LEADING THE WAY

Jonathan Scull auditions the Jadis JS1 Symmetrical D/A processor & J1 Drive CD transport

Jadis JS1 Symmetrical D/A processor: Dual-differential Bitstream DAC. Inputs: optical AT&T, coaxial S/PDIF (75 ohms), AES/EBU, presumably 110 ohms. S/N ratio: 98dB. Distortion: -90dB. Frequency response: 20Hz-22kHz. Analog section: S/N ratio: 90dB. Distortion at 1kHz: <0.1%. Bandwidth at -3dB: 1Hz-5kHz. Maximum output level at 0dB: 4V (balanced). Tubes: DAC module: two 6DJ8/ECC88/6922, two 12AU7/ECC82; power supply: one EL86, one EF86. Dimensions (two chassis): 19" (485mm) W by 13" (335mm) D by 4" (105mm) H each. Weight: 57.2 lbs (26kg). Serial number of unit reviewed: 118. Price: $11,990.

Jadis J1 Drive CD transport: Dimensions: 18⅝" W by 17½" D by 7" H. Weight: 66 lbs (30kg). Serial number of unit reviewed: 93100. Price: $12,500.

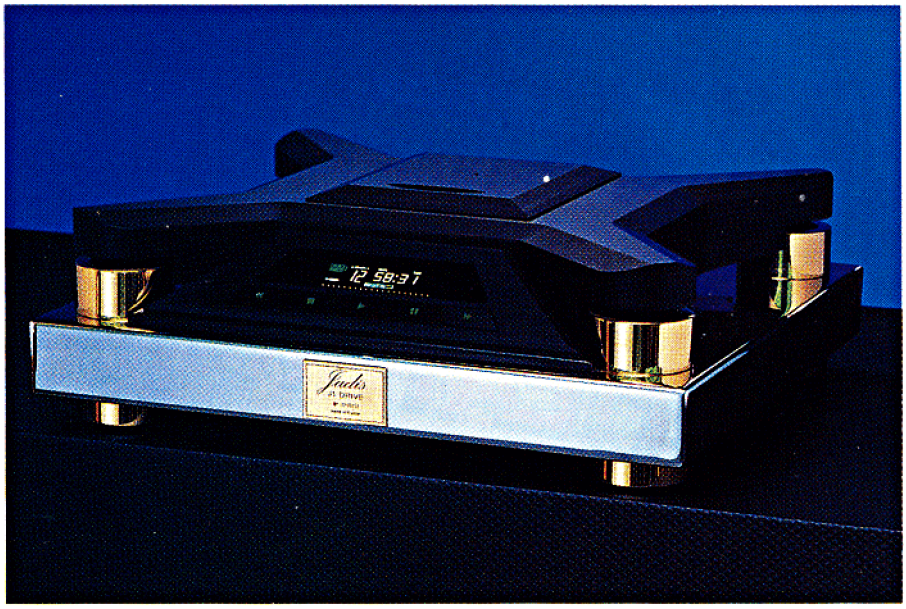
Both: Approximate number of dealers: 8. Manufacturer: S.A.R.L. Jadis, Chemin du Pech, 11800 Ville du bert, France. Tel: (33) 68-786330. Fax: (33) 68-788515. US importer: Fanfare International, New York, NY. US distributor: Northstar Leading The Way, 1255 Fifth Ave., New York, NY 10029. Tel: (212) 987-1724. Fax: (212) 987-1568.

As with many Jadis reviews, this one was a long time coming—call it the Victor Goldstein Function, if you will. In the same fashion as the JP-80MC DO iconized in September 1994 (with commentary by Yours Truly), the JS1 Converter I'd had on hand for a time was replaced with a more current production unit sporting Philips capacitors.

I listened contentedly for a time to this updated unit driven by the Forsell Air Bearing transport and an early-production C.E.C. TL 0 from Parasound (a hefty $17,500 the pop). Things really perked up when the sexy Jadis J1 Drive arrived, along with a fresh example of the TL 0 (review coming up to boil). Like the J1, this second (limited) "production" C.E.C. included a full complement of outputs, AES/EBU accompanying coaxial S/PDIF and glass. In this fashion, "datalink tri-wiring" comparisons were merely a flick of the switch away.

For comparison purposes, and to make sure I wasn't hearing things, I installed a Krell Reference 64 processor and DT-10 transport (both reviewed by RH in Vol.17 No.1) that I pulled from JE's system. (His Levinson No.30 had reappeared in upgraded 30.5 guise, arms akimbo.) These two digital front-ends represent complete polar opposites in philosophy, design, and execution, yet either might be seriously considered by the well-heeled music-lover out on an equipment binge. The Krell Kombo nets out at $21.9 kilobux (Reference 64, $14k; DT-10, $7.9k)—well within range of the Jadis pairing's $23,490.

For the most part, I drove the Reference 64 with the J1 Drive, the C.E.C. TL 0, or the Forsell—I didn't much care for the ergonomics or the sound of Krell's DT-10 transport. (And I nearly sliced my hands to ribbons on its sharp Krellian surfaces.) For a complete rundown on the Krell Kombo, see RH's review; for the most part, I agree with his contusions.



Jadis J1 Drive CD transport

The Forsell D/A converter, which comes in at a more modest $5000 (for now), provided an interesting counterpoint to the more expensive units, driven most successfully by its own soon-to-be-updated transport ($7000, also for now). Ranging to the opposite extreme in sound, the hyper-detailed TL 0 partnered the musical Forsell for a match made in Digital Heaven.

