

Approved February 5, 1992
Date

MINUTES OF THE HOUSE COMMITTEE ON ECONOMIC DEVELOPMENT

The meeting was called to order by Representative Diane Gjerstad at
Chairperson

3:35 ~~xx~~ a.m./p.m. on Thursday, January 30, 1992 in room 423-S of the Capitol.

All members were present except:

Representatives Baker, Bishop, Bradford, Edlund, Wagon, Wempe, and Wisdom. Excused.

Committee staff present:

Lynne Holt, Legislative Research
Betty Manning, Secretary

Conferees appearing before the committee:

Charles Warren, President, Kansas, Inc.
Dr. William Brundage, President, KS Technology Enterprise Corporation

The meeting was called to order at 3:35 p.m.

Chairperson Diane Gjerstad welcomed Dr. Bill Brundage who introduced his counterpart from Oklahoma, Dr. Carolyn Sales, President, Oklahoma Center for the Advancement of Science and Technology (OCAST). Dr. Sales made brief comments about the Oklahoma program which is patterned after the Kansas Technology Enterprise Center (KTEC) program. She was in Kansas to glean further information from the KTEC and the Mid-America Manufacturing Technology Corporation (MAMTC) programs. Oklahoma is planning to set up a field office under the umbrella of the Kansas MAMTC program.

The Chair recognized Charles Warren, President, Kansas, Inc., who gave an overview of the evaluation of KTEC conducted by the National Association of State Development Agency's National Consulting Service. Mr. Warren discussed the process of the evaluation and highlighted the favorable conclusion of the review team. Attachment 1.

Mr. Warren said as a result the economic development coordinating council has been established on an informal basis. The council consists of Secretary of Commerce, Laura Nichol; Dr. Bill Brundage, President KTEC; Paul Clay, Chief Executive Officer of MAMTC; Walt Woods, Director Cooperative Extension; Ron Nichols, President, Certified Development Companies Association and Tom Holt, Statewide Director of Small Business Development Centers. This council was established to discuss common issues such as data bases and common forms for referring clients. Mr. Warren felt it is a positive step toward coordinating efforts.

Representative Frank Weimer made brief comments regarding the maturity shown in the roles of the Department of Commerce and KTEC. He was favorable to the establishment of the coordinating council and that the money on the evaluation was well spent.

The Chair concurred with the coordinating council concept, although an agenda would be a more focused format.

The Chair called on Dr. Bill Brundage, President of KTEC. Dr. Brundage commended Lynne Holt on her indepth report on the "Third Wave Concept" and recommended she publish the article.

CONTINUATION SHEET

MINUTES OF THE HOUSE COMMITTEE ON ECONOMIC DEVELOPMENT,
room 423-S, Statehouse, at 3:35 ~~am~~ p.m. on Thursday, January 30, 1992

Dr. Brundage distributed his response to Kansas, Inc. on the National Association of State Development Agencies' (NASDA) evaluation of KTEC. Attachment 2.

Dr. Brundage commented on the question in the report which addressed accountability, KTEC straying from their mission, and cooperation with other agencies. Dr. Brundage said, according to the report, the team did not find any inconsistencies with regard to these subjects; in fact, spoke favorably in this regard.

According to Dr. Brundage, KTEC plans to have a strategic plan completed by July 1, 1992. He detailed activities planned for the coming year with regard to public information, telecommunications, commercialization and industrial agriculture. The 1991 Annual Report was distributed, Attachment 3, as well as a brochure of the evaluation results, Attachment 4.

The Chair thanked Dr. Brundage for his presentation and quoted from the evaluation report on accountability. "KTEC has more than adequate set of management systems and protocols; so much so that they would be the envy of many of their counterparts elsewhere in the United States." The Chair commended Dr. Brundage, his staff and KTEC board members on their accomplishments.

Dr. Sales distributed the Impact Report 1991 for OCAST. Attachment 5.

The meeting adjourned at 4:40 p.m.

**Management Review
of the
Kansas Technology Enterprise Corporation**

The National Association of State Development Agencies

National Consulting Service

January, 1992

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Eco-Devo
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Executive Summary

This report compiles the findings resulting from an on-site peer review of the Kansas Technology Enterprise Corporation conducted by the National Association of State Development Agency's National Consulting Service under contract to Kansas Inc. The work plan involved three on-site visits comprised of a two-day Resource Analysis and Needs Assessment by the NASDA project manager to identify the specific issues and questions to be addressed, and two longer Management Reviews conducted by a six member management review team selected for their expertise and experience with the specific types of areas that cover KTEC's programmatic and/or policy focus.

The KTEC program is found to be a unique and effective mechanism for promoting technology development among Kansas' businesses. It represents the kind of public/private partnership that many states are trying to build. However, the KTEC partnership should maintain its technology focus, so that this valuable organization can continue to function most effectively without diluting its mission. As such, it is one key component of a strong Kansas economic development team, which includes, among others, Kansas Inc. and the Kansas Department of Commerce.

KTEC's programs are market-driven and strongly supported by industry. The agency is entrepreneurial in nature, has a "can do" attitude, and has developed a sophisticated array of program initiatives and management practices that rate highly when compared to other state technology development programs or economic development agencies in other states.

KTEC should work within the framework developed by Kansas Inc., cooperating closely with and assisting the Kansas Department of Commerce in pursuit of the many economic development opportunities that are available to the state.

Commerce should be able to look to KTEC as an ally and technical expert as it promotes business retention and expansion, works to attract new investment to the state, explores the possibilities in international trade, provides financing assistance to support its companies and develops the network of Kansas communities that make up the local support for economic development.

It is recommended that the key players on the Kansas "economic development team" work together to clarify their roles and maintain management coordination and communication. In this regard, the peer review team believes that the ad hoc planning group convened by Kansas Inc. should be continued as the Kansas Economic Development Coordinating Council, for the purposes of program coordination and communication among all participants. Composition of the group can be determined by Kansas Inc. which should convene the group at regular intervals.

Together, KDOC, KTEC and Kansas Inc. can ensure that the resources and expertise needed are available and properly applied to best provide jobs and economic development in Kansas.

Overview and Methodology

On July 25, 1991 Kansas Inc. executed a contract with the National Association of State Development Agency's National Consulting Service to conduct a review of the organization and activities of the Kansas Technology Enterprise Corporation. The interim assessment was designed to examine the efforts of the Kansas Technology Enterprise Corporation (KTEC), its programmatic results as compared to similar efforts of other states, the structure of the technology development partnership in Kansas and the process by which this effort is managed by the state, and to identify options and issues for further improvement.

The two-phased work plan involved a two-day Resource Analysis and Needs Assessment by the NASDA project manager to identify the specific issues and questions to be addressed, and a longer Management Review conducted by a six member management review team (Exhibit A) of professionals qualified to conduct a peer review of the agency. The Management Review consisted of a two-part visit: 1) a **Technical Assessment** of the agency to determine KTEC's programmatic performance and provide the agency with options which can be used in future performance evaluations; and, 2) an **Organizational Analysis** with KTEC, the Kansas Department of Commerce (KDOC) and Kansas Inc. to help the "key players" involved with KTEC identify their respective roles, goals, objectives and opportunities for mutual support and coordination. The goal of these reviews was to enable KTEC to excel in serving the Kansas companies, citizens and public sector delivery systems.

Following a review of the agency's program performance and impact data made available by Kansas Inc., members of the Management Review Team made three on-site visits to KTEC. The first visit was made by Ann Osborne, the Team Project Manager, on September 30 and October 1 to provide a quick overview of the present situation in Kansas in order to identify the priority issues for the Management Review Team's attention and focus. The second visit involved Walter Plosila, Teresa Gidley, E. Blaine Liner and Ann Osborne who completed the Technical Assessment on November 5 and 6. Using their findings, Miles Friedman and Robert Leak conducted the Organizational Analysis on November 13 and made an oral presentation of the Management Review Team's preliminary findings to the Kansas Inc. Board of Directors and the Kansas Joint Economic Development Committee on Thursday November 14, 1991.

Technical Assessment Findings and Options

The Technical Assessment focused upon a limited review of KTEC to evaluate KTEC's performance and provide an assessment of the performance of KTEC in comparison with the best practices and standards among other state technology programs, and relevant options for improved performance. The review team interviewed public and private representatives as well as KTEC staff. The review team worked closely with Kansas Inc. staff and met with several individuals from the executive and legislative branches of government. The team did not conduct in-depth reviews of individual programs, but rather provided a preliminary review based on both consideration of secondary materials and performance data and interviewing of key staff and program participants. The meeting agenda is contained in Exhibit B.

The Team notes, however, that because KTEC is a leader among the 45 states with technology development programs in undertaking peer reviews and insisting on performance accountability, there is a much greater amount of program and management data (qualitative and quantitative) available than would otherwise be the case. This enabled the Team to be confident that even this short review could be anchored to previous in-depth analyses.

Program Review

The Management Review team interviewed the directors of the five Centers of Excellence, customers of the Research Applied Matching Funds Program, the director of an Industrial Liaison Office, the director of a Small Business Development Center, university officials, KTEC staff involved with administering programs, representatives of the KTEC and MAMTC boards, Department of Commerce staff, and state legislators. The team also reviewed the tracking system used by KTEC to monitor program activities.

Centers of Excellence

The Centers of Excellence Program has established academic research centers in Kansas universities that undertake research and technology transfer activities having a particular focus toward economic development. Each center focuses upon differing industrial sectors and areas of innovation. The Centers include: the Advanced Manufacturing Institute at Kansas State University in Manhattan; the Center for Excellence in Computer-Aided Systems Engineering (CECASE) at the University of Kansas in Lawrence; the Center for Technology Transfer at Pittsburg State University in Pittsburg; the Higuchi Biosciences Center at the University of Kansas in Lawrence; and the National Institute for Aviation Research at Wichita State University in Wichita. The Centers of Excellence are using KTEC's sophisticated tracking system to track individual project outcomes, conduct biennial peer reviews and collect aggregate data upon each center to monitor performance and ensure maximum performance.

Centers of Excellence are perceived to have a positive impact upon Kansas universities, making them more aware of the private-sector business culture, more responsive to the needs of entrepreneurs, and focusing technologies into results-oriented applied/commercial areas. Since the Centers have only been in operation for three years and are still moving into maturation, which typically takes about five years, it is still too early to fully assess results and outcomes. As they evolve, the Centers must address the following issues which were identified by the Team:

- 1) The University systems under which Centers operate are currently not suited to timetables, funding requirements, equipment, and product delivery needs of industry. Mechanisms to enable the universities to provide greater flexibility should be investigated to facilitate Centers' ability to meet industry needs.
- 2) KTEC's innovative use of the five-year strategic plans for each Center of Excellence should be commended. The requisite annual update provides not only an excellent management tool for KTEC to monitor its objectives, but focuses the Centers' activities towards commercialization and industry-based clients. This resourceful accountability mechanism has not been used by very many other states to guide their Centers. However it is not clear that the recent internal reorganization will provide sufficient direction or management oversight for the Centers program.

Entrepreneurs receiving follow-on Applied Research Grants as a result of participation with the Centers Program offered feedback about the Centers Program. They noted that KTEC's participation within the Centers of Excellence has helped to begin the process to sensitize academicians to the research needs of technology-based companies. However, a wide gap remains among Center faculty and staff perceptions of the needs and culture of entrepreneurial start-up firms. The entrepreneurs agreed that the university is not normally a good place to design and construct market-ready prototypes because of stringent public bidding requirements, inattention to company timelines and financing deadlines, and a cultural orientation that does not "fit" with the fast-paced, just-in-time management styles of the majority of start-up companies.

Another hurdle to be overcome in the partnering of university and corporate projects is that of project ownership; once the university signs on, it becomes their project, subject to the university culture, attitudes, timelines and procedures of the particular university bureaucracy. Who is in charge, who makes the design decisions, who has the ultimate say when the equipment or structural components are purchased, are all issues that often create conflict between the "owner of the product" and the university researchers.

The business owners commended KTEC on the level of entrepreneurship that it has been able to foster among the research faculty involved through the Centers of Excellence. They commended these faculty who

were being asked to think in ways that were not only traditionally foreign to academicians but are currently not-rewarded within the "publish or perish" university culture.

Applied Research Matching Fund

Applied Research Matching Funds are awarded on a competitive basis to private corporations or academic-corporate partnerships for projects that apply the existing store of scientific and technological knowledge and lead to new technologies, prototypes, or bases of knowledge that can be commercialized. Awards can be used for product design and development to the prototype stage, but are not intended to support basic research, technology transfer, seminars, training, facility improvement, market assessment or product development beyond the prototype stage. The applicant must provide 60% of project costs.

Applied Research Matching Grants appear to have performed in a manner to achieve the results for which they were designed. Conversations with Kansas entrepreneurs who received grant awards indicate that the program is not only well received in the marketplace, it has acted to encourage individuals and small companies to fast-track sound innovative concepts and designs to product commercialization. National Science Foundation studies and other national reviews of applied research funding programs have found that applied research matching grants are the most effective way to encourage commercialization and applied research.

Participants in the program noted that KTEC took an active interest in the specific research and development needs of their projects and introduced them to firms, university faculty, and financial investors. KTEC staff offered a rare spirit of encouragement that few of the entrepreneurs had experienced before. KTEC maintained ongoing contact with the companies throughout the grants application process and throughout the term of the project.

KTEC has benefitted from research and advice of other states in the development of its program guidelines and peer review processes. The Team commends KTEC for its development of a concise and informative brochure outlining the guidelines and application procedures for participation. The Management Review Team notes that KTEC has networked and communicated with states such as Ohio, Pennsylvania, and Indiana about guidelines and policy improvements to maintain a competitive position in Kansas.

KTEC has instituted an original methodology for the evaluation of its proposals. The weighing of the various proposal requirements (Commercial Potential 50%, Technical Merit 30%, Financing Plan 15%, and Technological Infrastructure development 5%), coupled with the Expert Peer Review and Market Feasibility Evaluations is an innovative and sophisticated approach to proposal evaluation which should result in greater project yields, independent technology-specific decisions, and effective leveraging of public-sector resources. The effective peer review system and outside feasibility analysis give the Management Review Team confidence that this is good mechanism for allocating the scarce resources available to KTEC (funds, time, staff, public/private participation etc.) for tech transfer.

The recent payback provisions instituted for the applied research grants is useful and will provide greater leveraging of public funds. This payback provision is proper for KTEC to implement; this decision follows the model of other states and offers a mechanism to recapture funding and ensure accountability for the recipient firms.

Other KTEC Programs

Training Equipment Grants provide a good way to leverage private money for equipment purchases within university centers. Pennsylvania's program has been successfully reauthorized by the legislature, despite tight budget constraints. The Pennsylvania program requires a three to one match of private dollars to program dollars for the purchase of engineering equipment. This program enables Kansas to focus its technology training efforts among community colleges and vocational-technical schools to encourage technologically oriented technical training. This is an appropriate role for KTEC to undertake and complements training programs offered through the Kansas Department of Commerce and the Kansas Department of Education.

Ad Astra Fund offers equity capital for seed level companies. Venture capital is an important issue facing Kansas. The Ad Astra Fund has not had a strong history for leveraging KTEC's investment and raising private-sector funds. To date this remains a concern for KTEC. However, the inability to raise blind-pool venture capital funds is a trend among technology seed funds across the United States. The issue of how to effectively leverage private sector dollars for technology investment funds is one that many states are grappling with. Tennessee has experienced similar obstacles in its Technology Seed Fund Program, despite strong state investment tax credits to promote investment. Staff members at KTEC and KDOC continue to cooperate to secure private venture capital investment for start-up firms in Kansas. Both KTEC and KDOC should continue to work together to investigate new options to address this seed capital gap.

Technology Transfer and Referral Services is a legislatively mandated program to establish a clearing-house for technology transfer and referral services. KTEC is implementing a computerized technical information data base in response to this mandate. Many states have tried to develop such a data base, with varying levels of success. The Management Review Team would caution KTEC to make the data base easily accessible to firms, marketing the services in such ways that have clear benefit to Kansas firms so that the program has meaningful results. Only with this approach will this program generate a good return on KTEC's original investment.

Industrial Liaison Offices were established by the legislature to help firms identify and solve production or other technical problems, improve production processes and capitalize on advanced production techniques and technologies. Careful and deliberate delineation should be maintained between the legitimate technology efforts and technical assistance services and those of sister agencies such as the Department of Commerce, the Cooperative Extension, and others.

Special projects enable KTEC to achieve an important flexibility to quickly meet special needs and respond to one-time technology-related issues. It is useful to note that funding commitments for special projects have decreased from 10% to 8% since last year which is a prudent trend. Linking activities supported by these funds to the strategic plan now being developed should provide some broad guidelines for responding to emerging opportunities. Special projects funds should continue to be utilized to take advantage of unique windows of opportunity. Conversely, new program components of ongoing duration should be submitted for legislative approval as budget line items.

The **Innovative Technology Enterprise Corporation (ITEC)** was institutionalized in March of 1991 as a result of a special project to protect the intellectual properties of entrepreneurs. The newly formed corporation operates through a public-private board. The agency's mission is to provide structure for assisting innovators in the commercialization of new ideas. The agency provides counseling, referrals, training, direct consulting and small grants to assist inventors who have valid ideas for new products and processes.

This concept offers an interesting approach to handling inventors and their unique needs. Very few states have contributed resources to this niche as it is a time and labor-intensive initiative which achieves measurable results over a long term. It is recommended that the current vacancy to the ITEC board be filled so that the organization can operate effectively. KTEC should also consider cross-training another staff member about the unique requirements of inventors and intellectual property issues because this agency currently revolves around a specifically skilled and uniquely trained person.

Mid-America Manufacturing Technology Center (MAMTC) represents a clear-cut opportunity to position Kansas as a national model for technology transfer and innovation. The NIST grant is a "feather in the cap" for the state, whose impacts should be clearly articulated and understood by public-policy makers and private companies. The award of this grant should not be taken lightly; organizational start-up should be fast-tracked to ensure that MAMTC quickly begins implementing the innovative ideas expressed in its proposal, including the mobile manufacturing plant and direct manufacturing assistance services. MAMTC offers the vehicle to improve the manufacturing outreach efforts for all KTEC and KDOC programs.

The emergence of the MAMTC center provides a unparalleled opportunity to focus the definition of the liaison centers as strictly targeted toward technology-oriented services by co-locating MAMTC field offices with Industrial Liaison offices, Small Business Development Centers, Community Development Corporations, Department of Commerce Regional Offices and University Centers of Excellence. The Center for Technology Transfer in Pittsburg offers a good model of this coordination and sharing of resources. Under this one-stop shop approach, the firm can achieve its technology-assistance and business/management goals more efficiently and service providers can more effectively hand-off referrals among one another. Through this one-stop-shop approach, KTEC could also implement its off-site tracking network, providing a unique tool to coordinate the services offered by all field delivery agencies.

The MAMTC program offers a rationale for technology transfer to be implemented on a regionalized basis. MAMTC must be structured so that it has the flexibility to respond to midwestern and Kansas firms and be industry driven. It is logical to assume that the MAMTC board will reconsider its organizational status in light of the recent Attorney General opinion. If experience shows that the organizational structure is an impediment, it should be revisited at that time. MAMTC is to be commended for streamlining its delivery system by integrating Centers of Excellence as outreach offices for MAMTC field offices. The mobile factory is a unique concept which will be particularly appropriate in delivering technology transfer services to the more rural areas of Kansas.

Overall Review of KTEC

In regard to the Technical Assessment Team's overall review of KTEC, we found the agency to have undertaken a wide range of programs consistent with both the 1986 Economic Development game plan mandated by the Legislature and its missions and goals. We did not find any major examples of KTEC straying from its statutory goals and mission. We found an agency that is entrepreneurial in nature, has a "can-do" attitude, and has developed a sophisticated array of program initiatives and management practices that rate highly when compared to either other state technology development programs or economic development agencies in other states.

KTEC's programs are indeed market-driven and strongly supported by industry. However, they are designed by policy and operational guidelines to protect both the integrity of the programs and assure full accounting and fiscal integrity in the use of the public sector resources. **Unlike technology programs in other states, KTEC limits its matching grants to in-state firms and encourages the Centers of Excellence to do likewise.**

The results from State technology development investments are likely to be seen over the long term; at a minimum of eight to ten years before significant results are obtained. KTEC has an appropriate mix of programs and has emphasized in its management that economic development/commercialization of its investments is always the top priority. Consequently, Kansas is seeing significant results somewhat sooner at least in the case of some of its programs. But maximum results will require patience and a willingness on the part of all players to invest in technology initiatives over the long term.

KTEC reports that through June, 1991, the State's investment of \$22.5 million has leveraged \$50 million in other resources, including \$11.5 million in venture capital. This is more than \$2 in match for every \$1 of state investment. KTEC also reports 49 start-ups assisted; 25 firm expansions; 463 employees trained; \$17.2 million in increased sales by firms; more than 3300 jobs created; 100 new technologies introduced; and 61 patents issued. While the Team did not verify these numbers, these results in the short-term compare most favorably to other state technology development programs, particularly in regard to job generation, patents issued and dollars matched.

The structuring of KTEC as a quasi-private entity has placed Kansas in a leadership role as other states are now only discovering the need to build a long term perspective into their technology efforts through creation of new structures, such as intermediary organizations.

In designing its technology programs, Kansas was also a leader by dedicating the state lottery as a source of revenue for the program. However, recent events have called in to question whether KTEC's program will continue to be supported by the lottery. It is important, therefore, for the State of Kansas to re-establish one of the design characteristics of KTEC -- more predictable funding through the state lottery or other dedicated revenue source.

It is also important to continue the semi-autonomous nature of the Corporation. This does not mean that the Governor cannot provide input or direction to the Corporation. Through appointments to the Board, through representation on the Board by her Secretary of Commerce, through recommendations on the budget, and in many other ways the Administration has considerable input and control over KTEC. In addition, KTEC's staff has acted like a state agency in terms of its compliance with state administrative requirements. Regardless, KTEC has acted as a state agency through the use of the state's accounting system, procurement system, consulting with state officials and obtaining "state approvals" even when it did not need to do so.

KTEC in most of its practices has recognized its responsibilities to its primary investor -- the state government of Kansas. It has acted prudently and conservatively in managing itself both like a private corporation and a state agency, giving state government a dual set of controls and accountability systems. While the establishment of such a dual system of controls is not easy for a start-up organization to accomplish, the Team believes that KTEC has acted prudently in doing such.

The Team found that the one significant underlying problem that must and needs to be addressed is one of communication with the Administration and its senior level officials and agency heads. The Team believes that this has been the cause underlying the friction and start-up problems in initiating the Manufacturing Technology Transfer Center. While this specific problem appears to have been resolved, the Team suggests that the underlying cause still remains and must be addressed.

While the term "accountability" was used in widely varying and differing ways by persons who were interviewed, the Team believes KTEC has a more than adequate set of management systems and protocols; so much so that they would be the envy of many of their counterparts elsewhere in the United States. On

the other hand, KTEC's relations, both currently and in the past, with the Department of Commerce and the Governor's Office are more isolated than found elsewhere in other states.

While KTEC is fully within its statutory powers to independently operate its programs, it must realize that technology development is but one part of a larger set of economic development policies and programs. For KTEC's programs to succeed, they need the support of the entire state government apparatus. They cannot operate in isolation.

While we do not believe that KTEC believes otherwise, we do suggest that an active effort be undertaken by KTEC, by the Kansas Department of Commerce, by the Governor's Office, and by others to improve their interaction and communications at senior levels of the State Government. Elsewhere in the country, whether the technology development programs are within or outside the direct control of the Department of Commerce, it is rare for all the parties involved not to recognize their complementary efforts and mutual needs.

KTEC has, since 1986, made conscious efforts to learn from other states as they have developed new programs and initiatives. As a result, programs such as the Centers of Excellence and the Applied Matching Grant programs have some of the more refined guidelines in regard to leverage/match of dollars, performance, reporting, and private sector involvement. Kansas has both learned from experience elsewhere in addition to charting new ground. Market reviews for the Applied Matching Grant program are unique in the country. Annual and now biennial peer reviews of the Centers through an outside (out-of-state) review is as an intensive a peer review system of any Centers program in the U.S.

In their enthusiasm to address the needs of the technology community, however, KTEC has moved in recent years into areas that have appeared to outsiders to either be broader economic development programs or a duplication of ongoing efforts. The Management Team's review of these instances generally found that many of these perceptions came from KTEC's recent efforts to establish two Industrial Liaison Offices.

In hindsight, these Offices might have been more appropriately called "Technology Liaison Offices." In addition, a specific list of activities each office was to primarily perform might have avoided instances where it appeared these Offices were undertaking activities already being performed by other agencies or departments. In defense of the Industrial Liaison Officers, most firms have multiple needs and where the office was knowledgeable of other areas, it was only natural to assist. KTEC and the Kansas Department of Commerce, in the short term, need to clearly define the primary activities of each in regard to the duties of Liaison Officers versus other business assistance operators whether they be Small Business Development Centers, Certified Development Corporations, or Regional Offices of KDOC, provided that they are re-established. In the long term, the Team has made a separate suggestion to co-locate MAMTC with the regional offices of KDOC and other business assistance providers. Indeed, separate liaison officers may no longer be needed by KTEC as the MAMTC program comes on line.

