KANSAS TECHNOLOGY ENTERPRISE CORPORATION

The Innovator 3

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The Kansas Technology Enterprise Corporation (KTEC) is a non-profit, quasi-public instrument established by the State of Kansas on January 12, 1987. KTEC's mission is to create and maintain employment by fostering innovation, stimulating the commercialization of new technologies and promoting the creation, growth and expansion of Kansas enterprises.

KTEC finances Centers of Excellence engaged in basic and applied research and technology transfer, awards matching grants for collaborative applied-research projects between academic institutions and industry, provides seed capital for emerging technology-based industries, provides a support network for the federal SBIR program and provides technical referral services.

KTEC is governed by a 15-member board of directors composed of financial, industrial, academic and government leaders. Funded by the State of Kansas and corporate sponsors, KTEC has assumed all powers, duties and responsibilities of its predecessor, the Kansas Advanced Technology Commission.

In its 10th anniversary issue, *Inc.* declared Apple Computer Cofounder Steve Jobs Entrepreneur of the Decade. Jobs and the fledgling company that soared have become the paradigm for the promise of innovation in America.

Theirs is the story of how brilliant youth, impetuous dreams and maverick business practices can build a new industry from the ground up. It proves true something Apple Researcher Alan Kay once said: The best way to predict your future is to invent it. In Kansas we have the same undying optimism and willingness to take risks that will enable us to literally invent the future of our state. It's our heritage to dream, to aspire to the stars. At heart, we're entrepreneurs. Small to medium-sized businesses are the core of our economy – 90 percent of our manufacturing firms have fewer than 100 employees.

Global Competition

The **Competitiveness** Agenda – Writing Our **Ticket** to the **Future**

by **Governor Mike Hayden**

It's not the large corporations that control the future of America, it's the small businesses, where nearly 75 percent of all new jobs are being created and where the highest proportion of new products are being delivered per R&D dollar. To compete nationally and internationally, we must write a competitiveness agenda in partnership with these small to medium-sized businesses.

Kansas' productivity lags behind the national average, and the nation, in turn, lags behind our foreign competitors. Seventy percent of U.S. production competes with foreign products, and we've lost market share in many key industries. In six of the last 12 years, the United States has imported more than it has exported, creating a negative trade balance. We may be on the upswing, though. In 1988 the United States experienced the most rapid growth in real GNP since 1984. Capital goods, automobiles and consumer goods registered real export increases in excess of 20 percent. Many factors are involved, but a change in the driving forces behind manufacturing productivity could be key.

In response to powerful global forces, the United States is beginning to produce more innovative, technology-based goods. Traditional mass production is being replaced by a new style of innovative, human capital intensive production that is thriving in small businesses across the nation. Forty-four states have taken an active role in supporting these innovative, technology-based businesses, spending more than $550 million in 1988 alone on technology development initiatives. Many are modeling government supported R&D centers after Japan's "technopolises" – literally, technology cities. We've witnessed the success of California's Silicon Valley, the Route 128 corridor in Massachusetts and Research Triangle Park in North Carolina. Now we're seeing Michigan nurture an Automation Alley, Texas develop its Silicon Gulch and our own state pioneer a Silicon Prairie.

It's no accident that the hot spots of activity cluster around some of the nation's finest colleges and universities. More and more states are fostering partnerships between their university and private sector researchers, capitalizing on their human resources to develop new advanced technology products and processes. In Kansas we have pockets of research excellence at our Regents' institutions, we have a solid base of small to medium-sized manufacturers, and we have a thriving entrepreneurial climate – all the makings for a world-class innovation center. Though we've seen a general decline in our export performance relative to the national average, our exports exceed the national average by as much as 8.4 percent in emerging technology-based businesses such as electronic equipment and fabricated metal products.

