

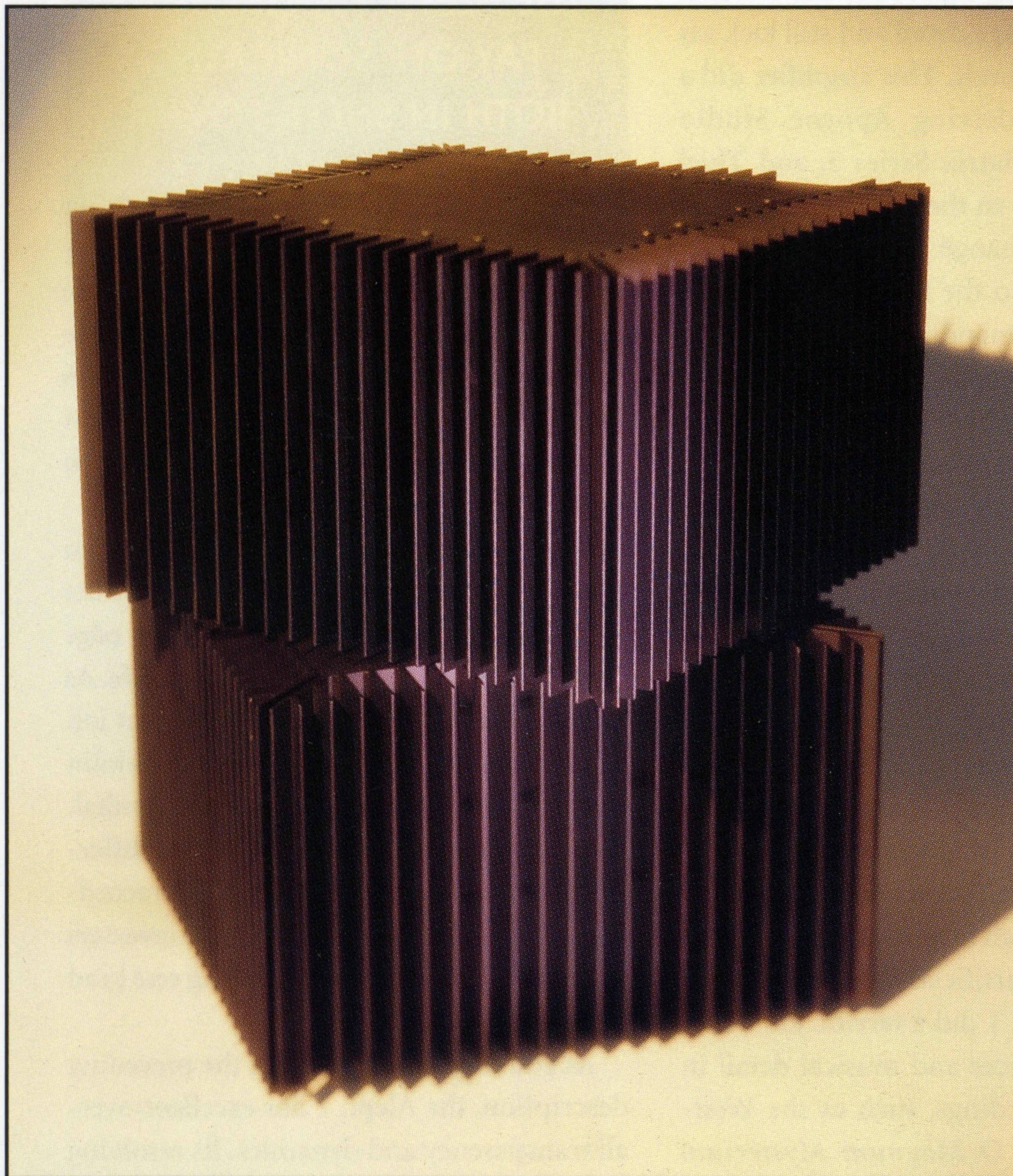
AURICLE

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PASS LABORATORIES

ALEPH 1

MONO AMP



reviewed the Aleph 0 mono amplifier, Nelson Pass's first product since forming Pass Laboratories, for the September 1994 issue. Its sound showed why Pass is widely regarded as one of the world's top designers of solid-state amps. The Aleph 0 demonstrated that a single-ended Class-A transistor design could have virtually all the sonic merits of a top triode tube

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For literature, circle No. 96

(and a switch to choose between them), and a set of binding-post output connectors. The Aleph 1, however, is nearly twice the size of the Aleph 0, and its power transformer is much larger. It weighs approximately 120 pounds and measures 16½ inches wide, 16½ inches deep, and 10½ inches high.

