Friday

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 mean big bucks: Trade shows, conventions and meetings held by associations headquartered in the Chicago area generated \$1 billion in delegate expendi-ture 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 June 23, to 365,000 from 359,000 the week ln thousands

of new claims 370 360 350

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

26 2 9 16 23
May June eciving unemployment benefits as a percenting the week ended June 16 from 2.4 percent the week before.

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.

That 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 lessthan-truckload carrier. Terms weren't dis-

E 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 are reviously, 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 aid. searchers said.

searchers 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.

summnt 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 necent. rise 3 percent.



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

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.

"Laaaa," 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

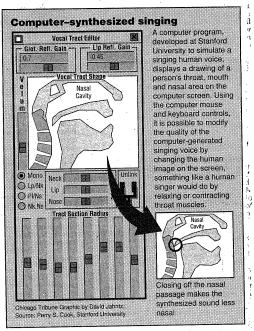
This is "Sheila," a computer construct of a female voice that Cook has developed in his studies of human singing at Stanford University's Center for Computer Research in Music and

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 ah immediate goal. What modern composers want, he said, is a generic human voice they can shape into some—See Computer, pg. 2



Architects' group to drop disputed

long-term with such merger-minded giants Philip Morris Cos., RJR Nabisco Inc. and

vany companies have become very frag-ted," he says. "We're already No. 1 or No. 1 most of the categories where we do busi-1. It doesn't matter if we're a \$20 billion, billion or \$5 billion company."

he firm enjoyed "another good year" in its al year ended June 30, Bryan says. He won't ie with estimates by analysts that its profits e up about 12 percent from a year earlier.
al results will be announced in several weeks. al results will be announced in several weeks.

may be hard to believe, but Bryan says he
n't received calls from other executives in
merger-wracked food industry asking
ther he's interested in a corporate marriage. Sure, I've had calls from investment bankers ing if they can do a deal, but not from other panies," says Bryan.

njanies," says Bryan.
Maybe they realize we aren't interested," s Ronald Culp, a public relations executive the firm. Bryan nods in agreement.

the Irm. Bryan nods in agreement. ryan says food "is not a growing business in aggregate," while "competition has become ce, particularly in the U.S. market." Nearly ry food company, for instance, is scrambling launch low-cholesterol, low-fat products, he

es. Discussing the recent breakup of Beatrice Co. It a series of raids and poor management wes, Bryan suggests that its shareholders bably could have done better-without the rivention of outsiders. He obviously holds little regard for junk dis, used to finance many of the big 1980s eovers. He refers to them as "loose money" ha disdainful tone to his voice.

ublic offering planned

Wisconsin Pharmacal Co., which plans to a new kind of condom designed to be worn women, is expected to go public in the didle of next week. A spokesman for the unwriter, Raffensperger, Hughes & Co., Indiapolis, says the timing of the initial stock ering will depend on market conditions. The Jackson, Wis.-based firm expects to offer



Knuckles

Daniels



Brvan

million shares of common stock for about \$6 each. They would trade on Nasdaq. Its management would continue to own 67 percent of the utstanding stock after the sale.

outstanding stock after the sale.

Most investor attention has focused on the condom, called Reality. A British firm holds the licensing rights, and Wisconsin Pharmacal is seeking Food and Drug Administration approval to sell it in the U.S.

BUSINESS BEAT: All in all, the biggest per BUSINESS BEAT: All in all, the biggest per-centage of MBA graduates from the University of Pittsburgh Graduate School of Business would rather work in Chicago. In a survey of June graduates, 22 percent said they will live and work in or near New York, and 14 percent picked Chicago. But 13 percent cited Chicago as the most desirable place to work, with San Francisco and New York tied for second place at 11 percent each at 11 percent each.

Broken down by gender, however, 13 percent of the males picked San Francisco as their ideal city. Chicago was second at 11 percent and New York third at 10 percent. Females, however, gave Chicago the nod with a 16 percent approval rating. New York was second at 11 percent and Boston third at 9 percent.

ercent and Boston third at 9 percent.

© Citizens National Bank of Downers Grove, which will turn 50 in September, is looking for 1940-vintage memorabilia.

COMING AND GOING: Barbara Knuckles, owner of Naperville Nannies Inc., a private employment agency specializing in child-care providers, was elected a director of Harris Bank Naperville... Bettg B. Daniels and Hugh H. McLean were elected executive vice presidents of York State Bank.