C.E.C., Krell, Forsell, Jadis. . .the mind boggles. Why should I even *bother* reviewing these ultra-expensive audio jewels, seemingly so far out of reach of most real-world music-lovers? Kathleen (in whose ears *I* trust) put her finger right on it—as usual: "Everyone can dream, *mon cheri*!" she explained when I put this burning question to her. "Why do you read *Classic and Sportscar*? Why do *I* read those real-estate ads for stone houses in Bucks County?" she added pointedly. Ah. . .yes, *ahem*. With Kathleen beside me, then, slowly I turn, step by step. . .

KLAATU BARAATA NICKTU! OR, CLOSE ENCOUNTERS OF THE JADIS KIND: THE J1 DRIVE

The J1 simply stuns with its ultramodern, sexy appearance. This transport is *seriously* attractive—it's the first Jadis product to eschew classic French audio architecture for 21st-century art-house sci-fi looks. If you've been struck by the timeless beauty of previous Jadis electronics, you might be floored by the cyborg chic of the J1 Drive—unless you're hopelessly moribund, that is. This new design aesthetic is also to be found in an upcoming line of medium-priced electronics from Jadis that all look straight out of a Jean Paul Gaultier future fashionscape. If you buy a component partly because of its look and feel—a sense of *perceived* value—then these new Jadis products may put you into an uncontrollable frenzy of desire.

In day-to-day use, the J1 imparts a feeling of real luxury. It whirrs silkily

during track seeks. It makes expensive-sounding relay noises, and a green interior light clicks on as you draw back the top cover to change CDs. There's a quality to its ergonomics which renders the experience of interfacing with it a true pleasure. Understand that this is not merely ease of use or the triumph of slick design over utility. The basic controls on the slanted front panel fell readily to hand—I found myself *drawn* to using them rather than repelled by bad design to seek out the remote.

The J1 sits on two broad points fixed in the front beneath elegant gold-clad footers, and one larger footer in rear center—all adjustable for leveling. Two pairs of gold, nonfunctional vestigial footers, located left and right rear, are mirrored above the square, nonmagnetic stainless-steel chassis by four gold cylinders which support the upper structure. But, once again, not everything is as it appears. While the upper assembly's two front legs, or outriggers, *are* sprung left and right front on these support cylinders, the rear pair are also nonfunctional. A circular assembly center rear of the upper deck defines the third springing point. The J1 is a perfect example of the whole being greater than the parts. *All* of life is done with mirrors, is it not?

Another mark of the 21st century wafting about the J1 Drive is a small blue serial port for diagnostics (!) located at the rear. *Tres moderne, n'est-ce pas?* I placed the J1 on the top shelf of a Michael Green Designs ClampRack, with a permanent colony of three Mpingos—arranged in a triangle, logo down and oriented in the direction of spin—on the slide-back cover of the deck. You *knew* there would be some Shun Mook about, didn't you? It's to drive the Internet's rec.audio.high-end into a fury—not to mention for best sound.

The JS1 Symmetrical D/A Processor, or, What's the Frequency, Kenneth?

Culturally hybrid in design, the JS1 is a mélange of Connecticut Yankee Jerry Ozment digital boards and a Jadis-designed analog stage and power supply. The JS1, which is possessed of a more traditional Jadis look than is the J1 Drive, is a two-chassis affair, with a pair of electrical umbilicals (analog and digital) connecting the DAC to the heavyweight power supply. And what a power supply! Surprisingly large heatsinks service an all-class-A design—that's as large and hot-running as some 100W amps!

The processor's topology surprised the hell out of me. It's composed of two dual-DAC Philips single-bit SAA 7323s arranged in dual-differential configuration. I queried Jerry Ozment[1] about this during a phone conversation in which I picked up a few tidbits regarding his end of this unit's design.

Jadis JS1 Symmetrical D/A processor

Like many, I suspect, I've associated single-bit conversion with lower-cost processors and less-than-perfect sound. Ozment told me that he'd costed both out, and found no difference in price between implementing a single-bit design or a multi-bit "ladder" DAC. Second—and this requires a leap of faith *until* you hear the JS1—he made the point that all contemporary DACs wind up giving you the same specs in the end. After all, digital technology is built around the 16-bit 44.1kHz sampling rate. Do the math (2^{16}) and you get the same number, whatever the chip set. As a result, Ozment felt that digital specs should be considered secondary in the overall design—it's the *character* of the sonics that one must evaluate.

The "clock extraction" and protocol conversion circuitry between the input and the DAC are proprietary to Ozment Engineering. I *was* able to wring out of Jerry that the re-clocking circuitry uses a so-called ring oscillator—"Not unique, but certainly better than earlier methods of reconstruction of the primary clock signal."

Getting back to the naughty French bits, the analog stage uses a pair of Sovtek 6922s as differential amplifiers to aid in the reconstruction of the "split" audio signal. The advantage to this topology is differential's well-known ability to rid the signal of noise via common-mode rejection. A pair of 12AU7s are used as cathode followers for their low output impedance.

D/A inputs are available in all three major formats, with transport outputs slightly idiosyncratic at RCA, XLR, and BNC. My CAT SL-1 Signature preamplifier is single-ended, and I had no interconnects terminated with BNC connectors, so I used the RCA outputs with the French Blue Siltech. The JS1 has a minimum of Christmas-tree lights; the only one I missed was an indicator for reverse phase. Then again, if you can't hear when it's wrong, you should turn in your Secret *Stereophile* Decoder Ring.