Options and Suggestions

To the maximum extent possible, KTEC should focus on programs and initiatives that target technology -- whether it be applying or "spinning-in" technology or "spinning off" technology. Other business assistance service providers should be relied upon to the maximum extent possible for provision of other business assistance services. The relationship of KDOC and KTEC in regard to locating sources of venture capital or providing international trade assistance are both good examples of such a division of responsibility.

As the Kansas Department of Commerce continues to broaden its efforts from a focus on recruitment to one based on building an entrepreneurial culture and business retention, KTEC itself could be a true resource to KDOC. In turn, it would be to KTEC's advantage to have KDOC improve its capabilities and focus on entrepreneurship and business retention.

The Team can cite two examples of how this relationship might work in the future. In the international trade area, KTEC can rely on KDOC's expertise, foreign offices and capabilities to help identify foreign partners, investors and export sales for Kansas technology companies in general and for matching grant recipients and Center participants specifically. The excellent staff working relationships in international trade should be replicated at the top levels of both organizations in all matters involving international trade.

A second example of collaboration between KTEC and KDOC is in the area of quality management. The opportunity represented by landing one of the few NIST-sponsored Manufacturing Technology Centers in the U.S. gives Kansas expertise at MAMTC that will be available to few states. In turn, MAMTC can extend its limited resources by helping to "train the trainers" -- that is, helping to train personnel at the Centers of Excellence and elsewhere that KDOC can call on to meet the total quality management needs of firms that are not likely to be serviced by MAMTC, e.g., services, manufacturing firms not incorporating technology, etc.

Finally, the Team suggests that KDOC and KTEC, in a cooperative effort, commission an outside economic analysis of the technology components of the Kansas economy. This would help identify trends and developments in the Kansas economy and strengths and weaknesses of its technology firms and the technology development system. It would assist Centers of Excellence in focusing on growth areas of technology and it would help target business assistance services. In the Team's review, we found that no one had a good handle on Kansas' strengths and weaknesses in technology development.

Organizational Analysis Findings and Options

The third team visit to Topeka was conducted by NASDA's Executive Director Miles Friedman and consultant Robert E. Leak, the former head of The Research Triangle Foundation in North Carolina and former head of economic development programs in North and South Carolina.

This team has been involved throughout the study for the purposes of examining the structure of the technology development partnership in Kansas and assessing the process through which this effort is managed by the state. This site visit was conducted so that the team could interview key leaders of KTEC, Kansas Inc., the State Legislature, the Executive Branch and the private sector. The site visit culminated with a report of preliminary project findings to a session of the Joint Committee on Economic Development and a meeting with the Board of Directors of Kansas Inc.

Interviews were conducted by Friedman and Leak during the course of the visit on a confidential basis. They ranged in duration from thirty minutes to two hours, and included on-site meetings with representatives from the Center of Excellence in Lawrence, Kansas.

Remarks made by Miles Friedman to the Joint Committee on Economic Development and the meeting agenda can be found in the attachments.

Issues

The team was impressed quickly by two overwhelming observations: One, that there is a strong, apparently effective partnership at work for technology development in Kansas, and that it enjoys very strong support, particularly from the state legislature. Two, that the divisive and prolonged political battle has created an atmosphere of personal animosity and institutional conflict that is interfering with everyone's ability to serve the state effectively.

The team determined that the political issues, as well as the substantive issues, would have to be dealt with if economic development efforts in the state of Kansas were to move forward effectively.

At the root of the conflict appeared to be concerns by the executive branch that the KTEC program be more accountable to the elected officials who are charged by the voters with monitoring how public funds are being used. This concern was exacerbated by the feeling that KTEC might be moving beyond its central mission and beginning to take on functions more properly belonging to the executive branch through its Commerce Department.

On the other hand, KTEC felt that its ability to operate had been hampered by proposals to change the location and structure of the organization. In turn, legislators felt that a program they took pride in "parenting" was under fire from the executive branch.

Findings

The issue of accountability is one that can plague any partnership between the public and private sectors. The use of quasi-public or quasi-private, nonprofit organizations is quite common among the states. They are generally used for reasons such as attracting private expertise, leveraging private capital, avoiding unduly restrictive strictures on public lending, supplementing the organizational resources of government, or otherwise filling a gap in service provision.

In general, such entities are created for a specific and narrowly-defined, special purpose, such as developing technology industries, providing export financing or conducting specific types of international marketing activities. In virtually all cases, there are provisions made for accountability to the public sector, including, most commonly, the use of boards of directors that are subject to some executive branch controls. In addition, program monitoring and reporting to the legislature is generally required when state appropriations are to be used by the organization.

We found that KTEC has the potential to be the kind of public-private partnership that most states strive for. The board is subject to gubernatorial appointment, and there are strict procedures in use for monitoring both the use of funds and the performance of programs. It would seem that KTEC has sufficient mechanisms in place to allow for effective monitoring and control by the executive and legislative branches. The relevant legislators appeared to be satisfied, although the executive branch was clearly frustrated.

There are some indications that KTEC is beginning to become involved in such areas as industrial attraction, international trade, business finance, and community development. While all of these are natural outgrowths of the work KTEC is charged with and capable of doing, it is more appropriate that KDOC take the lead in these areas, with KTEC providing support when the technology focus overlaps.

KTEC should be working hand in glove with Commerce, which should have the lead role, as the appropriate "quarterback" of the Kansas economic development team.

Options

If the program is successful, as appears to be the case, and if it has adequate vehicles to allow for accountability, as also appears to be the case, what can be done to ensure smoother operations from here on?

The ability of the governor to have a level of comfort with the program is certainly a legitimate desire. It was suggested, in this regard, that the governor will have opportunities to pursue this objective through an upcoming appointment she can make to fill a vacancy on the KTEC Board.

It is also suggested that the Secretary of Commerce participate on a more frequent and regular basis in KTEC Board meetings as often as possible. The governor and secretary could also choose to meet periodically with members of the Board (in groups or as a whole) to ensure that they have input to the agenda for KTEC.

While KTEC may be one of the best conceived and executed vehicles for technology economic development in the country, it will only weaken itself if it moves too far afield in its activities.

Effective organizations are often the victims of their own success. The more they accomplish, the more opportunities they generate, and the temptation to take on an increasingly ambitious work program can be compelling. Unfortunately, this can also be the downfall of any organization, particularly one that is set up to pursue a particular set of activities.

The Kansas Legislature carefully and artfully structured KTEC to be an effective advocate and support mechanism for technology industries, and this is one of the reasons for its tremendous success in the relatively short period of three years. This carefully crafted program could be in danger of losing not only executive branch support, but also credibility with the private sector and legislature, if it wanders into playing the role of an all purpose economic development agency.

One logical example of how KTEC and KDOC work together is presented by the case of brokering joint ventures between Kansas companies and international partners. Ideally, the excellent international division of the Commerce Department should have the lead on outreach and initial contact activities, and then should be able to draw upon the technical expertise of KTEC to help broker joint ventures that bring new technologies and/or capital to Kansas.

We were pleased to see that this kind of approach appeared to have the support of all concerned. In fact, the general idea that KTEC should do what it does best and play a specific, albeit important, role in the overall development team, was one that met with universal agreement. That Commerce should be the captain of that team, with Kansas Inc. lending a guiding hand, was also a widely popular concept.

The question is, of course, how do you get the team to function effectively?

The NASDA management team agreed with the NASDA technical team that had visited the previous week, in that KTEC appears to be a well structured and effectively functioning operation. Yet these assets can not be fully realized until KTEC can begin functioning more routinely as part of a Kansas economic development team, of which Commerce is the captain.

In this regard, it is imperative that the players begin to work together more closely and on a sustained basis. The key option put forth by the NASDA management team was that a Kansas Economic Development Coordinating Council be convened that would include all the key players (e.g., Commerce, Kansas Inc.,

KTEC) and it must meet regularly. The group can be convened by Kansas Inc., and can name its own chair or choose to rotate the chair amongst the members. Any additional members should be selected and agreed to by the parties named above, but in no case should the group be comprised of more than six to eight organizations. Each participating organization should be represented by its top official.

This Coordinating Council is not envisioned as a new agency or nonprofit organization. It should have no life of its own, no budget and no legislative authority. Rather it is a committee that would exist purely to facilitate communication among its members and, hopefully, would facilitate coordination, in practice, of the members' programs. In effect, the Council has its roots in an ad hoc group that has already met, having been convened by Charles Warren at Kansas Inc. with the encouragement of Laura Nicholl, the Secretary of Commerce.

The most important idea behind the Coordinating Council is to bring the key players face-to-face on a regular basis, so as to head off potential problems and create more opportunities to work together.

In any event, we felt it was essential to declare an end to the battles that have engulfed KTEC, the executive branch and the legislature over the past months. No one wins in this kind of environment, and everyone agreed that the parties must now "swim together or sink separately." There are indications from all quarters of support for the cooperative approach suggested by NASDA: Laura Nicholl was the person who first introduced NASDA to the scene as a prospective consultant, and Bill Brundage and the legislators all appear to be pleased with the results of our work. Each has committed to begin working together.

An additional issue raised was whether the Commerce Department has the resources it needs to effectively fulfill its role. Those interviewed, exclusive of Commerce representatives, proposed that, in fact, KTEC may have been moving into new areas out of the perception that Commerce resources were lacking.

There were indications that the legislature would be interested in exploring what areas, if any, needed bolstering at Commerce. Possible areas in which additional resources might be needed were mentioned, including international trade, finance and community development. There was also mention of reexamining the need for a Commerce field network and redefining the role that might play.

Thus, in regard to helping to limit KTEC activities to its core mission, the feeling was that if Commerce had sufficient resources, KTEC would be able to play a support role to Commerce. This would be a far more effective approach to overall economic development, and the issue of necessary resources may be one that bears further exploration.

Finally, new ideas should continue to be pursued that build upon the strong base provided by KTEC. For example, KTEC might want to explore initiation of a proactive technology licensing consortium that could work to help root out new patentable technologies that may then be commercialized.

Summary of Findings and Options

KTEC Management and Operations

KTEC offers one of the most comprehensive and sophisticated technology development programs in the country. However, individual programs tend to be under funded relative to other states.

The accountability systems in place (comprehensive tracking system, use of the state's procurement and budget offices, annual independent audits, extensive use of peer review, and an independent board of directors) are among the most advanced in the country.

The organizational culture is one which encourages entrepreneurship and enables KTEC to be responsive to opportunities. This must continue to be balanced with the need to maintain focus. The strategic plan which is currently under development should provide an opportunity to set priorities and fine-tune program goals.

KTEC has been more successful than most states in encouraging the involvement of small businesses, who tend to be most in need of technology assistance, in its programs.

KTEC's authorizing legislation permits and requires a broad range of activities. Current programs, as constituted, are well within this legislative mandate, which appears to have continuing support from the legislature.

The analysis of the economy presented in "Kansas Economic Development Strategic Plan" paints the picture of the economy in broad strokes. A more detailed analysis of the specific technologies important to those industries which are important to Kansas and of the technology development systems for those technologies would help to target programs. Such a study by outside experts could be jointly funded by Kansas Inc., KTEC and KDOC.

KTEC Programs

Centers of Excellence

Those interviewed believed that the Centers have had a positive influence on the Universities, making them more aware of and responsive to the needs of private industry.

The University systems under which the Centers operate are not always suited to industry needs. Mechanisms to allow greater flexibility in equipment procurement and staffing should be explored.

KTEC's innovative use of five-year strategic plans as a tool for managing the Centers is to be commended.

Coordination with the Applied Matching Fund program is excellent, providing a means to assist in the commercialization of more basic work done at the Centers.

Applied Research Matching Fund

Virtually everyone contacted for this review was enthusiastic about this program. It is perceived to have been a major contributor to several companies' product innovations. (This is in keeping with findings by the National Science Foundation and other national studies that this type of grant is an effective way to promote commercialization.)

The use of both scientific and marketing reviews for proposed projects is exemplary.

The recent change from a "grant" to a "fund" with a payback provision is in keeping with national trends and should help sustain an ongoing program.

MAMTC

The concerns over the organizational structure and location of the MAMTC appear to have been resolved for the short term. Immediate attention must now be given to implementing the proposed program.

The size and scope of MAMTC activities offers a new opportunity to rethink and redefine the service delivery system for small business assistance in Kansas. The recently initiated ad hoc planning group provides a good start.

Other Programs

The **Training Equipment Grants Program** is targeted at supporting the technology training efforts of educational institutions; KTEC's role in providing equipment appears to be appropriate to its mission.

The **Ad Astra Fund**, like most state venture capital funds, has had difficulty in raising private sector dollars. Staff should continue the good working relationships with Department of Commerce staff and investigate other options to address these capital needs.

Special Projects funds allow KTEC to respond to emerging opportunities, allowing needed flexibility in program operations. Linking activities supported by these funds to the strategic plan now being developed should provide some broad guidelines for such activities. Special projects funds should continue to be utilized to take advantage of new windows of opportunity. Conversely, new programs components of ongoing duration should be submitted for legislative approval as budget line items.

New Ideas should continue to be pursued that build upon the strong base provided by KTEC. For example, KTEC might want to explore initiation of a proactive technology licensing consortium that helps root out new patentable technologies that may then be commercialized.

External Relationships

Staff relationships between KDOC and KTEC appear to be good, especially in the areas of international trade and finance programs. Relationships between top management are somewhat strained. The strategic planning process and the ad hoc planning group recently convened by Kansas Inc. can provide opportunities to smooth these relationships. Apparently, the ad hoc planning group has already helped make strides in the right direction.

Among those interviewed, there was unanimous agreement that all of KTEC's activities should continue to be focused on technology, while KDOC should continue to provide leadership on general business assistance, international trade, tourism, and industrial recruitment. KDOC should serve as a coordinator and "packager" of services. KTEC should be a valuable resource to KDOC in this effort.

The public-private partnership upon which KTEC has been built has created strong support from the private sector and has provided for accountability to the public sector. KTEC's organization has allowed it to be a responsive, yet patient tool for investment in Kansas' technology base.

Conclusion

It appears that KTEC plays a vital role among the players who comprise the Kansas economic development team and is a superb vehicle for pursuing technology development. However, it should not compromise its effectiveness by diluting its mission.

Rather, KTEC should work within the framework developed by Kansas Inc., cooperating closely with and assisting the Kansas Department of Commerce in pursuit of the many economic development opportunities that are available to the state.

Commerce should be able to look to KTEC as an ally and technical expert as it promotes business retention and expansion, works to attract new investment to the state, explores the possibilities in international trade, provides financing assistance to support its companies and develops the network of Kansas communities that make up the local support for economic development.

Together, KDOC, KTEC and Kansas Inc. can ensure that the resources and expertise needed are available and properly applied to best provide jobs and economic development in Kansas. The atmosphere appears to be clearing and a new rededication to cooperation may be emerging. We hope that the progress made by the ad hoc planning group (referred to earlier) will be continued in the form of an ED Coordinating Council.

Attachment A Management Review Team Qualifications

The Management Review Team was selected through consultation between Kansas Inc., KTEC, and NASDA. Priority was given to contracting with those individuals whose names were mentioned most often during the interview process, however in several cases, scheduling precluded their participation. The team members were selected for their expertise and experience with the specific types of areas that cover KTEC's programmatic and/or policy focus. The NASDA Management Review Team represents the four priority areas outlined in the contract:

Robert Leak is a former state economic development director in North Carolina and South Carolina. He served as the head of The Research Triangle Foundation in North Carolina and has a strong understanding of the role of an integrated high technology organization in a state's total economic development system.

Walter H. Plosila is the President of the Montgomery County High Technology Council in Rockville, Maryland. He developed and established Pennsylvania's Ben Franklin Technology Program. He is a nationally-recognized consultant in the field of high technology, public-private partnership initiatives, and technology transfer.

Teresa R. Gidley manages the Research and Technology Programs of the Michigan Strategic Fund (MSF), Michigan Department of Commerce, where she is responsible for negotiating and monitoring support of the state's Centers of Excellence. Prior to joining the MSF, she managed technology transfer programs for the Industrial Technology Institute. Dr. Gidley's consulting experience includes extensive experience evaluating Industry/University Cooperative Research Centers for the National Science Foundation; identifying ways to improve relationships with state government for the National Academy of Sciences; and teaching research methods for managers for the National Technological University Management of Technology program. She is currently chairing a committee for the National Science Foundation to develop measures of technology transfer from centers. As a member of the National Governors Association Science and Technology Council of the States, Dr. Gidley will chair a group that will work with federal agencies to seek improved federal/state cooperation in science and technology programs. She recently co-authored a white paper on this topic for the Federal-State Dialog, National Academy of Sciences.

E. Blaine Liner is the director of the State Policy Center at the Urban Institute. He has been involved in the management of state and local government economic development and policy management programs for over 25 years. Mr. Liner recently directed the preparation of a performance monitoring system for state and local government economic development programs as part of a national effort to improve performance of development agencies. Most recently, Liner served as the principal investigator for a project to develop export market plans for five states in the Southwestern Bell service area. The research effort involved identifying sectors of

each state's economy that had competitive advantages in the global marketplace and matching these sectors to country imports of these products.

Miles Friedman is the Executive Director of the National Association of State Development Agencies. In the eleven years with NASDA, he has participated in peer reviews and evaluations of states' high technology programs, the development and fine-tuning of public/private partnerships, and the development of statewide strategies to achieve successful implementation and consensus for economic development programs.

Ann Osborne manages the National Consulting Service and is the Project Manager for the KTEC Management Review. For this particular project, Mrs. Osborne brings a particular expertise in the assessment of advanced technologies, including computer-aided manufacturing, robotics, and computer integrated manufacturing processes. She completed an assessment of the strategic facilities, equipment, resources, skills, and training necessary to support these strategic technologies for California University of Pennsylvania in 1988. Mrs. Osborne has participated in the strategic development of several advanced technology industrial parks (including strategic planning, financial packages, and consensus-building). She has also written grants for submission to the Pennsylvania Ben Franklin Advanced Technology Grants Program.

Attachment B
Technical Assessment Meeting Agenda
Kansas Technology Enterprise Corporation
NASDA Management Team Visit

Tuesday, November 5:

- 8:30 a.m. Meet at Kansas Inc. – briefing/review Peer Group comments
- 9:30 a.m. Leave for KTEC Tour, meet KTEC staff
- 12:00 a.m. Lunch at Kansas, Inc.
- 1:00 p.m. KTEC Board of Directors Interview (Carol Wiebe, Lloyd Silver, and Representative Rochelle Chronister)
- 2:00 p.m. Interviews – Directors of Centers of Excellence
- 3:30 p.m. Meeting with Return on Public Investment (ROPI) Group
- 4:00 p.m. Industry Liaison Program – Ivan Smith
- 4:00 p.m. Intellectual Property – Clyde Engert
- 5:00 p.m. Bill Brundage, KTEC President – Interview
- 6:30 p.m. Dinner, hosted by Kansas Inc. – Topeka Top of the Tower (Charles Warren, Jerry Lonergan, Diane Gjerstad, Anthony Redwood, Ted Kuwana, Howard Mossberg, Timothy Donoghue, Bill Brundage, Paul Clay)

Wednesday, November 6

- All interviews at Kansas Inc. Offices
- 8:00 a.m. KTEC Staff (Cindy Diehl and Chris Cooper)
- 9:00 a.m. Gary Reser, Governor's Legislative Liaison
- 9:30 a.m. KTEC Staff (Kevin Carr)
- 10:00 a.m. Private Business Clients of KTEC and Local Economic Development Representatives
- 10:30 a.m. Marianne Hudson – ex-KTEC Staff and MAMTC

11:30 a.m.

KDOC Staff – Carole Morgan, John Watson, and
Steve Kelly

12:30 p.m.

Jerry Carr

1:30 p.m.

Wrap-up with Kansas Inc. Staff

Attachment C
Organizational Assessment Meeting Agenda

**Kansas Technology Enterprise Corporation
NASDA Management Team Visit**

Wednesday, November 13:

- 8:30 a.m. Meet at Kansas Inc. – briefing/review Peer Group comments
- 9:00 a.m. Gary Reser, Governor's Legislative Liaison
- 9:45 a.m. Harland Priddle, former Secretary of Commerce
- 10:30 a.m. Tony Redwood, Institute for Public Policy and Business Research – University of Kansas
- 11:30 a.m. Lunch at KTEC offices with Representatives George Dean and Rochelle Chronister (both are also members of the KTEC Board of Directors)
- 1:00 – 3:30 p.m. Meet with Bill Brundage and KTEC staff
- Depart for Lawrence with Jerry Lonergan, Kansas Inc.
- 4:00 – 5:30 p.m. Tour:
Oread Labs – William Duncan
Higuchi Bio-Sciences Center of Excellence – Charles Decedue
- 7:00 p.m. Dinner with Charles Warren and Jerry Lonergan

Thursday, November 14:

- 9:00 a.m. Meeting with Rep. Diane Gjerstad and Senator Dave Kerr.
- 10:00 a.m. Presentation before the Joint Committee on Economic Development and the Kansas Inc. Board of Directors (Room 519-S, Kansas Statehouse).
- 12:00 noon Lunch at Kansas Inc. Offices, with Kansas Inc. Board of Directors

DRAFT

National Association of State Development Agencies (NASDA)
Review of
Kansas Technology Enterprise Corporation (KTEC)

Summary of Preliminary Findings and Options

This report summarizes the preliminary findings resulting from a limited review of KTEC conducted by NASDA under contract to Kansas Inc. The review team (Attachment A) interviewed public and private representatives as well as KTEC staff. Attachment B contains an interview schedule and a partial list of individuals interviewed. The review team worked closely with Kansas Inc. staff and met with several individuals from the executive and legislative branches of State government. The team did not conduct in-depth reviews of individual programs. Major findings regarding overall KTEC operations, specific programs, and external relationships are summarized.

KTEC Management and Operations

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The accountability systems in place (comprehensive tracking system, use of the state's procurement and budget offices; annual independent audits; extensive use of peer review; and an independent board of directors) are among the most advanced in the country.

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Kansas and of the technology development systems for those technologies would help to target programs. Such a study by outside experts could be jointly funded by Kansas Inc., KTEC and KDOC.

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Those interviewed believed that the Centers have had a positive influence on the Universities, making them more aware of and responsive to the needs of private industry.

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The concerns over the organizational structure and location of the MAMTC appear to have been resolved for the short-term. Immediate attention must now be given to implementing the proposed program.

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Other Programs

The Training Equipment Grants Program is targeted at supporting the technology training efforts of educational institutions; KTEC's role in providing equipment appears to be appropriate to its mission.

The Ad Astra Fund, like most state venture capital funds, has had difficulty in raising private sector dollars. Staff should continue the good working relationships with Department of Commerce staff and investigate other options to address these capital needs.

The Technology Transfer and Referral Service is developing a database of technical expertise. Many states have developed such systems and have been disappointed in the level of use. KTEC should further study the experience of other states in order to identify potential barriers to use.

Special Projects funds allow KTEC to respond to emerging opportunities, allowing needed flexibility in program operations. Linking activities supported by these funds to the strategic plan now being developed should provide some broad guidelines for such activities. Special projects funds should continue to be utilized to take advantage of unique windows of opportunity. Conversely, new program components of ongoing duration should be submitted for legislative approval as budget line items.

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Among those interviewed, there was unanimous agreement that all of KTEC's activities should continue to be focused on technology, while KDOC should continue to provide leadership on general business assistance, international trade, tourism, and industrial recruitment. KDOC should serve as a coordinator and "packager" of services. KTEC should be a valuable resource to KDOC in this effort.

The public-private partnership upon which KTEC has been built has created strong support from the private sector and has provided for accountability to the public sector. KTEC's organization has allowed it to be a responsive, yet patient tool for investment in Kansas' technology base.

CONCLUSION

The KTEC program is a unique and effective mechanism for promoting technology development. It represents the kind of public/private partnership that many states are trying to build. However, the KTEC partnership should maintain its technology focus, so that this valuable organization can continue to function most effectively. As such, it is one key component of a strong Kansas economic team, which includes, among others, Kansas Inc. and KDOC.

It is recommended that the key players on the Kansas "economic development team" work together to clarify their roles and maintain management coordination and communication. In this regard, we believe that the ad hoc planning group convened by Kansas Inc. should be continued as the Kansas Economic Development Coordinating Council, for the purposes of program coordination and communication among participants. Composition of the group can be determined by Kansas Inc. which should convene the group at regular intervals.



KANSAS
TECHNOLOGY
ENTERPRISE
CORPORATION

January 16, 1992

Dr. Charles Warren
Kansas Inc.
400 S.W. 8th, Suite 113
Topeka, KS 66603

Dear Charles,

Needless to say, KTEC is delighted with the conclusion of the NASDA Management Review. We have worked hard during our short history in order to make sure that Kansas will be a significant participant in the "global" economy. This evaluation confirms that KTEC is successfully fulfilling its role in technology economic development. We are particularly pleased with the statement on page 15, paragraph 8, which reads:

"KTEC offers one of the most comprehensive and sophisticated technology development programs in the country."