The Aleph 1's rated impedance is 10 kilohms for the unbalanced input

amp and have excellent bass and top-octave response. Pass Laboratories has now added the Aleph 1 amp and a matching Aleph P preamp to its line. The Aleph 1 provides more than twice the power of the Aleph 0 and incorporates other advances in sound quality.

The Aleph 1, a single-ended Class-A mono amplifier, sells for \$6,000 each. Like the Aleph 0, its styling is strictly functional: a black block of machined and anodized aluminum, with only basic features—a power switch and LED, balanced and unbalanced inputs

**SINGLE-ENDED
CLASS-A CIRCUITS
DO NOT HAVE TO BE
THE EXCLUSIVE PROPERTY
OF TRIODE DESIGNS.**

and 22 kilohms for the balanced input; gain is specified as 26 and 20 dB, respectively. Bandwidth extends to 100 kHz (the -3 dB point). Total harmonic distortion is rated at 1%, output noise at 30 nanowatts (500 microvolts), and common-mode rejection at 70 dB. The DC offset is no more than 50 millivolts. The Aleph 1 is rated to deliver 150 watts into 8 ohms, 300 watts into 4 ohms, or 600 watts into 2 ohms. This kind of power allows the amp to deal with the most demanding speaker loads.

Perhaps the only aspects of operation you need pay attention to are heat and warm-up. The Aleph 1 idles at 500 watts to ensure full Class-A operation with maximum headroom. As a result, its operating temperature is a comparatively high 122° F, so this Pass Labs amplifier requires good ventilation and cabinet clearance. And it takes at least an hour to warm up to its optimum operating condition.

The Aleph 1 shares much of its design philosophy with the Aleph 0. This includes an emphasis on simplicity and a minimum number of components to achieve the purest possible signal path. The Aleph 1 also retains the Aleph 0's Asymmetric Class-A topology, which uses a single-ended circuit rather than the normal push-pull arrangement. Pass Labs says that this sharply reduces crossover distortion, low-level non-linearity, phase problems, and odd-order harmonics.

Another holdover from the Aleph 0 is an element in the output stage to avoid clipping at negative current levels that are greater than the bias point. According to Pass Labs, the Aleph 1 can handle 50 amperes on both negative and positive peaks and can operate into impedances of less than 1 ohm at any phase of reactance. Its specified slew rate of about

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AUDIO

60 volts/ μ sec under load is some 10 times faster than the fastest signal likely to be encountered and is 100 times faster than most music signals.

Asymmetric Class-A circuits need current gain that increases smoothly, so the Aleph 1's gain stages use MOS-FETs (whose gain tends to increase with current) rather than bipolar devices (whose gain drops off at higher currents). The Aleph designs also use the wide bandwidth and capacitance of the MOS-FET to roll off the amp naturally, with a simple, single-pole characteristic.

The technology in the Aleph 1 does differ from that of the Aleph 0 in a number of important ways, however. It uses larger MOS-FETs in the front end than the Aleph 0 and biases them higher. The Aleph 0's 1-watt devices in the initial gain stage have been replaced with 20-watt devices. The 20-watt devices in the Aleph 0's second gain stage have become 150-watt devices in the Aleph 1. These higher capacity transistors permit increased idle current and a further reduction in feedback, making it possible for the designer to use simplified input circuitry without low-pass input filters. The only capacitor in the input circuit is a 10-pF compensation device in the feedback loop.

There are major changes in the Aleph 1's output stage. The individual power transistors are twice as powerful as those in the Aleph 0 and have an aggregate current-dissipation capacity of 800 amperes. There is no protective current-limiting circuitry, and the entire output stage consists entirely of N-channel MOS-FETs, comprising a bank of followers biased by a bank forming the constant-current source. This circuit is said to provide up to 150 watts of Class-A power into 8 ohms, with 300-watt peaks.