The JS1 *does* have a red-standby/green-operate lamp on the power supply, and three emerald-green lights to indicate frequency lock. Two large knobs either side of the control unit choose input and polarity, and two switches on the power supply turn the unit on and kill the high voltage to the tubes in standby mode. The selector knobs operate with a satisfying *thunk*, and continue to exude a sense of quality and Eurolux. Yes, the JS1/J1 exude. . .

System

The preamp I used was my reference CAT SL-1 Signature (with a factory-available shielded power cord between the control unit and power supply), gently squeezed into a Michael Green Designs ClampRack. The JS1 and its power supply were snuggled into another ClampRack with their original equipment footers removed. I ran tri-wired Siltech FTM4 Si interconnects and LS4-240 speaker cable to the crossovers of the Avalon Ascents, which were powered by my reference Jadis JA 200s (but of course!). Several break-in weeks were

1 Ozment Engineering, 40 E. Maple St., New Canaan, CT 06840. Tel: (203) 966-1732.

spent listening to the surprising Lamm Audio Labs M1.1s as well.

Power cords to the Jadis processor and transport alternated between Transparent Audio PowerLink Super and T&G Audio Labs PC2-A,[2] the so-called "Goldstein" version. (Oi-*vey*!) Both these and the Gen. 2s from Marigo allowed the Jadis equipment to develop its signature room-filling, ambient soundstage. Other power cables included AudioQuest AC-12 and AC-14, and my tried-and-true TARA Labs Affinity solid-core on the amps.

Acoustic treatment devices included the Shun Mook Spatial Control Quartet, which rendered room boundaries a notion of the past. There was, of course, a liberal scattering of The Original Cable Jackets throughout the system, as well as a number of Harmonix room-tuning dots on the walls and ceiling. (This is one well-treated loft!) I have four or five RoomTunes CornerTunes at the room's hot spots, and a gaggle of EchoTunes at the wall/ceiling interface behind the speakers. The Avalon Ascents and their crossovers were mounted on a set of the large, all-brass Audiopoints, the speakers placed well out into the room, with plenty of space to breathe and develop a big, airy soundstage.

Most reference CDs were treated with Harmonix RF-11 CD Foils, and I've painted the rims of many with Audio-Prism CD Stoplight. In addition, all CDs used during the review were treated with Audio Selection Bitstream, a "Multi-functional Spray Optimizer" distributed by Klaus Bunge at Symphonic Line.[3]

The digital cable thing

I wish to propose the following regarding digital datalinks: Give up the idea of finding *one* digital cable of *whatever* configuration to work best in your system. Those of you with high-resolution setups and multiple connections should consider wiring up with all three. 'Philes of every economic persuasion, not just demented reviewer types, should be thus equipped—plenty of fine-sounding digital cables are available to those on a budget.

I come not lightly to this conclusion. As I swapped out one type of digital interconnect for another, I found that "best" was an elusive target at best. What worked with one recording or label wasn't necessarily optimal with another. I found myself listening for a few moments, then experimenting with other connections until I found the one that sounded just right. I didn't document the minutiae of which cable sounded best with which recording—I'll leave that up to you; it'll vary given your cables, system, and its overall balance.

My experience with cables fascinated me. I haven't committed to glass as the medium of choice, although I've logged plenty of time with both AudioQuest Optilink Pro 2 and Jadis's own glass cable. This changed *significantly* with my experience with Aural Symphonics' Aural Optical and ioGEL optical impedance-matching goo, the latter meant to be lightly smeared onto the ends of the fiberoptic. "No smoking for 30 minutes before application, *ma cherie*!" I gleefully informed Kathleen as I read the supplied literature. I experienced with the gooped Aural Optical a smoothness and transparency of soundstage that I'd never before heard from glass—this is the *finest* glass connection I've heard to date, bar none. I'll have to try the ioGEL on the AQ and Jadis glass, but I was so knocked out by the sound of the Aural Optical that I left it in for the duration of the review period.

Coax fascinated as well. With the posh C.E.C. TL 0, the Forsell, and the J1 on hand, I had many opportunities to experiment. I had fresh Aural Symphonics and Marigo coax, both of which required additional break-in. I also hooked up XLO—a longtime favorite in our system. Jack King at Kimber Kable sent along a clutch of cables (they come in clutches, you know), including a length of Illuminati Datastream Reference, which has those trick 75 ohm connectors that look like Egyptian oil vases. While I enjoyed the warm, full upper frequencies and the robust sound of the Illuminati, what really knocked my socks off with the Jadis combo was Kimber's own AGDL coax, which I enjoyed even more than their top-of-the-line TGDL! So that's what I used for the review.

The AGDL sounded incredibly... masculine. It wasn't as smooth as the glass, but *man* was it focused and dimensional! This was particularly trenchant on male vocals, where the slight edge this cable can impart really punched out gutsy, ballsy performances when so recorded. The soundstage with AGDL wasn't quite as big or quiet as that managed by glass or especially AES/EBU, but there was a terrific sense of palpability.

On said AES/EBU front, the surprise was the Illuminati, which sounded great. And, as it's more pliable than the coax, it's also easier to work with. I found the JS1's AES/EBU input to give a generally more quiet, round, dimensional sound, but one a touch too laid-back and relaxed in the upper frequencies for my tastes. This was true with both the AudioQuest Diamond x3 and the Cartier-like Kimber AGDL. The Illuminati sounded open and fast-paced, *and* it sported an awesomely sized soundstage. The Illuminati's upper frequencies were bolder and stood out more than with the other balanced connections, while still retaining the strengths of the AES/EBU format. I used the Illuminati as the reference connection with the JS1.

