produced for European countries). It is not necessary to get the 20 amp model unless your AC is really poor and your house is wired with 12 gauge electrical cable. For most domestic applications, the 15 amp version is fine. The 14B ST's immaculate circuitry layout as much as eliminates interchannel interference, such as magnetic induction, signal bleed, etc. The signal path has been kept as short as possible and beefy transformers rated at 750 V/A each assure stability of the power supplies.

Our unit was spec'd out and provided rather impressive measurements. Harmonic distortion is 0.00332% at 20Hz, 0.00288% at 200Hz, 0.00343% at 2kHz and 0.00570% at 20kHz. Intermodulation distortion is 0.00374%; noise was measured at -110dB from 20Hz to 20kHz. Power at clipping measured 582 watts

per channel, though the component is rated at 500 watts/ch into 8 ohms and 800 watts/ch into 4 ohms. The input impedance is 15k ohms balanced and 50k ohms unbalanced. Input sensitivity is 2 volts balanced and 1 volt unbalanced (100w/8 ohms). All in all, this amplifier is an excellent piece of work by anyone's standards.

The Sound:

The 14B ST came in time to be used with the fabulous B&W 801s, reviewed in this issue and the JMLab Micro Utopias, reviewed in our last issue. Thus, two pairs of great, though different loudspeaker were used for this evaluation. The Wyetech Lab Opal preamplifier, the Audio Aero CD player, also reviewed in this issue, and our in-house Audio Alchemist DAC/DTI Pro/Elite transport made up the front end, while wiring was achieved with Nordost's Valhalla interconnects and speaker cables.

When the amplifier arrived, we connected it first to the B&W 801s, played a few CD tracks and then switched on the Magnum MD 108 to burn in and stabilize the Bryston. After having operated the amplifier for a few days, occasionally checking its sound, we proceeded with the "serious" listening tests. We began with what the Editor considers to be the most difficult to reproduce CD *Todo Sobre Di Madre*. This CD consist of large orchestral works along with solo trumpet, moog, accordion and bass—lots of bass. What makes reproducing this material so very difficult is the presence of extreme dynamics, almost simultaneously with finicky subtle "detail". Amps and speakers have a devil of a time trying to faithfully capture and reproduce the loud vociferous bass, for example, which is often married with very soft sounds of a muted trumpet. Whereas many components can reproduce one or the other element, few can handle it all. Enter: the Bryston 14B ST. This amplifier handled ALL passages with the utmost finesse, never labouring, never running out of steam; and with never a hint of harshness when dynamic high frequencies were present on the disc. That in itself is an accomplishment, but it's only the

If you like
bass—accurate
bass, that is—
this is your
amplifier

Source:
Bryston Ltd.

Price:
\$30,000 Cdn
\$500,00 US

Rating: ◆◆◆◆

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beginning. In addition to the smoothest highs we have heard produced by a solid state amplifier, the 14B manages "inner detail" finesse usually found only in low powered amplifiers—read (some) single ended tube jobs. All panelists commented that the amplifier's mastery of musical midband information and voices, especially female vocals, is on par with the best we have encountered to date. If you like bass—accurate bass, that is—this is your amplifier. The Bryston folks have successfully correlated midbass and deep bass information, melding it (sonically, of course) until it presents an effortless musical stream. They have tamed the 14B's sheer power to produce (or reproduce) deep, resolute bass. Listening to a double bass, electronically produced bass or the pedal notes of an organ is a lesson on how things should be done. Imaging, focal proficiency, spatiality and resolving capability are nothing short of stunning.

For other listening tests, we connected the 14B ST to the JMLab Micro Utopias with the identical back-up components used for our earlier tests. This time, with the Micros firmly planted on solid stands, we began by listening to classical material which the Micros do so well. And again, the Bryston showed that it can and will reproduce the most delicate musical passages, simultaneously with dynamic information, without accentuating or diminishing any part of the frequency spectrum. The 14B ST's sonic makeup complemented the JMLabs and introduced additional body and weight to the bass, creating richer sonic textures. Highs, midrange and bass frequencies were immaculately balanced, but the most noticeable sonic benefit was the ability of this system to recreate subtle details (inner detail).

Both pairs of loudspeakers used for our listening tests demonstrated the Bryston's knack for speed, accurate dynamics and outright control of the drivers. However, the amplifier's greatest accomplishment is its ability to convey what we know as "musicality". What we mean is that the 14B ST handles musical

program material without imposing its technical blueprint. Although complete sonic neutrality is impossible, we daresay that the Bryston comes very close to sounding neutral as it handles music without prejudice.

Synopsis & Commentary:

Regular readers may know that one of Bryston's multi-channel amplifiers—the 8B ST—has been used to evaluate loudspeakers in many of our reviews, usually in the bridged stereophonic mode. This provided us with over 400 watts per channel—a power house—while maintaining the finesse supplied by Bryston's 3B ST. The 14B ST is even more powerful than the bridged 8B ST. However, in addition to the increased power, this amplifier managed to sound a lot smoother, with musical finesse rarely found in powerful amps. Listening to our regular selection of CDs, there were occasions when our panelists couldn't discern sonic differences between the 14B ST and the single-ended Wyetech Lab amps. Though apparent when listening attentively, the Bryston mad cult, as its sonic footprint and tonal balance is quite comparable to the Wyetech Lab's Onyx, reviewed in this issue. Subtle differences can be appreciated, to be sure, but only those with "ears" can readily establish the identity—and it may take a little time even for them. Thus, what we have here is an outstanding solid state amplifier that can drive any speaker under the sun, while maintaining musical finesse in line with some of the best single ended vacuum tube designs currently on the market. And another thing: even trained ears will have difficulties identifying this amplifier as a Bryston product. We consider the 14B ST a high-end design without the customary high-end price tag (high-end, high, performance amplifiers usually go for about \$10,000). When an amplifier sounds this good, looks this cool and handles expensive loudspeakers effortlessly under demanding conditions, it deserves to be regarded as a first-class component. Audition it, buy it—and laugh all the way to the bank. ♦

The Bryston folks have successfully correlated midbass and deep bass information

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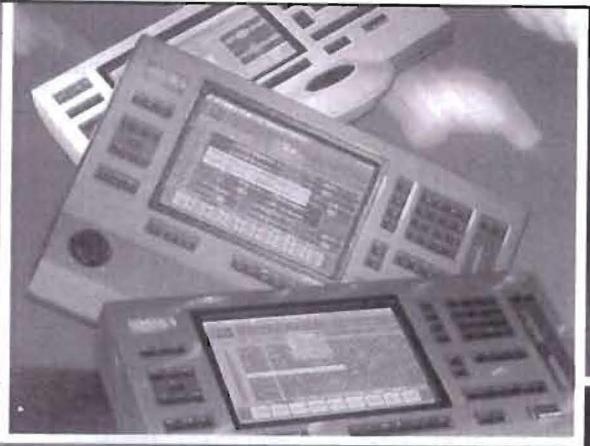
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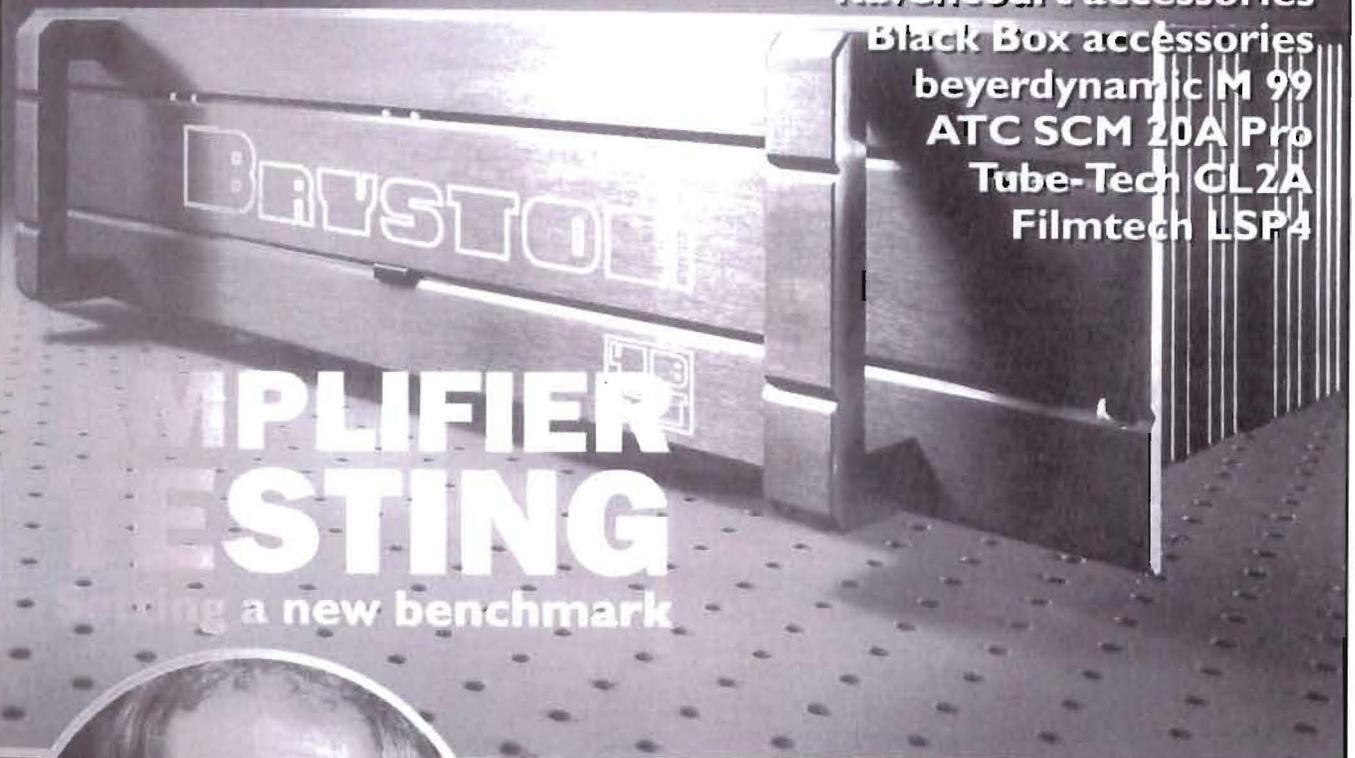
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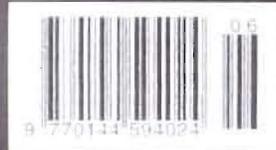
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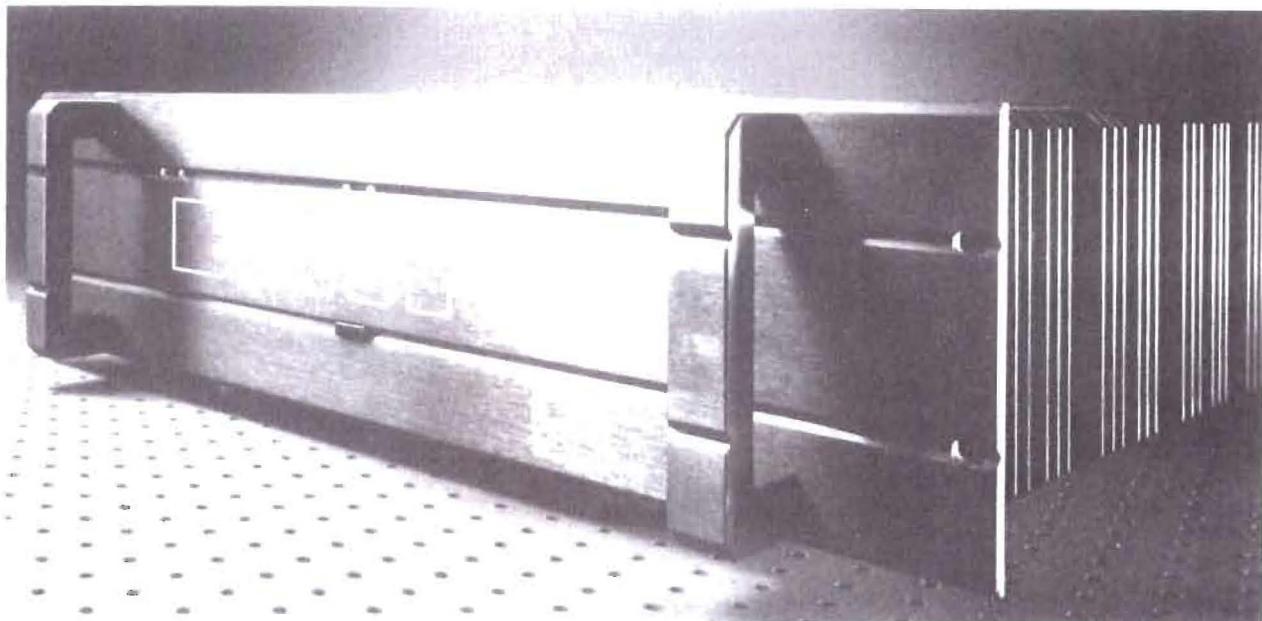
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Bryston 4B ST

Introducing Studio Sound's regular amplifier bench tests, **Paul Miller** assesses Bryston's 4B ST



FEW COMPANIES attempt to straddle domestic and professional markets with, ostensibly, the same products, but Bryston is one of the successful examples. Bryston sees itself as a purist company, catering for the sonic expectations of the hi-fi market while maintaining the rugged build and bomb-proof reliability demanded by the professional sector. It is distributed in the UK through PMC Ltd who implement Bryston's 20-year warranty. By all accounts, its

most popular product is the 4B ST power amplifier, a '250W' model that's sandwiched between the budget 3B and rather more substantial 7B/8B models. And at just £1,495 (UK, ex-VAT), the 4B clearly services an important sector of the pro market.

A 17-inch domestic version is provided without handles while the Professional iteration of the 4B is distinguished by two silver trim pots mounted alongside a pair of dual-colour LEDs on the fascia. The latter

flash red if the amp is driven hard into clipping (they remained resolutely 'green'

during my power tests to 1% THD) while the former are provided to trim gain and

Power Amplifier: Bryston 4B ST (Rated Spec. in brackets where given):

	20Hz	1kHz	20kHz
Max Continuous Power Output			
1% THD into 8ohm (one channel)	300W	305W	275W
1% THD into 8ohm (two channels)	295W	300W	270W
1% THD into 4ohm (two channels)	425W	430W	400W
Frequency Response @ 0dBW	0.04dB	0.04dB	-0.1dB
Dynamic Headroom (DHF)		+1.0dB	
Maximum Current (5msec, 1% THD)		29.6A	
Output Impedance	0.0137ohm		
Damping Factor	583.6		
	Unbalanced Input		
Stereo Separation (1kHz)	89dB		
(20kHz)	74dB		
Channel Balance, 1kHz (0dBW)	0.04dB		
Total Harmonic Distortion (0dBW, 1kHz/20kHz)	-97dB / -89dB		
(2/3 power, 1kHz/20kHz)	-99dB / -90dB		

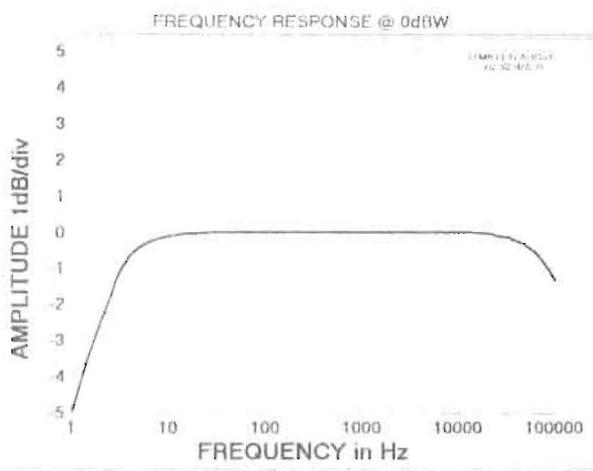


Fig.1: Frequency response

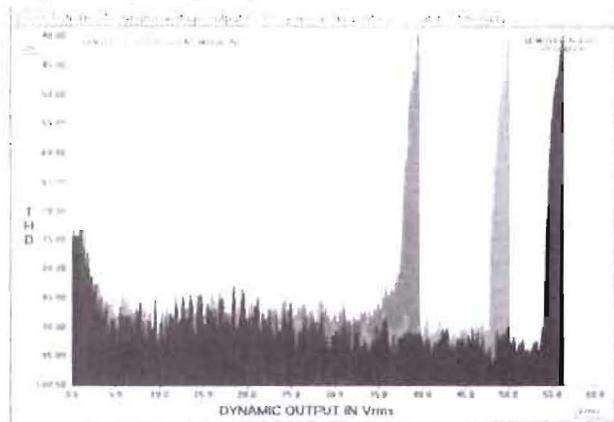


Fig.2: Dynamic voltage output

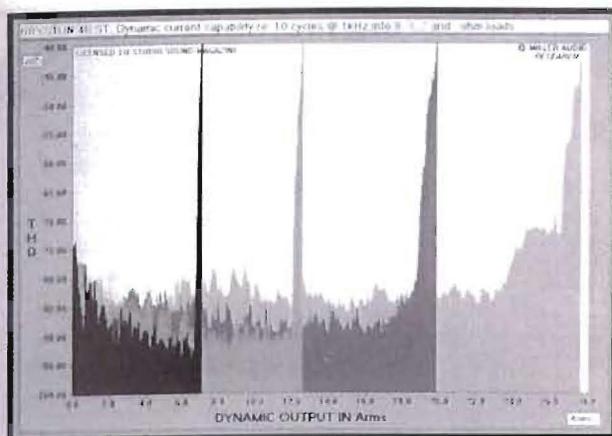


Fig.3: Dynamic current capability

balance. Turned fully clockwise, the 4B's full +29.3dB of gain is realised, falling to +16dB if the pots are reversed anticlockwise. This trim is independent of whether the unbalanced (RCA) or balanced (Neutrik) inputs are deployed. The 4B is also available in a 'THX version' that features remote power-up triggering. This might be employed to stagger the switch-on times of a multi-unit 4B rack, for example.

Bryston uses a dual-mono construction, right down to the use of separate toroidal mains transformers for each channel and, indeed, the 'sag' from 305W to 300W (one channel versus two channels/8Ω) is minimal. This said, a stereo separation of 74dB (re. 20kHz), while perfectly adequate, still implies a degree of coupling somewhere along the line. Meanwhile the two-channel 4Ω power output is equally generous at 430W, clearly besting its 400W rating. Do note, however, that full power at 20kHz drops by 0.9dB (8Ω) and 0.6dB (4Ω) though its response (Fig.1) stretches from

3Hz-80kHz (-1dB) at a nominal 0dBW (1W/8Ω). Incidentally, where available I have noted Bryston's own specification in brackets alongside its measured performance through the Test Table. In all respects, save input sensitivity, the 4B is seen to meet or exceed its minimum performance levels.

Under dynamic conditions, the 4B is capable of sustaining 395W, 625W, 784W (19.8A) and 762W (27.6A) into 8Ω, 4Ω, 2Ω and 1Ω loads, respectively, with one channel driven. Into 8Ω, this is equivalent to an IHF headroom of +1.0dB. The voltage profile (Fig.2) provides a measure of the 4B's load tolerance. In a perfect world, the 56Vrms output achieved across 8Ω (black trace) would be sustained across 4Ω, 2Ω and 1Ω (red, blue and green traces, respectively). The gradual relaxation in voltage witnessed here is preferable to an abrupt collapse in the regulation of the PSU into 2Ω or 1Ω.

This is further reflected in the almost uniform increase in current available into 8Ω, 4Ω, 2Ω and 1Ω loads (Fig.3, black, red, blue and green traces, respectively). The 28A maximum (29.6A over 5ms) is comfortably accommodated by Bryston's quad-complementary output stage, comprising some eight TO3-style bipolar devices per channel mounted on 3200cm² of heatsinking. As a result, there's no need for internal fan cooling nor, if the amplifier is

Total Harmonic Distortion (0dBW, 1kHz/20kHz) (2/3 power, 1kHz/20kHz)	-97dB / -99dB -99dB / -90dB (-95dB ± 3dB)
CCIR Intermodulation Distortion (0dBW) (2/3 power)	-100dB -103dB (-100dB)
Noise (A wtd, re 0dBW) (re 2/3 power)	-88.6dB -110.0dB (-106dB)
Residual noise (sawtooth)	-75.4dBV
Input Sensitivity (for 0dBW) (for full output)	97mV 1704mV (1400mV)
Input loading	49kΩohm / 20pF
DC offset, in/out	+2mV / +4mV
Serial Number	448225
Retail Price	£1495 (ex-VAT)

mounted in a 19-inch rack bay, is it strictly necessary to use external air-conditioning. Control cupboards might be a different issue, however. Otherwise, and aside from an excusable loss in composure above 24Arms, the highly consistent distortion profile of the 4B demonstrates little or no progressive VI-limiting. This, together with the low 0.014Ω output impedance, suggests the 4B will behave very consistently with all manner of speaker loads, assuming a decent gauge of cable is employed.

Distortion, too, remains exceptionally low under these taxing conditions and is very close to the limit of measurement (~-90dB) using a Short-Term

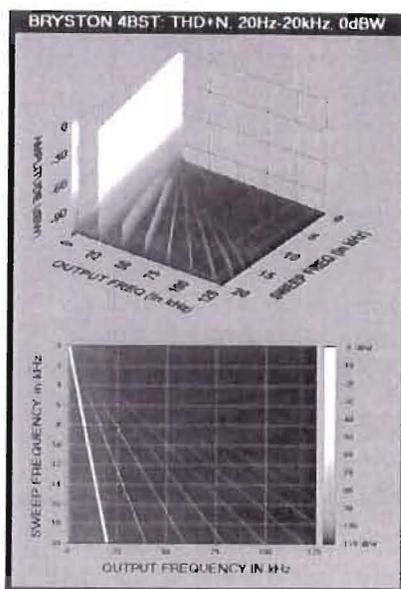


Fig.4: THD+N

itself on the linearity of its amplifiers, specifying IM products at <0.0009%. This is confirmed by Fig.5 where both 2nd-order (1kHz) and 3rd-order (18kHz and 21kHz) products are at or below -100dB.

Fig.5 also highlights some

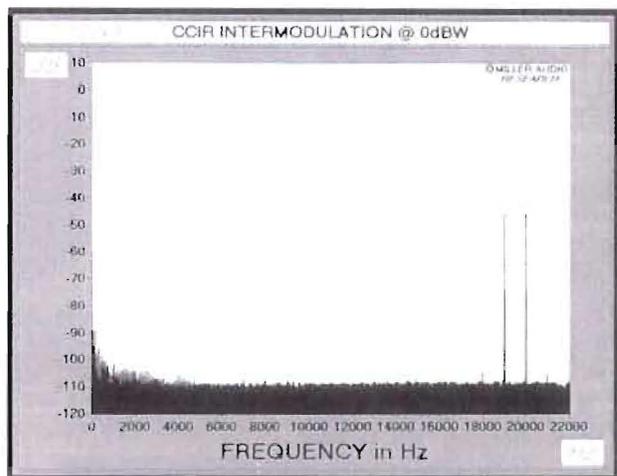


Fig.5: CCIR intermodulation

Fourier Transform and just 10ms of data! Under continuous conditions, THD hovers around 0.0013% midband and 0.003% at HF across 90% of the amplifier's dynamic range. The increase from mid-to-high frequencies is visible on the 3D plot (Fig.4) beyond 5kHz, but is primarily composed of innocuous 2nd and 3rd harmonics. The higher 4th-9th harmonics are indicative of crossover distortion, but, at typically <0.001%, are of little issue. Indeed, Bryston prides

PSU residual (an earth-lift is provided), but the A-wtd S/N ratio of 88.6dB (re 0dBW) is still 1dB or 2dB above average for a product in this class. Relative to two-thirds output, a figure of 110dB suggests the 4B will not prove the limiting noise factor in a typical rig! All in all, the Bryston 4B ST emerges with a clean bill of health - a powerful, value-oriented amplifier with no significant flaws and, significantly, the reassurance of a 20-year warranty. ■

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AUDIO - The Equipment Authority - June 1999

BRYSTON • 4 • Critical Acclaim

COREY GREENBERG

BRYSTON 9B-ST FIVE-CHANNEL POWER AMP



As we wind up this millennium we've come to a point in the half-century history of hi-fi where most reviewers are so much dumber than the vast majority of their readers that their opinions are actually taken to mean the *opposite* of what they're supposed to. So instead of reading hi-fi reviews nowadays, we mostly decode them.

Like it or not, we're living in the era of the "Bizarro Review." The term takes its name from the Bizarro World.

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a time-warp zone in the Superman comic books where everything is bass-ackwards: Bizarro dogs meow while Bizarro cats bark. Bizarro rain falls upward, and Roberto Benigni wins the Academy Award for Best Actor. "Me am so happy!" a sad-faced denizen of the Bizarro World will pout, displaying not only the opposite meaning of many high-end reviews these days but also their unique prose style.

I mean, it's gotten to the point where I read certain reviewers raving

about a product and I know automatically that if *they* love it, it's got to suck. And if they're *not* so hot on it, nine times out of ten I'll listen to the same piece of gear and it'll be drop-dead fantastic. (I have to admit it's taken some of the fun out of truffle-pigging the good gear each month.) The fad for single-ended triode tube amps helped flush a lot of these guys out of the woods for me. Anyone dumb enough to fall for such aggressively colored and distorted sound and then go on the record as fawning over it as somehow being more "real" and "soulful" than the sound of a good modern amp, whether solid-state or tube-based, is a guy who really knows what he am talking about.

I bring all this up because there is no brand of hi-fi gear that audiophile reviewers so consistently go Bizarro over than Canada's Bryston, Ltd. The company's amps are so utterly clean, neutral, and ridiculously better-sounding than 90% of what passes for high-end these days that, as with the speakers of its like-minded compatriot Paradigm, it's no wonder the *Life Am Beautiful* crowd just doesn't get this stuff. Reviewers in the high-end mags almost always seem to go out of their way to temper a Bryston amp's outstanding measurement graphs and their reluctant admission of its excellent overall sound with half-assed gotchas. Such as: "A very capable performer with lots of muscle but, regrettably, a shade less of that elusive see-through transparency I

enjoy from my reference single-ended triode amp that am so musical and soulful."

As for me, I know that every time I've heard a Bryston amp powering a set

of speakers, I know I'm hearing those speakers at their very best. I've always come away incredibly impressed by how clean and neutral these amps sound. They take the audio signal and amplify it, and

**EVERY TIME I HEAR
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they don't seem to do anything else to it at all. And that's really *all* you should ask a great amp to do. I know some audiophiles look for an amp to add "life" or "bloom" to the sound, much in the way that MSG does to food, oak does to wine, and Viagra does to overtenderized meat. But the smart boys know better, which is why so many pro studios, mastering houses, and film soundtrack mixers rely on Bryston amps to get the clearest possible picture of what they're doing with the sound you eventually get served up at home.

Which brings me to Bryston's latest amp, the \$3,695 Model 9B-ST. The five-channel, 120-watt 9B-ST is the company's entry in a popular new category: the expensive, five-channel finesse amp meant for the highest-quality multichannel playback. Lots of mid-priced five-channel amps hit the market before such brands as Proceed and Krell got into the game, but the necessary compromises made to shoehorn five amps into a conventional-sized chassis meant a noticeably lower level of sound quality. Then Proceed and Krell came along and said, "You people really want five channels of true audiophile-grade amplification in one box? Okay, but it's gonna *cost* you." To the tune of five painful grand, yes, though these high-dollar finesse amps really do deliver five honest channels of high-powered, audiophile-grade sound, something you're just not going to get from even the best "100W" A/V receiver and mid-priced five-channel amps. Krell's KAV-500, in particular, is such a solid, clean-sounding brute that I've made it the anchor of my reference rig for the past several years.

Now comes Bryston, with an amp that, at 65 pounds, is lighter than Proceed's \$4,995, 119-pound AMP 5 and slightly heavier than Krell's \$5,000, 47-pound KAV-500. It's rated for comparable power, 120 watts per channel versus the Proceed at 125 watts and the Krell at an even 100. Except the Bryston's only \$3,695, and a hundred bucks more gets you the THX version, which is exactly the same amp but with a nifty 12-volt auto-on trigger you can rig to your surround preamp for remote turn-on and with a slightly higher than normal input sensitivity (per Lucasfilm's increasingly irrelevant specs for home theater).

I've long since given up on trying to correlate the model number of a Bryston amp with the number of channels it has. The company's 3B-ST, for example, is a stereo amp, but so's the 4B-ST, while the 5B-ST is a three-channel amp, the 7B-ST is a monoblock, and the 8B-ST is a four-channel number! A Canadian (or a Klingon) would say that this scheme of naming each new amp one number higher than the last, regardless of channel count, is perfectly logical, and certainly Spinal Tap's Nigel Tufnel would approve, as the 9B-ST is *one higher, innit?* An American reviewer might wish for a more literal naming scheme but only to have something, however tiny and niggling, to bitch about when faced with critiquing a product like the 9B-ST.

LIKE OTHER BRYSTONS,
THE 9B-ST ACTS AND
SOUNDS LIKE
A MUCH BIGGER AMP.



Unlike nearly every other multichannel amp on the market, the 9B-ST is actually five completely separate 120-watt mono amps housed in a single chassis (that's 19 inches wide, 5 1/4 inches high, and 16 inches deep; a 17-inch-wide version is available). The only thing the five channels share is a split feed off the incoming AC. Each amp channel is on a separate plug-in card that fits snugly into a slot inside the chassis. While virtually all five-channel amps (including the Krell KAV-500 but not the Proceed AMP 5) run all their channels off the same power supply, Bryston fits each of the 9B-ST's amps with its own compact but still quite beefy toroidal transformer and power-supply circuit

right on the card. Krell maintains that it's better to run all channels off a single, larger power supply so that channels running into the red (the five channels) can "steal" some juice from those that coast most of the time (the surrounds); Bryston obviously feels different, explaining that interchannel crosstalk and other dynamic interactions among the five channels is greatly reduced, if not eliminated entirely, giving each amp its own power supply. A side benefit of this design is that, say, one channel goes out (something that happens to Bryston amps about often as the Knicks take a kid named Greenberg in the first round of the draft) you can pop the card out and have it repaired without taking the whole amp down.

The 9B-ST's spare front panel sports only a pushbutton power switch and five little LED status indicators, one per channel. Turn the amp on, and the lights go green. But push it past 120 watts on any of the channels, and the corresponding LED flashes red, indicating overload. When I first got the Bryston I thought this was kind of a cheeky feature, but the more I lived with it, the more I appreciated it. The Krell KAV-500 lacks these overload indicators, so you've got to actually *listen* to tell it's puking. What am I, a golden retriever here? Give me the LEDs.

The very heavy-duty speaker outputs (though plastic-barreled and smoothed to boot, to prevent the use of standard European regulations, which mandate that these connectors prevent your usual spade-lug-terminated speaker cables from being inserted). Remember, people: Guns don't kill people, spade lugs do. Anyway, if you want to party with the 9B-ST, you need to tip off your cables with banana plugs or, better, leave the ends bare, insert them into the holes underneath the posts, and screw them down tight for maximum contact integrity.

Owing to Bryston's longstanding presence in pro studios, the 9B-ST has only unbalanced RCA and balanced XLR inputs for each channel but a balanced (TRS, a.k.a. "tip-ring-sleeve") quarter-inch phone jacks wired in parallel with the XLRs. Audiophiles might find the Bryston's phone inputs a bit odd because you don't really find too many phone plugs in home hi-fi except on

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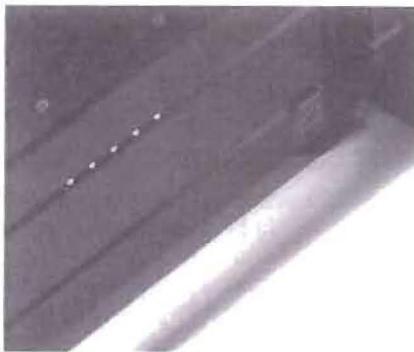
end of a headphone cord. But if you want to have some fun with the Bryston's inputs, plug a pair of headphones into one of the channels, scream your @%#\$ head off into one of the cups, and you'll have a kind of hillbilly microphone. The key here is that since the Bryston really wants to see a line-level input signal and you're only giving it a few millivolts, at best, you really need to cough up some serious lung to get any kind of sound at all out of your speakers. With practice and lots of whiskey sours, you'll be hitting those Bon Scott high notes in no time, to the delight of your family and friends.

I auditioned the Bryston 9B-ST in my main reference system, which handles everything from two-channel music to 5.1-channel DVD movies to real-time RealAudio rhythm and blues on the Net (courtesy of the mighty WWOZ-FM, New Orleans, at www.WWOZ.com). Swapping out my usual Krell KAV-500 for the Bryston at regular intervals, I fed both with a system centered around Theta Digital's Casablanca surround preamp, which handled Dolby Digital processing from a Toshiba SD3107 DVD player and performed 20-bit D/A conversion for Theta's Data III CD/laserdisc transport. A quartet of NHT 3.3s served as the main and surround speakers (each of these has its own 12-inch subwoofer, so I set the Casablanca to run the 3.3s full-range all around), while NHT's matching AudioCenter-1 sat atop my Pioneer big-screen. All electronics were plugged into API Power Pack AC-line filters, with Canare line-level and digital cables and Kimber 8TC speaker cables hitching everything together.

My listening setup is a good torture test for five-channel amps, mainly because I drive a roomful of moderately sensitive full-range speakers very, very loud in a large open loft. It's no wonder, then, that I went through a long list of mid-priced five-channel amps looking to find one that could give me the power and finesse I needed, with only a sad little pile of blown fuses and the acrid smell of burnt transistors hanging in the air to show for it. It wasn't till I finally got hold of the excellent Krell KAV-500 that I could live with a single amp driving the whole shebang. Call me crazy, but I like the KAV-500 better than Krell's bigger and more sophisticated two-channel marquee amps. It's more neutral-sounding, and it

plays my NHTs louder than its 100-watt/channel rating would seem to imply.

The Bryston 9B-ST sounds quite different from the Krell. Though the KAV-500 has been my first choice in a five-channel amp for several years now, when I listened to both amps in a matched-level comparison, it was immediately obvious that this



EVEN WHEN THE 9B-ST'S CHANNEL INDICATORS FLASH READ ON PEAKS, THE SOUND DIDN'T HARDEN.

new Bryston surpassed the Krell very nearly across the board. Living with the excellent Krell had taken my system's sound to a new height, but the Bryston raises the bar significantly in all of the areas that I believe are most important to an amplifier's sound (or, rather, its lack of one).

The most obvious improvement was in the bass. Although Krell amps have long had a deserved rep for the tightest tush, the Bryston's low end was tighter, more powerfully controlled, and far more cleanly articulated. Whether I was listening to Radio-head's bottom-heavy Brit techno on *OK Computer* (the band's only even halfway-decent record) or Willie Weeks' classic Fender jazz bass mastery all over *Donny Hathaway Live*, the 9B-ST locked the quartet of 12-inch woofers all around me in a much more manly grip than the KAV-500, pulsing the music along at what almost seemed like a quicker, more energetic tempo. If I had to draw an analogy, I'd say the Bryston's low end sounds like a really tight sealed woofer and the Krell's like a good ported one—still very meaty, just not nearly as tight and well defined.

The Bryston also scored in the areas of image focus and treble purity. If I had to pinpoint one nagging fault of the Krell, it would be its high end, which tends to harden audibly as you push it harder. Of course, all amps, whether solid-state or tube, do this when pushed to their brink, but the Krell's ramp-up toward hardness seems to happen a bit sooner in the treble than in the rest of the spectrum. I've also found the combination of the Krell and the NHTs can, if the source material isn't smooth-sounding to begin with, get a bit too forward over the long haul. Not so with the Bryston. The more I listened to the system with the 9B-ST in the chain—and the louder I listened—the more I wanted to keep playing music. Even when the amp's channel indicators flashed red on peaks, the sound didn't harden. In fact, I had to crank the volume up till the red lights stayed on for the sound to audibly distort, and at that level it was way too loud even for me. This has been my experience with other amps in the Bryston stable. The 9B-ST may be rated for a "mere" 120 watts per channel into 8 ohms (200 watts into 4 ohms), but like other Brystons it acts and sounds like a much bigger amp.

Overall, the sense I got from the Bryston was that it's a more neutral and powerful amplifier than the Krell KAV-500, which itself is more neutral and powerful than just about any other five-channel amp you're going to find at any price. Either would be a major step up from most other multichannel amps on the market. But to my ears, the Bryston is the better-sounding, more character-free amplifier. That the THX version costs \$1,200 less than the Krell is the kind of gravy I like best.

Once again, Bryston delivers a power amplifier that's so good it almost works against its standing as a high-end audio product. If you're looking for an amp with "life" or "soul" or "warmth" to bring zest to your system, the 9B-ST won't do it for you. But if, like me, you're seeking a serious five-channel amp that offers a powerful yet crystal-clear view of whatever audio signal you feed it, I don't know of any other that will fit the bill better. I look forward to the months ahead as I begin to use the Bryston as my new reference amp, because my system has never sounded nearly as good as when the 9B-ST has been in the driver's seat. Even at \$3,795, this amp is a steal. Highly recommended.

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Secrets of Home Theater and High Fidelity

- Bryston 9B-ST
Five-Channel
Power Amplifier
- 120 Watts
RMS/Channel into
8 Ohms; 200
Watts/Channel
into 4 Ohms
- THD: < 0.01%
- Damping Factor:
500
- Size: 5 1/4"H x
19"W x 16"D
- Weight: 59
Pounds
- MSRP: \$3,495 US

Product Review **Bryston 9B-ST** Five-Channel Power Amplifier - April, 1999

J.E. Johnson, Jr.



BRYSTON

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Bryston 9B-ST

Bryston is not only a company that has been in business for more than 20 years, but it is the only company that warranties their products for 20 years. They started out two decades ago just fixing anyone's Bryston amplifier for free, because so few of them broke down. So, when they went bigtime, they had to choose a warranty period. How about 20 years?

OKAAAAAAAAAY!

BRYSTON

The Bryston 9B-ST is the five-channel power amplifier version of the 3B-ST (two channels), 5B-ST (three channels), and 8B-ST (four channels). All of these amplifiers are modular, with each module having its own complete power supply, including an 0.25 kVA (250 watts) toroidal transformer, dual 15,000 μ F power supply capacitors, and ± 60 Volts on the rail, providing 54 Joules per amplifier channel (that's 1,250 watts of toroid and 270 Joules of energy storage total, which is a LOT for a 120 watt/channel, five-channel power amplifier). Four bipolar output transistors per channel deliver 120 watts per channel into 8 Ohm loads and 200 watts per channel into 4 Ohms.

On the surface, it doesn't look intimidating does it, in a world filled with five channel home theater amplifiers rated at 120 watts per channel? One thing though: look at the weight . . . 59 pounds. That's pretty heavy for a multi-channel amplifier of such a modest rating. The reason? An absolute KILLER build quality. After all, this thing is supposed to be around for at least 20 years.

If you look at the main photo of the 9B (next to the specifications above), you can see some of the 28 screws that hold the cover on the chassis. Four screws attach each side, and four screws hold each of the five amplifier modules in place. There are so many, I decided just to use a stock photo of the 9B insides (photo at below). Click the video button and you will see and hear how solid the chassis is. You can see the five toroids and the upper power supply capacitors. What you can't see is the fact that each module is covered on both lateral sides (in other words, covering the transistors, resistors, etc., and also covering the underside where the



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Bryston 9B-ST

solder joints are) by metal plates to seal out dust (the edges of each module are covered too), which over time, can decrease the heat dissipation of various circuit parts in uncovered amplifier



boards. The rear of the 9B has a three-prong (grounded) AC cord receptacle on the left, and then each of the modules' end panel,

having an XLR balanced jack, slider switch for selecting balanced or unbalanced RCA (gold plated), and a +6 dB position for increased sensitivity in the balanced input (1 volt input produces 100 watts output into 8 Ohms instead of 2 volts input with the normal balanced switch setting).

The five-way speaker binding posts are unique and will be welcome to those of us who use spades and bare wire connections on our speaker cables. Each binding post has the usual opening in the back for a banana plug, but the front end has a slot and hole that serve as a convenient guide to slip the spade or bare wire into (see photo at left). It's very simple, very clever, and very useful.



The front panel has a push button on/off switch and five LEDs that indicate power on. They turn red at channel clipping. Massive handles let you carry the amplifier or move it around on a shelf. Actually, the handles add kind of a nice look to the front. The only handles I have are on my waistline.

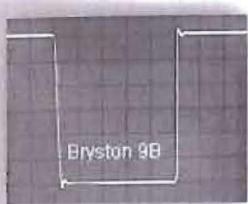
We tested the Bryston 9B-ST with our reference home theater system, including the Yamaha DVD-S700 DVD Player, Yamaha DSP-A1 (used as a processor with the pre-outs going to the Bryston), Krix Speakers, and Nordost cables.

The first thing I would like to say is that the Bryston performed like a much more powerful amplifier. Undoubtedly, this is due to the massive amount of current available from the power supplies. 270 Joules is a large number for a five channel amplifier of this rating, so transients are given the large (short term) juice that they ask for. Bryston amplifiers had a reputation, some years back, of slight brightness. That has all been worked out of the design now, and the 9B sounded terrific at any volume I cared to set it to. Also, there is a tremendous amount of fine detail in this amplifier, something I only rarely hear in home theater power amplifiers. I could

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Bryston 9B-ST

detect almost no hum, even though we have a very hum-inducing setup with lots of components and interconnects going all over the place.



The square wave response (10 kHz ± 15 Volts) is practically straight up & down with nice tight corners, and only a small amount of overshoot. Measured bandwidth was 360 kHz (down 3 dB from 10 kHz sinewave value at ± 20 Volts). This is a very wide bandwidth, which means no phase shift in the audible band. The 9B uses two

voltage gain stages and four current gain stages, which give the large bandwidth.

Postscript -



"You want to spend how much for that new amplifier in our home theater? Isn't the one in the receiver good enough?" Those might be the words coming from your wife when you tell her you are buying yet another box for the den. Hi-Fi equipment is expensive, at least the good stuff is. But, it's all relative. The problem is that our worlds exclude each other, even on vacations. We go golfing, and they go to the museums. We like audio equipment, and they like jewelry. Well, it's not such a problem after all. Here is a picture of a pair of

tanzanite and diamond earrings I bought for my wife as an anniversary present (original design copyright Alex Samet 1998). They cost \$2,500. About the same price as a Velodyne HGS-18 or M&K MX-5000 subwoofer, two of the best in the world. Now, I may be a typical male, but jewelry seems like just a bunch of shiny rocks that cost a lot of money. No inherent value, really. Bushels of uncut gemstones sit in warehouses to keep the price high. On the other hand, subwoofers, amplifiers, speakers, etc. have a whole bunch of stuff in them. Things that took a lot of work to make. Things that required parts from all over the country, maybe even all over the world.

You might wonder what a pair of earrings has to do with the Bryston 9B-ST. Well, both are handmade from the finest parts. Both give pleasure to their owners. Both are expensive, and both are worth it to the respective purchaser.



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In summary, the Bryston 9B-ST is a real **WOW** product, with astonishing build quality and great sound. It has been designed for very high fidelity at modest power. However, I consider it to be conservatively rated, probably sneaking quite a bit more power for those high impact movies than one might imagine. It is obvious that Bryston has chosen to set standards rather than follow them.

EXCLUSIVE

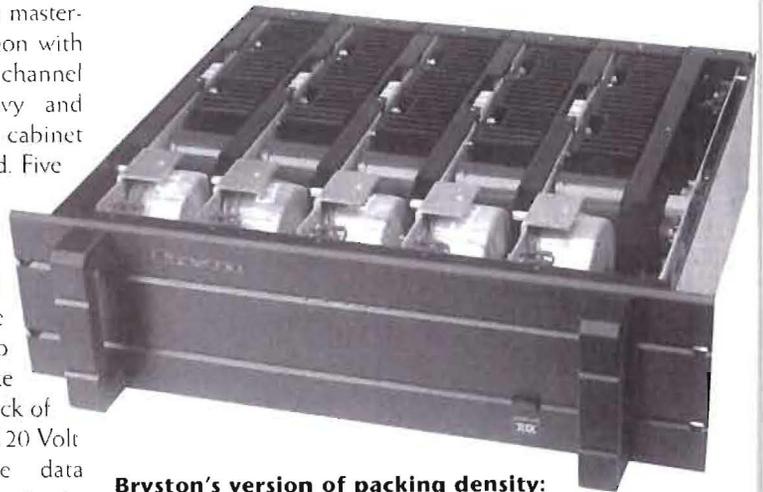
The High Art of Integration - an Example is the 5 Channel Power Amplifier

Bryston 9B-ST

Amplifiers from Bryston are welcome guests in the HEIMKINO editor's office. Not only do they have the reputation of being indestructible, but they are also constantly put to work because of their superb measurements and their seductively clean sound. The new Five Channel Model 9B-ST, the most compact Bryston Amplifier so far, now makes its stage debut.

Bryston presents a masterpiece of integration with its first five channel amplifier. In its heavy and exceptionally robust cabinet every cubic inch is used. Five identical amplifier modules including their transformers and their heatsinks are located close to each other. The electrical connections to the outside world take place directly on the back of each module, only the 120 Volt connection and the data exchange for protection circuitry takes place on a circuit board directly behind the front. A small module on the right outside takes over control and steering functions - and that's all there is to the amplifier.

Workmanship The commitment to detail already becomes evident while the amplifier is being opened. No less than 30 screws must be removed before the top can be taken off. That we are dealing here with counter-sunk standard threaded screws, and not the usual self-tapping sheet metal screws, is a matter of course for the Canadian manufacturer. Compared to earlier models, the loudspeaker terminals for the 9B-ST are considerably more massive, and for the balanced inputs time-tested pro-



Bryston's version of packing density: This concentrated assembly makes over 1 kW available when necessary.



Each of the five amplifier modules contains a transformer, heatsink, and the complete amplifier circuitry.

fessional combination XLR and phone jacks are used. Thanks to internal volume balancing the total amplification for both input methods are identical.

Engineering The power output of the 9B-ST shows it to be a close relative of the proven Bryston 3B. It also shares its enormously high bandwidth and supplies almost complete of

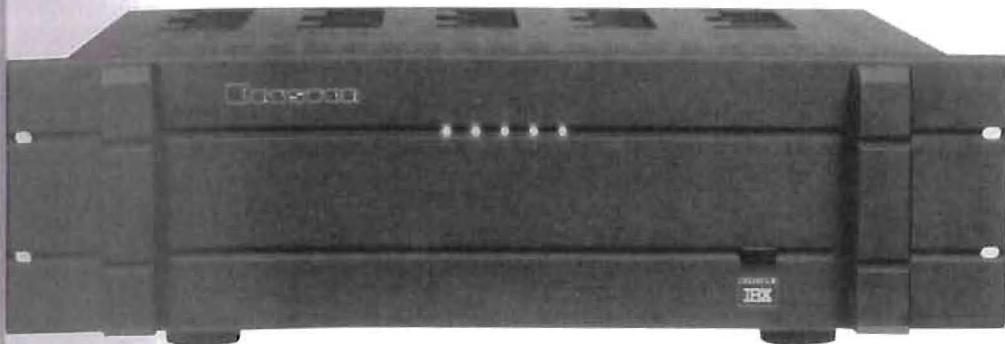
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EXCLUSIVE



If desired the Bryston Amplifier is also available without the 19 inch mounting hole extensions, and without handles, in 17 inch format.

put to above 100 kHz) with minimal noise. As before, distortion values are only barely measurable, and the sound-wise especially noticeable intermodulation distortion values have even been markedly decreased. With a full doubling the damping factor has also been increased, better stability at high frequencies led to a four fold better value at 20 kHz. The reason for these improvements are on the one hand due to the compact assembly with extremely short cabling, and on the other hand the optimized circuit design by Stewart Taylor. The sponsor of the "ST" in the type designation, fundamentally retained the unique basic circuitry, but apparently could still increase its speed and thus optimize its high frequency and high output operation. With a

maximum of 148 watts, most 8 ohm loudspeakers will be supplied with sufficient steam, especially so, if a subwoofer takes over the low bass in the system. The sturdy design obviously also accommodates speakers with 4 ohm impedance, in which case up to 228 watts per channel are supplied - even to all channels simultaneously. In this case the difference in amplification between channels is a vanishing negligible 0.02 dB, thus one can truly refer to five equal amplification channels. But if the Bryston amplifier should sometimes be driven close to its maximum output, the light emitting diodes on the front panel give warning by changing their color from green to red.

Sound Bryston amplifiers

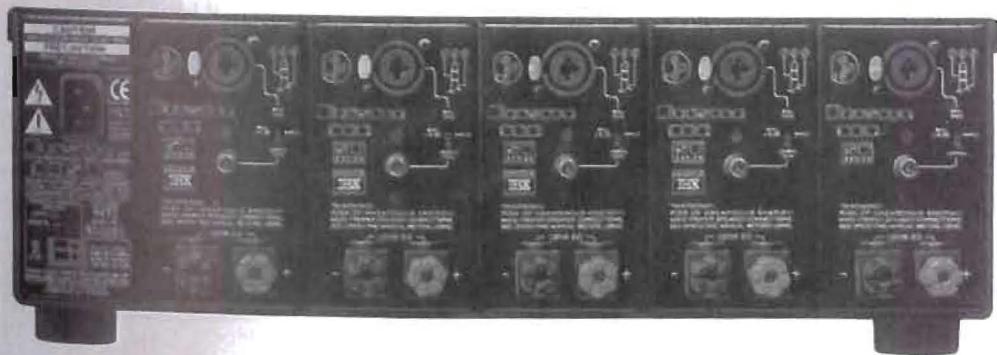
could never be listed among the spectacular ones where one right away enjoys bloated bass or screaming highs. These are also the sort of amplifiers where one becomes tired of them after a short time. Exactly the opposite is the case with Bryston, and ultimately as a first owner one should be able to fully enjoy the 20 year long warranty. To begin with they are powerful, thanks to the five separate power transformers, even more powerful than one can reasonably expect from a 150 watt per channel compact power amplifier. On top of that they sound very matter-of-fact, very honest, without any kind of accentuation of specific frequency ranges, and without suppressing any details. Compared to previous Bryston amplifiers the 9B-ST goes to

work in the upper ranges somewhat more supplely, which for example can be noticed with female voices or with softly played stringed instruments. It must of course also withstand comparison with the superb Proceed AMP 5, and it proves to be a thoroughly equal opponent. Where the AMP 5, besides its dreamlike manufacturing and appearance quality, can bring a very airy and transparent high frequency reproduction into the field, the 9B-ST makes points by a trace more dynamics and emphasis in the lower ranges.

Summation With this amplifier everything matches correctly: Price, performance, and engineering. According to our experience one will still enjoy the well-balanced, powerful sound for years to come, probably even more so with each passing year, and exactly that makes the Bryston amplifier so desirable and such a good value for the money.

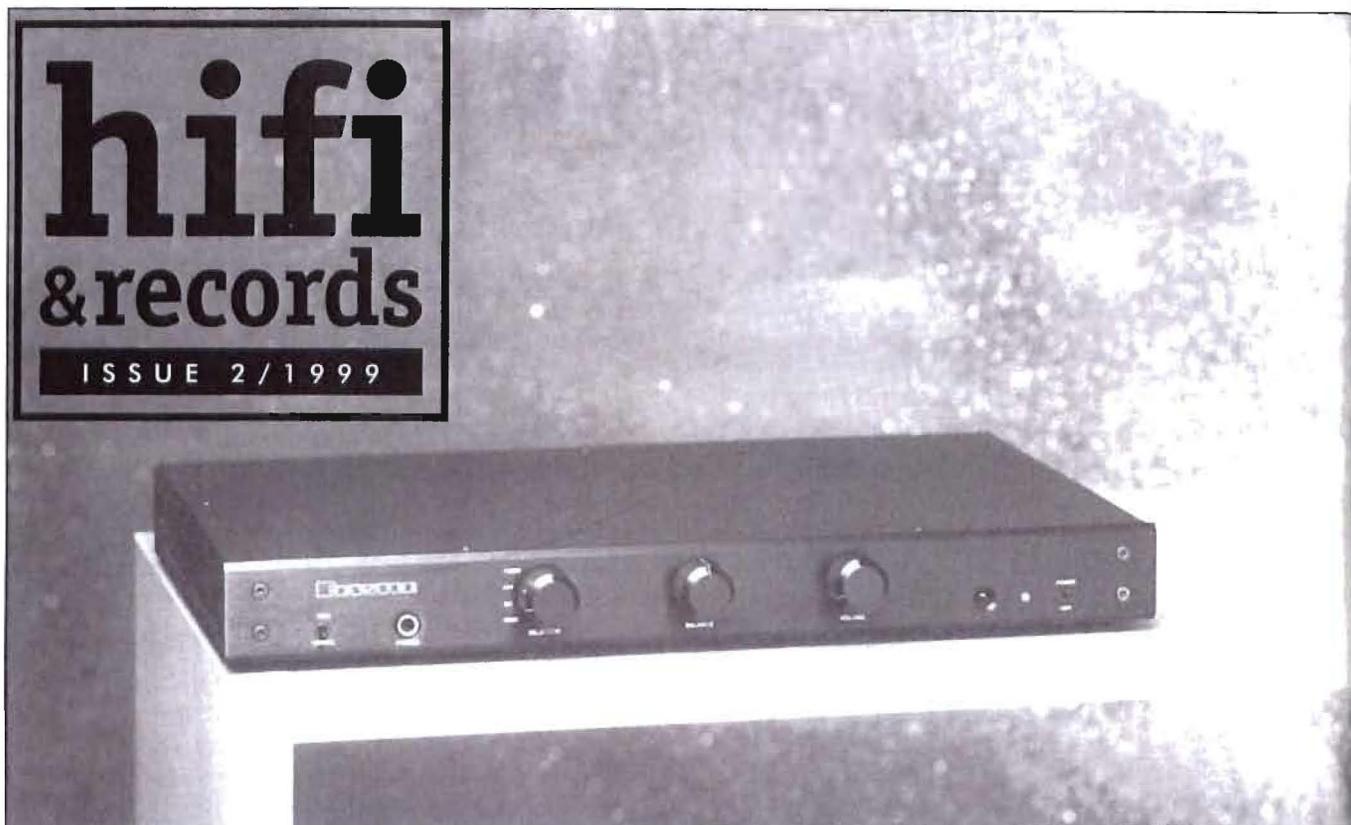
Christoph de Leuw

Translated from the German by Peter Ullman



With the balanced inputs, when desired, the volume control can be disabled, then they play (no longer conforming to THX) 6 dB louder. The small jacks on the left side are for remote control operation.

BRYSTON 9B-ST
DISTRIBUTION: Sun Audio, 81675 Munich
MEASUREMENTS: 19" x 5.25" x 16"
PRICE: 8.000 DM
SIGNAL-TO-NOISE-RATIO: 95 dB (A)
DISTORTION: 0.009 %
POWER OUTPUT (8 OHMS): 148 Watts (x 5)
STANDBY CURRENT: 3 VA



Bryston B-60

"It is surely not the best amplifier in the world, but do give it a listen", suggested the Sun-Audio sales manager Thomas Bernhardt, after he had read about our planned power amplifier comparison in the preview section of our last issue. In hindsight one can only say "a clever sales understatement" but one that is appropriate for what is probably the most unpretentious power amplifier in the world market.

What advance praises should we have taken seriously? After all the Bryston (amplifier) from Canada is only one "professional studio rack space" tall, and with its feet takes up barely two inches. That is the reason why we underestimated the B-60, while at the same time it exerts an almost magical attraction for the ladies. He or she who appreciates products without embellishments,

without complications, unadulterated, knows at first glance - long before the first audition - that this one "will be great!"

With these kind of customers Bryston will storm many an open door with its 20 year warranty. People who are by nature skeptics might suspect an irresponsible exaggerated marketing trick, but Bernhardt has a simple and plausible explanation ready for what is hard to believe, i.e. in the past Bryston has always repaired all amplifiers as an accommodation with out charge and does not intend to change this. And so that customers don't discover this unprecedented service after years, and only if something goes awry, this policy has been made official and declared as the warranty. In addition this warranty does not apply only to the original owner as is usual, no, it is even

transferable. Imagine the following local advertisement: "For Sale, Bryston B-60, Remaining Warranty - 18 Years!"

But only a company that for the last 35 years has been manufacturing amplifiers for professional studios and since the beginning of the seventies also HiFi equipment, can afford to do this. And since professional studios appreciate reliability in every variation above all, Bryston power amplifiers for example drive B&W loudspeakers in the well-known Abbey-Road-Studios. An importer from another country - not in connection with this report - told us that in a span of seven years he only had to repair two pieces of Bryston equipment. In one amplifier the customer had dropped a coin through an air vent. An appropriate comparison: Bryston amplifiers are as enduring as a Mercedes Diesel

From the outside one does not discern the ruggedness of the B-60, in fact its flat metal cabinet conveys true elegance. All colors are available as long as they are black. No less unpretentious than the amplifier itself is the metal remote control. It only has buttons for "volume up", "volume down", and "mute", but no system integration, no remote turn-on via computer, no circuit connection with a microprocessor brain of the washing machine, just simply "HiFi."

As "playing partners" the Bryston (amplifier) accepts four high level inputs and one tape deck. Unfortunately it does not have a phono input*, but a "speaker disconnect" headphone jack. On the back one can separate the preamplifier and power amplifier sections of the B-60 by means of two sets of RCA jacks. And with the shielded and "phase" marked AC cable the subject of styling is complete.

The inside of the flat "Canadian" displays a beautifully detailed layout in whose signal path not even one op-amp will be found. A long metal rod extends all the way to the rear panel, so that the input selection can take place right at the input, and even for the balance control, Bryston uses an encapsulated Noble potentiometer. On the right hand side are two toroidal transformers (each 120 VA), and two

6,000 mfd. filter capacitors per channel are part of the power supply as well. For each channel there are two bipolar Motorola output transistors mounted on a sheet metal heat sink, which in turn transmits the heat to the amplifier top plate by use of heat sinking paste. What does not quite fit into the picture with this "closed construction format" are the power supply fuses, because if one "blows" the instrument must go in for service.

The laboratory noted that Bryston has equipped the B-60 with considerable power handling capacity, after all 85 watts into 4 ohms and peak power up to 140 watts are nothing to sneer at. The price for this are minimal reserves, when the Canadian (amplifier) reaches its limits, it distorts immediately. However the B-60 would hardly be purchased to drive power hungry loudspeakers to high volume levels, but rather in order to just hear music at normal volumes.