During the past year there apparently was a perception by some that KTEC, as a public/private partnership, was not as accountable as it would be if structured as a true state agency. We can understand this concern because it always has been our concern as well. Consequently, KTEC established strict procedures to assure accountability. This was done the first year of operation. Moreover, this is an ongoing process and will continue to be taken seriously. Our efforts are supported by the following comments from the study:

Pg. 2, para. 4

"...because KTEC is a leader among the 45 states with technology development programs in undertaking peer reviews and insisting on performance accountability, there is a much greater amount of program and management data (qualitative and quantitative) available than would otherwise be the case."

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"KTEC's programs are indeed market-driven and strongly supported by industry. However, they are designed by policy and operational guidelines to protect both the integrity of the programs and assure full accounting and fiscal integrity in the use of the public sector resources."

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"...KTEC's staff has acted like a state agency in terms of its compliance with state administrative requirements even though it need not have done so. Regardless, KTEC has acted as a state agency through the use of the state's accounting system, procurement system, consulting with state officials and obtaining "state approvals" even when it did not need to do so."

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"We found that KTEC has the potential to be the kind of public private partnership that most states strive for. The board is subject to gubernatorial appointment, and there are strict procedures in use for monitoring both the use of funds and the performance of programs. It would seem that on paper, KTEC has sufficient mechanisms in place to allow for effective monitoring and control by the executive and legislative branches."

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There was also a perception that KTEC had strayed from its mission. This is unfortunate because we never have been able to identify an activity that was outside of KTEC's Enabling Legislation. The evaluators were unable to identify any examples. The following are comments taken from the study:

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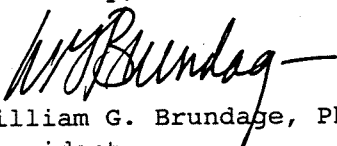
"...we found the agency to have undertaken a wide range of programs consistent with both the 1986 Economic Development game plan mandated by the Legislature and its mission and goals."

Individuals not familiar with KTEC not only felt that we were operating in areas outside our legislation but also felt that we were not cooperating with other state agencies. Every effort has been made to direct Kansas businesses to the appropriate assistance, including: KDOC, SBDC's, other businesses, etc. KTEC understands that in many cases technology alone will not help a company. Many firms have needs outside of technology such as marketing, management or finance. Whenever this is the case, we make every effort to refer them to the appropriate assistance.

The Kansas Technology Enterprise Corporation understands its role in the Kansas economy. Moreover, we have and will continue to cooperate with other state economic development agencies because this is a "team" effort. KTEC has evolved to that point of maturity whereby it can now contribute significantly to the state's efforts in economic development. This will happen as others become familiar with KTEC and understand the resource that we represent.

If you wish to discuss the report in more detail, please contact me.

Sincerely,



William G. Brundage, Ph.D.
President

PRESENTATION TO
THE
HOUSE ECONOMIC DEVELOPMENT
COMMITTEE

JANUARY 30, 1992

Presentation by:

William G. Brundage, Ph.D.
President of
Kansas Technology Enterprise Corporation

Eco-Devo
Attach # 2
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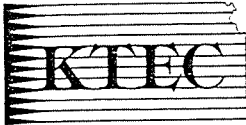
Kansas Technology Enterprise Corporation

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NASDA Evaluation Summary Brochure

I. Response to NASDA Evaluation



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112 W. 6th, Suite 400 • Topeka, KS 66603

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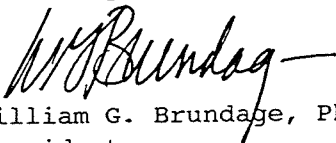
"...we found the agency to have undertaken a wide range of programs consistent with both the 1986 Economic Development game plan mandated by the Legislature and its mission and goals."

Individuals not familiar with KTEC not only felt that we were operating in areas outside our legislation but also felt that we were not cooperating with other state agencies. Every effort has been made to direct Kansas businesses to the appropriate assistance, including: KDOC, SBDC's, other businesses, etc. KTEC understands that in many cases technology alone will not help a company. Many firms have needs outside of technology such as marketing, management or finance. Whenever this is the case, we make every effort to refer them to the appropriate assistance.

The Kansas Technology Enterprise Corporation understands its role in the Kansas economy. Moreover, we have and will continue to cooperate with other state economic development agencies because this is a "team" effort. KTEC has evolved to that point of maturity whereby it can now contribute significantly to the state's efforts in economic development. This will happen as others become familiar with KTEC and understand the resource that we represent.

If you wish to discuss the report in more detail, please contact me.

Sincerely,



William G. Brundage, Ph.D.
President

II. 1992 Activities

KTEC

PROGRAMS

- Centers of Excellence
- Applied Research Matching Grants
- Research Equipment Matching Grants
- Training Equipment Grants
- Small Business Innovation Research Grants
- Kansas Technical Research Database
- Seed Capital
- Industrial Liaison
- Special Projects

AD ASTRA FUND

ITEC

MAMTC

INDUSTRIAL AGRICULTURE

Overland Park
Manhattan
Wichita
Great Bend
Garden City
Pittsburg

Missouri
field office

KTEC's 1992 Activities

Return on Public Investment

The Institute for Public Policy and Business Research at the University of Kansas is developing a Return on Public Investment (ROPI) model so that KTEC can evaluate the economic impact of its programs. The ROPI steering committee includes: Sen. Dave Kerr; Sen. Janis Lee; Rep. Bob Mead; Rep. Dave Heinemann; Rep. George Dean; Rep. Diane Gjerstad; Bud Grant, KCCI; John Moore, Cessna; Jack Pierson, Preco; and Jarvin Emerson, KSU.

Third Party Review of Position Descriptions

KTEC has contracted with Ernst & Young to evaluate staff positions, and review office procedures. KTEC's staff of eight is committed to the best possible management of Kansas' investment.

Strategic Planning

By June 30, KTEC will complete its strategic plan.

Public Information

In an effort to increase the public's knowledge of KTEC, we have contracted with an individual to serve as KTEC's Public Information Director.

Telecommunications

State-of-the-art telecommunications in Kansas has been promoted by KTEC for several years. This special project began as a consortium of providers and users who worked together to design and establish a network easily accessible by business, education, the medical community and government. The project management committee includes: Andy Scharf, Division of Information Systems and Communications (DISC); Russ Phelps, Southwestern Bell Telephone; Barbara Paschke, Kansas Board of Regents; and David Brevitz, Kansas Consolidated Professional Services.

Commercialization

KTEC is embarking on a more formal and disciplined process of commercializing technologies. Executives on loan from industry will provide expertise in financing, management and marketing of new technologies and assist the vice president of commercialization to this end.

Industrial Agriculture

KTEC has earmarked \$100,000 to promote industrial agriculture in 1992. This investment will allow Kansas to pursue industrial opportunities, create a capacity for fund management of public/private portfolios, begin the process of becoming a Regional Center, and ultimately enhance Kansas' opportunity to benefit from federal allocations for such efforts. KTEC is working on this project with the Board of Agriculture, the New Uses Council, and the Kansas Value-Added Center.

Centers

The Centers of Excellence are beginning the process of implementing a structure that will allow them to further leverage KTEC funding, involve more research faculty and work with a greater number of Kansas businesses. They intend to become more involved in giving direction to Kansas' economic development initiative.

III. Fact Sheet

KANSAS TECHNOLOGY ENTERPRISE CORPORATION (KTEC)

112 West Sixth, Suite 400, Topeka, KS 66603; (913) 296-5272

MISSION:

To create and maintain employment by encouraging entrepreneurship, stimulating the commercialization of new technologies, and promoting the creation, growth and expansion of Kansas businesses.

HISTORY:

- 1983 Kansas Advanced Technology Commission (KATC)
Established within the Department of Economic Development
 - 1986 Kansas Technology Enterprise Corporation (KTEC)
Created by the Kansas Legislature; established as a state-owned corporation
 - 1987 KTEC became operational
-

WHY WAS KTEC CREATED?

The Kansas Legislature and the Executive Branch joined forces to create KTEC because the technological needs of Kansas businesses required a new and more appropriate way in which to make them more competitive on a global scale.

Specific reasons:

- To provide scientific and engineering leadership;
 - To remove technological, institutional and economical barriers to business expansion;
 - To blend the cultures of academia, the private sector and government;
 - To better address the needs and potentials of the Kansas business community;
 - To operate like a business with the capability to be responsive in a timely manner;
 - To use technology to modernize and diversify the State's economy;
 - To establish credibility with business and academia;
 - To transcend political boundaries; and
 - To address unique accountability and management requirements.
-

EFFECTIVE ADMINISTRATION AND LEADERSHIP:

KTEC is administered by eight staff members and a 16-member Board of Directors representing the private sector, government and academia. We have been effective because:

- enabling legislation allows KTEC to operate like a business, yet maintain all of the controls necessary when utilizing public funds.
 - true leadership is provided by those experienced in science, academia and the business sector.
 - KTEC's FY 1991 operations budget was held to approximately 10% of its overall budget.
 - KTEC is performance-driven.
 - KTEC is one of the most cost-effective government agencies in Kansas and among its counterparts in other states.
 - This is documented by an in-depth evaluation executed by the National Association of State Development Agencies (NASDA), Washington, D.C. Their report stated that "KTEC offers one of the most comprehensive and sophisticated technology development programs in the country."
-

DYNAMIC PUBLIC/PRIVATE PARTNERSHIPS:

The complexity and cost (both in human capital and technology) of competing globally demand partnerships between government, academia and the private sector. These partnerships, through leveraging of resources, allow the state and the nation to be competitive.

Through these public/private partnerships KTEC has established an effective and unique network that capitalizes on scientists, engineers, financiers, accountants, marketers, and various academic and government agencies.

With limited resources, these partnerships are the most cost-effective manner in which to achieve this economic development goal.

2-11

THOROUGH ACCOUNTABILITY:

In all probability, KTEC is more accountable for its activities than any other state agency.

For example, the following are required:

- 16-member board of directors.
- audits performed by the Division of Post Audit at their discretion.
- annual audit by private accounting firm.
- evaluation criteria for all KTEC programs.
- peer review by some of the nation's best managers of technology development programs.
- oversight by Kansas Inc.
- a business plan with an update completed through the Strategic Planning process.
- all funds processed through Division of Accounts and Reports.
- annual budget must be prepared as requested by the Division of Budget (performance indicators included).
- regular reports to the Legislative Economic Development Committees.

Other activities which demonstrate accountability:

- Strategic Planning - professional assistance provided by IBM and Dr. Warren McFarland of the Harvard Business School. KTEC's plan should be finished by July 1, 1992.
- Return on Public Investment (ROPI) - KTEC has contracted with the Institute for Public Policy and Business Research at the University of Kansas to complete a Return on Public Investment model. This will allow KTEC to evaluate the impact of its programs on the State's economy.
- Committees - Advisory committees comprised of experienced individuals from business and government, assist KTEC with reviewing and making recommendations concerning its grant and Center programs.
- Tracking System - KTEC has developed a computerized system that enables it to manage information pertaining to the Centers of Excellence and grant programs—including the capability to track a company's progress long after completion of a project.

INNOVATIVE INITIATIVES:

The Innovative Technology Enterprise Corporation (ITEC) grew out of a Special Project funded by KTEC. ITEC is serving the needs of inventors and entrepreneurs with a variety of fee-based services and seminars.

The Mid-America Manufacturing Technology Center (MAMTC) was created following KTEC's receipt of a \$12.9 million, six-year grant from the National Institute of Standards and Technology. The Center will work closely with more than 2,600 small and mid-sized manufacturers in Kansas and the Kansas City metropolitan area.

POSITIVE RESULTS*:

Investments:

- State of Kansas investment--\$22.5 million;
- Leveraged with \$50 million in industry and federal funding;

Results:

- \$17.2 million in increased sales for Kansas companies;
- 49 company start-ups through KTEC assistance;
- 25 company expansions;
- 3,316 new jobs created;
- 100 new technologies developed at our Centers or through our grant programs;
- 61 patents.

*Through June 1991.

IV. Clippings

Gambling plans

—Scott Weaver/The Capital-Journal

The Kickapoo Indian Nation announced Wednesday the selection of Sodak Gaming Supplies of Rapid City, South Dakota, as manager of its planned gambling casino. At a news conference on the reservation west of Horton, Kickapoo Chairman

Steve Cadue, right, and Sodak President Mike Wordeman, in sports jacket, watched Dave Harcourt, Sodak sales manager, unroll blueprints for the casino. The Kickapoos intend to build a casino south of Hiawatha. Story on Page 7-B.

Standards group moving to Kansas

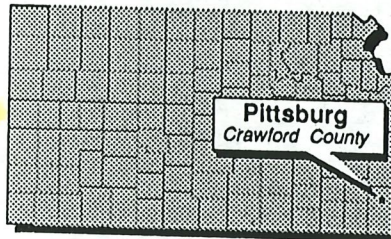
By BARBARA JOSEPH
The Capital-Journal

PITTSBURG — An international manufacturing standards organization will move the headquarters for one of its subcommittees to Pittsburg State University from Geneva, Switzerland, university officials announced Wednesday.

The decision will provide the university and the state new opportunities to develop national and international industrial contacts and help the country compete in the global marketplace, officials said.

At a Jan. 15 meeting in Carmel, Calif., the international subcommittee's board voted to move the headquarters, or secretariat, for the International Standards Organization's Engineering Dimensioning and Tolerancing Committee to this country, under the direction of the American National Standards Institute.

ANSI in turn chose the university's Center For Technology Transfer as the site for the secretariat, upon the recommendation of the United States.



The International Standards Organization, based in Geneva, has since its founding in 1946 designed and promoted international industrial manufacturing standards. Its members are national standards bodies from 86 countries, including the U.S. body, ANSI, headquartered in New York City.

The Center For Technology Transfer, one of the Kansas Technology Enterprise Corp.'s five university economic development centers, helps Kansas plastics and printing industries apply the latest technology to their products.

The subcommittee's secretariat had been headquartered in Geneva since 1976, but the Swiss government decided to permit its move.

With the decision, Pittsburg State becomes the second university in the world to be host to an ISO secretariat. Rutgers University is the international secretariat for ceramic tile standards. Hosts for other ISO secretariats are governmental bodies, private organizations and industry.

As secretariat, the Center for Technology Transfer will ensure certain equipment is made to standard sizes and fits. It would ensure, for example, that tires are the same sizes worldwide and that their nuts and bolts are interchangeable.

Dr. Robert Ratzlaff, university vice president for academic affairs, said in a prepared statement the secretariat would help train Kansas industry in national and international standards. He said it also would provide the university and the state with industrial contacts.

Dr. Victor Sullivan, dean of the university's School of Technology and Applied Science, said having input into industrial standards would provide this country greater entry into international markets. And he said follow-

ing ISO standards is crucial.

"My guess is there aren't more than five or six companies in Kansas that know what the ISO is," he said. "They need to get cracking because they won't be able to sell their manufactured products outside the U.S. and Canada unless they're manufactured under ISO standards."

Sullivan said being host to the secretariat would cost about \$40,000 annually. He expects that to be financed totally by private industry. He said \$20,000 already has been pledged.

Robert Nickolaisen, a professor in the university's Department of Engineering Technology and a member of the ANSI Dimensioning and Tolerancing Committee, first suggested the university as a potential site for the secretariat, officials said.

Offices for the secretariat will be in the university's Shirk Hall. The secretariat will name the subcommittee chairman, organize international groups to revise and update standards manuals, maintain records and act as liaison to national standards bodies in other countries.

Enrollment drops at three state universities

The Associated Press

Spring enrollment was down at the University of Kansas ...

sources are so limited," he said.

Spring enrollment at the Lawrence campus, off-campus centers in

centers increased by 41 students.

The enrollment for Jan. 15, the first day of classes was down 2,585

"Our students, faculty and staff have shown remarkable patience in dealing with the high ...

2-14

A combine with a twist

Spinning concave design may reduce machine size 30%

By LARRY REICHENBERGER

Rotary combines will get a new twist if Mark Underwood's dream comes true. The Burr Oak, Kan., farmer and his cousin Ralph Lagergren have designed a new rotary threshing system that features concaves which turn along with the rotor. Early indications are the design improves threshing efficiency—a trait the partners believe could downsize future combines by 30% or more.

The key feature of this "Bi-Rotor" design is a threshing cage with holes throughout. This cage turns in the same direction as the threshing rotor that spins inside it, though at a slower speed.

"The holes in our threshing cage are smaller than those in conventional concaves and separating grates, so less trash gets through," says Underwood. "However, because the holes cover the full 360 degrees, rather than the standard 120 degrees, and because the cage is turning, the grain gets through and threshing efficiency is improved."

Underwood explains that this improved efficiency allows the threshing and separating area of the Bi-Rotor design to be shorter—4' or less compared with 8' or 9' in current rotary machines. "If combines were built using our rotor, they could be built smaller."

The partners have pursued their idea for more than a decade. Recently, they raised over \$200,000 from private investors and K-Tech, a Kansas agency that helps fund new business ventures, to finance development. The concept was tested with engineers at Kansas State University last year, and field tests continue this year with the unit installed in a Case IH 1480 combine.

THE "BI-ROTOR" UNIT features a rotor that whirls at approximately 800 rpm while a surrounding threshing cage turns at 50 rpm. The unit takes up roughly half the space of a conventional rotary threshing mechanism.

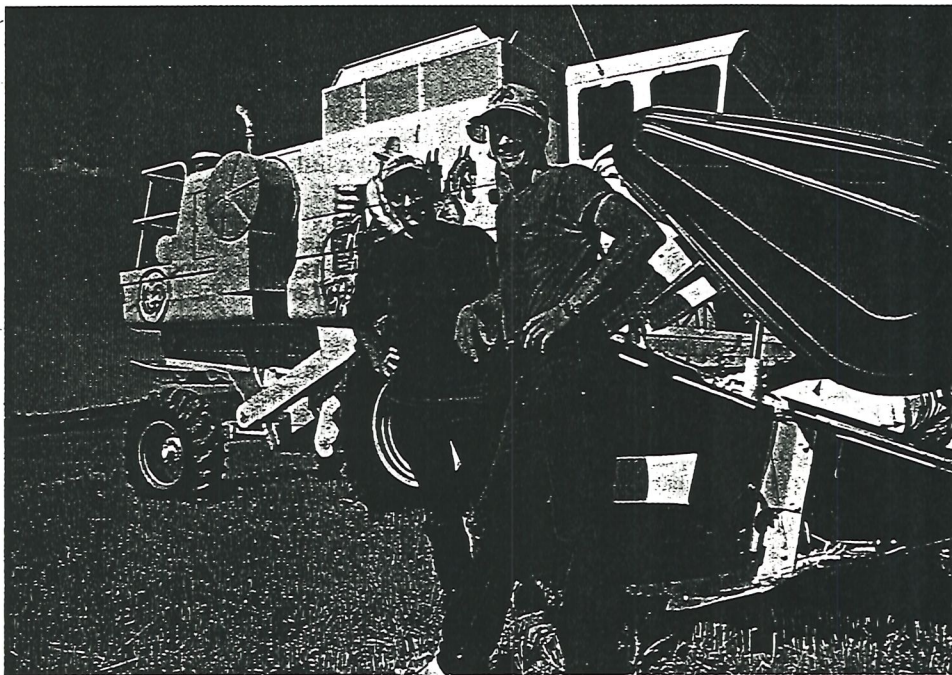


PHOTO BY THE AUTHOR

AFTER THEY DEVELOPED a new threshing mechanism for rotary combines, Mark Underwood, left, and Ralph Lagergren painted their prototype white and asked Jewell, Kan., farmer/artist Jim Nelson to add murals. "We want farmers to know it's different," says Lagergren.

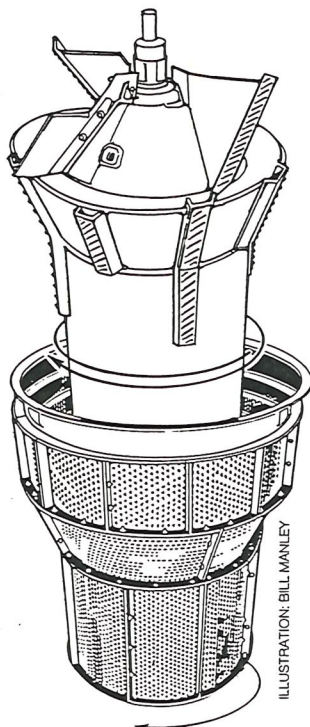


ILLUSTRATION: BILL MANLEY

"Early indications are promising," says Kansas State's Stan Clark. "The harvesting capacity, grain loss and grain quality of the Bi-Rotor appear to be comparable to a standard machine of similar size. That's intriguing because this is only the first prototype. With fine-tuning, future models could perhaps be improved."

Part of the credit belongs to a uniquely designed rotor. It features rasp bars on the intake fins and is less than half the length of comparable threshing rotors. "The shorter rotor results in less ground-up straw reaching the chaffer, so cleaning capacity is increased," says Lagergren.

"We also keep material off the chaffer with chaff-relief chambers installed in the threshing area. These openings in the side of the combine vent about 15% of the chaff, but we think with some redesign we could take 30% or more of the chaff out before it reaches the chaffer."

OCT 8 1991



AP Laserphoto

KU Prof. Kai Wai Wong, left, discusses patent with KU's Robert Zerwekh and John Carlin.

Patent issued on superconductor

Associated Press

LAWRENCE—A University of Kansas researcher hopes a patent granted to Kansas and three other universities could revolutionize transportation, communication and consumer products within a decade.

Kansas officials announced receipt of the patent Monday for their work on superconductive material research.

It is for a vanadium-based superconducting oxide that can carry electrical currents without energy losses, at higher temperatures better than other superconductive materials.

Scientists have envisioned practical uses for the materials, including super-fast computers,

inexpensive energy, medical advances and travel.

"All of our research to date clearly shows that vanadium is the best available superconductive material in terms of stability and its ability to be fabricated for practical use," said Kai-Wai "Ken" Wong, Kansas professor of physics and astronomy.

The patent is based on research done by Wong and professors at the universities of Missouri-Kansas City, Arkansas and Hong Kong.

Wong said the day when vanadium-based superconducting substances are used widely in commercial applications is far in the future.

However, development in the

area has been rapid and it is possible the technology could be in use within a decade, he said.

The patent limits rights to the application of vanadium-based material but until it is used commercially, there will be no significant royalties, he said.

Wong and his colleagues are working with Midwest Superconductivity Inc., a private Lawrence company, to market the material.

"Competition is extremely intense in this arena," said former Kansas Gov. John Carlin, who is president of MSI.

The research has been financed by MSI, Kansas Technology Enterprise Corp., a state-financed economic development agency, and other sources.

NOV 6 1991
KANSAS
Emporia Gazette

Page 0

THE EMPORIA

282 Video Network Tested in Rural Hospital

By Matt Truell
Associated Press Writer

TOPEKA — A lawmaker visualizes the day when rural Kansas doctors and their patients will talk to specialists in Kansas City, Kan., and Wichita over a two-way television.

Sen. Roy Ehrlich, R-Hoisington, chairman of the Committee for Health Care Decisions for the 1990s, offered that picture on Tuesday after hearing a presentation from an official from the University of Kansas Medical Center.

William Mahler, director of the Med Center's information technology department, said an interactive video network across the state hooked into the Med Center could improve the quality of health care in rural areas. A two-way video between the center in Kansas City, Kan., and the Hays

Medical Center has been installed as a pilot project.

The interactive video allows medical specialists from the Med Center and KU's School of Medicine in Wichita to talk both to doctors and patients at Hays.

"This tool may not only enhance quality health care in rural Kansas, but may also bridge the distance barriers and provide support otherwise not available to the primary physician," Mahler told the Committee for Health Care Decisions for the 1990s.

The Hays Medical Center is involved in a pilot project for what could become an extensive video network extending to medically under-served rural areas.

"It's unbelievable," Ehrlich said. "This is something that could be utilized very, very much by one doctor, two doctors, with

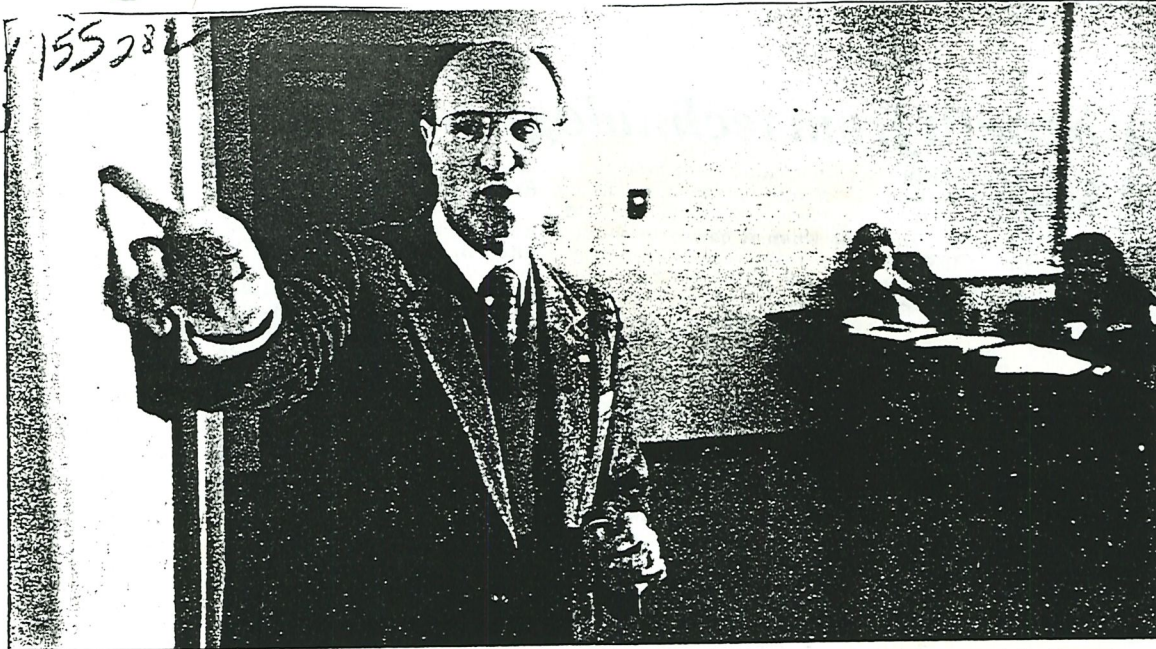
the knowledge of the University of Kansas."