Le son

The J1/JS1's soundstage was very Jadisian: airy, layered, enormous, and truly enveloping. This was apparent on the terrific Chesky remastering of Barbirolli's Sibelius Symphony 2 in D (Chesky Gold Series CG903), and Leonard Bernstein's and the New York PO's wonderfully recorded performance of Mahler's Symphony 3 (Deutsche Grammophon 427 328-2), both of which run riot with orchestral color and the re-creation of space and air. As does Duke Ellington's vibrant, effulgent *Ellington Jazz Party* (Columbia CK 40712), which, although somewhat differently balanced than its Columbia Special Products LP sibling, still managed an extraordinary sense of space, air, and especially focus. Importantly, the presentation remained both intimate and engaging. Everyone who listened to *Jazz Party* through the Jadis combo was transfixed in the listening chair—you have no idea how messy that can be.

To be sure, this all-enveloping acoustic sweep wasn't solely within the province of large orchestral works. Dead Can Dance's *Into the Labyrinth* (4AD/Reprise 45384-2), along with most of my Art of Noise CDs, generated generous, eye-popping soundfields which came from all over the 3-dimensional acoustical map. Moving to the intimate, Branford Marsalis sounded stunning, alive, palpable, and wonderfully expressive on *Trio Jeepy* (Columbia CK 44199)—especially on that killer kut "The Nearness of You": the air, layering, transparency, and beautiful musical timbres all conspired to deliver a sound that was as close to perfection as I've ever heard.

Harry Connick Jr.'s *We Are in Love* (Columbia CK 46146)—a *Columbia* no less (or "no more," it might be said)—vocal and small-ensemble recording puts the lie to "digital can't do it." The liner notes reveal that it was mastered by Bernie Grundman in 1990, and features Branford yet again on the enjoyable "A Nightingale Sang in Berkeley Square."

Well-recorded audiophile CDs that

2 T.G. Audio Lab, 5000 Redstart, Houston, TX 77035. Tel: (713) 721-4756.

3 5883 N. Victoria Dr., Indianapolis, IN 46208-1653. Tel: (317) 299-5578.

have no whit of charm or musical value are plentiful; but, once again, you score with the Connick disc. I found Junior surprisingly likable and charming, despite the diabetes-inducing title and the fact that the *hairdresser* is credited in the liner notes! Take my art director, please. [*badaBOOM!*] The Jadis rendered this recording in a breathtakingly ambient fashion. Connick was set well back in the soundfield, the scads of air surrounding both Junior and the accompanying musicians truly astounding. Flipping digital connections, it was possible to develop between the speakers a living and breathing Connick that made my hair stand on end. It's *alive*! Well, that's better than plotzing or getting riveted all over the listening chair!

Another unexpected but welcome quality was the Jadis combo's urgent, driving sense of pace, energy, and excitement. It's said that components that zip you along and take your breath away on first blush often prove fatiguing in the long run. Not so the Jadises. They captivated from the first CD, only to improve with time. The *Ellington Jazz Party* was a good example; pace and separation of individual musical lines are *everything* with this magical, upbeat recording—the entire presentation loses its dramatic, finger-popping edge without them. Regardless of the material, if it was in the pits, the Jadis extracted and delivered the beat that made the music happen.

This exciting, fast-paced rhythmic presentation was not at the expense of subtlety, which the Jadis combo elegantly delivered. Cyndee Peters' haunting voice floated slightly right and very rear in "House of the Rising Sun," from Opus 3's *Test CD 4.1* (CD19400). Instruments were beautifully rendered, and sounded forth from their own unique locations within an airy, open, and layered soundstage. The bell in the beginning shimmered so realistically, the bongos startled with such facility, and Peters' voice sounded so nuanced that I instantly felt better about recommending that you load your plastic to the hilt for the Jadis front end. But perhaps by the time you're buying Jadis you aren't concerned about such matters—rather, let's say your investment consultant will be happy that *you're* happy. Sign here.

The Jadis combo's brilliance, transparency, enormous soundstage, and speed of presentation delivered a jump-up-and-get-involved excitement that was invigorating and engaging. Its quick transients, detailed soundstage, and powerful bass easily led me down music's pathways with not a moment's hesitation. In fact, the JS1 was unmistakably balanced toward the fast, immediate, and revealing side, rather than to what some might consider more traditional Jadis values, such as harmonic richness.

Don't get nervous. Hand in hand with this faster-than-fast presentation was a harmonic bloom, a truth of timbre that could not be denied, and which supported the detail and speed that give music its life. The JS1 balanced all these disparate elements in a successful attempt at creating the sonic soufflé that is reproduced music. *Don't slam the door!*

To hear some of these subtler qualities, listen to Eric Bibb on "I Want Jesus to Walk With Me," from *Spirit & The Blues* (Opus 3 CD 19401). I never managed to take any notes during this beautiful and compelling song; I was too moved and affected—responses that were previously only available from analog, *mes amis*.

Through the Jadis combo, the midrange textures of D'Indy's "Sarabande et Menuet," from *French Chamber Music* (London 425 861-2), were the loveliest I'd ever heard from this recording, allied with a gorgeous upper-midrange/lower-treble clarity and harmonic richness that were truly icing on the sonic cake.

