

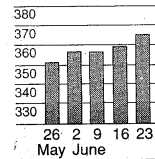
Friday Ticker

■ **ADM to buy Pfizer business:** Pfizer Inc. agreed to sell its citric acid business to Decatur-based Archer-Daniels-Midland Co. Pfizer's citric acid sales in 1989 were more than \$180 million.

■ **Trade shows mean big bucks:** Trade shows, conventions and meetings held by associations headquartered in the Chicago area generated \$1 billion in delegate expenditure revenue in 1989, according to the Chicago Society of Association Executives.

■ **Jobless claims rise:** Initial claims for state unemployment insurance on a seasonally adjusted basis rose 6,000 in the week ended

Initial jobless
in thousands
of new claims



June 23, to 365,000 from 359,000 the week before, the Labor Department said. In the week ended June 16, 2.43 million people were receiving state unemployment benefits, down 33,000 from the preceding week's 2.47 million. The number of people receiving unemployment benefits as a percentage of those covered by unemployment insurance fell to 2.3 percent in the week ended June 16 from 2.4 percent the week before.

■ **Korea-U.S. jet deal cemented:** A \$4 billion deal between South Korea and the United States to co-produce F/A-18 fighter jets starting in 1992 is now in place, U.S. officials said. South Korea had announced it would buy 120 McDonnell Douglas' F/A-18 Hornets to strengthen air defenses and build a foundation for its aerospace industry.

■ **TNT to buy United Truck:** TNT North America, a Rosemont-based unit of TNT Ltd. of Australia, agreed to purchase all outstanding shares of United Truck Lines Inc. of Spokane, Wash. United is a regional less-than-truckload carrier. Terms weren't disclosed.

■ **Utility cuts clean air tab:** Illinois Power Co. lowered its estimate cost of complying with the pending Federal Clean Air Act by \$300 million, to between \$250 million and \$550 million. Previously, before more details of the legislation were known, the utility had estimated costs at \$550 million to \$850 million.

■ **Searle drug rated highest:** A blood pressure drug, Verapamil SR, marketed by Monsanto Co.'s G.D. Searle subsidiary, is more effective among black patients than two competing drugs by Bristol Myers Squibb Co. and ICI Pharma, University of Maryland researchers said.

■ **Brady urges easier credit:** In a move that puts added pressure on the Federal Reserve to loosen its grip on credit, Treasury Secretary Nicholas Brady called for lower interest rates to keep the 7½-year economic expansion on track. "We are enjoying slower than projected growth and that's not good," Brady said ahead of next week's economic summit of top industrial democracies.

■ **General Tire raises prices:** General Tire, a unit of Continental AG of West Germany, raised prices by 2 to 4 percent on its General brand tires for the replacement market, effective Aug. 1. Prices on all passenger tire lines will increase 4 percent with the exception of high performance lines, which will rise 3 percent.



Photo for the Tribune by Kristy MacDonald/AP

Perry Cook, at Stanford University, is developing software that will allow computers to mimic human singing. "You can find out what it sounds like to hear someone with three noses sing," he says.

Computers head for harmony

Soon, the machines may sing—literally

By Jon Van
Chicago Tribune

PALO ALTO, Calif.—After punching a few computer keys, Perry Cook leans back and smiles as the melodious sound of a female singer echoes from the stereo speakers perched on a bookcase above his desk.

"Laaa," goes the voice, on and on, without pausing for breath—until Cook closes the mouth of a drawing on his computer screen, silencing the voice.

This is "Sheila," a computer construct of a female voice that Cook has developed in his studies of human singing at Stanford University's Center for Computer Research in Music and Acoustics.

It may be the forerunner of altogether new sounds that composers of electronic music will bring to the public later this decade.

Just as computer technology has provided musicians with electronic synthesizers that can make sounds unlike any produced by traditional acoustic wind or string instruments, the day is close at hand when musicians will "play" the human voice as one more instrument in their electronic band.

Someday it may even be possible for a computer to re-create the voice of a famous singer of the past, such as Enrico Caruso. But Cook said such a feat won't be possible for years and isn't an immediate goal. What modern composers want, he said, is a generic human voice they can shape into some-

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Computer-synthesized singing

Vocal Tract Editor

Glet Refl. Gain: 0.7 Lip Refl. Gain: -0.45

Vocal Tract Shape

Neck Lip Unlink

Tract Section Radius

Chicago Tribune Graphic by David Jahntz; Source: Perry S. Cook, Stanford University

A computer program, developed at Stanford University to simulate a singing human voice, displays a drawing of a person's throat, mouth and nasal area on the computer screen. Using the computer mouse and keyboard controls, it is possible to modify the quality of the computer-generated singing voice by changing the human image on the screen, something like a human singer would do by relaxing or contracting throat muscles.

Closing off the nasal passage makes the synthesized sound less nasal

Architects' group to drop disputed