The Hays Medical Center now has a portable studio that will allow specialists to interview patients there.

Ehrlich said he can envision the day when every doctor's office in rural Kansas would have such a video system.

The cost of the pilot project is \$390,000. The money is being provided by the Meade Johnson Pharmaceutical Co., the Kansas Technology Enterprise Corp., the KU Med Center and the School of Medicine in Wichita, which is a branch of the KU Med Center.

Mahler said during the first year of operation, physicians will study the extent to which the system is used and will develop recommendations on how it could be deployed.



LOTTERY FUNDS — Dr. Charles Decedue, executive director of Higuchi Biosciences Center in Lawrence, explains the nature of his business with the aid of an overhead projector this morning at Barton County Community College. Rep. Bob Mead, R-Pawnee Rock, invited officials from the University of Kansas and HBC to BCCC to explain how money from the Kansas Lottery is actually being used. — (photo by Marcus W. Stratton)

All this for a buck

Program shows how lottery finances research

By SUSAN THACKER
Tribune Staff Writer

When a Barton County resident spends \$1 on a Kansas Lottery ticket, he probably isn't thinking about biochemical research or creating jobs for scientists. But there's a direct correlation between the two, Rep. Bob Mead R-Pawnee Rock, said today.

To illustrate the point, Mead invited representatives from the University of Kansas and the Higuchi Biosciences Center at KU to visit Barton County Community College today.

The Lawrence-based HBC relies on research financed in part by Centers for Excellence at the state's universities. With lottery funding, the Kansas Technology Enterprise Corporation finances the five centers, including KU.

Dr. Susan Lunte, assistant director of the HBC Center for Bioanalytical Research, said KTEC's financial support helps ideas develop from an idea to a marketable product. HBC works with national and international markets, including Oread, which has grown to 100 employees — 75 percent of which are Kansas natives.

Dr. Charles Decedue, executive director of HBC, said it can take 10 years and \$250 million to develop a single drug. HBC helps Kansas provide service to small businesses that are at the beginning of the process.

"Higuchi doesn't want to own the gold mine, but it does want to own the general store next to the gold mine," Decedue said.

Mead said he brought the HBC representatives to Great

"We can have it right here in Barton County. We have to broaden our vision. This exercise today is planting seeds: We can do it, but we have to believe that we can do it. We have to know that we can do it."

— Rep. Bob Mead on economic development

Bend to encourage area business people to look beyond agriculture and the oil industry.

"The hope that I have is that we use their research to benefit all of Kansas," Mead said. The speakers agreed that economic development funding can create high-tech jobs, good salaries and some new businesses.

"We can have it right here in Barton County," Mead said. "We have to broaden our vision. This exercise today is planting seeds: We can do it, but we have to believe that we can do it. We have to know that we can do it."

Other scheduled speakers were Dr. Diane O. Thompson, assistant director of the HBC Center for Drug Delivery Research, and Dr. Julian C. Holtzman, director of the Center for Excellence in Computer Aided Systems Engineering. Discussions were scheduled this afternoon so Barton County business people and other community representatives could identify needs which possibly could be solved through KTEC, the Centers for Excellence or other organizations.

282 Small firms may benefit from technology center

Beginning this fall, small and mid-size Kansas companies can be just a phone call away from changing their manufacturing techniques.

By contacting the Mid American Manufacturing Technology Center or one of the six affiliated technology transfer offices, a company can request engineering help with problems, simple or complex.

Farhad Azadivar directs the Advanced Manufacturing Institute at Kansas State University, one of the six regional sites. He talked about the multi-million dollar federal-state effort to transfer the newest manufacturing techniques to Kansas companies.

Azadivar explained that technological and engineering advances often have been made at the large, national laboratories and research universities. But that new knowledge has not been made available systematically to small companies. To break the log-jam and bolster the competitive ability of the 300,000 U.S. small companies, a

national system of manufacturing technology centers was started in 1988 by the U.S. Department of Commerce. The Omnibus Trade Bill of 1988 set up three centers, and in 1991 two more centers were designated, including MAMTC.

The National Institute of Standards and Technology awarded \$12.9 million to fund the MAMTC proposal prepared by Kansas Technology Enterprise Corporation and its partners: Advanced Manufacturing Institute at Kansas State University; Center for Productivity Enhancement at Wichita State University; Center for Technology Transfer; Garden City Community College; Tech-Industry Consultants at Johnson County Community College; and Western Kansas Technology Corporation at Great Bend.

Under the proposal, MAMTC will serve the 2,600 small to mid-size Kansas companies that make aircraft and motor vehicle parts, fabricated metals, farm and industrial machinery, plastics, tool and die, wood kitchen

cabinets and other products.

"Many small companies employ no engineers," he said. "So when it comes to solving even relatively simple engineering problems they have been handicapped. A complex problem like designing a machine part or developing a new product poses a serious hurdle for them," he said.

The Advanced Manufacturing Institute has provided technical assistance to companies for several years, a role the NIST grant will strengthen, Azadivar noted. Two additional engineers will be hired to work with businesses. "Several products developed collaboratively between KSU engineers and various Kansas companies are close to production stage," he said.

"We also hope to stimulate the interest in computer-aided manufacturing technologies among Kansas manufacturers so they will become more competitive," he said. "Economic development for Kansas and creating new jobs in the state is

the goal of the entire effort," Azadivar said.

During the coming year the Advanced Manufacturing Institute will be designing a "Factory on Wheels" - a large truck outfitted with computer numerical control machines and computers programmed to operate them. This demonstration unit for computer-aided design and manufacturing and numerical machining will travel the state so people can get hands-on experience with the newest technologies, Azadivar explained.

AMI also will test a new two-way interactive video teleconferencing system. With a device called a CODEC, which transmits voice and pictures via phone lines, engineers at Manhattan will be able to communicate long-distance with a company and actually look at a part or machine that is causing the problem.

MAMTC also will strengthen the extensive program of technical seminars and conferences offered by AMI.

OCT 25 1991
KANSAS
Manhattan Mercury



Staff photo by Rod Mikinski

Greg Spaulding shows his invention to State Rep. Sheila Hochhauser, Dennis Mullin and Roger Maughmer this morning. The device counts pills and drops them in bottles.

Device to ease pharmacists' headaches

Sherry Wright
Staff Writer

Engineer Greg Spaulding was building computer peripherals when his wife, Pam, a pharmacist, approached him one day and said, "Why don't you do something useful?"

Members of the Kansas Senate Ways and Means Committee and House Appropriations Committee watched the "something useful" in operation this morning.

The Spauldings have designed a robot — an automated prescription dispensing system (APDS) that is counting pills and dropping them into pill bottles in the Spauldings' garage.

The couple's dream, of course, is to manufacture a number of APDSes and install them, not in their garage, but in pharmacies across the country.

Spaulding's full-time job is with the Advanced Manufacturing Institute at Kansas State University. Dispensing Technologies Incorporated, the company formed to produce and market the APDS, is his second full-time job.

The Spauldings have some funding from Kansas Technology Enterprise Corporation and some from private investors. They need about another \$250,000, Spaulding said, to manufacture and market the device "on a shoestring."

The state legislators visited the Spauldings this morning as part of their tour of state-funded facilities. While AMI and KTEC funds have helped with the initial stage, Manhattan Chamber of Commerce Economic Development Director Dale Stinson said he doesn't believe additional

state funds will be forthcoming. Private and corporate supporters are needed now, Stinson said.

Mrs. Spaulding foresees big benefits for registered pharmacists like herself. Kansas, like many states, requires pharmacists to counsel patients about drug usage. But the number one complaint among her colleagues, she said, is that there's never time for counseling.

"My school was really big on counseling," Mrs. Spaulding said. "I don't want to stand back there and count all day. I think this will free us up to do much more."

She also believes the APDS will improve safety in her field. Computers, after all, count more accurately than humans. And no pharmacist, using this device, can pull the wrong bottle off the

See No. 3, back page

Device

③ Continued from Page A1

shelf. Spaulding even plans to make an additional safety factor available — a system that will recognize the proper drug by its weight and will let the pharmacist know if the pills it selects are too light or heavy to be those required by the prescription.

The machine automatically selects the right drug from data that comes directly from the doctor's prescription slip. One thing it won't do, however, is read the doctor's handwriting. The pharmacist must still decipher that and type the data into the computer's memory.

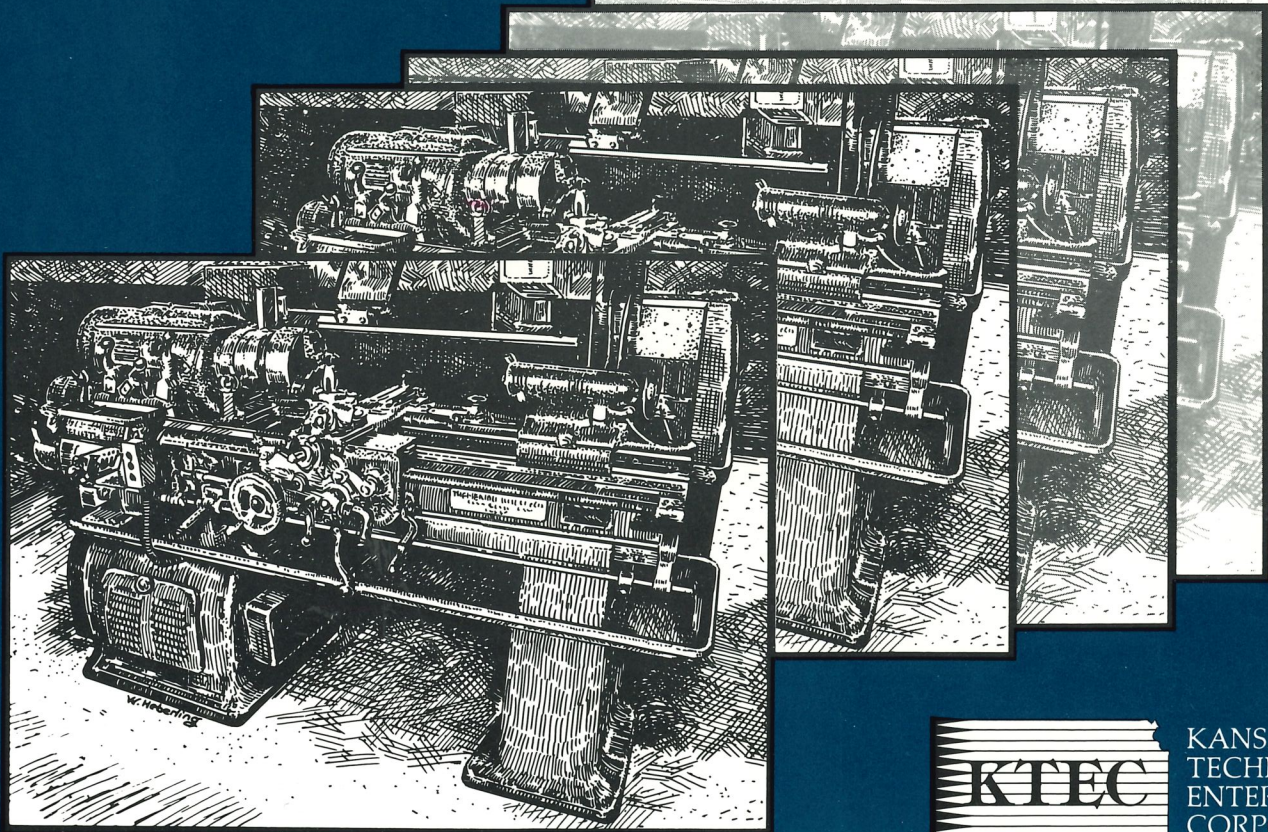
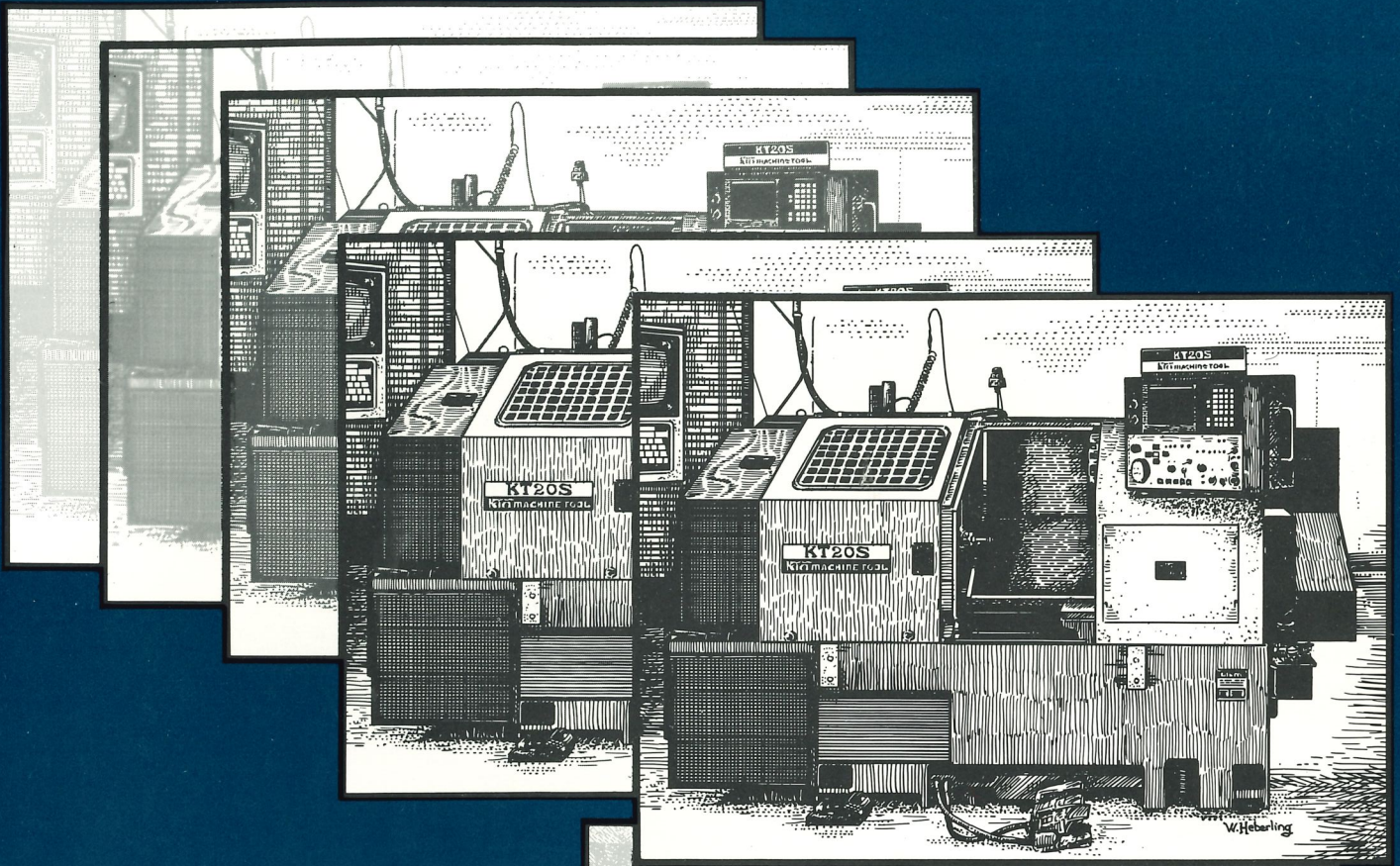
And that, Mrs. Spaulding admitted, really can be tough. Professional pharmacy journals, she said, run "See if you can guess what this says" reproductions of prescription slips. "I never can figure them out," she said.

Despite that one limitation, Stinson believes the APDS is a good product. "But out in the world there are lots of good products," he said, "and funders have to make a choice."

"Dealing with new start-up companies is extremely exciting, but it's also extremely frustrating because you have to raise risk money."

1991 ANNUAL REPORT

MANUFACTURING: A Key Component in Kansas' Economic Future



KANSAS
TECHNOLOGY
ENTERPRISE
CORPORATION

*Eco-Data
Attach 3
01-30-92*

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Mission Statement

The Kansas Technology Enterprise Corporation (KTEC) is a non-profit corporation 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 between academic institutions and industry, provides seed capital for emerging technology-based industries, awards SBIR matching grants for proposal preparation, 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.

Governor Joan Finney and Members of the Legislature

State Capitol Building
Topeka, Kansas 66612

Dear Governor Finney and Members of the Kansas State Legislature,

Since its inception in 1987 as a quasi-public, non-profit organization focused on advanced technology economic development, the Kansas Technology Enterprise Corporation has become one of the most successful agencies of its kind in the nation.

The reason is simply that we recognize and believe in the promise of technology. Invention and innovation are the root of advanced technology economic development. Consequently, our strategy to successfully move Kansas into the 21st Century has been innovative—creating public-private partnerships that are cost effective and technology-driven.

Our strategy is working. KTEC has developed an infrastructure unequalled anywhere in the nation. Our Centers of Excellence are interacting with Kansas companies in unprecedented numbers. Our applied research and training equipment programs are realizing amazing results in new marketable technologies and training of our workforce. Our Special Projects included the establishment of the first Patent Depository Library in the State of Kansas, as well as creating an interactive video network for use by businesses, the medical community, and educators.

As evidence of our outstanding infrastructure, Kansas was one of two states selected in 1991 by the National Institute of Standards and Technology to establish a Manufacturing Technology Center to assist small- and mid-sized manufacturers. This federal grant program will infuse more than \$40 million to bring the newest technologies to Kansas manufacturers and prepare them to compete globally.

KTEC's programs are designed to help existing Kansas companies, assist in establishing new companies, relocate companies to Kansas, and encourage the State's entrepreneurs and innovators. As you read our 1991 Annual Report, you will see that we are assisting Kansans in every corner of our state.

We are sure of our mission at KTEC, and we are proud to be part of Kansas' economic development initiative.

The Kansas Technology Enterprise Corporation is pleased to submit to you its 1991 Annual Report in accordance with K.S.A. 74-8111.



Carol Wiebe
Chairman



Dr. William G. Brundage
President



KTEC President William G. Brundage and KTEC Board Chairman Carol Wiebe

1991 Highlights

Funding

The Kansas State Legislature continued to demonstrate its commitment to fostering technology-based industry in Kansas when it appropriated \$7,410,700 in proceeds from the Kansas Lottery to the Kansas Technology Enterprise Corporation (KTEC) in FY 1991.

When Governor Joan Finney's inaugural message indicated that she endorsed KTEC's dissolution, economic development proponents rallied to the corporation's support. Indeed, when it became evident that KTEC and Kansas were semi-finalists for the prestigious Manufacturing Technology Center award by the National Institute of Standards and Technology, legislative members provided additional funding to indicate Kansas' support of KTEC and its programs.

Mid-America Manufacturing Technology Center

In late 1990, KTEC and various other economic development groups worked together to prepare a proposal which was submitted to the National Institute of Standards and Technology in competition for one of two new manufacturing technology centers to be funded in 1991.

In February 1991, KTEC was notified that Kansas had indeed made the cut to the final four and would undergo a site visit. Within ten days of the site visit, Kansas Senator Bob Dole announced that Kansas and Michigan were the two new sites chosen by NIST. Overall, NIST will award \$12.9 million into Kansas over the next six years to improve the technology of small- to mid-sized manufacturers.

NIST indicated that it was the infrastructure established by KTEC that made the Kansas proposal so attractive. More information concerning MAMTC is located on page 7.

Centers of Excellence

Core funding for the Centers in FY 1991 increased to \$3.2 million. Each Center's funding increased proportionately to its achievements, goals and objectives. In addition, as a whole the Centers leveraged their funding with \$2.9 million in industry funding and \$3.9 million in federal funding.

All of the Centers have made progress in their mission to assist new and existing Kansas businesses. More than 385 companies interacted with the various centers during FY 1991. Two companies were encouraged to relocate in Kansas and nine new companies emerged from center-assisted work.

Most impressive is the fact that 23 new technologies have been developed by the Centers and are currently being commercialized.

A review of each Centers' accomplishments in FY 1991 begins on page 7 of this KTEC Annual Report.

Grant Programs

Fifty-two Applied Research Matching Fund awards were made representing a \$1.54 million investment for the State. Private sector funding added up to nearly \$2.7 million.

Training Equipment Grants totalling \$150,000 were approved by the Board of Directors in FY 1991. These grants were leveraged with an equal amount of matching dollars plus contributions of equipment worth more than \$2 million.

Small Business Innovation Research Awards totalling more than \$35,000 went to nine Kansas companies covering a wide range of research objectives.

Special Projects

Special Projects took a new direction in FY 1991 and funded more initiatives than in KTEC's past. Outstanding opportunities for inventors and entrepreneurs provided KTEC with the opportunity to create an organization

1991 Highlights

named Innovative Technology Enterprise Corporation.

In cooperation with the telecommunication industry, KTEC leveraged Special Project Fund money to establish four interactive video conferencing sites in the state.

And, thanks to seed money from the Special Project Fund, the State of Kansas now has a Patent Depository

Library located at Wichita State University.

Read more about these and other special projects beginning on page 18.

Ad Astra Fund

KTEC has had the unique opportunity to invest seed capital for the State of Kansas as a limited partner in the Ad Astra Fund. Read more about these exciting investments on page 17.

Recommendations for the Future

Fulfillment of KTEC's mission hinges on several critical factors: the cooperation and dedication of all Kansas' economic development agencies to work together for the common cause; the ability to respond rapidly to the marketplace; the long-term availability of stable funding sources; and the commitment of program funds through the start-up phase, when results may not be readily measurable. In accordance with legislative requirements under K.S.A. 74-8111, KTEC recommends the following actions that would enable KTEC and its program participants to better address the purposes of this Act:

1) Develop a model for evaluating economic development investments in the State of Kansas. KTEC

already is, through a third party, developing a Return on Public Investment (ROPI) model that will demonstrate KTEC's economic impact on the State. It is recommended that this model be utilized to measure the results of all state investments in economic development.

2) Develop a statewide strategic plan integrating the strategic plans of all economic development agencies in Kansas. KTEC will complete its strategic plan by the Fourth Quarter of FY 1992. However, an overall plan for the State should be developed to include the goals of all economic development agencies. Moreover, such a plan would assist the State in determining the costs, setting priorities, and evaluating progress.

1984 - 1991 Accomplishments

Total funding for KTEC and All Programs Summary Report, FY 1984 - FY 1991*

Investments
\$22.5 million in state funding
\$24.3 million in industry funding
\$14.1 million in federal funding
\$11.5 million in venture capital
\$.1 million institutional funding

Results
\$17.2 million in increased sales
49 company start-ups
25 company expansions
3,316 jobs created
463 industry employees trained
100 new technologies
61 patents issued

Kansas Centers of Excellence Summary Report, FY 1984 - FY 1991*

Investments
\$8.92 million in state funding
\$10.67 million in industry funding
\$12.66 million in federal funding

Applied Research Matching Grant Fund Summary Report, FY 1984 - 1991*

Investments
\$7.1 million in state funding
\$11.9 million in industry funding
208 grants awarded
20 projects completed

**Includes activities of KTEC's predecessor, the Kansas Advanced Technology Commission.*

Centers of Excellence

In 1983 the Kansas legislature created the Centers of Excellence program, and the Kansas Board of Regents authorized three centers. These centers are now known as the Higuchi Biosciences Center at the University of Kansas, the Advanced Manufacturing Institute at Kansas State University, and the National Institute for Aviation Research at Wichita State University. The Center for Technology Transfer at Pittsburg State University was established in 1988 and the Center for Excellence in Computer-Aided Systems

Engineering at the University of Kansas was established in 1989.

KTEC Centers of Excellence are university-based research centers that serve the technical needs of Kansas businesses. Each of the five centers has its own technology focus and provides applied and fundamental research, product development, networking programs, training, seminars and technical consulting for client companies.

Although each center serves a different industry and has a

unique set of programs and organizational structure, each is meant to meet three objectives:

1. To build high quality research programs that are focused and comprehensive;
2. To develop and transfer technology to industry, and commercialize technology; and
3. To assist in the expansion of existing companies and the formation of new companies.