So how about that upper midrange/lower treble where so many digital front-ends go wrong? I picked up a CD of one of my favorite (slightly threadbare-sounding) Two-Eyed Columbias: Thelonious Monk's *Criss-Cross* (CK 48823). I didn't expect much from a standard-issue Columbia CD (what they did to Miles!); but with a Harmonix CD Foil slapped to its derrière, it sounded anything but lean. The title track was dynamic, expansive, quick, exciting, and welcoming—especially through the upper mids. In a word, involving.

The Jadis combo handled deep bass with grace and power. The Art of Noise's "Camilla," from *The Ambient Collection* (China/Polydor 843 403-2, AAD, by the way), is one of my standby woofer workouts. The Jadis knocked it out deep, tight, and tuneful (and ambient, of course), with no apologies tendered or required. The extension, depth, and quality of the bass were further enhanced by the hybrid Lamm M1.1s—true SuperBass territory.

The critical midbass? *C'tait facile!* Put on Dean Peer's *Ucross* (Redstone RR91012), close your eyes, and hear articulated and expressive solo electric bass like you've *never* experienced. Another touchstone of virtuosity, this time for the acoustic bass, is "Mondscheinsonate/Round Midnight" (Beethoven/Thelonious Monk, arr: Brown/Almeida) on Ray Brown's and Laurindo Almeida's *Moonlight Serenade* (Jeton LC 6766). (I didn't realize they knew each other!) It sounded powerful, redolent, romantic, expressive, brooding, and achingly, hauntingly beautiful—just as it *ought* to.

With the Jadis processor, any recording that wasn't *completely* hacked to death in the mix had a chance of sounding good. Take my Columbia, please! Believe me, you don't *want* an expensive Formula One front end on exotic fuels that make most CDs sound like crap. You pay the big bucks, you want *music*, and the Jadis delivers, especially when partnered with its own J1 Drive.

So what have we got here? Plenty of state-of-the-art bass, tight and well-controlled, if not quite as deep as that managed by the Krell; a midrange that most manufacturers can only dream about as they toss and turn at night, trying to figure out how they can deliver this type of sound at a more reasonable price; and crisp highs that offer an (almost) perfect blend of clarity, extension, and harmonic integrity when the J1 and the JS1 are tied together. Almost? It's still digital, kiddies; but I, for one, could easily live happily ever after with a front end that sounds this good.

Forbidden Planet Redux, or, If This Is Sweden, It Must Be Thursday!

One afternoon, I found myself on my knees (yet again), cleaning the JS1 with the audiophile's cleaning companion: Spic'N'Span's *Cinch*. It leaves no residue, audio homemakers! I felt like Jeeves doing the silver. As I polished the JS1's gleaming surfaces, I stared thoughtfully at the Krell, the Forsell, and the C.E.C., falling into a rumination about the differences between them. If ever a group of front-end calculators seemed like they were from different digital planets, these are they!

The Krell surprised me with its colorful, enjoyably harmonic completeness in the upper midrange/lower treble. I'd been predisposed to hear the much thinner presentation I'd experienced several times under poor conditions at a nearby dealer. The Krell Reference 64's bass was better than that of the Jadis JS1, but its midrange and highs, while not quite as grainless, open, or bloomy as those of the French unit, were nothing to be ashamed of. This was coupled with a soundstage that was a touch less immediate and enveloping than that of the Jadis.

I agree with the recently suggested 30% contribution factor regarding transports—I was able to coax a more refined sound out of the 64 by switching to the Jadis, the Forsell, or the C.E.C. in different but meaningful ways. In most cases, the J1's balance of sound seemed per-

fectly chosen, the transport sounding splendid with most processors. In any case, those of you who have bought into the Krell sound and design aesthetic will discover much happiness with the Reference 64 and, to a lesser extent, the DT-10.

One thing I'll say that will earn me no points with We-Don't-Need-No-Steenkin'-Magic-Wood-Here Dan D'Agostino is that I rapped at different places on the DT-10's chassis and top covers and noted that, despite its build quality, it sounded different here and there. Time for a little tuning! Because of its front-to-back central assembly, I had to use *four* Shun Mook Diamond Resonators, and a trio of Shun Mook Mpingo discs on the transport's top.

Despite the possible wrath of D'Agostino, it was worth it. The Illuminati cable, along with most of the other AES/EBUs on hand, continued to work well with the Krell; the Kimber AGDL stumbled and gave way to XLO; and the Aural Symphonics again proved transcendent—especially with the separate clock link established. D'Agostino-reeno will be happy to hear that the only thing I could do with the tightly coupled power supply and DAC was to put them up on small Audiopoints. INCOMING!

The Forsell sounded more like the Jadis, especially with its high bloom factor and enveloping acoustic. The Swedish stuff sounded very liquid, no question. (Not a criticism, but I wouldn't describe the JS1/J1 combo as liquid.) While the Forsell setup is wonderfully musical, it still didn't cut the Poupon in the dynamics, pace, and transparency departments. I've not so much to say about these Swedish Air Bearing'd digital apparatuses; the transport is soon to receive an important and overdue upgrade to current-production specs with the "newer" top assembly and boards. These things will arrive in the fullness of Forsellian Time, and ink will be spilled when appropriate.