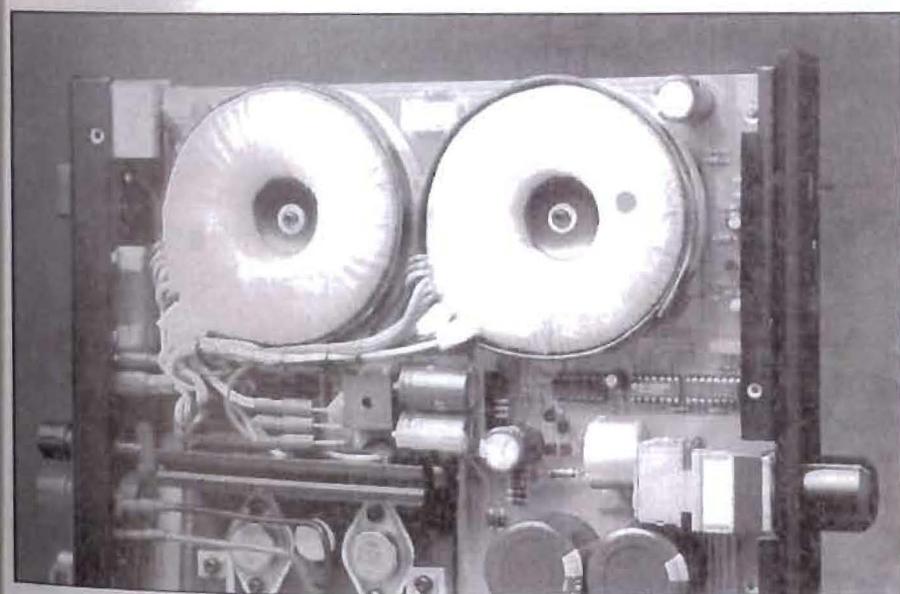
And this job the Bryston (amplifier) does superlatively and in a much superior fashion than is suggested by its outer appearance. This amplifier one can also embrace whole heartedly for audible reasons, it has something tremendously sympathetic about itself. Even our photographer who

does his "own testing" in his hall-like photo studio attested that the Bryston (amplifier) "swings well - that there's something to it."

Indeed the Bryston (amplifier) somehow always sounded nice, yes pleasing. It is not an amplifier in order to eavesdrop into the farthest corner of a recording, and it does not sound as open and multifaceted as the top of the class. However this does not matter because the B-60 is vocally balanced, and it conveys a musical totality. Moreover it has style, because it does not let one down. This sounds similar to the description of a good old NAD amplifier, and indeed the Bryston (amplifier) could pass as its "big brother." A "musical" amplifier, which despite its graceful appearance, sounds astonishingly powerful. Ideal in order to simply listen well to music, and otherwise to place the topic HiFi behind the music.

Conclusion

This is not an amplifier for people who already wish for an update two weeks after their purchase. The Bryston (amplifier) one can set up, turn it on, forget it, listen to music - subject closed, presumably for many years. The B-60 performs its amplifying duties in an engaging fashion, competently but not obtrusively, very pleasingly, and not seductively false. One must not be deceived by its unpretentious outside appearance.



Prerequisite for the Shallow Construction Height: Bryston Uses Two Flat Toroidal Transformers. The Encapsulated Motor Potentiometer is from Alps.

Bryston B-60

W x H x D 17 x 1.75 x 10.5 in.
Warranty 20 Years

BRYSTON

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HIGHLY professional

This month we bring you a system with a twist: it hails from a manufacturer rather than a dealer. Tim Bovern reports.



In each of *Choice* we deliver you, our dear readers, a System of the Month - a fine fusion of potent kit commonly chosen for review by a reputable hi-fi dealer. This time we've got a set-up offering a somewhat different spin. Instead of asking a dealer for recommendations, we've gone direct to a manufacturer to consider the permutations for a rather unusual combo.

The outfit in question is PMC, or The Professional Monitor Company, to give the Hertfordshire-based manufacturer its original, extended name. As monikers go it's a mite bullish but undoubtedly accurate, as PMC spends much of its time developing monitor speakers for the professional recording industry. These are used for mastering in studios around the world (too many to

count, according to PMC), including every top BBC location and several blockbusting Hollywood studios (PMCs were used to create the soundtracks for the likes of *Titanic* and *Jurassic Park*). An impressive pedigree indeed.

As we said, PMC's chosen system is unusual, though that has little to do with the configuration of the company's own direct contribution - the TBI loudspeaker. An average-looking two way stand-mount designed and priced for the domestic market, its 40cm high MDF cabinet, 12.5cm doped paper mid/bass cone and 25mm metal dome tweeter are hardly unusual. Engineering quality is exemplary, however, including effective use of transmission-line bass loading, and as a full review in *HFC* 160 revealed, it came complete with excellent sonic results. Frankly, to find such articulate and musical speakers on the wallet-friendly side of £500 is rare indeed.

MAPLE SYRUP

Now here's the rub. A second facet of PMC is acting as the UK distributor for Canadian amp specialist Bryston, another outfit with firm foundations in the world of professional recording. The two companies have formed a close working relationship, with considerable cross-referencing between their respective product ranges, so it's hardly surprising PMC recommends the Canadian's product as a perfect match in the current-shifting department. More of a shock to the system is the form PMC's suggested amp partnership takes - a preamp and two small mono power modules which bolt onto the back of the speakers!

Called Powerpac 60s, these £423 a-piece 60 Watt modules are so designed for two reasons. First, there's the convenience factor. By hooking them to the speakers piggy-back style they vanish from sight, unlike most monoblocks which are ugly affairs that'll take up acres of valuable rack space. If you prefer you can attach them onto (or into) a wall, which also

makes them ideal for home cinema use. Second, there are sonic advantages in keeping cable length between amp and speakers to a minimum, the VDC 42-strand OFC cable supplied with the amps is just a few inches long.

Of course, that means interconnect cable runs are likely to be much longer between each power amp and Bryston's BP-20 preamp - a £1,126 model with a distinctly pro-oriented design. Rugged build quality ensures it weighs in at a surprising 7.5 kg, with a slim, 4.3cm high front panel designed for simplicity, no glittering aesthetics. Three large controls handle volume, balance and source selection, together with four small switches for muting, polarity inversion, mono/stereo selection and tape monitoring. Inputs stretch to seven at linelevel, including four XLR jacks providing two balanced inputs, and pre-outs are also supplied in both balanced and unbalanced form. We used the former, for which PMC supplied some three metre long VDC 'pro' XLR cables.

SPELLBOUND

With the amp/speaker interface sorted, PMC's choice of source would form the final, critical piece of the puzzle. We couldn't have been happier with the decision - Acoustic Precision's Eikos CD player was once described by our esteemed Editor as "the best source component I've heard to date". A Pioneer PD-S904 at birth, it has since been enhanced beyond all recognition by hi-fi miracle workers Tom Evans and Patrick Hanscombe to become a £2,350 player of supreme resolution and musical precision.

On paper this should add up to an impressive collective indeed: the CD player's musical energy, the amp's authoritative power and the speakers' clean, natural air should go together like champagne and strawberries. Indeed, first impressions are of a wonderfully clear and lucid sound, like dipping your ear into a pool of crisp, fresh sound. Bass is perhaps a touch indistinct and the mid-balance a little forward, but there's no sign of grain or gristle - just cool, liquid treble and vivid transparency through the middle frequencies.

"Its resolution and dynamic qualities ensure instruments emerge with full-blooded textural character, attacking leading edges with relish and providing that sense of 'inner detail' sought by any true audiophile."

Pace and timing are right on the button, keeping rhythm with metronome precision, and imaging is precise and open enough to help give music a sense of true, palpable presence. One thing's for sure - we're talking 'fi' with real 'hi'.

Play the right material, particularly music of a more laid back or acoustic nature, and this system is almost breathtaking. Its resolution and dynamic qualities ensure instruments emerge with full-blooded textural character, attacking leading edges with relish and providing that sense of 'inner

detail' sought by any true audiophile. Space and definition are foremost among its talents, able to conjure attention-grasping ambience from the digital code on any well-recorded disc, while those with a penchant for vocals will be impressed by their bold yet unstrained presence.

With a track like Kristin Hersh's *Your Ghost* coursing through the system it's hard not to be spellbound. Plucked guitar sounds clean and resilient, a vibrant contrast against the blackest of sonic backgrounds, while Hersh's voice projects cleanly into the room and takes its place centre stage... if only ears could smile, I'd have been grinning from lobe to lobe.

There are times, however, when the total effect becomes somewhat dry and hard, particularly with more dense or aggressive material. Though definition is undeniably impressive, the full-tilt rasp of brass during Mahler's *Fifth Symphony* proved a little too sharp for our ears, and slinging on the ear-slapping beats embedded into DJ Punk Rock's *Chicken Eye* CD resulted in an almost wince-inducingly flinty sound.

Nonetheless, this remains a system worthy of accolade and would probably relax with more extended running in. It combines novel design with thoroughbred resolution, knife-edge imaging and well-endowed dynamics, and is well suited to the smaller listening room. It's a touch tense at times, but with the right music it'll hold you captive from the first note to the last.

VERDICT

SOUND ★★★★★

SYNERGY ★★★★★

VALUE ★★★★★

Here's a system that challenges the traditions but certainly cuts the mustard when it comes to the all important sonics. A touch temperamental in character, yet undoubtedly talented.

■ Bryston: 20 YEAR GUARANTEE

■ PMC: FIVE YEAR GUARANTEE

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Email: sales@promonitor.co.uk

THE SYSTEM COMPONENTS

PREAMPLIFIER

BRYSTON BP-20

A slim and rugged control amp with a distinctly 'pro' feel. It's a touch pricey, but flexibility is good and quality of engineering very high. Output to power amp(s) is bt XLR only.

Alternatives: Exposure XVII
Meridian 502



CD PLAYER

ACOUSTIC PRECISION Eikos/Lithos A&D

A highly modified Pioneer original, re-tuned to an immensely impressive level of performance. It's neutral balance will not suit everyone, but resolution and pace are exemplary. Sizzling sonics in a shiny, black box.

Alternatives: Naim CD2, Revox Exception E426



MONOBLOCKS

BRYSTON Powerpac 60 pair

Neat 60 Watt mono power amp modules with a clever bolt-on design. Sound is a touch mid-dominant but generally good, and their discreet nature is a novel bonus.

Alternatives: Musical Fidelity X-A200
Moth Series 30 Monoblocks



CABLES & SUPPORT

PMC supplies a few inches of 42-strand VDC speaker cable with the Bryston power amps for piggy-back mounting. The interconnects we used between pre and power were VDC professional XLR cables, supplied by PMC, speaker stands were Soundstyle and equipment supports Mana.

SPEAKER

PMC TB1

Superbly clean and refined-sounding loudspeakers. Meticulously built using high quality components, their articulate and musical balance is precisely judged, and at the price they're something of a bargain.

Alternatives: Dynamic Audience 50
AVI NuNeutron



BRYSTON • 17 • Critical Acclaim

HI-FI CHOICE FEBRUARY 1999

stereophile
GUIDE
to
HOME THEATER

Reprinted from June 1998
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MONOBLOCK POWER AMPLIFIER

Bryston Powerpack 120

Steven Stone

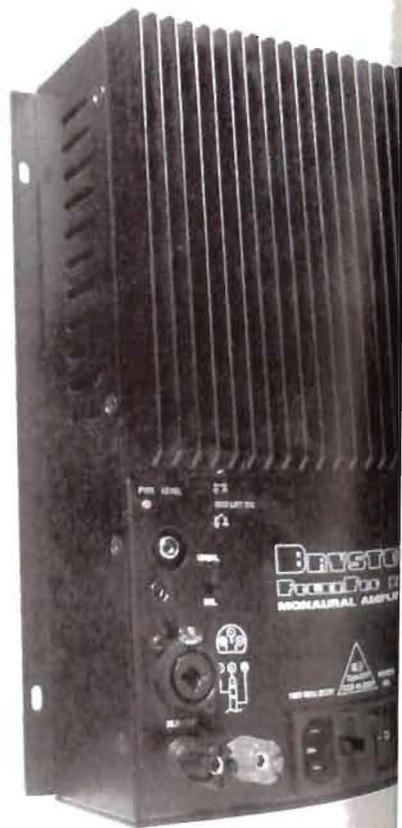
Like monoblocks. They're usually lightweight, compact, and easy to schlep around, and Bryston's latest entry in the monaural amp sweepstakes is especially enticing. Not only is it bantam-size, it's also designed to bolt directly onto the back of your speakers. Still, beautiful as small might be, power amplifiers are about delivering current. Can Bryston's diminutive contraption put out? Let's buy them dinner, take 'em to a movie, and find out.

Tiny town tour

Most amps are big, rectangular boxes, but the Powerpack 120 is a small rectangular box. Over half of its top surface is heatsink. Below these fins are a ground-lift switch, green power LED, input-level adjustment screw, balanced/unbalanced input selector, RCA single-ended input, XLR balanced input, IEC power-cord receptacle, power switch,

and a pair of five-way speaker terminals. The speaker terminals are gold-plated circular deales very similar to those on the Cinepro 3k6 amplifier I reviewed in the January 1998 issue. Luckily, I always keep a quarter in my pocket for tightening down variations on the five-way binding-post theme.

The Powerpack 120's audio circuitry and power supply are very similar to the Bryston 8B's. There are four gain stages: three for current, one for voltage. The circuit topology is fully balanced and complementary throughout. Especially interesting is Bryston's use of PNP and NPN bipolar transistors in pairs for each half of the last current gain-stage. Apparently this arrangement produces a better transfer function and a more linear response. The first current gain-stage also has some voltage gain capacity, so the voltage stage doesn't have to supply as much output swing.



BRYSTON • 18 • Critical Acclaim

The Powerpacks deliver an amazing amount of information, enough to **beguile** almost anyone.

Input-impedance worrywarts will be happy to know that the variable resistor that controls the input sensitivity is placed after an input buffer, so the impedance doesn't change with input level. Finally, the company directed special attention to reducing high-frequency distortion. Unlike many amplifiers, in which distortion at 20 kHz is 20 times the level at 1 kHz, the Powerpack 120's distortion level at 20 kHz is only three times what it is at 1 kHz.

Installation was effortless. (I feel very formidable lifting three amplifiers without so much as a grunt.) In my home-theater setup, I used the single-ended RCA inputs; in my stereo room, I tried the balanced XLR connections. The ground-lift switch was useful in the home-theater installation. Even with all the amps powered from the same dedicated outlet, I heard hum if the grounds weren't lifted.

There were no unruly turn-on noises, but the Powerpack 120s did sort of "burp" about 15 seconds after turnoff. Chris Russell of Bryston attributed this to a power-supply artifact during shutdown. According to Bryston, the

current production models have a relay to eliminate this phenomenon.

Lilliputian lollapooza

The Bryston Powerpack 120 might be physically exiguous, but it delivers Brobdingnagian sound. (Gotcha lookin' in your Webster's yet?) The sound is big – very big. This amp excels at preserving low-level details and subtle musical cues. Whether it's the whisper of a diva's skirts sliding across an opera-house floor or the *walla walla* of a discrete surround-sound crowd, the Powerpack lets you hear into the mix in a way that's usually the exclusive province of megabuck amps. In this regard, the Powerpack nearly equals my Class AAA reference, the Pass Aleph 1.2. The Bryston's low-level finesse translates into involving sound. It draws you into music and soundtracks; subtle cues that many amps blur into oblivion are preserved for your enjoyment.

While it isn't as lush or romantic as a tube amp, the Bryston is still quite musical. Acoustic guitars and saxophones have just the right amount of warmth, sparkle, and sheen. Voices have a natural quality, especially on



DTS soundtracks. Only when I compared it directly to the Pass Aleph 1.2 did it sound a bit matter-of-fact. Massed strings have slightly more edge through the Bryston. If your speakers err on the bright side of the musical spectrum, the 120s won't help push them back toward neutrality.

While the Bryston has less mid- and low-bass "slam" than the massive, multi-channel Cinepro 3k6 I reviewed in the January issue, it still has reasonably good low-bass extension and weight. It can still rock your world with bombastic sources. Though it doesn't exhibit the dynamic ease of a high-power amp, the Powerpack does pretty well for 120 watts into 8Ω, preserving the leading edges of transients nicely on such explosive soundtracks as *The Long Kiss Goodnight*.

Only dynamic peaks are wanting compared with the high-power Cinepro. The 3k6 handles bombast with no sense of strain, while the Bryston becomes a wee bit hard and never gets quite as loud. In addition,

SPECIFICATIONS

- Powerpack 120** monaural solid-state amplifier
- Power output:** 120W/8Ω, 200W/4Ω
- Distortion:** <0.007%, 20 Hz - 20 kHz at 120W
- Noise:** >106 dB below full output
- Slew rate:** >60V/μs
- Power bandwidth:** 1 Hz - 100 kHz
- Damping factor:** >500 at 20 Hz
- Input sensitivity:** 1 V for 100W out
- Input impedance:** 10Ω unbalanced, 20 kΩ balanced
- Dimensions:** 12" x 7.25" x 3.6" (HxWxD)

- Weight:** 10 lbs.
- Price:** \$750 each
- Warranty:** 20 years parts and labor, shipping one way.

Manufacturer
 Bryston Ltd.
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 Peterborough, Ontario
 K9J 7Y4 Canada
 tel. (705) 742-5325
 fax (705) 742-0882
 www.bryston.com

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midrange dynamics are not as effortless or as seemingly unlimited as the Cinepro's. When it comes to dynamics, nothing succeeds like more power.

The Powerpack 120's upper-frequency presentation is mighty fine. Piccolos, triangles, and those all-important birds twittering in the rear channels have a realistic, airy quality. The Bryston's high-end extension clearly outclasses that of the Marantz MA-500 monoblocks, which sound much softer with less extension. The Bryston is nearly the equal of the Boulder 500AE in top-end extension. Only the Pass's extra sweetness and suavity on top clearly best the Bryston.

REVIEW SYSTEM

Digital Sources

Denon LA3500 LD player
Sony D-8 DATMan
PS Audio Lambda CD transport
EAD DSP-7000 III D/A converter

Analog Sources

VPI HW-19 series IV turntable with
Clearaudio/Souther TQ-1 tonearm
and Denon/van den Hul 103C
cartridge

Fanfare FT-1 FM tuner
Sony SLH-900 Beta VCR
Fisher FVH 8901 Hi-Fi VHS VCR

Preamplifiers

Chiro C-800 w/5.1 outboard Dolby
Digital/DTS converter
Lexicon DC-1 w/Dolby Digital
Gold-Aero dB-45 phono preamp
Michael Yee PFE 1 phono preamp
Wadia Model 17 A/D converter

Power Amplifiers

Marantz MA-500 THX-certified (5)
Cinepro 3k6

Video Monitor

Proton 331

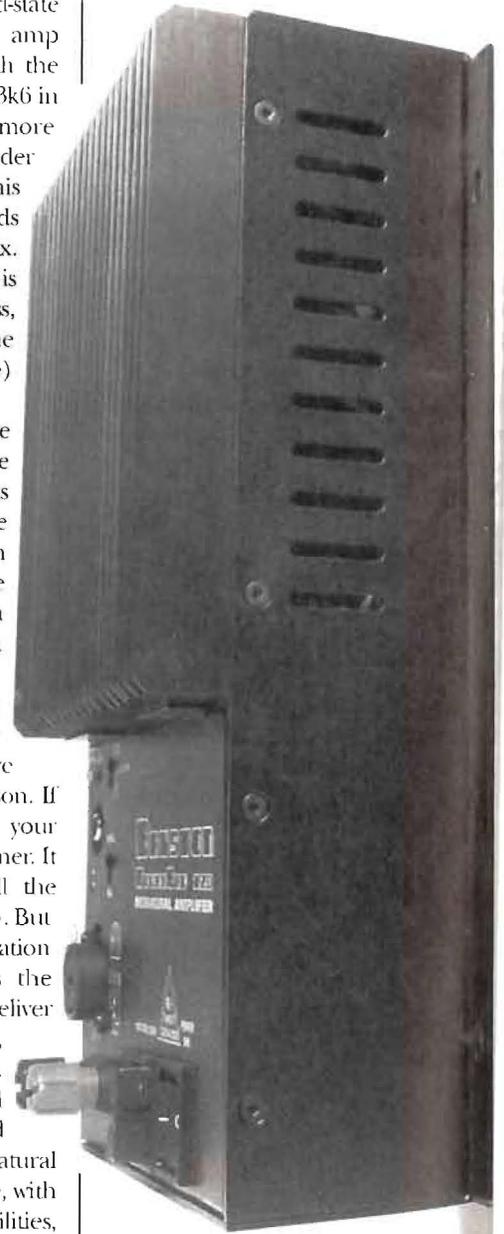
Cables

XLO THX-certified interconnects and
speaker cables
Monster THX certified interconnects
and speaker cables
Aural Symphonics Generation II
speaker cable for front L/R speakers
Straight Wire Maestro interconnects
AudioQuest Diamond interconnects
Discovery Plus-4 interconnects
Illuminati coaxial digital cable

Depth rendition is acceptable, especially for a modestly priced solid-state amplifier. Within my current amp hierarchy, the Bryston betters both the Marantz MA-500 and the Cinepro 3k6 in dimensionality, but the (vastly more expensive) Pass Aleph and Boulder 500AE are both superior in this regard, especially on sounds emanating from way back in the mix. The Brystons' sound-stage width is not as extended as those of the Pass, Boulder, or Cinepro, but it's the equal of the (less expensive) Marantz monoblocks'.

The Bryston's electronic texture and grain are quite similar to the Cinepro 3k6, but the Pass Aleph is substantially more liquid. The Boulder 500AE also has less grain than the powerpacks. Trailing the group is the Marantz MA-500, which sounds ever so slightly electronic in comparison to the rest.

The Cinepro 3k6's and Bryston 120s' similar prices (\$3499 for the 6-channel Cinepro, \$3750 for five Powerpacks) invite direct comparison. If accurate dynamic presentation is your bailiwick, the Cinepro is a clear winner. It has enough power to deliver all the goods (in fact, just about *any* goods). But if inner detail and low-level information float your boat, the Bryston is the obvious choice. The Powerpacks deliver an amazing amount of information, enough to beguile almost anyone. They also have greater dimensional capabilities, additional top-end extension, and a slightly more natural harmonic timbre. For folks like me, with long-ingrained audiophile sensibilities, the Brystons have great appeal.



MEASUREMENTS BY THOMAS J. NORTON

The frequency response (unbalanced), signal/noise I(A-weighted), and THD+noise at low power into 4Ω and 8Ω are all excellent. The balanced frequency response and THD+noise into 2Ω are very good. The squarewave performance is near ideal and the amplifier has low IM distortion at high power. The input impedance measured 10 kΩ unbalanced and 26 kΩ balanced. Gain measured 23 dB balanced and 29 dB unbalanced. The output impedance is very low. Clipping (1% THD+noise at 1 kHz): 150W into 8Ω, 227W into 4Ω, 139W into 2Ω.

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End of the road

The Powerpack 120s are really nifty little amps. They're easy to set up and can be shoehorned into tight spaces. In addition, they include an amazing 20-year warranty to the original owner, including one-way shipping. Each amp even comes with its own test sheet. On top of these perks, the 120s are fine

performers. They excel at dredging up oodles of low-level information, their high-frequency extension is excellent, and they're delightfully harmonically neutral. In some situations you might wish for additional power, but for any speaker with THX-standard sensitivity, the Powerpacks

have adequate drive for everything but multiple nuclear-warhead detonations.

Verdict: solid Class AA performance at a reasonable Class AA price. I like 'em; as a matter of fact, I like 'em so much, I think I'll go carry a couple around the room right now.

BASIC AMPLIFIER FEATURES

Here's my list of what features are and are not important in your basic power amp:

Power-Cord Receptacle: IEC standard is preferred. Permanent AC cords are not a good idea. For one thing, thanks to new European standards, they're no longer universally accepted. They're also ergonomically inelegant: you can't use a cord of the proper length for your particular application. Finally, if your amp decides to commit electronic seppuku, it's reassuring to know that you can grab the power cord, give it a yank, and render the amp powerless.

On/Off Switch: It's nice to be able to turn your amp on and off without reaching for the AC cord.

Power-On Light: How many times have you wondered why your system isn't working, only to find out it wasn't turned on? There's a reason why these are often referred to as "idiot lights".

Speaker Terminals: Spring-clip connectors are the pits. Odd screw-down terminals such as those on the Marantz MA-500 are only slightly better. Woe unto those without banana-plug connectors. Five-way binding posts are clearly the best terminals. Lately I've become partial to the plastic ones with circular barrels

and slots that accept quarters. They're easy to tighten and hard to strip.

Input Connectors: Single-ended RCA inputs are a must. XLR balanced inputs are a plus, especially if they have the correct input impedance to support long cable runs.

Ground-Lift Switch: Home-theater systems are complex and prone to ground-loop hum. The ability to disable or "lift" the ground is a necessity for a hum-free system. Yes, you can use "cheater plugs" to go from three-way to two-way AC, but a ground-lift switch is far more elegant and safe.

Accessible Fuses: Virtually all power amplifiers are protected by fuses. When one blows (and sooner or later, one will), you should not have to pull the amp out of the rack and unscrew the lid to access the fuse.

Additional lights, extra knobs, multiple switches, meters, doodads: This is stuff you don't need. They just add to an amp's cost and usually diminish its overall performance. Long live simple black boxes! - SS

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Fax: (705) 742-0882
Website: bryston.ca

Bryston Power Amplifier Model 9B-ST

Source: Bryston Ltd.

Rating: ★★★★★



A sound system composed of separate components has always been considered to be the best, and the same holds true for home theatre. The model 9B-ST amplifier is for serious home theatre enthusiasts who wish to recreate the cinema experience as realistically as possible. In an effort to simplify the assembly process, Bryston designed the 9B-ST as a modular five channel amplifier either for Dolby Digital™ or any other full-range set-up. Bryston, one of North America's leading manufacturers of professional and home audio components, has added the 9B-ST to its

other home theatre amplifiers: the three channel 5B-ST, reviewed in Volume 8, #4 and the four channel 8B-ST, reviewed in Volume 9, #4.

Appearance:

Bryston stayed with the customary black chassis and faceplate. The unit's front accommodates five LEDs (one for each channel) which indicate the unit's operating status—green for normal operation and red for clipping. The on/off switch is located to the right of the LEDs. On the rear of the unit, gold-plated RCA inputs as well as XLR for balanced connections are provided; a small toggle switches the inputs.

The 9B-ST is available in two versions—one with a 19 inch faceplate and handles; the other with a 17 inch faceplate without handles. Both amps are available in THX™ versions. The amplifiers measure 17 inches deep and 5.25 inches high and both versions weigh 65 pounds.

Technology:

The 9B-ST consists of five modular amplifiers that deliver 120 watts each into an 8 ohm load and 200 watts into a 4 ohm load. These modules share a single chassis, but each contains individual dedicated circuitry, power supply, multiple filter capacitors and toroidal transformer. Bryston managed to maintain 110dB signal to noise ratio over the entire audible frequency range (from 20Hz to 20kHz). Total harmonic distortion and intermodulation distortion is less than 0.007% at 120 watts from 20Hz to 20kHz. Slew rate is quoted as greater than 60 volts per microsecond; damping factor at 8 ohms and 20Hz is over 500. The result is an amplifier which operates almost distortion free and very quietly overall. Th

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ratio of the amplifier's output impedance to its load impedance and its damping factor assures that the amp effectively ignores the loudspeakers' load impedance variations. Further, the 9B-ST has the ability to rapidly deliver the output signal, rising above and falling below zero at better than 60 volts (slewing rate). The amplifier has a special buffer with gain at the input—a technique which isolates the source from non-linear input signals. Distortions are addressed with a split gain function between two low-feedback elements. The signal within the amplifier is conducted at a low impedance to remove noise added by its circuitry. This arrangement results in a fifty percent drop in distortion at high frequencies and lowers the noise floor to at least ten times below that of digital signals. The preceding technical information is but a part of the complex engineering offered by the 9B-ST design.

The Sound:

Our system hookup wasn't complicated at all. We removed our in-house 8B-ST and a centre channel amp and connected the 9B-ST in their place. An Onkyo preamp/processor, the Angstrom Trinity Project home theatre speakers (reviewed in Vol. 10 #3), an elaborate Jamo HT loudspeaker system (reviewed in this issue) as well as the Dahlquists (reviewed in Vol.10 #4) were used for the auditioning sessions. Source components included a Sony VCR, an Onkyo and a Pioneer Elite DVD player. Then we settled down to watch and listen to a few, to us, familiar Dolby Digital formatted movies. The first thing we all noticed was the 9B's astoundingly clear dynamics. Upon further listening, we found that the 9B's outstandingly spirited sound wasn't a departure from the Bryston "sonic signature" we know and admire in the 8B, but rather demonstrated a greater ability to communicate correctly various dynamic shades. Based on this observation, we believe that the 9B offers a touch

better tonal sophistication than the 8B, most likely as a result of the unit's impeccable signal to noise ratio. There is almost dead silence between signals. In Dolby Digital home theatre installations, it is of the utmost importance to process signals independently and with dynamic accuracy. This is relatively easy to understand by sitting in the so-called "sweet spot"—the position that renders the best all-round information. A movie soundtrack, when properly processed, makes use of five channel information, which you shouldn't hear out of any of the channels. Rather, the processed information must be a mirage-like image from the screen, behind the screen and off-screen. The audio data doesn't put you in the centre of the action, but allows you to determine all fundamental and ambient sound. The 9B does this so convincingly that we find it difficult to believe that there could be a better amp out there in audio land. Its sonic characteristics include fine transparency, outstanding tonal balance, awesome dynamic range capability and authoritative imaging. The Bryston does it all, with any loudspeakers we had in-house for the auditions. There is no reason to believe that there are incompatible speakers on the market, but that is another kettle of fish.

Synopsis & Commentary:

During the last decade or so, Bryston has brought to the market up-to-date technology and an almost uncanny sensitivity for the professional and consumer electronics industry. Our high-end home theatre reviews always included Bryston amplifiers; they are reliable, they are built to last and they offer sonic sophistication rarely found in HT amplifiers. Our film editing expert, Ron Sanders and our sound editing expert, David McCallum work with Bryston electronics set up in professional environments. Both are editors who work with sound and the realism needed for film. Although home theatre consumers may not look for the same stringent

standards required in professional audio/film, we contend that an HT system should embrace the same values as professional systems. We consider the 9B-ST an excellent foundation for a high-resolution cinema system. The final degree of cinematic authenticity will depend on the end-user's choice of speaker system. The amplifier can handle almost any medium-efficiency speaker, in any price range. As in audio only, it is important to use upscale cabling and the best processor/preamplifier you can afford. Bryston will be releasing their own processor/preamp in the very near future. The best we have heard so far is a Bryston 8B-ST/EAD Theatremaster combination. We have little doubt that the 9B-ST is a step above most amps, including their own. Find a Bryston dealer and arrange a demo because, in this business, hearing is believing and what you'll hear is absolutely wonderful—entertainment at its best.



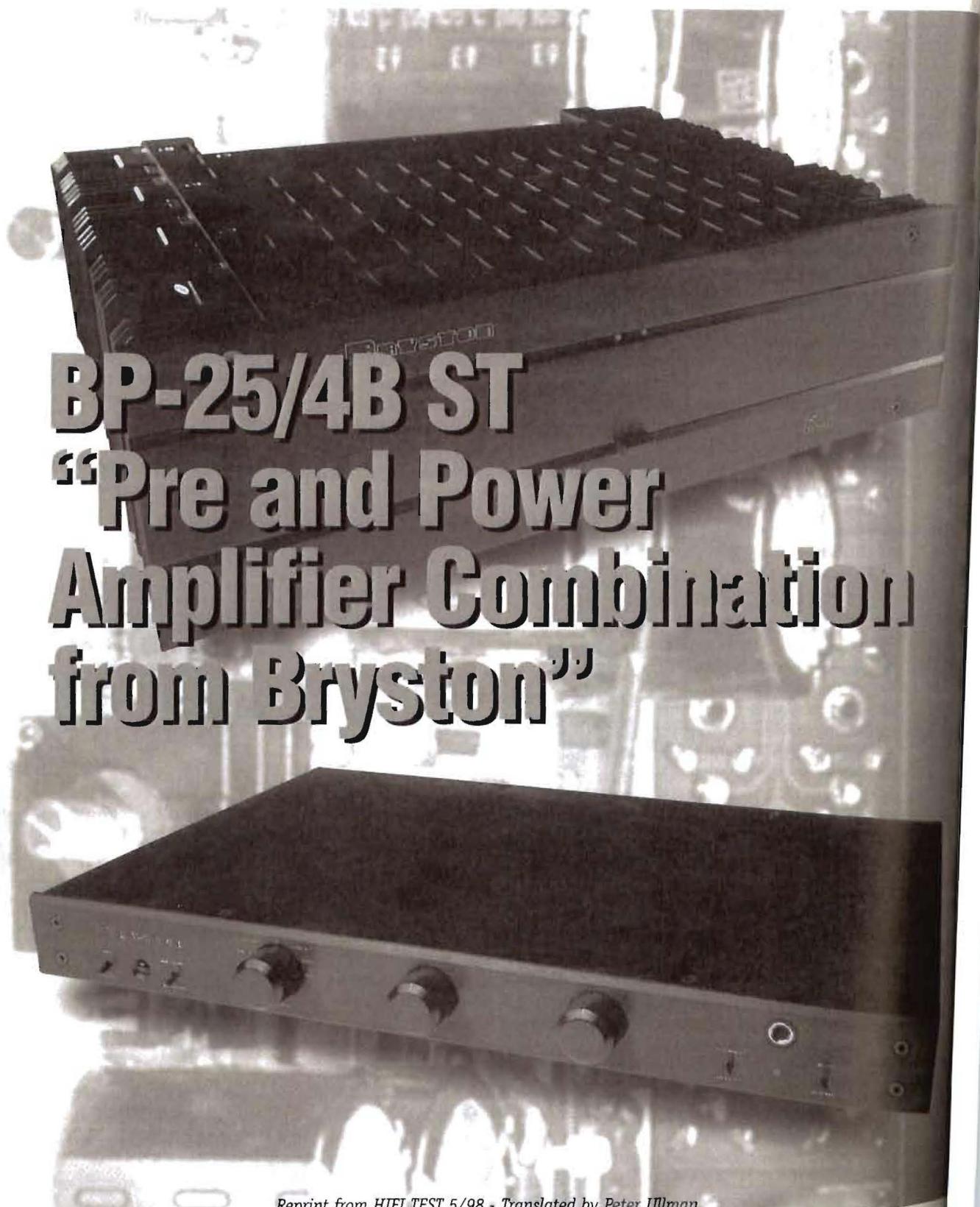
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Tel: (705) 742-5325
Fax: (705) 742-0882
Website: www.bryston.ca



HIFI Exclusive

THE OPTIMUM FROM CANADA'S HIGH-END FORGE



**BP-25/4B ST
“Pre and Power
Amplifier Combination
from Bryston”**

Reprint from HIFI TEST 5/98 - Translated by Peter Ullman

BRYSTON • 24 • Critical Acclaim

Over 44 Pounds of exquisite parts for a Stereo Power Amplifier, and 16 additional pounds for the matching Preamplifier. The total combination finely tuned and built into an armor-like cabinet.

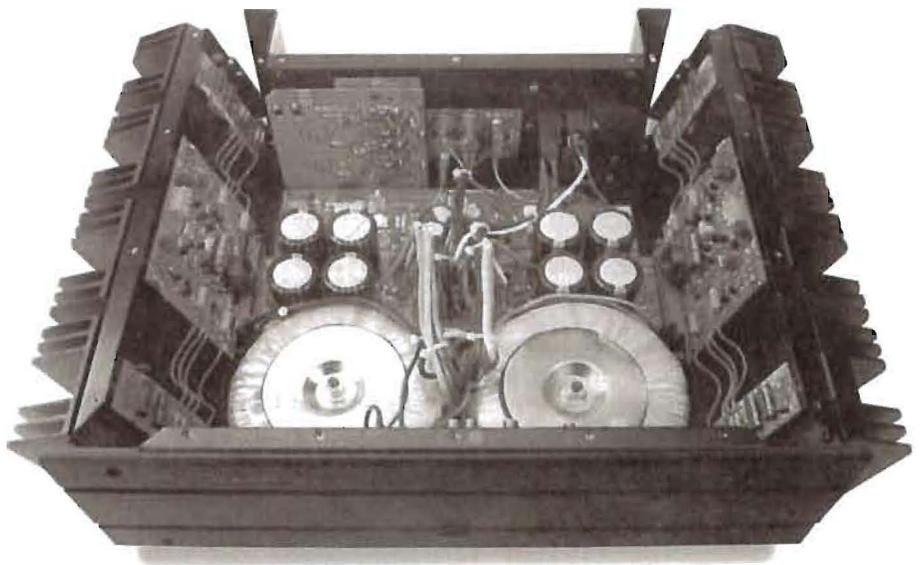
The sound optimized with care and love for detail - Therefore we have an audiophile dream amplifier!

Unfortunately the manufacturing of an audiophile high-end pre and power amplifier combination is not quite as simple as described above. Many years of experience, comprehensive know-how, and foremost a proper amount of musical "feeling" are necessary in order to build an unsurpassed top class HiFi product. Bryston has recourse to these virtues, because HiFi Products of extremely high standard have been developed and manufactured by the amplifier specialist from Ontario

(Canada) for over 20 years. A quick look into the long list of professional Bryston customers reveals the best-known sound studios of the world and a long list of radio and TV stations, all of whom rely on the indestructible construction and excellent sound quality of the Bryston products. What other manufacturer, besides Bryston, provides a 20 year warranty for their products?

HIFI TEST evaluated the combination consisting of the BP 25 Preamplifier, with MC phono stage, and the 4B ST Power Amplifier for you.

4B ST



4B ST: Amplifier Construction of the Purest Approach

Behind the almost unassuming name, 4B ST, hides a true power amplifier meteor. Already the robust housing of massive metal in flawless workmanship arouses astonishment. The inside of the 4B ST is dominated by two gigantic transformers which, together with large quantities of electrolytic capacitors, provide completely separate power supplies for both output stages. The actual output stage circuit boards for the completely independent monaural sections are mounted directly on the

massive heat sinks which provide adequate cooling for the eight output transistors of each channel. Besides the truly impressive dimensions of the subassemblies and the clearly visible conscientiousness of manufacture the 4B ST "power house" offers a small technical subtlety which is unique in amplifier technology. Bryston's chief developer, Stuart Taylor, (from whence the ST) does

not, as is usually done, utilize N and P transistors respectively for amplifying the positive and negative half-waves of the music signals, but instead lets both the N and P types

operate simultaneously. By use of this unconventional, but extremely effective, circuit design, small

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asymmetries between the N and P transistor types are cancelled out. The result is almost ideal behavior especially during the amplification of small signals.

For the technical layperson the simpler apparent highlights of the 4B ST are its immense output, the impressive laboratory data, and the distortion-free balanced XLR inputs. With 2 x 396 watts and a 4 ohm load, a distortion factor of two zeros after the decimal point, and a damping factor of over 300 (over 100 would already be remarkable) the 4B ST amplifier is totally beyond the norm. And those, who want even more, can operate the 4B ST in bridged mode and enjoy 780 watts at 8 ohms. Additionally it is astonishing that even the region of 100 kHz is amplified without glitches, proof of the enormous "speed" and "clean" (circuit) design of the 4B ST.

BP 25 Preamplifier with Phono Stage

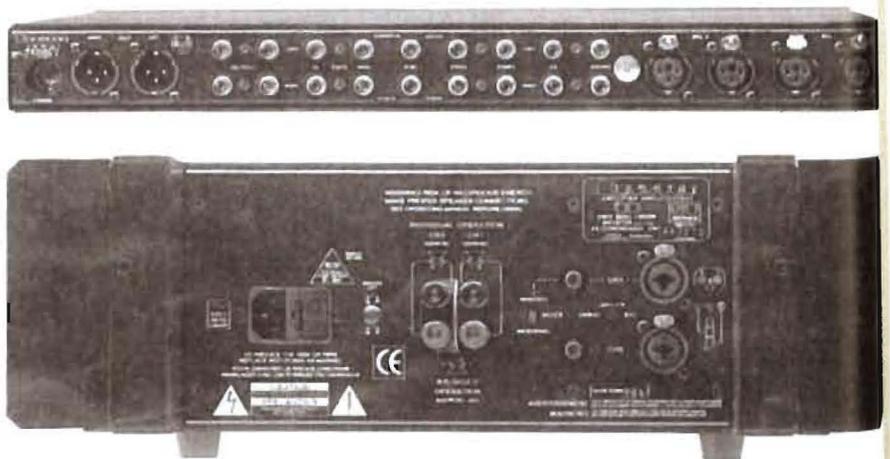
The matching BP 25 preamplifier with its extensive components provides competition for many a power amplifier. Constructed no less expensively than the 4B ST, the BP 25 boasts 5 unbalanced RCA, 2 balanced XLR, and one MM/MC phono input, as well as two (unbalanced) RCA and one (balanced) XLR outputs. The switchable phono section consists of an elaborate, discretely built MM section and two high-grade (and immensely expensive) mumetal encapsulated MC transformers. In order to keep interfering electrical fields away from the sensitive subassemblies of the preamplifier, the power supply of the BP 25 is built into a separate housing. An encapsulated rotary switch, located directly behind the inputs, is used for switching input sources. Especially interesting for sound perfectionists is the "phase switch" on the front of the unit, which

by simply inverting the music signal produces to some extent with certain CD's (for example "Graceland", Paul Simon) amazing changes in spatial reproduction. Furthermore the remote control, which controls volume and phase, is up to par because it is made of massive metal and fits comfortably in one's hand.

Listening Test

We connected the BP 25 phono preamplifier, the 4B ST power amplifier, and a Proceed "CDP 1" CD player with balanced cables from Sun Audio, and allowed a three-day warm-up period for the entire combination. For the test we used a pair of JBL L90 and two Celestion Kingston loudspeakers in our listening room. The first listening attempt was carried out with the JBL dynamic monitors and the Quincy Jones production of "Handel's Messiah." The massive, abysmal drum beats right at the beginning of the "Overture" were reproduced powerfully and at the same time extremely precisely and controlled by the Bryston combination. The percussive, dynamic upper tonal sections of these drums were reproduced so naturally and glass clearly that one could believe that one were sitting directly next to this

drum. The enormous effort, the simultaneously required in the region, the Bryston combination achieved without batting an eyelid. Where other amplifiers become "bloated" and "harsh" at high volume levels the Bryston combination really came into its own. At the same time the 4B ST did not act simply as a power house. The "Kingston" speakers from Celestion, beloved for their true tonal and spatial reproduction, revealed further strengths of the Bryston combination. Loose, airy, and lively, without nervous or hyper active, of this preamplifier and power amplifier always stayed with the matter hand and reproduced "Keb Mo" acoustic guitar true to life in the listening room. The strong impressive voice of the black blues singer radiated with every nuance, and even percussive attack of his guitar resounded almost explosively. Ever



Easy-to-Use Input Jacks and Dependable Speaker Binding Posts
Furthermore: Balanced Inputs and resp. Outputs for Interference-Free Operation

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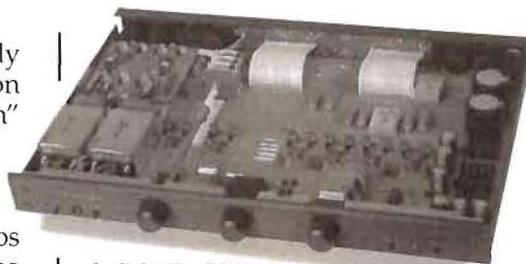
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...effort, the...
...produced with extreme precision...
...despite the rather compact "Kingston"...
...speakers - thanks to the 4B ST.

Conclusion

...not a surprise that sound studios...
...depend on Bryston amplifiers. The...
...almost unlimited dynamics, the...
...the "Kingston" timbleness and speed of the Bryston...
...combination imbue all types of music...
...and space with not simply more apparent...
...ealed further "pressure" but bring genuine "liveliness"...
...and musicality to the light of day - that...
...is genuine reference qualities. In light...
...of this high sound standard and the...
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**Left in the Picture:
The Encapsulated Transformers in the
BP 25 Preamp**

can unconditionally recommend this combination for about 9,000 marks!

Michael Voigt

LABORATORY REPORT

**Preamplifier and Power Amplifier Combination
25 BP/4B ST**

Output: 2 x 279 watts/8 ohms
2 x 394 watts/4 ohms
2 x 220 watts/2 ohms
1 x 780 watts/8 ohms
1 x 420 watts/4 ohms

Distortion: 0.007%/1 kHz/5 watts/8 ohms
Unweighted Signal-to-Noise Ratio: 81 dB (A)/1 watt
Channel Separation: 73 dB/1 kHz
Damping Factor: Over 300/8 ohms

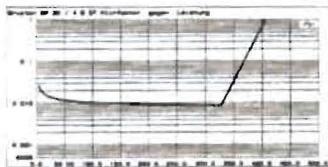
Power Output

The horizontal axis of this diagram displays the maximum output of the amplifier (with a load of 4 ohms). The vertical axis indicates the percentage of distortion, which increases drastically when the output of the amplifier is exceeded. The maximum permissible value is shown to be .7%, which corresponds to the maximum power output.



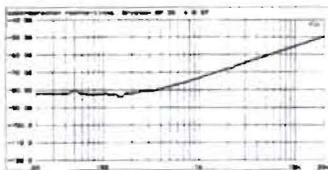
Distortion

The distortion factor of an amplifier indicates the relationship between the actual usable signal and disturbing distortions as a percentage. This value should naturally be as small as possible. The diagram depicts the distortion factor of the 25 BP/4B ST combination on the vertical axis for the entire frequency range from 20 Hz to 20 kHz, at an output of 5 watts.



Cross-Talk

In the ideal case a signal amplified by the right channel should not be found, i.e. heard, in the left channel. Unfortunately both amplifier channels do affect each other slightly due to electromagnetic coupling, so that minute amounts from one channel can be found in the respective other one. Our diagram shows the parts of the signal of the right channel which are contained in the left channel. This "cross-talk" should be as small as possible, therefore the curve should be quite low.



ESPECIALLY NOTED

- + Extremely rugged construction
- + Balanced input and output
- + High class phono stage



BP 25 PHONO

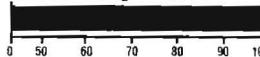
Distributor: Sun Audio, Munich
Hot Line: 0 89-47 94 43
Price: About 4,500 Mark
Sound Quality: **OUTSTANDING**
Appearance: **VERY GOOD**
Workmanship: **OUTSTANDING**



RESULTS



Outstanding - 100%



Price/Performance Ratio: **Very Good**

HIGH-END

ESPECIALLY NOTED

- + Extremely rugged construction
- + Balanced input and output
- + Bridgeable



4B ST

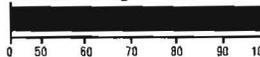
Distributor: Sun Audio, Munich
Hot Line: 0 89-47 94 43
Price: About 4,500 Mark
Sound Quality: **OUTSTANDING**
Appearance: **VERY GOOD**
Workmanship: **OUTSTANDING**



RESULTS



Outstanding - 100%



Price/Performance Ratio: **Very Good**

HIGH-END



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Fax: (705) 742-0882
Website: bryston.ca

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the absolute sound®

THE HIGH END JOURNAL OF AUDIO & MUSIC

Issue 113

July/August 1998

The Bryston 3B ST Amplifier



AT THE TIME WHEN HIGH END AUDIO BEGAN, ONLY ANALOGUE SOURCE MATERIAL WAS AVAILABLE, and vinyl dominated the audio scene. The LP does not stand up very well by any obvious measurement criteria except upper frequency limit, but it sounds, at its best, remarkably good. It was this discrepancy that led High End audio away from trying to evaluate sound quality via measurement and even from trying to correlate the two.

Digital in contrast is naturally numerical — numerical interpretations spring from it automatically: Dynamic range = 6 x number of bits; maximum frequency = - sampling rate, and so on. Numbers have crept in the High End door, sneaking in on digital's shadow.

The Bryston 3B ST amplifier is an interesting instance — it offers both superb sound quality and superb performance by numerical measures. Now I surely do not mean to suggest that the Bryston was designed by numerical measurement criteria alone. The Bryston people listen very carefully and also have collected listening impressions from their dealers and customers for many years.* But they seem to have established, over years of listening and measuring, a way to connect the two in practice. And to some extent, the 3B ST represents a successful attempt to live up to the numerical criteria implied by digital standards, while at the same time offering truly remarkable sound quality from either digital or analogue sources. It is a

champion in both worlds, the technical and the musical world of listening.

In the context of the attention now being paid to new digital standards and the descriptions of the significance of numbers of bits, it seems appropriate to translate usual ideas of amplifier performance - technical measures and when possible, listening impressions - into digital terms. In this situation, 6 dB is 1 bit. For example, 16 bits corresponds to 96 dB of dynamic range or signal-to-noise ratio. (Actually, 1 bit is equivalent to slightly more than 6 dB, but 6 dB is a good enough approximation for present purposes.)

The Bryston 3B ST Amplifier

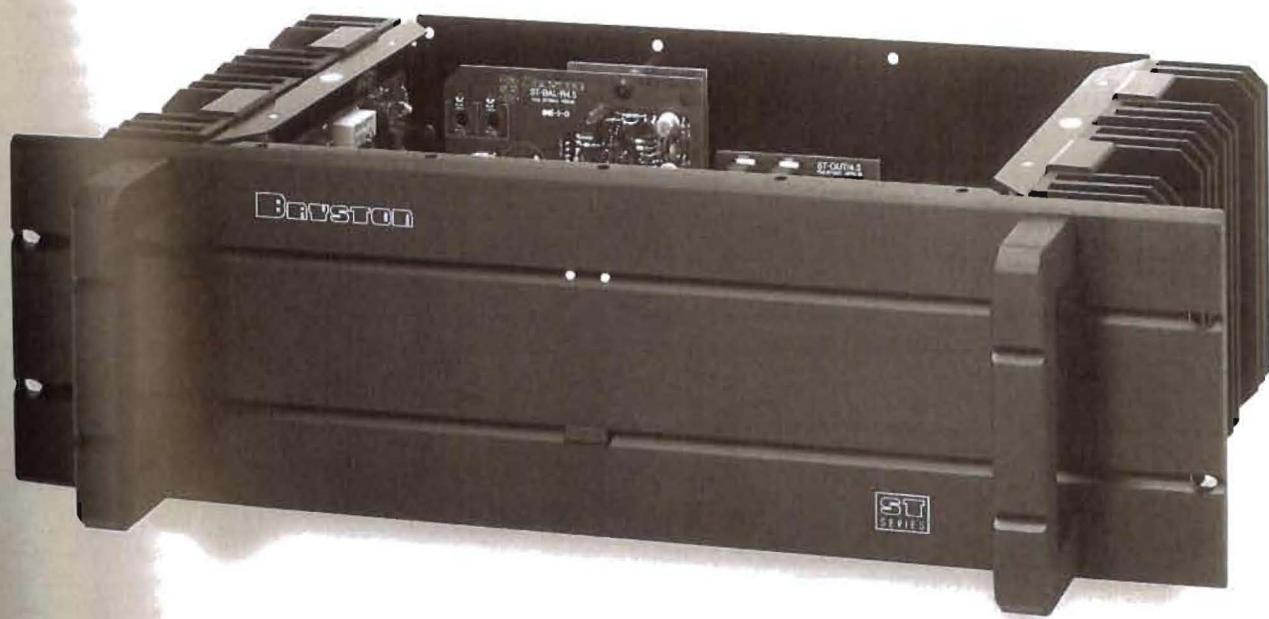
To clarify this kind of conversion to digital, let's think about noise first. The 3B ST is extraordinarily quiet. Its noise level is circa 115 dB below full output. (Exact figures depend on what kind of weighting is used.) This means that the 3B ST can cover the whole dynamic range of CD with ease. Indeed, its signal-to-noise ratio is equivalent to 19 bits plus ($6 \times 19 = 114$). In listening terms, this means a silent "black" background.

Now let us take distortion. Distortion figures (THD + noise) for

For comparison's sake, suppose an amplifier has 1% distortion + noise. This is 40 dB down from signal. But that is only between 6 and 7 bits down! So if a signal is at the peak level, 16 bits, then the error is already affecting between 9 and 10 bits. In effect, the resolution is enormously reduced. (No one thinks much of a CD player that drops 9 bits!) Similarly, .1% distortion + noise, 60 dB down, is 10 bits down, so at the 16-bit level, 6 bits are turned into garbage.

amplifiers. But the clarity is more than a frequency-response effect, or so it seems to me. Indeed, even when I used a Sigtech "target curve"¹ to roll the top down somewhat, the clarity remained.

Of course, interpreting listening experiences in terms of technical criteria is risky. Moreover, it is hardly clear how measured electronic performance, which invariably exceeds speaker performance in measured terms by such a large margin, is reflected in the listening experience at all. But somehow the Bryston 3B



the 3B ST run on the order of .002% or less of the signal, at nearly the rated output of the amplifier. This translates to distortion about 94 dB or more below signal. ($1\% = 1/100$ of signal = -40 dB; $.1\% = 1/1000 = -60$ dB, the figure dropping by 20 because power in dB is proportional to voltage squared while percent distortion is given in voltages, not power.) Once again, the full range of CD is covered, or essentially so. This is truly extraordinary performance, matched by few amplifiers.

This might seem at first sight to be an idle exercise in dB arithmetic. But listening to the 3B ST, one begins to think that it is not idle at all. The amp is unusually quiet and unusually transparent. So much so that prolonged listening with high-quality digital sources has given me a new appreciation of what can be accomplished in a certain kind of crystalline clarity, a virtually complete transmission of signal. Granted the 3B ST seems to have a slightly more prominent top end than most

ST together with, for instance, the exceptional Harbeth Monitor 40 speakers with (in particular) their remarkable upper frequency performance, gave a virtually unprecedented access to fine detail of

The Bryston 3B ST Amplifier

sound. When the Sigtech prodded the system the last small steps to neutrality, the result was a remarkable insight into recordings, a feeling that the sonic window had become cleaner than almost ever before.

There is a school of thought that finds this kind of nearly absolute transparency not entirely consonant with musical experience. This was made explicit some years ago by Jean Hiraga, dean of French audio critics (and designer of a line of well-thought-of tube amps), who claimed that the low-order harmonic distortion of tube amplifiers was not just benign but actually beneficial in that it masked disagreeable higher-order distortions in the recording. (This refers to power amps only. Low-level tube circuitry can be very low in distortion.) In my view this has been extended, without being made so explicit, to noise masking as well. Some people seem to have come to hear the noise-masked sound as natural and musical. And of course the fact is that most recordings, especially older recordings, were consciously or not, balanced and miked for playback in a masked playback environment, since until recently no other environment was possible. (I refer now to electronics; the old Quads, whatever their other limitations, were and are quite an unmasking speaker.)

Times change. As it happens, Bryston amplification is widely used in serious professional monitoring. To take a random example, I noted shortly before writing this review that the Chesky recording of David Chesky's *Three Psalms for String Orchestra* was monitored with Bryston amplifiers. Perhaps not coincidentally, this recording sounded remarkably pure and beautiful with the 3B ST. Indeed most recordings showed their best. Certainly one could observe their limitations; and, sometimes in rather startling ways, problems in the

music itself were made apparent that were in other circumstances not so obvious. For instance, slight irregularities in piano voicing, notes with a bit of excess "twang" or hammer tone, were unusually detectable on close-to piano recordings, and so on. But on the whole, being able to hear so far into the recordings was much to their musical advantage. The clarity was hypnotic in musical terms.

I believe a new general picture is emerging here. Audio until recently was a matter of distortion and noise masking other distortion and noise. In the absence of a source medium that even began to approach the signal-to-noise and distortion performance of the ear, the perception of quality in playback was inevitably a matter of revealing a lot but not too much. We instinctively sought components that would reveal the musical wheat but hide the noise and distortion chaff. Of course, this was going on at a very subtle level, but going on it nonetheless was.

In this context, digital, deeply flawed though it was in early execution, eventually improved to the point that it became a salutary shock. In spite of the bandlimiting of the CD standard, it otherwise offered a far lower level of noise and distortion than vinyl. And it thus called for amplification that would match its unmasking capabilities, both in low noise and low distortion. At the same time, it demanded, with its uncompromising high frequencies, high-frequency transducers of the highest possible quality. Without complete success in all aspects - the digital source itself, the amplification, and the speakers, especially in the top end - the result could be musically less satisfying than the old systems, involving complementary maskings, which had also developed a great degree of refinement.

The 3B ST and Bryston BP-2 preamp with the Monitor 40s Sigtech (with the Sigtech also functioning as a D-to-A converter, and on occasion with the Sigtech's digital output feeding the Morch D-to-A), and especially in the context of the extraordinary ScanSpeak Excel tweeter implemented in the Monitor 40s, signal for me a new era. They provide a system in which the full theoretical potential of CD digital is nearly revealed. And this potential comes quite close to meeting the capabilities of the ear itself in many respects. The new digital standards will come even closer, but really well-executed CD is already surprisingly good.

This does not mean that musical realism is complete. Stereo itself has limitations, as do microphones. And even exceptional speakers, even combined with the Sigtech system, do not attain the low distortion, low noise, and smoothness of response of the amplification. But in this total system, I do find a sense of clarity of presentation without harshness or edginess and a purity that is an unending source of musical satisfaction.

There are many amplifiers that offer distortion nominally well below the supposed thresholds of audibility of distortions of various kinds. But the Bryston 3B ST made me wonder if these supposed thresholds have not been set far too high. The 3B ST simply sounds cleaner and purer and more nearly devoid of grain and noise

The Bryston 3B ST Amplifier

whether signal related or otherwise, than almost any other amplifier I've heard.

For all its virtues, the 3B ST is not universal in its applicability. It is not seemingly very happy with loads below 2 ohms, and with difficult loads and/or low-sensitivity speakers, it can complain. (The original Carver Amazings had it crying for mercy when I turned it up.) The 3B ST is a rapier, not a saber. Bryston has bigger amps (or one can run the 3B ST in bridged mode) when more muscle is needed.

I am well aware that some people will look at the 3B ST and say, oh, just another solid-state device of moderate power and extended highs. And the

3B ST is indeed a fairly conventional amplifier, as I understand it, as far as general circuit design goes. But the Bryston people seem to have managed, by consistent, long-term listening tests and technical refinements, to have moved to the forefront in the particular way I have been describing. The 3B ST is an unpretentious, small black box. It is not a designer statement, visually. And it is not very expensive. But it goes very far in the direction of perfection in amplification, in transmitting the entirety of its input signal. Built carefully, it is guaranteed for 20 years. You are likely to want to keep it that long. When the new digital standards show up and even with CD

reaching its potential, most amplifiers are being left behind. What use is 20 bits of resolution, or even just all of CD's 16, if your amplifier has resolution and S/N ratio for only 12? The 3B ST is up to the challenge.

ROBERT E. GREENE

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Fax: 705-742-0882
Source: Manufacturer loan
Power Rating: 120 watts/channel
Warranty: 20 years, parts & labor,
fully transferable

MANUFACTURER'S RESPONSE:

Bryston thanks REG for a remarkably perceptive review of the 3B ST. . . We do indeed recognize that digital audio has raised the bar, so to speak, and that the old-guard amplifier products with 0.1% [total harmonic distortion] are simply not good enough any more. At the same time, measurements alone will not necessarily yield a musical sounding result. That takes many years of experience with transient response, power-supply design, noise analysis, load-driving criteria, and stability parameters before one can be sure that the amp will actually produce a music signal as pure as the steady-state measurement figures might imply.

We agree that the 3B ST is not meant to drive loads below 2 ohms ... In a typical system in a normal home environment, however, it will produce results just like those REG heard, and of course, musical enjoyment is the issue; indeed, it is the entire reason for the audiophile experience.

—CHRISTOPHER W. RUSSELL,
VP ENGINEERING, BRYSTON LTD.