K.S.A. 74-8106 empowered KTEC to establish and evaluate Centers of Excellence, and award funding on

Board of Directors



Standing (l-r): The Honorable Dave Kerr, State Senator, Hutchinson; Dr. Theodore Kuwana, Regent's Distinguished Professor, University of Kansas, Lawrence; Dr. F. Victor Sullivan, Dean, School of Technology and Applied Science, Pittsburg State University, Pittsburg; Lloyd T. Silver, Jr., President, LSC, Inc., Mission Hills; Dr. Gale Simons, Associate Dean for Research and Director Engineering Experiment Station, Kansas State University, Manhattan; The Honorable George Dean, State Representative, Wichita; Sam Brownback, Secretary, Kansas Board of Agriculture, Topeka. Seated (l-r): The Honorable Rochelle Chronister, State Representative, Neodesha; John Moore, Senior Vice President, Cessna Aircraft, Wichita; William Brundage, President of KTEC, Topeka; Chairman Carol Wiebe, Director Economic Development, Hillsboro Development Corporation, Hillsboro; Dr. John Breazeale, Vice President Academic Affairs, Wichita State University, Wichita; The Honorable Norma Daniels, State Senator, Valley Center. Not Pictured: Laura Nicholl, Secretary, Kansas Department of Commerce, Topeka; Richard A. Bendis, President, Management Resources of America, Inc., Overland Park; Ivan W. Wyatt, Kansas Farmers Union, McPherson; John Davis, President, Fidelity State Bank, Garden City.

a competitive basis. The "Qualification and Evaluation Criteria for Centers of Excellence" specifies KTEC's expectations for existing and proposed centers.

Each of the Centers is measured by a comprehensive set of quantitative and qualitative criteria. In addition, the Centers undergo a rigorous peer review every other year by a team of nationally recognized individuals with expertise that meshes with the various Center's research focus.

In FY 1991 KTEC appropri-

Advanced Manufacturing Institute (AMI)

Kansas State University

Focusing on research in integrated design, manufacturing and assembly, and the intelligent processing of engineered materials, this Center supports and collaborates with Kansas companies of all sizes to enhance their manufacturing technology, develop new products and increase productivity.

AMI leveraged its core funding of \$675,000 with more than \$725,000 from industry and federal sources. More than 134 companies actively participated in Center activities, and 50 received direct technical assistance.

FY 1991 accomplishments included:

- approval by the Kansas Board of Regents changed

ated \$3.2 million funding to five Centers of Excellence, including:

- \$675,000 to the Advanced Manufacturing Institute;
- \$300,000 to the Center for Excellence in Computer-Aided Systems Engineering ;
- \$360,000 to the Center for Technology Transfer;
- \$1.05 million to the Higuchi Biosciences Center; and
- \$780,000 to the National Institute for Aviation Research.

A description of each Center and its 1991 accomplishments follows.

the center's name to AMI.

- installation of equipment completed and operational for Integrated Design, Manufacture and Assembly laboratory.
- 13 conferences (five satellite) and workshops were held with more than 700 participants.
- 15 new technologies or industrial processes were researched or developed.
- 18 grant proposals were submitted to local and national funding agencies for a total of \$3.25 million.
- initiation and funding of the Intelligent Processing of Engineered Materials program.
- five-year funding in the amount of \$1,229,241 was approved by the Federal Department of Energy for AMI as a test site for electric vehicles.

Continued on page 8

Mid-America Manufacturing Technology Center

In March 1991, the National Institute of Standards and Technology (NIST) awarded KTEC a Manufacturing Technology Center grant to help 2,600 small- to mid-sized manufacturers in the Kansas and Kansas City metropolitan area. The \$12.9 million grant (over six years) will facilitate the establishment of the Mid-America Manufacturing Technology Center (MAMTC).

The NIST program is prestigious. Kansas' proposal was one of two selected from a field of 20 proposals in a national competition. MAMTC's goal is to advance the technical capabilities of small manufacturers, typically those having less than 500 employees, and to ensure that these manufacturers remain competitive globally.

MAMTC is designed to help small manufacturers become more productive and competitive. Services will focus on placing advanced manufacturing technology on the factory floor. Clients can reduce their costs and develop new markets through four main types of help:

- direct consultation — engineers visit companies, identify and resolve problems.
- training — customized and general seminars and workshops.
- networks — discuss problems, develop new relationships, tell MAMTC what they need.
- demonstrations — give companies a chance to see equipment without having to purchase it.

MAMTC will provide assistance in many areas of technology. It's anticipated that the majority of their work will be in quality enhancement, CAD/CAM, process planning, plant layout, inventory control, cost accounting, scheduling, materials handling, and inspection.

Centers of Excellence

continued

Center for Excellence in Computer Aided Systems Engineering (CECASE)

University of Kansas

CECASE was established at the University of Kansas in October of 1989 to meet the design and computer-aided systems engineering needs of Kansas companies. Specifically, CECASE's purpose is to conduct multi-disciplined research into methodologies for computer aided analysis and design of advanced engineering systems, and to develop prototype software products.

In 1991 the Center received \$300,000 in core funding from KTEC. Joint research projects with industry and federal agencies added \$497,558 to its operating budget. CECASE obtained university funding and industry matching funds for equipment totalling \$169,516.

FY 1991 accomplishments included:

- hiring of permanent staff for Center.
- five companies sponsoring work at CECASE plus an additional nine companies actively participating at the Center.
- two new companies formed through Center assistance.
- completion of three software packages.

Center for Technology Transfer (CTT)

Pittsburg State University

The Center's technology transfer, technical assistance and research programs help companies from a wide range of industries in design, testing, and developing prototypes, products and processing methods.

CTT has a special partnership with the Institute for Economic Development at Pittsburg State. The collaboration provides business clients access to management assistance, capital creation, and technology transfer expertise.

CTT leveraged its core funding of \$360,000 with \$216,683 in industry funding for core programs and KTEC Applied Research Matching Fund awards.

In FY 1991 CTT embarked upon a joint venture with the University of Southern Mississippi and KTEC to establish a consortium for plastics and polymer technology commercialization.

FY 1991 accomplishments included:

- technical assistance to more than 100 Kansas businesses.
- assistance in 20 technology transfer projects.

- five new companies formed due to significant help from CTT.
- 10 patents or copyrights issued.
- two new technologies developed.
- six conferences sponsored with more than 900 participants.

Higuchi Biosciences Center *University of Kansas*

The Higuchi Biosciences Center (HBC) includes the Center for Biomedical Research, the Center for Bioanalytical Research (CBAR), the Center for Drug Delivery Research (CDDR) and the new Center for Molecular Engineering and Immunology (CMEI). Two additional centers will be added in future years. The various research foci include the three activities that are essential to the pre-clinical phase of drug therapy development—analysis, delivery, and formulation.

During FY 1991, HBC leveraged its core funding of \$1.05 million with \$2.15 million in federal grants and contracts, and \$1.75 million in corporate grants and contracts.

Overall highlights included:

- more than 40 companies interacted with HBC.

- 11 core-funded and eight new industry-funded research projects initiated.
- two Kansas companies, Oread Laboratories, Inc., and Cypress Systems, Inc., began marketing products that originated in HBC research.

- the National Institutes of Health awarded \$4.9 million in grants for the construction of a new biotechnology building that will house HBC.

- HBC sponsored three

conferences and offered two short courses.

- four technologies in various stages of transfer to the commercial sector.
- established the Hybridoma/Tissue Culture Laboratory to provide cell growth services.

Center for Bioanalytical Research

Established in 1983, CBAR develops methods to detect, identify and analyze trace amounts of biologically active compounds in living systems and environmental contaminants.

FY 1991 accomplishments included:

- five new core-funded projects.
- three industry-sponsored pharmaceutical analysis projects with Roche Dermatologics, Sterling Drug, and Marion Merrell Dow.
- three technologies transferred to Oread Laboratories for commercialization.

Continued on page 10

Technology Transfer and Referral Services

KTEC has spent more than two years establishing a technical information database to support economic development in Kansas.

Through the database, KTEC plans to disseminate research and technical information; refer clients to faculty researchers and laboratories for testing new products or processes; assist inventors in locating enterprises or entrepreneurs that may have applications for their innovations; provide management assistance to small enterprises of special importance to the Kansas economy; and encourage the use of state resources at educational institutions and small business development centers.

The Kansas Technology Resource (KTR) Data Base Project involves the creation of two personal computer-based databases—the first focuses on people and resources at the universities, while the second will focus on the private sector.

Using a classification scheme based upon the Library of Congress Classification Schedule, the KTR database currently has more than 1,300 entries, and is being implemented at Kansas State University, Emporia State University, Washburn University, Ft. Hays State University, the University of Kansas, Wichita State University, and Pittsburg State University.

The KTR database will provide an inventory of university-based research resources, capabilities, facilities, and equipment; independent laboratory research resources; corporate research and development activities; private marketing resources; vocational and technical training programs; and university-held and privately-held intellectual property available for commercialization.

Centers of Excellence

continued

Center for Drug Delivery Research

CDDR's focus is research that leads to the development and commercialization of pharmaceutically-based products including drug delivery systems, prodrugs as drug delivery systems, and preclinical systems.

FY 1991 accomplishments included:

- four new core-funded projects.
- five new industry-sponsored projects with Ciba-Geigy, Taisho Pharmaceuticals, Rugby-Darby, and Marion-Merrell Dow.
- entering a joint agreement with Oread Laboratories to study an anti-cancer drug.
- developing a proposal to move CDDR's cyclodextrin to the point that an investigational new drug application can be filed with the FDA.

Center for Molecular Engineering and Immunology

CMEI's focus is research that examines genetic engineering, including the control of antibody formation.

FY 1991 accomplishments included:

- two industry-funded research projects underway.

National Institute for Aviation Research (NIAR)

Wichita State University

Established as a Center of Excellence in 1985, NIAR responds to the research and advanced technology requirements of the aviation industry.

The Institute has built a solid reputation of working with private industry as well as government in such areas as: aerodynamics and propulsion; crashworthiness, aging aircraft and other structure issues; aircraft deicing; advanced flight stimulations and human factors; advanced manufacturing technology, producibility and quality; information systems and management issues in aircraft design, manufacture and operation.

To leverage NIAR's core funding of \$780,000 in FY 1991, it secured \$2.37 million in industry and the federal government matching.

FY 1991 accomplishments included:

- 141 companies assisted.
- operational status of the Impact (Crash) Dynamics Laboratory.
- providing product development support to 27 individuals and firms.

- winning \$116,000 National Science Foundation grant to upgrade the Institute's Walter Beech Memorial Wind Tunnel.
- publishing a unique Airline Quality Rating methodology that resulted in national interviews.
- presentation of NIAR's capabilities to six major aerospace manufacturers and three federal laboratories.
- 32 workshops/short courses with 956 participants.
- continuing aviation research for the Federal Aviation Authority.

Applied Research Matching Fund

With an eye on commercial application, and a finger on the pulse of the Kansas economy, KTEC awards Applied Research Matching Fund monies to private enterprises and Kansas educational institutions.

Projects must apply current scientific and technological knowledge and lead to new developments that can have a positive impact on the Kansas economy. Every proposal faces close scrutiny of both the research direction and the budget anticipated in the project by the Applied Research Matching Fund Committee. In addition, a wide network of technical experts is drawn upon for recommendations as to which projects should receive funding. KTEC funds up to 40 percent of the project's research costs. The industry match must be 60 percent or greater.

In FY 1991, 60 proposals were presented to KTEC for their potential to lead to innovation, new knowledge or technology. Based upon staff investigation and committee recommendations, 52 of those projects received funding. This

\$1,524,980 investment of state funds is a sound method of expanding the technological base of Kansas, as well as enhancing employment opportunities. The industry match in these projects totaled \$2,645,260 for a joint investment of \$4,170,240 in Kansas' future.

(Grants are listed on pages 12, 14, and 16.)

Training Equipment Grants

In FY 1989 KTEC made its first Training Equipment Grants to four Kansas Area Vocational Technical Schools and Community Colleges. In FY 1990, funding constraints forced KTEC to eliminate this valuable investment for the State. However, in FY 1991, the vision of the Kansas Legislature allowed KTEC to once again fund this program.

Briefly, the proposals are:

- Wichita AVTS will train machinists on a CNC milling and lathe/turning center. This project is intended to alleviate the acute labor shortage for highly skilled machinists in the Wichita area. Generally, it will serve the 150 small machine shops in the area with on-site technical training.
- Garden City CC will focus on upgrading skills related to the utilization of automated systems (electronics, hydraulics, pneumatics and robotics) in various Southwest Kansas industries.
- Cowley County CC will train aircraft powerplant mechanics and develop the skills they need to meet upgraded FAA maintenance guidelines. General Electric, which employs 1,000 individuals in Cowley County has invested roughly \$2 million in the training equipment for the college.

School	Project	KTEC\$	Match\$
Wichita Area Vocational-Technical School	Computer Integrated Manufacturing Technology	\$60,000	\$60,000
Garden City Community College	Enhancement of Industrial Technology Training Equipment	\$45,000	\$45,000
Cowley County Community College	Aviation Power-plant Mechanic Program	\$45,000	\$45,000

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Company Name	Location	Project	KTECS	Match\$	University
Advanced Video Technology Inc.	Overland Park	Video Teleconferencing Room Controller	\$51,472	\$96,196	
Agri-Technology, Ltd.	Coffeyville	Bi-Rotor Combine Harvester Development, Phase II	\$56,236	\$84,354	Kansas State University
American White Wheat Producers Association	Atchison	Research, Development, and Implementation of a Marketing System for Hard White Winter Wheat	\$34,498	\$52,652	
ASIMA Corporation	Independence	Development and Commercialization of Process Technology of Waste By-Products and Non-Traditional Feed Ingredients	\$98,000	\$214,366	Pittsburg State University
BMC America	El Dorado	BMC Rotary Valve Gemini 350 V-8	\$14,000	\$23,100	
Beech Aircraft Corporation	Wichita	Resin Transfer Molding Producibility Study for Beech Aerospace High Performance Low Cost Missile	\$14,900	\$44,416	Wichita State University
Beech Aircraft Corporation	Wichita	Development of Electrically Conductive Adhesives for Composite Systems	\$8,000	\$12,000	Kansas State University
BioCore, Inc.	Topeka	Economical Burn Dressing	\$15,000	\$28,500	
BioCore, Inc.	Topeka	Pilocarpine Delivery by Collagen Carrier	\$15,000	\$28,000	
BioCore, Inc.	Topeka	Collagen Foam	\$9,833	\$14,750	
Center for Technology Transfer	Pittsburg	Polymer Science Project (KTEC-PSU-CTT-USM)	\$250,000	\$375,000	Pittsburg State University
Cessna Aircraft Company	Wichita	Corrosion Fatigue Testing of 6013 Al Alloy Sheet Metal	\$1,840	\$4,002	Wichita State University
Champion Timing Systems Tech.	Topeka	Athletic Timing System	\$8,800	\$13,200	
Coleman Outdoor Products, Inc.	Wichita	Analysis and Testing of the Coleman RAM-X Canoe	\$8,127	\$18,198	Wichita State University
COMDISCO Systems, Inc.	Lawrence	Development of New Modeling Structures Within the Block Oriented Network Simulation (BONeS)	\$18,409	\$27,614	University of Kansas
Continental Exploration, Inc.	Leawood	Sequence Stratigraphic Investigation of Morrowan Strata to Improve Exploration Success	\$12,087	\$18,130	Kansas Geological Survey
CrustBuster, Inc.	Dodge City	Recycling/Composting Machinery & Equipment	\$65,752	\$98,626	
Cypress Systems, Inc.	Lawrence	Heavy Metals Analyzer	\$14,000	\$21,380	
DewEze Manufacturing, Inc.	Harper	Maximum Traction and Independent Deck Flotation for Automatic Leveling Mowers	\$59,400	\$89,100	

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Small Business Innovation Research Grants

KTEC provides matching funds up to a maximum of \$5,000 per proposal, to Kansas small businesses for preparation of proposals to federal agencies under the Small Business Innovation Research (SBIR) program. Proposals meeting the requirements are eligible for up to \$500,000 in federal awards.

KTEC also offers a support network for SBIR concept evaluation, identification of appropriate SBIR solicitation topics, federal agency contact, and technical assistance. This network includes academic researchers, industry experts, SBIR awardees, KTEC staff, business consultants, economic development organizations, and proposal writers. Costs involved in utilizing this network qualify for SBIR matching funds.

Federal agencies grant nearly \$500 million annually to innovative small firms under this program. SBIR awards are highly competitive, based on excellence in technological innovation as well as marketability. State cost-sharing in the application for an SBIR grant can be critical to the receipt of federal funds. An eligible company may receive up to three awards from KTEC annually.

FY 1991 SBIR awards:

Company	Project	KTEC\$	Match\$
BioCore, Inc. Topeka	Stress Induced Changes in Cellular Activity During Aging	\$5,000	\$5,768
BioCore, Inc. Topeka	Living Composites as In Vitro Biological Test Systems	\$5,000	\$5,768
BioCore, Inc. Topeka	An Alternative Matrix to Tissue Culture Plastic	\$5,000	\$5,768
Anthony Chiropractic Clinic, Inc. Lawrence	The Use of Prone Ambulatory Lumbar Extend-Track Unit for Degenerative Spondylos	\$1,840	\$2,760
Accumix Inc. Garden City	Precision Mixer for Drug or Micro-Ingredient Vapor Deposition on Feed	\$2,400	\$2,400
Wilch Manufacturing, Inc., Topeka	Orthopaedic Collagen Composite Matrix	\$3,675	\$3,675
Wilch Manufacturing, Inc., Topeka	Collagen Barrier Contraceptive Device	\$3,675	\$3,675
On-Track Corporation Overland Park	Electronic Vehicle Identification Number Reader	\$5,000	\$5,000
Midwest Superconductivity, Inc. Lawrence	Development of Poly Crystalline High Tc Superconducting Ceramics SQUID Based Detection Systems	\$3,710	\$3,710
B&D Instruments and Avionics, Inc. Valley Center	Piezopolymer Optimization for Boundary-Layer Flow Sensor Arrays	\$4,263	\$4,263

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Company Name	Location	Project	KTEC\$	Match\$	University
George Morris Associates	Eskridge	Morris Modular Carbonizer/ Incinerator Prototype Model #PS 90 5611	\$14,990	\$22,485	
George Morris Associates	Eskridge	Testing, Pre-Marketing Preparation Demonstration of the Carbonizer/Incinerator Prototype #PS 90 5611	\$14,600	\$21,900	
Gold Standard Medical Corp.	Leawood	Gold Standard - Blood Gas Probe	\$13,500	\$37,500	
Hybrids International, Ltd.	Olathe	Development of High Frequency Oscillators in Dip Package for Super Computers, High Speed Engineer, Phase II	\$46,025	\$71,100	
Interface Concepts Inc.	Pittsburg	Digitally Automated Employee/ Student Time and Attendance Verification System, Phase II	\$37,090	\$62,733	
Kansas Wheat Commission	Manhattan	Premium Color and Quality Wheats for Kansas' Agricultural Industry	\$60,000	\$90,000	
Kantronics, Inc.	Lawrence	High Frequency-Digital Signal Processing Modem	\$5,359	\$8,482	University of Kansas
Kantronics Inc.	Lawrence	Radio Frequency BIG Amp	\$12,068	\$18,102	
Komala Classic	Topeka	Komala Classic	\$6,000	\$12,940	
Kraft Tele-Robotics, Inc.	Overland Park	A Flexible Material Handling/ Cell Control System for an Automated Manufacturing Cell	\$26,025	\$39,041	Kansas State University
Magic Visions Inc.	Lawrence	Auditory and Tactile Prosthetic Device for the Sightless	\$12,000	\$18,000	
McPherson Manufacturing, Inc.	McPherson	Data Research Acquisition	\$15,000	\$64,250	
Midwest Superconductivity, Inc.	Lawrence	The Fabrication, Evaluation, and Application of a Superconducting Quantum Interference Device SQUID	\$75,000	\$112,500	
Mobay Corporation	Shawnee Mission	Development of Vaccine for Cats Against Toxoplasma Gondii	\$48,683	\$73,025	KU Medical Center
Mobay Corporation	Shawnee Mission	Development of a Vaccine for Cats Against Toxoplasma Gondii, Supplemental Funding	\$14,840	\$22,260	KU Medical Center
Mobile Care, Inc.	Great Bend	Mobile Care Units, Phase I	\$14,823	\$24,810	Kansas State University
Mobile Care, Inc.	Great Bend	Mobile Care Units, Phase II	\$35,500	\$57,665	Kansas State University
On-Track Corporation	Overland Park	On-Track Derailment/Flat Wheel Detection System	\$55,090	\$82,635	

Continued on page 16

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Industrial Liaison

KTEC's Industrial Liaison Program targets the retention and expansion of current Kansas businesses as its goal.

Two regional offices—the Western Kansas Technology Corporation (WKTC), located in Great Bend, and Tech-Industry Consultants, Inc. (TIC), located in Lenexa, help firms identify and solve production or other technical problems, improve production processes, and capitalize on advanced production techniques and technologies.

Each office received seed funding in the amount of \$150,000 from KTEC, in addition to sponsorship by a consortium of regional interests, including colleges, universities, businesses, and economic development organizations. These offices are non-profit organizations with a board of directors appointed for oversight of operations.

Chief operating officer for WKTC is Richard Sidles, hired in July 1990. A branch office in Garden City was established in November 1990 with the hiring of Kent Shelman. During its first year of operation, WKTC contacted 154 companies and provided technical assistance to 37.

President of TIC is Dr. Ivan Smith, hired in August 1990. TIC contacted 178 companies, individuals or organizations and provided assistance to 107 during its first year of operation. Approximately 20 presentations were made to service or civic organizations. During this first year, TIC arranged for university staff to assist over 30 companies in its service area. More than a dozen companies were assisted in proposal preparation for Applied Research Matching Fund grants.

WKTC and TIC were involved in the NIST proposal preparation and subsequent site visit. Both office locations will serve as regional offices for MAMTC.

In addition, TIC staff and consultants have been instrumental in assisting KTEC in setting up the MAMTC operation.

Kansas Value-Added Center

The Kansas Agriculture Value-Added Processing Center (KVAC), which is associated with Kansas State University, strives to enhance agricultural, economic and rural revitalization by promoting the growth of value-added processing facilities in Kansas.

FY 1991 funding for KVAC was \$674,276. As mandated by the State Legislature, KVAC does not compete for Center of Excellence funding but receives a line-item allocation in KTEC's budget. KVAC director Richard R. Hahn, Ph.D., and a 12-member leadership council govern and facilitate the activities of KVAC.

FY 1991 activities included:

- 18 projects funded in the amount of \$214,136.
- 13 training grants provided in the amount of \$8,743.
- six training seminars sponsored.
- four issues of Food Focus published and distributed to 850 Kansas companies.
- 35 companies assisted with nutrition labeling.
- more than 80 companies received technical assistance.

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Company Name	Location	Project	KTEC\$	Match\$	University
Oread Laboratories, Inc.	Lawrence	High Sensitivity Amino Acid Analyzer	\$24,900	\$80,150	University of Kansas
Oread Laboratories, Inc.	Lawrence	The Development of Chemiluminescent Immunoassays for a Thyroid Panel	\$10,660	\$15,990	
Oread Laboratories, Inc.	Lawrence	Modified Columns for Capillary Zone Electrophoresis	\$13,974	\$24,460	University of Kansas
Osborne Industries, Inc.	Osborne	FANSYS: A Design Program for Single and Variable Speed Fans	\$8,000	\$12,000	Kansas State University
Osborne Industries, Inc.	Osborne	Computerization of Sow Feeding & Estrous Detection Tests Under Low Investment Housing Conditions	\$9,980	\$14,970	Kansas State University
Plant Bioregulator Technologies Inc.	Overland Park	Investigation of PBT's Cytokinin Products for Turf Grass Seed Germination, Root Growth & Tillering	\$5,715	\$8,570	Kansas State University
Preco Industries Inc.	Shawnee Mission	Autoscript Software Rewrite	\$14,984	\$31,616	University of Kansas
Restaurant/Water Technologies	Lenexa	Water Study	\$4,800	\$7,200	Kansas State University
RUF Corporation	Olathe	A Geographic Document Editor	\$14,950	\$22,425	
Terra Sanctuary Inc.	Manhattan	Development, Testing and Destruction of Shotcreted Short-span Bridges and Culverts	\$28,285	\$115,190	
Terra Sanctuary Inc.	Manhattan	Development of Multi-Person Storm Shelter	\$6,260	\$37,826	
TouchFax Information Systems	Overland Park	Public Access Facsimile and Communications	\$80,140	\$120,210	
United Telecommunications Inc.	Westwood	Analysis and Simulation of Traffic Management Algorithm for Frame Relay/Fast Packet Networks	\$10,400	\$24,891	University of Kansas
Wilch Manufacturing, Inc.	Topeka	High Efficiency Sublimator	\$15,000	\$26,750	

Ad Astra Fund

Early stage or start-up firms in the advanced technology industry have tremendous potential for growth. Forseeing this kind of opportunity for the State of Kansas, KTEC formed a limited partnership in late 1988 with Sam Campbell, president of Campbell-Becker, Inc., a venture capital management firm in Lawrence. The partnership, called Technology Partners Limited Partnership, is the general partner of a seed-capital fund known as Ad Astra Fund, L.P. (Fund). KTEC is a limited partner.