Measurements from RH

The Jadis had a maximum output level of 6.65V RMS from the balanced outputs, 3.33V from the single-ended jacks. The processor's single-ended output impedance was very high, measuring 2.7k ohms at 20Hz, dropping to 770 ohms at 1kHz and above. These high values are due to an undersized output coupling capacitor. Nevertheless, the balanced output impedance was even higher—double that of the single-ended output impedance (5.4k ohms at 20Hz). The Jadis clipped when it was asked to drive a low 600 ohm load impedance. With a decade resistance box in parallel with the Audio Precision System One's 100k ohm input impedance, the Jadis started clipping with 1.8k ohms in parallel with 100k ohms (the total resistance was 1768 ohms) at any audio frequency. The very high source impedance provided by the Jadis suggests that it should be used with high-input impedance preamplifiers, and that passive level controls are out of the question.

Looking at the Jadis's single-ended outputs when the processor was driven by a positive-going impulse revealed that the unit doesn't invert absolute polarity unless the front-panel polarity switch is in the 180° position. The balanced outputs, however, inverted absolute polarity because the Jadis's XLR pin assignment is pin 3 hot, rather than the North American/AES standard of pin 2 hot. If your preamp is pin 2 hot (very likely), the Jadis will be inverting from the balanced outputs. Having your dealer reverse the pin 2 and pin 3 wires on the XLR jacks will make the Jadis non-inverting when used with pin 2 hot preamps.

It was impossible to measure the Jadis's DC offset: a very-low-frequency noise (I estimated it to have a frequency of about 0.1Hz, a period of 10 seconds) shifted the DC up and down over a range of −6mV to +3mV.

Although the Jadis locked to any of the three standard sampling frequencies (32kHz, 44.1kHz, 48kHz), the front-panel light marked "44" stayed on all the time, regardless of the sampling frequency driving the Jadis. The light marked "48" never illuminated, even when the processor was driven by a 48kHz digital signal.

Fig.1 shows the Jadis's de-emphasis error (top pair of traces) and frequency response (bottom pair of traces). Note that I've swapped the position of the de-emphasis and frequency-response curves, and changed the vertical scale so that we can see the extent of the positive de-emphasis error. (The scale is, however, still calibrated at 0.5dB/vertical division, as in all our other frequency-response graphs.) The huge de-emphasis error will cause pre-emphasized CDs to sound very bright (nearly a 3dB boost at 10kHz). The irregular shape of the frequency-response curve above 2kHz is caused by passband ripple in the Philips SAA7323 digital filter.

In the crosstalk plot (fig.2), we can see reasonable performance (just better than 100dB channel separation across the band), along with what looks like power-supply noise at 180Hz. The peaks and dips above 1kHz are unusual, particularly because their frequencies are slightly different between the left and right channels. These peaks and dips appear to be a crosstalk phenomenon—they don't show up in later spectral analyses.

Fig.3 is a spectral analysis of the Jadis's output when decoding a 1kHz, −90dB dithered sinewave. There's a positive linearity error apparent (the trace at 1kHz peaks above the −90dB horizontal division), and we can see a fairly large amount of power-supply noise at 180Hz. The overall noise level is also moderately high between 20Hz and 500Hz. Note that I installed the power supply well away from the processor for these measurements. With the power supply near the processor, the power-supply noise was much greater. I also tried to minimize the noise with different grounding schemes and AC cheater plugs. The results shown here represent the lowest noise level I could achieve.

Extending the measurement bandwidth and driving the Jadis with digital silence (a code of all zeros) produced the plot of fig.4. The most salient characteristic is the presence of energy in the left channel at 44kHz, probably caused

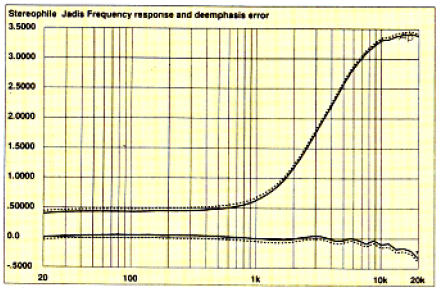


Fig.1 Jadis JS1, frequency response (bottom) and de-emphasis error (top) (right channel dashed, 0.5dB/vertical div.).

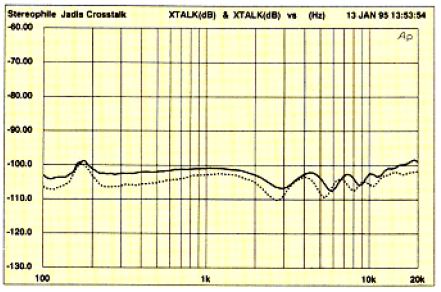


Fig.2 Jadis JS1, crosstalk R–L (L–R dashed, 10dB/vertical div.).

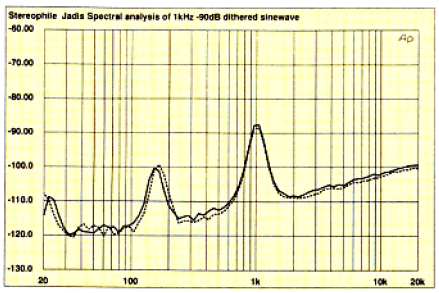


Fig.3 Jadis JS1, spectrum of dithered 1kHz tone at −90.31dBFS, with noise and spuriae (⅓-octave analysis, right channel dashed).

by leakage of a digital clock into the left-channel analog audio circuit. The power-supply noise at 180Hz is again apparent.

The Jadis's linearity plot (fig.5) shows a positive linearity error starting at –70dB. At –90dB, the linearity error was about 1.5dB (left channel) and nearly 3dB (right channel). Because the Philips SAA7323 Bitstream DAC has inherently good low-level linearity, the Jadis's positive "linearity error" may be caused by noise in the processor's analog circuits that simply swamps the very low-level test signal.