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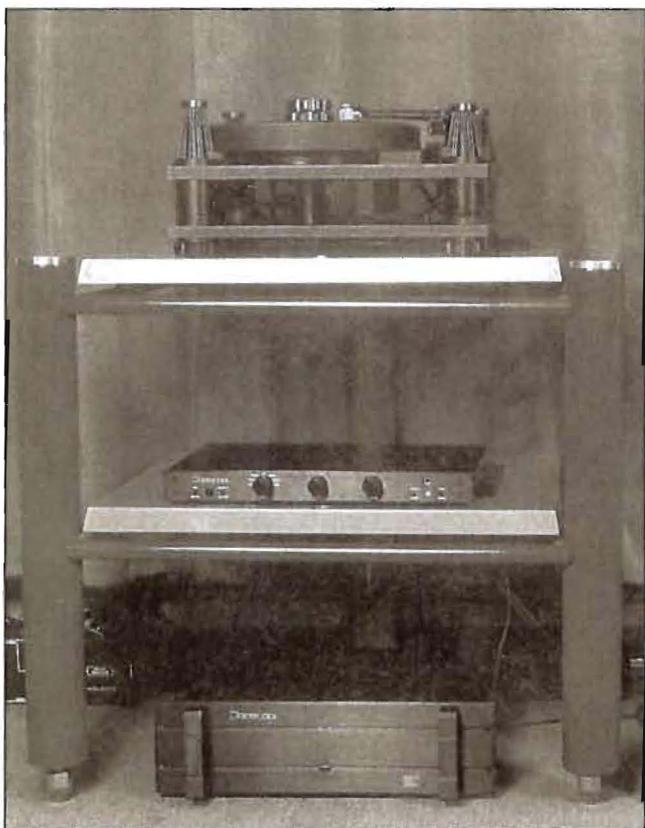
SOUND ⁺ & VISION

Reprinted From
Sound & Vision 10-11/98

Translated from German by Peter Ullman

HIGH-END-TEST

MARTIN FREUND



Assembled Prominence: The promising Bryston pre and power amplifier combination fought honorably in the SOUND & vision listening room for "sound" high accomplishments. It was musically inspired by its majesty, the SME-30 record player, and its queen, a Benz Ruby cartridge...

A Golden Duo

Separate pre and power amplifier combinations cost considerably more than integrated amplifiers, but promise more universal application possibilities and better sound. All the more so when a good phono stage is offered. For our test we have chosen a very interesting combination which is far removed from the Hi-Fi mainstream.

Canadian Heavy Weights

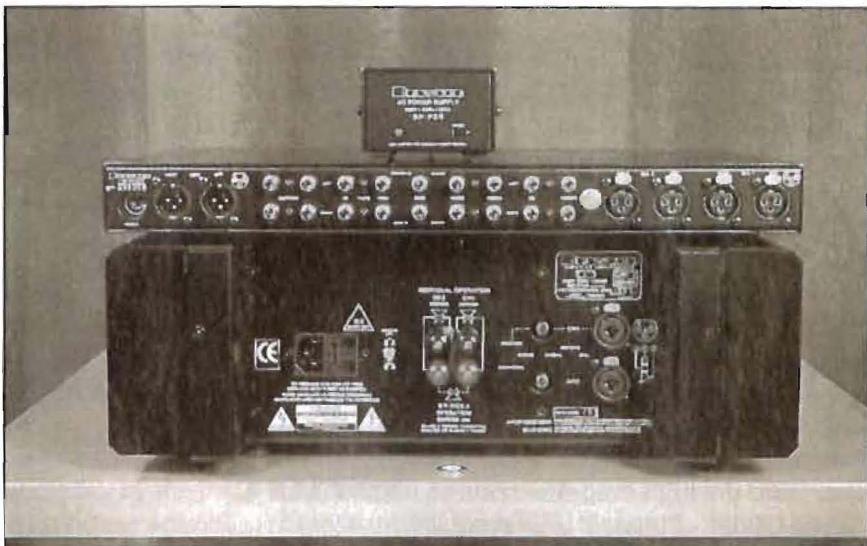
The Bryston products which were tested, the BP-25 preamplifier and the 4B-ST power amplifier, come from Canada. A surprisingly small, remote controllable, preamplifier and a classically appearing, strong, power amplifier, which despite its 2 x 250 watts

does not exhibit monstrous measurements, but retains handsome and compact good looks. The BP-25 preamplifier is just 4.5 cm (1.77 in) high and despite that offers more than enough applications. In addition to the four high level inputs, and the tape monitor, there are two balanced XLR inputs. The

output section is also equipped with two unbalanced (RCA) outputs and one balanced XLR output, thus covering all possible requirements including bi-amping. The cabinet of the BP-25 makes an outstandingly rugged impression, and the operation of the component, thanks to the handy knobs and the sensible control layout, is really fun. In addition there is a remote control for volume adjustment and for absolute phase reversal. A special technical feature is the separate enclosure for the power transformer, whereas filtering and regulation takes place within the main housing. This is only one of the many measures which help the BP-25 to be as noise free as possible. Also the channel and the input cross talk has obviously been minimized. The results they can be proud of: With 107 dB signal-to-noise ratio the diminutive Canadian achieves a world record, and input cross talk - common more often than one would believe - there is absolutely not even a trace. Bravo! The BP-25 offers as an option phono inputs for just MM or for both MM and for MC cartridge input (selectable on the front panel). We had the latter version available which exhibits a superb signal-to-noise ratio (85 dB, A rated, for both the MM and MC resp. 5 mV/0.5 mV). The MM input is very precisely equalized (+0.13/-0.06 dB) and has a useful input sensitivity of 5 mV, which however is too low for medium and high output MC cartridges. The MC input with 0.2 mV sensitivity is also suitable for very low output cartridges. The equalization is not completely ideal here, it exhibits a minimal high-frequency roll-off of about 1 dB at 20 kHz (-0.3 dB at 10 kHz, 25 ohm source impedance). The MC section uses step-up transformers, which are

optimized for a very low system impedance of about 5 ohms (for example Ortofon cartridges). With high impedance MC cartridges (around 25 ohms) a small amount of high-frequency roll-off may occur.

given high marks for this power amplifier. A dual mono power supply with two gigantic toroidal transformers and four electrolytic filter capacitors (200,000 mfd per channel!) create "lots of steam"



Hook-Up Marvel: The Bryston preamplifier provides balanced inputs as well as outputs. Also the power amplifier is preferably connected in this professional manner.

Rugged Power Package

The 4B-ST power amplifier, already available for many years, and again and again improved, has almost become a legend. Originally developed for professional applications it quickly developed a reputation for its harmonious sound, which is due, among other attributes, to its harmonically descending extraordinarily low distortion (0.0012% at 1 W), in which the pleasant sounding K2's dominate. The "quad-complimentary" circuit configuration which consists of four specially selected bipolar transistor pairs, each pair with its own driver transistor, must be responsible for this. But also stability and bass control must be

and enable the 4B-ST to provide ultra-fast, exceptionally tight bass response. Also the damping factor is correspondingly high (>400 at 8 ohms/1 kHz). It is preferable to use the balanced line to hook up to the BP-25, while the loudspeaker terminals accept either bare cables, spade lugs, or banana plugs. A special feature allows the 4B-ST to be bridged which then offers the immense output of 800 watts at 8 ohms. But even in stereo operation loudspeakers have nothing to lose, since we measure continuous output of 270 respectively 380 watts at 8/4 ohms, and peak output an ample 470 respectively 630 watts at 4/2 ohms. It is gratifying to note that also here the signal-to-noise ratio of 90 dB, respectively 98 dB at 1 watt, is very high. The Bryston combination, so to speak, is already prepared for the high resolution digital era.

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BRYSTON • 33 • Critical Acclaim

And it is befitting that the Canadian manufacturer provides a 20 year warranty which further enhances the all around favorable impression of these components.

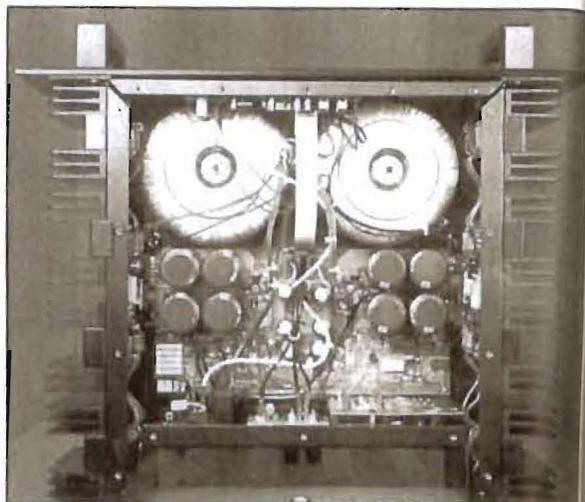
Audiophile Rendezvous

In the SOUND & vision listening room the pre and power amplifier combination was allowed to prove what it had soundwise "on the ball." For the adequate judgement of the phono stages the Egli Fischer Firm kindly loaned us an SME-30 turntable with an SME-V tonearm. Phono cartridges used were a Shure Ultra 500 (MM), an Ortofon Rohmann (MC), as well as a Benz Ruby and the high output version of the Glider. Piegas P10 served as reference loudspeakers as well as the elegant compact Guarneri

box speakers from Sonus Faber. The combination CD transport/digital processor CM3000AC/PreDA3000 from T & A, as well as the Jade/DSP Generation V from Theta served as digital sources.

MM Sound: Not Antiquated by a Long Shot

Those who believe that MM phono cartridges can only attain a nostalgic round record reproduction without notably high frequency response should listen sometime to the MM input stage of the Bryston preamplifier. It achieves fascinating listenability with brilliant highs and precise instrument location. Human voices are prominently articulated and yet sound very natural, and in addition one experiences the room acoustic reproduction as being just right. In a class by itself is the tight, dynamic bass reproduction, which immensely benefits music heavy with low

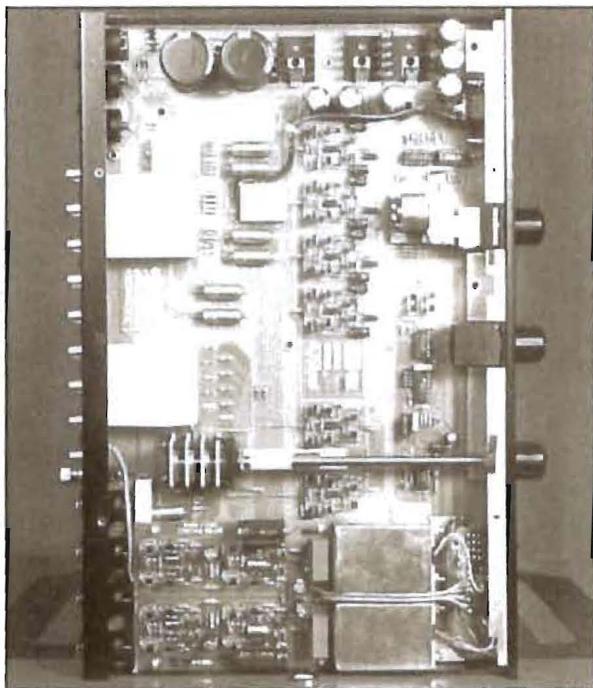


The secret of the ultra-stable bass reproduction of the Bryston power amplifier revealed. Prodigious filter capacity and two massive toroidal transformers. Noteworthy is the service-friendly and also thermally thought out construction, which makes it clear why Bryston is able to offer a 20 year warranty.

frequencies. Its terse and precise pace (not to be confused with the artificial grandstanding of many cheap phono stages) also predisposes this MM phono stage for jazz and pop music where it truly conveys the spirit of this music by virtue of its vigorous tonal characteristics. But also classical music lovers will value the exceptional pace which is by no means lacking in refinement, and this all the more so because no annoying background noises hinder the enjoyment of the music.

MC Sound: The Zenith of Emotion

The Bryston MC phono stage reproduced the Benz Ruby cartridge with great precision but



Dense Packaging: It is quite remarkable what the exquisite Bryston preamplifier combines in electronics and manifold connection options within the smallest possible space. The compact dimensions are possible because of the external power transformer.

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did miss a bit of resolution with this prime cartridge. The integrated step-up transformers dealt much better with the Ortofon Rohmann (impedance 6 ohms) cartridge. The treble response was now very well balanced, and finely tuned, with good bass and lean, yet well voiced elementary tone fundamentals. The acoustic environment reproduction was deemed to be excellent, the dynamics, which came especially to the forefront because of the exemplary freedom from distortion, as very good.

CD Sound: Nothing Finer

The Bryston pre and power amplifier combination demonstrated peak performance when connected to the high quality digital sources used for this report. With classical music the Bryston combination impressed with full-bodied rounded reproduction, which accords voices a wonderful, almost tube-like, timbre. We had not expected such beautiful sound from a professional power amplifier right off the bat! This must be appreciated all the more because everything that's bloated and not clearly defined is foreign to the two "Canadians." The

reproduction precision is without a doubt superb, and also the key area of treble resolution and spatial openness, despite the distinct aesthetic sound, will leave no one disappointed. The Bryston combination harmonized splendidly with the brilliant and analytical Piega loudspeakers which are propelled to sensational bass performance with exemplary delineation and burst accuracy by the 300 watt power amplifier. But even the small box speakers from Sonus Faber profited from the close-to-reference low tone definition. Acoustic jazz has the appropriate swing and low notes, while rock and roll are reproduced effortlessly with true-to-life volume, without hardening the sound picture or softening the bass.

BRYSTON BP-25 AND 4B-ST TEST SUMMARY



The surprise in the test: Starting with CD's this pre and power amplifier combination sounds exceptionally beautiful, and always endows music with a

subtle, golden, brilliance. Transparency and spatial openness are simultaneously excellent, and bass reproduction is even suspiciously reference-like. The MM phono input operates noise-free, brilliantly, and dynamically, and for the MC phono input one must first find a suitable, low resistance MC cartridge. If one looks at the superb workmanship and the perfected practical operation usefulness one easily comes to the conclusion that these are true "best-buy" components. For a North American power amplifier with this sound and output criterion one normally pays at least 6000 (Swiss) Francs (about US \$4320) and more. Since in addition one receives a 20 year warranty, a "buy" recommendation is made even easier.

Bryston BP-25

Compact and exceptionally easy-to-use preamplifier with brilliant MM input and altogether very high sound standard.

Sound	very good-excellent
Handling	excellent
Workmanship	excellent
Price/Performance Ratio	very good

*Line-/MM Version Fr. 3590.-/4290.- (\$2585/\$3089)
Rating: deficient, satisfactory, good, very good, excellent - in reference to the respective price class.

Bryston 4B-ST

This brawny package from Canada surprises with subtle, charming, beautiful sound amidst outstanding dynamics and controlled bass. A true "best-buy."

Sound	excellent
Handling	excellent
Workmanship	excellent
Price/Performance Ratio	very good-excellent

Rating: deficient, satisfactory, good, very good, excellent - in reference to the respective price class.

BRYSTON

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review

Preamplifier and power amplifier

Bryston BP-25MC/7B-ST

VACLAV SKARDA, PAVEL DUDEK



The Bryston company, whose products recently appeared on our market, is based in Canada and produces very high quality preamplifiers and amplifiers and also the professional audio products. The combination of the BP-25MC preamplifier and 7B-ST monoblocks (with 500W/8 Ω of output power), a subject of this review, is basically its flagship amplifier product. In the information materials of Bryston, though, it is not considered as anything special. It is just the application of the basic Bryston construction philosophy, which is also contained in the lower models, for the very high power output and excellent sound. In the commentaries and explanations of the Bryston designers, you will not find anything about magic connections and special circuits, which will allow listener to reach unheard of levels of sound quality. It is more probable that you learn something about the minimization of the noise levels and all kinds of distortion, about the optimization of circuits and about the emphasis on the product reliability. As a proof, there is the full 20 year transferable warranty on all Bryston products.

The current, fifth generation of Bryston amplifiers carries the ST label, which are the initials of Mr. Stuart Taylor, Bryston designer, who is the author of the most recent important design changes. The new series started quite innocently, when Stuart Taylor was assigned to redesign the 8B, the Bryston four channel power amplifier. The simple positioning of the transformers horizontally turned into the complete redesign of the signal paths, which resulted in much better measured parameters as well as the sound quality. The circuit design changes were subsequently applied to all Bryston power amplifiers. The preamplifiers were also redesigned. Stuart Taylor used specialized measuring equipment for finding and eliminating the sources of noise, distortion and ground loops. The result was again much lower noise and distortion levels and better sound quality.

At the end of the introduction, I would like to direct your attention to the interview with Bryston chief-designer Chris Russell in the corresponding section of the magazine, and now, I will pass the word to Pavel Dudek, who prepared the technical part with its own introduction.

Technical description

I really like the recordings of the American company Telarc, because they really excel in the absolute correctness and naturalness of the recorded sound. It doesn't matter if you listen to the symphonic orchestra, string quartet or jazz recording. The whole production is excellent. Sound engineer Jack Renner doesn't take any chances with the recording (as my musician friends explained to me in detail) and very carefully chooses the components of the recording chain, which are subsequently quoted in the CD booklet. Mr. Renner originally used the Threshold and Krell amplifiers, recently, though, he started to use the products of Bryston. Yes, my friends, not any super expensive components (even if the price is not usually the issue, because the companies are proud to "lend" the product for free), but the relatively inexpensive components of this Canadian company. I did not know why, but now, after the personal experience with Bryston products, I understand Mr. Renner. The reason is the absolute sound neutrality and excellent resolution of detail.

7B-ST Monoblock

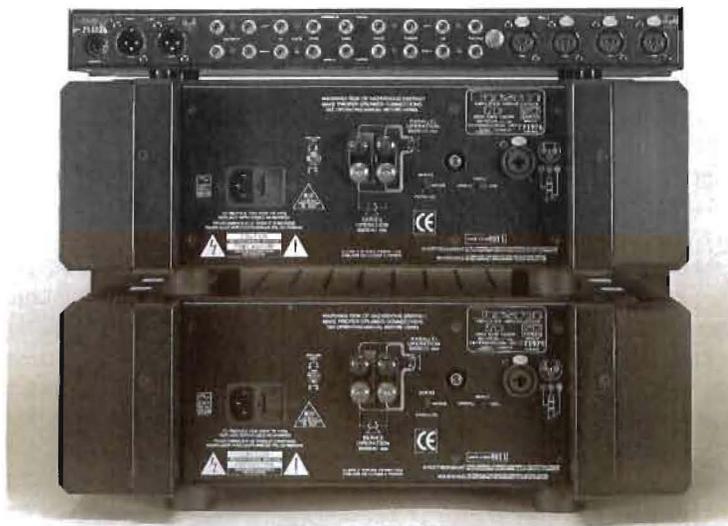
The 7B-ST power amplifier is of the bi-monaural construction. It means that everything, which handles the analog signal, is totally separate for each channel (two power transformers, two rectifiers, independent capacitors). Why is everything doubled in the monaural amplifier? I will explain later.

If the amplifier does not have separate power transformers, it is not dual-mono, as is often quoted i.e. on Sony or as my colleague Kraut wrote in the Accuphase P-450 review. Bi-monaural is not also the amplifier with the separate secondary windings on the power transformer.

It is important to emphasize the advantages of the bi-monaural construction. When the audio signal is reproduced, the power output modulates the DC voltage of the power supply. If the power supply is common for both channels, this modulation is transferred to the other channel and vice versa. The result is higher cross-talk and subsequent deterioration of the localization of the sound images. A bit better solution is the aforementioned use of separate transformer windings for each channel. You can easily recognize this type of amplifier by two pairs of capacitors and two rectifiers in the power supply. If the amplifier has only two power supply capacitors, you cannot speak about bi-monaural construction at all (P-450).

Bryston 7B-ST is a monaural amplifier, which enables two modes of usage. The first one is described by the manufacturer as Serial, which is only a different description of the usual bridged configuration. In this mode, the two amplifier sections are driven by the signal in opposite phase and the load (speaker) is connected between them. The second mode, Parallel, enables the paralleling of both modules for much higher current delivery. It means that the amplifier will be able to work into substantially lower load impedance.

7B-ST is basically the modification of the already tested 4B-ST. The major difference is, that it is permanently connected for mono operation (serial or parallel, see above). The second pair of input terminals on the back is therefore missing. The input is switchable for non-symmetrical (gold plated RCA) or symmetrical (XLR/Jack - Neutrik)



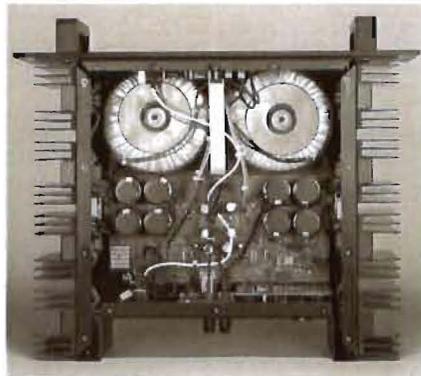
connection. The outputs are five way binding posts with gold plated contacts. Between them is the isolation ridge which prevents the short-circuit by bare wire. Nice touch. The power cord is three-prong,

System

CD players: Pioneer PD-95, Krell KAV 300cd. **Record players:** Thorens TD-115 + Ortofon MC3000, SME 20-V + Benz Micro M0.9. **Speakers:** Energy 22.3, B7W Matrix 801 Mk.III, Chario Academy 2, Xavian XN 125, JPW Sonata. **Interconnects:** Bryston XLR, Kimber KCAG **Speaker cable:** Krautwire Model 2/II LE. The system was placed in Standfon stand

the component therefore works in Safety Class I. But, it is possible to disconnect the working ground of the amplifier from the chassis using the switch on the back. The ground is not disconnected completely, but through the 10 Ohm resistor, which is sufficient for the elimination of ground loops possible when connected to other equipment working in the Class I. Using the usual "cheater" plug is much more dangerous.

The amplifier modules, placed vertically on their heat-sinks, are connected to the power supply via



heavy-duty PCB connectors. The power transistors are hand-matched, each driver - output pair is handled as a composite output element in the "Quad-complementary" configuration.

Worth to mention is the clipping indicator on the front panel. The green LED, which indicates the power-on and normal operation, turns orange when approaching clipping and to red from 1 dB in clipping and up. The indication is very fast and accurate over the whole audio band. I would like to mention, too, that the entire amplifier is hand-soldered, which is at the price and "Made in Canada" quite unusual.

BP-25MC preamplifier

The BP-25MC preamplifier is constructed in the similar fashion as the power amplifiers. It means very simply and efficiently, nothing unnecessary. With the exception of the phono modules and small PCB, carrying the unbalanced connectors, it is placed on one high-quality one-sided circuit board, which covers the bottom of the chassis. Everything is hand-soldered. To the preamp,

five unbalanced (including phono cartridge) and two balanced sources, can be connected. All contact surfaces are gold-plated. The preamp has two unbalanced and one balanced output, one tape loop is available.

The line amplification for the BP-25MC is provided by discrete amplifier modules, three per channel. Two of these op-amps are to buffer the signal to the tape output and level control, the remaining four for the two balanced outputs. These proprietary circuits are specified as delivering high output with low noise. The input signal is switched using the multi-packet switch (Lorlin), volume control is a blue motorized ALPS potentiometer, 10 k Ω . The outputs are connected by relay, which switches on with delay after power-up to avoid the surges. It is also used by the Mute function. The absolute polarity of the signal can also be switched. Both these functions and the volume are available on the remote control, which has sturdy metal case. There is also headphone output on the front panel.

It is important to note that there are no integrated circuits in the signal path of the preamplifier. All



gain stages are based on the proprietary discrete operational amplifier in balanced configuration. The circuit is the simplest possible, i.e. differential amplifier, voltage amplifier and emitter follower, everything, of course, complementary. The

operational conditions are set for class A operation, the output transistors therefore run quite hot. The already low DC offset, which is typical for this kind of connection, is eliminated by the bipolar capacitor at the output amplifiers.

The phono stage uses similar topology as the line inputs. The stage uses the so-called half-passive RIAA equalization. The basic configuration, i.e. two gain stages with the equalization between them and in the feedback loop, is used for the MM cartridge. For MC, high-quality step-up transformer is used, which is the best solution for high signal-to-noise ratio. The preamplifier has an external power transformer, the power supply itself is shared by both channels.

Conclusion: The amplifier combination under test provides a very high construction and also sound quality for very reasonable price. Impressive output power reserves of the power amplifier will result in excellent reproduction of low frequencies, the bi-monaural construction in the excellent soundstage definition. I do not hesitate to say that it will perform head-to-head with much more expensive amplification components.

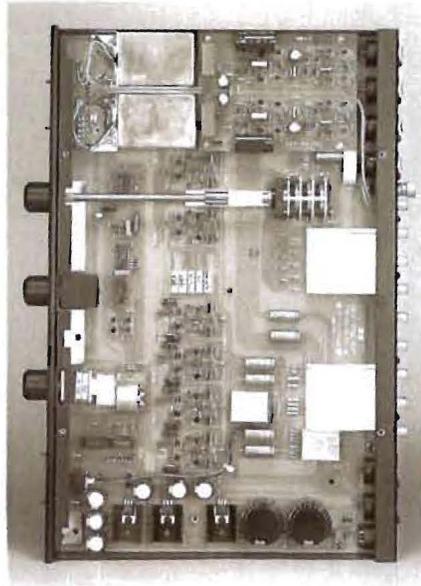
Sound quality

The judgment of the sound quality of reference amplifiers is not an easy task for the reviewer. On the other hand, the first acquaintance with such a product is an interesting experience for the newcomers to the high-end audio world. Some things are very easy to realize in the first listening, but very few, even experienced listeners are capable of such immediate subjective characteristic of a product, that they will not need to change anything in it after long-term listening.

When the consumer is choosing the amplifiers by listening to them in studios, there is an advantage for the products with an interesting sound characteristic. The problem is, though, that this "interesting" characteristic may be caused by some kind of distortion, which may result in unpleasant feelings after long-term listening. The amplifier, which does not distort the signal in any way, may

be not that attractive at the first listening.

The amplifier combination under test can, because of its absolute neutrality, easily fall into this category. There is, though, one characteristic, which will catch even inexperienced listener on the first listening (when using appropriate speakers), and that is the reproduction of bass. Major role here is played, of course, by the 7B-ST



monoblocks. In the bass, reproduced by this amplifier, there is a clear physical feeling of the extension to the lowest of the low frequencies, without any boominess in this region (the measured frequency response is, of course, ruler flat). The result is (with the speakers possessing the appropriate bass extension) the much increased feeling of the presence in the original recording space, as a result of the reproduction of the "air movements" in

the bass tones itself, one octave higher, are reproduced with very fast attack and also decay of the tone.

To describe the characteristic of this amplifier at the most important mid-frequencies and highs is not an easy task. The reason is that especially after a long-term listening, the characteristic signature is surfacing here, and it is the absence of any sound distortion or coloration. And this is for any listenable sound level (at least in smaller listening spaces). The "listenable sound level", though, has a bit different meaning with this amplifier. When I listened to a rock record Soundgarden - Superunknown, I found myself dragged into the music and turning the volume up. Suddenly, I got a feeling that I must be playing really very loud. I switched on the sound level meter and measured the average level at 115 dB. But the sound was still very clear without any trace of distortion or dynamic compression. When I turned the volume a little bit more, the speakers produced audible distortion, but the amplifiers never reached clipping.

The amplifier has a very clean upper frequencies and you cannot ascribe any characteristic signature to the midrange. When you listen to a well recorded rock recording, it is a real pleasure to sense i.e. the beautiful sound of the Fender Stratocaster with its characteristic signature. With classical, it was very easy to distinguish the quality of a recording by the sound of a violin. The listening to the famous Frank Zappa - Yellow Shark was an ultimate listening experience. As far as the soundstaging is concerned, you can feel again, that it is defined essentially by the quality of recording,



Bryston BP-25MC and 7B-ST

Parameter	measured values	conditions
Output power/harmonic distortion	2x900W/0.01%	Z=4Ω
	2x610W/0.01%	Z=8Ω
Frequency response	20-20000Hz (-0.13dB/+0.02dB)	Z=4Ω
	100kHz (-3dB)	Z=4Ω
Slew rate	SR=65V/μs	Z=4Ω
Damping factor	DF=417/1kHz	Z=4Ω
	DF=384/10kHz	Z=4Ω
Signal to noise ratio	mains freq. -106dB lin.	vst. Z=600Ω
	noise -120dB lin.	
Cross-talk	not measured	
Input sensitivity	2.12V/900W	Z=4Ω
	0.745V/900W	Z=4Ω
Input impedance	50.1kΩ	
DC offset	4.8mV	Z=4Ω

Measurements

In the last issue of our magazine, we got acquainted with the Bryston company and its standard amplifier models, the 4B-ST power amplifier and BP-4 preamplifier. Their advantages, rational and robust construction, high power and very good measured parameters are further developed in today's models. The power part is handled by two monoblocks, each capable to deliver the amazing 900 W into 4 ohms. It is very improbable that this amplifier will ever be working at the clipping in the domestic conditions. As a result, the possible problems

without any added phase anomalies. Each sound image is very clearly defined and positioned, the whole presentation is very natural.

Another typical characteristic, which I never experienced before, is the total "blackness" after each reproduced tone. You can hear only the tone itself and nothing, what would follow it, be it some noise envelope or the sign of distortion. Dynamic capabilities of the amplifier, its speed and timing accuracy are truly excellent.

The phono section of the preamplifier had enough gain even for the low-output Ortofon MC-3000 and its sound characteristic was also excellent.

Conclusion

By acquiring the combination of Bryston 7B-ST power amplifier and BP-25MC preamplifier, the audiophile receives the amplifier with reliable, precise construction, in which everything is dedicated to one goal - undistorted reproduction of music.

Over time, I had the possibility to get acquainted with many high-end amplifiers of the worlds finest audio companies. All these products performed truly excellent, but later I realized that each of them possessed some characteristic signature. Majority of the sound attributes were excellent, especially the bass of the big amplifiers. But in some areas, the deviation from the totally transparent behavior could be found. In the worse case it was the trace of grain or hardness in the top midrange and highs. Or, on the better side, the smoothness or warmth of the midrange, which eventually comes up also as a distortion. With the latter type amplifier, it is easy to become used to this type of distortion and still judge it as the ultimate.

When using the Bryston BP-25MC/7B-ST amplifier, I did not find any such sound deviation. I can say with no hesitation that, to the person, who is interested in really undistorted sound reproduction without embellishments, and does not need to warm up his room (by the Class A amplifier), this amplifier combination is the end of the road.

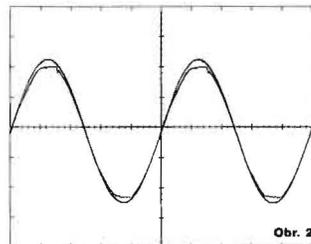
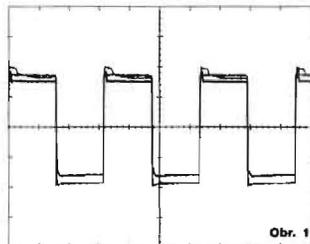
in clipping is not necessary to take into account. The very high power is attained by the bridging of two identical amplifiers.

The static and dynamic parameters of amplifiers are very good and do not differ considerably from the previously measured models. The slew rate is 65 V/s, high damping factor is less frequency dependent.

The response to the 3.15 kHz square-wave signal just before clipping is on the Fig. 1 (the black line is for the nominal 4Ω load, the red for complex load and the blue shows the

ideal response). On Fig. 2, the 10 kHz sine wave at the onset of clipping, is depicted (red line, the blue line is the ideal shape). The differences between the measured and ideal curves are discernible, but not significant. They will not have an influence on the signal quality.

Conclusion: The combination of the 7B-ST monoblocks and BP-25 preamplifier is very-high-power amplifier unit which can be used for the high quality amplification also in large listening environments.



Bryston BP-25MC preamplifier

Total harmonic distortion less than 0,0025% at 3V output

Signal to noise ratio 100 dB unbalanced, 103 dB balanced

Frequency response 20 ÷ 20 000 Hz +/- 0,1 dB

Maximum output 15 V†unbalanced, 30 V†balanced

Input sensitivity 500 mV

Phono section

Frequency response 5Hz ÷ 30 kHz v†p-smu 1dB

Signal to noise ratio equivalent to 1k ohm metal-film resistor (thermal noise >85dB below 600uV input, unweighted).

Gain at 1 kHz 34 dB MM, 66,5 dB MC

Inputs 4x Line Cinch, 2xXLR, 1xPhono MM/MC, 1xTape

Outputs 2xCinch, 1xXLR, Tape, Phones

Dimensions (w x h x d) 43,5 x 4,4 x 28 cm

Weight 8 kg

Price 61.790,- Kč

HiFi ★★★★★
Verdict Excellent

Bryston 7B-ST power amplifier

Output power 500W/8 or 2 ohms, 800 W/4 or 2 ohms

Distortion less than 0.007% from 20 Hz to 20 kHz at 500 watts, 1M or THD

Noise >106dB below full output

Slew rate >60V/s v†parallel >120V/s serial

Power bandwidth 1 Hz to 100 kHz

Input sensitivity and impedance Cinch 1,0V/50kΩ, XLR 2,0V/20kΩ for full output

Heatsinking surface 9600 cm²

inputs Cinch, XLR a Jack ¼", all contacts gold plated

Dimensions (w x h x d) 48,25 x 13,33 x 39,4 cm

Weight 18 kg

Price (pair) 127.980,-

HiFi ★★★★★
Verdict Excellent

Bryston B-60R integrated amplifier

The *Anti-High End*.

That's who I felt like with this amplifier, and it felt all right. Good, even. Let me 'splain.

You've been to the shows, you've read the 'zines, you've visited your local hi-fi salon—which means that you've seen the BIG SYSTEMS. Big speakers. Big amps. Big turntables even, fer crissakes. You know it's what you want, what you would have if you could. It's enough to give a guy (but probably not a gal, as gals seem to be more sensible about these things) System Envy. Size *does* matter.

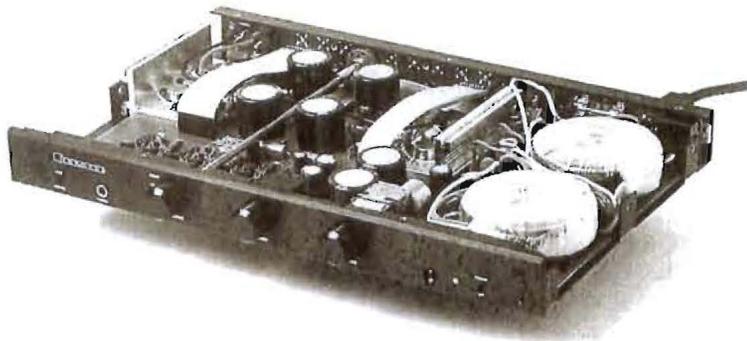
Contrast the big-boxes-and-lots-of-'em picture of audio nirvana with *this* get-up: CD player/integrated amp/speakers. A minimal setup, to be sure, with each part on the smallish side as well.¹ Not an imposing system; not the kind that *makes a statement* before you even turn it on. The heart of this modest rig, and easily the most visually unassuming member of the group, was the Bryston B-60R integrated amp. The interior decorator inside me was thrilled, but what about his roommate, the music lover/audiophile? Would he find some salvation in such a simple setup? Could the two of them peacefully coexist?

There once was an integrated from Bryston . . .

As I was saying, the Bryston B-60R presents a tidy little package reminiscent of the classic British integrated amps. The "R" is for Remote, which controls volume and provides muting—unavailable without the remote—and adds \$300 to the price.² That's a pretty expensive remote, when you consider you can buy an entire surround-sound receiver *with* multifunction remote for \$300. But the B-60R is, in true high-end fashion, a hefty chunk of machined aluminum instead of injection-molded plastic, and the Brystonians tell me that the motor drive for the volume control

¹ Oh, all right, I had a turntable and phono stage, too, but they were kinda off to the side. Uh, yeah, there also were other amps and whatnot strewn about for comparison purposes. Okay, okay, so those NHT 2.5's are pretty big, but the Joseph Audio RM-7's Signatures are *my* *poor*, so just give it a rest, would ya?

² Sam; Telling raved about the remoteless B-60 in his May '97 "Sam's Space" column (Vol.20 No.5). —JA



Bryston B-60R integrated amplifier

wasn't cheap, either—after all, it's gotta be good for 20 years. Unless you're a total hair-shirt audiofool, you'll want the remote; remotes are *good*, even if all they let you change is the volume.

The back panel has rows of left- and right-channel RCA jacks for the four line-level inputs, a tape loop, and pre-out/power-in (a handy feature that allows the B-60R to be used to feed a Dolby Pro-Logic surround-sound processor). The five-way speaker terminals that flank the RCAs are a little different from most. Instead of fitting a nut-driver, there are slots in the head that allow you

to tighten it with a coin. That's just what this country needs—a good five-cent binding-post wrench. What's more, the coin-drive method's limited torque-ability helps prevent overtightening. Last but not least on our back-panel tour, there is an IEC jack for power.

Frontside and center are three knobs: Selector, Balance, and Volume. A tape-monitor switch and headphone jack may be found on the left; remote receiver, power LED, and power switch on the right. And that's it.

All the signal circuitry is fully discrete and takes the dual-mono thing to

Description: Solid-state line-level integrated amplifier. Inputs: Four gold-plated RCA line-level, one tape loop. Outputs: 1/4" headphone jack, 1 pair 5-way speaker terminals. Pre-out/main-in RCA jacks.

Preamplifier section: Frequency response: 20Hz–20kHz, ±0.5dB. Maximum output: 15V IM or THD at 3V output: <0.005%. High-level sensitivity: 500mV. Rated noise: 100dB below 500mV, 20Hz–20kHz. Input sensitivity: 500mV. Input impedance, 50k ohms; tape input impedance, 10k ohms. Preamp and tape output impedance: 100 ohms.

Amplifier section: 60Wpc into 8 ohms (17.8dBW), 100Wpc into 4 ohms (17dBW). THD at rated output (60Wpc): <0.02%, 20Hz–20kHz. IM distortion: <0.01%, 10mW–60W.

Noise: 106dB below full output. Slewing rate: >60V/μs. Power bandwidth: 0.5Hz to >100kHz. Damping factor: >500 at 20Hz, ref. 8 ohms. Input sensitivity: 0.775V for full output. Input impedance: 50k ohms. Output impedance: <0.016 ohms. **Dimensions:** 17" W by 2.5" H by 12.5" D.

Serial number of unit reviewed: 600153.

Prices: \$1795; \$1495 without remote. Approximate number of dealers: 80. Warranty: 20 years, unlimited, transferable.

Manufacturer: Bryston, 677 Neal Drive, Peterborough, Ontario, Canada K9J 7Y4. Tel: (705) 742-5325. Fax: (705) 742-0882. Web: www.bryston.ca.

an unusual level: two separate power supplies, each with its own custom toroidal transformer. If you're familiar with the Bryston family, the B-60R is basically their BP-20 preamp and 2B amp conveniently put together in one handy (and did I say *small*?) package. As one would expect from a company that offers a 20-year warranty, the build quality is outstanding.

The following is a report on the second B-60R to come my way. The first one, while seemingly fine in all other regards, produced a thump on turn-on: not a major, speaker-threatening BOOM, but a low, muffled *thud*. I mentioned this to James Tanner at Bryston, who said that shouldn't happen. In short order he sent me a new, thumpless replacement.

Let's listen in, shall we?

Over the past several months, I've been listening mostly — and quite happily — to tubed electronics. Then along came the little B-60R, looking so small, so... *punny* — especially compared to those hulking, glowing tube amps and preamps. How could that little box, which never even got very warm, ever match up? And what could I expect sonically, since my ears had

Measurements

The Bryston B-60R was hot, but not alarmingly so, following its one-hour, 1/3-power preconditioning test. The B-60R's line input impedance measured 51.6k ohms, a comfortably high value that should be compatible with any consumer program source. The Bryston's output impedance is very low — under 0.04 ohms up to 1kHz, increasing to 0.06 ohms at 20kHz. The output impedance at the B-60R's tape outputs measured 49.5 ohms and was virtually unchanged with changes in source impedance, indicating buffered tape outputs. The output impedance at the preamp outputs measured 72 ohms and the preamp section's gain (full volume setting) is 4.8dB, making the B-60R suitable for use as a preamp, perhaps for future use in driving a more powerful, onboard amplifier.

DC offset at the main outputs measured 4.9mV in the left channel, 3.7mV

in the right. Signal/noise ratio (ref. 1W into 8 ohms), with the level control set at 12:00, measured 79dB from 221Hz to 22kHz and 74dB from 101Hz to 500kHz, both unweighted, and 84dB A-weighted, all values to the nearest decibel. (The corresponding values at the full setting of the level control are 63dB, 63dB, and 71dB, respectively.) The Bryston is noninverting, a positive-going input resulting in a positive-going output. Its volume-control tracking is good: within 0.27dB over the range measured (9:00 to 3:00). The B-60R's voltage gain at the maximum setting of the level control is 34dB. All of the following measurements were taken at this maximum setting.

Fig.1 shows the frequency response of the B-60R. The response is virtually unchanged as the load impedance changes, due in large part to the amplifier's low output impedance. Fig.2 indi-

cates the Bryston's output with a 10kHz squarewave input, a fine result with a fast risetime and only a slight rounding of the waveform's leading edge. The Bryston's 1kHz squarewave response, not shown, is near textbook quality.

Fig.3 shows the B-60R's crosstalk, a good though not exceptional result. The slight inconsistency between the channels is unlikely to have audible consequences. The increase at higher frequencies is typical of most two- (or more) channel components, and is generally due to capacitive coupling between channels.

The THD+noise percentage vs frequency results in fig.4 are outstanding, and typical of Bryston amplifiers I have measured in the past. It is also typically difficult to get a readable THD waveform from this manufacturer's products at low power, and the B-60R was no different. Fig.5 shows the THD+noise output waveform of the Bryston with a 1kHz input and a high 40W level into a 4 ohm load. There is a hint of third-order harmonic dominance plus some higher-order harmonics, but noise is the principal component even at this high output level. (The distortion waveform into 8 ohms was even harder to find, and into 2 ohms the amplifier would shut down at the levels required to get a usable result before the waveform could be captured. No harm resulted from these shutdowns; the Bryston resumed operation

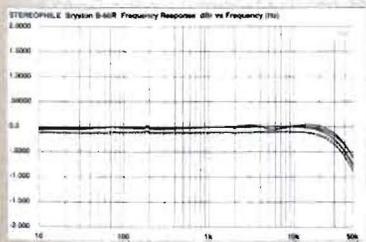


Fig.1 Bryston B-60R, frequency response at (from top to bottom at 6kHz): 1W into 8 ohms, 2W into 4 ohms, and 2.83V into simulated speaker load. (0.5dB/vertical div., right channel dashed.)

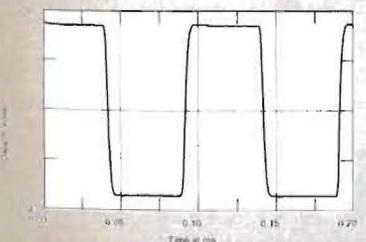


Fig.2 Bryston B-60R, small-signal 10kHz square-wave into 8 ohms.

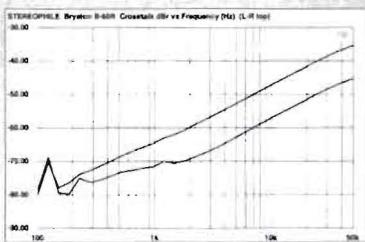


Fig.3 Bryston B-60R, crosstalk, L-R (top) and R-L (bottom) (10dB/vertical div.)

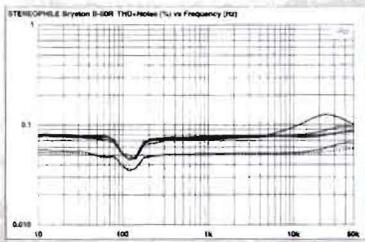


Fig.4 Bryston B-60R, THD+noise vs frequency at (from top to bottom at 20kHz): 4W into 2 ohms, 2W into 4 ohms, 1W into 8 ohms, and 2.83V into simulated speaker load (right channel dashed).

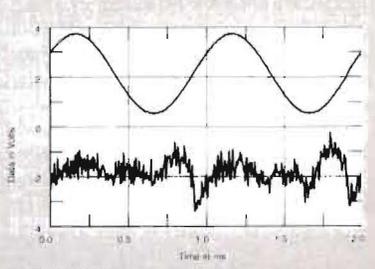


Fig.5 Bryston B-60R, 1kHz waveform at 40W into 4 ohms (top), distortion and noise waveform with fundamental notched out (bottom, not to scale).

become conditioned to a steady diet of thermionically treated soundwaves - could I go back to the solid-state farm after seeing the bright lights of Tube City?

Well, *sure* I could—at least, that's a big "10-4, good buddy" with the B-60R in the mix. The Bryston provided a clean, detailed, transparent soundscape without stridency—or, put another way, offered the virtues of solid-state

without the vices. The bass was a particular treat, both with the not-bass-shy NHT 2.5i's and the small-but-bov-just-how-do-they-make-that-much-bass Joseph Audio RM-7si Signatures. Compared to what I'd been experiencing with both the Anthem AMP-1 and the JoLida SJ-502A integrated, with the Bryston the bass went deeper, tighter, and with more control.

On the Yo-Yo Ma, Edgar Meyer/Mark O'Connor *Appalachian Waltz* CD (Sony Classical SK 68460), "Druid Fluid" features the bass and cello grinding away together, dropping down now and then to their lower registers. The Bryston brought out the power of those sonorous low notes, which, combined with the richly detailed texture produced by rosin, bow, strings, and wood, put me

Measurements

after cooling down for a minute or so.) Fig.6 shows the spectrum of the Bryston's output with 50Hz reproduced at a level of 60W into a 4 ohm load. All of the artifacts here are below -90dB (0.003%). Fig.7 shows the intermodulation in the output caused by a combined 19+20kHz signal at 53W into 4 ohms. All artifacts with this input are below -80dB (0.01%), which was also true of the 8 ohm result (at 36W, not shown).

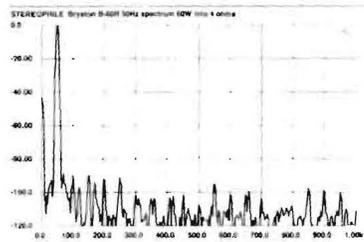


Fig.6 Bryston B-60R, spectrum of 50Hz sine-wave, DC-1kHz, at 60W into 4 ohms (linear frequency scale).

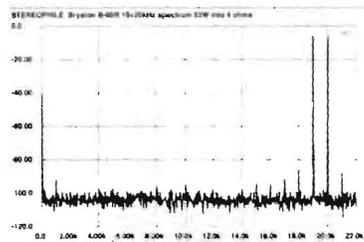


Fig.7 Bryston B-60R, HF intermodulation spectrum, DC-22kHz, 19+20kHz at 53W into 4 ohms (linear frequency scale).

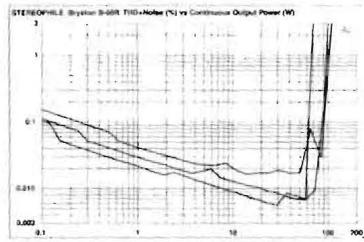


Fig.8 Bryston B-60R, distortion (%) vs continuous output power into (from bottom to top) 8 ohms, 4 ohms, and 2 ohms.

Fig.8 shows the THD+noise vs power curves for the B-60R, one channel driven, at 1kHz. The discrete clipping measurements for the B-60R (1% THD+noise at 1kHz), to the nearest watt, are shown in Table 1. With continuous tones, the Bryston marginally exceeds its power rating into 8 ohms, but falls just a few watts shy into 4 ohms (at the power-line voltage used in the test).

JA used the Miller Audio Research "Amplifier Profiler" to check the Bryston's output power on tonebursts, which are more typical of a music signal. Using a 10-cycle-on, 40-cycle-off burst with a fundamental frequency of 1kHz, and plotting the THD+noise against the output power gave the traces shown in fig.9. Into 8 ohms (black trace) just over 100W is available on this toneburst signal, this increasing to 170W into 4 ohms (red) and 265W into 2 ohms (green). Into the punishing 1 ohm load, however, the voltage had dropped sufficiently that the output power was only just greater than it was into 2 ohms (blue trace). At lower pow-

ers, the distortion into this extreme load was also significantly higher than into higher impedances. However, repeating this test into a reactive load (8 ohms plus -45° phase angle) gave a result very similar to the black trace in fig.9, implying that the Bryston will work well with real-world loudspeakers.

The Bryston B-60R is not truly happy driving a low impedance load—no surprise for such a compact integrated amplifier. But in every respect that matters for most applications, it turned in a fine set of test-bench measurements.

— Thomas J. Norton

Load	Both Channels Driven W (dBW)		One Channel Driven W (dBW)
	(L)	(R)	(L)
8 ohms (line)	67 (18.2)	67 (18.3)	67 (18.3)
4 ohms (line)	92 (16.6)	93 (16.7)	93 (16.7)
2 ohms (line)	115V	116V	115V
			95 (13.8)
			116V

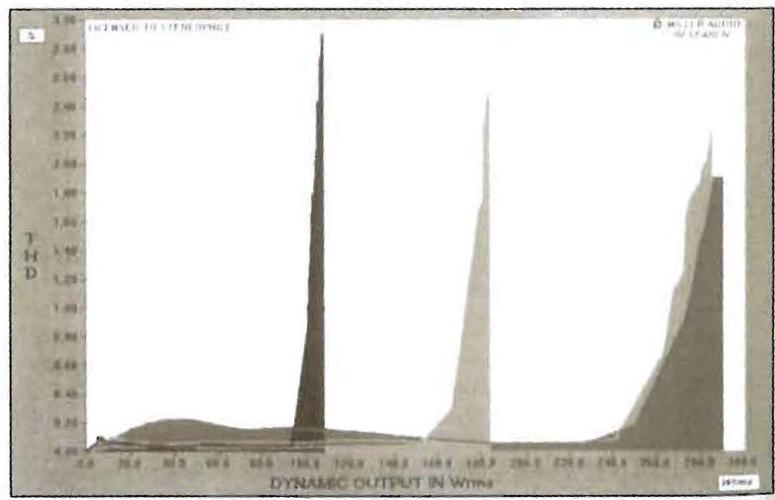


Fig.9 Bryston B-60R, distortion (%) vs dynamic output power into 8 ohms (black), 4 ohms (red), 2 ohms (green), and 1 ohm (blue).

Associated Equipment

Comparisons were made with the JoLida SJ 502A integrated amp, and also with the Sonic Frontiers Anthem PRE 1L/AMP 1 combo. Analog playback: Linn Axis turntable, Linn Basik Plus tonearm (with stock Linn wiring), Benz Micro Glider cartridge. A VTL 2.5 preamp and the Anthem PRE 1P phono stage were used for their phono sections (reviews of both forthcoming), linked via XLO Pro Type 100 interconnects. Digital playback: Enlightened Audio Design CD-1000 CD player, connected via Synergistic Research Alpha. Speakers: NHT 2.5i and Joseph Audio RM-7si Signatures on Lovan stands. Speaker cables: Cardas Crosslink 1, single-wired. Headphones: Grado SR-60.

Accessories: Audio Power Industries Power Wedge 116 and 110, Power Enhancer, and Power Link power cords. Can't live without my Nitty-Gritty Model One LP cleaner, with N-G's Pure-2 cleaner and topped with LAST No.2 preservative. A Hunt EDA record-cleaning brush was employed just prior to playing LPs. The stylus was cleaned with a soft brush or a Signet SK305 electronic cleaner with matching fluid, with the now'n'then application of LAST's STYLAST stylus preserver. Flux was busted by a Sumiko FB-1 Fluxbuster. Most stuff sat on Bright Star Audio Big Rocks, which kept the bad vibes under control. Cones from Michael Green and Golden Sound DH Cones, as well as the G-Flex M1 "Balls Of Steel," sat beneath various components. An Arcici Superstand II and my homemade MDF-and-wood amp stand provided good foundations. RoomTunes' CornerTunes were used, as well as my own homebrewed panels. —Lonnie Brownell

right there — or did it put them *here*? My notes say "sweet and detailed" — two words you don't always put together but wish you could. Even when all three virtuosos were furiously sawing away together, there was no sense of confusion; each line was well delineated. The presentation via the JoLida integrated was similar but somewhat softened: the bass wasn't quite as powerful or well controlled, the focus all around was slightly

softer, and the overall soundstage presentation was less forward.

The Squirrel Nut Zippers' *Hot* (Mammoth MR 0137-2, CD) has seen a lot of play hereabouts, and their *nouveau "le jazz hot"* was run through this setup as well. The Bryston offered more bite, more brassy brass tone on the trumpet, and the aforementioned firmer grip on the bass. The soundstaging with both the JoLida and Bryston was good, the main difference here being (again) a matter of perspective: the Bryston gave a more up-front look, while the JoLida was more mid-hall. Reading the above, you'd probably think the Bryston had the edge in rhythmic pace. You'd be right, but it wasn't that big a difference; for my money, both amps did an excellent job of keeping the beat.

Lou Reed's "Perfect Day" (from *Transformer*, RCA AFL1-4807, LP) is a beautiful happy/sad ballad that is also a fine example of mid-'70s state-of-the-art pop production, with 3-D placement of flat, cut-out singers and instruments floating in a multitracked space. It's also a little dry, which the Bryston played back to perfection, but without edge or glare. "Hangin' Round" is a full-on rush that brings a whole new dimension to the concept of "pace." I'm happy to report that the Bryston got me all twitchy during that cut. And yes, that's a *good* thing.

I was, I'll readily admit, captivated by the intense detail the Bryston was able to bring forth. On Cannonball Adderley, *et al's* rendition of "Autumn Leaves" from *Somethin' Else* (Blue Note ST-46338, reissue LP), I was able to easily follow Hank Jones's comping way back in the mix, behind Art Blakey's and Sam Jones's rhythms and Cannonball's and Miles's solos. But this detail didn't come at the expense of soul or beauty. The vinyl reissue of the Piaf/gorsky/Munch/BSO reading of the Dvorák Cello Concerto (RCA/Classic Records LSC-2490) gave me the Irish Coffee Effect: I was energized by the speed of the bow's attack on the strings, then eased by the cello's warm but mournful tone, echoed by a distant flute. "Gawd, that's beautiful," said my notes. "Well put, notes," I replied. "May I quote you?"

Oh, yes, there *is* a headphone jack. Plug in, and the speakers are muted. (An indicator LED on the front panel turns red so you'll know for sure.) Using my good ol' Grado SR-60s, the sound from the 'phone jack was very reminiscent of the sound from the speakers — clean and quick but not strident, with excellent bass.

So what was the downside? you ask. Power? For me, no; for the kind of listening I do, which can get loud but not mind-numbingly so, the Bryston offered plenty of power. Any frequency-spectrum aberrations? No, it was completely clean up and down the scale. Harshness? No, not at all, though it *was* a little forward in perspective — which is neither a good nor a bad thing, it just *is*, and at most is a matter of taste. And it did offer incredible detail without being unnatural.

So was the Bryston B-60R *perfect*? There was one *very* small thing — something you don't often find at this end of the price spectrum. It's that almost indescribable something that the absolute best systems (to my taste) have, something that more often than not comes in glass bottles. No, I don't mean intoxicating beverages, but what pours out of vacuum tubes — the ability to impart a sense of dimension to the instruments and voices that transforms them from flat images to living, breathing entities on the soundstage. The JoLida and Anthem amps gave me *some* of that — the cut-out figures were well shaded, you might say — while the Bryston offered slightly less. Still, because of the detail the Bryston could produce — its stunning ability to expose every nuance and do so without being in my face — I almost forgot to notice.

So tell me what you want — really

It's music, right? The audio system is merely a means to that end, but a necessary means, an important one. Right? Right. That's why you're reading *Stereophile*, and why you'd consider spending as much on a sound system as you would on your car, maybe more. My system, with the Bryston B-60R integrated amplifier at its center, certainly costs more than some used cars, so it passes that litmus test.

I can tell by the way you're fidgeting that you're still worried about impressing the neighbors. Well, don't — they'll be impressed by the sound you're able to conjure out of such a small, unobtrusive rig, whether they're audiophiles or not.

Finally, what about the price? Those pesky neighbors (or significant others) may raise their eyebrows at \$1795 for such a small box, but you'll know that you've got a true high-end component — a *pair* of them, actually — in that diminutive enclosure.

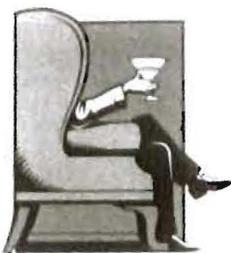
Anti-high end? Not me. But I am into *stealth* high end, and the Bryston B-60R is all of that. Highly recommended. ☒

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Sam's Space
Sam Tellig



J', as some French hi-fi critics like to say. "I had a thunderclap."

This time it was literally true.

Early last summer, lightning struck the transformer on the street outside our house and the lights went out with a terrible bang. Fortunately, I had disconnected the two hi-fi systems but not our home-theater setup—Marina's *seestem*, in which I'd installed the Bryston B-60 integrated amplifier that I wrote about in May 1997 (Vol.20 No.5). I had also neglected to disconnect the phone line to my computer modem.

Four hours later—around 3am—the power company brought our electricity back on line. I quickly surveyed the damage.

When power came back on to the Bryston B-60, so did the smell of burning silicon. Phew! I quickly flipped the Off switch and heard a horrendous bang through the speakers. *Encore un coup de foudre*. Yet another thunderclap! *Mon dieu!* I ran upstairs to test my computer.

It was alive—thank goodness—but my modem wouldn't respond.

No sleep now. I phoned Micron Electronics. After taking me through some diagnostic tests, their tech-support guy shrugged his shoulders (I could hear him shrugging over the phone) and said, "Well, I guess your modem got fried."

"Okay. What to do now?"

"No problem," he said. "You're still under warranty. We'll ship you a new modem tomorrow, UPS Blue."

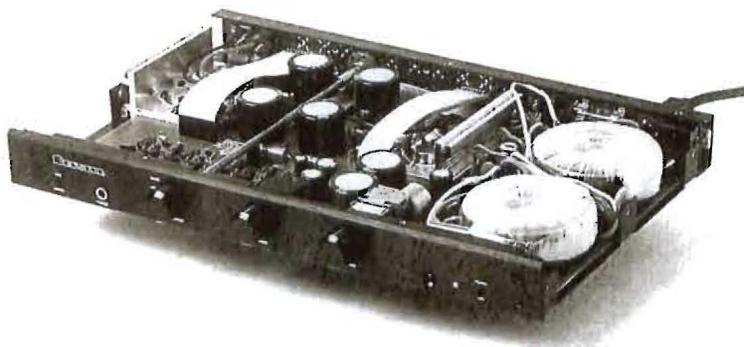
Now *that's* customer service. Would I have the same luck with Bryston?

Next day, after catching up on some Zs, I phoned Bryston, got a return authorization number, and shipped the electrocuted B-60 to their service center in Vermont.

Under warranty? Not really. But Bryston fixed the amplifier anyway. I suspect they'd do the same for you, in a similar situation.

I installed the Musical Fidelity X-A1 in Marina's *seestem* as a stopgap. When the Bryston returned, I decided to try it out again in the living room—with several speakers from B&W, including the CDM1 Special Edition.

Wow!



Lightning must be good for the amp. For whatever reason, it sounded better than ever. I suspect Marina's steady diet of TV and Russian pop music had more to do with it.

But the lightning had subjected the

The lightning had
subjected the Bryston
to the ultimate burn-in.
It sounded richer, fuller,
better than ever

Bryston to the ultimate burn-in. The sound was now richer, fuller than I remembered—with more body, more bloom in the midrange, and even more sweetly extended highs. Resolution was remarkable. I say "was"—Marina didn't let me hold onto *her* amp for long.