Computer

Continued from page 1

thing surreal.
"Once you program a computer to make the sound of a human voice singing, you can modify it in interesting ways," said Cook.
"You can find out what it sounds like to hear someone with three noses sing."

Computerized speech research is

Computerized speech research is a hot area attracting much attention around the world, but computerized singing is being researched formally by only a handful of scientists. They see singing as more interesting than speech, however, and many people paid to do speech research do some bootleg singing work in their spare time, said Cook.

"Most speech research is looking for ways to generate computer

for ways to generate computer speech cheaply that is intelligible," said Cook. "They're not looking at the subtleties of sound genera-

the subtleties of sound generation."

Cook has taken wave forms produced by the human glottis and modeled them in a computer program, running them through a computer model of the throat and into a simulated mouth. The program also takes into account some sound waves breaking off to travel through the nose.

Cook hasn't yet added items to his program to simulate the sinus cavity or the tongue, teeth and lips. But even in its simplicity, the program makes sounds remarkably like the human voice.

This works because Cook has learned a few tricks to fool the ear. He introduces a certain amount of noise into the signal, adds some vibrato and programs the computer to hit each note a bit imperfectly at first, then slide to the right pitch.

"It doesn't hit the note correctly, which most singers wouldn't if you saked' them to artistically render a

"It doesn't hit the note correctly, which most singers wouldn't if you asked them to artistically render a single note on a single vowel," said Cook. "They wouldn't hit it just right. Usually, they come in from below. Coming in from

above sounds abnormal."

above sounds abnormal."

Cook's program provides a drawing of the human throat and nasal cavity on the computer screen. As an operator changes the throat's shape, simulating what a singer might do with muscles, the computer's sound changes.

Using volunteer singers, Cook records human voices singing individual notes, with and without vibrato. He studies wave patterns generated by these voices to analyze the degree of control people with trained voices have and what qualities give each voice an indi-

lyze the degree of control people with trained voices have and what qualities give each voice an individual sound. He hopes to use these insights to introduce more subtleties into his program.

"You get to a point where you can characterize a singer using 50 or 60 numbers, to describe their pitch, volume, range and other qualities," said Cook.

It is well within possibility to capture an individual's voice in a computer program, said the researcher, who has degrees in music and voice as well as engineering. But that doesn't mean computers will start doing perfect imitations of pop singers any time soon.

"What we're talking about here is capturing the voice as a musical instrument," Cook said. "I may be able to program a computer to generate a singing voice that sounds remarkably like Rod Stewart's, but that doesn't make the computer use that instrument in the same way as Stewart.

"The phrasing, emotions and other individual qualities a singer brings to a performance aren't addressed at all."

Computer programs using artificial intelligence, wedded to pro-

dressed at all."
Computer programs using artificial intelligence, wedded to programs like Cook's that recreate individual voices, are what lead to the idea that machines could successfully mimic performances by specific well-known humans, Cook said. But that could open legal and ethical issues.

ethical issues.

"Right now, we're concentrating right now, we're concentrating on building a system that can generate a human-sounding voice so that composers can start with that and then make music that sounds unearthly," he said.

ve to push its baby foods. Ogilvy has made pitch and JWT has a new campaign set for a launch, pending approval by Piergallini, who lead a Gerber delegation at the Feb. 13 eting with top JWT executives at JWT Chigo offices. I any case, JWT Chicago will still hold onto ther's new line of toddler foods, moving into stem markets.

stern markets.
WT also works on Gerber Baby Formula, a
nt venture between Gerber and Bristolyers, which is providing the advertising, a
4 million budget in the second half of 1989
tracked by Leading National Advertisers.
But like any parent, Thompson doesn't want
lose its baby.

eiman taps McClure

veiman Marcus' Oakbrook Shopping Center re has a new VP and general manager. She's rhara McClure, recently one of three merudise managers at Neiman's store on North chigan Avenue and formerly store manager B. Altman & Co. in Short Hills, N.J. Clure succeeds Charles C. Siegmann, who is iring after a nine-year stint with Neiman in k Brook.

k Brook.