Fig.6 is the noise-modulation plot, made by driving the Jadis with a 41Hz sinewave at five levels from –60dB to –99dB, high-pass filtering the processor's output to remove the test signal, and plotting the spectrum of the processor's output. The test shows how the processor's noise floor shifts in level or changes spectrally as a function of input level. Ideally, the five traces would perfectly overlap, looking like a single trace. The Jadis's performance was far from this ideal, with very wide deviation between traces. This means that the Jadis's noise floor will shift and change spectrally as the input level changes—as much as 8dB at some frequencies.

The Jadis's reproduction of a 1kHz, –90dB undithered sinewave (fig.7) shows a moderately good waveshape, but also some high- and low-frequency noise. The low-frequency noise I saw on the voltmeter when trying to measure the Jadis's DC offset can be seen here skewing the trace. We're looking at a 1kHz signal riding on top of a very low-frequency noise component (and the 180Hz power-supply noise).

The Jadis produced a very clean intermodulation-distortion spectrum (fig.8), seen by the relative absence of spikes in the FFT-derived spectrum. The 1kHz difference component is the only IM product of consequence, but is less than 20dB above the noise floor.

I looked next at the Jadis's jitter performance with the Meitner LIM Detector. The transport driving the Jadis was a PS Audio Lambda transport (the same transport and interconnect we use for all our jitter measurements), and the test signals were taken from the CBS Test Disc. I measured the jitter at the SAA7323 DAC's 128x-oversampling (5.645MHz) clock.

The jitter varied in RMS level (400Hz–22kHz bandwidth) from a low of 57 picoseconds (an input signal of all zeros) to a high of 125ps (input data representing a 10kHz, 0dBFS sinewave). Fig.9 shows the Jadis's clock-jitter spectrum with a 1kHz full-scale sinewave input signal. The spectrum is made up of many periodic jitter components, which overshadow the signal-correlated jitter at 1kHz, 2kHz, and 3kHz. The RMS jitter level was 85ps. When driving the Jadis with a 1kHz, –90dB sinewave, the jitter spectrum looks very different (fig.10). Now the signal-correlated components dominate, and the rest of the plot is very clean (the large spike in jitter energy at 7.35kHz is caused by the S/PDIF subcode's data rate). The RMS level was also 85ps.

Fig.11 shows the Jadis's jitter spectrum with a digital input of all zeros. We can see just a few periodic components, with the 7.35kHz subcode-induced jitter dominating. The RMS jitter level measured 57ps. Finally, I drove the Jadis with a 10kHz full-scale sinewave, which produced the plot of fig.12. Note the spike of energy at the test-signal frequency of 10kHz, and also the relatively clean trace

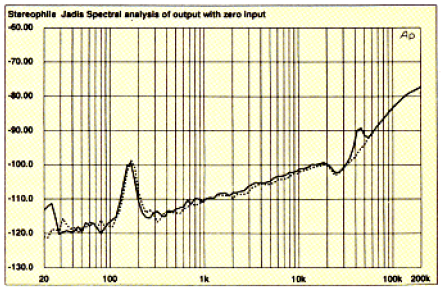


Fig.4 Jadis JSI, spectrum of digital silence, with noise and spuriae (⅓-octave analysis, right channel dashed).

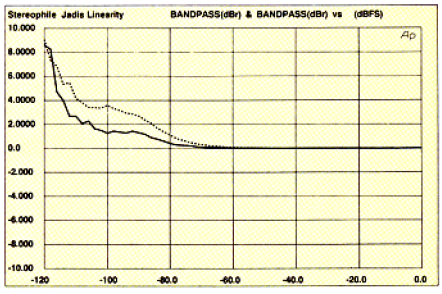


Fig.5 Jadis JSI, departure from linearity (right channel dashed, 2dB/vertical div.).

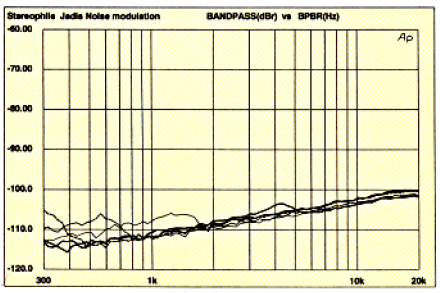


Fig.6 Jadis JSI, noise modulation, –60 to –100dBFS (10dB/vertical div.).

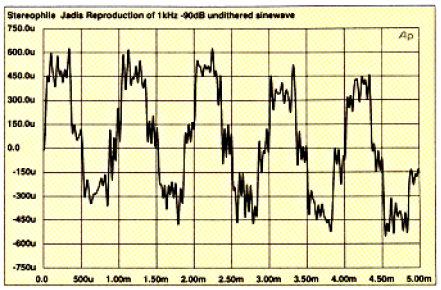


Fig.7 Jadis JSI, waveform of undithered 1kHz sinewave at –90.31dBFS.

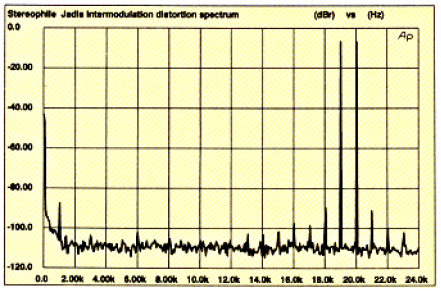


Fig.8 Jadis JSI, HF intermodulation spectrum, DC–22kHz, 19+20kHz at 0dBFS (linear frequency scale, 20dB/vertical div.).