Not such a hot idea

It's probably *not* such a hot idea to leave equipment on all the time. While you're home, it's okay to leave your system on overnight when you know you'll be listening again first thing in the morning. But leave home and leave the system on? Uh-uh. In summer, I not only turn all systems off, I pull their plugs.

Besides, many amps don't *need* to be left on all the time to sound their best. (CD players and digital processors are another matter, alas.) The Bryston B-60

requires only an hour or so of warm-up to sound its best.

Once it's broken in, that is. Like a lot of gear, the Bryston seems to need several months of break-in.

That's tough on reviewers, because we may never get to hear how good a piece of equipment actually is. We've already sent it back and are listening to the next product.

Lonnie Brownell best described the B-60 in the July '98 issue when he called it "stealth high-end." As in Stealth Bomber. As he noted, you won't impress your friends. The amp's not big enough—only 2½" high, it's almost invisible. Nor does it cost enough to cause pain: \$1795 with remote, \$1495 without. Call me hair-shirt (or hare-brained), but I think the remoteless version is more attuned to the B-60's spirit of frugality. (Lonnie disagrees.)

What really riles me are these so-called "experts" who pop up now and then in places like the *New York Times* or the *Wall Street Journal* to advise the public that one needs to spend at least \$10k for a good stereo system. The public, perhaps quite wisely, opts out.

Truth is, you could build a splendid stereo system around the B-60 for under \$5k, maybe under \$4k. Put a Rega Planet CD player in your solar system and add a well-chosen pair of loudspeakers, like the Meadowlark Kestrel or B&W CDM 1 Special Edition. Out of this world!

Can you do better than the Bryston B-60?

You can do different.

The Conrad-Johnson CAV50, which I'll get to in a moment, sure sounds different. The new C-J integrated has the virtues of a classic piece of tubed gear vs the Bryston's classic solid-state virtues.

Other solid-state integrations may sound different too. But what of it? Please don't forget that, as critics, we writers are always describing differences. That's good, but sometimes the differences get overblown.

The LFD Mistral that I wrote about in September and the Plinius 2100i that I will be writing about seem to have more light and life. I find they have a somewhat more airy, more open, more immediate sound. But the differences are subtle. Maybe the Bryston is a little less insistent and, over the long term, easier to listen to.

Or take the Jadis Orchestra—a much better deal now that its price has been lowered to \$2495. Now *here's* an integrated with a distinctive sound: explosively dynamic, exuberantly full-bodied. Is the Jadis Orchestra right and the Conrad-Johnson CAV50 wrong?

With a fine piece of gear, the kinds of differences that seem to matter so much to reviewers may not matter much to you. The important thing is to find a good piece of gear that you like.

Then keep it.

Inconspicuous consumption

I'm big on the Bryston B-60 not because of any one thing, but because of its combination of attributes. Build quality. Twenty-year warranty from a

company that will likely be around for at least another...oh, 50 years. Resolution—hard to beat at any price. Small size. Absence of frivolous features. Most of all, the Bryston represents inconspicuous consumption.

When I'd auditioned the Bryston earlier, I'd had little time to listen to its line amp except through headphones, where it acquitted itself very well indeed. This time I ran a pair of Kimber Silver Streak interconnects from the B-60's preamp out, bypassed the power-amp section, and used the B-60 as a line stage to drive a pair

I'm big on the
Bryston B-60
most of all because
it represents
inconspicuous
consumption.

of Cary 2A3 Signature monoblocks.

As you know, I'm not so keen on most active preamps—or line stages, as phonoless preamps are now usually called. The solid-state models tend to give the sound an electronic glare, while tubed units often muddy the sound and muffle the bass. Generally speaking, I think you need to spend around \$2000 or more to get a good active line stage. It's enough to make even an active guy like me go passive.

But what's this?

The remoteless Bryston B-60 costs \$1495 and is as good as any \$2000 solid-state line stage I've heard. No electronic glare. No murky sound. No muddy bass. Clean, quick transients. Superb clarity.

This, of course, is why the B-60 is such a killer with cans. (That's British for headphones.) Phones are driven directly off the line stage: there's enough output, and the power-amp section doesn't come into play. Simpler is better. The result is sonic purity and headphone amplification that are as good as any I've heard from solid-state. (I'm using the Sennheiser HD600 and Grado RS-1 phones as references—very revealing.)

Even if you listen with headphones once in a while—late at night, for instance—you should put the Bryston at the top of your list for auditioning. Many otherwise fine integrated amps lack a jack for phones.

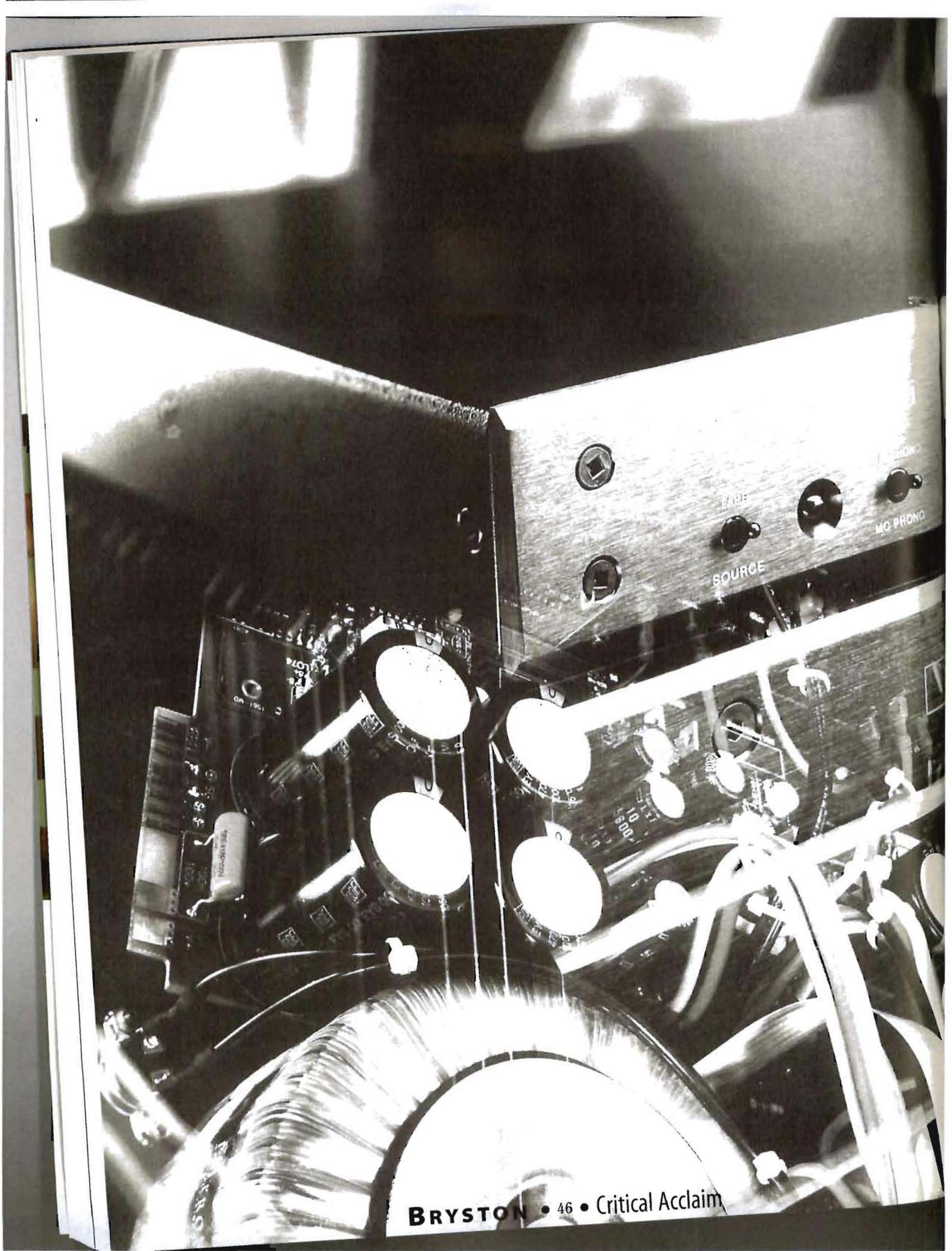
As for the sound quality, ask Marina. "I want my Bryston back," she said.

Contacts

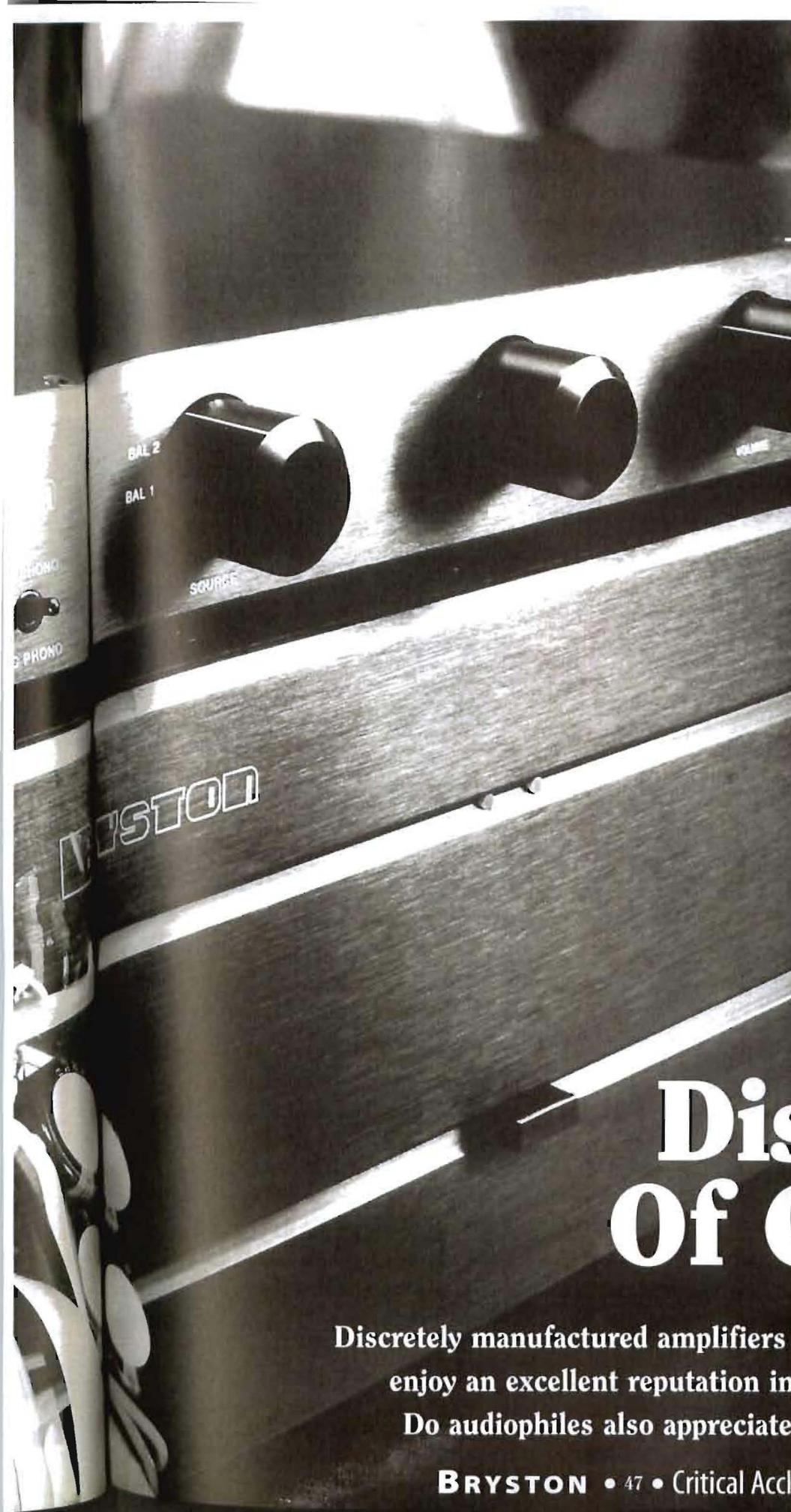
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Website: bryston.ca

- Sam Tellig

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BRYSTON • 46 • Critical Acclaim



By Joachim Pfeiffer

They are still available, the finer things in life. Developed with love for detail, reliably manufactured treasures which gratifyingly distinguish themselves from mass produced articles. In the realm of High-Fidelity, acoustic toys which claim exclusiveness can cost a large amount of money - at least generally speaking. When smaller manufacturers insert expensive parts into their components which are only available in limited numbers, then prices quickly race into stratospheric heights.

It is gratifying to note that in the Canadian Firm Bryston the thinking has larger dimensions. Otherwise, their amplifiers would be marketed at prices which would amount to multiples of what the German distributor, Sun Audio of Muenster, actually levies. 4500 Mark each is what Sun Audio asks for the excellently equipped 25 BP pre-amplifier (including phono stage and remote control) as well as for the efficient 4B power amplifier. In light of the received value this pricing should go into the annals of High-Fidelity as a small miracle. Why, let me clarify by the following facts.

All Bryston pre-amplifiers and amplifiers - the Canadian "smithy" builds nothing else - come with an absolutely bona fide (and not just on paper) totally encompassing 20 year warranty. This is a carefully formulated, simple sales lure - since service claims after this period of time are still obligingly honored. Time and again owners of ancient Bryston equipment turn up who do not recognize their "old-timers" after they had been reconditioned by the Sun Audio technicians

Discretes, Of Course!

**Discretely manufactured amplifiers from the Bryston Company
enjoy an excellent reputation in the world of professionals.
Do audiophiles also appreciate these Canadian amplifiers?**

BRYSTON • 47 • Critical Acclaim

and who were left speechless when the bill was presented to them: 0 Mark.

The construction and finish of the Canadian paragons promise genuine exclusiveness. In the pre-amplifier as well as in the amplifier no low-cost chips are put to work because all the circuits employ discrete construction. Phono stages which make use of integrated circuits for both equalization and pre-amplification of stellar MM and MC even in higher priced equipment, in Bryston components, as a matter of course, are discretely built.

Although hardly profound reasons can be offered against automated parts insertion into printed circuit boards, it should be mentioned that Bryston refuses to utilize production robots in their manufacturing areas, every component is 100% hand assembled.

The Bryston Team has earned an outstanding reputation with its professional equipment. Approximately half of the sales of this independent family owned business are in this market area. Bryston amplifiers set the stage in many select studios. Besides their musical capabilities, their long life and reliability make an excellent impression on sound engineers. Nevertheless, there is hardly any difference between the professional components and the Hi-Fi models. The dual mono 4B Amplifier shows off precisely the same parts as its "studio brother." The professional version is provided with a front panel displaying a large Bryston Logo, the obligatory holes for 19 inch rack mounting, and two external input level controls, nothing else. The professional amplifier costs 4800 Mark in this country.

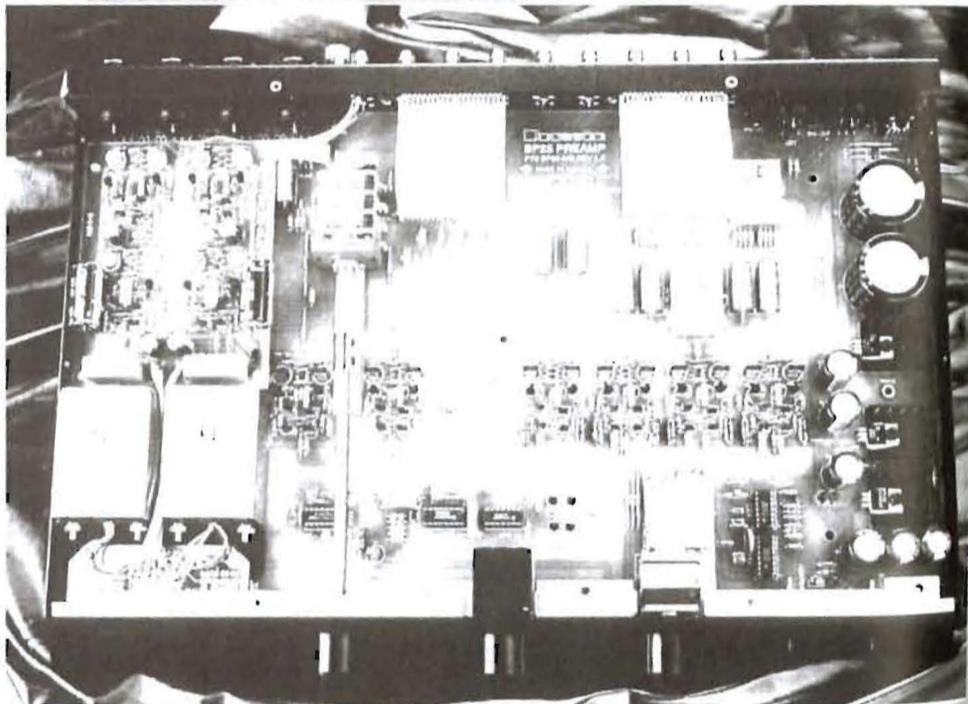
In my report describing the Transrotor "Aspect" record player (AUDIO 8/96) I criticized average and hideous phono sections which insidiously desecrate the sound of valuable vinyl records in many pre-amplifiers and integrated amplifiers. The Bryston pre-amplifier lives on the sunny side of the street. Analog freaks jump for joy when the BP-25, after a relatively long break-in period (three weeks), reproduces the qualities of excellent MM and MC cartridges. For example, I chose the Grado "Reference II" MM cartridge with wooden body and permanent stylus. Despite the fact that the interior construction of this legendary cartridge was borrowed from its plastic encased predecessor, there is an enormous

Reprint from German
audio magazine - AUDIO 9/96

The Bryston BP-25 Pre-Amplifier Passes the Measurements Test

It consists of noble ingredients: An outboard power supply, an integrated line filter, as well as especially selected transformers with triple MU metal shielding (only this material protects reliably against electromagnetic interference) after the MC phono input. All of these catapult the carefully constructed Bryston BP-25 pre-amplifier into the upper tiers of High-Fidelity.

The outstanding measurement results underscore the claims of the Canadian preamplifier. The CD input boasts a more than respectable 97 dB signal-to-noise ratio. The two phono inputs also have excellent signal-to-noise ratios, i.e. MC: 64 dB, MM: 77 dB.



Additionally, the BP-25 impresses with its industry standard low output impedances (Unbal: 75 ohms, Bal (XLR): 145 ohms). Consequently the laboratory results confirm that this pre-amplifier is one of the most perfectly conceived, planned, and manufactured Hi-Fi components available today. The Bryston BP-25 is also available as a line stage only. It costs 3,500 Mark without the phono section.

difference in sound between the two models. Freedom from hiss and sweetness in voice reproduction remained, but in the area of dynamics and resolution the new "Reference" is dramatically improved. Ultimate pre-amplifiers like the Cello "Audio Suite" denote these sound differences still a bit more dramatically, but the Bryston, at a ten times lower price, sounds anything else but ten times worse. It truly succeeds, with astonishing proficiency, in recreating acoustic environments, and in reproducing professional voices with sparkling strength and with natural expression. Furthermore, the sound stage hardly narrows when reproducing complex passages.

Also people with high and ultra-high priced MC cartridges "get their money's worth", in the true sense of the word, with Bryston equipment. Especially audio freaks who call murderously expensive cartridges their own and who perhaps are afraid that their investment is money thrown out the window, hap-

pily gloat with thanks for the BP-25 pre-amplifier. The Bryston proves to them that exorbitantly priced cartridges have the right to exist. The breathtaking authenticity of a Clearaudio "Insider" (13,000 Mark, Test AUDIO 1/96) is reproduced by the BP-25 without any degradation. That is sensational.

Ultimate transparency admittedly remains the domain of horrendously expensive pre-amplifiers, but the Bryston comes very close

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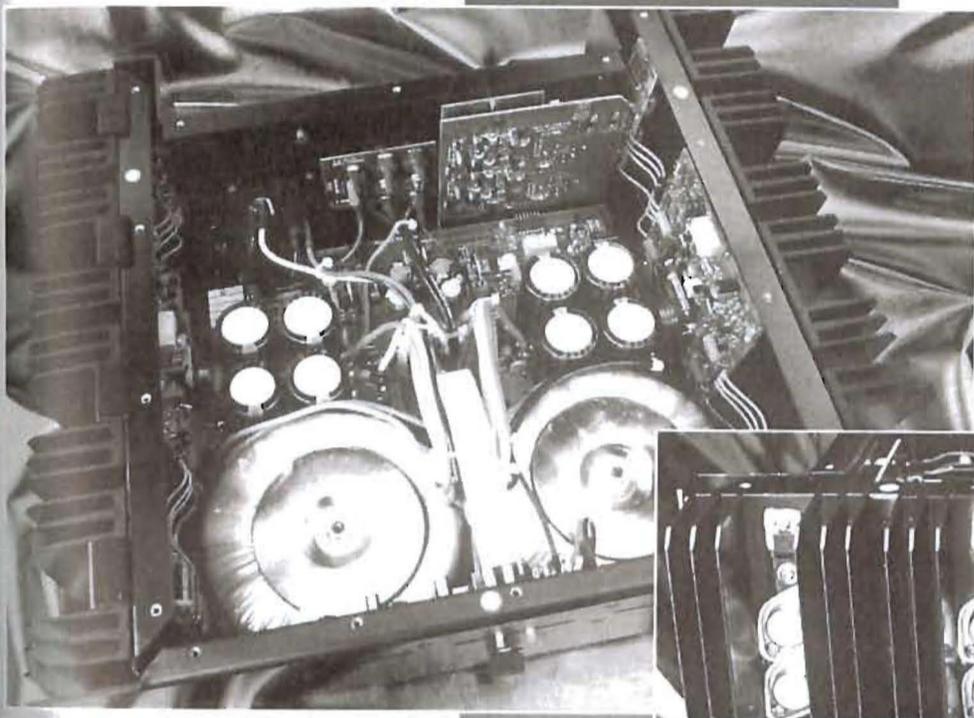
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to the optimum. And the few centimeters which separate the BP 25 from the absolute peak, paradoxically lend it its charm. Tendentiously warm it creates tonal colors with "juicy" red and orange hues, no "shrill" blue or no "poisonous" yellow.

Considerable enjoyment can also be found while listening to various silver disks. Thanks to its color intensive mid-range, its con-



toured but nevertheless smooth bass, and its finely detailed upper spectrum, the BP 25 invites relaxed listening. The advantages of analog reproduction - assuming a perfectly adjusted record player is used as the source - still maintains their upper hand.

Although the tonal balance of the preamp is only correct after three weeks of operation, the 4B amplifier reaches its optimum performance in less time. For the length of my listening tests in my home environment the sturdy brute powered alternatively the Wilson Audio "Watt/Puppy 5" loudspeakers as well as the German competition, Audio Physic "Caldera" reviewed in AUDIO 2/1996. Actually neither the Wilson nor the Audio Physic loudspeakers require power amplifiers with ultra-high power or current output capabilities. But dark acoustic clouds appear on the horizon when electronic junk is used for amplification. Recently I auditioned several power amplifiers priced from 20,000 to 40,000 Mark, and two of these amplifiers I sent back to their manufacturers. One, the topically interesting, fully balanced, Cello "Encore 150" (the end of

The Bryston 4B ST Shows its Muscle

The Bryston 4B ST is the fifth generation of a power amplifier legend. The latest re-launching was accomplished by the audio engineer Stuart Taylor. The established dual-mono

construction remained (refer to large illustration) with generously dimensioned power transistors (refer to small illustration). In contrast to its predecessors Taylor succeeded in once again lowering distortion and improving the signal-to-noise ratio, results which could be substantiated by our laboratory. The superior unweighted signal-to-noise ratio (86 dB) confirms this. Also the respect inspiring continuous power output of the 4B, i.e. per channel 325 watts into eight ohms, and respectively 460 watts into four ohms, enables the mighty brute to "light a fire" under difficult-to-drive loudspeakers.

When the power output of the 4B is insufficient, the Canadian amplifier can be operated as a monoblock. Then it spews out considerably more than 800 watts into eight ohms.

the road? I don't know, it could be!) I continued to audition further.

And now this. When sometime in May I powered up the Bryston 4B and connected it to the Wilson Audio Loudspeakers there was a "click". What does it mean, in what world are we living? After a few bars of music the reasonably priced Canadian amplifier swept away the dubious competitors. It demonstrated dynamically how to reproduce vivacity, and we don't even have to mention the wealth of tonal colors. When we switched to the phenomenally good "Caldera" loudspeaker our positive impression was not altered at all. The competitors could kick and struggle all they wanted - the Bryston packed them right back into their box, pardon, into their cardboard carton.

What started promisingly continued to grow in intensity. Let's play a disk - naturally a black one - which I had received from Fuerth shortly before my



press deadline from the busy supplier Da Capo: "The Very Best Of Crowded House" (Capitol 8 38396 1). The music might seem simple at a first hearing, but with repeated listening facets opened up, which probably would have been forever hidden from me via radio or television. Guitar runs don't sound canned, they sound real. The proportions of the instruments are correct, the Bryston preserves the fine dynamic structures of the rapid music of the strings, the precise impact as well as the breezy, very natural decay.

Wow! In a class by itself, at least in this price range, the Bryston 4B, exemplified by its acoustical behavior, is unique. The Wilsons and even more the "Caldera" accept amplifiers with much "steam under the hood." They accomplish the feat of playing loud and ultra-loud with extremely low distortion. Even a power amplifier brute like the McIntosh MC 1000, which puts out at least

Reprint from German audio magazine - AUDIO 9/96

1200 watts per channel, doesn't force the American or the German "dream loudspeaker" into surrendering. When these giants receive the full "Mac" dosage they just play very, very loud - but it does not hurt at all.

The Canadian Hammer: Bryston attains entry into the High-End Olympics

I could also ascertain this phenomenon with the Bryston amplifier. If it is driven to its maximum power output, it continues to provide full range of reproduction, without weakened dynamics, until the so-called "clipping" is reached, when it goes into the red zone. By the way, I prefer amplifiers whose sound tends to get "darker" when they reach their maximum sound level, rather than those whose clipping is harsh, bright, and consequently nerve-racking.

There is no question that the Bryston Duo caught my fancy, and that I got much pleasure and joy from listening to it. It remains to be seen how well it will do against the established competition. Close your eyes and open your ears! In the AUDIO listening room the Canadians "warmed-up" against amplifier combinations from all over the world, which besides outstanding sound also guaranteed an especially favorable price/performance relationship.

80 sound points, perhaps 85 - are there possibly even 90 points available for one of the two test candidates? We worked our way forward, compared and finally reached a clear conclusion: With an incredible total of 90 sound points the 4B Bryston power amplifier leads the exclusive top class of its field. That is, in light of its price, a fabulous achievement which AUDIO crowns with five "ears."

But it gets still more outrageous. The Bryston BP-25 preamplifier achieved the leap into the high-end olympics. Its entry into the reference-class could not be prevented. A super-component, and especially also for analog freaks.

Bryston is for us, and for me personally, one of the outstanding discoveries of the year. Discretion a matter of honor? Yes, certainly, as far the circuitry is concerned. However, there's no reason to keep the unbridled enthusiasm in check.

Reprint from German audio magazine - AUDIO 9/96

SUMMARY

Bryston BP 25

Distributor Sun Audio, 81675 Munich, Germany, Telephone: 089/47 94 43

PREAMPLIFIER

Listprice with/without phono stage	4500 Mark/3500 Mark
Warranty Period	20 Years
Measurements W x H x D (cm)	43 x 4.5 x 28
Weight	8 kg.

CONNECTIONS

Phono MM/MC	● / ●
Line Stage Inputs: Unbalanced/Balanced (XLR)	4 / 2
Tape	●
Outputs: Unbalanced/Balanced (XLR)	2 / ●
Headphone Jack	●

FEATURES

Record Switch	—
Tape Copy	—
Tone Control/Disconnectible	—
Loudness/Adjustable	—
Remote Control	●

THE AUDIOGRAM

Sound CD/Direct/XLR	Outstanding - 95/95/95
Sound MM/MC	Outstanding - 95/95
Finish	Very Good
Workmanship	Very Good
Operation	Very Good
Special Features	Outboard Power Supply

Reference Class -



Bryston 4B ST

POWER AMPLIFIER

Listprice	4500 Mark
Warranty Period	20 Years
Measurements W x H x D (cm)	43 x 14 x 37
Weight	20 kg.

CONNECTIONS

Inputs: Unbalanced/Balanced (XLR)	● / ●
Input Level Control	Optional
Loudspeaker Outputs	One Pair

FEATURES

Monoblock Operation (Bridgeable)	●
Power Output Display	—
Special Features	Ground Lift
AUDIO Reference Number	78

THE AUDIOGRAM

Sound: Unbalanced/Balanced (XLR)	Very Good 90/90
Finish	Very Good
Operation	Very Good
Workmanship	Very Good

Top Class -



Translated by Peter Ullman

BRYSTON

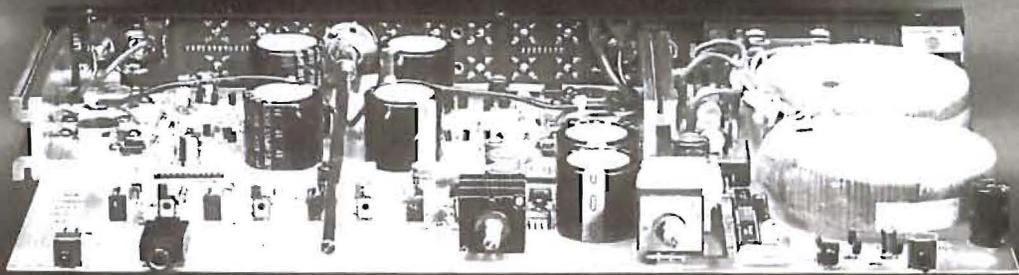
STEREO

STEREO MAGAZINE FOR HI-FI • HIGH END • MUSIC

**"SOUNDWISE, TECHNICALLY, AND MECHANICALLY
THERE IS NOTHING TO COMPLAIN ABOUT WITH
THIS INTEGRATED AMPLIFIER"**

STEREO TEST RESULT

EXCELLENT ◆◆◆



BRYSTON

Minimal Art

By: Michael Eichelsdoerfer

Bryston is on the right track as shown by the pre-amp and power amp stages of this Canadian product. However the crowning understatement is the new BP-60 Integrated Amplifier. Extremely small, amazingly good...



Reprint from German Magazine:
"STEREO" - 1/97

BRYSTON • 52 • Critical Acclaim



Language blesses and amuses us with all sorts of fun. One of these is the concept of the "Truth of the Day." It insinuates that beloved truths can sometimes last for an astonishingly short time. It's the same way unfortunately in politics, in love, and also in the High End. The best known High End "Truth of the Day" is the answer to the question of what is the most important link in the reproduction chain. The answer is completely arbitrary; today it's the signal source, tomorrow the loudspeaker, next week the amplifier. And sometime or other someone will assure you that none of this matters if you do not have the correct cable.

In order to try and salvage the honor of all my colleagues and myself; this is not meant to be malicious, but rather the opposite. We are all seriously trying to understand and come to terms

Especially sensible within the ultra-flat housing: separate circuits for each channel. A single transformer could hardly supply enough power for the output stages.

with music reproduction. And when we listen with amplifiers through loudspeakers which constantly show up every improvement then we quickly assume the source to be the most important link in the chain. If we are already listening through superb CD players and amplifiers then the improvement of the loudspeaker appears to be the most urgent task at hand. Therefore the most important link in the chain is frequently the one with which we are least satisfied. Or said differently: the

capability of a component to grow with improvements of the chain is a good sign for its sound quality and relegates it finally - in a positive way - to the "least important" link of the HiFi chain.

I like such components. I am familiar with unpretentious integrated amplifiers which appear to make investments in CD players and loudspeakers worthwhile and which do not make themselves obvious in a negative sense. One of these is new. It is the integrat-



Test Profile

Bryston BP-60

Price: DM 3800

A genuine Bryston product. The BP-60 stands out by means of its powerful and solid music reproduction. Spatial reproduction and detail are fine, but the tonal and dynamic capabilities are even better.

Soundwise, technically, and mechanically no fault can be found with this integrated amplifier.

STEREO TEST RESULT

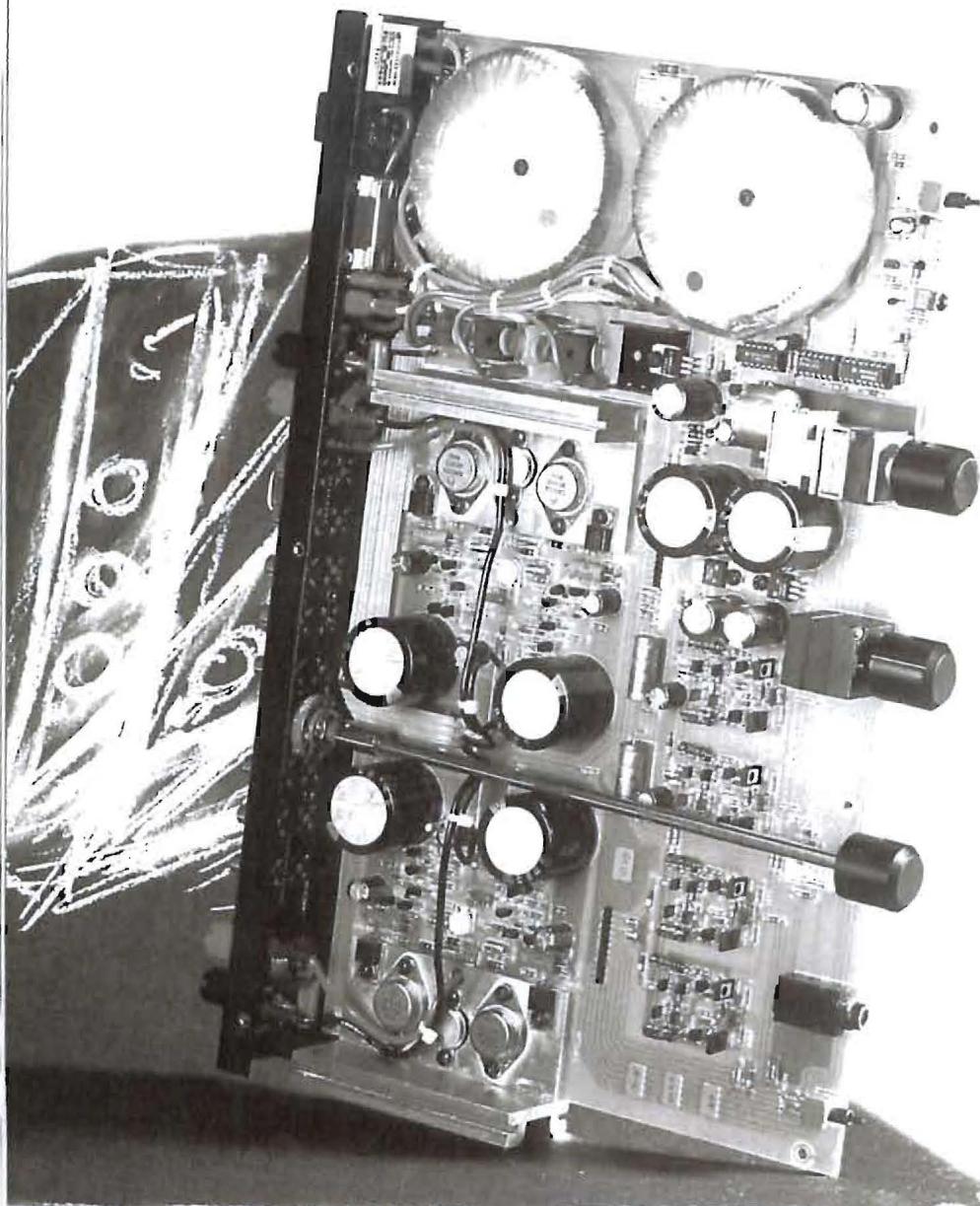
EXCELLENT ♦♦♦

ed amplifier from Bryston, which answers here (in Germany) to the name "60 BRI."

I was quite eager to find out how far the Canadians would be able to go to pack the qualities of their pre-amplifier and their power amplifier into a tiny enclosure. The BP-60 is the flattest integrated amplifier that I have encountered. Why? Bryston also builds studio electronics, and these are only built in standardized sizes. A "height unit" of the "professionals" measures 44 millimeters, and only integral multiplications are allowed. Therefore the next alternative height would be 88 millimeters - too large.

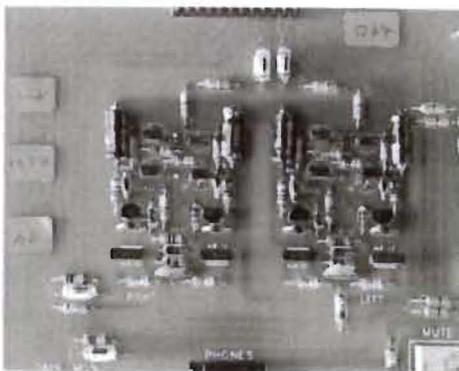
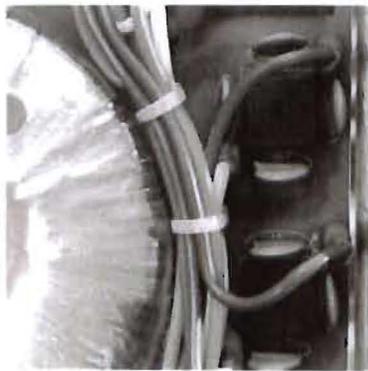
The flat construction technique deserves commendation. A single transformer with sufficient output would not fit into the enclosure. Therefore two transformers (one per channel) are used, which is certainly not detrimental. It was also impossible to install large heat sinks, therefore Bryston connects, by means of screws, the internal heat sinks to the bottom and top (of the enclosure) and thus assures proper heat-sinking through the chassis.

The amplifier circuits of the BP-60 are strictly discrete. The low-signal circuitry was taken from the BP-25 pre-amplifier, and the main amplifier circuits use the same Motorola transistors as



Reprint from German Magazine
"STEREO" - 1/87

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the large Bryston power amplifiers. Thanks to the metal chassis two power transistors are used per channel in order to be able to deliver almost 110 watts continuous operation into four ohms. Carefully thought out signal paths, high quality potentiometers and switches, special German made electrolytic capacitors - the handwriting of the Bryston engineers is unmistakable in the BP-60.

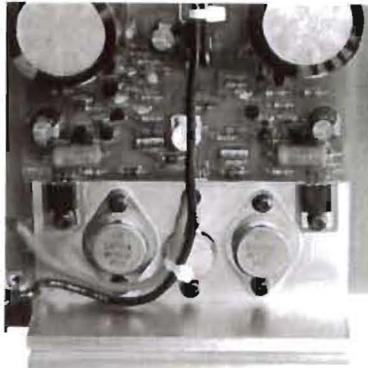
Equally so in the front end. Four high level inputs and one tape deck can be switched, and balance and volume can be adjusted, that's it. The headphone jack and the capability to separate the pre-amplifier and the main amplifier sections by means of a wire jumper in the rear are the only luxury features.

Every Bryston component is made the same way and many people love them for that. Where else does one find a twenty-year warranty? Where else does one find a design that one does not get tired of after a number of years? And not in the least: Where does one find so much good sound for ones money? The Canadians truly succeeded in transferring the "sound picture" of their larger amplifiers

Plastics did not make the grade: The remote control has a metal housing



Detail workmanship: Rectifiers with smoothing capacitors (upper left) and discrete amplifiers. Each channel has two power transistors (right)



TEST SET-UP COMPONENTS

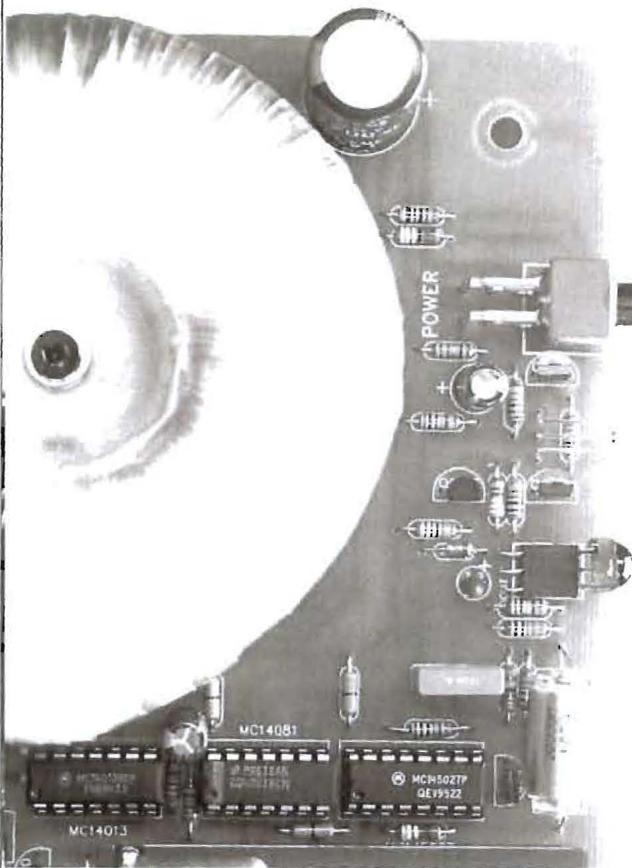
CD Transport:	Camtech CD Transport
D to A Converter:	Camtech DAW
Digital Link:	Apogee A-II 0
CD Player:	Naim CD 2
Loudspeakers:	Sonus Faber Guarneri Homage; HGP Fuga; Jamo Concert 8; Martin Logan request
Speaker Cables:	MIT T2
Accessories:	Sun Power Strip; Groneberg Power Cable

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"STEREO" - 1/97

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to their small integrated one. The BP-60 does not sound "small" at all, it only looks it. For example, let's talk about dynamics. This concept is sometimes ambiguous, therefore I want to go into a bit of detail. Often we mean the coarse dynamic capabilities, which some people claim are only achievable by means of extreme power reserves. Nonsense, the BP-60 is a great example of the opposite.

Distortion-free:
The remote control receiver works without a digital stepper



It plays with appropriate energy and strength, it knows the difference between pauses in the music and fortissimo. At normal volume this is less a question of power output and more a matter of circuit design.

Another topic is dynamic detail. To correctly recreate rise and decay times is a great art, which the Bryston accomplishes very well. For example: listen to large different size cymbals in a group of percussion instruments, do they all sound alike? I really don't enjoy "soft" amplifiers of this type, but fortunately the BP-60 is of a different caliber. Finally: Inner dynamic structure - what is it? Perhaps the most important area altogether! Seemingly simple musical events

sound quite blasé with some electronics, with others surprisingly exciting. "What" is played is one thing, "how" it is played is another. The Bryston conveys both, it also convinced me in these areas.

All these are "dynamic" capabilities which the Bryston possesses. I do not want to hide the fact that other, especially more expensive amplifiers, reproduce even deeper sound stages, and that the colorful firm pace of the BP-60 is not for people who are afraid of music and especially not for those who want to clearly hear "the triangle way back left."

Of course the BP-60 masters every type of program it might

Laboratory Report

Despite its flat construction the BP-60 does a very decent job. It delivers 74 watts into 8 ohms, and 107 watts into 4 ohms. The peak wattage into 4 ohms is 135. Spurious noise is minimal, crosstalk is 60 dB. The motor driven volume control has very minor channel-to-channel differences - up to 60 dB the difference is less than .4 dB. The BP-60 distorts when input voltages exceed 3.1 volts therefore unusual extremely loud CD players should not be used.

Measurements: 43.5 x 5.5 x 35 cm. (W x H x D)

encounter. However the reproduction never emphasizes the size of a room nor does it sound especially silky, rather it sounds smooth, energetic, and powerful. The Bryston even reproduces amazingly deep bass - although it seems to me frequently that especially this capability, more so than the coarse dynamic pace, is based on the available electric power as well as the power of the final stage.

In short: This integrated Canadian amplifier is one of the best that can be had for the money today. The ability to transfer the warranty to the second and third owner is truly terrific, however I doubt that a BP-60 will leave its first owner very quickly.

Reprint from German Magazine: "STEREO" - 1/97

Translated by Peter Ullman

BRYSTON

BRYSTON • 56 • Critical Acclaim

BRYSTON BP25 Preamplifier & 4BST Power Amplifier

by Richard Morgan

In a perfect world an audio amplifier would take the music signal input from a source component (such as a CD player), provide switching facilities between those sources, then amplify that signal to a point where it is driving the speaker system and producing music to a level appropriate to prevailing conditions.

In this perfect world the amplifier would add nothing of its own character (electronic or otherwise) to the music and it would in theory allow all the information passed through it to reach the speakers (and then our ears).

But this is certainly not a perfect world and the aforementioned scenario has never been achieved, much to the sonic disdain of compulsive music nuts and hi-fi boffins the world over.

There are amplifiers which make a 'good fist' of things though and come pretty close to the ideal of a 'straight wire with gain'. One of those is the Bryston range of products from the Canadian manufacturer of the same name.

Bryston is one of those perennial brands which is respected the world over, initially for its range of professional products and later for its dedicated domestic and crossover products. In recent years Bryston has been carving itself a strong niche in the Australian market and with its latest range of amplifiers is receiving the kudos from the critics it richly deserves.

The Bryston BP25 preamplifier and 4BST power amplifier are pigeon pair products which can lay firm claim to being excellent high end hi-fi. They are superbly engineered, beautifully made and have innate performance which blows the pants off many competitive so-called 'esoteric' amplifiers which have reputations which are, 'enviable'.

This Bryston amplifier duo keeps some impressive company in the market but differs in its simplicity in both form and function. There are no fancy circuits laying claim to mythical performance capabilities, just excellent fundamental approaches to design. There aren't myriad functions, nor are there artful illumination systems here, instead there is a welcome mark of austerity and space age functionality in their appearance, hi-fi components should, to my mind, be



there for the hearing and not for the seeing. I have heard the comment that Bryston is a conservative company, but if conservative means adopting common sense design approaches, more power to it (pun intended!). Then of course there is that unmistakable air of quality inside and out which separates the products from their competitors.

The BP25 preamplifier is super slim and, you guessed it, black. Bryston has separated the BP25's power supply from its main chassis and in one fell swoop isolated one of the main sources of interference in a preamplifier from the delicate internal workings (and the signal they are processing).

An independent power supply is a relatively simple and effective amplifier design technique but is often avoided due to costs constraints. In a high-end product such as this, the performance enhancement greatly outweighs any cost increase. The power supply is quite sturdy, which

is another bonus, and can be located a little under a metre from the main component.

Bryston has fitted the main power switch to the preamplifier on the power supply box along with an indicator. The supply is connected to the preamplifier via a five-pin DIN-style connector.

The front of the BP25 is simple and dominated by rotary controls labeled source, balance and volume. There is no phono section for turntable aficionados, but Bryston has ultra high quality preamplifier options which cater to the requirements of people with moving magnet and/or moving coil cartridges.

The source selector switches between inputs for a compact disc player, video recorder, laser disc player (or similar), a tuner, and two balanced inputs. There's also provision for an auxiliary component. The balance control has a centre-channel detent position and the volume control has a smooth operation.

Reprinted from Audio & Video Lifestyle Magazine - Australia

● BRYSTON BP25 Preamplifier & 4BST Power Amplifier

Small toggle switches handle the rest of the front panel functions. These include a muting switch, mono/stereo selector, switching for a tape machine and polarity switching.

The operation of most of these functions will be readily clear to you, but the last, polarity switching, is unlikely to be familiar. In essence this reverses the phase of the music signal (except for signals in the tape loop) to cater for software which has been engineered with reverse polarity at the recording stage. It's desirable for optimum sonic performance to maintain polarity throughout the chain of events, particularly when we are involved in performance of the calibre produced by this amplifier system. The polarity switch can restore dynamics and transient performance to incorrectly recorded music and, believe me, this happens more than you think.

Rear panel connections provide for standard

Product:	Bryston BP25 & 4BST Amplifier System
Price:	BP25 \$3,339 4BST \$4,299
Weight:	BP25 3.6 kg 4BST Not Stated
Dimensions:	BP25 480 x 440 x 28 mm 4BST Not Stated
Distributor:	Syntec International Pty Ltd 60 Gibbes Street Chatswood, NSW 2067
Telephone:	(02) 417 4700
Facsimile:	(02) 417 6136

RCA inputs and outputs and provide XLR connector facilities for two input products and one output to the power amplifier.

Balanced component connection offers remarkable (in this instance) benefits in the real world, that is playing music, for performance by removing interference caused by cable function. The major benefit is a lowering of the inherent noise floor and the associated enhanced delineation of the music as a result.

However, I should mention that performance of the Bryston duo in unbalanced mode (the majority of my listening) was simply superlative and it's my guess that balanced operation will be relegated to the lofty pursuits of the fringe elements in audio (unless the amplifiers are used in pro applications and there are multiple meters of cabling involved).

Also, the connection facilities fitted to the BP25 would have to rate as the highest quality I've seen!

Moving to the component providing the grunt (power), and the 4BST (ST standing for stereo) power amplifier continues the trend established by its preamplifier partner.

It is a solid superbly built product with an austere appearance and masculine cosmetics courtesy of twin rack handles and rack attachment holes. In essence, I guess, it's a domestic

amplifier product in professional clothing.

The front panel features twin power LEDs and a power switch. The rear panel offers a number of connection and operation facilities. There are gold plated RCA connectors for unbalanced left and right channel preamplifier input and gold plated XLR facilities for balanced connection. A simple switch options either choice. Massive gold plated binding terminals provide for super speaker cable attachment and the unit has a simple switch facility for bridged mono (single channel) operation.

Enough power is certainly not going to be a problem with the 4B's 290 watts per channel available before clipping on a single (favorable) test tone noted on the supplied check-out sheet.

In music situations, useable power output is likely to be less (and more like the 250 watt per channel nominal rating), and the 4B will surely pack one helluva punch if it's required to.

If it's staggering power you want, then the 4B can be used as a single channel amplifier (which means you'll need two for stereo) with a power output of, wait for it, 800 watts (rated) into an 8 ohm load. In this mode the 4B will provide what the more crass of us refer to as a 'grunt-fest'.

Having said that, the unit is so much more than just a watt-making machine. It's a perfect example of engineering refinement, good manners and 'gentlemanly conduct' (referring to the inference of this phrase before it became an example of political incorrectness). Bryston has gone to incredible lengths to push along the music signal while it's being amplified as cleanly as possible. The techniques used to achieve this have been extensively trailed and tested and found true.

Sensible circuitry, well laid out signal paths, careful wiring and super quality components are factors which make for a great amplifier yet to which lip service is all too often paid. Not so with the 4B, and the BP25 for that matter. They are amplifiers with a minimum of compromise and a maximum of functionality.

You often read critiques which extol the virtues or otherwise of an amplifiers performance. They talk about the amplifier's sound quality or character. However, more often than not, deficiencies in an amplifier's performance are being highlighted, where noise, distortion and other gremlins ride piggy back with the music you want to hear and actually compromise the amplifier's operation and what it's trying to achieve.

The better an amplifier is, or in this instance an amplifier system, the fewer gremlins there are messing with the music, the more accurate and involving that music will be. In the case of this Bryston system there's nary a gremlin in sight. Distortion (even in its nastiest forms) is so low it's not even a factor and the noise floor is at the specification of compact disc (and way below the rather sad recorded reality of the medium).

The result is that if you match appropriate CD player and speakers with the system you will hear a fastidious replica of what the performers and musicians (or engineers in some instances) intended you to hear, music, minus the muck.

The price of this Bryston system puts it solidly at the high end of the hi-fi market. But it's performance (which had me searching for superlatives) places it well into the esoteric range and in this contact greatly enhances its 'sonic value for dollar'. You even get a basic remote control with the BP25!

The icing on the Bryston cake is the company's 20 year guarantee and warranty. Faith in your product? You bet!

T E C H N O T A L K

BRYSTON BP25 & 4BST AMPLIFIER SYSTEM

Product Type: Separate high-end pre and power amplifier system

BP25 PREAMPLIFIER

Total Harmonic Distortion: Less than 0.0025% at 3 volts out
 Frequency Range: 20-Hz-20kHz within 0.1dB
 Signal-To-Noise Ratio: 10dB unbalanced, 103dB balanced
 Maximum Output: 15 volts unbalanced, 30 volts balanced
 Sensitivity: 500mV
 Impedance: 4 ohms nominal
 Power Requirement: 125 watts RMS recommended

4BST POWER AMPLIFIER

Power Output: 290 watts per channel at clipping, at 2kHz into 8 ohms
 Intermodulation Distortion: 0.005% or less (SMPTE)
 Harmonic Distortion: 0.00461% or less 20Hz-20kHz
 Signal-To-Noise Ratio: Better than 116dB at rated power 20Hz-20kHz

Built ^{for} Comfort:



The Bryston 7B ST Monoaural Power Amplifier

by Dick Olsher

Where does a solid-state power amp fit in the audio food chain? That's a question every self-respecting loudspeaker in search of a high-calorie meal ought to ask itself. Some amps are shark-like in character: predators waiting to bite off a woofer or two. Others, like Charlie the Tuna, are eager to please. The latter types are likely to drive your speakers to a tweeter-tickling orgasm. But how can you tell? To dis-

cern whether an amp might be friend or foe, it's necessary to examine two areas of performance in which transistor amps normally excel: current delivery and damping factor.

The first question out of a prospective buyer's mouth is usually: "How many warts?" To which I would answer that amps deliver current—not watts. A typical power rating of so many watts into 8 ohms is inadequate to describe an amp's

performance into real-world loads. Power ratings are established on the basis of test bench measurements with a resistor. Even a monkey knows that a voice coil is not purely resistive, but exhibits an inductance component that for an 8" woofer is on the order of 0.5 mH. Then there are complex crossover networks and driver resonances that are excited simultaneously with a music signal, resulting in a major amplifier headache. It has been es-

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Bryston 7B ST Monaural Amp

estimated that the instantaneous power demand of some 8-ohm loads can resemble that of a 1-ohm resistor. That's getting precariously close to short-circuit conditions, and although mass market receivers and amps look good on paper into an 8-ohm load, I guarantee you that they will choke under these conditions. Their power supplies, output devices, and heat sinking aren't up to the task of sourcing in excess of 10 amps of current—which represents 100 watts into a 1-ohm load—even for short periods of time. As a proud owner of a 7B, you'll sleep well at night with the knowledge that the Bryston can deliver 800 watts into a 1-ohm load!

The subject of damping factors has been generally misunderstood by consumer and professional alike. The ratio of the amp's source impedance to that of the load has been used as a figure of merit to gauge an amp's ability to control the transient behavior of a cone. That's really only an

before you jump to the conclusion that these effects are categorically bad, consider that occasionally the result may be synergistic. The amp/load interaction may actually complement or contour the overall balance for the better—much like the action of a tone control. For the record, the 7B's source impedance is well below a tenth of an ohm, which completely eliminates the problem of load interaction.

An audiophile's search for audio nirvana is often frustrated by the naive mixing of components Chinese-menu-style: a class A amp from column A, and a class A speaker from column B. The result is often class D: musical disappointment with a capital D. I firmly believe that many times one component ends up class B and another class A simply because of the particular system context these components are thrown into by a particular reviewer. In some other system, it's quite possible that the relative rankings of these components might be reversed.

The 7B sits on top of Bryston's ST series in terms of power delivery. All ST amplifiers use Bryston's Quad-Complementary output stage that is exceptionally linear while virtually eliminating irritating odd-order harmonic distortion products. The power supply deploys dual custom toroidal power supplies per channel and multiple filter capacitors.

The output stage consists of two amplifier modules, each with its own power supply. There are sixteen power transistors per module for a total of thirty-two devices. The modules may be combined in either of two modes to form a single mono amp. In series mode, the modules are connected in a bridged configuration, which means that the output voltage swing is additive. This mode is recommended for driving loads from 3-to-8 ohms. In parallel mode, the voltage swing is that of a single module, but the current drive is additive. This mode is recommended for driving loads from 1-to-3 ohms. A switch on the back panel allows conversion from one mode to

Being in this business for over 20 years, as Bryston has, counts for a lot in my book. It suggests a network of loyal dealers, satisfied customers, and a mature product line.

issue with poorly designed drivers; the real significance of a low damping factor is in its implication for amp/load interactions. An amp with a high source impedance (usually a consequence of low-feedback designs) will interact with a speaker's impedance to alter the overall frequency response. The magnitude of the effect depends on whether the source impedance is 2.5 or 2 ohms, and on how uneven the speaker's impedance is as a function of frequency. Worse case, 2-to-4 dB response deviations may be introduced by the amp. And yes, 3 dB alterations in the tonal balance are audible enough that even Joe Sixpack should be able to hear them. But

Some of the most musical and enjoyable systems I've heard over the years consisted of fairly modest individual components that harmonized together like angels in heaven.

Being in this business for over twenty years, as Bryston has, counts for a lot in my book. It suggests a network of loyal dealers, satisfied customers, and a mature product line. In addition, Bryston's presence in the pro sound area implies a strong commitment to reliability. Take a look at its standard warranty: twenty years, parts and labor, and shipping one-way. That's a warranty for almost a generation of trouble-free music.

the other, but note that the speaker wiring must also be changed in the process. However, at least with the 3-to-8 ohm loads I auditioned the 7B with (the Chario 1000 Reference, the B&W DM601, and the Sam-adhi Acoustics Rocket), I clearly preferred the parallel mode for its smoother textures, better depth perspective and image focus, and slightly more dynamic presentation.

Both balanced and unbalanced inputs are accepted. The choice may be made with the flick of a switch. Note that I did all of my listening via the unbalanced inputs.

MAY, 1997

MAY, 1997

Although its personality was never offensive nor especially assertive, the Bryston managed nonetheless to leave its imprint on the music. Harmonic textures were portrayed with a distinctly Canadian touch: cool and clear. Imagine a wintry Canadian vista. The air is fresh, and the snow is deep underfoot. You can see for a hundred miles. It almost feels like you could reach out and touch the mountains in the distance. The feel for the music's immediacy was superb, but the balance projected from the lower mids on down was diametrically opposed to that of classic tube sound. I'm thinking here of a Mac 275 or a vintage Marantz. There was none of the romantic glow or warmth that classic glass is famous for. The fire in the Bryston's hearth was subdued. It became obvious to me that its furnace needed some stoking. It was time to alter the system context. So I put on my chef's hat and added tube sound to the mix.

The Presence Audio line stage, one of my favorite line-level preamps, was introduced into the front end. Voilà! Much of the lean and bony character of the lower mids vanished. At last a decent measure of quintessential heart and soul suffused the orchestral power range. The basic point is that almost no amp can be expected to perform optimally by being blindly dropped into an existing system context. Once I was willing to recognize the Bryston's special needs, I was beginning to enjoy its considerable sonic talent.

I was particularly surprised by its level of refinement through the upper octaves. Treble transients were nicely textured and controlled. The grit and hash ubiquitous to transistorized designs were not in evidence here. Neither did I pick up the sort of bright tinge that I've come to associate with odd-order harmonic distortion products. On the other hand, the Bryston's sonic verity at the top of the spectrum leaves bright sounding speakers with no place to hide. This is not a rolled-off and soft-sounding amp, hence care in system building is required to avoid antagonizing a hostile tweeter. I had no trouble, however, with either the B&W DM601 and its metal dome or with the Chario Reference 1000 and its soft dome. In fact, there was considerable synergism between the Bryston and the B&W DM601. It was pure joy to hear the B&W puppies sing

sweetly through the upper mids and presence regions. Violin overtones—a challenge for most amps—were served up with their sheen and sugar content fully intact.