Manhattan-based Newspaper Advertising reau hasn't decided whether it will fill the ancy created by the resignation last week by n Grasse, regional VP here. Grasse, a former ham-Laird & Kudner executive, who joined bureau eight years ago, left to pursue other ortunities. A bureau official indicated there aft be some restructuring in the Chicago of-5, whereby the regional post might not be set.

nd. In the move: Susan Ward appointed a sen-VP at Golin/Harris Communications...

a Bedell named sales manager for Com-terined Marketing Technologies Inc.'s Chica-of Jo-de Compensional: Birthday greetings to Ken 1 \$7007 lel Zahn, Cheri Mock, Lou Tripodi,



Ward





McClure

been narrowed to Daniel J. Edelman Inc., Hill Exemination of Danier of Learnian line, This Knowlton, Golin/Harris Communications, all Chicago, and the Manhattan headquarters of Burson-Marsteller and Cohn & Wolfe, its sister agency there, sources indicate. Some observers think Cohn & Wolfe may have the edge in this competition, which may be decided by the end of this month. Spiegel reportedly has meetings planned with the contenders the week of July 16. The winner would succeed Chiat/Day's Jessica Dee Communications in New York, which 15 months ago was awarded the business, after Oak Brook-based Spiegel's split with Burson-Marsteller in Chicago, its PR agency since 1981. At the time, Spiegel awarded its apparel PR account to Jody Donohue Associates in New York, which isn't affected by this review. Spiegel plans to place a stronger emphasis on corporate PR when it decides on a new agency.

TBWA in New York picked up advertising & Knowlton, Golin/Harris Communications, all

corporate PR when it decides on a new agency.

TBWA in New York picked up advertising for Neet (a depilatory) from Young & Rubicam and for Woolite, largely handled by McCamerickson, in a reassignment of brands stemming from British global marketer Reckitt & Colman's recent purchase of most of American Home Products Corp.'s Boyle Midway division. Neet and Woolite combined have estimated billing of \$10 million to \$15 million. Y&R continues as agency for Pam, a no-stick spray, and Butter Buds, a butter substitute, two Boyle Midway products merged into American Home Products' American Home Foods unit. Neet and Woolite are now marketed by Reckitt & Colman's Airwick Industries unit. Media and Moditant Reckit & Colman's Airwick Industries unit. Media and Moditant Reckitt & Colman's Airwick Industries unit. Media and Moditant Reckitt & Colman's Airwick Industries unit. Media and Moditant Reckitt & Colman's Airwick Industries unit. Media and Moditant Reckitt & Colman's Airwick Industries unit. Media and Moditant Reckitt & Colman's Airwick Industries unit. Media and Moditant Reckitt & Colman's Airwick Industries unit. Media and Moditant Reckitt & Colman's Airwick Industries unit. Media and Reckitt & Colman's Airwick Industries unit.

UAL

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bank loans for its transaction.
There has been speculation
banks want some vendors or other
large investors to be involved in
the transaction, perhaps to counter somewhat the influence of the
unions on the post-acquisition operation of the airline.
By calling for UAL to suspend
talks with vendors, the buyout
group could be signaling that it
can't obtain sufficient financing
commitments without some so-

can't oftain sufficient inflaments commitments without some so-called "vendor financing." It also may indicate that the group would have greater bargaining leverage with those vendors about financing. UAL doesn't make a deal be-

if UAL doesn't make a deal beforehand.

The UAL board is believed to have held telephone conference calls Monday and Tuesday, in part to discuss the status of the jet-order talks. The board received the request from the buyout group and complied with it Tuesday.

Before the order that negotiations be suspended, representatives of the three major aircraft manufacturers and the three major engine suppliers had been expected

to arrive Thursday in the Chicago area to begin a final round of negotiations with UAL.

That would have started a kind of "bakeoff" competition, with UAL bargainers moving from group to group in search of the best terms. It is believed a deal might have been hammered out in a few days and the order announced as early as Monday.

Among the models UAL is said to be considering are Boeing Co.'s proposed two-engine 777, the three-engine A330 or four-engine A340 from Airbus Industrie and the three-engine MD11 from McDonnell Douglas Corp.

It was unclear whether vendors that might provide financing would get the bulk of or the entire order from United. It also was uncertain to what degree UAL management would allow the buyout group to negotiate the order.

As part of its merger agreement with the UAL board, the group agreed that by Aug. 9 it would have commitments for at least half the amount needed for its \$201-a-share offer and so-called "highly confident" letters from financing sources for the remainder.

On the New York Stock Exchange, UAL stock closed Thursday at \$150 a share, up 87 cents.