If we can further develop our advanced technology businesses, we can improve our export performance and become increasingly competitive in the world market. But this is just part of the equation. Kansas must also foster innovation and entrepreneurship in its existing industries by improving the transfer of technology from research labs to industry. The best possible Kansas for all Kansans depends on many partnerships. One that must be encouraged is the partnership between government, education and the private sector. Through cooperative efforts, our state can lead technological change and profit from our own innovations. ■

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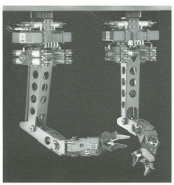
Applied Research Matching Grants



KTEC is actively seeking promising research proposals for review in fiscal year 1990. The Legislature has appropriated $850,000 for the ARMG program in FY '90, and KTEC will add to this a FY '89 rollover of approximately $750,000. Proposals will be reviewed for their potential to lead to innovation, new knowledge or technology; to expand the technological base within the state for the given field of research; to enhance employment opportunities within Kansas; and to be technically sound and produce measurable results. Companies of all sizes – whether they employ one or 100,000 – are encouraged to submit proposals. ■

Grant Deadlines

To receive funding in fiscal year 1990, Applied Research Matching Grant proposals must be submitted by the quarterly deadlines published in the program guidelines and procedures. For a copy of the latest revised version, write KTEC, 112 West 6th, Suite 400, Topeka, KS 66603, or call (913) 296-5272. ■

Robotics

Targeting the Market of the Future: Robots in Space

"We started out in the off-shore oil industry, as a supplier of manipulator systems for remote vehicles – small submarines that allow the operator to perform tasks underwater.... We did business anywhere in the world that you find oil. Then we found that there were applications in other environments for that technology. We now have equipment at Three Mile Island being used for the cleanup efforts. In the last year and a half, we've become active in the space program.... That's the future of our product, to stay competitive."

Brett Kraft
President
Kraft TeleRobotics, Inc.
Overland Park, Kansas

As early as the 1990s, NASA expects to use robots for hazardous work in space. Tasks such as space station assembly, inspection and maintenance will be performed by semiautonomous telerobots, which rely on a "man in the loop" to make difficult decisions, yet execute repetitive tasks without human assistance. Telerobotics research is ongoing in university and private labs across the country, but few have the combined expertise of the University of Kansas and Kraft TeleRobotics, Inc. of Overland Park, Ks. Kraft's highly capable teleoperated manipulator system needs only the addition of sensor-based controls, under development at KU, to be able to perform the selective autonomous operations NASA requires.

Founded in 1975 to supply the offshore oil industry with manipulator systems for underwater work, Kraft is repositioning its products to serve the nuclear and aerospace markets. With just 25 employees and $3 million in annual sales, the company has limited resources for in-house research. "Our number one priority is to generate revenue, which will permit us to continue our engineering and development of new products," says President Brett Kraft. When the opportunity arose to team up with the University of Kansas' Computer Integrated Manufacturing (CIM) Laboratory and Space Technology Center, Kraft says, "It seemed like a natural thing to work together on a research program." He explains, "Teleoperation means there's a man in the loop. KU's goal is to replace the man with computer-controlled sensor packages. NASA wants to retain the man-in-the-loop capability. We're bridging the gap between teleoperation and an independent robot."

For the three-phase, 28-month program, Kraft has donated $280,000 of the $400,000 cost of a dual-arm electronic master/hydraulic slave telerobotics system. KTEC matched 40 percent of Kraft's costs with a $120,000 applied research matching grant. The NASA Langley Automation Technology Branch has also committed $400,000 to the program, which may become the leading augmented telerobotic research program in the world. Through past research totalling more than $1 million, KU's CIM Lab has acquired considerable computer resources and staff expertise. Dr. Terry N. Faddis, associate director of the CIM Lab, is the project's principal investigator. "Eventually we'll incorporate the things they develop into our product line," Kraft says. "That's the future of our product, to stay competitive." Improvements in Kraft's products could result in at least a 20 percent sales increase. Ultimately, Kraft's telerobotic system may be the NASA space program's system of choice. ■