Midrange textures were fairly liquid and smooth; more so when the Presence Audio line stage was added to the chain. The microstructure of the music was very much in evidence. I'm referring to the nuances and modulations in frequency, volume, and time that imbue music with its personality and emotions. Rhythmic drive was unrestrained. Harmonic colors were quite accurate, especially with the Presence Audio preamp. Clarity abounded: the reverb signature of a hall was nicely fleshed out, allowing me to follow transient decay into the noise floor of the recording. Unquestionably, the Bryston not only got my attention but also managed to push my buttons.

Bass performance was every bit as good as I had expected it to be from a high-current drive amp. Bass lines were tightly controlled with the sort of definition most tube amps can only dream about. In particular, detail through the upper bass range was clearly exposed. Reproduction of cello and double bass benefited from the Bryston's ability to delineate detail and timing nuances. *Starker Plays Kodaly* [Delos DE-1015] exploded onto the soundstage with rare intensity. Starker attacks the cello like a man possessed. His visceral string technique came alive in no uncertain terms. Kick drum was reproduced with plenty of punch. The Bryston could really rock 'n' roll with the greatest of ease when pushed hard by the program material.

In matters of spatial definition and image focus, I didn't expect much tube magic, but actually the Bryston did well. It could crisply focus and resolve instrumental outlines, but fell a bit short of 3-D palpability in its portrayal of same. And depth perspective was a bit curtailed.

It's indeed rare for any power amp to successfully blend brawn and finesse. The truth is that high-power amps usually don't have much else going for them. The realities of the marketplace are such that too many times we're faced with a choice between the big and dumb and the sweet and small. Providing it is properly integrated into a system, the Bryston 7B

delivers sledgehammer bass, engaging dynamics, and sweet harmonic textures in one soundly engineered package.

The Bryston is very listenable. But unlike a number of solid-state amps that get there with rolled-off highs and soft textures, the Bryston does it by avoiding irritating distortion products. It's not often that Toobman recommends a solid-state amp. Toobman says: a mandatory audition at this price point. **BT**

MANUFACTURER

Bryston Ltd.
P.O. Box 2170
677 Neal Drive
Peterborough, Ontario
Canada K9J 7Y4
Tel: 705-742-5325
Fax: 705-742-0882

Samples tested: SN 770870 & 770871

DESIGNER

Stuart Taylor
Price: \$4,795/pr.

SPECIFICATIONS

Power output: 500 watts mono into 2 to 8 ohms; 800 watts mono into 1 to 4 ohms.

Power Bandwidth: less than 1 Hz to over 100 kHz

THD & IM Distortion: less than 0.007% from 20 Hz to 20 kHz at 500 watts

Signal to noise ratio: greater than 106 dB below full output

Input sensitivity: 1.0 V for full output, unbalanced input; 2.0 V balanced input

Input impedance: 50 kOhm unbalanced, 20 kOhm balanced

Dimensions: 19"W x 5.25"H x 15.5"D

Weight: 42 pounds

ASSOCIATED EQUIPMENT

Digital front end: Accuphase DP-75 CD Player

Analog Front end: Basis Ovation table w/Graham 1.5T tonearm, Symphonic Line RG-8 Gold cartridge, Arthur Loesch phono preamp (built by J. C. Morrison).

Line Stage: Presence Audio Deluxe, Air Tight ATC-2

Speakers: Chario Reference 1000, B&W DM601, Samadhi Acoustics Rocket.

Speaker Cable: Audio Note SP & SPX

Interconnect: Fadel Art Products IC-15S, Acrotec 8N

ACCESSORIES

Power cords by Marigo Audio Lab,

Marigo Audio Lab Apparition line conditioner,

Seakay Line Rover line conditioner, Coherence

Music system's Electraclear, Ultra Resolution

Technologies Bedrock equipment stand,

Townshend Audio Seismic Sink.

QUÉBEC AUDIO

BRYSTON 4B ST AMPLIFIER



Bryston, the Ontario manufacturer has long been showered with praise by sound professionals for its reliability; they have become a legend. In the early 80's, I had the opportunity to listen to a regular stereo system with the original 4B. In spite of its evident sturdiness, as much mechanical as electrical, and a respectable output power, there was only a hint of finesse missing in this model to make it into the high end category.

While certain manufacturers change models periodically, others rather change the version under the same basic name. The 4B's last version, ST, has been named in tribute to Stewart Taylor, Bryston's head engineer.

First class quality

As soon as the 4B ST comes out of the box, the sturdy casing with its "standard 19 inches" front board displays an impression of solidity and quality. The black glints of the anodized aluminium hide another wonder: the coming of age of the internal circuits. Military material has a reason to be envious. It's sturdily built, and made to last! Two big toroidal transformers and oversized supply parts confirm the impression of quiet strength coming from the internal "double mono" construction. Everything in the 4B ST has been designed for surviving rock tours.

20 years warranty

January 1st 1990, Bryston puts into effect a remarkable warranty program that covers all audio products that have been manufactured and sold by them, no matter when, under the name Bryston. This guarantee covers repairs, parts and labour, as well as

return delivery costs to the original owner or any subsequent owner. This automatic warranty on all construction defects takes effect on the date of manufacture and is good for 20 years! Are there any manufacturers in the world, who are as sure of the quality and durability of their products?

Social classes in high-fidelity?

Amplifiers, even if they have a 20 year guarantee, built with exacting standards to survive "Heavy Metal" tours do not necessarily fit in for domestic use, especially if "Heavy Metal" doesn't meet the buyer's preferences. We assume that material reserved for high end product use, although more fragile, gives us the right to a more refined sound reproduction, more subtle and more defined. This is virtually a question of aristocracy: did Stewart Taylor add a pint of "blue blood" to the latest 4B's incarnation?

The best of the two worlds: listening

My usual system is to use representatives of the old American "aristocracy": a pair of McIntosh MC-30's, which have been rebuilt with the best available components. This pair of old "freaks" usually subdues all other amplifiers heard in my sound studio, especially those with transistors, whatever their power. Only a Threshold in pure class A could get close. Not only has the just unpacked 4B ST allowed itself to make fun of them, but it has also, after a night spent playing the eighth track of "Sheffield/XLO Test and Burn-in CD" added insult to injury by introducing itself into what was their reserved field: the precision of the image and fine definition of the treble.

Everything that goes through the 4B ST is beautiful to hear: the bass has an exemplary balance and firmness, and above all is true. My "standard test" for the definition of

the bass is currently "Hotel California" by the Eagles (Hell Freezes Over, track 6), whereas "The Long Ships" by Enya (Watermark, track 10) shows depth and power. The trebles have a transparency without being surprisingly aggressive. The totality of the tracks "VTL Sampler" 1 and 2 indeed reveals this and even more, the tracks 4 and 5 of "Stereophile Test CD 3". The whole spectrum is combined in the representation of sound images with astonishing realism, so astonishingly truthful that "Secret Story" by Pat Metheny and the latest "Beau Dommage" were listened to without a break from beginning to end.

Another 20 years of aristocracy!

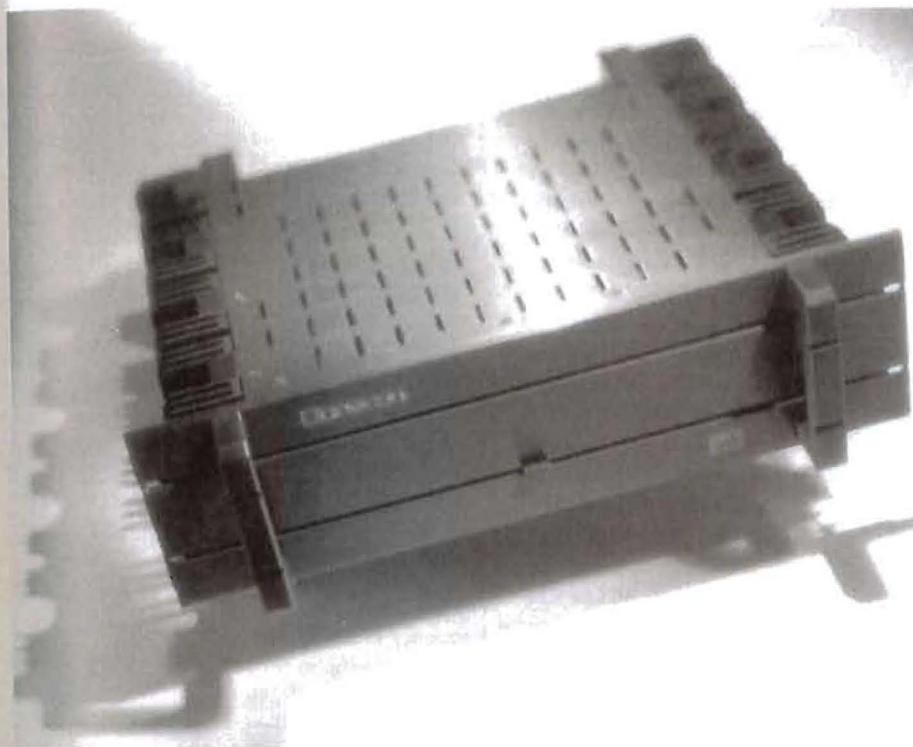
The new "aristocrat" not only shows that he has "blue blood", but also that he has muscle: 250W/channel driven by 8 ohms and 400W/channel driven by 4 ohms can wake anything that sleeps. It is also fitted with normal and balanced inputs which can be switched at will. In case my old McIntosh dies (it's a question of time!), the Bryston 4B ST will, without a doubt, be at the top of the list. It has the same heritage. Anyhow with a retail price of approximately \$2,600., it takes only \$130. per year to get a new aristocrat in the family! In closing, I would like to say that in the field of high fidelity, purchases of real values are rare, but Bryston 4B ST is one of them. Check it out for yourself!

Manufacturer's specifications

- Power: 250W/channel/8 Ω and 400W/channel/4 Ω
- Signal/noise ratio: +106 dB
- Sensitivity: 1.4V
- Dimensions: 19 x 5.25 x 15.5 inches
- Weight: 18 kg.
- Price: \$2,595.
- Guarantee: 20 years parts and labour
- Distributor: Bryston Canada

EDWARD J. FOSTER

BRYSTON 4B ST AMPLIFIER



It's been almost two years since a Bryston product crossed my bench. That one (the BP 20 preamp, *Audio*, July 1994) was such a pleasure that I looked forward to getting my hands on the 4B ST power amplifier. Bryston's "ST" line of power amps strikes me as quite sensible. The 4B ST is a bridgeable stereo amp delivering 250 watts per channel into 8 ohms in stereo or 800 watts, bridged. The 3B ST is a similar amp, with an 8-ohm stereo rating of 120 watts per channel. The 7B ST has two amp modules but is designed for mono-phononic use; the two modules can be "bridged" to double the output voltage into relatively high-impedance loads (3 to 8 ohms) or operated in parallel to double the current into relatively low-impedance loads (1 to 3 ohms). Interesting concept. The 8B ST is a four-channel amp that is otherwise similar to the 3B ST; it can be configured to drive four, three, or two speakers. All of

these amps are available in THX versions, which differ only in having 12-volt trigger inputs for remote turn-on; the 4B ST that I tested was the standard version.

Technically, Bryston seems to have done its homework. The 4B ST's topology is classic, with each amplifier module built around eight custom output devices powered by separate positive and negative 85-volt supplies. There are two large toroidal power transformers, one for each channel.

Both unbalanced and balanced inputs are provided, the former via gold-plated RCA phono jacks and the latter through gold-plated connectors that can accept both XLR and ¼-inch stereo phone plugs. All inputs sport fully discrete active buffers. A slide switch centered between the jack pairs selects balanced or unbalanced input. The output terminals are gold-plated multiway binding posts set on standard ¾-inch centers and outfitted with wire holes large

enough for heavy-gauge wire. Another slide switch, between the RCA jacks and the output terminals, selects bridged or stereo operation. In bridged mode, either channel 1 input is used, and the load is connected between the red output terminals. (The wiring details are clearly indicated on the back panel.) Between the output terminals and the combination IEC line-cord jack and fuse holder is a toggle switch for lifting the signal-ground connections to the chassis. Lifting the grounds breaks the hum-pickup loop that might occur through a common power ground when you're using multiple amplifiers, yet it still permits the chassis to be grounded for safety. Good thinking!

The front panel is straightforward: solid handles near each end, a centrally located power button, and two multicolor LEDs above the power switch. The LEDs indicate normal operation (green), the approach of clipping in each channel (yellow), and clipping (red). They also flash red momentarily on power-up and may glow red if signal is present as the supply voltages collapse when powering down; neither condition is cause for concern.

The ¼-inch black-anodized aluminum panel is drilled for rack mounting. When not rack-mounted, the 4B ST sits on feet that provide a bit more than ½ inch of clearance above the supporting shelf. Black-anodized heat sinks along each side provide adequate cooling without a noisy fan. The chassis is designed so that you can temporarily rest this hefty amp on its backside without having to disconnect the wiring. Nice thought!

Measurements

With continuous signals, the Bryston 4B ST ran warm (but not dangerously hot) during my bench tests but remained a good

Rated Output: Stereo, 250 watts per channel into 8 ohms or 400 watts per channel into 4 ohms; bridge mono 800 watts into 8 ohms.

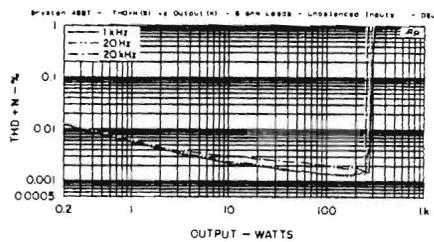
Dimensions: 19 in. W x 5¼ in. H x 15½ in. D (48.3 cm x 13.3 cm x 39.4 cm).

Weight: 42 lbs. (19 kg).

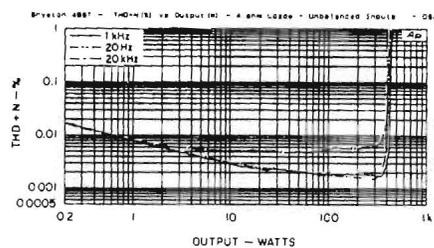
Price: \$2,095; THX version, \$2,295.

Company Address: 677 Neal Drive, Box 2170, Peterborough, Ontario Canada K9J7Y4. (705) 742-5325

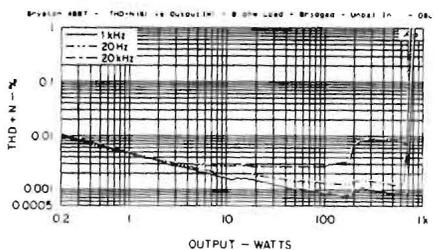
Photo: Michael Green



A



B



C

Fig. 1—THD + N vs. output in stereo with 8-ohm loads (A), in stereo with 4-ohm loads (B), and in bridged mode with 8-ohm load (C).

bit cooler in normal operation. Perhaps the heat was due to the high supply voltages. Theoretically, an amplifier whose power supply delivers +85 and -85 volts could deliver 450 watts into 8-ohm loads, almost 2.6 dB above Bryston's 250-watt rating. What the 4B ST actually delivered on the bench was 300 watts (24.8 dBW) of continuous power into 8 ohms at clipping and 0.1 dB more (310 watts) with the IHF dynamic-headroom tone burst—more than it's rated for but still less than theory would suggest. That's not a complaint; the data simply suggests that Bryston uses a rather stiff power supply, which many people consider to be an advantage.

I measured total harmonic distortion plus noise (THD + N) as a function of output for stereo operation with 8-ohm loads, stereo operation with 4-ohm loads, and bridged mono operation with an 8-ohm

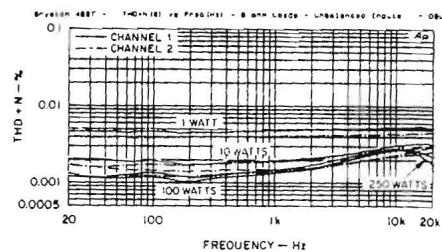
load (Fig. 1). The data was taken at 20 Hz, 1 kHz, and 20 kHz. I used the unbalanced inputs for these measurements, since that is how most people will use the 4B ST. With 8-ohm loads, both channels driven, I could keep my AC line at the standard 120 volts. With 4-ohm loads, I was unable to hold the line at 120 volts when both channels were driven to rated output. I therefore made the 4-ohm stereo test with only one channel driven, justified by the fact that the 4B ST has separate supplies for each channel. Bridged operation into 8 ohms, while technically similar to 4-ohm stereo operation, makes it impossible to drive only one channel at a time. Thus, as the amplifier approached clipping in this mode, the line dropped to approximately 110 volts.

The results for dynamic output power and headroom listed in "Measured Data" were obtained with both channels driven and with my meter reading an average of 120 volts across the AC line (the meter fluctuates a bit while an amplifier is being pulsed). Since the 4B ST was being driven to full power only part of the time in this test, I could maintain 120 volts at lower output settings of my vari-

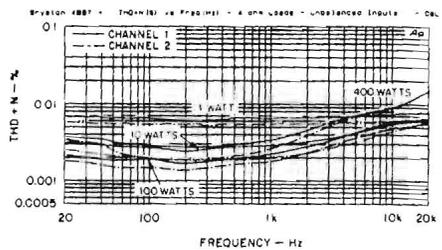
able-voltage transformer than I had been able to use in the sine-wave tests. Therefore, I also took data using the same transformer settings that had been needed to maintain 120 volts at the sine-wave clipping point (or the maximum I could manage when 120 volts couldn't be maintained). At these

THE SOUND WAS EFFORTLESS AT ALL LISTENING LEVELS, WITH TIGHT BASS AND BRIGHT, CLEAN TREBLE.

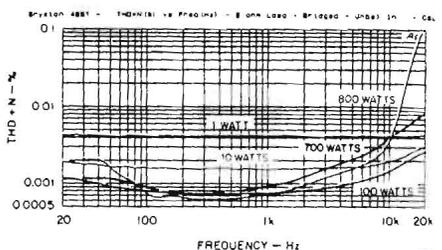
settings, my line meter naturally read more than 120 volts, and the numbers came out 0.5 to 1 dB better than those listed in "Measured Data."



A



B



C

Fig. 2—THD + N vs. frequency in stereo with 8-ohm loads (A), in stereo with 4-ohm loads (B), and in bridged mode with 8-ohm load (C).

Measurements of THD + N versus frequency (Fig. 2) were made at output levels of 1 watt, 10 watts, 100 watts, and rated power. The last, of course, varied with conditions: 250 watts per channel in stereo with 8-ohm loads, 400 watts per channel in stereo with 4-ohm loads, and 800 watts for bridged operation into 8 ohms. Driving the amplifier in bridged mode to 800 watts with an 8-ohm load dropped the AC line well below the 120-volt standard. I therefore repeated the measurement, this time at 700 watts; calculations showed that the amplifier's distortion at this power level with the available line voltage would be the same as its distortion at 800 watts with a true 120-volt line. The worst-case THD + N is listed in "Measured Data" for each operating configuration at 10 watts and at rated output. I have also reported the bridged 700-watt data, since it is probably more

BRYSTON • 64 • Critical Acclaim

typical of what the distortion at rated power would have been had I been able to maintain a 120-volt line.

If you compare these distortion figures with those of many similarly rated amplifiers, you'll see that Bryston has placed prime emphasis on performance. Even the worst-case THD + N is vanishingly low under all conditions, and the 1-watt curves in Fig. 2 (which stand above the others over most of the frequency range) reflect residual noise rather than distortion.

The noise is unusually low for an amplifier that combines such high power with reasonably high gain. On an A-weighted basis, worst-case output noise was a minuscule -93.6 dBW when the unbalanced inputs were used and negligibly worse with the balanced input. When referenced to rated output power, A-weighted signal-to-noise ratios ran from 116.3 dB (balanced input, stereo) to a whopping 123.5 dB (unbalanced input, bridged).

Figure 3 shows third-octave noise power (in dBW) versus frequency for the worst-case operating mode, 8-ohm stereo operation with balanced input. Obviously, the 4B ST is outfitted with excellent power-supply filters: Note the relative absence of components at 120 Hz and its harmonics. The

components that do appear are based on 60 Hz and its odd harmonics, suggesting that the components are caused by minute amounts of magnetic flux leakage from the power transformers (even toroids aren't perfect) or from the power-line wiring. In any event, since the very worst noise level (channel 1 at 60 Hz) is a mere -94.3 dBW, hum should certainly be inaudible. Because my setup in the lab is designed to avoid ground loops, it made little difference whether I made this measurement with the signal ground connected to the chassis or lifted from it. In normal use, you may well find the ability to separate the signal and chassis grounds quite beneficial.

Figure 4 shows frequency response with 8-ohm loads. In stereo mode, only the channel 1 data is shown, since the results for channel 2 were identical; channel balance was as near perfect as it is possible to document. It's clear that the Bryston 4B ST is a wideband design: Its high-frequency -3 dB points approach 200 kHz in stereo and 130 kHz in bridged operation, where the rolloffs of both channels combine. At the low end, the -3 dB point is far below 10 Hz,

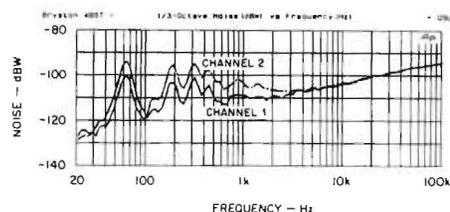


Fig. 3—Noise spectrum, worst case (stereo mode, balanced input).

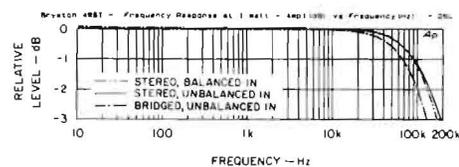


Fig. 4—Frequency response.

the limit of the measurement; in the most important range, 20 Hz to 20 kHz, response is dead flat.

Channel separation was a perfectly adequate 70 dB, in both directions, from 20 Hz to 1 kHz; it was 65 dB or better at 4 kHz and better than 60 dB at 8 kHz. Input/output phase error was less than 5° at 10 kHz and less than 10° at 20 kHz. Input impedance was relatively high for a power amp, almost 50 kilohms at the unbalanced input; this should present no problems for any preamp. Damping factor was a solid 600 at 50 Hz, and output impedance remained relatively low across the frequency band (180 milliohms at 20 kHz).

Use and Listening Tests

With only one 4B ST at my disposal, I confined my auditioning to the stereo mode, using the unbalanced inputs. My program sources were a variety of CDs and a few DATs that I had recorded live. Again and again, I heard an effortless quality at all listening levels and a clean, tight bass (especially noticeable in piano recordings) coupled with a bright high end that had nary a trace of frizziness. This is definitely a golden-ear amplifier at a silver-ear price. It's so solidly built, it carries a 20-year warranty! It's technically impressive, sonically superb, and a top value. I find it easy to recommend the Bryston 4B ST with enthusiasm and would love to keep it hard at work in my reference system. Pair it with a BP 20 preamp, and you'll have a system to drool over. A

MEASURED DATA

Output Power at Clipping (1% THD at 1 kHz): Into 8 ohms, 300 watts (24.8 dBW) per channel, both channels driven; into 4 ohms, 440 watts (26.4 dBW) per channel, one channel driven (see text); bridged, into 8 ohms, 820 watts (29.1 dBW).

Dynamic Output Power, All Channels Driven: Into 8 ohms, 310 watts per channel (24.9 dBW); into 4 ohms, 525 watts per channel (27.2 dBW); into 2 ohms, 710 watts per channel (28.0 dBW); bridged, into 8 ohms, 1,000 watts (30.0 dBW).

Frequency Response: Stereo, unbalanced input, 20 Hz to 20 kHz, +0, -0.05 dB, with -3 dB points below 10 Hz and at 195 kHz; stereo, balanced input, 20 Hz to 20 kHz, +0, -0.01 dB, with -3 dB points below 10 Hz and at 174 kHz; bridged, 20 Hz to 20 kHz, +0, -0.1 dB, with -3 dB points below 10 Hz at 129 kHz.

Dynamic Headroom: Stereo, 0.9 dB re 8-ohm rates power and 1.2 dB re 4-ohm rated power; bridged mode, 1.0 dB re 8-ohm rated power.

THD + N, 20 Hz to 20 kHz, at Rated Output: Stereo, less than 0.0033% into 8 ohms and less than 0.0158% into 4 ohms; bridged, into 8 ohms, less than 0.130% at rated output (see text) and less than 0.0058% at 700 watts.

THD + N, 20 Hz to 20 kHz, at 10 Watts Out: Stereo, less than 0.0035% into 8 ohms and less than 0.0063% into 4 ohms; bridged, less than 0.0032% into 8 ohms.

Sensitivity: Stereo, unbalanced input, 96.6 mV for 0-dBW output and 1.53V for rated output into 8 ohms; stereo, balanced input, 193.0 mV for 0-dBW output and 3.05 V for rated 8-ohm output; bridged, unbalanced input, 97.0 mV for 0-dBW output and 2.74 V for rated 8-ohm output.

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BRYSTON • 65 • Critical Acclaim



**BASIC
BLACK THE
BRYSTON
3BST
AMPLIFIER** WAYNE
GARCIA

The Bryston 3B-ST is one of those audio products that is so inherently good at what it's supposed to do—letting us enjoy music—that I fear many dyed-in-the-wool audio junkies will never even audition it. It doesn't cost tens of thousand of dollars. It's not big and beefy and impressive looking. Nor is it sexy or exotic. It won't perform one death-defying audio feat after another—"Step right up, ladies and gents, and you will hear, for the first time ever in the history of high-end audio, the subway cars traveling in a north-south pattern under London's Kingsway Hall!" No, it won't impress your audiophile buddies, and it certainly won't

gain you brownie points in the component-of-the-month club (a 3-series amplifier has been part of the Bryston lineup for some twenty-odd years). Yet here is a product that, at \$1,495, is affordable, extremely well-built, easy to use, and powerful enough (120 watts/channel) to drive almost any speaker one might mate with it. It comes with a twenty-year transferable warranty. It will give to whoever chooses to take it home lots and lots of musical pleasure, and really is, for regular humans, about all the amp most of us will ever need.

Like the venerable Vandersteen 2CE, the Bryston 3B-ST could best be described by the old adage "better than the sum of its parts." Indeed, over the years I've experi-

enced components that, although they may not excel in their ability to soundstage or render a sense of depth, get the basics of tonality and coherence so very right that they are among the most convincing, involving, and present I've heard (like the classic Spendor BC-1 loudspeaker, or for that matter, many of my favorite mono records.) Conversely, there are components that do excel in one or many areas of the audio check-list that don't come close to engaging our emotions in the music—for this listener the highly-touted BEL 1001 Mk II exemplifies such a component.

Now, although they've always been workhorses and a "good value" (that's sort of like the euphemism "cute personality"),

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earlier Brystons were distinctly solid-state, sort of the Schwarzeneggers of the power amp world, with all the good and bad that term implies—robust and reliable, efficient, clean and crisp with thunderous bass but also with some of the attendant crudities such as graininess, dryness, and an electronic edginess. Few audiophiles would take one home to meet mother. The ST series is a different breed altogether.

The 3B-ST—the ST stands for Stuart Taylor, the man largely responsible, along with Chris Russell, for the development of this design—has been in production since March, 1995, and was a direct result of Bryston's first attempt at building a multi-channel amplifier (by essentially sticking two 3B-NRBs, the then current model, onto one chassis.) Realizing that they'd merely stepped laterally instead of forward, Russell and Taylor set about rethinking what they wanted from an amplifier. They began by

...earlier Brystons were distinctly solid-state...robust and reliable, efficient, clean and crisp with thunderous bass—but...Few audiophiles would take one home to meet mother.

further improving on the modular construction of the NRB series, (where they had eliminated the wiring harness associated with the power supplies, and instead decided to incorporate the power supply into the amp's main circuitry). Relocation of the power transformers to minimize and mutually cancel their magnetic fields resulted in a further 8dB improvement in signal to noise ratio over the NRB. They then redesigned the amp circuit path itself. Through further simplification, and the elimination of high-impedance pathways on the printed circuit boards, Taylor and Russell achieved a reduction of 6dB in distortion—cut it by half—especially at the high frequencies.

This new thinking, and the measurable gains in lowered noise, have led to audible improvements in all ST-amps. The 3B-ST is an accurate, neutral (those are *good* qualities) device that projects the music against a background of deep black.

Listen, for example, to the delightful *Tarentelle* [Harmonia Mundi HM 379]. The Atrium Musica de Madrid plays, with great wit and beauty, an amazing array of instruments on these early-music dance hits. And the different tonal and textural qualities of the guitar, viol de gamba, various wooden flutes, organ, clavichord, tambourine, triangle, drums, etc., have been captured by the Harmonia Mundi engineers with all of their distinctive nuances, sizes, shapes, and materials intact. Also captured is the sheer joy the musicians of the Atrium Musica took in playing this unusual music together. The 3B-ST allows all this joyousness to be communicated with a natural, unforced ease. At times it may slightly warm up or round things out—a touch of warmth is the most consistent additive of the amplifier—and, although it tips the tonal balance to the darker side of neutral (unlike say, the Pass Labs Aleph 3, my current reference amplifier, or many of the classic pieces from Audio Research), that quality is far from offensive.

This music also demonstrates one crucial area in which the 3B-ST excels: pace and dynamics. In order to evoke the hurdy-gurdy frenzy whipped up by a number of these tunes the amplifier must be quick and nimble. The Bryston kept up with the astonishing variety of tonal, textual, and dynamic twists and turns that make this record so much fun.

These great middle-age dance tunes inspired me to pull out another classic recording of gypsy music, *Manitas de Platas' Guitarra Flamenco* [Vanguard VSD 79203]. The Andalusian roots of this moving, earthy music were conveyed through the Bryston with great beauty, poetry, and sensuality. The spidery, sometimes brooding, always virtuosic guitar playing of "Silver Hands"—and on the third track, "Tarantas," the mournful singing of José Reyes conjures images of olive-skinned, black-haired men and women in smoky cave-like taverns drinking wine and living a life far removed from our workaholic world.

Continuing the Spanish theme, I played the Classic Records CD reissue of the magnificent Decca *España!* [CSCD-6006-]. Here, Argenta leads the London Symphony Orchestra through a variety of saffron-flavored orchestral showpieces (see Michael Gray's review on page 123) with great rhythmic energy and vibrancy. The space carved out by the Bryston—by the way, it

Manufacturer's Information

Manufacturer

Bryston
P.O. Box 2170
Peterborough, Ontario
Canada K9J 7Y4
Tel: 705-742-5325
Fax: 705-742-0882

Designers: Stuart Taylor and Chris Russell
Price: \$1,495
Warranty: 20 years, transferable

Specifications

Power Output: 120 watts/channel (8ohms), 200 (4 ohms), 400(bridged, 8 ohms)
Distortion: Less than 0.007% from 20Hz to 20kHz at 120 watts, 1M or THD
Damping Factor: Over 500 at 20Hz, ref. 8 ohms
Noise: >106dB
Input Impedance: 20k balanced
Inputs: Balanced and single-ended
Dimensions (inches): 5.25H x 19W x 9D
Weight: 22 lbs

Associated Equipment

Analog Front End: Voyd Plus turntable, Wheaton Triplanar IV arm, Van den Hul Grasshopper cartridge
Digital Front End: Thera Pro basic IIIa DAC and Data basic II Transport
Electronics: Audible Illusions Modulus 3 preamp, Pass Labs Aleph 3, and Sonic Frontiers SFS-40 amplifiers
Speakers: Swans Allure, Wilson WITT, Metaphor 2 revised
Cables and Interconnects: Nirvana and Empirical Design digital, interconnects and speaker cables
Accessories: MIT Z Center, Stabilizer, Iso Duo, and cords; ESP Power Cords, Crosby/Entec Substation; A.R.T. Pucks; Townshend Audio Seismic Sinks

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will convey, quite convincingly, the acoustic spaces of different recordings—is big, dramatic, and most importantly, plants the musicians and their instruments solidly between the speakers with weight and volume.

Shifting musical gears, I played two of the finest—but quite different in mood and feel—(Capitol) Sinatra records, *Only The Lonely* [SW 1053], and *Songs For Swingin' Lovers!* [W 653]. Thematic records like these create a very specific atmosphere and feeling. *Swingin' Lovers!*, for example, is all uptempo, cool, light and Martini-dry. *Only The Lonely*, on the other hand, is amber colored, definitely a Scotch or Bourbon album. The final track on the latter, "One For My Baby," begins with a distant saloon piano. Sinatra sounds so weary it seems as if he can barely get the words out. At the end of the title phrase the word "baby" disappears into the air like a whisp of cigarette smoke. When he sings, "I'm feelin' so bad, can't you make the music easy and sad," the



Bryston delivers the mood so well that you want to go put your arm around the guys shoulder and comfort him. It gave me chills.

Although the Bryston is highly satisfying musically, there are a few colorations I should point to that keep it out of the world-class category. In addition to the added warmth that I noted earlier, there is also a slight grain—call it black velvet or charcoal—that is somewhat soft and powdery (not to say, tube-like) in the texture it adds to the signal. Those qualities, along with a slight lack of refinement and low-level resolution, are about the only quibbles I have with this amp.

So, the 3B-ST isn't perfect. (But then, what is?) It won't help you lose weight, have a better sex life, or become fabulously wealthy and beautiful. But based on this listener's experience—the 3B-ST sets a new benchmark for "entry-level" high performance in a power amp. Unless you've got the needle in way deep—buy one, forget about it, and live happily ever after. 

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MAY 1996





Bryston 3B ST Amplifier

**Bryston 3B ST
Power Amplifier
Sugg. Retail: \$1795**

**Manufacturer:
Bryston Limited
P.O. Box 2170, 677 Neal Drive
Peterborough, Ont. K9J 7Y4
(705) 742-5325 FAX 742-0882**

A company that takes a rather low-key approach to product introductions or updates, *Bryston* has recently brought its *ST* series of amplifiers into the market with little fanfare. The *ST* designation is tribute to the man who refined the basic circuitry of these Chris-Russell designed amps, Stuart Taylor. Having identified a number of potential areas of improvement while developing the multi-channel *8B* model, Stuart has subsequently incorporated these into the full amplifier line. The one exception is the *2B*, which by its modular nature is less amenable to such changes, and as a lower-powered (50 wpc) model with fewer power transistors has been regarded as having less need (nor physical space) for such changes.

According to a new brochure, the "ST Series amplifiers incorporate the use of an innovative gain stage topology which yields a substantially lower noise floor through the use of low-impedance pathways within the amplifier. This same approach also has strong advantages in reducing the overall distortion performance. Bryston's computer controlled distortion analyzers confirm Intermodulation Distortion levels less than 10 parts per million (Below 0.0009%) are typical

for this new circuitry."

Of course, the *3B ST* is a completely dual-mono design, with two large toroidal transformers stacked so that their magnetic fields cancel to minimize noise generation, and "multiple filter capacitors per channel, rather than single pairs of larger filter cans. This allows improved high frequency response and reduces overall losses in the supply."

Other *ST* changes include a rationalization of input levels, so



that the balanced input does not produce 6 dB higher output level; as well, when an amplifier is used in bridged mode, its gain is identical to that when operated in stereo. These changes have been made so that the various models are more easily compatible when used in home theatre systems and professional installations.

Rated at 120 watts per channel, it comes with an individual measurement sheet listing distortion, power and noise figures. Having sets of these for three generations of *3B*, I was able to make some interesting comparisons, particularly between the *ST* and *NRB* models. These should, of course, be taken in the light of an understanding that steady-state distortion measurements do not tell all, and can be made lower at

the expense of increasing dynamic distortions which are very difficult to quantify.

That said, it is worth noting that none of the *3Bs* reaches the figure quoted above from the brochure, 0.0009%. The *ST* boasts 0.00149% IM (which is close), while the *NRB* manages 0.00293%, while the previous *3B* is a hair higher at 0.003%. Frankly I don't think these (nor also the THD figures) are all that significant, though very impressive. If there are significant progressive improvements in sound quality, it would be hard to attribute them to triple-zero increments of IM or THD.

Of more importance to the ear are power and noise measurements. Here we see a progression from 137 watts at clipping to 142.1 (*NRB*) to the *ST*'s 151 watts. But that has less effect on dynamic range (less than 1 dB, in fact) than the noise measurements. Over three generations the *3B* S/N ratio has gone from 100 dB below its rated output to 115 dB (the *NRB* was -105), and the significance of these 15 dB cannot be over-emphasized. To put it in perspective, a 10 dB level increase is an apparent doubling of sound level, and a tripling of power output. Not even the best current digital systems can achieve even 100 dB (see our feature, *Squeezing The Lemon Again*). A noise floor of 115 dB means you can put your ear to the speaker (and I did) and hear nothing, no hiss, hum, buzz or burble, if the rest of the electronic chain is similarly quiet.

It also means that the kind of noise and distortion (and at these low levels they are almost the same, the main difference being that noise obscures low-level de-

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tail while distortion rides on it dynamically) we expect in electronic music reproduction is absent to an astonishingly greater degree than found in other amplifiers. Other components can achieve close to 100 dB, and noise in a system tends to be cumulative, amplified with the signal at each gain stage. The buck stops at the amplifier stage with its own inherent noise, and it will faithfully amplify and reproduce all the noise that gets to it. This is also a good reason to seek the benefit of the common-mode noise reduction provided by balanced cables.

Inefficient speakers will push the noise floor of an inferior amplifier down, while very sensitive ones will show up its failings. Though it is current orthodoxy to pair very efficient speakers with single-ended tube designs of low wattage, which usually have mediocre noise figures, it makes more sense to employ a very quiet amplifier, so that your 100-dB-sensitivity speakers won't keep hissing at you. Of course, the best way to realize 115 dB of SN/Ratio as dynamic range is to use speakers that have this kind of sensitivity and can play at 115 dB.

And we haven't talked about sources yet. It could be argued that with a cumulative noise floor of only 80-to-90 dB at the amplifier input, any greater S/N ratio in the amplifier is irrelevant, but I think that the low-level distortion components inherent in an amplifier that has a poorer-than-100-dB noise floor become a factor.

Certainly this is the most logical explanation for the quite unobvious sonic improvement when the *ST* amp was substituted for the *NRB*. Though the noise floor in my listening room is quite low, just as one can hear below the noise floor, I could hear into the music more with the *3B ST*, and layers of detail became apparent as veils of distortion/noise disappeared. The soundstage also moved back behind the speakers and had more sense of graduated depth, suggesting there was more than the elimination of noise involved. My guess is that it's transient distortions which

ride the envelope of low-level complex musical signals, and which can't easily be measured as THD or IM, but do appear in noise figures. These distortion components can be power-supply leakage that modulates the audio, as well as noise generated in the circuitry addressed in the *ST* modifications.

Certainly the sonic improvements can be described as much in terms of absence than in relation to additive improvements: less noise, less distortion, less veiling. I could hear into the musical performance in a way that wasn't possible with most other amplifiers, including previous *Brystons*.

The other noticeable change in the *3B ST* was in the bass. There seemed to be a little less of it until I realized that it was there, but better controlled and clearly more specific in pitch. This effect was very similar to (but more subtle than) the comparisons I did (through the *ST*) between our digital and analog master tapes of the upcoming *Ian Sadler* organ CD. The analog bass sounded a little fuller and richer, but this was largely due to an increase in harmonic distortion, this becoming apparent when the digital's more focused and timbrally accurate bass was heard. Though THD and IM figures are far too low in both *NRB* and *ST* amps to attribute this heard effect to these, again, transient distortion may well be a factor.

The other perceived part of the *ST* bass sound was its control, the woofers in my speakers being started and stopped in a way reminiscent of the powerhouse *7B* monoblocks' control. Clearly the damping factor delivered to the speaker is much higher than that of the *NRB*, something which should be most clearly heard by owners of ported speakers.

In the weeks I've been listening to this amplifier I've talked to others who've heard it in various circumstances, simply because I felt uneasy at the magnitude of the improvements I'd been hearing. It's not too often that I get to directly compare an amplifier with its predecessor, and am inclined to think such refinements

are usually incremental. Without offering a judgement, I asked a *Bryston* dealer, a sales rep (for other competing products), some of our writers, and various friends who knew my system fairly well and might notice a change for better or for worse, "what do you hear?"

I was surprised at the near unanimity. Some were surprised when the *ST* amps were compared with audiophile products at several times the price, but all commented on the aspects of soundstaging and bass control, as well as greater detail and openness that I've described above. One of our writers (and I'll let him reveal himself) immediately (well, not quite *immediately*, but after an hour of intense listening) had to have a *3B ST*. No previous amplifier, including the *NRB* series, and none other more exotic amplification devices, had seduced him over a decade. But as we listened to those audiophile icons we use to make such judgements (mostly LP, I might note), he kept grinning and saying things like, "Gee, I never heard that harmony back there..." or, "that viola entry was late." A little Joni Mitchell, maybe some Gus Mahler, some Audio Ideas outdoor sounds and *Debussy Préludes*, and he was a goner.

Me too, I'm afraid. My recordings start via *ST* (Stuart Taylor's *BMP-2* microphone preamplifier) and will end with the *3B ST*. Listening to the masters for our organ CD on the same day as I recorded them and heard to the organ itself in the church convinced me that *Bryston* has provided a new level of accuracy in audio reproduction. As our tube amplifier reviews in this issue suggest, this may not be what everyone wants, but it's sure nice to know that you can have it, especially when the price is so reasonable.

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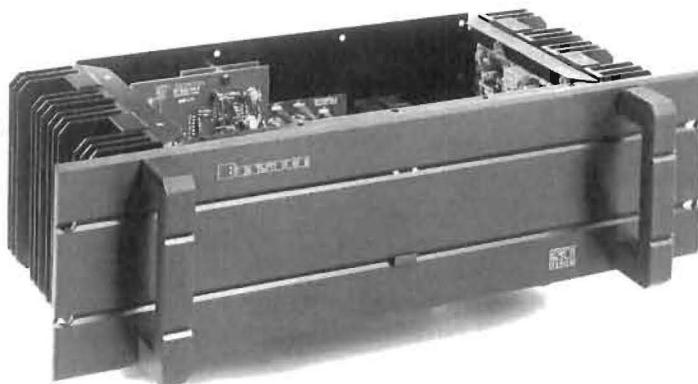
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Authorized reprint of
The Inner Ear Report
Volume 7, #4

85 Moorehouse Drive, Scarborough ON, Canada, M1V 2E2 Tel. (416) 297-7968
Subscriptions are available for \$16.00 U.S. annually (4 issues) in North America

Bryston Amplifier Model 3B ST
Source: Bryston Ltd.
Price: \$1,795.00
Rating: ♪♪♪



Bryston has been around for a long time and, contrary to common belief, the company has been catering to aspiring audiophiles as long as they have been in the professional field. It's been about four years since Bryston brought us new models of the 3B NRB and 4B NRB. With the new models, the designation NRB has been dropped and the a rather visible ST designation depicts the current design. Bryston has always been a rather conservative company who doesn't jump on trendy new technology and the ST series came as somewhat of a surprise to us. However, we know that the company has devoted a lot more energy to research and development of new technologies, the sum total of is the ST Series amplifiers.

Appearance:

Nothing much has changed and at first glance, the amplifier appears to be the same as the previous model. The faceplate is beautifully styled and offers a classic look which almost became Bryston's trademark. A pair of handles remind us of Bryston's world-wide involvement in the pro market. An On/Off switch and two small LEDs blends well into the frontal appearance. The rear of the amplifier accommodates RCA inputs

as well as balanced (XLR) inputs. A small self-cleaning slide switch allows selection of these input. Another switch serves as a ground selector whereby the signal ground can be floated from the chassis ground. Another slide switch allows mono or stereo operation. A detachable power-cord connects to a push/lock holder which accommodates the fuse. A pair of five-way binding posts complete the unit's rear panel. The amplifier weighs twenty-two pounds and measures 19 x 51/4 x 9 inches.

Technology:

The 3B-ST is made up of two amplifier modules which employ four output transistors per channel — eight in all. Two power supplies rated at 55 volts each have been employed. The ST-Series amplifier offers a number of improvements. There is a special buffer-with-gain at the amplifier's input, which addresses a number of important parameters. It isolates the source from the non-linear input impedance of the amplifier's input. These impedances variations are tiny, but still measurable and can add distortion to the input signal. In this design, the signal within the amplifier is conducted at a very low impedance to eliminate most, if not all of the noise

that's added by the amp circuitry. It's done with a split gain function between two low-feedback elements to reduce distortion below that of a single-element path. The power supply differs from the earlier model as well. Special printed circuit boards and connector technology virtually eliminates wiring in the signal path and prevents unit-to-unit variability and signal degradation in cabling. The amplifier circuit has been refined to drop distortions at high frequencies by more than 50%. With the ST-Series, Bryston has achieved new standards for low distortion and a noise floor ten times lower than that of the best digital signals. Our model had been bench tested with following results:

Total harmonic distortion at full power — no more than 0.00556%

Intermodulation distortion (60 Hz to 7kHz) — no more than 0.00168%

Power at clipping (8 ohms) — 152 watts

Noise 20 Hz to 20 kHz, input shorted in dB below rated output — minus 108 dB.

The Sound:

The brand new unit, just out of the box sounded quite good although

it hadn't been burned in by us (Bryston operates each amplifier for one-hundred hours to burn it in). We connected the 3B-ST to the PMCs, reviewed in this issue, tuned in to an FM station and let it play for about three days, before we settled into the first listening session. The most apparent trait — if one could call it that — is the amplifier's knack to resolve inner detail. Whereas the highs sounded extremely smooth with the NRB model, the ST comes across more detailed with a better reach into the upper ranges. The ST's entire midrange area exhibited a more detailed character than the previous NRB model — which lends the amplifier a revealing and resolving quality rarely found in amplifiers in this price category. The mid-bass area of the amplifier has much the same quality as the region above. These characteristics lend the unit an uncanny tonal equilibrium and may be responsible for the excellent presentation of inner detail.

In one of our tests, we connected the amplifier with a pair of our in-house Ethera Vitae loudspeakers. The Etheras have that certain sonic sophistication to correctly manage (play back) characteristics of amplifiers. As well, we have had a 3B-NRB in our studio for about one year so that we can find compatible equip-

ment for components under review. The system is well known to our listening panel and all we had to do, was insert the 3B-ST where previously the NRB had been used. We did just that and this proved to be quite an experience. Whereas the NRB model hinted at some hardness in the upper frequency regions, the ST model remained much more refined, yet utterly revealing. We evaluated the bass and compared it with the NRB; and again, the ST outperformed the earlier model, distinguishing itself with a richer, more robust mid and low bass performance. Finally, and not immediately noticeable, the 3B-ST offered a better defined sound-stage, specifically, the front-to-back information is more apparent and the image depth has improved. This sort of refinement isn't overwhelming and some of our panelists didn't notice it until the more experienced listeners pointed it out. It is possible that the amplifier's subtle revealing quality, the lowered noise floor and the smooth sonic quality made the previously mentioned imaging more apparent.

Synopsis & Commentary:

Bryston is a relatively conservative company which doesn't come up with new "improved" models every year. Traditionally, Bryston will not

touch that which hadn't been successful and hadn't proven its value in the market-place. The new ST series had been quietly developed and its technology had been implemented in the model 8B before the company made the decision to change all of their designs. In other words, the ST series has already been tested in the applications around the globe.

In all of our tests, the 3B-ST exhibited an improvement over the NRB model. The all-round sonic character of the new 3B can be described as refined, very detailed and certainly musical. The older NRB model had been one of our favourite amplifiers in the lower wattage range — if one can call 120 watts "lower wattage". However, the 3B-ST — while not dramatically different — offers improvements not related to dynamics, more power or more refinement in one specific area; it supplies better all-round sound, best described as more sonic sophistication. We feel that the 3B-ST's performance/price ratio is astounding. Add to this, Bryston's twenty year warranty, and there isn't a doubt that the 3B-ST amplifier comes in as a bargain since we are getting a high-resolution amplifier at a relatively low price.

Bryston 5B

Pure pro power pummels (and pleases!) our panelists.

At *Home Theater* magazine, we hear from pro-audio companies all the time; seems they all want to get into home theater. Usually, the line we hear goes something like, "All that consumer hi-fi stuff is OK, but wait till you hear what real professional gear can do." Problem is, I've heard what pro gear can do because I spent way

pro/consumer fence for years, winning the acclaim of both 230-pound, chain-smoking roadies and 145-pound, pipe-smoking audiophiles. Take one look at the 5B's back panel and you'll see the evidence: three decent-quality RCA input jacks, paired with 1/4-inch balanced input jacks. Balanced 1/4-inch inputs are a pro-sound feature if there ever was one, so we didn't bother with them. (You could, if you're handy enough to find or make some 1/4-inch to XLR



Bryston 5B

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A. Al and Brent ranked the Bryston best for natural-sounding dialog.
B. Unless you're handy with a soldering iron or like hanging out at pro audio stores, you won't have much use for the 1/4-inch balanced jacks.

too much of my youth playing in rock bands, and I was always the only guy who could figure out how to set up the P.A. system. Pros all say they care about good sound, but believe me, they care a lot more about having gear that still works even after it's been dropped from a truck and barfed on by an over-indulging audience member. Thus, you haven't read about much pro gear in this magazine because we've tried it and it usually doesn't sound as good as consumer stuff. And all too often, these companies don't even bother to put consumer-friendly RCA jacks on the gear they're trying to pass off as home theater equipment.

Bryston's a very welcome exception to this rule. This company's been successfully straddling the

adapters and you've got one of the few preamp/processors with balanced outputs.) The 5B's available with pro-style rack handles, or without—same price either way.

This amp's also available with or without THX certification; we tried the non-certified version. According to Bryston, the two amps are identical except for the THX logo and the 12-volt trigger input on the THX version's back, which lets you turn on the amp automatically when you connect it to a preamp/processor with a 12-volt output. Oh yeah, the THX version also costs \$200 more. The basic 5B we tried retails for \$2,295, or \$765 per channel. At 120 watts per channel, that's a pretty pricey \$6.37 a watt. Each channel has its own discrete power supply, with three toroidal transformers and

20,000 microfarads of storage capacitance per channel.

With this amp, though, you definitely get what you pay for. The 5B simply blew us away; Al, Terry, and I all liked its sound best overall. Al summed it up in one word: "stunning." And he elaborated further: "great midrange clarity and detail, slightly rolled off in a pleasant way." Terry loved the amp, too, but being used to the very mellow-sounding Denon amp, he perceived the 5B as ever-so-slightly bright. The 5B came after the bright-sounding Acurus and Parasound amps; I heaved a quiet sigh of relief when we listened to a

dialog-intensive section of the *Benny & Joon* laserdisc, and finally heard really natural-sounding voices. Al agreed that the 5B was easily the best amp for dialog.

It seems that with every amp, though, there was one contrarian on the panel, and this time it was Robert. RR didn't really dis the 5B, but he did rank it down near the bottom. All he'd say was that it was "very mellow, with somewhat tubby but very satisfying bass."

We shant say more, except "CHECK IT OUT!!!"

What Do You Think?

In this Face Off, it was very interesting

to discover that amps that sound quite good in stereo do not necessarily sound as good in three-channel mode

My favorite amp was the Bryston, which sounded startlingly good on everything we played through it. The midrange clarity and detail that I heard on music tracks carried over when we switched to laserdiscs, resulting in very natural-sounding dialog. Following the Bryston were the Proceed and Denon amps, which both performed incredibly well on music and movies, although the Denon's dark, mellow sound will obviously not appeal to everybody's taste. I felt the Acurus's bass lacked authority and weight, but when you take its very affordable price into consideration, the 200X3 is a very recommendable amp for home theater use.

The Parasound and Chiro amps lagged behind the other four. Neither sounded good to my ears in three-channel mode, with dialog that seemed unnatural and/or bloated. In stereo, the Parasound fared better, but was far too bright for my taste, while the Chiro sounded murky and spatially indistinct.

—Al Griffin

Listening to these six amps

brought to mind the depiction of the female nude by Western painters over the last five centuries. You've got Van Eyck, Rubens, Manet, Modigliani, and every beret-wearing bum in between, and each of them had a different notion of a good lookin' rack. Some guys like an amp with some flesh on it, others (like me) like 'em lean and cut.

The amp that spun every guy's magneto but mine was the Bryston. Smooth and zaftig, this was the Rubens of the sextet. Its mellow, rounded edges are a taste I've acquired, but I can understand that for some it's the only ride that satisfies. For me, the Denon was the most musical of the bunch. Delivering great attack and articulation "from privy to fundament," this amp also produced the most believable soundstage: unquestionably my first pick. The Chiro was also very coherent top to bottom, and while somewhat forward, exhibited lightening-fast bass. A must-listen, especially at the price. The Proceed, while not inexpensive, also acquitted itself nicely in every area of sonic importance.

While these amps distinguish themselves one from the other, I ultimately suspect that, like other pleasures, one could achieve satisfaction with any and all, once the lights are out and the music is working its magic.

—Robert Ross



What a pleasure to hear so many amplifiers with such refined sound! There was only one that I didn't find to be just downright great, the Proceed AMP3, which sounded dry and constricted to my ear.

I ranked as number five my old friend the Acurus 200X3, for a sound that's brighter and a tiny bit out of tonal balance. But I still love this amp, so for four other units to stand out above it is quite an achievement. Checking in at number four was the Parasound HCA-2003. The Acurus and Parasound sounded almost indistinguishable to me—great impact on explosive sounds but a tiny bit bright and fatiguing.

I ranked as number three the Chiro C-300. A truly fine amp, it exhibited great clarity in both surround and stereo tests. Despite the blind testing conditions, I immediately picked the Denon POA-8300, my current reference amp and second-favorite in this test. The Denon is a real class act—it lacks the brute impact of higher-powered models, but is so clear and uncolored it is pure pleasure to listen to.

To my ears, the clear winner was the Bryston 5B. The characteristic that set this one apart from the pack was how it let the sound breathe so freely. It really opened up our speakers with a clarity the other units couldn't match.

—Terry Landry

I heard a lot of sounds I liked

when listening to these amps, even though they sounded a lot different. I actually had a tougher time ranking these than I did ranking speaker cables last month, because it was for the most part a matter of picking my favorite flavor.

My favorite flavors in this test were vanilla (Bryston), mocha (Denon), wild berry (Chiro), and dark chocolate (Proceed)—I can't really cite a clear standout between them. Maybe I liked the Bryston best, though, because it sounded the smoothest, with the most neutral balance. To me, the Proceed sounded about 98 percent as clean as the Bryston; toss a coin between those two, or just buy the Bryston, which costs less. The Chiro brought a smile to my face every time; it just sounded really right, despite its slight edge. I can't say what I liked so much about it, but given its reasonable price, I can say it's the amp I'd buy. The Denon sounded wonderful on dialog, and really mellow on music.

The cayenne (Acurus) and jalapeño (Parasound) amps were both impressive, but too bright-sounding for me. But I suspect rockers would really dig the Parasound for its killer bass, dynamics, and clarity.

—Brent Butterworth

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Show Me The Power

Bryston 5B & 3B Amplifiers

Each step up in my hometheater system, from the entry-level AV receiver to the excellent Carver AV 505 five-channel amp to the amps under review, represents a move toward greater fidelity, greater control and greater enjoyment. With their sweet tonal character, well-defined midrange, control and transparency throughout the spectrum — as well as enough power to get you off the line quick — the Bryston 3B and 5B provide a hell of a ride, and represent a real step up in my system. The 3B (two channels) runs \$1,565 and the 5B (three channels) \$2,465.

If you kick these babies' tires, you better be wearing steel-toed boots — they're built like tanks. With quarter-inch slotted-steel faceplates, chunky handles and nicely finished heat sinks, these amps cut a clean, confident profile. At 120 watts into 8 ohms (200 watts into 4), they're a very stable power source. They clip only at insanely high and constant levels, well beyond the point of pain. Choose single-ended or balanced inputs. A switch on the back panel even allows the amps to run in mono configuration, doubling their power.

The 3B's two channels drove my rear surrounds, and the 5B's three my front three speakers. In this configuration, these amps possessed a smooth, dimensional, slightly warm balance that was a pleasure to listen to. Voices, both male and female, had a natural timbre and a resonance that lacked the mechanical electronic edge that produces a hyped-up, cold feeling. Though not as full-bodied, refined or extended at either of the frequency extremes as the Krell 300S, the Brystons gave a satisfying account of themselves in all the parameters that define a great amp.

Their transparency made pegging a specific coloration difficult. When wired with the AudioQuest Ruby X3, they seemed a little slow, transient



speeds a bit smeared. With the Synergistic's Synergy home-theater interconnects and speaker wire, however, that blurriness went away. Transients became Formula 1 quick, detail became more coherent and clear. For a great example of this lithe and nimble performance, check out *Toy Story* (Walt Disney home video 6703as). The sonics in this technically miraculous, charming film are spectacular. Surround effects are blended tastefully and seamlessly to the main

ry of stampeding single-digit somethings careening around our loft. The pitter-patter of the little feet is captured naturally, accompanied by joyful shrieks. The orchestra backing up the shenanigans, though well captured timbrally, is a bit foreshortened in depth and space.

Dynamically, both 3B and 5B are lively and when presented with a pedal-to-metal signal, and never fail to leap off the line. My system took on a newfound architecture and stability that allowed the signal to accelerate and decelerate with little lag. In chapter 10 (*Toy Story* again), Sid, the evil toy-torturing kid, blows up a small action figure with an M80. The explosion is sonically and dynamically complex. First there is a snapping sound, followed immediately by a billowing boom that quickly disappears into the noise floor. All these components are presented with a dynamic clarity that gives this passage real presence. Unless you have a huge room and super-inefficient speakers, the Brystons may be all you will ever need.

At a hair over \$1,000 for the combo, the Brystons may prove to be too heavy for the budget. But don't get the idea that they are not a good value—they are. Superb build quality, a 20-year transferable warranty (that's not a typo!), a natural tonal balance and stable power delivery make these amps a fine choice for home-theater enthusiasts who want their next step in upgrading to be the leap that sends them into the world of high end performance.

Greg Petan

Sound 7.7

Warmly balanced, lively and dynamic. Excellent detail without sterility. Bass control is very good; bass performance is outstanding.

Operation 10

Plug em in, set em up, forget em for 20 years. Owner's manual will make this easy and quick.

Value 9

High price is justified by outstanding performance, great build quality and a 20-year warranty from a company that will probably still be around.

channel's active soundstage. Since we are talking toys here, we get a great variety of plastic clicking, wood blocking and metal boinging, sounds that depend on clean transients to convey reality. With the 3B and 5B, that's what you hear.

In imaging, you can't much fault the Bryston combo. In chapter six of *Toy Story*, we get to experience a caval-

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BRYSTON • 75 • Critical Acclaim

Power Amplifier

BRYSTON 8B AND 5B ST

By Peter Aczel
Editor and Publisher, *The Audio Critic*

Regular readers of this journal know that a Bryston power amp is always a completely predictable performer. There are very few audio equipment brands about which I can say they are as good as money in the bank, but Bryston is one of them. Chris Russell's basic amplifier circuit concept, frequently discussed in our pages, has changed very little over the years; in this instance it has undergone some refinements. Chris's engineering associate Stuart Taylor (ST) is recognized as a layout guru, and has come up with entirely new physical layouts for these multichannel amplifiers in order to simplify the signal paths and bring distortion, hum, and noise down to new low levels. Another improvement has to do with what Bryston calls their input-buffer-with-gain, also designed to lower distortion and noise, but certainly not a major change. In all essentials, a Bryston is a Bryston is a Bryston - just specify how many channels you want on one chassis and how much power per channel. Whatever configuration you choose, you'll have an amplifier on the leading edge of the art.