An advantage of the output circuit in the Aleph 1 is that it makes full use of all the output devices to dissipate the enormous power constantly running through the amplifier. One-third of the output stage of the Aleph 0 was used only when the output was at high negative current; it did not conduct at idle. In the Aleph 1, the output devices share equally in the idle dissipation. (Pass Laboratories says this change in the output stage has been so successful that it has been incorporated into all Aleph 0s produced since December 1994.)

The changes in the Aleph 1 pay off sonically, both in sheer power and in nuance. Like the Aleph 0, the Aleph 1 shows that Class-A single-ended circuits do not have to be the province of triode tube amplifiers, which often are little more than midrange amplifiers—amps that get much of their sweetness and distinctive sound by limiting dynamic power and rolling off the bass and treble.

The Aleph 1 can reproduce the subtlest low-level soundstage detail and still kick ass at rock listening levels. This amplifier did a superb job of driving Apogee Studio Grand, B & W Matrix Series 3, and Thiel CS7 loudspeakers to their limits, and it did so without any change in sound character from the softest to the loudest passages of even the most demanding recordings. This amp also has the nuance and delicacy to get the best out of small mini-monitors, ribbon drivers, and electrostatics. The Aleph 1's sound has the same superb openness, air, and transparency that I vividly remember from the triode power amplifiers of yore. It is quieter than any tube amplifier I have heard to date, however. The music emerges from Stygian silence rather than from a slight electronic haze.

I loved the Aleph 1's reproduction of choral music and harpsichord. One of the key tests of an amplifier's resolution is how much detail you can hear in complex choral passages without artificial etching of any element. The Aleph 1 did a terrific job of reproducing the voices and musical detail in high-quality recordings, such as the Westminster Choir's *O Magnum Mysterium* (Chesky CD 83), the SBHS (Santa Barbara High School) Madrigals' recording of *Earth Chants* (Sheffield 10049-2-F), and the Turtle Creek Chorale's *Postcards* (Reference Recordings RR-61CD).

The Aleph 1 also did an excellent job of reproducing *Pomp & Pipes*, by the Dallas Wind Symphony under Frederick Fennell (Reference Recordings RR-58CD). Compared to the Aleph 0, it had notably better dynamics and very deep bass, as well as more power. I had thought the Aleph 0 was good, but the Aleph 1 has notably superior bass definition, "slam," and extension. It doesn't have the slight warmth in the deep bass that characterized the Aleph 0 but re-

tains the Aleph 0's exceptionally realistic transitions from the bass to the lower midrange and its ability to reproduce accurately such instruments as bass guitar, grand piano, and cello.

The Aleph 1's midrange combines sweetness with detail and life. Again, these are

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sound characteristics I associate with the best triode tube amps, although there are differences. The Aleph 1 has slightly less transient and dynamic energy than most triode tube amps, but it is slightly cleaner in reproducing low-level midrange detail.

The upper midrange and treble of the Aleph 1 also are improved. They retain the Aleph 0's freedom from hardness or edge but add a bit of energy and dynamic life. As a result, the Aleph 1 can do an excellent job of reproducing the top octaves of the violin and the complex "shimmer" of the cymbal. It does a superb job of revealing the different levels of upper-octave detail in recordings, phono cartridges, and D/A converters without coloring them or favoring one kind of sound over another.

As you might suspect from the preceding description, the Aleph 1 has excellent overall transparency and dynamics. Its resolving power also gives it outstanding imaging and soundstage depth and width. This is an amplifier that does not impose its character on the soundstage but preserves all of the information in the recording and induces your speakers to do their best. The Aleph 1 is one of the most musically convincing amplifiers around (particularly, I feel compelled to add, when partnered by the Aleph P preamp). With really good recordings, its performance is exceptionally lifelike, and no aspect of musical ambience and presence is emphasized over another. Its mix of sonic virtues comes as close to combining the best of both tubes and transistors as any amplifier I have yet heard. **A**