Since 1989, the State of Kansas has appropriated \$1.8 million for investment in the Ad Astra Fund. Other partners interested in technology development include such companies as Kansas Power and Light, Southwestern Bell Telephone Company, along with several others.

The objective of the Fund is to enable KTEC to leverage the money appropriated by the State with private sector funds. The Fund seeks quality, high return investments in companies whose technology has a broad market appeal and a management team which is highly motivated, capable, and dedicated to the creation of a successful business.

To date, Ad Astra has made investments in 10 companies:

Crescendo Systems, Inc., a company involved in development of application software for banking institutions.

Cypress Systems, Inc., a company which develops and markets electrochemical instrumentation for scientists.

Diagnostic Concepts International, Inc., a manufacturer and marketer of diagnostic test kits used with automated testing instruments.

Interactive Concepts Inc., a company involved in marketing software products developed primarily by universities.

Midwest Superconductivity, Inc., a company involved in marketing a newly patented superconductive material.

Novatech, Inc., a designer and manufacturer of computer based data acquisition and control systems.

Oread Laboratories, Inc., a company involved in research and development studies of pharmaceutical products in the U. S. and abroad.

Sitback Technologies, Inc., a company which develops, publishes and markets personal computer software programs.

3D Biomedical Imaging, Inc., a company which develops and markets a software system for three-dimensional reconstruction and visualization.

BioCore, Inc., a company developing new applications using collagen.



Centers Committee, standing (l-r): The Honorable Rochelle Chronister, State Representative, Neodesha; Lloyd T. Silver, Jr., President, LSC, Inc., Mission Hills; Robert Dougherty, P.E., President, Dougherty & Associates, Prairie Village; Robert Zerwekh, Associate Vice Chancellor, Research, Graduate Studies and Public Service, University of Kansas, Lawrence; The Honorable Norma Daniels, State Senator, Valley Center. Seated: Chairman Marianne Hudson, KTEC, Topeka; Carol Morgan, Deputy Secretary, State Department of Commerce, Topeka; Timothy Donoghue, Vice Provost for Research and Dean of the Graduate School, Kansas State University, Manhattan.

Special Projects Fund

Special Projects are those opportunities that arise unexpectedly and yet do not qualify under any of KTEC's programs.

A number of projects have fallen into this category during KTEC's short history—projects on biotechnology, intellectual property, and telecommunications, to name a few.

FY 1991 was no exception to the rule:

Intellectual Property Program

KTEC has invested \$138,276 in FY 1991 to establish a program for protecting intellectual property, including funds for an Invention Development Assistance Program (IDAP), which grants up to \$1,000 to individuals to move their ideas into the marketplace.

The success of the Intellectual Property Program (started in February 1990) provided KTEC with an opportunity to form an organization called Innovative Technology Enterprise Corporation (ITEC) in March 1991.

Nearly 300 individuals have contacted KTEC concerning this program and more than 140 inventors have been assisted. More than 60 participants have attended the two seminars, Evaluating Your Invention, and Developing Your Invention which were

developed and are presented by ITEC's president, Clyde Engert. Twenty applicants for IDAP assistance have been approved.

Governor's Satellite Office

Annually KTEC joins the Kansas Departments of Administration, Commerce, Revenue, Human Resources, Corrections, Health & Environment, Wildlife and Parks, Transportation and the State Water Office in cost-sharing to fund the Governor's Satellite Office located in Wichita. The amount is \$2,500 and comes from the Special Project Fund.

State Fair

Each year KTEC sponsors a booth at the Kansas State Fair in Hutchinson. Historically the expenses for the booth have been funded from Special Projects. In FY 1991, the State Fair expenses were \$1,293.

Proposal to NIST for Manufacturing Technology Center

When the request for proposals was issued by the National Institute of Standards and Technology in September 1990, it was determined that a technical writer would be needed to complete Kansas' proposal. The KTEC Board of Directors approved \$9,000 of the Special Project Fund to meet this expense.

Application and Entrepreneurship in the Electronic Heartland

In late 1990, the Docking Institute of Public Affairs at Ft. Hays State University approached KTEC as a co-sponsor of a proposal to encourage the western Kansas workforce to address the training implications of the information age technology. KTEC dedicated \$2,500 of the Special Project fund to assist with the proposal.

Polymer Science Project

A collaborative polymer plastics research proposal linking the University of Southern Mississippi, Pittsburg State University and KTEC was developed with \$11,750 of the Special Project Fund in late 1990. Today there is a consortium between the universities in engineering plastic prototypes using advanced techniques.

Kansas Quality Improvement Plan

A consortium of Kansas businesses seek to build an international reputation for Kansas as a source of knowledge and experience in the practice of Total Quality Management. KTEC earmarked \$25,000 for development of a strategic plan to achieve this objective.

Patent Depository Library

The 1990 Kansas Legislature directed KTEC to recommend to the U.S.

Patent and trademark office a location for the Kansas Patent Depository Library. KTEC provided \$52,000 from its Special Project Fund to meet one-half of the one-time expenses necessary for the document collection and related equipment. The PDL was established at Ablah Library, Wichita State University.

Telecommunications

Today's information-based global economy requires state-of-the-art telecommunications. It is KTEC's belief that telecommunications is essential for Kansas to be successful in its economic development efforts.

For several years, KTEC has promoted a consortium of providers and users to establish a telecommunications network easily accessible by business, education, the medical community, and government.

In early 1991 four coder/decoder units (codecs) were purchased with \$200,000 from the Special Projects Fund. They are located at Southeast Kansas Education Service Center, Greenbush; University of Kansas Medical Center, Kansas City; Western Area Health Education Service Center, Hays; and the Advanced Manufacturing Institute, Manhattan.

Carry-over expenses for the Director of the Tele-

communications Consortium were covered through the Special Projects Fund. In FY 1991 this amounted to \$8,453.

National Science Foundation, Experimental Program to Stimulate Competitive Research (EPSCoR)

EPSCoR is a program offered to states that in the past have been unsuccessful in achieving funding from the National Science Foundation. KTEC agreed to invest \$5,000 from the Special Project Fund to assist in the preparation of the initial proposal which will analyze the current state of science and technology research in Kansas.

Mid-America Manufacturing Technology Center

After being awarded one of two new Manufacturing Technology Centers funded by the National Institute of Standards and Technology, the KTEC Board dedicated \$100,000 of the Special Project Fund to assist in getting the program up and running.

Administrative Costs

Special Projects office rental, phone service, and one-time costs incurred during the NIST site-visit amounted to \$18,546 in FY 1991.



Applied Research Matching Grant Committee: Standing (l-r) Dr. Theodore Kuwana, Regent's Distinguished Professor, University of Kansas, Lawrence; Dr. Stanley Koplík, Executive Director, Kansas Board of Regents, Topeka; Dr. Robert Stutz, Consultant, Shawnee Mission; Chairman Kevin Carr, KTEC, Topeka; Carol Wiebe, Director Economic Development, Hillsboro. Seated: Dr. Gale Simons, Associate Dean for Research and Director Engineering Experiment Station, Kansas State University, Manhattan; The Honorable George Dean, State Representative, Wichita; Dr. F. Victor Sullivan, Dean, School of Technology and Applied Science, Pittsburg State University, Pittsburg.



KTEC Staff: (l-r) Kevin Carr, Vice President; Cindy Diehl, Administrative Officer; Chris Cooper, Accountant; Janie Rutherford, Director of Marketing; Janelle Berroth, Database Operator. Not pictured: Marianne Hudson, Vice President; Christy Bayless, Secretary.

Investments in Kansas

BioCore promotes medical products

...a burn dressing that can be sold over the counter...an alternative surface for culture growth in laboratories...new-use products containing collagen. Each of these innovative ideas have come from one man and each idea has been promoted through KTEC.

Dr. Manoj Jain, the owner of a start-up company called BioCore, Inc., approached KTEC in the fall of 1990 to create a burn dressing that could be sold over the counter, similar to a Band Aid. KTEC funded an Applied Research Matching Grant for BioCore. By the summer of 1991 the product was on the market .

With the burn care market estimated at \$100 million, Dr. Jain optimistically hopes to fairly rapidly capture 1-2% of that market.

BioCore also has completed several Small Business Innovation Research proposals in application for federal funding.

Bi-rotor combine "in the field"

More than 10 years ago Mark Underwood, a Burr Oak farmer, visualized a combine that was physically smaller, had fewer moving parts, and was more efficient. Several years later, he put his ideas on paper and shared them with his cousin, Ralph Lagergren, now of Haslet, Texas.

Although agriculture was in the midst of a severe depression in the mid-eighties, the entrepreneurs pursued patents in 1984 and 1985. Then, from 1985 to 1990 the two raised funds, built a scale model, began lab testing at Kansas State University and finally, in June 1991 they began test cutting wheat in Texas. The prototype combine caused quite a stir in wheat fields, local coffee shops, and among custom wheat cutters from Texas to Nebraska, and Colorado. Today, it appears that the machine will eventually be manufactured and commercialized in Kansas.

Funding to build the scale model and perform the lab tests was provided by a KTEC Applied Research Matching Grant.

Testing facility plays key role in biz jet development

The CitationJet, recently flight-tested by Cessna Aircraft in Wichita has been enhanced by the accessibility of the National Institute of Aviation Research (a KTEC Center of Excellence) at Wichita State University.

As early as 1985, Cessna was working cooperatively with NASA and WSU to develop a wing featuring natural laminar flow airfoils. In 1987 wind tunnel studies at WSU were conducted to develop practical design flaps and control surfaces for use with the new airfoils. A KTEC Applied Research Matching Grant helped fund the research.

The CitationJet was introduced as a light business jet designed to carry six occupants at speeds as high as 437 m.p.h. and altitudes up to 41,000 ft. Today, Cessna has customer orders for approximately 100 CitationJets which sell for \$2.5 million each.

**REPORT
OF THE
INDEPENDENT
AUDITORS**

REPORT OF INDEPENDENT AUDITORS

Board of Directors
Kansas Technology Enterprise Corporation

We have audited the accompanying financial statements of the Kansas Technology Enterprise Corporation (KTEC), as of and for the year ended June 30, 1991. These financial statements are the responsibility of KTEC's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

As discussed in Notes 1 and 2, the financial statements include investments in limited partnerships. The values of the underlying investments held by these limited partnerships have been estimated by the general partners in the absence of readily ascertainable market values. We have reviewed the procedures and underlying documentation used by the general partners in arriving at the estimates of market value. Because of the inherent uncertainty of valuation, those estimated values may differ significantly from the values that would have been used had a ready market for the investments existed, and these differences may be material.

In our opinion, except for the effect of such adjustments, if any, as might have been determined to be necessary related to the valuation of the investments in limited partnerships as discussed in the previous paragraph, the financial statements referred to above present fairly, in all material respects, the financial position of the Kansas Technology Enterprise Corporation at June 30, 1991, and the results of its operations and cash flows of its proprietary fund types for the year then ended in conformity with generally accepted accounting principles.

Our audit was made for the purpose of forming an opinion on the financial statements taken as a whole. The combining financial statements are presented for purposes of additional analysis and are not a required part of the financial statements of the Kansas Technology Enterprise Corporation. Such information has been subjected to the auditing procedures applied in our audit of the financial statements and, in our opinion, is fairly stated in all material respects in relation to the financial statements taken as a whole.

Ernst & Young

Wichita, Kansas
November 8, 1991

KANSAS TECHNOLOGY ENTERPRISE CORPORATION

COMBINED BALANCE SHEET — ALL FUND TYPES AND ACCOUNT GROUP

June 30, 1991

	Governmental Fund Type	Proprietary Fund Type	Account Group	
<u>ASSETS</u>	<u>General</u>	<u>Enterprise</u>	General Fixed Assets	Total (Memorandum Only)
Cash and investments	\$ -	\$ 79,933	\$ -	\$ 79,933
Restricted cash and investments	-	19,151	-	19,151
Investments in limited partnerships	-	2,005,978	-	2,005,978
Accounts receivable	-	2,000	-	2,000
Unexpended appropriation	1,223,990	-	-	1,223,990
Prepaid expenses	-	475	-	475
General fixed assets	-	-	175,873	175,873
Equipment, net of accumulated depreciation	-	203	-	203
Total assets	<u>\$1,223,990</u>	<u>\$2,107,740</u>	<u>\$175,873</u>	<u>\$3,507,603</u>
<u>LIABILITIES, FUND EQUITY AND OTHER CREDITS</u>				
Liabilities:				
Accrued liabilities	\$ 31,857	\$ 2,968	\$ -	\$ 34,825
Fund equity and other credits:				
Investment in general fixed assets	-	-	175,873	175,873
Contributed capital	-	2,131,955	-	2,131,955
Accumulated deficit	-	(27,183)	-	(27,183)
Fund balance (deficit):				
Reserved for:				
Encumbrances	61,479	-	-	61,479
Grants and awards	1,162,511	-	-	1,162,511
Unreserved and undesignated	<u>(31,857)</u>	<u>-</u>	<u>-</u>	<u>(31,857)</u>
Total fund equity and other credits	<u>1,192,133</u>	<u>2,104,772</u>	<u>175,873</u>	<u>3,472,778</u>
Total liabilities, fund equity and other credits	<u>\$1,223,990</u>	<u>\$2,107,740</u>	<u>\$175,873</u>	<u>\$3,507,603</u>

See accompanying notes to financial statements.

KANSAS TECHNOLOGY ENTERPRISE CORPORATION
 STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN
 FUND BALANCE — GOVERNMENTAL FUND TYPE

Year ended June 30, 1991

	Governmental Fund Type <u>General</u>
Revenues:	
Appropriations from State of Kansas:	
General Fund	\$ 204,453
State Economic Development Initiatives Fund	5,229,889
Other revenues	<u>11,979</u>
Total revenues	5,446,321
Expenditures:	
Grants and awards	5,331,392
Salaries and wages	344,245
Contractual services	389,848
Commodities	8,570
Capital outlay	27,887
Miscellaneous	<u>39,261</u>
Total expenditures	<u>6,141,203</u>
Deficiency of revenues over expenditures	(694,882)
Other financing uses:	
Operating transfer out	<u>(95,000)</u>
Deficiency of revenues over expenditures and other financing uses	(789,882)
Fund balance at July 1, 1990	2,006,790
Less: Lapsed appropriations	(3,820)
Residual equity transfer out	<u>(20,955)</u>
Fund balance at June 30, 1991	<u>\$ 1,192,133</u>

See accompanying notes to financial statements.

KANSAS TECHNOLOGY ENTERPRISE CORPORATION

STATEMENT OF REVENUES, EXPENDITURES AND CHANGES IN FUND BALANCE -
BUDGET AND ACTUAL (BUDGET BASIS) — GENERAL FUND TYPE

Year ended June 30, 1991

	General Fund		
	Budget	Actual	Variance Favorable (Unfavorable)
Revenues:			
Appropriations from State of Kansas:			
General Fund	\$ 204,453	\$ 204,453	\$ -
State Economic Development Initiatives Fund	5,334,749	5,229,889	(104,860)
Other revenues	<u>-</u>	<u>11,979</u>	<u>11,979</u>
Total revenues	5,539,202	5,446,321	(92,881)
Expenditures:			
Grants and awards	6,425,787	5,331,392	1,094,395
Salaries and wages	346,678	344,245	2,433
Contractual services	520,398	353,584	166,814
Commodities	13,073	8,570	4,503
Capital outlay	13,637	89,366	(75,729)
Miscellaneous	<u>-</u>	<u>39,261</u>	<u>(39,261)</u>
Total expenditures	<u>7,319,573</u>	<u>6,166,418</u>	<u>1,153,155</u>
Deficiency of revenues over expenditures	(1,780,371)	(720,097)	1,060,274
Other financing uses:			
Operating transfer out	<u>-</u>	<u>(95,000)</u>	<u>(95,000)</u>
Deficiency of revenues over expenditures and other financing uses	<u>\$(1,780,371)</u>	(815,097)	<u>\$ 965,274</u>
Effect of current year encumbrances		61,479	
Effect of prior year encumbrances		(36,264)	
Fund balance at July 1, 1990		2,006,790	
Less: Lapsed appropriations		(3,820)	
Residual equity transfer out		<u>(20,955)</u>	
Fund balance at June 30, 1991		<u>\$ 1,192,133</u>	

See accompanying notes to financial statements.

KANSAS TECHNOLOGY ENTERPRISE CORPORATION

COMBINED STATEMENT OF REVENUES, EXPENSES AND
CHANGES IN ACCUMULATED DEFICIT — PROPRIETARY FUND TYPES

Year ended June 30, 1991

Operating revenues:	
Charges for services	\$ 4,515
Equity in net loss of limited partnerships	(66,248)
Miscellaneous	<u>360</u>
Total operating revenues	(61,373)
Operating expenses:	
Grants and awards	2,048
Salaries and wages	21,130
Contractual services	13,287
Commodities	822
Miscellaneous	<u>2,569</u>
Total operating expenses	<u>39,856</u>
Operating loss	(101,229)
Nonoperating revenues:	
Interest	<u>1,457</u>
Total nonoperating revenues	<u>1,457</u>
Loss before operating transfer	(99,772)
Operating transfer in	<u>95,000</u>
Net loss	(4,772)
Accumulated deficit at July 1, 1990	<u>(22,411)</u>
Accumulated deficit at June 30, 1991	<u>\$ (27,183)</u>

See accompanying notes to financial statements.

KANSAS TECHNOLOGY ENTERPRISE CORPORATION
COMBINED STATEMENT OF CASH FLOWS — PROPRIETARY FUND TYPES

Year ended June 30, 1991

Cash flows from operating activities:	
Operating loss	\$ (101,229)
Adjustments to reconcile operating loss to net cash used in operating activities:	
Depreciation	19
Equity in net loss of limited partnerships	66,248
Change in assets and liabilities:	
Accounts receivable	(2,000)
Prepaid expenses	(475)
Accounts payable	(89)
Accrued liabilities	<u>2,968</u>
Net cash used in operating activities	(34,558)
Cash flows from capital and related financing activities:	
Acquisition of capital assets	(222)
Capital contribution	<u>21,955</u>
Net cash provided by capital and related financing activities	21,733
Cash flows from noncapital financing activities:	
Operating transfer in	95,000
Cash flows from investing activities:	
Interest on investments	1,457
Investments in limited partnerships	<u>(7,242)</u>
Net cash used in investing activities	<u>(5,785)</u>
Net increase in cash and cash equivalents	76,390
Cash and cash equivalents at July 1, 1990	<u>22,694</u>
Cash and cash equivalents at June 30, 1991	<u>\$ 99,084</u>

See accompanying notes to financial statements.

Notes to Financial Statements June 30, 1991

1. Summary of significant accounting policies

The Kansas Technology Enterprise Corporation (KTEC), a body corporate and politic and a public instrumentality, was created by the legislature of the State of Kansas (State) in March 1986 (K.S.A. 74-8101) and transferred the responsibilities and duties of the existing State Office of Advanced Technology to KTEC effective January 12, 1987.

KTEC's principal statutory functions and responsibilities are:

- To foster innovation in existing and developing businesses, especially the creation, growth and expansion of Kansas enterprises in a diversified range of primary sectors, which develop value-added products, processes and services.
- To finance basic research, applied research and development, and technology transfer at Kansas educational institutions which meet competitive standards of excellence and which create innovative collaboration between Kansas educational institutions and Kansas enterprises.
- To award applied research matching grants to Kansas educational institutions and Kansas private enterprises in order to move innovation and applied research toward commercial application.
- To engage in seed-capital financing for the development and implementation of innovations or new technologies for existing resource, technology-based and emerging Kansas businesses.
- To provide technical referral services to such small, new, emerging or mature businesses and encourage Kansas educational institutions to establish technical information data bases and industrial liaison offices which are easily accessible by both private and public sector Kansas organizations.

The financial statements of KTEC have been prepared in conformity with generally accepted accounting principles (GAAP) as applied to government units. The Governmental Accounting Standards Board (GASB) is the accepted standard-setting body for establishing governmental accounting and financial reporting principles. The following is a summary of the more significant policies:

Reporting Entity

KTEC is a component unit of the State of Kansas as defined in pronouncements of the GASB. The operations of KTEC are presently funded through appropriations made by the State legislature. Receipt and disbursement of appropriations for KTEC operations are controlled by the State.

The accompanying financial statements include the transactions of all funds and account groups of KTEC. In evaluating how to define KTEC for financial reporting purposes, management has considered all potential component units. The decision to include a potential component unit in the reporting entity was made by applying the criteria set

forth in National Council on Governmental Accounting (NCGA) Statement 3 and the related NCGA Interpretation 7. The basic—but not the only—criterion for including a potential component unit within the reporting entity is the governing body's ability to exercise oversight responsibility. The most significant manifestation of this ability is financial interdependency. Other manifestations of the ability to exercise oversight responsibility include, but are not limited to, the selection of governing authority, the designation of management, the ability to significantly influence operations, and accountability for fiscal matters. A second criterion used in evaluating potential component units is the scope of public service. Application of this criterion involves considering whether the activity benefits the government and/or its citizens, or whether the activity is conducted within the geographic boundaries of the government and is generally available to its citizens. A third criterion used to evaluate potential component units for inclusion or exclusion from the reporting entity is the existence of special financing relationships, regardless of whether the government is able to exercise oversight responsibilities. Based upon the application of these criteria, the following organizations have been identified as part of the reporting entity:

Innovative Technology Enterprise Corporation (ITEC)

This nonprofit organization which is wholly-owned by KTEC was incorporated in March 1991 to assist Kansas entrepreneurs in the protection of new technology. KTEC provides financial and operational assistance as deemed necessary.

KTEC Holdings, Inc.

KTEC's wholly-owned subsidiary, KTEC Holdings, Inc. was incorporated in Kansas on April 19, 1988 to act as KTEC's nominee for the purpose of holding title to various seed-capital investments acquired for the exclusive benefit and account of KTEC.

Mid-America Manufacturing Technology Center (MAMTC)

This nonprofit corporation which is wholly-owned by KTEC was incorporated during fiscal 1991 to become a regional manufacturing resource for businesses by improving the efficiency and quality of manufactured goods.

The combined financial statements include the accounts of ITEC and KTEC Holdings, Inc. MAMTC had no financial activity during fiscal 1991. The following organization has been excluded from the reporting entity:

Kansas Agricultural Value-Added Processing Center (KVAC)

KVAC is an organization associated with Kansas State University. KTEC exercises no control over KVAC's budget or operations, nor does KTEC exercise oversight responsibility.

Basis of Presentation

The financial transactions of KTEC are recorded in individual funds and an account group. The various funds and account group are reported by type in the financial statements. Amounts in the "total-memorandum only" columns in the accompanying financial statements represent a summation of the combined financial statement line items of the fund types and account group and are presented only for analytical purposes. The summation includes fund types and account groups that use

Kansas Technology Enterprise Corporation
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different bases of accounting, both restricted and unrestricted amounts and interfund transactions that have not been eliminated. Consequently, amounts shown in the "total-memorandum only" columns are not comparable to a consolidation and do not represent the total resources available or total revenues and expenditures/expenses of KTEC.

KTEC uses the following fund categories, fund types, and account group:

GOVERNMENTAL FUND TYPE:

The General Fund is used to account for all financial resources except those required to be accounted for in another fund. The general fund is KTEC's operating fund and includes the portion of the State General Fund and State Economic Development Initiatives Fund appropriated to KTEC by the State of Kansas.

PROPRIETARY FUNDS:

Enterprise Funds are used to account for operations (a) that are financed and operated in a manner similar to private business enterprises - where the intent of the governing body is that the cost (expenses, including depreciation) of providing goods or services to the general public on a continuing basis be financed or recovered primarily through user charges; or (b) where the governing body has decided that periodic determination of revenues earned, expenses incurred, and/or net income is appropriate for capital maintenance, public policy, management control, accountability, or other purposes.

ACCOUNT GROUP:

The General Fixed Assets Account Group accounts for the fixed assets used in governmental fund type operations.

Basis of Accounting

The accounting and financial reporting treatment applied to a fund is determined by its measurement focus. The governmental fund is accounted for using a current financial resources measurement focus. With this measurement focus, only current assets and current liabilities generally are included on the balance sheet. Operating statements of this fund present increases (i.e., revenues and other financing sources) and decreases (i.e., expenditures and other financing uses) in net current assets.

The proprietary funds are accounted for on a flow of economic resources measurement focus. With this measurement focus, all assets and all liabilities associated with the operation of these funds are included on the balance sheet.

Fund equity (i.e., net total assets) is segregated into contributed capital and retained earnings components. Proprietary fund-type operating statements present increases (e.g., revenues) and decreases (e.g., expenses) in net total assets.

The modified accrual basis of accounting is used by the governmental fund type. Under the modified accrual basis of accounting, revenues are recognized when susceptible to accrual (i.e., when they become both

measurable and available). "Measurable" means the amount of the transaction can be determined and "available" means collectible within the current period or soon enough thereafter to be used to pay liabilities of the current period. Expenditures are recorded when the related fund liability is incurred.

The accrual basis of accounting is utilized by the proprietary funds. Under this method, revenues are recorded when earned and expenses are recorded at the time liabilities are incurred.