The rated power per channel of the 4-channel 8B ST and 3-channel 5B ST is the same: 120 watts into 8 ohms. My measurements showed 150 watts to be available at extremely low distortion: between -96 and -98dB (barely over 0.001%) at any audio frequency. Into 4 ohms the output did not quite double but reached 225 watts with -90 and -96 dB distortion, the least good figure being the 20 kHz reading (-90 dB = 0.003%). The THD + N curves were entirely noise-dominated and indicated extremely low noise even at only 10 milliwatts output (-61 and -64 dB, depending on the load). With two channels bridged, I measured 400 watts into 8 ohms with distortion that dipped as low as -100 dB at 1 kHz and -93 dB at 20 kHz.

The PowerCube test (see Issue No. 20 pp. 16-17, for a complete explanation and illustrations) painted a pretty decent picture, with 39.5 V into 8 ohms/0° (195 W), quite gently declining voltage into all the purely resistive loads down to 1 ohm, and always slightly higher voltage into the reactive loads than into pure R. Into 1 ohm/0° there was still 22.3 V (497 W) available.



Bryston 5B ST Amp



Bryston 8B ST Amp

(Remember - the PowerCube uses 1 kHz bursts of 20 ms duration, limiting the amplitude at 1% distortion.) For better performance you would have to go to one of the mega-power-supply amplifiers. With two channels bridged, the PowerCube slopes much more steeply, since 2 ohms and 1 ohm loads are not a good match to the bridged output stages, but there are still no anomalies into reactive loads. Into 8 ohms/0° the PowerCube reading was 72.5 V (657 W) in the bridged mode.

Needless to say, the frequency response of each Bryston channel is dead flat. At approximately 1 watt into 8 ohms I measured 0.0 dB deviation from 10 Hz to 2 kHz, -0.04 dB at 20 kHz, and -0.22 dB at 50 kHz. Channel separation as measured at the same output level is OK but not great: 40 dB at 20 kHz, increasing by 6 dB per octave at decreasing frequencies, reaching 64 dB at 1 kHz and 90 dB at 20 kHz.

The obvious comparison that comes to mind here is with the McIntosh MC7106, which is a 6-channel model listed at \$3500.00. The Bryston amps do quite a bit better on the PowerCube, indicating a power supply advantage, but the McIntosh is even lower in distortion (though not at 20 kHz in the bridged mode) and slightly higher in power output before clipping. The noise floor is a very close contest, but in channel separation the McIntosh wins. The Brystons both have balanced (XLR) inputs in addition to the standard RCA phono jacks; the McIntosh does not. On the other hand, the McIntosh is dead silent mechanically and electrically, whereas both Brystons have a slight mechanical hum coming directly from the power transformer, especially when cold, and produce small but audible on/off thumps through the speakers. As for warranties/guarantees, Bryston is way ahead with their free and unconditional 20-year deal, but the McIntosh amp offers more complete electrical protection against failure and abuse. On balance, I'd say the audio purist will lean toward the Brystons and the convenience seeker toward the McIntosh, but overall it's a win-win situation.

In any event, I rate both the Bryston 8B ST and the Bryston 5B ST in the tip-top category of power amps.

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BRYSTON

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Tested samples on loan from manufacturer.

BRYSTON • 76 • Critical Acclaim

Bryston 8B-ST Home Theatre Power Amplifier

Source: *Bryston Ltd.*

Price: \$3,500.00 Cdn.

Rating: 🎵🎵🎵



This company doesn't need much of an introduction to audio consumers, as they have been around for more than twenty years. Regular readers may recall our previous reviews of the Bryston home theatre amplifier, the 5B-ST, which we used to evaluate the Polk and the Tannoy high-end systems. The 8B-ST is another of Bryston's home theatre amplifiers and represents the company's effort to incorporate full-range amplification to two front and two rear channels, part of the requirements of a Dolby Digital (AC-3) setup. The only channel missing here is the (full-range) centre channel. For this, we asked Bryston to supply us with a 120 PowerPac amplifier (look for its evaluation in this issue).

All told, we used 120 watts of amplification into the front left, centre and right channels and 120 watts into the two rear/side channels. A Pioneer Elite SP-99D with Dolby Digital (AC-3) capabilities served as the reamplifier/processor. We used Pioneer's Elite DVD/LD/CD player as the source compo-

nent. We believe this is a no-frills, no-nonsense system with the potential to accommodate loudspeakers in almost all price ranges.

Appearance:

As with all Bryston components, the 8B has the look of authority. A nicely styled faceplate accommodates four LEDs, the On/Off switch and a pair of handles. On the rear, it is logically arranged to provide access to the gold-plated input RCAs for each channel as well as XLR connectors for balanced cables. One switch allows input selection, another switch offers a choice of grounding (floating from the chassis' ground) and still another allows mono/stereo switching. A detachable power cord connects to a push-lock fuse holder. Five-way binding posts complete the rear-panel's appearance.

Technology:

The 8B-ST consists of four modular 3B-ST amplifiers, each with its own +/- 55V power supply as well as four Bryston output devices for a total of sixteen. The unit can be configured to operate two, three or four loudspeakers. Thus, it's possible to achieve four channel operation at 120 watts each, two-channel operation at 120 watts and one channel at 400 watts or two-channel operation at 400 watts each. The amplifier is therefore flexible enough to operate as a powerful stereo amplifier or—at 120 watts of discreet power—a four-channel home theatre amplifier of substance. This 3B-ST-based design offers a

**It's possible
to achieve
four channel
operation at
120 watts
each.**

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number of noteworthy refinements. There is a special buffer-with-gain at the amp's input which isolates the source from the non-linear input signal. A split gain function between two low-feedback elements reduces distortion below that of a single-element path. The signal within the amplifier is conducted at a very low impedance to remove noise added by the amplifier circuitry. This method yields a fifty percent drop in distortion at high frequencies and lowers the noise floor to ten times below that of the best digital signals. Thus, it is an amplifier which not only sounds clean but also delivers great dynamics.

The Sound:

Most of the home theatre systems sold to consumers are based on amplification derived from integrated amplifiers or receivers. These units range from low-powered amps to over one-hundred watts per channel receivers. All professional theatre systems, however, employ separate components which provide the best separation, potentially more power and are the key to professional cinema sound. Bryston has long been a supplier of professional sound systems which are used in theatres and studios around the world. This pro expertise is instantly audible in a setup such as the one we had in-house. We used the 8B-ST connected to the NHT home theatre system as well as a Signet system. Both setups were wonderfully musical when used in a stereophonic or surround sound mode, using a CD player or a Laserdisc. Movie soundtrack information is exemplary; a stunning example of what the industry can offer for those who have acquired an elevated degree of awareness. The information comes across with finesse, resolving the frequency spectrum in its entirety and defining even the smallest soundtrack nuances. We also noticed the amplifier's capability to recreate a solid stage with almost visible boundaries. But what most interests every audiophile is an amplifier's revealing quality—the extraction of inner detail. Audiophiles know what this is all about, but most home theatre fans aren't concerned with this subject. They should be, because there is a lot of nuance recorded on a movie's soundtrack. There is peripheral information which might be off-

screen, there is dialogue on-and off-screen, there are loud passages such as explosions, sometimes along with dialogue etc. Low-level sounds especially are difficult to reproduce and, while a lot of them can be heard faintly most of the time, the clarity is lacking. The 8B-ST captures and reproduces this information uncannily allowing each sound to have its own little space within the listening environment. Needless to say, the dynamics are for we have here a system which 120 watts into four channels—480 watts of power without the centre channel (another 120 watts). The trick is not to boost these dynamics out of proportion with other information and the Bryston does this as you would expect a good audio amplifier would. Let's not forget a movie's musical soundtrack which ranges from pianissimo passages to fortissimo dimensions. Most amplifiers do not handle this type of data very easily. Well folks, the Bryston does it with great proficiency. All in all, the 8B-ST is a superb component which delivers astounding accuracy as well as a wonderful tonal balance.

Synopsis & Commentary:

The 8B-ST was the predecessor and the first amplifier which implemented the aforementioned technology resulting in the current 3B-ST amplifier reviewed in volume 7, #4. We thought that we might mention this, because, since then, the 3B-ST has become a benchmark design highly acclaimed by the audio press around the globe. As with the 3B-ST, the 8B-ST's audible benefits are obvious. It's a fine amplifier when used in the stereophonic mode for music and it's a killer amplifier when used as a home theatre component. The finesse of high-resolution audio combines with the mastery of multi-channel theatre-sound and consummates as a superior component, indeed a cornerstone, for a high-end home theatre setup. In this business, it's not uncommon to find good amplification for either audio or theatre sound, but it is rare to find an amp which caters to both the music lover and the home cinema buff. The Bryston pleases both camps.

**The information
comes across
with finesse,
resolving the
frequency
spectrum in
its entirety.**

BRYSTON

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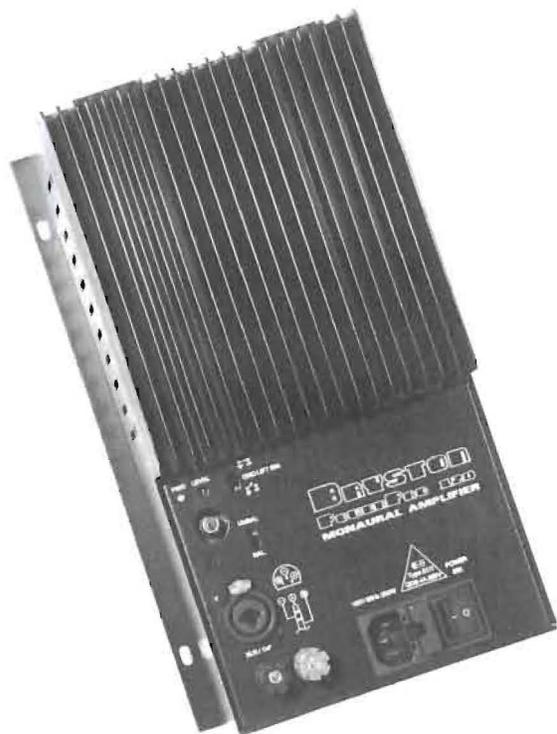
BRYSTON • 78 • Critical Acclaim

Bryston PowerPac 120 Amplifiers

Source: Bryston Ltd.

Price: \$1,780.00/pair Cdn.

Rating: 🎵🎵🎵



What we have here are two monaural Bryston 3B-St amps.

It could be said that these amplifiers are indicative of future developments as the audio/video industry develops into a consolidated media system. What we have here are two monaural Bryston 3B-ST amps which can be mounted on the rear of loudspeakers, or placed on the floor near the speakers. This approach allows for the shortest speaker cable run to the loudspeakers' terminals, but involves long(er) interconnects—really the classic audio component setup. If the amplifiers are mounted on the rear of the loudspeakers, they

add mass to the enclosures—which is an additional benefit, because it helps to diminish vibrations. When your system's front end—the preamplifier and source equipment—is close to the listening position, you'll need long interconnect runs. If, on the other hand, the front-end components are close to, or placed in the middle of the loudspeakers, the chance to pick up interferences from the amps is somewhat greater. It is recommended to place the preamp and source components well away from the power amplifier(s).

Appearance:

The two amplifiers are rather small measuring only 12 inches long, 7 wide and 4 inches high. They weigh about 16 pounds each. The chassis has been designed to accommodate the amplifier's heat-sinks and its mounting arrangement. The units can be mounted almost anywhere, even in small spaces. There is a ground-lift switch, an on/off switch, a level control (29 to 13dB), a fuse and a detachable power cord. RCA and XLR connectors and five-way speaker terminals complete the amplifier's design.

Technology:

Fundamentally, the mono amplifiers are left-and-right-channel components of the popular 3B-ST stereo amplifier and—like the 3B—employ four output transistors in each unit. The power supplies are rated at 55 volts and are designed to eliminate most wiring in the signal path. A special print

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BRYSTON • 79 • Critical Acclaim

ed circuit board and modern connector arrangement provides the shortest means of signal transfer. A special buffer with gain at the amp's input addresses a number of critical elements. It isolates the source from non-linear amp input impedance which can add distortion to the input signal. The signal inside the amplifier is conducted at a very low impedance to eliminate most of the noise added by the amplifier's circuitry. This is accomplished by a split gain function between two low-feedback elements which reduce distortion below that of a single-element path. This and other techniques effectively produce an amplifier which reduces distortions significantly at high frequencies. The end-result is a unit which offers the refinements and resolving capabilities of usually higher-priced—often more powerful—amps. This brings us to . . .

The Sound:

It has always been our opinion that the 3B-ST is Bryston's statement amplifier. It offers refined sonic characteristics in line with much more expensive units. At 120 watts (per channel) the amplifier doesn't offer a lot of slam, but it delivers exemplary finesse with sparkling highs, finely etched inner detail, fully resolved bass and great tonal equilibrium. Similarly the PowerPac 120 amps, have one of the lowest noise floors in the business, which may account for their uncanny image retrieval. In fact, the imaging is a touch better than the 3Bs, particularly in front-to-back layering and focus on instruments and voices. It's speculation on our part, but it may be because of the power supplies' proximity and the elimination of interchannel reaction that we perceived the slightly improved imaging quality of the PP120s. Stunningly clear highs, striking midrange, and robust, well-resolved bass complement the all-round presentation of sound/music.

Synopsis & Commentary:

The idea to connect the amplifier directly to the loudspeaker isn't new and dates back

to the sixties. Monoblock separates have also been on the market for quite some time, but the industry at large ignored the piggy-back method, unfairly so in our opinion. Most monoblocks perform better because of the separated power supplies and components. The PP120's, yes, of course, they are monoblocks—mountable monoblocks, that is. They can be mounted on a wall, in a wall, or on the rear of loudspeakers, making them versatile in applications such as home installations, home theatre setups and as part of multi-amp systems. We have no idea why it took the industry so long to re-introduce this rather efficient method of amplification. Placed out of the way, the amps can't be seen, fulfill the same function as a typical stereo component and offer sonic advantages to boot. It may be of interest to our readers to learn why Bryston came up with the design and what prompted them to offer this rather pro-audio approach to consumers.

Bryston's distributor in the U.K. is also the manufacturer of the PMC brand of loudspeakers and for some time now, they have sold their PMCs with Bryston electronics, which they believe to be a match made in heaven. For convenience, most PMC models offer predrilled mounting threads on the rear panel of their speakers. They registered great success with this arrangement which encouraged Bryston to explore the potential with other loudspeakers. So, if and when you are in the market for a new amplifier, you should consider the PP120s instead of a single amplifier. As always, hearing is believing and you must listen for yourself. The PowerPac 120 amplifiers have our blessing and you may agree with us as soon as you have auditioned them.

AMPLIFIERS

**It has always
been our
opinion that
the 3B-ST is
Bryston's
statement
amplifier**

BRYSTON

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EQUIPMENT REPORTS

CANADIAN EVOLUTION

Larry Greenhill listens to the Bryston BP-25MC preamplifier and the Bryston 3B-ST and 7B-ST power amplifiers

Bryston BP-25MC: full-function, transformer-input, moving-coil preamplifier with remote control for volume, mute, and balance. Inputs: four pairs of RCA unbalanced inputs plus one (optional) phono input, two pairs of balanced female XLR inputs. Outputs: two pairs single-ended on RCA jacks, one pair balanced on XLR jacks, tape output on RCA jacks. Phono section specifications: frequency response: 5Hz–30kHz, ± 0.5 dB. THD: $<0.005\%$, 20Hz–20kHz, at full output. S/N ratio: approximately equivalent to 1k ohm metal-film resistor (thermal noise >85 dB below 600 μ V input, unweighted). Voltage gain at 1kHz: 34dB (additional gain from moving-coil transformer 16.5dB or 22.5dB. Line Section: maximum output: 15V unbalanced, 30V balanced. Distortion: $<0.0025\%$ at 3V output, IM or THD. Sensitivity: 500mV. S/N ratio: 100dB ref. 500mV unbalanced input, 20Hz–20kHz; 103dB ref. 11V balanced input, 20Hz–20kHz. Dimensions: 17" (432mm) W by 1.75" (44.4mm) H by 11" (280mm) D. Weight: 17 lbs (7.5kg). Serial number of unit reviewed: 250063. Price: \$2995 (including external BP-BS power supply and internal BP-1 phono module).

Bryston 3B-ST: solid-state stereo power amplifier. Output power: 120W continuous into 8 ohms (20.8dBW), 200Wpc continuous into 4 ohms (26dBW); 400W continuous into 8 ohms in bridged mode (26dBW). Distortion: 0.007% at 120W, 20Hz–20kHz, IM (60Hz+7kHz, 4:1, SMPTE method) or THD. S/N ratio: 106dB ref. rated output, 90dB IHF. Slew rate: >60 V/ μ s. Damping factor: >500 at 20Hz ref.

8 ohms, equivalent to an output impedance of 0.016 ohms. Input sensitivity: 1V for 120Wpc into 8 ohms; 2V for full output, balanced. Input impedance: 50k ohms unbalanced, 20k ohms balanced. Polarity: noninverting. Dimensions: 19" (482.5mm) W by 5.25" (133mm) H by 9" (228mm) D. Weight: 22 lbs (10kg). Serial number of unit reviewed: 332826. Price: \$1565.

Bryston 7B-ST solid-state monoblock amplifier. Output power: 500W continuous into 8 ohms (27dBW), 800W into 4 ohms (26dBW). Distortion: 0.007%, 20Hz–20kHz at 500W, IM (60Hz+7kHz, 4:1, SMPTE method) or THD. S/N ratio: 106dB ref. rated output, 90dB IHF. Slew rate: >60 V/ μ s parallel mode, >120 V/ μ s series mode. Damping factor: >300 at 20Hz at 8 ohms, equivalent to an output impedance of 0.03 ohms. Input sensitivity: 1.4V for full output, unbalanced; 2V for full output, bridged. Input impedance: 50k ohms unbalanced, 20k ohms balanced. Polarity: non-inverting. Dimensions: 19" (482.5mm) W by 5.25" (133mm) H by 15.5" (394mm) D. Weight: 44 lbs (18kg). Serial numbers of samples reviewed: 770933, 770934. Price: \$4795/pair.

Common to all three: Approximate number of dealers: 90. Manufacturer: Bryston Ltd., P.O. Box 2170, 677 Neal Drive, Peterborough, Ontario, Canada K9J 7Y4. Tel: (705) 742-5325, Fax: (705) 742-0882.

Canadian electronics manufacturer Bryston Limited has been producing consumer and professional amplifiers since 1974 [see Robert Deutsch's interview, also in the October 1996 *Stereophile*—Ed.]. Bryston amps are engineered to be physically and electrically rugged, to meet the stringent demands of professionals, many of whom leave their studio amplifiers turned on for years. While lightness in the chassis was valued over the audiophile massiveness found in some high-end consumer amplifiers, studio engineers and concert pros continued to favor Bryston amps, which easily passed the "steel toe" test. The 4B, for example, became a standard amplifier for recording engineers and touring musicians.

This ruggedness and reliability allowed the company to institute a unique warranty program that covered each of their products for a full 20 years. This warranty includes all audio products ever manufac-

ured and sold under the Bryston name. Besides covering all parts and labor costs, the company pays shipping costs one way. This is all the more significant for products like the 4B, which, in one form or another, has been in production for the last 20 years. This warranty, plus the very competitive US prices of Bryston products, make them good values.

Bryston amplifier reviews in this magazine have been quite favorable, always yielding Class B or borderline Class A ratings. The NRB products, for example, had been the result of circuit innovations that lowered the amplifiers' power-supply impedance while boosting energy storage as much as 28%.¹ The 4B-NRB (Vol.15 No.5, Vol.16 No.1) was praised for its bass "slam and snap" while the 7B-NRB (Vol.16 No.10) received accolades from TJN for its high power and "full, warm low end ... allied to a very neutral midrange and sweet, clear highs."

In 1994, Bryston released an evolutionary new line of solid-state products to replace its NRB line. Bryston's new "ST" amplifiers—the 3B-ST, 4B-ST, and 7B-ST—reflect the design contributions and initials of a new engineer at Bryston, Stuart Taylor. In this report I evaluate three of Taylor's new designs: the remote-controlled BP-25MC preamplifier, the moderate-power 3B-ST stereo amplifier, and the high-power 7B-ST monoblocks.

BRYSTON BP-25MC

The Bryston BP-25MC preamplifier is a full-function control center with two

¹ The Bryston 4B-NRB power amplifier excelled in its ability to coax deep bass out of lazy subwoofers. In fact, the review dubbed the 4B-NRB the "Bass Master." But when I talked with Chris Russell—Bryston's VP of Engineering and a specialist in dry humor—during the 4B-NRB review period, he refused to say exactly what the initials "NRB" stand for. Caught off guard later at *Stereophile's* 30th Anniversary party at the 1992 CES, Chris finally confessed that "NRB" meant "no real bass." Sure, Chris!

balanced and four single-ended inputs, including one input for a moving-coil cartridge. The BP-25 is shielded in a black steel cabinet said to reduce electromagnetic interference effects. The power transformer is housed in a small external chassis, the BP-PS. The BP-25's remote control allows volume up/down, along with buttons for mute and absolute polarity. Signal switching and audio connections, including balanced and unbalanced input and output connectors, are heavily gold-plated to provide good long-term connections. A 12V AC/DC screw terminal connector on the rear of the power supply provides convenient use when used in conjunction with the remote start feature optionally available on Bryston power amplifiers.

From left to right, front-panel controls include a Tape/Source toggle switch, the infrared sensor for the remote, and an MM Phono/MC Phono toggle switch. Next is a rotary control to select input sources, which includes settings for Bal 1, Bal 2, Phono, CD, Tuner, Video (for laserdisc), and Disc. At panel center is a rotary balance control. To the right of this is the motor-driven volume control, followed by toggle switches for Polarity/Invert and Mute/Normal. (These switches change settings each time they're switched up or down, rather than muting, for example, only when Mute is pushed down.) The tricolor LED glows green when the preamplifier is not muted or inverting, yellow when non-muted and inverting, and red when muted.

The BP-25MC's build quality and circuit layout are superb. Almost all components are directly mounted on the main system circuit board extending the full width and depth of the chassis. Signals from the unbalanced jacks travel from an input board to this main board via two large ribbon cables. The main board features solder mask and extensive component designators. A written table at pcb center bears the signatures of those installing the capacitors and semiconductors, and the date the system board was completed. Many individual components are used, including very-high-quality film capacitors in a number of places. Looking at the system board from above, I saw no point-to-point wiring.

The BP-25MC's internal power supply—situated at the right when viewing the chassis from the front—seems to be rugged and well-designed. It employs a discrete bridge rectifier (four 1N4004 diodes) feeding two 4700 μ F electrolytics. Three 3-pin IC regulators are mounted on individual heatsinks, two of them (a 7824 and a 7924) supplying \pm 24V to the electrolytics, while



Bryston BP25-MC preamplifier

the third (a 7808) supplies voltage for the logic to control muting on turn-on. Final filtration is accomplished on the low-voltage regulated side by 2200 μ F electrolytics. A separate source for the power-on muting system shorts all inputs until the preamplifier has settled. Additional 2200 μ F electrolytic capacitors provide further filtration at key points in the preamplifier, including the phono stage.

The BP-25MC's built-in phono section occupies the left side of the chassis: two matching circuit areas, one per channel, run the depth of the chassis side by side. Two metal-shielded cans, transformers for the moving-coil input, sit just behind the front panel. (These transformers are identical to the company's TF-1 outboard transformer.) The BP-25MC can be ordered with two different gain configurations: the higher configuration of 22.5dB gain, with the transformer wired in series; or 16.5dB gain, with the transformers wired in parallel for a higher source impedance. Behind the transformers sit two identical circuit boards for the moving-magnet cartridges, these including the RIAA equalization circuitry. Total gain for moving-coil cartridges at mid-frequency through the entire phono section of the BP-25MC is 56.5dB.

The line amplification for the BP-25MC is provided by discrete amplifier modules, three per channel. Two of these op-amps are to buffer the signal to the tape output and level control, the remaining four for the two balanced outputs. These proprietary circuits are specified as delivering high output with low noise. The high 24V rails supplying the op-amps mean that the preamp is relatively resistant to overload.

Listening to the BP-25MC: My interest in the Bryston BP-25MC preamplifier first centered on its remote control—it allowed me to adjust volume during casual listening sessions. This proved to be addictive, as my listening position was 12' from the preamplifier. I soon discovered that the infrared sensor has a narrow angle of reception at

that distance, and will not respond if signaled from more than 45° off-axis. To make certain the preamp responded, I turned it so that one corner overhung the edge of the shelf. I also found that when the preamplifier was left on for long periods of time without use, it sometimes went into mute; the remote's Mute and Phase pushbuttons then had to be cycled repeatedly to wake the BP-25MC from Mute.

Even with these minor frustrations, the Bryston BP-25MC proved to be a superb preamplifier for reviewing. The volume-control settings provided stable and reliable output, essential for product comparisons. When reviewing the three D/A processors mentioned in the sidebar, I made a light pencil-mark on the front panel next to the rotary volume control to record the approximate setting needed to produce the same voltage out (read by a multimeter) at the speaker terminals when playing a tone from a test CD. These settings produced the same voltage, within 100mV, each time the appropriate D/A processor was put into the system.

Initial impressions of the BP-25 MC, obtained by listening through its phono section, was that it leaned toward a warm, somewhat distant presentation with an open-sounding top end. As time went on, this sonic signature became clearer and more distinct, particularly in comparison with other preamplifiers at my disposal. With the Quad ESL-63s and Totem Model 1s, which emphasize midrange character, the BP-25 had a warm, smooth midrange. The Snell Type A Reference system revealed the preamp's open, unrestrained top end.

The line section had good bass extension, with a powerful, focused bottom end. Synthesizer-generated deep bass chords in "The Hit," from James Horner's *Patriot Games* soundtrack (RCA 66051-2) sounded clear and solid. The pace and energy of the choir's foot-stomping on Lyle Lovett's "Church" (from *Joshua Judges Ruth*, MCA MCA1-10475) were easily experienced. The Bryston BP-25MC rendered the full weight and power of the bass drum in

"La Fiesta Mexicana," from *Fiesta* (Reference Recordings RR-38CD). Bass slam came from the bass guitar and drum kit on "Behind the Veil," from *Jeff Beck's Guitar Shop* (Epic EK 44313). Gain-matched comparisons between my Levinson ML-7A and the BP-25MC showed equal abilities to render the impact and clarity of deep bass from synthesizer and bass drum heard on the "Main Title" track of Horner's *Clear and Present Danger* soundtrack (Milan 35679-2).

The BP-25MC's phono section was equally competent in the bass, reproducing 32Hz pipe-organ notes as well as the rhythmic drive and pace of the double-bass sections of orchestral music. This was evident in its accurate portrayal of the wide dynamic range and pow-

erful orchestral rhythms found in Shostakovich's Symphony 6 (Stokowski/CSO, RCA LSC-3133). Similarly, the BP-25MC equaled the ML-7A in reproducing the rhythmic drive of Bartók's *Concerto for Orchestra*, as heard on Classic Records' remastered LP of the original RCA recording (Fritz Reiner/CSO, LSC-1924). This firm, solid bass was also heard on "After Antheni," from the LP of James Horner's *Glory* soundtrack (Virgin ST-VR-897678, 1-91329). The full orchestra and the Boys Choir of Harlem presents a dense, colorful sonic fabric; the BP-25MC conveyed a lovely, warm string tone and the full strength of the soprano voices without strain or distortion.

The BP-25MC's midrange repro-

duction convincingly captured instrumental and vocal timbres. On "I Don't Get Around Much Anymore," from the *When Harry Met Sally...* soundtrack (Columbia CK 45319), Harry Connick, Jr.'s voice had just the right timbre without sounding tubby or nasal. On "Grandmother Song" (from *The Raven*, Chesky JD115), I heard Rebecca Pidgeon's delicate soprano center-stage in a palpably three-dimensional sonic image. The piano placement on that recording—slightly behind and to the right of the singer—is eerily precise, and was depicted with equal precision by the BP-25MC and the ML-7A, as were the dynamics of Pidgeon's voice. However, the ML-7A was slightly more transparent and more immediate, and did a better job of ren-

SYSTEM AND ROOM CONTEXT

Because first impressions can be misleading, I believe that audio equipment should be auditioned over a long period of time: the Bryston BP-25MC preamplifier was used in my listening system for nine months before I began writing this review. Though the power amplifiers came later, they still did service for a good six months, driving a variety of loudspeakers. The amplifiers were run both single-ended and balanced, and, when used in a bi-amplified system, as both main and subwoofer amplifiers.

Comparison solid-state electronics were chosen for the listening sessions to match the Bryston gear in control options (preamplifiers) and power ratings (amplifiers). The BP-25MC was compared with the discontinued Mark Levinson ML-7A and its moving-magnet L2 phono option (set for 44dB gain and 50k ohms input impedance), with a Duntech/Audio Standards MX-10 head amp for my system's low-output Spectral moving-coil cartridge. Analog interconnects included AudioQuest LiveWire Topaz interconnects and Krell Cogelco balanced leads.

Comparison amplifiers for the 3B-ST and 7B-ST included two Mark Levinson 100Wpc dual-mono units: the discontinued No.27 and a new No.331. I also compared the Bryston 7B-ST with the now-discontinued 250Wpc Krell KSA-250. This classic amplifier, rated Class A in *Stereophile's* "Recommended Components" when still available, served as the comparison amplifier for *Stereophile's* previous reviews of Bryston amplifiers.

Listening tests were carried out in two rooms. The first, my main lis-

tening area, is the most spacious, having an estimated volume of 5500ft³ and an effective room length of 51'. The main listening area is 26' long by 13' wide by 12' high, with an 8' by 4' doorway at the back of the room opening into a 25' by 15' kitchen. With only a single area rug, this space is a "live" listening environment. (This large room's exact dimensions, construction, contents, listening positions, rugs, windows, and bass modes were described in Vol.15 No.3, p.181.)

The Bryston, Krell, and Levinson amplifiers drove, at different times, two different loudspeaker systems in this room: the main loudspeakers (Snell Reference Towers or Quad ESL-63s) with parallel bi-wired runs of Sumiko's OCOS speaker cable, or the systems' subwoofers (Snell SUB-1800s or Bag End S-18s) via Monster speaker cables. For each installation, the main drivers (Quads or Snells) were set up 6-8' from the back wall, with the subwoofers placed in the corners.

For the preamplifier listening sessions, a single amplifier/loudspeaker setup was selected consisting of Snell Reference Type As with a pair of Bryston 7B-STs driving the Towers, and a now-discontinued Krell KSA-250 driving the SUB-1800 subwoofers. The two preamplifiers were linked to the Snell EC-200 Electronic Crossover via a pair of AudioQuest Topaz single-ended interconnects. Single-ended Randall Research interconnects were used from the crossover to the 7B-ST and Krell KSA-250 power amplifiers.

Other associated equipment used in the main listening room included a Day-Sequeria FM Reference tuner, a

Rotel RHT-10 FM tuner, and a Linn Sondek LP12 turntable with Lingo Mod, Ittok arm, and Spectral moving-coil cartridge. CDs were played on a Krell MD-1 turntable driving an Audio Alchemy DTI jitter attenuator using a 75 ohm Silver Starlight digital coaxial cable. This unit fed either an Adcom GDA-700 D/A processor or an Audio Alchemy DDE v3.0 HDCD[®] over its I²S bus. This converter was fitted with an RW-1 Remote Wand One.

A smaller, 12' by 12' second room was used for additional Bryston 3B-ST amplifier comparisons. This room is carpeted wall-to-wall, making it a less "live" listening environment than the larger room. Two modified Dahlquist DQ-10 loudspeakers¹ were set up at one end of the room on Dahlquist stands, driven from the amplifier under test (the Bryston 3B-ST or the Levinson No.27) by QED Qudos Profile B speaker cables. This system was controlled by the now-discontinued Krell KBL solid-state preamplifier. Sources included a Pioneer Elite F-93 FM tuner connected to a Magnum Dynalab ST-2 "whip" antenna and a Magnavox CDB650 CD player.

—Larry Greenhill

¹ The Dahlquist DQ-10 was introduced about the same time (ca 1975) as the original Bryston 4B. Like many Brystons, my DQ-10s have survived the intervening decades, but not without modification: a Randall Research modification kit replaced the piezoelectric tweeter with a ribbon driver; all capacitors in the crossovers were replaced with polypropylene film types, with much guidance from Walt Jung; and, after the Bryston 3B-ST turned them into dust, Miller Sound re-coned both woofers. The good news is that these changes have increased the speakers' power-handling capacity, and made them faster and more dynamic. The bad news is a loss of the soundstage depth found in the stock factory design.

dering the sweetness of that voice.

The Bryston BP-25MC captured the timbre of string instruments while playing two of my favorite excerpts from the chamber music literature. One is from the third movement of Haydn's Quartet in d ("The Quinten"), recorded live by the Lindsay String Quartet (CD, ASV CD DCA 622). This movement features a canon with two violins playing together in octaves, followed three beats later by viola and cello; its driving tempo has earned it the nickname of "The Witches' Minuet." The music was greatly enhanced by the timbre of the instruments, the warmth of the viola and cello resonances, the tonalities of wood and bow, the sweetness of the violin strings. The recording contains the usual ambient audience noise found in a live recording, including coughs and chair movements, which added to the hall ambience. The BP-25 MC gave a wider soundstage than the ML-7A, with the cello far to the left. The ML-7A, however, was more neutral, with clear delineation of instruments and space. The '7a also captured more timbre from the cello and viola, more sense of wood and bow. Violin string tone was equally sweet through either preamplifier.

The second piece—the *Assai agitato* of Schumann's Quartet in A, Op.43 No.3 (Joachim Koeckert Quartet, Calig-Verlag CAL 50849)—showed that the Bryston BP-25MC was the ML-7A's equal in capturing the rhythmic pace inherent in brilliant chamber music. The BP-25MC captured the dark, swirling torment of the *Listesso tempo* section, and its preservation of natural string resonance was quite involving. Dynamics and good transient response were also evident with the BP-25 MC, as heard during the opening movement of Prokofiev's *Romeo and Juliet* on the original direct-to-disc vinyl (Leinsdorf/LAPO, Sheffield Lab 8). Both the ML-7 and the BP-25 MC were able to capture the dynamics of "Romeo Resolves to Avenge Mercutio's Death," totally involving me. While the BP-25MC did a better job of creating the orchestra's rhythmic drive, the ML-7A was somewhat better at conveying the width and depth of the orchestral sonic image, as well as its timbre.

The BP-25MC's treble register was extended and neutral. Space was well depicted, almost equal to the ML-7A's transparency and ability to reveal the sense of air around instruments. Generous soundstage depth and width were heard playing Holst's *Chaconne* (Howard Dunn/Dallas Wind Symphony, Reference Recordings RR-39CD). Driven by Bryston 7B-STs or the ML-7A, the Snell Type A Reference System created a seamless choral fabric behind José Carreras, spread across the soundstage

in the opening *Kyrie* of *Misa Criolla* (Philips 420 955-2, DDD). The spoken "Well done!" was perceived correctly over both preamplifiers at the extreme left stage, where it appears at the end of Anna Maria Stanczyk's performance of Chopin's Scherzo in b-flat, Op.31 (on *Stereophile's* first Test CD).

Overall, the BP-25MC proved to be fast and powerful, and excellent in bass response and soundstage presentation. In direct comparisons to the (discontinued) ML-7A, the \$2995 BP-25MC lagged behind only in terms of transparency. However, it does have a remote control for the volume and an internal phono module that accepts low-output moving-coil cartridges, which the Levinson does not. —Larry Greenhill

Measurements from TJN: Unless otherwise noted, the measurements presented are for unbalanced operation. The output impedance of the BP-25 at its line output measured 50 ohms (99 ohms, balanced), with insignificant variations with changes in the level control. The line-level input impedance measured 48k ohms (16.6k ohms, balanced), left, and 49.5k ohms, right, again virtually independent of the level control. Phono input impedance measured 50k ohms (MM) and 220 ohms (MC). The output impedance at the tape output was just 99 ohms regardless of source impedance, indicating full buffering of the tape outputs.

DC offset at the BP-25's outputs was unmeasurable. The preamp is non-inverting from its line inputs to its main outputs or its phono inputs to its tape outputs (we take all phono measurements at the tape outputs) in the unbalanced mode; in the balanced mode pin 2 is positive. Line-stage voltage gain (CD input to line output) measured 10.6dB, unbalanced and 16.5dB, balanced. Phono gain measured 35.4dB (MM) and 57.1dB (MC). S/N measured 99dB (unweighted) over a bandwidth of 22Hz–22kHz, 82dB (unweighted, 10Hz–500kHz) and 102dB, A-weighted (all ref. 1V) for the line stage. The same readings for the phono stages were, respectively, 76dB, 71dB, and

82dB (MM) and 69dB, 66dB, and 78dB (MC). The balanced line readings were 95dB, 81dB, and 97dB—slightly less than the unbalanced readings.

The frequency responses of the BP-25 are shown in fig.1. Though not readily apparent from this graph, I found the level control tracking to be good; no more than 0.3dB variation from a 9:00 setting to maximum. The only item worthy of note in fig.1 is the high-frequency rolloff in the moving-coil response, just over -3dB at 20kHz—we don't think it is a measurement artifact; perhaps it is some sort of compensation for the often-rising high-end response of the moving-coil cartridge (a useful idea, but it should be defeatable, in my judgment). [The manufacturer says this measurement must be made at a source impedance of 5 ohms or less.]

The crosstalk of the BP-25 is shown in fig.2. All increase with frequency in the expected manner, due to capacitive coupling. While there are significant differences between the channels, particularly in the phono stages, the absolute separation is so great in the worst case that I consider this to be of academic interest only. The input voltages used here, were quite high—the only way to keep the low noise level of the BP-25 from swamping its even lower crosstalk. The line input voltage used was 2.4V, the MM input 152mV, and the MC input 16.8mV—all far higher than you would ever see in practice.

Using the same high input levels, the THD+noise vs frequency for the BP-25 is shown in fig.3 (the balanced result is also shown here, using a 1.2V input,

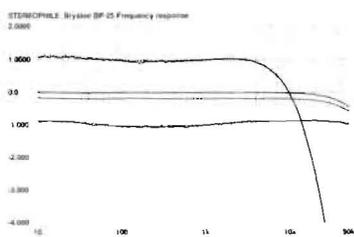


Fig. 1 Bryston BP25-MC, frequency response at 1V output into 100k ohms for (from top to bottom at 1kHz): MC phono, line, MM phono line (right channel dashed), 0.5dB/vertical div.

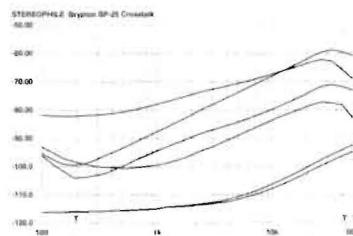


Fig. 2 Bryston BP25-MC, crosstalk (from bottom to top at 1kHz): L-R, R-L, line, L-R, MC; L-R, MM; R-L, MC; R-L, MM (10dB/vertical div).

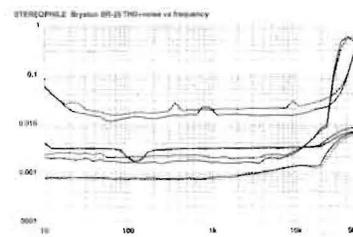


Fig. 3 Bryston BP25-MC, THD+noise vs frequency at (from top to bottom at 1kHz): MC phono; line, balanced; MM, phono; and line, unbalanced (right channel dashed).

which results in the same output voltage as 2.4V input in the unbalanced mode). Again, the distortion levels are vanishingly small. The rise in the high-frequency distortion in the phono stages is simply due to the high input levels used in the test to minimize the effects of noise, and should have no audible consequences.

Fig.4 shows the THD+noise plotted against output voltage at 1kHz. The minimum points in the curves, just before the distortion increases rapidly, were the values chosen to run the measurements plotted in figs.2 and 3. The rise in apparent distortion with decreasing output voltage is simply due to the fact that the actual distortion content is below the noise at these levels.

The BP-25's output spectrum reproducing 50Hz at a very high output level of 10V is shown in fig.5. While some artifacts pop out from the background, they are at an extremely low level (close to -100dB or 0.001%).

Finally, the phono overload margin of the BP-25 was also very good; for the moving magnet setting, 1 THD+noise was reached at an input of 261mV at 1kHz, 2.26V at 20kHz, and 28mV at 20Hz. The input signal used for the latter measurements was unequalized and the variation with overload margin with frequency is due to the characteristics of the RIAA curve.

There is little to comment on in the test-bench performance of the BP-25. Apart from the HF response of the moving coil input—which may have been deliberate and therefore defensible—the results are superior right down the line. — Thomas J. Norton

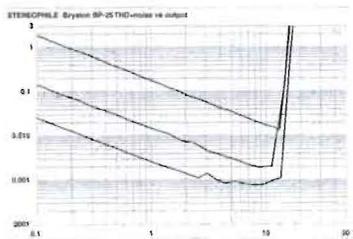


Fig.4 Bryston BP25-MC, distortion (%) vs output voltage into 100k ohms (from bottom to top at 1V): line, MM, MC inputs.

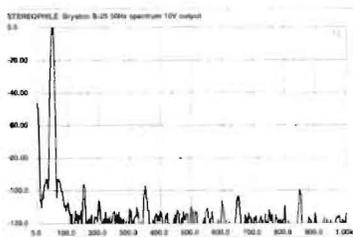


Fig.5 Bryston BP25-MC, spectrum of 50Hz sine wave, DC-1kHz, at 10V into 100kOhm (linear frequency scale). Note that the third harmonic is the highest in level at -97dB (about 0.0015%).



Bryston 3B-ST power amplifier

Summing up: The moving-coil features and its purist, low-profile chassis and outboard power source make the Bryston BP-25MC preamplifier perfect for the audiophile market. It is optimized for quiet operation to handle low-output moving-coil phono cartridges. I grew totally addicted to the remote-control options, so I warn you right now: If you take this preamp home as a loaner from your local audio dealer, you'll buy it.

If you do, you won't be disappointed—the BP-25MC has world-class bass response and a midrange that can capture much of the natural instrumental timbres of chamber and orchestral music. Bryston has done very well with the BP-25MC; I recommend it as a solid Class B product for any system. —Larry Greenhill

BRYSTON 3B-ST

The 3B-ST is a solid-state stereo power amplifier with an output stage running in class-AB2. Its 22-lb weight, diminutive chassis, and slim faceplate profile belie its 120Wpc power rating. While the entire chassis is used as a heatsink, the 3B-ST maintains Bryston's black, finned, rack-mount style. In fact, one could stack the 3B-ST, the 4B-ST, and the 7B-ST, and they would appear very similar from a distance. Similar interior design approaches are also used for the 3B-ST and 7B-ST; the following description of the mechanicals and circuit layout of the 3B-ST will apply, in many respects, the 7B-ST as well.

The 3B-ST's front panel is a 1/4" sculpted, rack-sized piece of aluminum inscribed with two narrow horizontal grooves (the two front handles are similarly grooved). This single piece of extruded metal is buff-finished with a fine abrasive like jeweler's rouge; the resulting surface is so smooth that a finger rubbing the surface leaves no mark. The only lettering besides the company name is the "ST" logo. Otherwise, there are two tricolor LED power indicators, one per channel. These remain green

while the unit is powered, turning yellow at the clipping threshold, red for clipping or internal fault. The clip-sensing circuit uses a comparator to detect the source of signal distortion, including clipping, short circuits in cabling, and excessive DC or supersonic signals. The brief instructional notes indicate that it's normal for the individual right and left LEDs to decay at different rates. The square Power pushbutton is the only front-panel control.

The back panel has a complete set of inputs and switches. Each connector or switch is surrounded by clearly labeled instructions in white lacquer, in English and French. This makes it possible to set up the amplifier without having to locate the written instruction sheet. From left to right along the back panel are the following features: first, a detachable AC connector with a removable fuse holder containing two 250V, 4A fuses, one for each channel. A "Ground Lift" toggle switch is connected between the chassis ground (including the power cord's third prong) and the signal ground. Occasionally a grounding situation with another component, such as a preamplifier or another amplifier also equipped with a three-pronged grounded line cord, will cause a 60Hz hum from a ground loop set up between signal and chassis ground. Switching the Ground Lift into the up, or open, position reduces 60Hz hum without resorting to a cheater plug. This proved useful in my system, with its 45' of single-ended interconnect runs between preamplifier and crossover.

The 3B-ST's output connectors consist of two pairs of gold-plated, 5-way binding-posts. For bridged operation, the two amplifier sections are operated with one channel inverted to form a single push-pull amplifier with double the output voltage. Only the left unbalanced or balanced input is used in the bridged mode. The slide switch for switching between stereo and bridged operation can be found just to the right of the output terminals. All Bryston

amplifiers are equipped with three pairs of input connectors: a pair of unbalanced RCA jacks, a pair of balanced XLRs (pin 2 positive), and a pair of 1/4" phone jacks (tip positive).

Opening a Bryston product requires a Roscoe S-1 square-recess screwdriver to turn the machine screws that fasten the top panel. These screws are snugly fitted into the chassis's threaded steel inserts by means of a locking thread-sealer, which lowers vibration and increases structural stability. The 3B-ST uses gold-plated board-edge connectors on driver and input boards. Soldered and other gas-tight mechanical connections are used for signal circuits. Circuit boards are very-high-quality double-sided epoxy-glass, with component-designator screening.

All Bryston amplifiers get a rugged 100-hour factory burn-in consisting of

a squarewave input signal driving the amplifier into a capacitive load, slightly under clipping. Unlike a resistive load, which dissipates all the energy as heat, a capacitive load feeds back the entire signal into the amplifier, which puts maximal thermal stress on the output stages. After burn-in, each 3B is again tested; the results are shipped with the amplifier.

Except for the single power cord and the back-panel bridging-circuit board, the 3B-ST is a true dual-mono design. Two 225 VA toroidal transformers are located just behind the front panel. It has separate $\pm 55V$ power supplies with two 10,000 μF smoothing electrolytics for each channel. Short leads bring these filter caps to within 1" of the output circuitry.

The 3B-ST's power supply is "stiff" in that it is relatively unaffected by a big

current draw: whether the amp is idling or at full-power current draw, the rail voltage will not sag by much. Holes have been drilled into the heatsink recesses in the chassis sides to allow unimpeded airflow, even if the amplifier is placed on a carpet. The slow-start circuitry introduced in the NRB line, added to avoid line surges when the amp is turned on, has been continued in the ST Series 7B and 4B.

Listening to the 3B-ST: After reviewing a steady stream of massive audiophile power amplifiers, the relatively tiny, lightweight Bryston 3B-ST spelled relief. During the review I placed it atop a Mark Levinson No.331. Rated at the same power as the Bryston, the '331 is four times as expensive, almost six times as heavy, twice as deep, and almost twice as tall! For someone

THE BRYSTON STs

Stuart Taylor was working in a sound studio in Toronto in 1972 when he purchased one of the very first Bryston amplifiers. Over the years he kept up a close relationship with the Russell brothers, who ran Bryston, and in 1988 came to work for them. Among Taylor's early assignments was the redesigning of Bryston's four-channel Home Theater amplifier, the 8B. Though the job began as a routine fine-tuning of a product before it was to be reintroduced to the market, it quickly led to major redesigns of all Bryston amplifiers.

Chris Russell, Vice President of Engineering, asked Taylor to design an improved layout for the 8B that would allow its four transformers to operate within a single chassis within Bryston's performance limits of noise and distortion. Taylor first reorganized the 8B's parts layout, placing the transformers vertically against the inner front panel. Then he methodically tracked down all sources of noise by reworking all the grounds, finding tiny millivolt ground loops and eliminating them. Using new distortion-measuring devices, Taylor looked at the signature of the noise and gradually "massaged it out" by eliminating point-to-point wiring, reorganizing component placement, and changing the gain structure of the overall amplifier.

Taylor also found that he could cut high-frequency distortion in half by running shielded wires rather than

pcb traces. By changing or eliminating most internal wiring, he was able to reduce crosstalk, hum, and noise. Later, he reduced chassis depth in the redesigned 4B-ST and 7B-ST to shorten the path lengths between input/output connectors and main amplifier circuit boards.

A key change involved reworking the input circuitry to derive some of the amplifier's gain from Bryston's proprietary input buffer. It was evident to Taylor that the NRB series' balanced inputs sounded better than the unbalanced...and the balanced input was the only input using Bryston's proprietary buffer. Applying it to all inputs on the ST Series, Taylor was able to reduce noise by lowering the source impedance of the signal inside the amplifier. This also reduced distortion!

Stuart Taylor and Chris Russell explained why this design approach improves their amplifiers' performance: Imagine a hypothetical amplifier with an open-loop gain of 1000, open-loop distortion of 1%, and a required closed-loop gain of 25. Because the ratio of closed-loop to open-loop gain (and distortion) is 1:40, the expected closed-loop distortion will be 0.025%. If one then cascades two of these amplifiers, the closed-loop gain need now be only 5; the total gain is $5 \times 5 = 25$, same as before. The overall distortion, however, is now 0.005% in each amp, adding geometrically to about 0.007%, or several times lower than before.

Although these calculations are hypothetical, and actual results are influenced by considerations of stability, bandwidth, and gain, the ST Series shows a noise floor reduction of 6-8dB compared with the NRB series, and a decrease in distortion by a factor of three. In contrast to designs that use brute-force feedback, the ST designs are said to show no tendency to increased distortion at higher frequencies.

Taylor notes that the balanced input buffer in the NRB-series amplifiers required 100% feedback to achieve unity gain. The ST Series, which provides a gain of 2x in the input buffer, requires less feedback in the buffer and less feedback in the amplifier modules that follow. This addresses concerns from both Robert Deutsch (see his interview with the Bryston staff and me, also in the October 1996 *Stereophile*) and myself that the new ST Series' gain structure might complicate the signal path over previous designs. Taylor's answer was simple and persuasive: The ST Series adds no additional feedback or complications. It just reduces noise and distortion.

The success of Taylor's ST redesign was rewarded when the ST Series logo was applied to the faceplates and rear panels of the new 1994 Bryston products. In addition, each ST Series internal circuit board has the letters "S" and "T" highlighted on the Bryston name label, just as an artist might sign a painting.

—Larry Greenhill

used to doing the audiophile amplifier lift drill—deep breath, bend at the knees, lift straight up to protect the back—moving the 3B-ST's mere 20 lbs around was pure joy.

Yet the tiny 3B-ST packs plenty of power for a bantamweight. The Dahlquist DQ-10s gave visual evidence of this punch and kick when I played a Bob Marley medley at a healthy volume in my smaller listening room. Although the music was cooking with no obvious distortion, the surrounds on both speakers' 20-year-old woofers disintegrated on one drumkit crescendo, spraying the dust from dried and hardened rubber rim supports into the room. Peter Madnick of Audio Alchemy put me in touch with Miller Audio, who re-coned the woofers. Upon their return, the Bryston 3B-ST and DQ-10s played the Marley tune louder; this time the woofers remained intact.

The notes for my first listen to the Bryston 3B-ST on the Snell Reference Towers reported on this speed and power. Like the 4B-NRB I reviewed several years ago, the 3B-ST's strengths are in the power regions of the audio spectrum: midbass and bass. The 3B-ST delivers fast, powerful, well-defined bass with depth, extension, and solidity. It combines "snap" and "slam," allowing the listener to perceive both the low-frequency energy and the tightness and definition of the leading edge of the bass pulse. These qualities make it the equal of the No.331 in dynamics and speed.

However, the very revealing Snell Reference A system also revealed mild sonic differences between the Bryston 3B-ST and Levinson amplifiers. While the 3B-ST seemed more forward in the midrange, the Levinson sounded smoother and sweeter, with a more open top end. Choral pieces had more dimensionality on the No.331, with a wider and deeper soundstage.

However, the 3B-ST's dynamics and punch made it a very good match for smaller dynamic loudspeakers such as the Totem Model 1s when playing vocal, clarinet, and piano selections. Over the Totems both the 3B-ST and No.331 did admirable jobs of delineating voices and instruments and accurately depicting their spatial positions. The lead singer's voice on the first Blue Nile LP (*A Walk Across the Rooftops*, Linn LKH1) has a full, three-dimensional quality and warmth quite separate from the music and special effects. Suzanne Vega's startling capella "Tom's Diner" (on her *Solitude Standing* CD, A&M 5136) was lifelike and three-dimensional through both amplifiers.

As an upper-range amp, the Bryston

3B-ST was clean, fast, and very dynamic, but not as transparent as the No.331. The Levinson pulled ahead in reproducing the silvery sheen on cymbals in Jeff Beck's "Behind the Veil." On Richard Thompson's "I Misunderstood" (from *Rumor and Sigh*, Capitol CDP 7 95713 2), the 3B-ST revealed such midrange nuances as Thompson's plosive accent on the last consonant of every line. The Bryston 3B-ST also allowed me to hear the layering of textures in the mix on this CD. The No.331's slight brightness, on the other hand, woke the somewhat reticent Quads to give more depth to the sonic portrait.

My listening notes and sessions, then, reveal the Bryston 3B-ST to be not only a surprisingly powerful amplifier with strong dynamics, but also the equal of more expensive solid-state amplifiers in its ability to deliver powerful bass, wide dynamic contrasts, and involving vocal reproduction. Only in the areas of imaging and soundstaging did amplifiers costing more than four times as much begin to pull ahead of the 3B-ST.

—Larry Greenhill

Measurements from TJN: I made a full set of measurements of the Bryston 3B-ST using its unbalanced inputs, with selected measurements repeated in the balanced mode, as noted below.

Following its $\frac{1}{3}$ -power, one-hour preconditioning test, the 3B-ST's heat-sinks were very hot, though not outside the normal range of temperatures usually encountered in this test. The 3B-ST is noninverting when driven from its positive, unbalanced input; at the balanced, XLR input terminal, pin 2 is positive as specified. DC offset measured 5.5mV in the left channel, 4.1mV in the right.

The Bryston 3B-ST's input impedance measured 49.7k ohms (16.2k ohms, balanced). The output impedance measured under 0.03 ohms at 20Hz and 1kHz, increasing to a maximum of 0.09 ohms at 20kHz. Voltage gain measured 29.2dB (23.1dB, balanced). The unweighted signal/noise (ref. 1W into 8 ohms) measured 92dB over a 22Hz–22kHz bandwidth, 83dB over a 10Hz–500kHz bandwidth. The A-weighted figure was 95dB. The corresponding figures for balanced drive were all just under 1dB worse (higher) in all cases.

Fig.6 shows the small-signal frequency response of the 3B-ST (the unbalanced result is shown, the balanced was a virtual overlay). There is little worthy of comment here. The same is true of the 10kHz squarewave response (fig.7), which is virtually textbook, with good risetime, and no overshoot or ringing (the 1kHz squarewave looked like it

came directly from a squarewave generator, and is not shown).

Fig.8 shows the 3B-ST's crosstalk. The difference between the two channels should be of no audible consequence at such high absolute separation levels.

The manner in which the Bryston's THD+noise varies with frequency is shown in fig.9. The THD of the Bryston is so low that I used 10 times our normal output power for this measurement to get results that were not obscured by noise. Note that for the simulated real load, I measured at an output of 8.9V—a small change from our recent practice. (Since the impedance of that load varies with frequency, stating a wattage for this reading is not particularly relevant, as the wattage will vary with frequency for a constant voltage. 8.9V was chosen here because that would be the output voltage for an output of 20W if the load were a pure 4 ohms.) Fig.10 compares the THD+noise in unbalanced and balanced modes; note that the unbalanced is lower—though both are very low.

The waveform of the distortion at 25W into 2 ohms is shown in fig.11. It is heavily third harmonic, with some noise. The waveforms (not shown) into 4 and 8 ohms were similar, though with higher powers required to get a significant reading above the low levels of noise.

The 3B-ST's output spectrum reproducing 50Hz at 154W into 4 ohms is shown in fig.12. The distortion products are all extremely low in level—below –90dB or 0.003%. At an output of 31.2V into our simulated real load,² I obtained the result shown in fig.13. Only the third harmonic (at –68dB or 0.04%) is in any way relevant, though other artifacts at less than –80dB are visible.

Figs. 14 and 15 show the output spec-

² Why 31.2V? As is noted above, the impedance of the simulated load varies across the frequency range, making interpretation of the result difficult if we relate the output to power. I therefore measured the voltage at which the amplifier clipped at 1kHz into the simulated real load (1% THD+noise), 38V in this case, and took the measurement at 82% of this. Why 82%? Because we normally take the reading at 67% of rated power, and power is proportional to the square of the voltage—0.82 squared is 0.67. This procedure will be used for this measurement in future reviews.

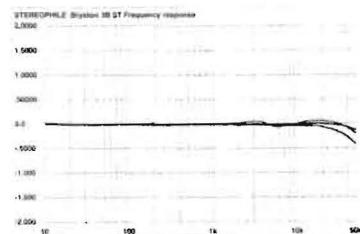


Fig.6 Bryston 3B-ST, frequency response at (from top to bottom at 20kHz): 2W into 4 ohms, 1W into 8 ohms, and 2.83V into simulated speaker load (right channel dashed, 0.5dB/vertical div).

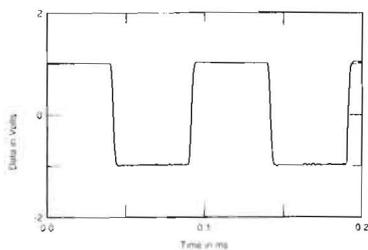


Fig. 7 Bryston 3B-ST, small-signal 10kHz square-wave into 8 ohms.

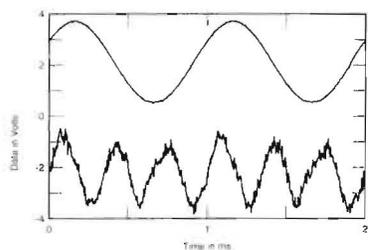


Fig. 11 Bryston 3B-ST, 1kHz waveform at 25W into 2 ohms (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

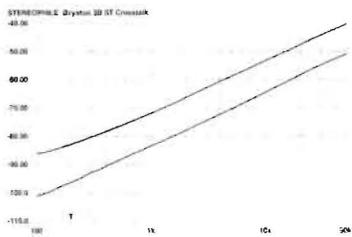


Fig. 8 Bryston 3B-ST, crosstalk (from top to bottom): L-R, R-L (10dB/vertical div.).

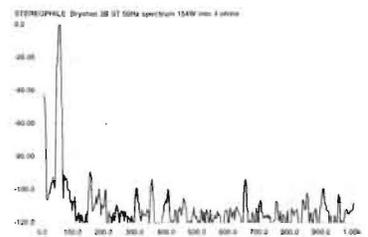


Fig. 12 Bryston 3B-ST, spectrum of 50Hz sine wave, DC-1kHz, at 154W into 4 ohms (linear frequency scale).

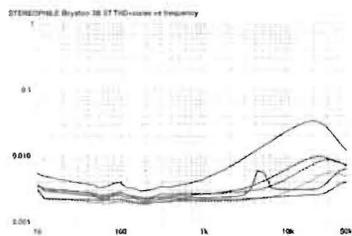


Fig. 9 Bryston 3B-ST, THD+noise vs frequency at (from top to bottom at 10kHz): 40W into 2 ohms, 20W into 4 ohms, 8.9V into simulated speaker load, and 10W into 8 ohms (right channel dashed).