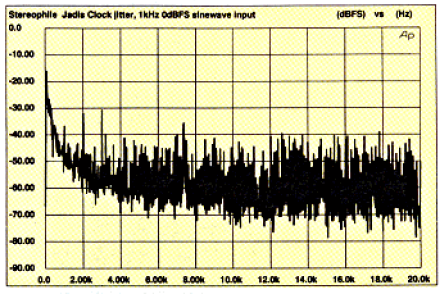


Fig.9 Jadis JSI, word-clock jitter spectrum, DC–20kHz, when processing 1kHz sinewave at 0dBFS (linear frequency scale, 10dB/vertical div., 0dB=1ns).

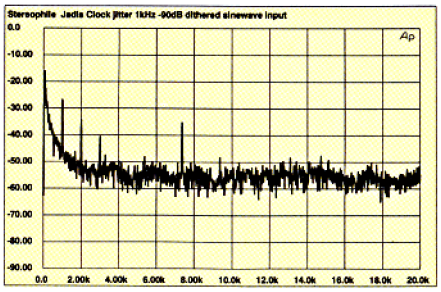


Fig.10 Jadis JSI, word-clock jitter spectrum, DC–20kHz, when processing 1kHz sinewave at –90dBFS (linear frequency scale, 10dB/vertical div., 0dB=1ns).

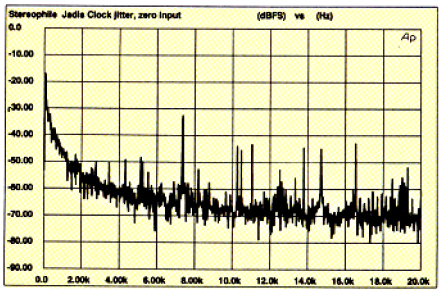


Fig.11 Jadis JSI, word-clock jitter spectrum, DC–20kHz, when processing digital silence (linear frequency scale, 10dB/vertical div., 0dB=1ns).

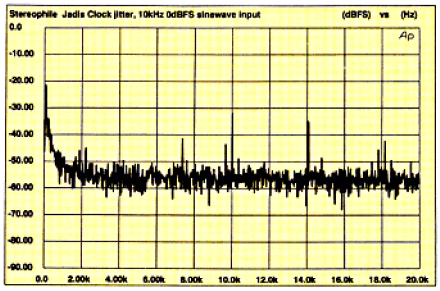


Fig.12 Jadis JS1, word-clock jitter spectrum, DC–20kHz, when processing 10kHz sinewave at 0dBFS (linear frequency scale, 10dB/vertical div., 0dB=1ns).

overall. The RMS level, however, increased to 125ps. The Jadis's clock-jitter spectrum and RMS level varied greatly as a function of the input signal—not a good thing.

Note that these RMS jitter levels are on a 5.645MHz clock, which has a period 16 times shorter than the 352.8kHz clock frequency of a multibit converter's 8x-oversampling (352.8kHz) clock. Because the 85ps of jitter represents a greater proportion of the clock's period on the faster clock, it's worse than 85ps of jitter on an 8x clock. Moreover, 1-bit type converters as used in the Jadis are more sensitive to jitter, and are also susceptible to a much wider band of jitter than are multibit converters.

Overall, the Jadis processor showed far from exemplary bench performance. The large de-emphasis error (probably caused by a wrong-value capacitor or resistor), the presence of 180Hz power-supply noise in the audio circuits, the linearity error, and the poor noise-modulation performance do not befit a product so costly. Nonetheless, what matters is how a component sounds, not how it measures. Don't let the poor measured performance dissuade you from buying the Jadis if you like the way it sounds. —**Robert Harley**

JS SUMS UP

Does your $25k buy the magnificent sound you might expect for this kind of money? Or are you paying for mere cachet and social standing among a small group of well-heeled (and possibly out-of-touch) audio cognoscenti? Is *any* transport/DAC combo worth this high a retail price? [*Insert pause for dramatic effect.*] Fear not—the Jadis JS1 Symmetrical D/A processor/J1 Drive CD transport combo was the best digital front-end I've ever had the pleasure of auditioning in our system.

The Jadis pairing's sound was virtuous, vivid, and verisimilitudinous. Detailed, immediate, fast, and exciting, it developed a first-class sense of pace, aided by a deep, powerful, expressive, and differentiated bass line. Macrodynamics *leaped* from the soundfield, *riveting* our guests to the Ribbon Chair time after time. Startle factor: ten out of ten. At the same time, it proved completely sophisticated in its handling of microdynamics; God is in the details. It was all subtlety, elegance, and nuanced microdynamic shadings.

The soundstage was *huge* in all respects, yet remained transparent to its farthest recesses. Focus was superb, sharply drawn edge definition serving as a foundation for the Jadis's ability to paint a breathing, palpable image before me.

A telling digital moment occurs when you switch from digits to analog, or vice versa. I don't know about you, but this is usually accompanied by a feeling that, although digital is improving, it still doesn't have the verisimilitude of analog. I won't say that the Jadis is perfect, but its artifice permitted me to feel closer to the music, and less cheated by digital, than I've ever felt before. This is presumably why you're paying the big bucks.

Ahhh, *mon amour*, let me take you away from all this. . . —**Jonathan Scull** $