

Approved April 3, 1986  
Date

MINUTES OF THE Senate COMMITTEE ON Assessment and Taxation

The meeting was called to order by Senator Fred A. Kerr at  
Chairperson

11:00 a.m./~~xxx~~ on Wednesday, April 2, 1986 in room 519-S of the Capitol.

All members were present ~~except~~ XXXX.

Committee staff present:

Tom Severn, Research Department  
Melinda Hanson, Research Department  
Don Hayward, Revisor's Office  
LaVonne Mumert, Secretary to the Committee

Conferees appearing before the committee:

Senator Alicia Salisbury  
Senator Wint Winter  
Dr. Tony Redwood, University of Kansas  
Dr. Philips V. Bradford, Advanced Technology Commission  
Charles J. "Jamie" Schwartz, Department of Economic Development  
Jim Ploger, Governor's Office

S.B. 755 - Establishing the Kansas technology enterprise corporation

Testimony from Representative Jim Braden was distributed to the Committee  
(Attachment 1).

Senator Alicia Salisbury told the Committee that she feels it is very important to retain the mission statement in some form in the bill. She said the bill would allow the state to invest in the university system and be able to realize a return from that investment. Senator Salisbury advised that the bill treats the Advanced Technology Commission as a separate entity rather than being a part of the Department of Economic Development, as it is now. S.B. 755 provides for a board of directors from the public and private sector.

Senator Wint Winter noted that the bill is a governmental organization type of bill. He discussed the difference between basic research and applied research.

Dr. Tony Redwood testified that while Kansas has an outstanding educational system, there has not been a great deal of interaction between the universities and private sector. He noted that S.B. 755 deals with about seven of the recommendations in his report. He does not think that Kansas will become a mecca for high technology but is more concerned with application of basic technology. Dr. Redwood talked about the industry liaison program. He advised that all the proposals contained in S.B. 755 have been borrowed from other states. Chairman Kerr asked how the bill will affect those areas of the state not close to a university. Dr. Redwood answered that there may be some concentration in those areas but he feels that the universities function on a regional basis. Senator Karr asked about the Small Business Innovation Research matching grant program. Dr. Redwood replied that there is a federal program whereby businesses can apply for \$50,000 to help with the initial development of an idea. They are then eligible to compete for an additional grant of \$500,000. This second phase is very competitive. Some 19 or 20 states have a provision to provide some type of match for the initial \$50,000 grant, while it's an advantage for those companies seeking the second grant. Dr. Redwood said this program would be a part of the Advanced Technology Commission if S.B. 755 does not pass.

Dr. Philips V. Bradford provided a diagram of a sophisticated control device (Attachment 2). He said this research was funded in part by industry and in part by the Advanced Technology Commission. The product would be used by industries, such as a flour mill, to catch irregularities and would

Unless specifically noted, the individual remarks recorded herein have not been transcribed verbatim. Individual remarks as reported herein have not been submitted to the individuals appearing before the committee for editing or corrections.

14 B6

CONTINUATION SHEET

MINUTES OF THE Senate COMMITTEE ON Assessment and Taxation,  
room 519-S, Statehouse, at 11:00 a.m./~~pm~~ on April 2, 1986

produce a higher quality flour product. Dr. Bradford noted that the optical sensing head has other applications as well. He said there are 52 of these research matching grant projects in Kansas right now. He mentioned that some faculty professors are interested in marketing the product but they need some type of seed capital as is proposed in S.B. 755.

Charles J. "Jamie" Schwartz said that everything, with the exception of Section 10 of the bill, is already being done or has been proposed by his agency. He mentioned that start-up companies are extremely mobile, but if they start in Kansas, they will most likely stay in Kansas. Chairman Kerr asked about the cost of funding the bill. Mr. Schwartz said that the only additional funding over and above prior years is \$190,000 for the Small Business Innovation Research program.

Jim Ploger spoke in behalf of the Governor in support of the bill. He said S.B. 755 puts together a lot of things that already exist in a more cohesive manner.

The Committee discussed the Industrial Extension Service and the accountability provisions of the bill.

Senator Frey moved that section 1 of the bill be stricken. Senator Hayden seconded the motion, and the motion carried. Senator Salisbury moved that lines 85-91 be stricken. Senator Mulich seconded the motion, and the motion carried. The Committee discussed the definitions for basic research and applied research. Dr. Bradford noted that it is important that these definitions conform to the federal definition. The Committee, by consensus, agreed to delete "in key exporting" from line 95 and all of line 96. It was agreed to delete lines 113-121.