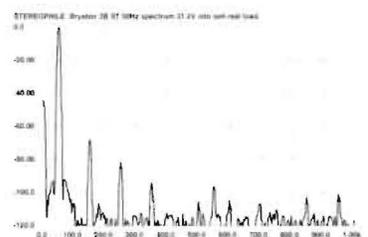


Fig. 13 Bryston 3B-ST, spectrum of 50Hz sine wave, DC-1kHz, at 31.2V into simulated loudspeaker load (linear frequency scale). Note that the third harmonic is the highest in level at -70dB (0.03%).

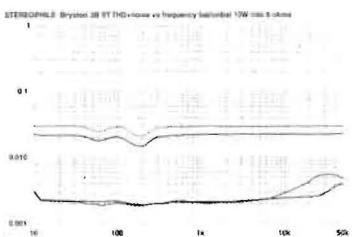


Fig. 10 Bryston 3B-ST, THD+noise vs frequency at (from top to bottom at 10kHz): 10W into 8 ohms, balanced; and 10W into 8 ohms, unbalanced (right channel dashed).

trum resulting from the amplifier driving a combined 19+20kHz signal at 70.5W into 8 ohms and 117W into 4 ohms, respectively (visible clipping is present above this output with this input signal). While clearly more IM products were produced into the 4 ohm load, in all cases the artifacts are very low in level—below -80dB (0.01%).

The way in which the 3B-ST's THD+noise varies with output power (at 1kHz) is shown in fig.16. The discrete clipping levels for the 3B-ST are shown in Table 1. Into 8 ohms, bridged, the 3B-ST reached clipping (1% THD+noise at 1kHz) at 453W (line

voltage 114V). Note that the 3B-ST's power supply is starting to give up into a 2 ohm load. It will drive the load, but at considerably reduced power.

The Bryston 3B-ST produced a solid set of measurements, especially notable for its low distortion, noise, and crosstalk. I would not choose this amplifier to drive a loudspeaker which hovered around 2 ohms for most of the audible range, but fortunately such loudspeakers are rare.

—Thomas J. Norton

Conclusion: The Bryston 3B-ST stereo power amplifier is a compact, rugged, reliable amplifier whose 20-year warranty and modest price make it a real value. It is a perfect entry-level audiophile amplifier, its clean power and low price making it a perfect choice for those who want to start with an audio system and later buy another 3B-ST for a home-theater system.

Sonically, it resembles the NRB Brystons, specifically in the areas of bass and midrange dynamics, punch, and

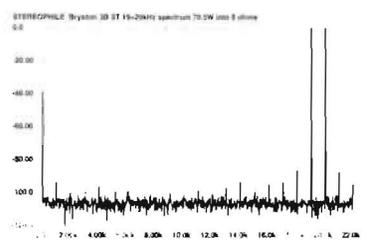


Fig. 14 Bryston 3B-ST, HF intermodulation spectrum, DC-22kHz, 19+20kHz at 70.5W into 8 ohms (linear frequency scale).

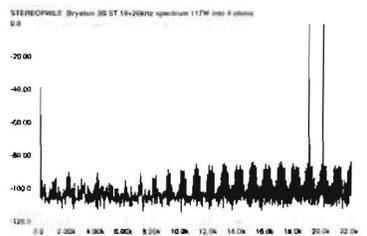


Fig. 15 Bryston 3B-ST, HF intermodulation spectrum, DC-22kHz, 19+20kHz at 117W into 4 ohms (linear frequency scale).

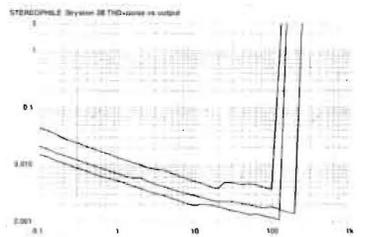


Fig. 16 Bryston 3B-ST, distortion (%) vs output power into (from bottom to top at 100W): 8 ohms, 4 ohms, and 2 ohms.

solidity, where it equals top amplifiers like the Classé 15 and the Mark Levinson No.331. (These much-more-expensive amplifiers, however, better the 3B-ST in transparency, high-end openness, and soundstage depth.) The Bryston 3B-ST is recommended as a solid Class B contender.

—Larry Greenhill

BRYSTON 7B-ST MONOBLOCK
The original 7B was intended to be Bryston's most powerful amplifier. The first designs were reverse-engineered from the company's 250Wpc 4B power amplifier by dropping that model's power-supply voltages to enable it to provide more current, then bridging the two channels (series operation) or paralleling them. The result was the Bryston 6B, a subsequent redesign resulting in the 7B. TJN reviewed the NRB-THX version of the 7B in October 1993 (Vol.16 No.10, pp.193-202), praising it for its "sweet... subtly refined... warm... full-quality" sound, which was somewhat less "lively [and] immediate" than the comparison amplifier, the now-discontinued Krell KSA-250.

As TJN's review of the 7B-NRB-

Table 1 Bryston 3B-ST Discrete Clipping Levels (1% THD+noise at 1kHz)

Impedance ohms	Both Channels Driven		One Channel Driven
	W(dBW) (L)	W(dBW) (R)	W (dBW) (L)
8	154.8 (21.9)	155.6 (21.9)	157.1 (22)
(line)	119V	119V	119V
4	224.9 (20.5)	241.5 (20.8)	225.6 (20.5)
(line)	118V	118V	118V
2			116.7 (14.7)
(line)			119V

THX suggests, Bryston designed the two operating modes into the 7B to enable its bridged design to handle a wide variety of loudspeaker loads. It's relatively easy if your loudspeaker has nominal impedance at either extreme—use the series configuration for a 16 ohm load (like Sound-Lab Ultimate), and use the parallel configuration if you own Infinity Kappas or Apogee Scintillas, whose impedances dip below 2 ohms. And that gray area between 3 and 8 ohms? Series configuration should be employed for loudspeakers nominally rated above 3 ohms; the parallel mode can be used for loudspeakers whose impedance is rated below 3 ohms by the manufacturer.

The 7B-ST is similar to a bridged 3B-ST in voltage swing, but has double the number of output devices. However, the 7B achieves parts savings and simpler circuitry by having only two drivers, to allow for the series mode to configure half the devices out-of-phase. When the amplifier is run in parallel mode, all output devices are tied together with 0.05 ohm resistors. These changes give the 7B-ST much greater current-delivery capacity. The 7B-ST can be configured by back-panel slide switches in "series mode" to provide high-voltage output for speaker loads of 3 to 8 ohms, or into the high-current "parallel mode" configuration to drive loudspeakers of low (1–3 ohm) impedance. Like other bridged designs, the 7B has high power ratings, including a 500W rating for 8 ohm loads and an 800W rating for 4 ohm loads.

Like that of the 3B-ST, the 7B-ST's front panel displays the "ST Series" logo and has a rectangular power switch located at panel center. However, being a monoblock, it has only one tricolor power-on LED. In addition, the 7B-ST is deeper and heavier than the 3B-ST, with double the heatsinking (6400cm³ of chassis vs 3200cm³) to handle the greater current draw. The 7B-ST's center chassis is 2" shallower than that of its NRB predecessor. This represents another Stuart Taylor design innovation—previously unused chassis space between the rear of the main system

board and the back panel has been eliminated to give shorter wire runs between back-panel connectors and the main circuit board and to allow the amp to be pushed back to the full shelf depth without crushing the connecting cables.

There are three toggle switches, two pairs of loudspeaker terminals, and balanced and unbalanced inputs on the back panel in addition to the detachable power cord. As on other Bryston amplifiers, white lacquer diagrams and instructions are printed on the back panel; an instruction manual is not needed. This is very important for the Bryston 7B-ST, which features unique optional bridging configurations for the speaker terminal hookups. The switches select between balanced or unbalanced inputs, series or parallel operation, and, as in the 3B-ST, a Ground Lift switch to float the chassis ground from the signal ground.

The 7B-ST's input circuitry features the "ST" input buffer circuit, now standardized for the single-ended and balanced inputs of all ST Series amplifiers. Input circuitry is completely symmetrical. Multiple pairs of bipolar transistors are used in the output stage, each pair controlled by a single driver transistor. Output devices are hand-selected to precisely match transistor betas. Each input driver-output pair is treated as a composite output device that Bryston labels as its "Quad-Complementary" configuration. The company claims that this configuration has been fine-tuned to deliver high linearity and low-order distortion products. Open-loop distortion is claimed to be low, approximately 0.05%, and negative feedback is primarily local.

The amplifier's dual ±60V power supply uses two 500VA toroidal transformers, one for each amplifier module, again located just behind the front panel. Short pcb spacing brings the eight 10,000µF electrolytic filter caps to within 1" of the output circuitry. Internal protection circuitry is designed to handle most fault conditions, including shorts and DC-offset. A "soft-start" turn-on feature prevents a sudden huge draw on the power line when the amplifier is switched on. As TJN noted, this feature prevents you from blowing circuit breakers if your home-theater system includes multiple pairs of 7B-STs.

Listening to the 7B-ST: The Bryston 7B-ST monoblock, the most substantial piece of electronic gear in this review, required the most care in setup. I first used a pair of 7B-STs to drive the large Snell SUB-1800 subs set up in series mode. The monoblocks were stacked, with the Ground Lift on, and driven via the unbalanced inputs. Later, I attempted to connect these amplifiers in paral-

lel to drive the Snell Reference Towers. This was done for two reasons. First, most of TJN's subjective impressions of the earlier 7B-NRB-THX were gathered when his amplifiers were configured in parallel mode. Second, I carried on an e-mail correspondence with Robert Deutsch, who had used the 7B-NRBs in parallel to drive various dynamic loudspeakers he'd been reviewing. There seemed to be an impression that the amplifier might sound best in the high-current parallel mode.

Switching the 7B-ST into parallel mode required bi-wired speaker cables: four leads, two per speaker terminal. My OCOS cable is bi-wired, but, unfortunately, at one end the two cables for each terminal are soldered together for convenience; this meant that I needed to run an additional set of cables. I added a pair of Levinson HFC-10s to make a total of three pairs of cables per speaker—what might be considered a "tri-wired" setup. Although this produced decent sound, I went on to disconnect (after the unit was powered down) one of the Levinson cables to make certain that it was wired to the same speaker as its companion OCOS cable. When I turned the amplifier back on, I heard a tiny pop—one of the two 7A fuses had blown. I replaced the fuse, turned the amp back on, and breathed a sigh of relief when its LED lit up green. Impressed with 7B-ST's ruggedness, I decided to conduct the remainder of the listening sessions with the 7B-STs run in series. This was the appropriate setting for all the loudspeaker loads I used for this review.

The 7B-ST made a terrific impression on first hearing: open, exciting, transparent, dynamic, effortless—and it appeared to be the optimal amplifier for the Snell Reference Towers. All the qualities I liked about the 3B-ST were there: speed, drive, slam, and superb control of the mid- and upper bass. Yet the 7B-ST had other sonic qualities not so evident in its little brother, such as its very airy, open top end, sweet mid-range, and ability to render the best imaging and soundstaging I'd heard in a long time. It seemed to capture many of the best qualities of my comparison amplifiers, including the Levinson No.331's delicate detailing and transparency, and the (now discontinued) Krell KSA-250's ability to delineate the full width and depth of the soundstage. What was missing, at least in my setup, was the midrange warmth that TJN had noted in the 7B-NRB-THX.

The 7B-ST proved to be an outstanding bass amplifier—*ie*, from 80Hz down—when driving the huge Snell SUB-1800 subwoofers. In this configuration, the 7B-ST easily sustained

the solid pedal chords of the Lay Family Concert Organ playing "The Lord Is My Light and My Salvation" on the Turtle Creek Chorale's HDCD-encoded CD of the music of John Rutter (Reference Recordings RR-57CD). It equaled the Krell KSA-250 in capturing the sudden, dramatic plucked-bass and synthesizer notes during the opening of "Something's Wrong," from Randy Edelman's *My Cousin Vinny* soundtrack (Varèse Sarabande VSD-5364). The Bryston monoblocks were lightning-fast in controlling the Snell SUB-1800's 18" subwoofer cones. I heard this best during the dramatic opening of the Eagles' "Hotel California" (from *Hell Freezes Over*, Geffen GEFD-24725). The band's conga section erupted with shocking power at the first hint of the melody, and played on clearly through the crowd's wild applause and foot-stomping.

The first chords of Terry Dorsey's "Ascent" on *Time Warp* (Telarc CD-80106) shook the room, giving ample evidence of the 7B-ST's bass "slam." This was also starkly obvious as these monoblocks delivered the burning pace generated by the tom-tom strokes and subterranean synthesizer chords on David Bowie's "Putting Out Fire," from the *Cat People* soundtrack (MCA 1498, LP). The 7B-ST made it as easy to discern pitch changes in the deep-bass synthesizer notes on Jeff Beck's "Behind the Veil" as did the Krell KSA-250.

The 7B-ST's bass power was particularly impressive listening to "Gnomus," from Jean Guillou's organ transcription of Mussorgsky's *Pictures at an Exhibition* (Dorian DOR-90117). I was most impressed with the apparent image size and sense of space around the Great Kleuker-Steinmeyer organ. There was a sense of great depth and expansiveness. The bass notes in this relatively quiet passage shuddered the air, vibrated objects in the room, and had a solidity I had not heard before. Other solid-state amplifiers on hand could not control the SUB-1800's bass response as well. The Bryston 7B-ST's speed, snap, focus, and dynamics made it my preferred amplifier for driving the Snell Reference Towers.

Switched to the Type A References' midrange-tweeter towers, the 7B-STs produced music with dynamics, power, depth of image, and airiness. All the dynamic speakers—including the Totem Model 1s, the Dahlquist DQ-10s, and the Snell Reference Towers—blossomed when driven by the Bryston 7B-STs. Snap, focus, width of soundstage, and depth of image—all were enhanced. My vinyl collection sprang to life with exciting, driving dynamics, particularly the jazz recordings. The



Bryston 7B-ST power amplifier

Bryston 7B-ST depicted the placement and depth of piano and drums on Dave Grusin's rendition of "Keep Your Eye on the Sparrow," from the direct-to-disc *Discovered Again* LP (Sheffield Lab 5). Ron Carter's string bass and Harvey Mason's kickdrum were clearly delineated in space just behind Grusin's keyboard. The amplifier's "snap" speeded up the bass response of both dynamic systems. And the 7B-ST was able to yield enough information to discern that the bass beat was, in fact, a "floor stomp" in the opening *Kyrie* of *Missa Criolla* over the Snell Reference Towers.

Imaging from the pair of 7B-STs was first-rate, equaled only by the huge dual-mono Krell KSA-250. During the instrumental finish of Richard Thompson's "Why Must I Plead" (from *Rumor and Sigh*), the acoustic guitar's sonic image fell outside the right Snell Reference Tower. Soundstage depth and width were exemplary on the Holst *Chaconne*.

Over the past few years the Bryston 7B-ST has received accolades in the pages of *Stereophile* from TJN, RD, and Dick Olsher. I confirm the high quality of this monoblock amplifier; my listening revealed to me how much better the ST Series has become. The new 7B-ST has much less of the midrange and upper-bass warmth that were reported of the earlier NRB-series amplifiers, and its high power and flexible bridging arrangements are designed to handle divergent speaker loads. For example, it would be a good choice for driving high-impedance speaker loads such as the Sound-Lab Ultimate.

—Larry Greenhill

Measurements from TJN: Following its one-hour, $\frac{1}{2}$ -power preconditioning, the Bryston 7B was hot, though not unusually so considering its rated power output. I ran a complete set of measurements on each on the 7B-ST in its series mode (recommended for 3–8

ohm loads), with selected measurements in the parallel configuration (including the 2 ohm tests). Most of the measurements were made in the balanced mode this time around, though a number of significant measurements were repeated in the unbalanced mode.

The input impedance of the Bryston measured 16.7k ohms balanced and 48.9k ohms unbalanced (essentially the same in the parallel configuration). The gain was 23.3dB balanced, 29.3dB unbalanced. The output impedance was low—a maximum of 0.05 ohms at 20Hz and 1kHz and 0.14–0.16 ohms at 20kHz, depending on test conditions. This suggests a very consistent performance with a wide range of loudspeakers, at least with respect to overall amplifier/loudspeaker frequency response. The Bryston's DC offset was a negligible 1.7mV. Signal/noise (unweighted ref. 1W into 8 ohms) measured 92dB over a bandwidth of 22Hz–22kHz, 84dB from 10Hz to 500kHz, and 94dB, A-weighted (the unbalanced measurements were essentially the same). The 7B was noninverting, a positive impulse at the input remaining positive at the output. In its balanced mode, XLR pin 2 was positive.

Fig.17 shows the frequency response of the 7B. In the parallel mode—not shown—the response was a little flatter on the top end, down 0.1dB at 50kHz into 8 ohms and less than 0.25dB at 50kHz into 4 ohms. The 10kHz squarewave response is shown in fig.18. The Bryston 7B-ST has an excellent risetime, with only a slight overshoot apparent on the bottom half of the wave (this is hard to spot on the trace shown and was barely visible on an oscilloscope). The 1kHz squarewave (not shown) was virtually perfect. (The squarewave responses in the parallel configuration, not shown, were virtually the same.)

As with the 3B-ST, the low-power THD+noise vs frequency results in fig.19 were taken at ten times higher

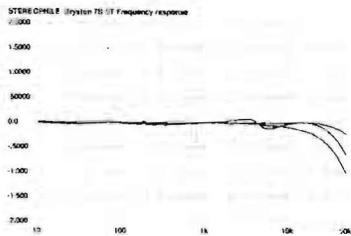


Fig. 17 Bryston 7B-ST, frequency response at (from top to bottom at 30kHz): 1W into 8 ohms, series, balanced; series, balanced, at 2.83V into simulated speaker load; and at 2W into 4 ohms, series, balanced (0.5dB/vertical div).

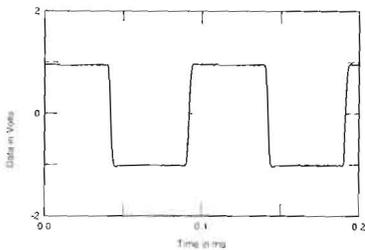


Fig. 18 Bryston 7B-ST, small-signal 10kHz squarewave into 8 ohms.

than normal output. This was the only way to minimize the effects of low-level noise on the reading. Only the result into the simulated load shows any peculiarity. And the maximum distortion is still below 0.3%.

The plot of the distortion waveform, at 1kHz, shown in fig.20, was taken at 4 ohms into 200W. At lower power levels the distortion was buried in the noise. The distortion is primarily third-harmonic (and remains third-harmonic in the parallel mode driving 2 ohms, not shown.)

Because of the extremely high power capability of the 7B-ST, I limited the high-power output spectrum measurements below, to 200W maximum instead of the $\frac{2}{3}$ power normally attempted. Since this measurement takes a little longer than the clipping measurement, I had no desire to blow up our test-bench load! For the same reason, the 50Hz spectrum response into a simulated real load was not taken. Fig.21 shows the Bryston's output spectrum driving 50Hz at 200W into 4 ohms. All of the artifacts lie below -90dB (0.003%). The same is true of fig.22, which shows the intermodulation artifacts resulting from driving a combined 19+20kHz signal at 200W

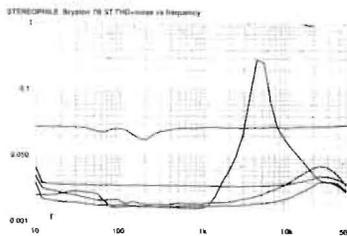


Fig. 19 Bryston 7B-ST, THD+noise vs frequency at (from top to bottom at 5kHz): 9V into simulated speaker load; 40W into 2 ohms; 10W into 8 ohms, unbalanced; 20W into 4 ohms; and 10W into 8 ohms balanced (all series drive).

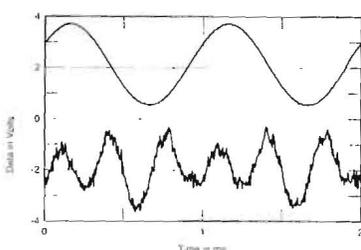


Fig. 20 Bryston 7B-ST, 1kHz waveform at 200W into 4 ohms (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

into 8 ohms. The response for 200W into 4 ohms is not shown; all of the artifacts were at or below the levels in fig.22.

The manner in which THD+noise changed with output power for the 7B (at 1kHz) is shown in fig.23. The actual discrete clipping-point measurements (clipping defined as the 1% distortion) were 613W into 8 ohms (27.9dBW), 954W into 4 ohms (26.8dBW), and 595W into 2 ohms (21.7dBW). (The line voltage for these measurements varied between 118V and 119V; the readings for 4 and 8 ohm loads were taken in the series configuration and the 2 ohm load in the parallel connection.)

The measured performance of the Bryston 7B-ST, particularly its tremendous power output with very low distortion, was first-class.

—Thomas J. Norton

Summing up: The Bryston 7B-ST monoblock power amplifier is an exceptional product. It's very powerful, and joins my reference Krell KSA-250 as an amplifier that can handle any loudspeaker load, play wide-dynamic-range music effortlessly, and excel in

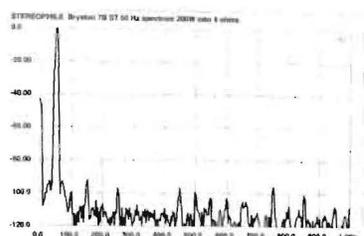


Fig. 21 Bryston 7B-ST, spectrum of 50Hz sinewave, DC-1kHz, at 200W into 4 ohms (linear frequency scale).

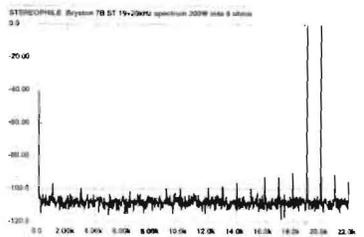


Fig. 22 Bryston 7B-ST, HF intermodulation spectrum, DC-22kHz, 19+20kHz at 200W into 8 ohms (linear frequency scale).

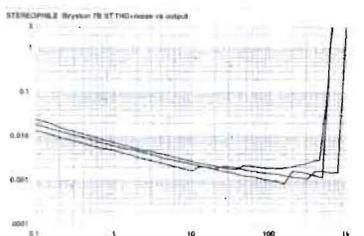


Fig. 23 Bryston 7B-ST, distortion (%) vs output power into (from bottom to top at 100W): 8 ohms, series; 4 ohms, series; and 2 ohms, parallel.

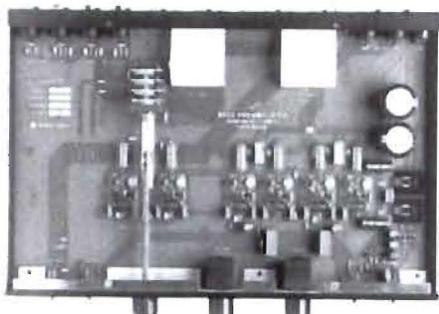
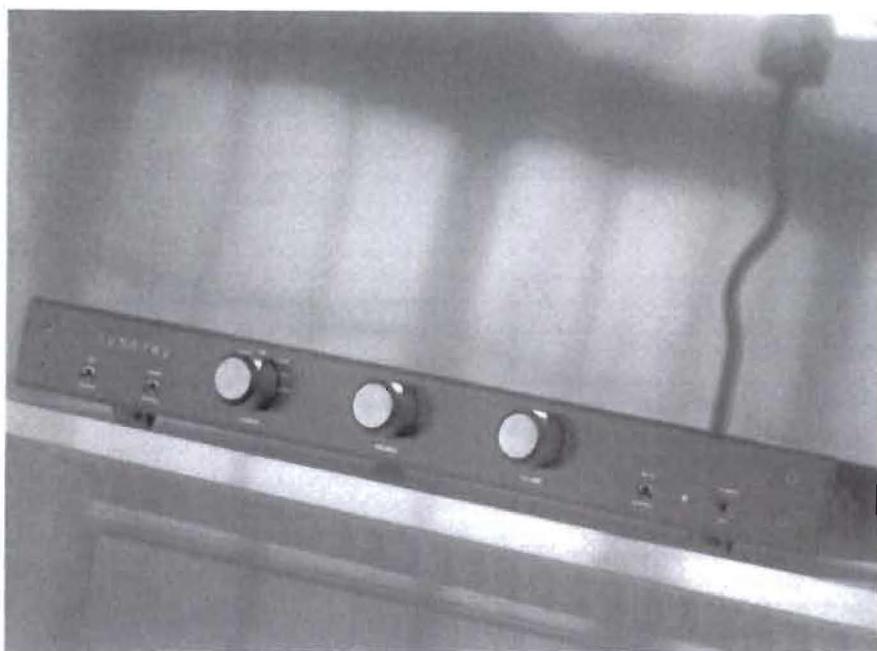
imaging and soundstaging. It can "wake up" reticent dynamic loudspeakers over their entire sonic range; in particular, it brought dry, reticent top ends to life. It equaled the Class A recommended amplifiers at my disposal—the Mark Levinson No.331 and the discontinued Krell KSA-250—in dynamics, transparency, and ability to transmit music's rhythmic pace.

This solid-state monoblock should be auditioned by anyone who needs a new amplifier for driving high-impedance electrostatic loudspeakers, or dynamic loudspeakers that seem somewhat bass-shy. The Bryston 7B-ST rates a solid Class A recommendation.

—Larry Greenhill

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BRYSTON BP20 PREAMP



As audiophile preamplifiers go, the Canadian-made Bryston BP20 is a steal. A suggested retail price of \$1,395 isn't bad for a line-level preamp these days—at least in the company that the BP20 keeps—yet this Bryston bespeaks quality both inside and out. And as we'll see shortly, it acquits itself superbly both on the test bench and in the listening room.

The Bryston BP20 is utterly simple in concept and use. It aims merely to select the program source; provide control of volume, balance, and mode (stereo or mono),

and transfer the result to a power amplifier without altering dynamic range or contributing noise and distortion of its own. The BP20 handles line-level signals exclusively; an external phono preamp model BP1 is available for moving magnet cartridges as well as a model TF-1 step-up transformer for moving-coils.

Three rotary controls dominate the front panel: "Source," "Balance," and "Volume." Pairs of small toggle switches lie to the left and right, somewhat lower than the rotary controls. The leftmost chooses "Tape" (monitor) or "Source," and the adjacent one selects "Stereo" or "Mono" operation. The first to the right of the knobs activates partial muting; the one at the far right is "Power." A two-color LED between the latter pair glows red when power is first applied and green when the preamp is stable and has come out of muting.

Some dyed-in-the-wool purists may object to use of a balance control rather than separate left-and-right volume adjustments, but I think that's carrying purism to a ridiculous extreme; a balance control—

especially one as fine as Bryston's—is infinitely easier to use and more accurate than individual volume adjustments for each channel. I had a quibble about the panel markings on my test unit, which was from the original production run. The toggle switches operated "backwards"; i.e., when the toggles pointed down to the original's "Monitor," "Mono," and "Mute" markings, the monitor was off, the system was in stereo, and the sound was on. In each case, "down" meant "function off." By popular demand ("more like torchlight storming of the factory gates," says Bryston) this was changed after the first 50 units were made. Current units are labeled above and below the toggles, and the toggles point to their actual settings.

Input and output connectors are arrayed along the back panel in reverse of the usual order, i.e., with the inputs toward the left rear (viewing the preamp from the front) and the outputs on the right. This was probably done to minimize the signal path within the preamp, which makes good sense. There are two sets of balanced inputs ("Bal 1" and "Bal 2") followed by five pairs of unbalanced inputs ("Video," "CD," "Tuner," "AUX 1," and "AUX 2"). The BP20's balanced inputs use gold-plated

SPECS

Rated THD: Less than 0.0025% at 3 V out.

Frequency Response: 20 Hz to 20 kHz, ± 0.05 dB.

S/N, 20 Hz to 20kHz: Unbalanced input, 100 dB re: 500 mV; balanced input, 103 dB re: 1 V.

Maximum Output: Unbalanced output, 15 V; balanced output, 30 V.

Sensitivity: 500 mV.

Dimensions: 19 in. W x 1 3/4 in. H x 11 in. D (48.3 cm x 4.4 cm x 28 cm).

Weight: 8 lbs. (3.6 kg).

Price: \$1,395.

Company Address: U.S., Bryston - Vermont, R.F.D. 4, Berlin Montpelier, Vt. 05602; Canada, Bryston Ltd., 57 Westmore Dr., Rexdale, Ont. M9V 3Y6

Photo: Bill Kourimis



XLR connectors with standard pinout: Pin 1 for ground, pin 2 for the noninverting input, and pin 3 for the inverting input. The unbalanced inputs employ gold-plated RCA jacks.

Two pairs of unbalanced outputs (again via gold-plated RCA jacks) and one set of balanced outputs (via gold-plated XLR connectors) are provided. The tape inputs and outputs are unbalanced (via gold-plated RCA jacks) and are situated between the final unbalanced inputs and the unbalanced outputs. The tape inputs provide a sixth unbalanced input—selected by the “Tape/Source”

toggle—or can be used to loop the signal through an external processor. At the far right of the back panel (viewed from the front) is a five-pin DIN jack that carries a.c. power to the BP20 from its external transformer.

Circuitry
Internal layout and construction are superb. With the exception of the unbalanced jacks, all components mount directly to one main board that extends across the entire width and depth of the chassis. The unbalanced jacks are mounted on a second board, with the signals conveyed to and from the main board by two ribbon cables. There’s no point-to-point wiring in the BP20 whatsoever.

The power-supply circuitry (except for the line transformer, which is external) lies at the far right of the main board and uses a discrete bridge rectifier (four 1N4004 diodes) that feed a pair of 4,700- μ F/50-V electrolytics. Two IC regulators (a 7824 for the positive supply and a 7924 for the negative), mounted on individual heat-sinks, supply ± 24 V to the electronics. A pair of 1,000- μ F/25-V electrolytics serves as the final filter. A fifth diode provides a separate power source for the power-on muting system, which disconnects all output lines (via a relay) until the system has stabilized.

Six identical operational amplifiers are used in the signal path, three per channel. Each is fabricated from discrete components (eight transistors and sundry passive devices) laid out in individual compact “blocks” on the main board. This arrangement would seem to provide the best of both worlds: the short signal path and predictable parasitic elements characteristic of an IC op-amp and the ability to hand-select individual components that discrete designs provide. Perhaps of paramount importance is the ability to engineer the discrete blocks with active devices that offer both low noise and high output swing. (Most IC op-amps work from ± 15 V supplies; the BP20’s electronics operates from ± 24 V.)

The input amplifier operates in balanced mode when connected to either of the balanced inputs; when switched to any of the unbalanced feeds, the inverting input is referenced to ground. In the unit I tested, this amplifier operated with a voltage gain of 6 dB; its output was padded down by a like amount before the signal passed to the “To Tape” jacks, so the voltage gain from an unbalanced input to the tape outputs was precisely unity (0 dB). In current units, the buffer amp has unity gain, so no pad is needed. The tape loop comes after the input stage and is unbalanced, like the output from the first-stage amp. After being routed through the “Mono,” “Mute,” “Balance,” and “Volume” controls, the signal is amplified by a second noninverting stage and then handed directly to the unbalanced output connector and to pin 2 of the balanced XLR output. A unity-gain inverting stage derives the other half of the balanced output and feeds pin 3 of the XLR.

Measurements
Circuit topology of the Bryston BP20 is utterly classic and provides unbalanced

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Measurements
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and transformerless balanced inputs and outputs. The circuitry works as well as it does—despite employing a gain stage prior to the volume control—because of the high power-supply voltages from which the BP20’s operational amplifiers work. You can pump upwards of 10 V rms into any input without fear of front-end overload, and that level should be more than adequate for any conceivable audiophile application.

Output drive capability is equally impressive (see Fig. 1); I measured a level of 16.1 V rms at the unbalanced output (and twice that at the balanced output) before distortion increased noticeably. At a typical output level of 2 V rms, THD + N is no greater than 0.0016% across the audio band when using the unbalanced inputs and outputs (Fig. 2). From a balanced

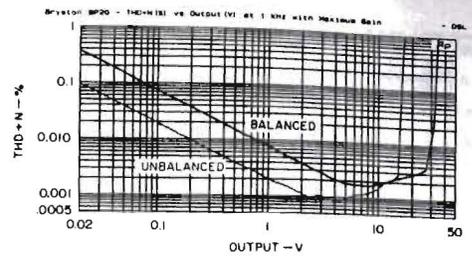


Fig. 1—THD + N vs. output at 1 kHz.

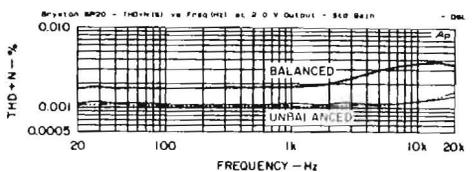


Fig. 2—THD + N vs. frequency.

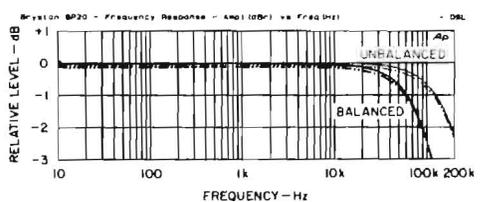


Fig. 3—Frequency response.

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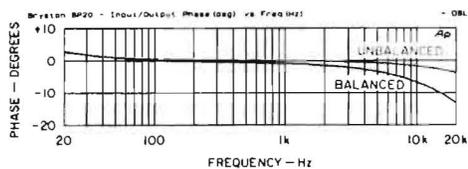


Fig. 4—Input/output phase linearity.

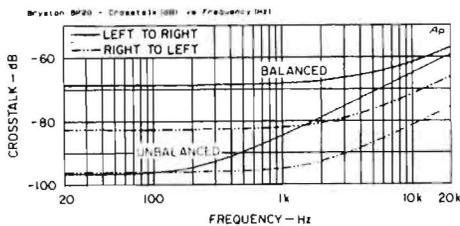


Fig. 5—Interchannel crosstalk.

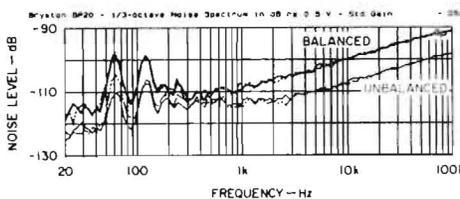


Fig. 6—Noise spectrum.

input to the balanced output, THD + N remains under 0.002% from 20 Hz to 2 kHz and hits a maximum of 0.0037% at 16 kHz. The higher level of THD + N in this configuration is probably due to the additional amplifiers employed in the balanced mode and to the fact that, with the volume control set for standard gain in the unbalanced mode, the levels through the balanced arrangement are higher than they would be from the unbalanced output. In either configuration, however, THD + N is nothing to be concerned about.

For the record, in testing the Bryston BP20, I decided to make all "unbalanced" measurements from an unbalanced input (the CD input in this case, but all are the same) to the unbalanced output. For the "balanced" measurements, I used the "Bal 1" input ("Bal 2" is identical) and the balanced output and used the same volume

setting I employed for unbalanced measurements. As a result, system gain for the balanced measurements was 6 dB greater than that used for the unbalanced measurements. Note also that in Figs. 2, 3, and 6, solid curves are for the left channel and dashed curves for the right.

Frequency response (Fig. 3) is within +0, -0.03 dB across the audio band with unbalanced operation and +0, -0.12 dB with balanced operation. Again, the difference comes from the additional electronics needed for balanced drive. The -0.25 dB point occurs at 60 kHz, unbalanced (30 kHz, balanced), and response is down 1 dB at 125 kHz and 62 kHz for unbalanced and balanced operation, respectively. Minor performance differences between the two operational modes can also be detected in input/output phase linearity (Fig. 4), crosstalk (Fig. 5), and the noise spectrum (Fig. 6). In each case, unbalanced operation produces the superior numbers, but not by much.

Does this mean you should forgo balanced operation and use the BP20's unbalanced connections? Not really. The benefits of balanced operation rarely show up on the bench but can be a major factor in the real world. When properly implemented, balanced connections eliminate ground loops and reject interference pick-up on the connecting cables. This can be important when running long lines between a source component and the preamp—or between the preamp and the power amp—especially when operating in an electrically noisy environment. (This is one reason why professional installations use balanced connections.) If you're using a balanced source and a power amp with a balanced input, by all means try balanced wiring. You're likely to find it superior when the runs get lengthy.

With the balance control at its detent, channel gains matched within ± 0.045 dB in both operational modes. To my mind, that certainly validates Bryston's decision to use a balance control rather than having separate volume controls for each channel. The A-weighted noise was -98.6 dB re: 0.5

V (the EIA/IHF reference output) from the CD input and was -91.7 dB from the "Bal 1" input. Either way, available dynamic range (referenced to maximum output level) comes out at a stunning 122 dB. Input and output impedances (49 kilohms and approximately 50 or 100 ohms, depending on the output tested) suggest that there will be no problems interfacing the BP20 with other equipment. Ditto when it comes

THE BRYSTON'S SOUND QUALITY IS STUNNING, UTTERLY EFFORTLESS WITH AND TRANSPARENT WITH EVERY TYPE OF MUSIC.

to maximum gain (11.2 dB unbalanced, 17.2 dB balanced).

The muting switch dropped the signal level by just over 20 dB. Channel separation, although setting no new records, should be adequate. I measured 84.1 dB at 1 kHz with unbalanced connections and 67.6 dB at that frequency with balanced operation in the worse (left-to-right) direction. Overall separation is better than 61 dB from 20 Hz to 10 kHz in either mode.

Use and Listening Tests

The Bryston BP20's sound quality was stunning—utterly effortless and transparent with every type of music I tried. This was true whether using the balanced inputs (fed from my Sansui CD-X711 CD player) or the unbalanced inputs (fed from my Sony DAT deck or from the Sansui CD player). I try to minimize wire runs in my system (I used no more than a half meter from the source to the Bryston preamp and no more than a meter from the BP20 to my Apt 1 power amp), so the benefits of balanced connections were not as apparent as they might be in a more far-flung setup. But with either connection, the BP20 delivered uncommonly detailed reproduction, which I especially appreciated in the high treble and during quiet passages. There just doesn't seem to be a "noise floor" under this preamp or a high-level ceiling over it. Believe me, that's high praise indeed!

Edward J. Foster



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The Inner Ear Report 85 Moorehouse Drive, Scarborough, Ontario, Canada, M1V 2E2, (416) 297-7968
Volume 6, #1

Bryston Preamplifier Model BP20
Source: Bryston Ltd.

Rating: 95%, 🎵🎵



In the last two years or so, Bryston has introduced new models amplifiers to their professional market as well as to the consumer electronics market. For at least as many years, we had been asking Bryston what they are going to do about a new preamplifier, and their answer had always been the same: "It's coming." Well folks, here it is, Bryston's brand new BP20 — a line-stage device with a new look, a new design approach and a new disposition toward the serious audio consumer.

Appearance:

This is a rather sleek looking piece of equipment, where Bryston departed from its earlier pro-audio appearance. The BP20's control unit is only 1.25 inches high, 12 inches deep and 19 inches wide with rack ears. Three small knobs symmetrically arranged, represent the *Selector* switch, the *Balance*, and the *Volume* control. On the unit's right, a *Mute* button and the *ON/Off* switch complement the *Monitor* and *Mono* switches on the left. A small LED on the right shows the status of the preamp: Red for muted output, green for unmuted output. The Bryston logo is on the unit's upper left. It is the only other visible element on the uncluttered, logically arranged faceplate. There is an external power supply, which

isn't as large as one would expect it to be.¹ A small indicator LED on the unit shows when it's connected to the AC. Nothing much to tell you about the power supply, other than that it can be placed away from the control unit in as small a space as you choose. The BP20 looks good, feels good and offers the appearance of quiet decorum.

Technology:

This preamp's attractiveness is more apparent when one looks inside. The BP 20 is a dual mono preamplifier.

Its separate unit isn't the actual power supply for the preamp. It's located inside, on the main chassis. The transformer, however, is external, housed in a small case. Bryston reasoned that the noisiest part of a preamp is the transformer, not the power supply itself. The circuit boards are grounded on separate plains. Each input is individually grounded. There is no internal wiring. All components plug directly into glass-epoxy circuit boards. Intermodulation distortion has been reduced to 0.001% from 20Hz to 20kHz. Crosstalk practically doesn't exist. Signal switching is achieved with heavy gold plated switches. Buffered inputs provide for low distortion and improved linearity from source components. The BP20 is housed in a

steel cabinet to shield and protect it from magnetic interferences. Bryston's pro connection is found on the rear of the preamp. There are two pairs of XLR (balanced) inputs and one pair of XLR gold plated male output connectors. All inputs are gold-plated.

Bryston currently manufactures a phono preamp for the professional industry, such as radio stations. It plans to market the same device, slightly modified, to consumers. Its basic design will incorporate a moving magnet input. An optional moving coil head-amp is also available. Please check with Bryston for details on its availability and its price.

The Sound:

Before we get into this, let us tell you that we never did like the sound of the earlier Bryston preamp, the 12B, which we had reviewed a few years ago. Although it had specked out to be wonderfully linear, its strength and sonic merits were restricted to its phono preamp section. All of the high-level sources, however, sounded rather restricted, giving the impression that it couldn't quite finish what it had started. The new BP20 is an entirely different-sounding device. Its sonic signature is best described as rich, mellow and musical. Yet, this unit has the ability to reveal musical subtle-

**Bryston – P.O. Box 2170, 677 Neal Drive, Peterborough, Ontario, Canada K9J 7Y4
Tel: (705) 742-5325, Fax: (705) 742-0882**

ties and nuances, usually attributed to much higher-priced designs. The highs come across widely commodiously and well balanced with the entire midrange segment. Upper and lower midrange information is succinct smooth and seamless. It sounds a bit euphonic on occasion, more noticeable when listening to large orchestration. This trait isn't unpleasant at all and some of our panelists regarded it as a benefit, others thought that it sounds too pleasing – too pleasing?² Personal taste and the reviewer's bias causes these rather confusing statements. Most of our panel liked the midrange and thought that the BP20 midrange area sounds rather accomplished.

The bass region sounds potent, yet resolute and disciplined all the way down to the pedal-note vicinity. Because of the all-round sonic character of the BP20, bass tenacity comes across a little ambiguous at times. (There it is again, the euphonic sort-of sensation – liked by some disliked by others). Upon connecting the Bryston with three amplifiers, it was decided that the bass *does* sound accurately after all, and that it was the various amplifiers' sonic signatures, that had been revealed. This, of course delineates the Bryston as a

preamplifier with admirable sonic neutrality.

The sound stage conjured by the BP20 is beautifully detailed, renders realistic boundaries and appropriate focal finesse. Its three-dimensional imagery is, rather than overly impressive, a true depiction of a musical pulpit.

Synopsis & Commentary:

Bryston has produced some rather sophisticated high-end gear for the past few years. A lot of their products aren't designed for the home audio market, but find their way into consumers' homes anyway. Regarded as one of the world's best professional audio manufacturers, Bryston's reputation in the home audio market hadn't kept up with the fame they enjoy otherwise. Well, we believe that the time has come for audiophiles to seriously look at this company as a contender for high-end products – affordable high-end. We had connected the BP20 with Carver Silver Nine-t mono blocks, an OCM 500, a Sugden amplifier and Bryston's own 3B. Not surprising, a special synergy exists when the BP20 is connected with the 3B. This combination literally sings and shows that when the right system is put together, the outcome is stunning. If

we had to rate these components as a system, it would rank as high as the 3B (99%, ♪♪♪). However, since we had arbitrary success with other components, the above rating is appropriate. The bottom line is cut and dry: This is a superb preamplifier.

Specifications:

Frequency response..2Hz to 20kHz
Maximum output.....15 volts
Balanced out.....30 volts
IM or THD....0.0025% at 3 volts out
High level sensitivity.....500mV
Rated noise, ref. 500 mV
unbalanced input 20Hz- 20...10dB
Dimensions.....19x 1.75x 11 inches
Weight.....8 lbs., 3.6kg

¹ See the "Technology" section for an explanation.

² Our editor thought that there is no such thing, stating that it's either right or wrong. He came to the conclusion that the midrange section sounds just beautiful and musically correct.

“David Rich, as an engineer, is one of the biggest fans of Chris Russell as an engineer, so David should have written this review of Chris’s latest-and-greatest preamp. Because of various intramural errors – all of them my fault – David never had a chance to do so, and therefore, since “the buck stops here,” I am closing up the breach.

The BP20 replaces the 11B and 12B series in the Bryston line and represents a complete rethinking on the part of Chris Russell of just how a preamp should go together. The basic Bryston gain-stage topology, using operational amplifiers



*Bryston
BP-20
Preamplifier*

made up of discrete components and +24 V power supplies, has not changed (at least as far as I can see), but the physical layout and construction of the unit are new and different. The main chassis is pancake-flat (barely 1 1/2" high); the power-supply transformer is a separate external unit with an “umbilical cord.” The PC boards have been redesigned, the signal paths simplified, and a ground plane incorporated. Each of the two channels has two XLR balanced and one XLR balanced output, five unbalanced

inputs and two paralleled unbalanced outputs, plus a tape loop. That provides a lot of interface flexibility.

There is no selector switch (a debatable signal-path simplification), only a toggle switch for Tape /Source selection. A balance control with 12 o'clock detent is next to the continuously variable volume control. The construction details are absolutely beautiful; parts quality is high.

Two favorable characteristics became apparent in the course of my measurements: (1) there was no “better” channel, the two being absolutely identical in distortion and noise, and (2) the balanced signal path was just as low in distortion and noise as the unbalanced. This uniformity was new in my experience. On the other hand, the balance control at

the detent was off by 0.7 dB at unity gain with 2 V out (XLR in/out).

The THD + N versus level measurements yielded outstanding results. With either unbalanced in/out or XLR in/out, the 20Hz and 1kHz distortion dropped to a minimum of -97dB shortly before the clipping level. The 20kHz curve showed a

small amount of dynamic distortion but only above 4 V and 8 V out (unbalanced and balanced, respectively), so it is of no significance. Maximum undistorted output was approximately 14 V unbalanced and 28 V balanced – I think that should be sufficient for any application, don't you? The curves were absolutely linear (i.e., noise-dominated); the noise floor appeared to be no better and no worse than I had seen in other topnotch preamplifiers, give or take a couple of dB. Channel separation, one of the stumbling blocks with a compact chassis and a balance control, was much improved over the 11B. Under worst-case conditions (balanced was worse than unbalanced, unity gain worse than full gain), the separation was 70dB or better (up to 85dB) at nearly all frequencies. Messing with the balance control made things worse at the highest frequencies; 54dB at 20kHz was the most screwed-up reading I was able to obtain that way. This is still highly acceptable performance.

The Bryston BP20 is only the second preamplifier we have tested – the first was the Krell KRC-2 that will accept both balanced and unbalanced inputs and deliver both balanced and unbalanced outputs. If that's what need – and in certain highly elaborate audio systems you almost surely will – the Bryston outperforms the Krell in most respects at 38 cents on the dollar (unless you feel the Krell's CMOS remote control alone justifies the other 62 cents). As a purely unbalanced front end the Bryston has some rivals, though no indisputable superiors, and its look-and-feel make it a delight to use in any event.”

The BP20... represents a complete rethinking on the part of Chris Russell of just how a preamp should go together.

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S A M ' S S P A C E

Sam Tellig

Bryston B-60 integrated amplifier

Bryston is one of North America's most established hi-fi makers. Based not far from Toronto in Peterborough, Ontario, Bryston has been in business since 1962.

But audiophiles don't get excited about Bryston — not, at least, those hardcore audiophiles who love to keep changing equipment, who think of hi-fi as a competitive sport. Bryston! Why, their 2B amplifier has been in production for almost 20 years! How *boring*.

How boring, too, the fact that Bryston equipment is now *guaranteed* for 20 years. Who owns something for 20 years? (Bryston customers, obviously.) My buddy The Brass Ear is unlikely to own a piece of equipment for 20 *weeks*. ("Twenty days!" said Brass Ear when I read this to him. "Twenty hours. Minutes!")

With Bryston gear, you get solid engineering and impeccable — I was going to say unimpeachable — build quality. This is what you pay for; not bulletproof faceplates, gold-plated name badges, or the like. Because Bryston gear is not overbuilt, it's not overpriced.

Being made in Canada also helps, now that NAFTA has kicked import duties down to nearly nil. And Bryston's importer is Bryston, so the stuff can be very keenly priced.

The B-60 is Bryston's first integrated amplifier. Without a remote, it'll set you back \$1495; with a remote, \$1795. Before you fork over the extra \$300 for the remote, be aware that it only controls volume and mutes — that's it. It doesn't change source or adjust channel balance. It won't control your CD player.

There is no onboard phono option. If you want to do phono through the Bryston, that could cost you almost as much as the B-60 itself. The BP-1 phono stage — rumored to be excellent — runs \$750. Add \$550 for an outboard TF-1 transformer for low-output moving-coils.



Bryston B-60 integrated amplifier

Fortunately, there are plenty of decent outboard phono stages available for less money — for instance, the \$199 Creek OBH-8 moving-magnet phono stage or \$249 OBH-9 moving-coil phono stage, neither of which Roy Hall has bothered to send me, but both of which are said (by independent sources) to be quite good. Roy could use the business. It's only a matter of time before he loses his new cellular phone for good — into Long Island Sound, perhaps, or the Atlantic Ocean. Or maybe a creek (small *d*).

The B-60 is remarkably small — a standard 17" wide by only 2" tall — so you can squeeze it into tight spaces. It's a black box, plainly but elegantly styled in a way that reminds me of the Advent receiver of more than 20 years ago. The Bryston is far better built. (The Advent 300 had high-end sound, but not high-end build quality.)

Essentially, the B-60 combines in one chassis two Bryston separates — the aforementioned 60Wpc 2B power amp and the BP-20 preamp. "The 2B amplifier has long been a customer favorite because of its sweetness and transparency," said Chris Russell, Bryston's

Vice President of Engineering.

Like the 2B, the B-60's power-amp section uses two bipolar transistors per channel. These are closely computer-matched, according to Chris, as they are for Bryston's separate power amps.

"Not many integrated amplifiers have dual power supplies.¹ Nor do they use as expensive or refined a preamp section as we do," said Chris. "The B-60 benefits from all the research that went into the BP-20, which was *heavily* researched, the aim being to devise a circuit path that has very low distortion and very low noise."

So what about the advantages of producing an integrated amp, as opposed to a separate preamp and power amp?

"There's the obvious saving because you assemble one chassis, not two." Chris took a deep breath before continuing. "You also get the sonic advantages of eliminating the concept of interconnect cables."

"Fine by me," I replied.

"All this controversy about cables tends to lead people down the wrong

¹ Dual power supplies are standard with the B-60, not an optional extra as they are with the YBA Intégré.

path," he continued. "People talk about how cables sound. Well, obviously, cables shouldn't have a 'sound.' There shouldn't be anything you can pin down as to what a cable is doing to a system. If it's doing anything, it's doing something that shouldn't be there."

"Let's tell Jonathan Scull," I said. "You save all this money on interconnects and you can put it toward a Shakti stone... or a set of Shun Mook Mpingo discs. Or maybe some audiophile feet—all the tweaks that C. Victor Campos, of Adcom, refers to as 'magic shit.'"

Chris fell silent.

"What about having both chassis at the same ground point? Any advantage there?"

Chris revived. "Yes. Two different chassis are going to be at two different ground points, even if the difference is small. With the B-60, you have one starground for everything. That helps reduce hum."

Hmmmmmm.

The RCA jacks on the back are high-quality, gold-plated, and Teflon-insulated. There's only one pair of speaker terminals, but these are particularly well designed, with a ridge in the center to prevent positive and negative wires from accidentally touching and shorting the amp. Typical Bryston touch.

Remove the top cover and you'll see that the circuitry is all discrete: There are no integrated circuits, which Chris feels would compromise sound quality. "The problem with ICs," said Chris, "is you can't get them to sound consistently good." Signal paths are short, and the layout of the amp is clutter free. Remember, Bryston guarantees the product for 20 years.

"Twenty years!" exclaimed Brass Ear. "Imagine holding the same piece of stereo equipment for 20 years."

"Some people do. I'd keep a car for 20 years if I could. As it is, I keep a car for only 10." (I was needling Brass Ear, who sells cars—but not to me.)

The Bryston B-60 has four line-level inputs and a tape loop. The preamp and power-amp sections are connected by a pair of solid jumpers, allowing you to leave the preamp and come back into the power amp—handy if you want to use a surround-sound processor.

For a home-theater setup, you could purchase the three-channel Bryston 5B-ST power amp for \$2465, use it for the left, center, and right front speakers, and then use the power-amp section of the B-60 for your surround speakers. For an audio-only system, you could add a Bryston 2B-LP stereo amp for \$850 and bi-amp a pair of speakers—assuming your speakers allow for bi-amping. Total cost: \$2345. That's for a state-of-the-art line-stage and 60Wpc times

two—something to think about before you spend over \$2000 on someone else's integrated amplifier.

Many integrateds lack a headphone jack, forcing you to purchase a separate headphone amp for several hundred more. Not the B-60. Headphones are driven by the preamp section, which, according to Chris Russell, can deliver up to about 1W into most dynamic headphones—enough to drive my Grado RS-1s very dynamically indeed. I've never heard the Grados get it up better than they do with the B-60.

How does the amp sound? Damned good! Startlingly good, compared to most other integrated amps I've heard to date.

The B-60 could thus be the perfect choice for an apartment dweller—or someone who has small children and needs to listen through headphones late at night. I enjoyed my Grados so much with the Bryston that I often used the headphones even when I didn't have to.

The B-60 runs only slightly warm, so you can easily leave it on all the time for best sound. (By the way, break-in time was extremely fast—about 24 hours.) At idle, the B-60 consumes a scant 20–30W, according to Chris.

Let's get serious—how does the amp sound?

Damned good! Startlingly good, compared to most other integrated amps I've heard to date. The B-60 is... yes, let's consult the music critic's thesaurus. The sound is... unimpeachable. Next month I'll need a new adjective. (No problem—I'll read the record reviews in *Stereophile*.)

I did much of my listening with the Martin-Logan Aeriis *i*—a match made in hi-fi heaven. I also used the Cabasse Farella 400, another excellent match. While the B-60 is a small amp—rated at 60Wpc into 8 ohms, 100Wpc into 4 ohms—it will probably drive all but the most power-piggy speakers in all but the largest rooms.

Still, even with efficient speakers, a bigger amp will give you bigger sound—as I found out when I tried a pair of 1000Wpc McIntosh MC1000 amps with my 92dB-sensitive Farella 400s. No contest. A thousand watts per channel sounds more powerful than 60Wpc.

But is the Bryston's wonderful sound the result of its being such a small amp? Ah... that's a question to ponder. Many people believe that the best-sounding solid-state amps are those that use only

one pair of transistors per channel. You start paralleling pairs, and even the closest computer matching may not be quite so close.

How to describe the sound of the Bryston?

Neutral. Again, precisely the kind of thing many audiophiles find boring.

Not me. The Bryston wasn't boring. That's because its resolution was superb—of knockout quality. With most inexpensive integrateds, even if the sound is pleasant, there's usually a tendency of instruments to coalesce, to congeal—to sound like sonic mucilage.

Not the Bryston.

With a good recording, each instrumentalist was placed precisely in the soundstage, side to side, front to back—as it is with separate components typically costing hundreds if not thousands of dollars more. I could hear the recording environment—reverberations, the air in the hall. There's not only a lot of there there, there's a lot of *here* there:

The Bryston B-60 had a way of bringing the music forward, but not too far forward—certainly not throwing it in your face, but also not laying it back so much that the music seemed to be emerging from a tunnel.

High-end hi-fi is about this kind of transparency—about spatial resolution. It's about the quality of space—silences between notes, space between performers. It's also about breathing, sniffing, scuffing one's feet, even—I swear I've heard this in at least one recording—about farting.

"Stop that!" warned Marina, looking over my shoulder.

What's unusual—and, yes, startling—is to find this level of transparency in an integrated amp retailing for what seems to be an almost laughably affordable \$1495. (Another reason some audiophiles won't like the B-60—too inexpensive.) The Bryston B-60 gives you more than a taste of the High End—it *gives* you the High End. It gets you almost within touching distance of the Holy Grail.

I heard no hardness or grain. The midrange was especially smooth and sweet, making it a pleasure for me to listen to chamber music. Treble was well-extended—certainly not rolled-off, as it is with some integrateds. But it wasn't exaggerated. Bass was richly delineated, tight and tuneful—unimpeachable. (Heh-hch.)

But the power limitation tells. There's just so much bass *oomph* you can get out of 60Wpc. At least I didn't get boom, excessive bloom... or bloat.

I fault most solid-state gear for being harmonically thin—"threadbare" is the word I like to use. The B-60 wasn't threadbare, but the sound was not so rich and lush, or so full-bodied, as it is

with most tube amps — or as it is with a few solid-state integrateds, such as the Musical Fidelity A220 (see below).

In short, the Bryston B-60 is so outstanding, you should audition it before you buy any integrated — including integrateds selling for \$500 to \$1000. You may conclude that the Bryston is well worth the extra money, in terms of build quality — and, even more important, sound quality. You work too hard for your money to spend it on half-great hi-fi.

The B-60 is a great option, but not your only one. There's the Musical Fidelity A220 below — richer-sounding than the Bryston, but not so transparent. \$500 less, though. Conrad-Johnson should have introduced the CAV-50 tubed integrated for \$2495 by the time this column appears. Because the power-

The Bryston B-60
is a landmark product—a
great North American
integrated amp
at a super price.

amp section derives from the superb MV-55 amplifier, this unit might well be superb. But it costs \$1000 more than the Bryston; besides, it's tubed, and therefore not as maintenance free. (With the Bryston, your only maintenance for the next 20 years will be electricity.)

The Bryston B-60 is a landmark product—a great North American integrated amp at a super price. Finally! I

especially like it with the Martin-Logan Acrius *i*, where the speed of the amp complements the speed of the speakers, providing exceptionally clean, clear, crisp sound that still manages to avoid hardness, brittleness, or sterility.

Combine the Acrius *i* and the B-60 with a good CD source, like the Rotel RCD-990 Micro Mega Stage 5 or 6, and you, too, can have sound that compares with the very best there is at any price, in every aspect but that of scale. To put it another way, you can have truly great sound—just not gobs and gobs of it. Just as the Acrius *i* is a mini-Martin-Logan, but a Martin-Logan nonetheless, the Bryston B-60 is a mini-Bryston.

Bravo, Bryston! A landmark... a reference... a triumph... a steal! **S**

©Stereophile—Vol 20 No.5



The Bryston B-60 Integrated Amplifier

By Fred Kaplan

Up:

Step

A

One of the more notable trends in the hi-fi business the past year or so is the sudden ascendancy of that centrist product, the integrated amp. Though long-popular in Britain, where the indigenous hi-fi industry has made a specialty of the genre, it's been a category of goods all-but-unmarketable in the US. The masses consider it too exotic, preferring receivers, which hold in a single box not only an amp and preamp but a radio-tuner, as well—while the high-enders, with their purist insistence on separate components for separate functions, deem it not exotic enough. But now the mood is swinging, apparently from both directions. From "below," a surging stock market has set many once-indifferent consumers on an upwardly mobile road where, among the maze of other fancy electronic toys, the proliferation of compact discs and

home-theater systems has nudged them toward the fineries of "good sound." From "above," a sheer shortage of shelf space, perhaps combined with the outlandish prices charged these days for a simple one-meter pair of cable to connect a preamp with an amp, has triggered a compulsion to wind down. Of course, all this is theorizing. The fact, however, is that integrated amps are spreading, not only from the usual suspects in the upper-mid-fi ranks, but also—as has been documented in these pages—from such entrenched high-end firms (which never would have stooped to the task a few years ago) as Krell, Goldmund, Conrad-Johnson, Audio Research, and (we now approach our subject at hand) Bryston.

