

Exhibits

- Exhibit BX1

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EMERGING TECHNOLOGY

AMAZING LASER: Revolutionary new design of a widely used laser now combines miniature size and high power. This new type of semiconductor laser also offers unrivaled reliability and lower cost. It's expected to have a broad range of applications—data processing, satellite communications, medicine, and, ultimately, computers that process information using *light* instead of *electricity*.

Background:

In the past 25 years, lasers have gone from an esoteric curiosity to one of today's most important, versatile, and fastest-growing technologies. There are now dozens of different lasers—from low-power gas lasers used in eye surgery to powerful X-ray lasers expected to form the backbone of the Star Wars program.

The most commercially significant of all, however, is the semiconductor, or diode, laser. It's the workhorse of the electronics and telecommunications industries—used in compact disk players, fiber optic communications systems, etc. Diode lasers are prized for their compactness and high reliability. They resemble microchips and are made from the same semiconductor materials as chips.

Drawback:

The laser-on-a-chip is tricky to manufacture (tiny, faceted mirrors must be fabricated along its edges), and it produces only low-power beams.

Breakthrough:

New diode laser design produces beams many times more powerful than today's models—out of the same size package. It's also cheaper and less expensive to manufacture. Known as a *surface-emitting diode laser*, it uses its entire surface (not just the mirrored edge) to create a beam. A tiny grid, etched in the semiconductor material, precisely “tunes” emitted light into a single laser beam. This beam is more than **100 times** more tightly focused than that produced by standard (edge-emitting) diode lasers.

Added advantages:

Because the new lasers eliminate the need for precisely machined and focused micro-mirrors, they're also more reliable. In addition, surface-emitting diode lasers can be optically “locked” together to create a very high-power laser.

Status:

Commercial versions of the new laser should be available in one to two years.

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YEAST—RISING IN A NEW WORLD:

Baker's yeast—the same organism that has leavened bread and fermented wine for more than 6,000 years—is now beginning to make big payoffs in the world of biotechnology. It's making genetic engineering easier, more productive, and more profitable for scientists and biotech and pharmaceutical firms.

Background:

Genetic engineering centers upon the ability to modify the genetic makeup of simple organisms. Scientists select an organism and insert DNA (genetic instructions) that corresponds to the production of a particular protein, thereby “commandeering” the organism to do their bio... (ends on this page).

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