Budget

Annually, the legislature initiates KTEC's annual budget for the general fund through the appropriation process. Appropriations can be amended as fiscal conditions warrant, subject to legislative approval. Certain appropriations, referred to as "reappropriations," represent the continuation of a prior year's appropriation available in the current year. Unexpended appropriations are funds available for subsequent expenditures to the extent that encumbrances and reappropriations have been approved at June 30. Lapsed appropriations represent appropriated funds not expended or encumbered in the current year and not reappropriated to the following year.

The State's level of budgetary and accounting control is established through appropriation acts. The acts establish the authority for the various departments to expend monies from State funds. Shared funds are those State funds for which the State legislature has granted expenditure authorities to more than one agency. The financial statements of KTEC include an accounting of its financial transactions recorded within shared funds of the State and are not intended to present the entirety of all transactions and balances within those shared funds. The Kansas Annual Financial Report published by the State Department of Administration should be consulted for complete financial positions and results of operations for all funds of the State.

Encumbrances

Encumbrance accounting under which purchase orders, contracts and other commitments for the expenditure of monies are recorded in order to reserve that portion of the applicable appropriation is employed as an extension of formal budgetary control in the general fund. Encumbrances outstanding at year end do not lapse and are reported as reservations of fund balances since they do not constitute expenditures or liabilities.

Cash and Investments

At June 30, 1991, the balance sheet category cash and investments consisted solely of deposits (interest-bearing bank accounts and certificates of deposit) of which all was covered by federal depository insurance. All deposits are stated at cost which approximates market. KTEC currently invests only in certificates of deposit, though the Corporation's investment policy allows other investments in accordance with State of Kansas guidelines.

Restricted Assets

Restricted assets consist of certificates of deposit related to the Inventors Development Assistance Program (IDAP).

Investments in Limited Partnerships

Investments in limited partnerships are recorded at cost and are adjusted for KTEC Holding's equity in income or loss of the limited partnerships, including its share of unrealized gains or losses.

The value of the underlying investments held by the limited partnerships have been estimated by the general partners in the absence of readily ascertainable market values. Because of the inherent uncertainty of valuation, the estimated values of these investments may differ significantly from the values that would have been used had a ready market for the investments existed, and the differences could be material. The general partners believe that the estimated market value of these investments exceed the amounts reported on the balance sheet.

Distribution of net cash receipts and net capital proceeds of the limited partnerships are made at the sole discretion of the general partners. Distributions are shared among the partners in accordance with their applicable partnership interest as defined in the partners' agreements.

Prepaid Expenses

Payments made to vendors for services that will benefit periods beyond June 30, 1991, are recorded as prepaid expenses.

Inventories

KTEC has no inventories.

General Fixed Assets

General fixed assets acquired or constructed for general governmental purposes are reported as expenditures in the fund that finances the asset acquisition and capitalized in the General Fixed Assets Account Group, at cost (or estimate thereof). Donated fixed assets are reported at estimated fair market value at the time received. Depreciation is not provided on general fixed assets.

Equipment

Equipment acquired by the proprietary funds is reported at cost less accumulated depreciation. The provision for depreciation is computed using the straight-line method over the estimated useful lives of the related assets. The estimated useful life of this equipment is five years.

Compensated Absences

KTEC employees earn vacation based upon length of service, and unused vacation days can be carried forward to future years with certain limitations. KTEC accrues the cost of vacation pay as it is earned as a liability in the general fund.

Sick leave is earned by KTEC employees at a rate of one day per month of employment, with no total accumulation limit. Employees are not paid for accumulated sick leave upon termination. The costs of sick leave are recorded when disbursed.

Reserves

Reserves are reported in the general fund to indicate that a portion of

the fund balance is restricted by law or contract for a specific purpose.

Designated Fund Balances

The Board of Directors of KTEC have designated funds to be expended in subsequent years for certain projects and expenditures. Such designations represent financial resources available to finance these planned expenditures and are reported as a designated portion of the unreserved fund balance.

Grants and Awards

Grants and awards are recorded as expenditures in the year the grantee or awardee is entitled to the grant or award. Reservations of fund balances are recorded for grants and awards outstanding but not expended because the grantee or awardees are not entitled to such grants or awards until certain conditions are met.

Contributed Capital

Contributed capital represents amounts used to fund projects of the Proprietary Fund Types.

Appropriations Revenues

State appropriations are recorded as receivables (unexpended appropriations) and revenues when appropriation acts become effective.

Interfund Transactions

During the course of normal operations, KTEC has transactions between funds, including expenditures and transfers of resources to provide services. The accompanying financial statements generally reflect such transactions as operating transfers. Nonrecurring or nonroutine permanent transfers of equity are reported as residual equity transfers.

Financial Statement Presentation - Budget Basis

KTEC's policy is to prepare the annual operating budget on a basis which includes encumbrances as the equivalent of expenditures. The Statement of Revenues, Expenditures and Changes in Fund Balance - Governmental Fund Type does not include encumbrances outstanding at year end as expenditures because these would be reported as reservations of fund balances in accordance with generally accepted accounting principles under the modified accrual basis of accounting. The Statement of Revenues, Expenditures and Changes in Fund Balance - Budget and Actual (Budget Basis) - General Fund is prepared on the basis utilized in preparing the budget and, accordingly, includes encumbrances as expenditures.

Statement of Cash Flows

For purposes of the statement of cash flows for the proprietary fund types, all demand deposits and certificates of deposit (including restricted cash and investments) are considered to be cash equivalents.

Las Technology Enterprise Corporation
1991 Annual Report

2. Investments in limited partnerships

Investments in limited partnerships consist of the following:

Technology Partners, L.P.	\$ 290,378
Ad Astra Fund, L.P.	<u>1,715,600</u>
	\$ <u>2,005,978</u>

KTEC Holdings, Inc. is the sole limited partner of Technology Partners, L.P. Technology Partners, L.P. was formed for the exclusive purpose of organizing and serving as general partner of Ad Astra Fund, L.P. Ad Astra Fund, L.P. was established to make equity, equity-related or debt investments in seed-capital and early stage financings.

3. General fixed assets

The following is a summary of changes in general fixed assets for the year ended June 30, 1991:

	Balance at <u>July 1, 1990</u>	<u>Additions</u>	<u>Retirements</u>	Balance at June 30, <u>1991</u>
Professional equipment	\$ 9,212	\$ 1,125	\$ -	\$ 10,337
Office furnitures, fixtures and equipment	41,031	5,037	455	45,613
Other equipment, machinery, furniture and fixtures	6,468	1,128	-	7,596
Books and library material	1,551	553	-	2,104
Microcomputer systems and support equipment	16,396	15,693	-	32,089
Computer systems equipment	42,666	677	-	43,343
Computer software	<u>31,117</u>	<u>3,674</u>	<u>-</u>	<u>34,791</u>
	\$ <u>148,441</u>	\$ <u>27,887</u>	\$ <u>455</u>	\$ <u>175,873</u>

4. Residual equity transfer

During the year ended June 30, 1991, KTEC transferred \$20,955 (representing funds of the Inventors Development Assistance Program (IDAP)), to its wholly-owned subsidiary, Innovative Technology Enterprise Corporation (ITEC). This transfer was recorded as a residual equity transfer in the accounts of the general fund and as contributed capital in the accounts of ITEC.

5. Employee pension plan

Substantially all employees of KTEC participate in the Kansas Public Employees Retirement System ("System"), a cost-sharing multiple-employer public employee retirement system. The covered payroll for employees covered by the System for the year ended June 30, 1991 was \$264,958, while the total payroll was \$296,293.

Substantially all employees of KTEC are eligible to participate in the System after one year of employment. Employees who retire at or after age 65 are entitled to a retirement benefit, payable monthly for life, equal to 1 percent of their final average salary for each year of "prior" service and 1.25 to 1.5 percent for each year of "participating" service depending upon the number of years of service. Final average salary is the employee's average salary over the highest four years of credited service. Benefits fully vest on reaching 10 years of service. Vested employees may retire at age 55 to 60 with 15 years of credited service and receive reduced retirement benefits. Vested employees may retire at age 60 to 65 with 10 or more years of credited service, also at reduced benefits. The system also provides death and disability benefits. Benefits are established by State statute.

Covered employees are required by State statute to contribute 4 percent of their salary to the plan. The employer is required by the same statute to contribute the remaining amounts necessary to pay benefits when due. KTEC's contribution requirement for the year ended June 30, 1991 was \$18,993, which consisted of \$8,563 from the employer and \$10,430 from employees; these contributions represented 3.2 percent and 3.9 percent of covered payroll, respectively. Contribution requirements are actuarially determined and all such contributions were made.

The "pension benefit obligation" is a standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases and step-rate benefits, estimated to be payable in the future as a result of employee service to date. The measure, which is the actuarial present value of credited projected benefits, is intended to help users assess the System's funding status on a going concern basis, assess progress made in accumulating sufficient assets to pay benefits when due, and make comparisons among the System and employers. The System does not make separate measurements of assets and pension benefit obligations for individual employers. The pension benefit obligation at January 1, 1990 (the date of the most recent actuarial valuation available) for the System as a whole, determined through an actuarial valuation performed as of that date, was \$3.38 billion. The System's net assets available for benefits on that date were estimated to be \$3.46 billion, leaving an excess funded pension benefit obligation estimated at \$74 million. The contribution of KTEC

(employer and employee) for the period covered by this report represents .02 percent of total contributions required of all participating entities.

Ten-year historical trend information showing the System's progress in accumulating sufficient assets to pay benefits when due is presented in the Systems' June 30, 1990 comprehensive annual financial report.

6. Operating leases

KTEC leases office space and certain office equipment under operating lease agreements with remaining lease terms of one to three years. Future minimum payments under these lease agreements are as follows:

Fiscal year <u>ending June 30</u>	<u>Amount</u>
1992	\$40,944
1993	5,940
1994	<u>5,940</u>
	<u>\$ 52,824</u>

Total rent expenditures for the year ended June 30, 1991 were \$39,445.

7. Segment information for Enterprise Funds

KTEC Holdings, Inc. holds title to various seed-capital investments whereas Innovative Technology Enterprise Corporation (ITEC) is intended to be self-supporting through fees charged for services to Kansas entrepreneurs.

Financial segment information as of and for the year ended June 30, 1991 related to these two enterprise funds is presented below:

	<u>KTEC Holdings, Inc.</u>	<u>Innovative Technology Enterprise Corporation</u>	<u>Total</u>
Operating revenues	\$(65,888)	\$4,515	\$(61,373)
Depreciation expense	-	19	19
Operating loss	(76,885)	(24,344)	(101,229)
Operating transfers in	-	95,000	95,000
Net income (loss)	(76,885)	72,113	(4,772)
Capital contributions	1,000	20,955	21,955
Equipment additions	-	222	222
Net working capital	2,011,704	92,865	2,104,569
Total assets	2,011,704	96,036	2,107,740
Total equity	2,011,704	93,068	2,104,772

8. Revenues and expenditures

As mentioned in Note 1, KTEC operations are funded by the State of Kansas through the State General Fund and the State Economic Development Initiatives Fund. The composition of general fund revenues and related expenditures by funding source is as follows:

	<u>State General Fund</u>	<u>State Economic Development Initiatives Fund</u>	<u>Total</u>
Revenues:			
Appropriations from State of Kansas	\$204,453	\$5,229,889	\$5,434,342
Other revenues	-	<u>11,979</u>	<u>11,979</u>
Total revenues	<u>\$ 204,453</u>	<u>\$ 5,241,868</u>	<u>\$ 5,446,321</u>
Expenditures:			
Grants and awards	\$ 5,000	\$5,326,392	\$5,331,392
Salaries and wages	-	344,245	344,245
Contractual services	175,007	214,841	389,848
Commodities	6,968	1,602	8,570
Capital outlay	18,977	8,910	27,887
Miscellaneous	<u>5,905</u>	<u>33,356</u>	<u>39,261</u>
	<u>\$ 211,857</u>	<u>\$5,929,346</u>	<u>\$6,141,203</u>

KANSAS TECHNOLOGY ENTERPRISE CORPORATION
COMBINING BALANCE SHEET — ENTERPRISE FUNDS

June 30, 1991

<u>ASSETS</u>	<u>KTEC Holdings, Inc.</u>	<u>Innovative Technology Enterprise Corporation</u>	<u>Total</u>
Cash and investments	\$ 5,726	\$ 74,207	\$ 79,933
Restricted cash and investments	-	19,151	19,151
Investments in limited partnerships	2,005,978	-	2,005,978
Accounts receivable	-	2,000	2,000
Prepaid expenses	-	475	475
Equipment, net of \$19 accumulated depreciation	-	203	203
Total assets	<u>\$ 2,011,704</u>	<u>\$96,036</u>	<u>\$ 2,107,740</u>
 <u>LIABILITIES AND FUND EQUITY</u> 			
Liabilities:			
Accrued liabilities	\$ -	\$ 2,968	\$ 2,968
Fund equity:			
Contributed capital	2,111,000	20,955	2,131,955
Retained earnings (deficit):			
Unreserved	(99,296)	72,113	(27,183)
Total fund equity	<u>2,011,704</u>	<u>93,068</u>	<u>2,104,772</u>
Total liabilities and fund equity	<u>\$ 2,011,704</u>	<u>\$ 96,036</u>	<u>\$ 2,107,740</u>

KANSAS TECHNOLOGY ENTERPRISE CORPORATION

COMBINING STATEMENT OF REVENUES, EXPENSES AND
CHANGES IN RETAINED EARNINGS (DEFICIT) — ENTERPRISE FUNDS

Year ended June 30, 1991

	<u>KTEC</u> <u>Holdings, Inc.</u>	Innovative Technology Enterprise Corporation	<u>Total</u>
Operating revenues:			
Charges for services	\$ -	\$ 4,515	\$ 4,515
Equity in net loss of limited partnerships	(66,248)	-	(66,248)
Miscellaneous	<u>360</u>	<u>-</u>	<u>360</u>
Total operating revenues	(65,888)	4,515	(61,373)
Operating expenses:			
Grants and awards	-	2,048	2,048
Salaries and wages	-	21,130	21,130
Contractual services	10,619	2,668	13,287
Commodities	-	822	822
Miscellaneous	<u>378</u>	<u>2,191</u>	<u>2,569</u>
Total operating expenses	<u>10,997</u>	<u>28,859</u>	<u>39,856</u>
Operating loss	(76,885)	(24,344)	(101,229)
Nonoperating revenues:			
Interest	<u>-</u>	<u>1,457</u>	<u>1,457</u>
Total nonoperating revenues	<u>-</u>	<u>1,457</u>	<u>1,457</u>
Loss before operating transfer	(76,885)	(22,887)	(99,772)
Operating transfer in	<u>-</u>	<u>95,000</u>	<u>95,000</u>
Net income (loss)	(76,885)	72,113	(4,772)
Retained earnings (deficit) at July 1, 1990	<u>(22,411)</u>	<u>-</u>	<u>(22,411)</u>
Retained earnings (deficit) at June 30, 1991	<u>\$ (99,296)</u>	<u>\$ 72,113</u>	<u>\$ (27,183)</u>

KANSAS TECHNOLOGY ENTERPRISE CORPORATION
COMBINING STATEMENT OF CASH FLOWS — ENTERPRISE FUNDS

Year ended June 30, 1991

	<u>KTEC</u> <u>Holdings, Inc.</u>	<u>Innovative</u> <u>Technology</u> <u>Enterprise</u> <u>Corporation</u>	<u>Total</u>
Cash flows from operating activities:			
Operating loss	\$(76,885)	\$(24,344)	\$(101,229)
Adjustments to reconcile operating loss to net cash used in operating activities:			
Depreciation	-	19	19
Equity in net loss of limited partnerships	66,248	-	66,248
Change in assets and liabilities:			
Accounts receivable	-	(2,000)	(2,000)
Prepaid expenses	-	(475)	(475)
Accounts payable	(89)	-	(89)
Accrued liabilities	<u>-</u>	<u>2,968</u>	<u>2,968</u>
Net cash used in operating activities	(10,726)	(23,832)	(34,558)
Cash flows from capital and related financing activities:			
Acquisition of capital assets	-	(222)	(222)
Capital contribution	<u>1,000</u>	<u>20,955</u>	<u>21,955</u>
Net cash provided by capital and related financing activities	1,000	20,733	21,733
Cash flows from noncapital financing activities:			
Operating transfer in	-	95,000	95,000
Cash flows from investing activities:			
Interest on investments	-	1,457	1,457
Investments in limited partnerships	<u>(7,242)</u>	<u>-</u>	<u>(7,242)</u>
Net cash provided by (used in) investing activities	<u>(7,242)</u>	<u>1,457</u>	<u>(5,785)</u>
Net increase (decrease) in cash and cash equivalents	(16,968)	93,358	76,390
Cash and cash equivalents at July 1, 1990	<u>22,694</u>	<u>-</u>	<u>22,694</u>
Cash and cash equivalents at June 30, 1991	<u>\$ 5,726</u>	<u>\$93,358</u>	<u>\$ 99,084</u>



**Kansas Technology
Enterprise Corporation**

112 West Sixth, Suite 400
Topeka, KS 66603-3869

National Association
of
State Development Agencies

Management Review
of the Kansas Technology
Enterprise Corporation
Evaluation Results



KANSAS
TECHNOLOGY
ENTERPRISE
CORPORATION

112 W. 6th, Suite 400
Topeka, KS 66603

EOE

December 1991

*Eco-Devo
Attach # 4
01-30-92*

CONCLUSION

"The KTEC program is a unique and effective mechanism for promoting technology development. It represents the kind of public/private partnership that many states are trying to build."

"KTEC in most of its practices has recognized its responsibilities to its primary investor—the state government of Kansas. It has acted prudently and conservatively in managing itself both like a private corporation and a state agency, giving state government a dual set of controls and accountability systems."

"The KTEC partnership should maintain its technology focus so that this valuable organization can continue to function most effectively."

"The Kansas Legislature carefully and artfully structured KTEC to be an effective advocate and support mechanism for technology industries, and this is one of the reasons for its tremendous success in the relatively short period of three years."

"Together KDOC, KTEC and Kansas Inc. can insure that the resources and expertise needed are available and properly applied to best provide jobs and economic development in Kansas."

A complete copy of the evaluation report is available by contacting KTEC's office, 913/296-5272.

1984 - 1991 ACCOMPLISHMENTS

Total funding for KTEC and All Programs Summary Report, FY 1984 - FY 1991*

Investments:

\$22.5 million in state funding
\$24.3 million in industry funding
\$14.1 million in federal funding
\$11.5 million in venture capital

Results:

\$17.2 million in increased sales
49 company start-ups
25 company expansions
3,316 jobs created
100 new technologies
61 patents issued

Kansas Centers of Excellence

Summary Report, FY 1984 - FY 1991*

Investments:

\$8.92 million in state funding
\$10.67 million in industry funding
\$12.66 million in federal funding

Applied Research Matching Fund

Summary Report, FY 1984 - 1991*

Investments:

\$7.1 million in state funding
\$11.9 million in industry funding
208 grants awarded
20 projects completed

**Includes activities of KTEC's predecessor, the Kansas Advanced Technology Commission*

CALL FOR EVALUATION

In February 1991 the Kansas Technology Enterprise Corporation (KTEC) agreed to undergo an extensive evaluation to address concerns voiced by Kansas Governor Joan Finney and Secretary of Commerce Laura Nicholl.

The in-depth evaluation was organized by Kansas Inc. and executed by the National Association of State Development Agencies (NASDA), Washington, D.C. The Management Review Team included:

- Miles Friedman, Executive Director of NASDA;
- Ann Osborne, National Consulting Service for NASDA;
- Robert Leak, former state economic development director in North Carolina and South Carolina;
- Walter H. Plosila, President of the Montgomery County High Technology Council, Rockville, MD;
- Teresa R. Gidley, Manager of Research and Technology Programs, Michigan Strategic Fund;
- E. Blaine Liner, Director of the State Policy Center at the Urban Institute, Washington, D.C.

On November 14, KTEC's evaluation concluded with a presentation to the Kansas Legislature's Joint Committee on Economic Development.

Miles Friedman, Executive Director for NASDA, reviewed the findings of the Management Team with the Joint Committee. The following are excerpts from his remarks and the written report.

KTEC MANAGEMENT AND OPERATIONS

"KTEC offers one of the most comprehensive and sophisticated technology development programs in the country."

"We found an agency that is entrepreneurial in nature, has a "can-do" attitude, and has developed a sophisticated array of program initiatives and management practices that rate highly when compared to other state technology development programs..."

"KTEC's programs are indeed market-driven and strongly supported by industry."

"The accountability systems in place (comprehensive tracking system, use of the state's procurement and budget offices, annual independent audits, extensive use of peer review, and an independent board of directors) are among the most advanced in the country."

"The public-private partnership upon which KTEC has been built has created strong support from the private sector and has provided for accountability to the private sector. KTEC's organization has allowed it to be a responsive, yet patient tool, for investment in Kansas' technology base."

"KTEC has an appropriate mix of programs and has emphasized in its management that economic development/commercialization of its investments is always the top priority... Consequently, Kansas is seeing significant results somewhat sooner at least in the case of some of its programs."

KTEC PROGRAMS

The Management Team noted that "because KTEC is a leader among the 45 states with technology development programs in undertaking peer reviews and insisting on performance accountability, there is a much greater amount of program and management data (qualitative and quantitative) available than would otherwise be the case."

"KTEC has been more successful than most states in encouraging the involvement of small businesses, who tend to be most in need of technology assistance, in its programs."

Centers of Excellence "have a positive influence on the Universities, making them more aware of and responsive to the needs of private industry...KTEC's innovative use of five-year strategic plans as a tool for managing the Centers is to be commended."

Applied Research Matching Fund "has been a major contributor to several companies' product innovations...The use of both scientific and marketing reviews for proposed projects is exemplary...The recent payback provisions instituted for the applied research grants is useful and will provide greater leveraging of public funds."

Ad Astra Fund "like most state venture capital funds, has had difficulty in raising private sector dollars. Staff should continue the good working relationship with Department of Commerce staff and investigate other options to address these capital needs."

Training Equipment Grants "is targeted at supporting the technology training efforts of educational institutions... KTEC's role in providing equipment appears to be appropriate to its mission...and compliments training programs offered through the Kansas Department of Commerce and Kansas Department of Education."

Technology Transfer and Referral Service "is developing a database of technical expertise. KTEC should further study the experience of other states in order to identify potential barriers to its use."

Special Projects "allow KTEC to respond to emerging opportunities, allowing needed flexibility in program operations. They should continue to be utilized to take advantage of unique windows of opportunity."

Innovative Technology Enterprise Corporation (ITEC) "offers an interesting approach to handling inventors and their unique needs."

Mid-America Manufacturing Technology Center (MAMTC) "offers a new opportunity to rethink and redefine the service delivery system for small business assistance in Kansas...The NIST (National Institute of Standards and Technology) grant is a "feather in the cap" for the state, whose impacts should be clearly articulated and understood by public policymakers and private companies."

IMPACT REPORT 1991

- OCAST -

**OKLAHOMA CENTER FOR
THE ADVANCEMENT OF
SCIENCE AND TECHNOLOGY
JANUARY 1992**

*Eco-Devo
Attach #5
01-30-92*

“The long-term effect of OCAST will be development of new technology and products which should contribute substantially to economic diversity and growth in Oklahoma.”

-Barbara Lange, President/Intercomp/Stillwater

“The money spent by OCAST is an investment in Oklahoma.”

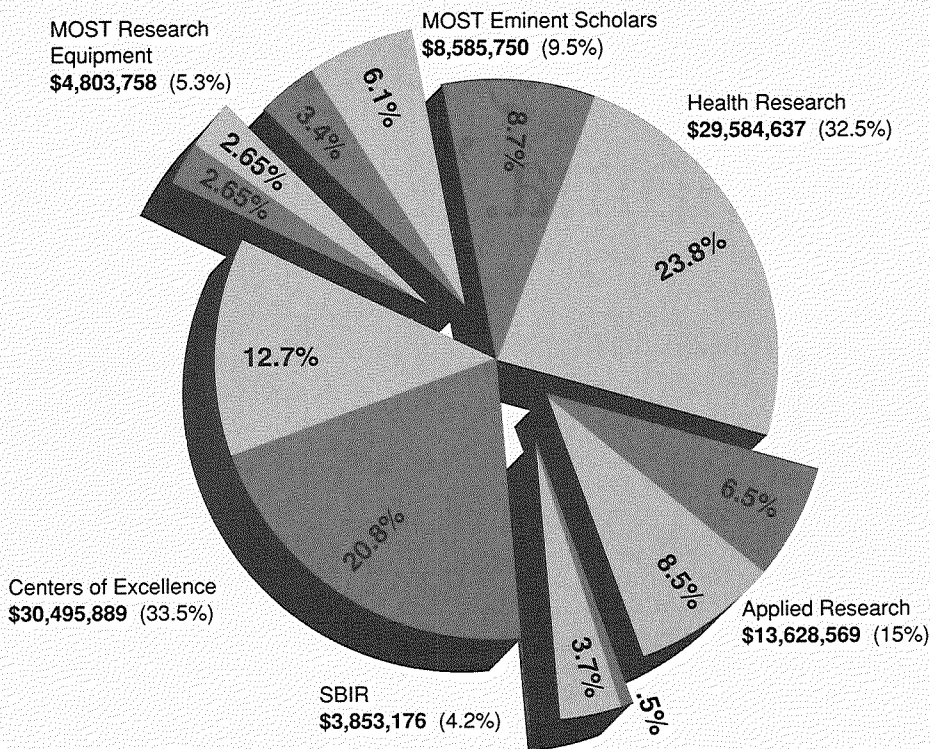
-J.R. Webley, Director of Contracting/
Advanced Systems Technology, Inc./Lawton

Through the Oklahoma Center for the Advancement of Science and Technology, Oklahoma is positioning itself as an inter-

national competitor in scientific research and technological development, application, and marketing.