The Canadians at Bryston designed the B-60 integrated amp primarily for the European and Far Eastern markets, but expanded the production line when they discovered, much to their surprise, that it was selling briskly in North America, too. Given the broader trend in the market, there's no mystery why the B-60 should be

making waves. It's a sleekly handsome, extraordinarily compact machine, yet sports four pairs of input jacks, a tape and an audio input jack for a video source, plus two more that can be used either for a surround-sound processor or to turn the unit into a dedicated preamp or power amp. Like many mass-market products, it also has a headphone jack in the front and a power-socket in the back. The only thing it lacks, along these lines, is a phono-section, though, alas, the market for such features has diminished (and, for those who still spin LPs, Bryston sells a couple of separate phono-stage preamps: the BP-1 moving magnet for \$750, the TF-1 moving coil for \$550).

I suspect those who are rising from the bog of receivers will find the B-60 a revelation, and those retreating from the tangle of separates will find it a pleasant surprise. When it comes to capturing the vital midrange of music (voices, woodwinds, small string ensembles), the Bryston is impressive by nearly any standard, not just for its size and price tag. On *Afterglow* [Mapleshade], you can sense singer Kendra Shank's palpable presence. Dawn Upshaw sounds properly, meltingly, glorious on Gorecki's Third Symphony [Nonesuch]—and, speaking of that recording, you can see the cellos before you toward

Bryston BP-60 Integrated Amp

the start of the first movement. On Analog Productions' gold-CD reissue of *Spirit Sensitive* (or the less spectacular but still quite nice aluminum disc on India Navigation), Chico Freeman's tenor saxophone projects the combination of warmth and brassy edge that one can usually hear only through much more expensive electronics.

The B-60 also does an excellent job of retrieving the ambiance and (if it's captured on the disc) the seamless spaciousness of a recording space, whether it's a studio, a concert hall, a jazz club, or a dive. The distance between the front and back rows of a stage and the layers of air between them are also well-delineated. Instruments and singers take on a natural 3-D focus.

Still, the Bryston has its weak points, and whether you can tolerate them will depend on your taste. Its most serious shortfall lies in the nether regions of the bass. The very lowest contrabass notes at the start of Gorecki's *Third* are barely audible. On "Maqam Hedjaz," from the Eduardo Paniagua Group's *Danzas Medievales Espanoles* [n-a Recordings], the lowest tones of the *bendir*, a big bass drum, sound not just quieter than its midrange tones, but also less distinct, almost as if they were coming from a different drum entirely. (However, the resonance of the drum and the echoes from the reverberant church, in which the session was recorded, come through fine.) Even when a bass violin plucks or bows somewhat higher notes, they sometimes lose their distinctiveness—or vanish—when massed strings, or simply a large number of any instruments, enter the fray.

I suspected this weakness came from what must be (in such a small box) the B-60's rather diminutive power supply. The issue, I figure, is not so much wattage (rated at 60 per channel, with clipping avoided up to 71), but rather power reserves. However, upon opening up the case, I saw two reasonably large—and, given the size of the overall unit, amazingly hefty—twin custom torodial power

supplies (one for each channel). In fact, a chat with the folks at Bryston reveals that, in terms of parts and circuitry, the B-60 is exactly the same as Bryston's B-20 preamp (which alone costs \$1495) and its 2B-LP power amp (\$850) combined, all in one box. So who knows what's going on here? Whatever the cause, when pushed to its limits, the B-60 has little headroom for momentary expansion. Certainly, at very least, the amp should not be hooked up to speakers that are difficult loads. (For instance, the Platinum Quattros, which are said to require at least 100 watts per channel, never opened up when driven by the Bryston—though the more efficient, and considerably easier, Gallo Nucleus Solos, which were used for this review, very much did.) The owner's manual states, "Impedance less than 4 ohms not recommended."

This limitation may also account for the amp's slight softening of transients. Back to the Kendra Shank disc: the various cymbals, bells, and shakers on Steve Williams' trapset lose some of their high-octave zing and shimmer; there's also a bit amiss in the forward edge of his drumstick blows.

A competing integrated amp, the almost identically priced (\$1400) Naim Nait 3-R (which Andrew Keen admired in the *April Fi*), is cleaner and clearer when it comes to bass tones (and overtones), percussive attacks, and dynamic contrasts. However, the Bryston is warmer, less strained, and also more detailed at getting the midrange right (especially voices) as well as the air and space in which the music blooms and swirls around. Ah, to find the little, sub-\$1500 integrated that fuses the best of both units. I suspect (though I base this only on memory, which might well be flawed) that the Musical Fidelity (known in the US as British Fidelity) A-1, which in its heyday sold for a mere \$700, may have fit the ticket, but it has been discontinued and was never available for very long in the US anyway.

Still, I do not wish to diminish the Bryston's considerable appeal. What it does well, it does at least as well as many separate amps or preamps that, together, cost a great deal more. And what it does less well, it does much, indeed startlingly,

better than the great bulk of gear owned by those for whom the B-60 would represent a big step up. ■

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Tel: 705-742-5325, Fax: 705-742-0882

Price \$1,495
Warranty: 20 years

SPECIFICATIONS

Power Output: 60 watts per channel into 8 ohms, 100 watts/ch into 4 ohms

Harmonic distortion: less than 0.02%, 20 Hz - 20 kHz, at 60 watts

IM distortion: less than 0.01%, 10 milliwatts to 60 watts

Noise: -106 dB

Slew rate: over 60 volts/microsecond

Damping factor: over 500 at 20 Hz (8 ohms)

Input sensitivity and impedance: 0.775 volt in for full output 50 K

ASSOCIATED EQUIPMENT

Digital front end: Audio Alchemy DS Pro transport, Audio Alchemy DTI v2.0 anti-jitter box, Orelle DA-180 digital-to-analog converter.

Speakers: Gallo Nucleus Solos, Platinum Quattros.

Cables: Nirvana interconnects, Mapleshade/Insound digital wire, Nirvana or Naim NAC A5 speaker wires.

ACCESSORIES

Black Diamond Racing Mk. 4 Pyramid Cones, TAD Power Purifier (with and without), Just-a-Rak Deluxe equipment stand.



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THREE INTEGRATED AMPLIFIERS

I didn't expect to be getting into integrated amplifiers this way. After a pleasant enough encounter with the Onix OA30 two years ago, the prospect of spending days, let alone weeks, with integrated amplifiers in the Big Rig wasn't a total turn off, but I didn't relish it either.

Here we have three integrations that span the price envelope from around \$750 to \$1,500. Of the three, I'm tempted to say that the Bryston B-60 is a flat out landmark component with all the greatness and staying power of an NAD 3020, the original Quad electrostatic, or the Linn LP-12. That's some heady company to be placed in, and I realize that with the number of incredible components we have covered lately, it may appear that MGD is stuck in the hyperbole mode and everything is making him flip his widgee. We certainly don't want to get into some kind of craziness where everything that is reviewed is "the best ever." That would not do. But in this case we truly do have one integrated that is the equal of at least half of the separate combinations one can buy (the Bryston), and two integrations that perform at a level far exceeding anything one could expect to obtain from separates (amp and preamp) at a similar price point when combined. I'll never sell this type of gear short again.

If you lack an understanding of just what an integrated amplifier is, it's little more than a preamplifier and a power amplifier in the same metal chassis. The back of the chassis has speaker terminals along with input jacks for CD players, tuners and the like. With an integrated, one no longer needs a set of interconnects to span the distance from amp to preamp, and (at least with all integrations that I am familiar with) there is only one power cord to go to the wall. Hence, the immediate savings of the cost of one set of interconnects and one AC power cord. Two of the integrations here have phono board options of useable vintage, though I would hesitate to use either in a system of substantial resolution. With an integrated amplifier one has the advantage of automatic compatibility between the amp and the preamp. There is no worrying about input and output impedances, tonal mismatches or the existence of a sonic synergy between the two units — it's all built in. Most integrations use a single power transformer to energize the power supplies for both the preamp and power amp sections of the design, and the power supply is certainly within the same chassis and metal work as the rest of the internal circuitry. By its very nature an integrated amplifier tends to breach many of the high-end design laws and electrical traditions that we impose upon equipment we consider worthy of our time and attention. That is going to change around here.

The Bryston B-60, \$1,495 (\$1,795 with remote). P.O. Box 2170, 677 Neal Drive, Peterborough, Ontario, Canada K9J 7Y4. ph 705.742.5325. fax 705.742.0882. Separate power supplies for each channel, using all discrete circuitry. Two bi-polar output devices per channel rated at 60 wpc at 8 ohms, and 100 wpc at 4 ohms. No

bi-wire terminals. Damping factor greater than 500 at 20 hz. Four stereo RCA inputs, one stereo tape loop, headphone amp and jack. No phono RIAA. Pre-out/main-in connections at rear allow for complete separation of amp and preamp sections. 2.5" x 17" x 12" (HWD) 20 lbs. 20 year warranty. On loan from manufacturer. *****

"The best little audio publication in the world"

BRYSTON • 103 • Critical Acclaim

By creating the B-60, Bryston may have caused itself, and many other manufacturers of separate audio components, many a sleepless night. There is no other way I can be more upfront and open about the whole thing, no matter how unconventional the results, or upsetting the news of this may be to some. The B-60 is not only an outstanding integrated amplifier, it also outperforms many, if not most, of the separate (amp/preamp) combinations that I have heard or am aware of. Those are big words bound to upset some who have a stake in the separates market, or who may simply have an unshakable faith in the way things have been done in the past regarding high-end amps and preamps. All of which lessens not one bit the significance of this component from Bryston. Short of using a power amp in the three grand range, and a preamp costing similar dinaro, few combinations of separate amp and preamp can exceed what the B-60 is able to do alone. And so as to leave you in no doubt of the import of what I am trying to express, I would at this time put the performance of the B-60 above most of the old time BFS fave combinations. I feel that there is no doubt that the B-60 is a more accurate performer than the Musical Designs SP-2B/PSE Studio IV combination that performed so well in the Everything's a Thousand System put together a few years back. And that's the best combo that I know of for under two thousand dollars. Adding an OCM 55 preamp to the PSE amp would make the contest a closer one, but despite the thousand dollar advantage the separates would then have, I wouldn't bet against the Bryston. And I could go on and on. But what I'm really saying here is that it takes some big time equipment to outdo the B-60. The combinations would together have to cost in the \$4,000-6,000 range, and it would have to be equipment that was synergistically matched and set-up to the nines. Randomly picked out amps and preamps costing \$10,000 each would take a real beating at the hands of this minnie-night. And one can forget pairing the B-60 against the integrateds that I've seen come out of the Orient. The build quality alone of the Bryston puts it way ahead.

Build quality and set-up. It's all Bryston, from the dual trannies to each regulated voltage gain stage. Internal wiring is at a minimum, and Bryston uses quality circuit boards and internal parts all the way through. The RCA jacks are flush mounted directly to a rear panel circuit board which is in turn connected to the active gain circuitry via computer grade ribbon wire. The two transformers independently power the right and left channels, and the power supplies for the preamp and the power amplifiers are located in distinctly different

sections of the chassis. The hands on inspection revealed nothing about the design that appeared intentionally compromised in order to save a buck, the twenty year warranty precludes that. And therein lies the basis for the price tag. \$1,500 for the basic model, and almost \$1,800 for the remote version exceeds substantially what one expects to pay for an integrated amplifier. That's where our old time preconceptions come into play.

Most 'philes wouldn't think twice about dropping three grand for a decently performing amp/preamp combo; or, if they did, at least they wouldn't consider the same as out of the realm of possibilities for a present or future system. Why then the double standard when it comes to an integrated? Maybe because most integrateds in the past have stunk sonically, and have been poorly constructed. I know that I have stayed away from them for those very reasons, and I assume a great many of you have too. But with the Bryston, and to a lesser degree the other two units reviewed here, the reasons of the past no longer hold true. At a point in time when audiophiles are looking for value and high performance in the same package, the Bryston B-60 seems to be pressing all the right buttons for the audiophile and videophile markets.

Set-up was a breeze. Four AudioQuest Sorbothane pucks were used as footers. I used a single TG Audio HSR power cord into the AudioPrism ACFX for AC. If one so desires, one can substitute the Sidereal power cord for the TG for equally positive results. Interconnects and speaker cables for all testing were from JPS, and the speakers used were the Merlin TSM's. Set-up with a quality digital front end, this was some kind of system! I should note that for a little less money (\$1,200), one can receive almost equally spectacular performance with the Speaker Art Clef loudspeakers. See the Clef review in 9/96.

Break-in time is about a week of constant use. When not in use, I activated the mute switch via the remote to keep things warmed-up. Initially the sound was overly warm and fuzzy, but I could tell that something special was going on. After a month of use, the unit was really starting to sing.

Degree of Absolute Transparency. You already know that this integrated is capable of some pretty amazing sound for its cost and size. So, instead of the usual blow-by-blow description of spectral balance, imaging, dynamic range and on, and on, let's get down to the Big Picture right off the bat. The salient sonic characteristic of the B-60 is its lack of noticeable electronic artifacts or signatures. As a result, its overall sound reminds one of a warm audio nest; a place to get comfy with the music, to experience all the joys incumbent with

a good recording. Music sounds relaxed and right through it. What makes this all work is the way it retrieves detail from a recording. Many units that have the warm and comfy feel to their sound, lack the ability to accurately reproduce details. With the B-60, details, including the leading edges of transients large and small, come across as naturally revealed and proportionate to fundamentals. Not seeming exaggerated, but still quivering with life, the B-60 allows the music to bloom dynamically and tonally. Between the sounds on the stage there is a noticeable lack of grunge and grain — the air is clear and the images are vivid.

Now, if this description of the B-60's sonics seem overly subjective, colorful and emotional in terms of its prose, remember that everything said above could have been related to you in terms of amplitude accuracy, frequency linearity, degrees of phase, and db's of noise. It's a dryer way of describing things, and certainly one that is less tolerant of creative expression, but everything that one hears can be described in terms of physical happenings, ie.; in terms of amplitude, frequency, phase and noise. A reviewer can objectively relate to another person the performance of a device in either manner, and be correct and accurate in doing so. Sometimes a frequency response aberration can best be described in terms of a deviation from a zero point, such as ± 2 db. But manufacturers such as Bryston long ago discovered how to design a circuit that is from all measurable aspects "perfect". Aragon can do it too, and so can RE Designs, and Krell, and PSE, and Symfonia, and SAC, and... you get my drift. Yet no one in their right mind would dare suggest that each one of these designs sound exactly the same. But they all measure perfect. Or do they? Well, not really. When the right kinds of measurements are possible, they will all measure differently too in terms of amplitude, frequency, phase and noise, but the necessary tests are not yet in place. Our ears and brains can hear those differences now without the need to invent some new test that strains the capabilities of today's comparison and measurement devices. And if the ear and brain can do that now, why withhold a colorful description of the day's events if it is an accurate one?

Back to the B-60. Negatives are strangely related to the positives that the unit displays. The warm audio nest characteristic of the amp is an indication of a wideband frequency rise, regardless of how small, in the mids and lower mids. The extreme clarity of the highs allows the B-60 to sound natural even with the micro-rise. The bass could be tighter. I know the damping factor is above 500 at 20 hz. Bass energy can run away a bit,

however, when the material is bass demanding and you have decided to punch up the volume. And while I haven't had the opportunity to try such a combination, my guess is that this bass negative with a cone woofer might make the B-60 something of a perfect match for some of the smaller Maggies (don't forget the long time association of Bryston with Magneplanar).

Compared against the Symfonia Opus 8 preamp and the RE Designs amps (now that just ain't fair), the B-60 isn't quite as harmonically full or correct. It's ridiculously close to the Symfonia/RE Designs combo, even when price is not a consideration, but it doesn't quite resolve down to the last drop the way the best separates do. Which may be no more than the B-60 not having the budget for the enormous power supplies that one is paying for in the best gear.

Conclusion. I think that Bryston is going to let me work with the B-60 for a while in order to put together a complete audio system based around it. I already have some speakers and some wire. About all that I need now is a digital front-end that is as good without spending \$5,000 for it. My initial suggestion would have been the Audio Alchemy DTI/DDE 3.0 with CG Transforms transport, but I'm waiting to see what the New AA is going to be like. The perfect digital mate would be a box player that performed like a separate ODAP/transport system. Ideally, it would be a little upscale from the digital system we selected for the Everything's a Thousand system, though the G&D Transforms player might do the trick. The Andrew's might also work if I can get it away from the Curmudgeon. I'm scheduled for a new Transforms player and transport soon, and I'll try to get the Andrews, but in the meantime, if you are a manufacturer of something digital that might be able to keep up with the B-60 for less than a grand or two, let me know.



Bryston B60



Bryston Integrated Amplifier Model B-60

Source: Bryston Ltd.

Rating: 



Bryston needs no in-depth introduction to the world of audio, other than to say that this Canadian company has been building audio equipment since 1974. That's twenty-two years in business and twenty-two years of experience. Conservative and careful when it comes to electronic designs, the company's successes over the past decade or so can be attributed to tradition — craftsmanship first, elaborate testing second. During the past few years, they've added new designs and new technology with the integrated amplifier yet another new product to their line up — the product under review here. The B-60 is the "brain child" of Stuart Taylor who is responsible for the ST series of Bryston's products.

Appearance:

The B-60 is similar in appearance to the BP-20 preamp. It's streamlined appearance offers a touch of class. Black in colour, the integrated amp measures only 17" (L) x 10.5" (W) x 1.75" (D) and weighs in at 12 lbs. The faceplate is uncluttered and arranged — from left to right — with the Bryston logo, a toggle switch for *Tape/Normal*, followed by a headphone jack, a selector knob — four high level inputs, (*Tuner, CD, Aux & Video*), the balance control, volume control, a red LED and finally the power switch. The rear of the unit accommodates two sets of speaker terminals, preamp out/main in, RCAs and the various inputs. A socket for the detachable power cord accommodates the unit's fuse. An optional, spartan remote

control for volume and mute functions, is available and makes life a little easier without confusing its operator.

Technology:

The B-60 is basically a combination of the BP-20 and the 2B and is rated at 60 watts per channel at 8 ohms and 100 watts per channel at 4 ohms. Upon a look inside the unit, readily noticeable are the two toroidal power supplies which are customized to fit into the compact chassis. Bryston explains that by employing independent power supplies, any possibility of channel to channel interference is prevented. All signal circuitry is fully discrete, avoiding non-linearities inherent in IC designs and a unique, ultra-linear input buffer with gain, results in a substantial reduction in noise and distortion. The unit boasts gold plated, five-way speaker binding posts and gold plated RCA input/output. The B-60 can be used as a stand alone amplifier or a preamp. All-in-all the pristine inner core is totally hand-assembled and then tested. Only the best components are used; 1% metal-film resistors, polystyrene capacitors and the implementation of military-grade components assure quality throughout the design. Although there are two series of heat sinks, they are not visible since they are directly attached to the chassis inside the unit.

The Sound:

This unit made two trips to our studio. On the first trip, we had a quick auditioning session for several hours and our first impression was quite favourable — almost astounding. It left us quite anxious for the unit to be returned for more elaborate listening tests. When the B-60 came back for the second time, we connected it with the rather upscale Gershman Avant Gardes and a pair of Totem Tabu loudspeakers. A Copland CD player and a Magnum MD 108 tuner were used for the source components, connected with Vampire interconnects. Transparent Audio cables connected the loudspeakers. We auditioned this unit with a wide variety of musical program material, ranging from pop to classical. The first — usually the most lasting — impression was that of surprise that an integrated amplifier with 60 watts a channel can produce the finesse and the musical calibre of more expensive separate components. Although Bryston used a modified version of their 2B amplifier as the heart and soul of the B-60, the integrated unit more or less matched the performance of a 3B-ST power amp with a synergistic preamplifier which also sounded better than the BP20/3B-NRB combination. We all thought that the B-60's musical finesse must be considered in line with some of the real high-enders out there in stereo nirvana land. To describe the unit's sound in detail is almost pointless because it seems to have all the attributes of the stuff audiophiles and music lovers look for. But here goes:

The highs come across as sweet as honey in the summer (liquid and smooth), while the midrange information is well balanced with frequencies above and below this segment of the audible spectrum. Additionally, the unit offers that certain clarity, but not restricted to

the highs or mids. Rather, the B-60 offers sonic transparency coupled with resolution right across the spectrum. Another impressive part is the unit's ability to recreate a sound-stage which is best described as multi-dimensional — that's when listeners aren't sure how to describe the sensation of listening "into" the music — a sonic phenomenon which allows listeners to identify instruments and their location within the sound-stage. Front-to-back layering (one of the dimensions) is outstanding. When driven at high volumes, the B-60 doesn't crumble, provided that medium efficiency speakers are used. We liked the Totem Tabu loudspeakers with this unit. The Avant Gardes also performed very well with the Bryston, but clipped the amp on high volume. On lower levels, however, this combination revealed the amp's sonic character as one with which even the fussiest ears can live with.

Synopsis & Commentary:

A few words about integrated amplifiers. Usually, separate components allow the end-user to customize the sound to complement loudspeakers or to cater to personal taste. Thus, one could use a great preamplifier with a low-powered amplifier, or any other configuration. The upside is that components can be upgraded one by one, spreading the expense over a manageable period of time. The downside is that it's more expensive and potentially more troublesome, starting with interconnects, continuing with the wide variety of "sonic signatures" and ultimately the question of synergy must also be addressed.

An integrated amplifier such as the Bryston and other serious designs, however, will not allow the introduction of an interconnect's personality, there are less connections to worry about and there isn't room for fussing

around. All this adds up to a component which — when designed properly — can simply plugged into the AC outlet, connected to the loudspeakers and that's all there is to it.

So the Bryston qualifies as a serious component which is made for those who aren't about to change their systems around every couple of years or so, but wish to have an excellent system with the emphasis on sonic quality without fuss. The pre-out/amp-in functions allow upgrading the system to employ a multi-channel configuration, home theatre etc. It's easily done and allows audiophiles at least some tweaking.

E.F. — our editor-in-chief — commented that the B-60 is one of the best, perhaps *the* best effort Bryston has come up with. The amplifier easily outperforms rivals in its price range, matches the calibre of equipment in the \$3,000.00 range and outright destroys a lot of the imports currently available. With the Bryston B-60 we feel that people out there in audio land are, as the old saying goes, getting a good bang for their buck.

Connect this integrated amplifier to a good pair of loudspeakers with quality cables and listen to your system sing — and sing it will; and buyers will sing too, or maybe they'll whistle, or laugh all the way to the bank when they think of the money they have saved. :|

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**The
Audio
Critic**

"This is a beautifully engineered, electronically flawless piece of equipment of limited usefulness. Crossing a separately amplified subwoofer over to the main speaker would be one of its more obvious applications; more about that in a moment. Here's what the 10B can do — and anything it can do, it really does perfectly.

In each channel, it can select 12 crossover frequencies, more or less evenly spaced between 70 Hz and 4.5 kHz, and activate Butterworth lowpass and highpass filters that have the selected

frequency as their passband edge. The attenuation slopes of the lowpass and highpass filters are separately adjustable to 6, 12, or 18 dB per octave (1st, 2nd, or 3rd order), and the highpass filter level as referenced to the fixed lowpass filter level can be set in 1 dB steps from -5 dB to +5 dB. And that's not all, as they say in those special offers on TV. By manipulating connections on the back panel, you can turn the 10B into a *mono*

...the 10B is unquestionably state-of-the-art and very reasonably priced for such a complex piece of equipment.

Linkwitz-Riley two-way?—but then of course you'll need two units for a stereo system. There are also professional versions with balanced inputs and outputs, special Linkwitz-Riley modules, you name it—hog heaven for the biamp / triamp crowd.



*Bryston
Model 10B
Active Crossover*

My measurements revealed absolutely no flaws, errors, or glitches in this complex system; the filter contours that I checked at random among the available permutations and combinations were all dead-on; dis-

crossover of even greater versatility—would you believe a variable-slope three-way or a 4th-order

tortion and noise were pretty nearly unmeasurable on my test bench at all audio frequencies regardless of the filter settings; in other words, the signal paths of the device appear to be perfect. (All right, there *is* one potential—but easily remediable—problem. Inside the unit, a 10-ohm resistor between chassis ground and signal ground appeared to be the cause of a slight but audible hum in the biamped system of one of my associates. Shorting the ground side of any one of the output jacks to the chassis killed the hum.)

David Rich, whose various EE degrees also stand for El Exigente, had only good things to say about the circuit design, which is implemented with discrete op amps. He praised the elegant simplicity of various engineering solutions in the 10B and called designer Chris Russell "a ridiculously good engineer," by which I think he meant that Chris goes to almost ridiculous lengths to refine his circuits and minimize distortion, without allowing the cost-effectiveness of his designs to go down the drain. That's what good engineering is all about. ↩

BRYSTON • 108 • Critical Acclaim

As for the limitations of the 10B, they have nothing to do with engineering but stem from the basic problems of crossing over real world drivers, which are very different from the idealized amplifier loads assumed by a "perfect" electronic crossover. Real-world drivers are, in effect, lowpass and highpass filters; only a dedicated crossover, whether passive or active, can process those filter characteristics in such a way that the interacting electrical/acoustical poles and zeros will yield the combined, measurable lowpass and highpass responses required in a particular design. In other words, a truly good crossover for a specific speaker system can't be separately bought off the shelf. The exception to that rule would be a subwoofer crossed over well below its upper roll-off frequency to a more or less full-range main speaker system. That way there are no preexistent poles imposed on the electronic crossover in the vicinity of the crossover frequency. Bryston has also come to the realization that this is the best possible use of the 10B and has recently added a new model, the "10B-sub," to the line, with all 12 crossover points at lower frequencies (40, 50, 60, 70, 80, 90, 100, 200, 250, 300, 400, and 500Hz). I think that makes a lot of sense.

As a subwoofer crossover, the 10B is unquestionably state-of-the-art and very reasonably priced for such a complex piece of equipment. I see no point in evaluating it subjectively, since the perceived sound quality will depend entirely on the speakers used and on the specific settings of the controls; the electronic signal path as such is obviously transparent. If your biamped subwoofer setup requires, let us say, 18dB per octave Butterworth filters crossed over at 100Hz

for best results, you can be certain that no better solution exists than the Bryston 10B. And if you then decide that 70Hz would be a better choice, the changeover will be totally painless. But don't imagine that you're a crossover designer for 2-way and 3-way speaker systems just because you own a 10B. There's a little more to it than that. ”

10B SPECIFICATIONS

Frequencies*	40 Hz, 50 Hz, 60 Hz, 70 Hz, 80 Hz, 90 Hz, 100 Hz, 200 Hz, 250 Hz, 300 Hz, 400 Hz, 500 Hz
Slope	6/12/18/24 dB per Oct.
S/N Ratio	-90dB
Distortion	0.005%
Normal Input level	1 volt
Input Impedance	20 k ohms
Output Impedance	100 ohms
Features	Stereo 2-way Monaural 2-way Monaural 3-way Balanced or unbalanced** Independent high and low pass frequency selection ± 5 dB of gain on high pass section
Dimensions	19 x 1.75 x 10 inches, 48.25 x 4.44 x 25.4 cm, wt: 12 lbs, 5.5 kg

* 10B OPTIONAL - 70Hz, 100Hz, 140Hz, 200Hz, 300Hz, 450Hz, 700Hz, 1 kHz, 1.4 kHz, 2 kHz, 3 kHz, 4.5 kHz
Custom frequencies available upon request.

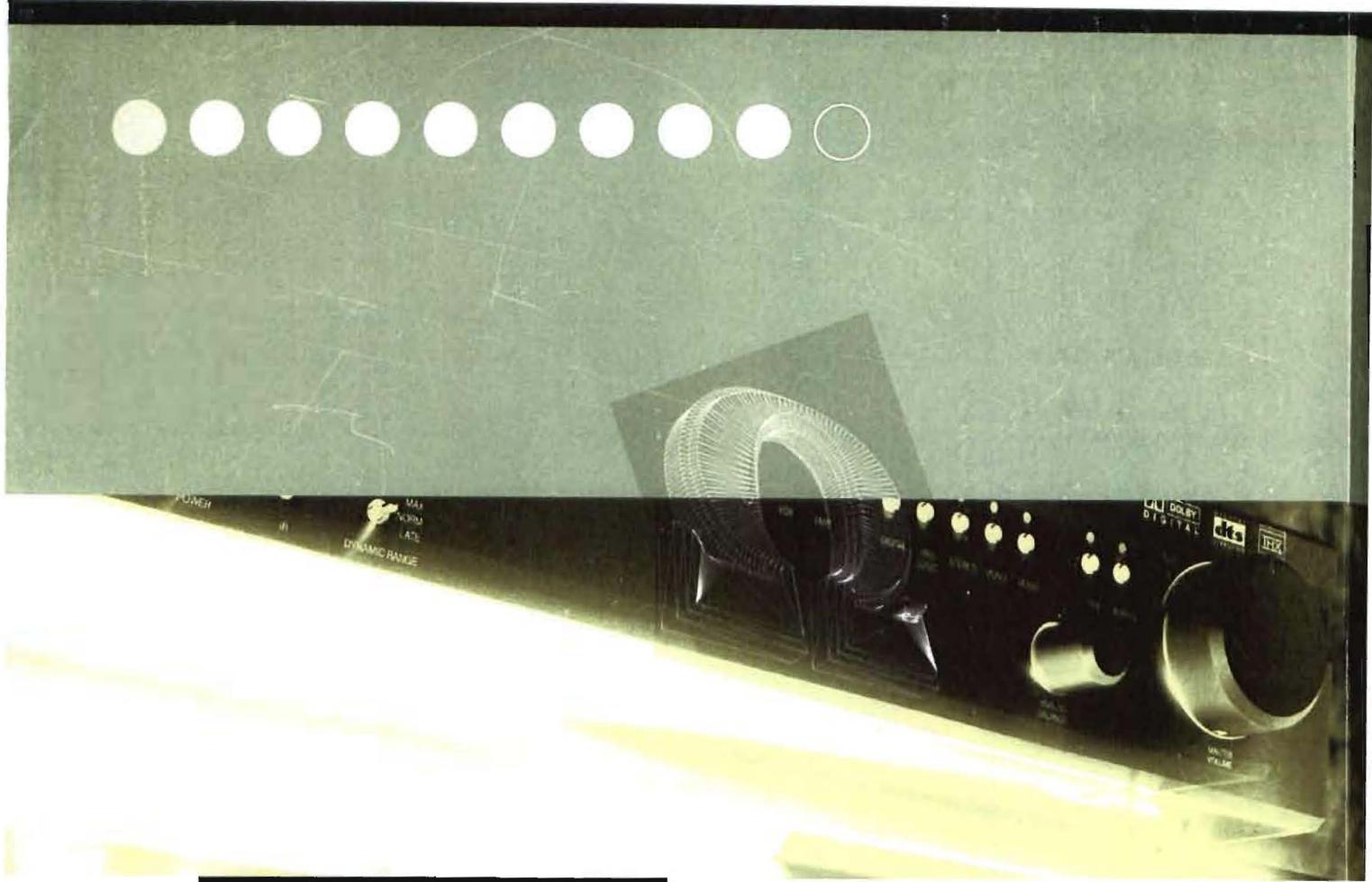
** Balanced Includes - Gold Plated XLR inputs & outputs

Printed on 50% recycled paper containing a minimum of 15% post-consumer waste.



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BRYSTON OWNER'S MANUAL

Instructions For

Bryston Preamplifiers

Models BP-20 and BP-25

GENERAL INSTRUCTIONS

Setup Recommendations:

Congratulations on your purchase of a Bryston preamplifier. We are confident it will provide you with many years of musical enjoyment.

You may place your preamplifier in any convenient location, with two possible exceptions. If you own the Bryston BP-25 remote-control version, position the preamplifier to maintain a direct line-of-sight between the hand-held remote and the remote sensor eye located on the left side of the preamplifier's front panel.

If you purchased the BP-25P or BP-25MC, which includes a Phono section, avoid placing the preamplifier directly on top of your power amplifier. Power amplifiers usually employ large power supplies and the transformer(s) in the power supplies can cause interference (hum) with the sensitive phono section inside the preamp.

Next, insert the 5-pin din cable from the outboard power supply into the input connector located on the rear of the preamplifier. Then plug the power supply into an appropriate AC power outlet. The preamplifier is powered up by engaging the slide switch located on the front of the external power supply. The "green" LED on the outboard power supply and the preamplifier front panel indicates power-on.

If the preamplifier has been placed in the "mute" position operating the volume up button on the remote will automatically un-mute the BP-25 preamplifier, turning the LED from red to green. On the BP-20 you must manually activate the mute toggle on the front panel. Both the Mute switch and the Polarity Invert switch are momentary-toggle types, operated by push-and-release.

BP-PS Power Supply:

The BP-PS outboard power supply provides AC power for the BP-20 and BP-25 preamplifiers. It has a slide power switch located on the front and a green LED to indicate power on.

On the rear of the unit is a three-position connector which provides a control voltage for remote turn on/off of your Bryston THX amplifier(s) or other amplifiers so equipped. This feature can be used in two ways depending on the wiring arrangement utilized:

Option one provides for the preamplifier and power amplifier to be turned on or off when you operate the power switch located on the front of the external power supply. Turning the power off with the switch on the outboard power supply removes AC power

from both the preamplifier and the power amplifier(s) for complete system shut-down.

Option two allows the power amplifier(s) to be turned on or off with the mute button on the hand-held remote control unit or the mute toggle on the front panel of the preamplifier. This will shut down your system 'for the night', completely removing power from the amplifiers, but leaving the preamp in the Mute/standby mode, indicated by the red LED on the preamplifier's front panel.

Please refer to the diagram on the included separate instruction sheet for further clarity and optional wiring arrangements.

Connections:

Connect the preamplifier's left and right outputs from either the RCA or Balanced XLR connectors to the appropriate left and right input jacks on your power amplifier. Balanced cables are an advantage if you are using long runs of cable, (greater than 20 feet), between your preamplifier and power amplifier.

Connect your CD player, tuner, tape deck, video recorder, or laser disc, etc. to the specific left/right preamplifier inputs. With phono-equipped models, (BP-25P or BP-25MC), connect your phono cables to the phono input jacks. If your turntable leads have a separate ground wire, it may be connected to the ground lug adjacent to the phono inputs on the rear panel.

The Bryston BP-20 and BP-25 preamps also feature two pairs of balanced XLR input jacks. Many signal sources, including CD-players and separate D/A converters are now available with Balanced outputs for minimum noise pickup on the cables.

The tape loop may be used to insert a surround sound processor, cassette tape deck or video tape recorder into your system. Plug your tape deck or external processor's input cables into the 'To Tape' jacks, and the processor or deck's output cables into the 'From Tape' jacks at the rear of the preamp. The tape or processor loop may be operated via the toggle switch located on the front panel of the preamplifier.

BRYSTON PREAMPLIFIERS

Input and Output Connectors:

Bryston preamplifiers are equipped with five pairs of RCA input connectors, two pairs of balanced XLR input connectors and one pair of RCA tape input jacks. The balanced inputs, (pin-1 ground, pin-2 positive and pin-3 negative). All inputs employ fully discrete active input circuitry. Two pairs of RCA main outputs, one pair of RCA tape outputs and one pair of balanced XLR outputs are also provided.

All input and output connectors on the BP-20

and BP-25 are gold-plated. Only cables with high quality gold plated connectors should be used with your preamp to avoid noise and distortion from the corrosion which will eventually appear on poorly plated cable connectors.

Bryston offers RCA or XLR cables with connectors gold-plated to 20 microinches, (up to 30 times heavier than standard gold-flashed cables). Standard 1 and 2 meter, or custom-length cables, are available.

Bryston BP-25 Remote Control:

The Bryston model BP-25 is supplied with a hand-held remote control unit. The remote features include Volume control, Mute, and Polarity Invert. All remote control functions may be operated manually from the front panel of the preamplifier if desired.

The Volume Control is a motor-driven design. This approach ensures the lowest distortion with maximum long term reliability.

The Polarity-Invert switch allows you to reverse the absolute phase of the audio signal, (not to be confused with left-versus-right channel phase), because polarity reversal can occur in the recording chain. (In fact, our investigations show that polarity is not consistently maintained in commercial recordings). It is desirable to maintain absolute phase as originally played in the recording

hall, as that will provide the most accurate representation of the original wavefront. This may be audible in some cases as a more realistic rendition of musical transients when the proper polarity for that recording is selected. The Bryston BP-20/BP-25 preamplifiers maintain non-inverting polarity at the Main output for all inputs when the pilot light is green, and inverting polarity for all inputs when the LED is yellow. The 'To Tape' outputs are always non-inverting.

The Mute control mutes the output of the preamplifier to allow for interruptions without affecting the volume control setting. (Refer also to the Power Supply section of this instruction sheet for information regarding remote Amplifier control via the Mute switch).

Bryston MM and MC Phono Section:

Bryston's Phono section is available in the BP-20 or BP-25 preamplifiers. It features state-of-the-art accuracy in equalization, extremely low noise and distortion, and provides headroom margins sufficient to prevent overload from any known phono source.

The Phono section may be ordered in either of two versions: Moving-Coil, (Model BP-20MC or BP-25MC), or Moving-Magnet, (Model BP-20P or BP-25P). The BP-20MC and the BP-25MC provides a front panel switch to choose the additional gain required for moving coil cartridges (See diagram page 4).

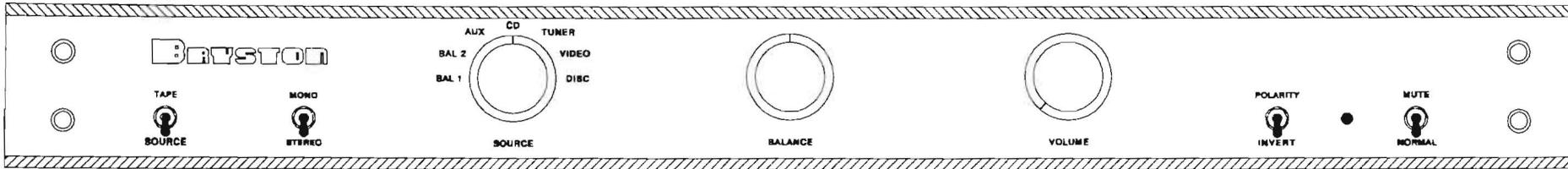
To access the Phono section on the BP-20MC or BP-25MC, simply plug your turntable interconnect leads into the Phono inputs on the rear panel of the preamplifier. Engage the **MM/MC Phono** toggle-switch located on the front panel of the preamplifier to the appropriate moving-magnet or moving-coil position and turn the "Source" rotary selector knob on the front panel to

Phono. (Please ensure the MM/MC switch is in the correct position for your cartridge, or your system will display audible problems, such as poor frequency response, low output, or both). If your turntable provides a separate ground lead, system noise may be minimized by connecting it to the ground lug adjacent to the phono inputs on the rear panel.

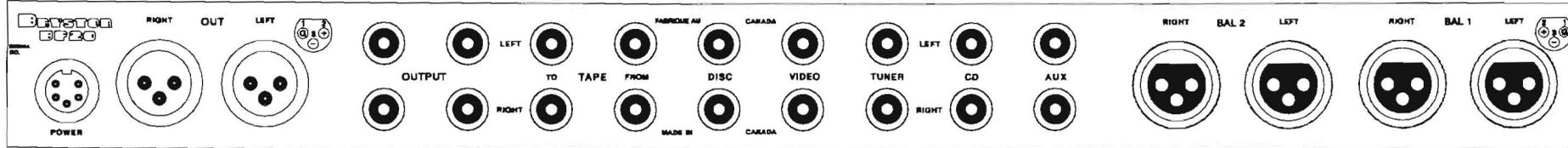
The BP-20P and BP-25P hookup procedure is similar, with the exception that there is no front panel switch between MM and MC. (This is replaced with the Stereo/Mono switch).

The Bryston BP-20 and BP-25 are line-level preamplifiers only. You may acquire Moving-Magnet or Moving Coil phono capability by returning it to the factory for updating. We also offer the Moving-Coil setup stage, as an outboard unit (TF-1), if your preamplifier already contains a Moving-Magnet phono section.

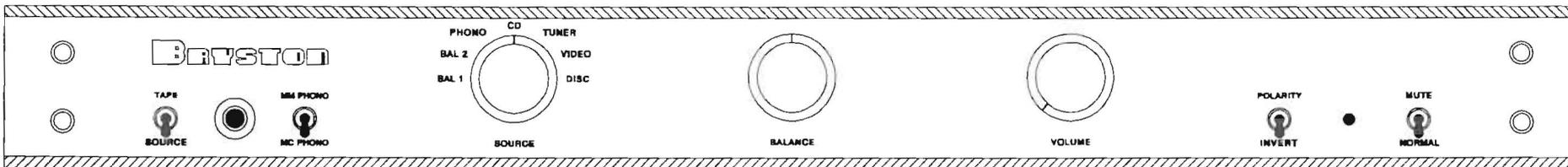
BP-20 Front Panel



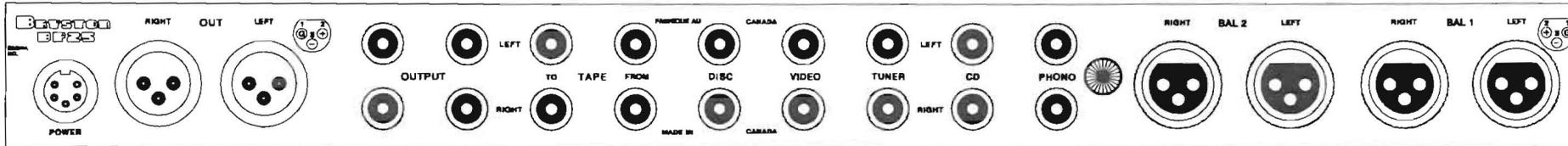
BP-20 Rear Panel



BP-25 Front Panel



BP-25 Rear Panel



BRYSTON PREAMPLIFIERS

BP-25 and BP-20 Functions:

BP-PS POWER SUPPLY : LED indicates GREEN when power on. Provides 12-Volt supply for remote turn-on of Bryston THX power amplifier(s) or others so equipped.

PREAMPLIFIER LED: Indicates RED when output muted. GREEN indicates output is non-inverting polarity. YELLOW indicates output has inverted polarity.

HEADPHONE OUTPUT (BP-25):

Allows monitoring of any input source with the use of headphones. It is recommended that you use headphones with input impedances greater than 50 ohms for optimal performance. If you wish to mute your loudspeakers while listening to your headphones simply engage the *MUTE* switch on the preamplifier (LED turns red). Be sure *not* to use your remote control (use the front panel volume control) to adjust the volume while listening to your headphones, as the remote will 'unmute' the preamplifier on 'volume up'.

FRONT PANEL CONTROLS:

MUTE/NORMAL TOGGLE: Mutes or releases mute at the main outputs, (not 'To Tape' outputs), without changing the volume control setting, each time pushed.

POLARITY/INVERT TOGGLE: Reverses polarity at main outputs each time pushed. (GREEN LED indicates positive polarity, YELLOW LED indicates inverse polarity).

VOLUME: Rotary control varies the output level to the 'MAIN OUTPUTS', (does not effect 'TO TAPE' outputs).

BALANCE: Rotary control adjusts the left-versus-right channel levels. The Balance Control is a tailored-inflection type which has very gradual action near the center of rotation allowing fine adjustments to the stereo image. For convenience the electrical center of the control is detented.

SOURCE: Rotary knob, determines which input will appear at the 'TO TAPE' outputs for recording or processing, as well as determining which program is available at the Main outputs. (When the 'TAPE/SOURCE' switch is in 'Tape' position, 'TAPE FROM' inputs appear at Main Outputs).

MONO/STEREO SWITCH: 'Stereo' position provides two-channel stereo at the Main outputs. 'Mono' position sums the main outputs to monaural. The 'TO TAPE' outputs are always stereo. (Switch not present on BP-25MC).

PHONO SWITCH (BP-25MC only): Allows the selection of either Moving-Magnet or Moving-Coil phono. (BP-25MC preamplifiers are equipped with a Phono MM/MC switch in place of the Mono/Stereo switch).

TAPE/SOURCE SWITCH: Source (down) position monitors whichever input is selected at the rotary SOURCE selector knob. Tape (up) position provides monitoring of the 'FROM TAPE' input for A/B comparison with the source. Should an external processor or equalizer be connected in the TAPE LOOP, the "TAPE/SOURCE" switch will act as an in/out switch for the external equipment.

REAR PANEL CONNECTORS:

BALANCED OUTPUTS: Output is taken from the three-pin "XLR" type connectors. Pin-1 is ground - Pin-2 is the positive (+) output and Pin 3 is the inverted output. The output is "ACTIVE BALANCED" (no transformer). *Never connect pin 2 or pin 3 to each other, to pin 1, or any ground.* The outputs are capable of driving 30 volts to any load 600 ohms or greater in balanced operation.

UNBALANCED OUTPUTS : There are two parallel unbalanced outputs for each channel available, utilizing gold-plated RCA-style connectors. The output is always in-phase with the input, and is capable of delivering 15 volts into any load of 600 ohms or greater.

TO-TAPE-FROM: The 'TO TAPE' outputs are selected by the rotary "SOURCE" knob and are provided as a recording output. This feed is unaffected by the operation of other front panel controls. The 'FROM TAPE' (unbalanced RCA) input is useful for monitoring tape playback or processed signals. Moving the "Tape/Source" toggle to 'Tape' (up) position monitors the recorded signal on recorders equipped with a separate playback head, or the processed signal when using a signal processor. Input sensitivity is 500mv, input impedance is 10K ohms.

UNBALANCED INPUTS: Input connectors are gold plated RCA Phono jacks. Input sensitivity is 500mv, input impedance is 50K ohms. On BP-25P, Phono input impedance is 47K, sensitivity is 5 mV. On BP-25MC, MMohms. Phono input is as above, MC Phono input impedance is 180 Ohms, sensitivity is 0.35 mV.

BALANCED INPUTS: Balanced input connectors are gold-plated 3-pin "XLR" style connectors. Pin 1 is ground, Pin 2 is positive input (+) and pin 3 is the inverting input (-). Input sensitivity is 1 volt, input impedance is 15k

BRYSTON 20 -YEAR WARRANTY

Bryston products are warranted to be free from manufacturing defects for a minimum of twenty years from the original date of manufacture. This includes parts, labour and return shipping to the first owner and all subsequent owners. Warranty coverage is automatic and commences with the original date of manufacture which is kept on file at Bryston.

In the event of a defect or malfunction, Bryston will remedy the problem by repair or replacement, as we deem necessary, to restore the product to full performance.

This warranty is considered void if the defect, malfunction or failure of the product or any component part was caused by damage (not resulting from a defect or malfunction) or abuse while in the possession of the customer, tampering by persons other than factory-authorized service personnel, or failure to comply with Bryston operating instructions.

This warranty gives you specific legal rights and you may also have other rights which may vary from province to province and country to country.

- BRYSTON SERVICE IN CANADA:
24 STEINWAY BLVD., UNIT 48
ETOBICOKE, ONTARIO
M9W 6T8
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FAX: 416-675-3103

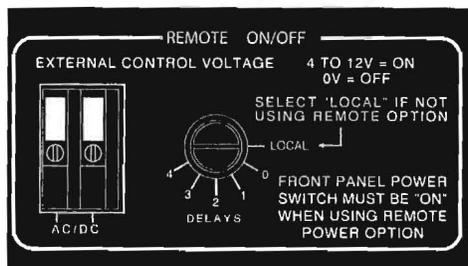
- BRYSTON SERVICE USA:
79 COVENTRY STREET
NEWPORT, VERMONT
PHONE: 802-334-1201
FAX: 802-334-6658

- BRYSTON SERVICE OUTSIDE CANADA:
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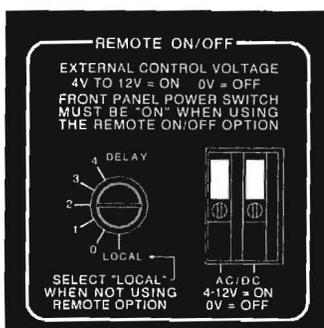
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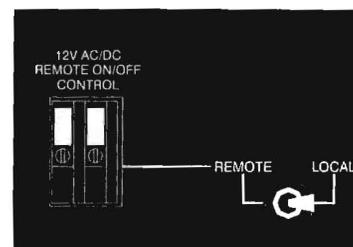
CONNECTING BRYSTON POWER AMPLIFIERS and PRE-AMPLIFIERS for REMOTE ON/OFF CONTROL



Rear panel detail of 5B/8B amplifiers



Rear panel detail of 3B/4B amplifier



Rear panel detail of 2B-LP amplifier

Bryston's remote amplifier on/off function allows the user to link the power on/off operation of Bryston's BP20/25 pre-amps to one or more Bryston power amplifiers, models 2B-LP, 3Bst, 4Bst, 5Bst, 7Bst & 8Bst. When the **Remote ON/OFF** switch on the rear panel of a Bryston power amplifier (shown above) is set to **LOCAL** the amplifier responds only to its front panel power switch. When the **Remote ON/OFF** switch is set to one of the delay settings, however, the amplifier will accept a remote control voltage (between 4 and 12 volts, either AC or DC) to turn the amp on or off. The delay settings cause the amplifier to wait for a few seconds after initially receiving a control signal before turning on the amplifier. This allows several amplifiers to turn on sequentially rather than simultaneously. If the remote on/off function is used, the front power switch on the power amplifier must be pushed in (ON). The exception to this is the 2B-LP on which a front mounted power switch is not standard. Also, the 2B-LP does not offer delay settings and it uses a rear mounted toggle switch to select between REMOTE, OFF (center position) or LOCAL (on). The source of the control voltage can be a Bryston's BP20/25 preamp or other control product capable of supplying 12Vdc (maximum) @ 64mW. When a Bryston BP20/25 is used, either the ON/OFF or MUTE/UN-MUTE operation of the preamp can be used determine when the control voltage is sent to the power amplifier. In addition, BP25 preamps are supplied with an infra-red remote control which can be used to toggle the preamp's MUTE function and thus can also be used to turn Bryston power amplifiers on and off. The power switches for the BP20/25 preamps are located on their external power supply (MPS-1) and turning this power supply on or off can also be used to turn Bryston amplifiers on and off remotely.

The rear panel of the MPS-1 power supply is equipped with a 3-terminal connector (see illustration on next page) which provides two different 12v output signals. The **+12V SW** terminal, which responds to the MUTE operation of the preamp, generates a 12VDC signal when the preamp is *not* muted. When the preamp *is* muted the 12VDC signal is interrupted and any remotely controlled power amps would turn off. The **+12V** terminal provides a 12VDC signal whenever the power supply is turned on.

To summarize:

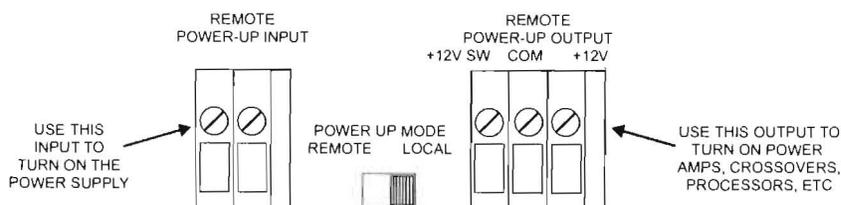
Option 1: Using the **+12V SW** and **COM** terminals of the rear panel of the preamps MPS-1 power supply, a 12-Volt signal is sent to the amplifier based on the status of the pre-amp's MUTE function. When the preamp is muted, the 12V signal is interrupted and the power amp turns off.

Option 2: Using the **+12V** and **COM** terminals, a 12 Volt control signal will be sent to the power amplifier *only* when the preamp power supply is turned ON. Therefore, the power amp will be turned on only when the preamp is turned on.

The terminal blocks will accept stranded wires between 12 and 26AWG, stripped up .35". The setscrews are used to open (loosen) and close (tighten) the wire cages.

CONNECTING BRYSTON BP20/25 PREAMPLIFIERS FOR OPTIONAL POWER ON/OFF FUNCTIONS

The Bryston MPS-1 power supply (supplied with all Bp20/25 preamps) has two ways of being turned on and two ways of turning on other equipment (such as Bryston power amplifiers).



The wires are secured by loosening the small screws, placing the wire(s) in the opening and tightening down on the screws. Stranded wire gauges between 12 and 26 AWG are acceptable.

Turning on the MPS-1 Power Supply:

MANUAL POWER-UP (Normal Operation)

To turn on your BP20/25 manually, make sure the **Power Up Mode** switch on the rear of your power supply is set to **LOCAL** and operate the master **Power** button on the front of the power supply as required.

CAUTION: If the switch is left in the **Remote** position, your BP20/25 preamplifier will not power-up when the **Master Power Switch** on the front of the MPS-1 power supply is engaged unless a 4-12 volt signal is present at the **Remote Power-up Input** (see above).

REMOTE POWER-UP USING A 4~12V CONTROL SIGNAL

To turn on your preamplifier remotely connect a 4~14 volt signal via two wires into **the Remote Power Up Input** terminals on the rear of the BP20/25's MPS-1 power supply. Place the **Power Up Mode** switch on the rear of the power supply in the **REMOTE** position and engage the **Master Power Switch** located on the front of the power supply. When a 4-12 volt signal is present the BP20/25 power supply will turn on. Removing the trigger signal turns the power supply off.

NOTE: The Master Power Switch on the front of the power supply must be engaged in order for the remote trigger function to operate. Polarity of the control voltage is not critical; either AC or DC is acceptable.

Using the BP20/25 and MPS-1 to turn on other equipment:

Power-Up Other Equipment when the MPS-1 is Powered-Up

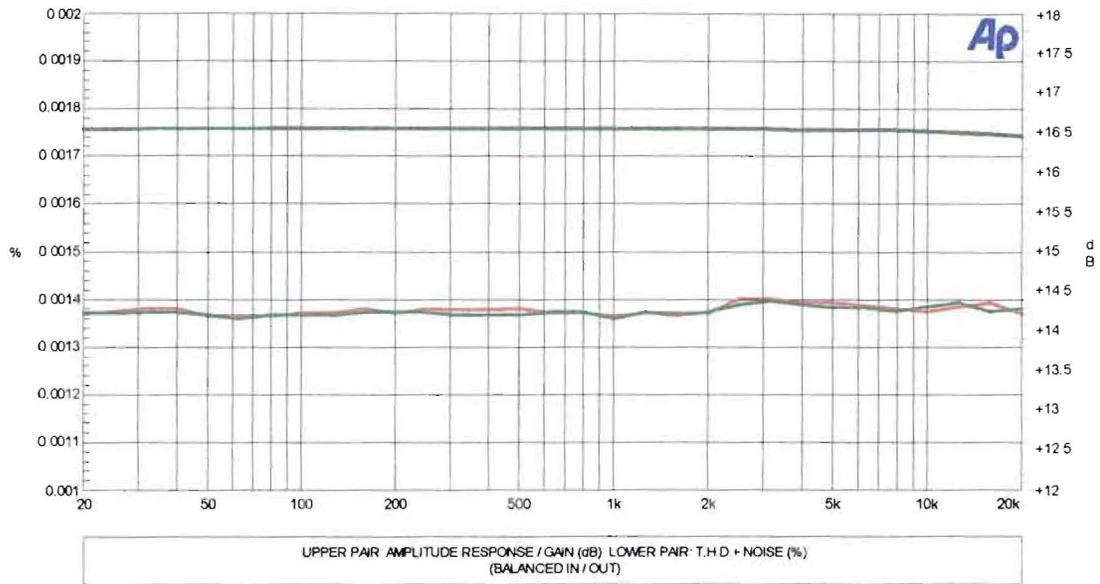
Connecting the **+12V** and **COM** terminals of the MPS-1 to the Remote On/Off terminals located on Bryston power amplifiers will allow the amplifier to be turned on whenever the MPS-1 is turned on.

Power-Down Other Equipment when the BP20/25 Preamp is Muted

Connecting the **+12V SW** and **COM** terminals of the MPS-1 to the Remote On/Off terminals located on Bryston power amplifiers will allow the amplifier to be turned OFF whenever the BP20/25 preamp is muted. When the preamp is un-muted the power amp will be automatically turned on.

BP20P PREAMPLIFIER SPECIFICATIONS

07/25/01 12:14:50



LEFT CHANNEL

0.00110 %

SMPTE I.M.D.

RIGHT CHANNEL

0.00111 %

UNWEIGHTED SIGNAL/NOISE (ref. 0.5V input @1khz)

-103.22 db

BALANCED

-103.24 db

-105.53 db

UNBALANCED

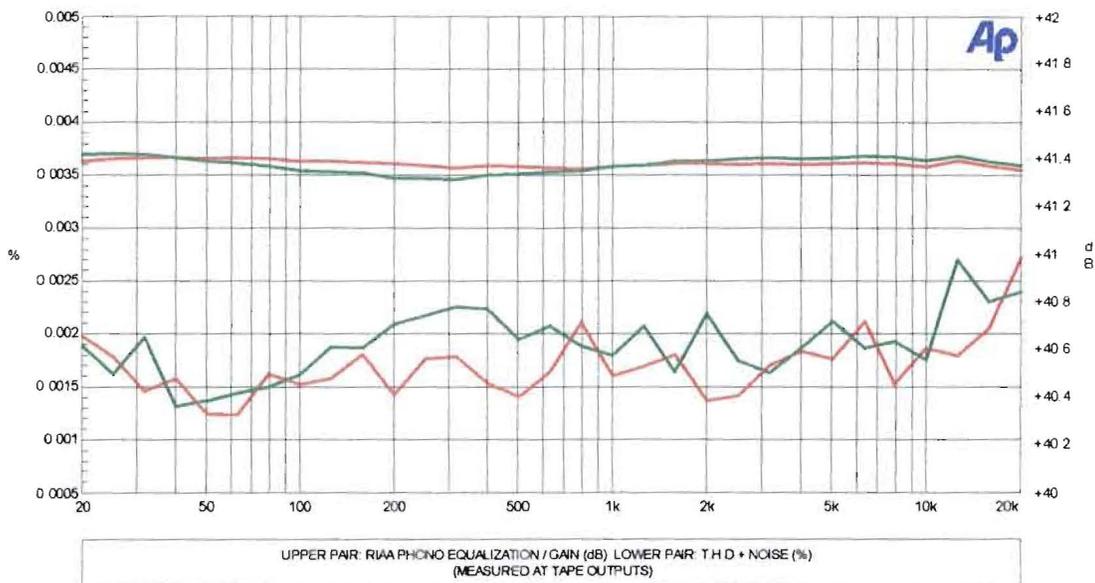
-105.52 db

Inspector: DjG

Serial #: 221870

BP20P PHONO INPUT SPECIFICATIONS

07/25/01 12:16:19



LEFT CHANNEL

RIGHT CHANNEL

A' WEIGHTED SIGNAL/NOISE

-81.71 db

**MM PHONO
(ref. to 5mv input@1khz)**

-81.76 db