The meeting was recessed until 5:30 p.m.

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Copies of the 1987 Office of Advanced Technology budget were distributed to the Committee (Attachment 3).

Dr. Bradford explained a chalkboard diagram of how S.B. 755 would operate. He provided a copy of the 1985 Annual Report of his office (Attachment 4). Dr. Bradford described the Small Business Innovation Research program (Attachment 5). He emphasized that this program provides outright grants which are awarded to only small businesses. The awards are made by a national panel of scientists and business leaders and are considered very prestigious. He talked about state roles in regard to the awards and described the three Kansas awardees. Dr. Bradford discussed the Industrial Liaison Program (Attachment 6).

There was discussion about the four legislators on the Board of Directors of K-Tech being ex-officio members. In response to Chairman Kerr's question, Dr. Bradford said that the centers of excellence would compete for funds under the provisions of S.B. 755. The Board of Directors would make decisions on who will receive the funds. He said that under the present set-up, each center has a specific allotment.

The Committee agreed to reinsert lines 116-121 in the amended version of S.B. 755. It was noted that the members of the Board are subject to Senate confirmation. Senator Frey made a motion that lines 303-307 shall be amended as follows: "(1) Five directors shall be persons from the private sector who represent industries of the Kansas economy which include, but are not limited to:". Senator Burke seconded the motion, and the motion carried. It was agreed to include a provision that appropriate geographical representation be considered when appointing directors who represent the private sector.

CONTINUATION SHEET

MINUTES OF THE Senate COMMITTEE ON Assessment and Taxation,  
room 519-S, Statehouse, at 11:00 a.m./~~p.m.~~ on April 2, 19 86

The Committee discussed whether or not to include provisions addressing party affiliation with respect to the Board of Directors. It was noted that there is no such provision for the current Advanced Technology Commission. It was agreed to strike the language following the word "universities" in line 316 through line 318. It was agreed to delete line 320 and all of line 321 prior to the ";". It was agreed to delete "in an industry" from line 323 and all of line 324. Senator Burke moved that the bill be amended to provide that the four legislators on the Board of Directors be full voting members. Senator Karr seconded the motion. Dr. Bradford was asked about the structure of the Advanced Technology Commission where the legislators are voting members. He favors legislators being voting members because they are more likely to attend the meetings, they provide a "good reading of the legislative climate", they have experience in working with other state agencies and other states also feel it to be of benefit. Upon a vote, the motion carried.

Senator Frey moved that the language following the date in line 387 through line 392 be stricken. Senator Burke seconded the motion, and the motion carried. It was agreed to delete the date in line 187 and to delete "national" from line 386. Senator Burke moved that the bill be amended to reflect an effective date of January 12, 1987. Senator Allen seconded the motion, and the motion carried. It was agreed to strike the date in line 404. It was agreed to insert the words "applied research" before the word "fund" in line 453. It was agreed that all captions in the bill would be deleted. The Committee agreed to delete the third word in line 462. It was agreed to insert the words "matching grant" before the word "fund" in line 533. It was agreed to delete the sentence starting after the word "program" in line 602 through line 607. It was agreed to delete "easily understandable language" from line 746, to delete lines 760 through 768 and to delete lines 769-775.

Senator Salisbury moved that the bill provide that the corporation shall recommend an appropriate funding level. Senator Parrish seconded the motion. After discussion, Senator Salisbury requested that her motion be withdrawn. The second agreed, and the motion was withdrawn.

It was agreed to strike lines 778-795. Senator Karr made a motion that a substitute bill for S.B. 755 be drafted. Senator Mulich seconded the motion, and the motion carried.

Meeting adjourned.



INITIATIVE NO. 4:

ESTABLISH A KANSAS TECHNOLOGY ENTERPRISE CORPORATION

REDWOOD/KRIDER REC. NO.: 7, 8, 9, 11, 14, 15, 16

BILL NO.: SB 755

A. Statement of Need

The Interim Report of the Kansas Economic Development Study states that the economic strategy for Kansas will involve providing support for innovation and the application of science and technology to the existing economic base as well as building upon existing strengths to develop new industry.