INVESTMENT PORTFOLIO

As of 9-30-91



OCAST AWARD	MATCH COMMITTED	TOTAL COMMITMENTS
\$38,613,147	\$52,339,623	\$90,952,779

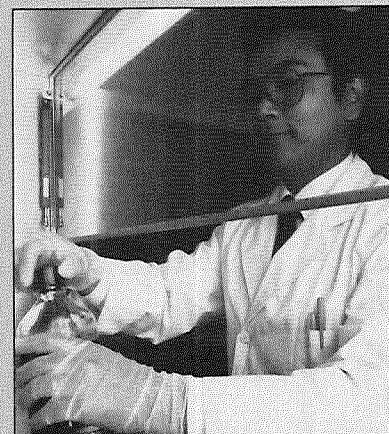
The following illustrations are about the success of OCAST. Success in leveraging state funds. Success in attracting new capital. Success in attracting outstanding scientists and students. Success in achieving new and important discoveries. Success in improving the quality of life in Oklahoma. Success in collaborative efforts between Oklahoma business, higher education and government. Success in motivating Oklahomans to take advantage

of available opportunities. And, success in a growing national recognition of Oklahoma and Oklahoma resources and capabilities.

Since its creation in 1987, OCAST has played a major role in the expanding importance of the innovative process in Oklahoma.



In four years, OCAST has more than doubled its investments in Oklahoma, resulting in a 136 percent return. OCAST awards totaling \$39 million in non-state appropriated support for Oklahoma research and development — a total of \$91 million invested in Oklahoma due to OCAST-administered funds.



Wooden Bridges Make a Comeback for Rural Oklahoma

“With OCAST funding, we can place the impetus on establishing an industry in Oklahoma. Without that funding, the program would not have been initiated.”

-Steve Anderson, Ph.D. Oklahoma State University

Oklahoma’s rural infrastructure is crumbling. Unfortunately, some of it is crumbling under the crushing weight of school buses, creating both inconvenience and safety concerns for Oklahoma parents.

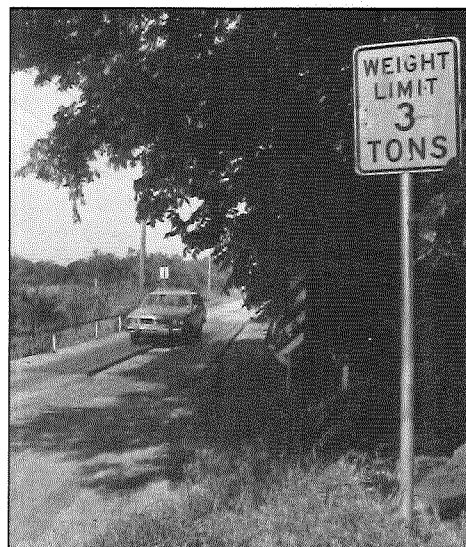
A recent federal report indicates that 11,800 state bridges are structurally deficient or functionally obsolete.

That means that 60 percent of Oklahoma’s rural bridges are in need of immediate replacement, at a time when county government resources are stretched to the limit and few dollars are available for bridge repair.

Steve Anderson, Ph.D., an Oklahoma State University Extension Forester, believes he has a solution, made possible in large part by a two-year \$172,000 award from OCAST to demonstrate how timber bridges can be used to replace old concrete structures rendered useless by age.

The OCAST award, as required, was matched by support from sources other than Oklahoma state government.

“Thanks to new technology, timber bridges can be constructed that cost 25 to 30 percent less than concrete structures,” says Anderson. The wooden bridges have a higher tonnage capacity, are less susceptible to corrosion and can be repaired by county workers with existing equipment.



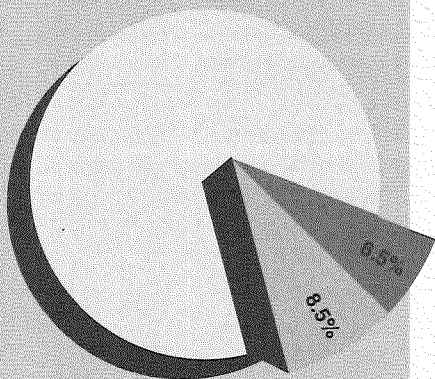
Researchers use Oklahoma-grown pine, cottonwood and oak trees to produce test timbers for the innovative approach to a unique problem. Scientific expertise available from OSU coupled with the private sector know-how of Timber King Inc., of Seminole, owned by Oklahoman Bob Hicks, will produce a low cost answer to a high dollar dilemma.

OCAST funding may be viewed as ‘seed support’ in that many of the public/private partnerships established will last well beyond the period of OCAST support.”

-Dr. Charles Taliaferro, Professor of Agronomy/Oklahoma State University/Stillwater

The Oklahoma Applied Research Program provides matching funds for research and development projects which have commercial potential. The program encourages collaborative projects which bring together resources from different organizations to enhance the prospects for commercialization of new technologies.

Applied Research
\$13,628,569 (15%)



'Blue' Laser Study Draws International Attention to Oklahoma

“We still have some tough technical hurdles but we will be addressing those issues with help from...OCAST.”

-William Harsch, Vice President/ Eagle-Picher Industries/Miami

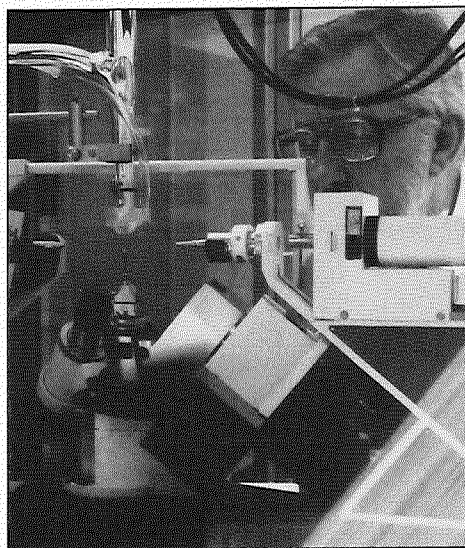
The Japanese are interested in blue laser. So are all manufacturers of color television sets, flat panel displays (computer monitors) and optical data storage discs. And, some of the most advanced research on the utilization of blue laser technology rests with a Miami, Oklahoma, company operating in concert with an OCAST-funded Center of Excellence.

“We still have some tough technical hurdles but we will be addressing those issues with help from the Oklahoma Center for Laser Development and Applications and OCAST. We stand a good chance of succeeding,” says William C. Harsch, vice president and director of research of the Eagle-Picher Research Laboratory in Miami.

Eagle-Picher has made significant progress in the area of blue laser technology. The Oklahoma firm is producing single crystals up to two inches in diameter, a previously unheard of size in the area of crystal production for laser use. Such crystals are necessary for making further advances in blue laser technology.

Color television sets use a cathode ray tube to process red, green and blue, the primary colors. Scientists know how to use light emitting diodes to produce green and red, but blue has proven more difficult.

Oklahomans will gain much from blue laser technology, whether it be from an improved economy, more convenient home appliances or better health care. With blue lasers, flat computer display terminals will be in full color; the thick cathode ray tube that currently powers our color television sets will be replaced by an inch-thick flat color screen; surgeons using



laser beams will put more laser power at the exact location of the injury; and because blue has the shortest wave length of any color, companies specializing in optical data storage discs can use blue lasers to store more information in less space.

Bill Harsch says materials and components made possible through blue lasers will be sold to U.S. companies and to the Japanese. But, the technology will stay in Oklahoma.

Thanks to Eagle-Picher, the Oklahoma Center for Laser Development and Applications and OCAST, the world is looking to Oklahoma for laser technology — and the next generation of television sets.

“OCAST support has allowed a project with high economic potential to go forward to developing an industry in Oklahoma.”

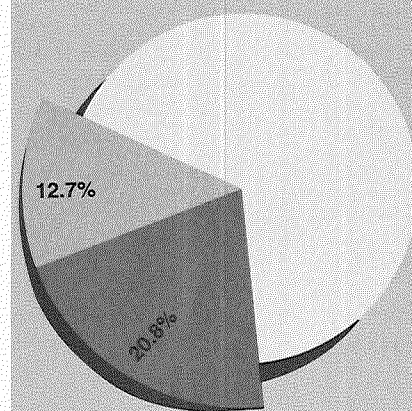
*-Loren Mason and Bill Painter
Owners/Tulsa Auto Core/Jenks*

Oklahoma's Centers of Excellence are establishing preeminence in specific areas of scientific and technological innovation. Centers of Excellence are collaborative research and development efforts involving resources from the academic, business and government communities.

OCAST provides funds on at least a one-to-one basis, matching the non-state funds secured by the Center participants. Recommended funding for each Center is \$1 million per year for five years.

The three Centers currently in operation include the Center of Excellence in Molecular Medicine, the Center for Integrated Design and Manufacturing, and the Center for Laser Development and Applications.

Centers of Excellence
\$30,495,889 (33.5%)



Scientist Finds New Link to Heart Disease in Women

“The quality of research done here, the cooperation and funding levels are known nationally and internationally. This has helped me have the opportunity to become more competitive for national research funds.”

-Robert A. Wild, M.D. University of Oklahoma Health Sciences Center

Dr. Robert Wild was recruited to Oklahoma from Pennsylvania in 1989. His reputation as one of the outstanding young health research scientists in the nation is proving to be well-founded.

Attracted to Oklahoma because of the state's new commitment to the support of science, technology and the innovative process, Dr. Wild is pleased with his move. Oklahoma is pleased to have Dr. Wild.

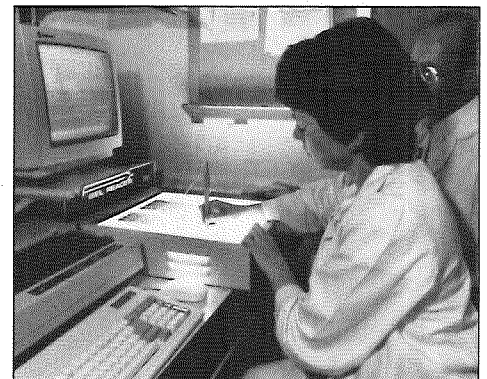
Less than two years after receiving a \$130,000 OCAST award in the Oklahoma Health Research Program, Dr. Wild's work here has generated \$862,000 in national funding. And, it has focused additional national and international attention on innovation taking place in Oklahoma.

Dr. Wild's story is only one of many such stories which can be found throughout all OCAST programs and services.

OCAST-supported research into the effects of excess production of androgen (a male hormone) in females, and the resulting increased risk of coronary artery disease is something of a breakthrough in women's health.

Under the guidance of Dr. Wild, the project originally was funded by a \$130,000 two-year award from OCAST. Based on initial findings, Dr. Wild and his team recently received a \$750,000 five-year grant from the National Institutes of Health.

Dr. Wild's project could lead to greater physician awareness of coronary disease risks, with resulting improvements in preventive health care for women nationwide.

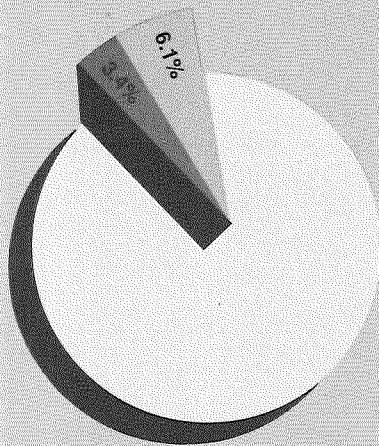


With the Oklahoma Center for the Advancement of Science and Technology now blossoming, the potential of biotechnology is growing.”

-Max Nichols, Columnist/The Journal Record/Oklahoma City

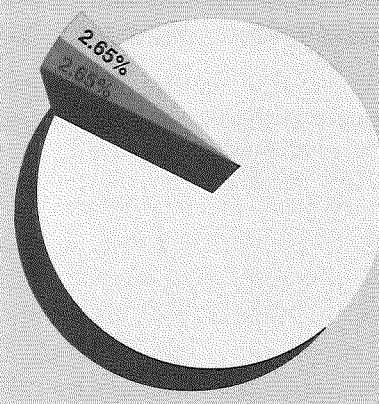
The MOST Eminent Scholars Program supports the creation of endowed chairs in scientific fields related to Oklahoma's economic development interests. Appropriations totaling more than \$3 million have been provided for the program to support eight endowed chairs. Required matching endowment funds bring total support commitments in the program to more than \$8 million.

MOST Eminent Scholars
\$8,585,750 (9.5%)



The MOST (More Oklahoma Science and Technology) Research Equipment Program enables Oklahoma institutions of higher education to purchase equipment essential to conducting competitive research.

MOST Research Equipment
\$4,803,758 (5.3%)



Symex Enters Clinical Trial Phase for Influenza Detection

“OCAST has made it possible to develop new diagnostics for influenza...The studies were done in Oklahoma, Oklahoma citizens will benefit from the improvement in health care, and profits from the sale of this technology will come back to Oklahoma.”

-James F. Maher, Ph.D. Symex Corporation

Clinical trials for an innovative approach to influenza diagnosis are underway, marking an important step in an OCAST-funded health research project that could save thousands of lives worldwide.

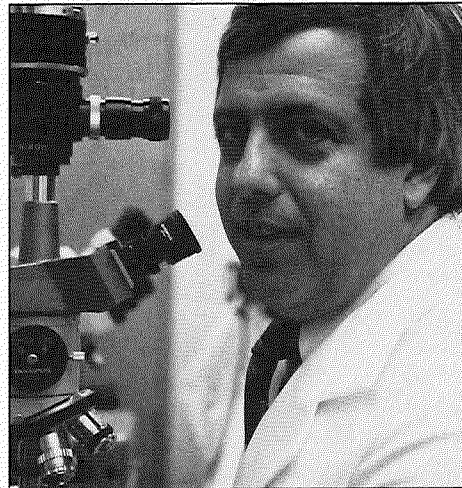
And the results are so promising, the project has attracted \$6 million in investments with an additional \$2 million expected to enter the program in the very near future.

The projected \$8 million investment in an Oklahoma firm would not have been possible without OCAST, according to James F. Maher, Ph.D., senior scientist with Symex Corporation, a Tulsa-based biomedical firm.

The OCAST awards have supported the development of an accurate and fast way to determine whether a patient has influenza. The clinical trial phase is the intermediate step that must be taken before the procedure can be made available to the public.

“We are a couple of years out but with OCAST’s help, we should be into the market and bringing sales into Oklahoma after next year,” said Dr. Maher. Symex Corporation plans to be the prime developer and supplier of innovative viral diagnostic technology and products. Forecast sales for 1994 surpass the \$25 million mark.

By providing a rapid diagnosis of influenza, Maher says physicians can



administer therapy more quickly to the elderly and the extremely young, the two groups most susceptible to the ravages of influenza.

Influenza annually costs U.S. citizens \$7 billion in treatment and hospitalization. Also, physicians are pressured by third party providers to perform a quick diagnosis before insurance coverage is processed. Until the Symex breakthrough, such quick diagnostic methods were unavailable.

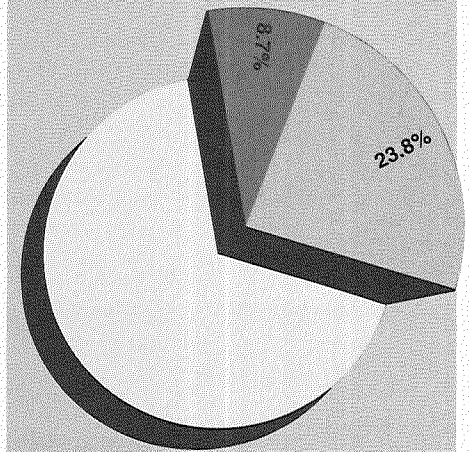
OCAST has awarded Symex \$90,000 in Health Research funds and two Applied Research awards totaling \$94,850. Every Oklahoman can expect to benefit from this investment in health research, either directly from improved health, or indirectly from the infusion of investment dollars into Oklahoma.

“Through the support of OCAST, we have been able to develop a track record that is bringing in federal money for additional projects.”

-Fred Silva, M.D., Chairman/Department of Pathology/O.U. Health Sciences Center/Oklahoma City

OCAST’s Health Research Program helps Oklahoma recruit and retain outstanding health research scientists, increases the competitiveness of Oklahoma researchers for national funds, improves health care for the state’s citizens and strengthens Oklahoma’s health care industry. The program supports research projects conducted by Oklahoma’s health scientists. Health research supported by OCAST has attracted \$29,584,637 in non-state appropriated support.

Health Research \$29,584,637 (32.5%)



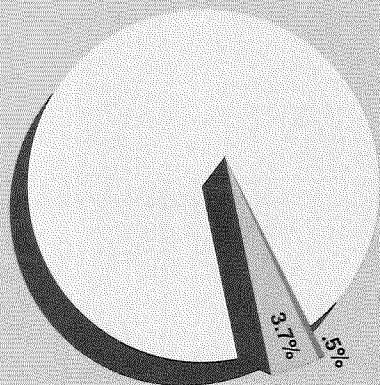
OCAST has significantly improved the research climate in Oklahoma.”

-Dr. Scott Taylor, President
Thermoplastic Pultrusions/Bartlesville

The OCAST Small Business Innovation Research Phase I Incentive Funding Program encourages small Oklahoma businesses to seek research and development funding by applying for federal SBIR Phase I grants. The three-phase federal SBIR program allows small firms to meet the R&D needs of federal agencies while taking steps toward possible commercialization of new technologies. The OCAST SBIR Phase I Incentive Funding Program defrays a portion of the costs associated with preparing a federal SBIR Phase I proposal.

OCAST's SBIR Matching Funds Program encourages Oklahoma firms which have won SBIR Phase I awards to pursue the more substantial federal SBIR Phase II awards. The program sustains small Oklahoma businesses through a critical gap in their federal R&D funding.

SBIR
\$3,853,176 (4.2%)



Oklahomans have submitted 1,275 applications for OCAST R&D support.

More than 100 private enterprises have participated in OCAST-assisted projects.

Surfactant Study Holds Promise for Clean Water

“Environmental cleanup and industrial waste disposal are going to be the growth industry of the 1990s and beyond. We just can't do this work without OCAST's support.”

-Sherril Christian, Ph.D. University of Oklahoma

Ben Franklin experimented with surfactants 200 years ago when he poured olive oil on a pond and watched the thin film of oil spread over the water.

Today, surfactant technology stands to create a multi-million dollar ground and wastewater treatment industry for Oklahoma, according to Dr. Sherril Christian, director of the Institute for Applied Surfactant Research at the University of Oklahoma.

Surfactants are a major component in detergent and have the ability to purify a stream or other contaminated waters by attracting or repelling tiny particles of contaminants.

Now in the pilot stage, this new technology is expected to result in start-up companies, bring additional work for existing companies and develop the state's reputation as an industrial leader.

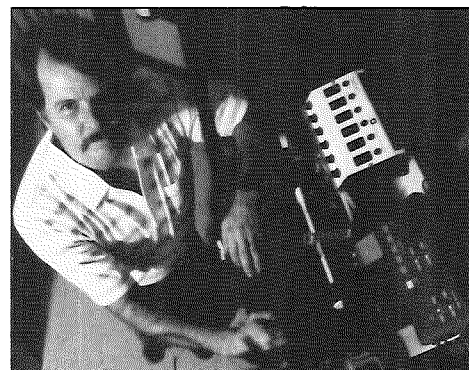
Dr. Christian collaborated with John F. Scamehorn, professor of chemical engineering, and Edwin E. Tucker, adjunct professor of chemistry at OU, on the surfactant studies.

The three are principals in Surfactant Associates, Inc., a Norman-based firm.

The collaboration received awards through the OCAST Applied Research and SBIR Incentive Funding Programs totaling \$299,427 over three years. All of the funds

were matched by non-state appropriated money in keeping with OCAST requirements. Potential customers include the U.S. Navy, which has long been interested in treating wastewater aboard ships at sea, and businesses, military bases and other interests which have polluted their own groundwater.

Surfactant research in Oklahoma has captured the attention of major corporations. Dupont and Conoco are among those who have indicated an interest in the studies conducted by Christian, Scamehorn and Tucker.



Technical Resources Access Center Finds Food Specialist

“OCAST is a demonstration that the state is committed to promote research and development.”

-Dr. Ron Kline, Professor/Aerospace and Mechanical Engineering University of Oklahoma

As the legend goes, yeast for the bread made by Dorothy Faye Phillips of Oklahoma City was handed down in the 1860s by a slave woman. That was common practice in those days, but what is surprising about the special culture is the bread it makes seems to resist mold, and remains fresh for up to 17 days at room temperature.

Those facts gave Dorothy Faye an idea. If these qualities did exist, she may have a marketable product.

When the Phillips family contacted OCAST, they were in search of information about yeast so they could determine whether they had an unusual culture that might revolutionize the baking industry.

Through the Technical Resources Access Center (TRAC), OCAST staff put Ms. Phillips in contact with Sue Knight, a food and nutrition specialist with Oklahoma State University, who is assisting in

the evaluation of Dorothy Faye bread.

TRAC is a database service which presently contains more than 1,650 detailed profiles of faculty members who can respond to most calls for help. TRAC saves time, effort and expense by quickly locating one or more expert resources who can provide technical assistance needed to answer questions or solve problems.

It helps people like Dorothy Faye Phillips.



Photo by Alan Riley, Journal Record

TRAC (Technical Resources Access Center) is an electronic database designed to assist Oklahoma businesses in identifying the in-state expertise necessary to address specific, technology-related problems. It is also useful to Oklahoma researchers seeking assistance or collaboration on research projects, and to economic development organizations and others interested in the technical resources available in Oklahoma.

This new database contains extensive profiles of Oklahoma experts in a wide variety of scientific, technological and related fields.

“Such help can create an environment of technical excellence...which will ultimately benefit all of the citizens of Oklahoma.”

-Senator Enoch Kelly Haney/Seminole

In addition to financial resources, OCAST has generated more than 170 collaborations - business with business, business with university, university with university. Collaborations like these improve R&D productivity and pool scarce resources.

OCAST is having a positive impact on the economic development of Oklahoma.”

-William Harsch, Vice President
Eagle-Picher Industries/Miami

Oklahoma's two traditional industries, energy and agriculture, are both beneficiaries of OCAST's commitment to science and technology.

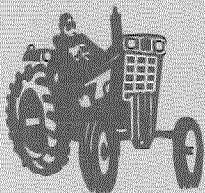
Energy related research and development has received \$6.4 million through OCAST funding.

Agriculture-related efforts have been funded by \$5.2 million to date.

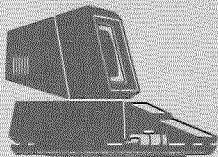
Additionally, \$6.2 million has been invested in state-of-the-art research equipment.



ENERGY RELATED
\$ 6,400,000



AGRICULTURE RELATED
\$ 5,200,000



RESEARCH EQUIPMENT
\$ 6,200,000

The Honorable Hannah D. Atkins
Former Secretary of State
Oklahoma City, Oklahoma

Douglas A. Branch
Attorney at Law
Day Hewett & Federman
Oklahoma City, Oklahoma

Dr. Hans Brisch, Chancellor
Oklahoma State Regents
for Higher Education
Oklahoma City, Oklahoma

Dr. Charles B. Browning,
Dean and Director
Division of Agricultural Sciences
and Natural Resources
Oklahoma State University
Stillwater, Oklahoma

Dr. Norman N. Durham
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for Academic Planning
Oklahoma State University
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G. Douglas Fox, President
Tribune/Swab-Fox Corporation
Tulsa, Oklahoma

Senator Enoch Kelly Haney
Oklahoma State Senate
Seminole, Oklahoma

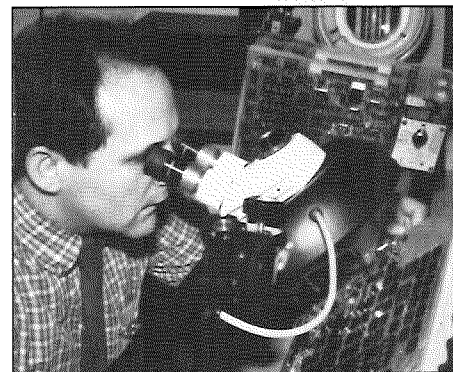
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Vice President and Director of Research
Eagle-Picher Research Laboratory
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Greg Main
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Oklahoma Department of Commerce
Oklahoma City, Oklahoma

Dr. Daniel J. O'Neil
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University of Oklahoma
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University of Oklahoma
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Oklahoma House of Representatives
Seminole, Oklahoma



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“The ideas have always been out there. Through OCAST, those ideas are becoming products and processes which make life richer for all of us.”

-Dr. Carolyn Sales, President, OCAST