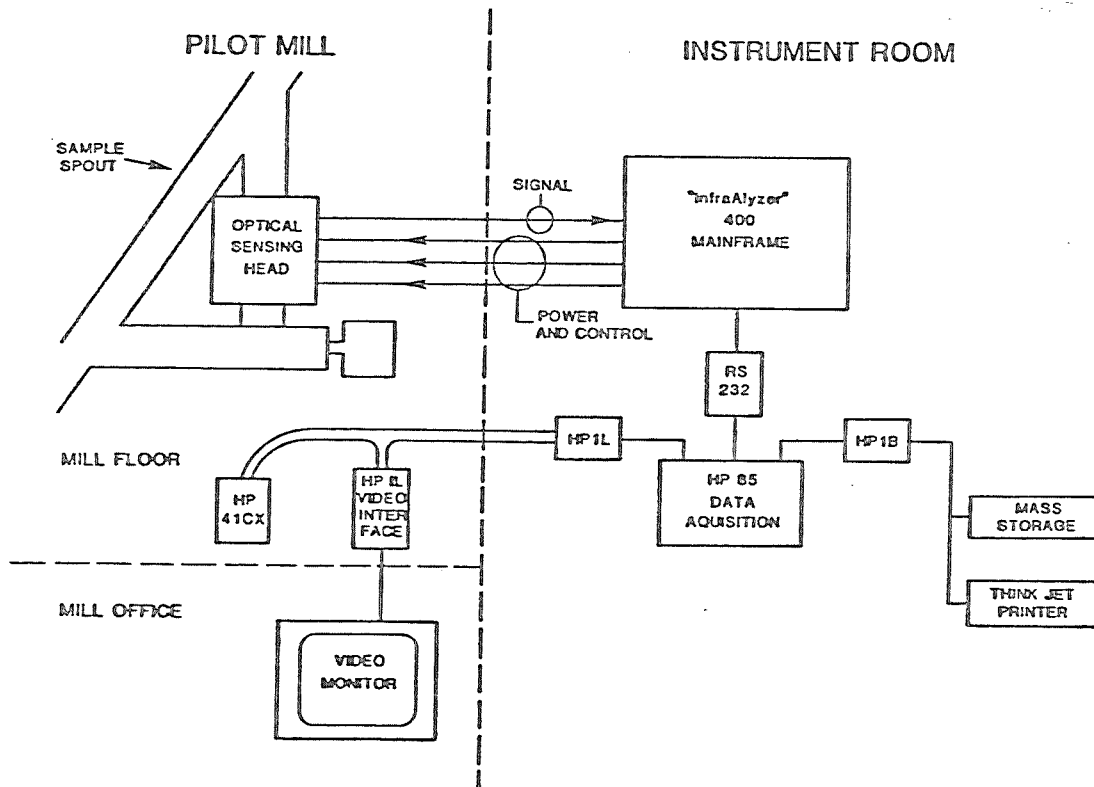
The Report found that an important barrier to the development of modern enterprises was the lack of interaction between the private sector and educational institutions with respect to basic and applied research and technology transfer. Another significant barrier is the lack of seed capital financing for the development of new products or processes by small innovative enterprises or new enterprises that engage in or supply to key exporting industries.

B. Mission Statement

The purpose of the Kansas technology enterprise corporation (KTEC) is to foster innovation in existing industry and the development of new industry in key exporting areas of special importance to the Kansas economy.

C. Bill Provisions:

1. The bill creates a nonprofit corporation called the Kansas technology enterprise corporation and absorbs the functions of the existing Advanced Technology Office and Commission. The Act also:
  - a. Provides for a continuation of centers of excellence.
  - b. Directs the Corporation to prepare need/mission statements and a business plan for institutes of applied science and technology to be located at state universities.
  - c. Provides for the continuation of the existing research matching grant program by creating an applied research fund.
  - d. Creates a seed capital fund which the corporation will invest in innovative, primarily technology based companies. These investments will generate a return on investment that will be recycled to be used for further seed capital investments.
  - e. Encourages the establishment of offices of technology transfer and industrial liaison programs to be located at the state universities.
  - f. Directs the corporation to prepare need/mission statements and a business plan for the establishment of a Kansas product development corporation.
  - g. Creates a state fund to match federal small business innovation research grants to small Kansas businesses.



**CHEMICAL SENSING WITH NEAR-INFRARED REFLECTANCE ANALYSIS**

**CONTROL OF FLOUR MILLS BY NIR ON-LINE MONITORING**

CHEMICAL SENSING WITH NEAR-INFRARED REFLECTANCE ANALYSIS

David L. Wetzel

Kansas State University, Department of Grain Science and Industry,  
Shellenberger Hall, Manhattan, KS 66506

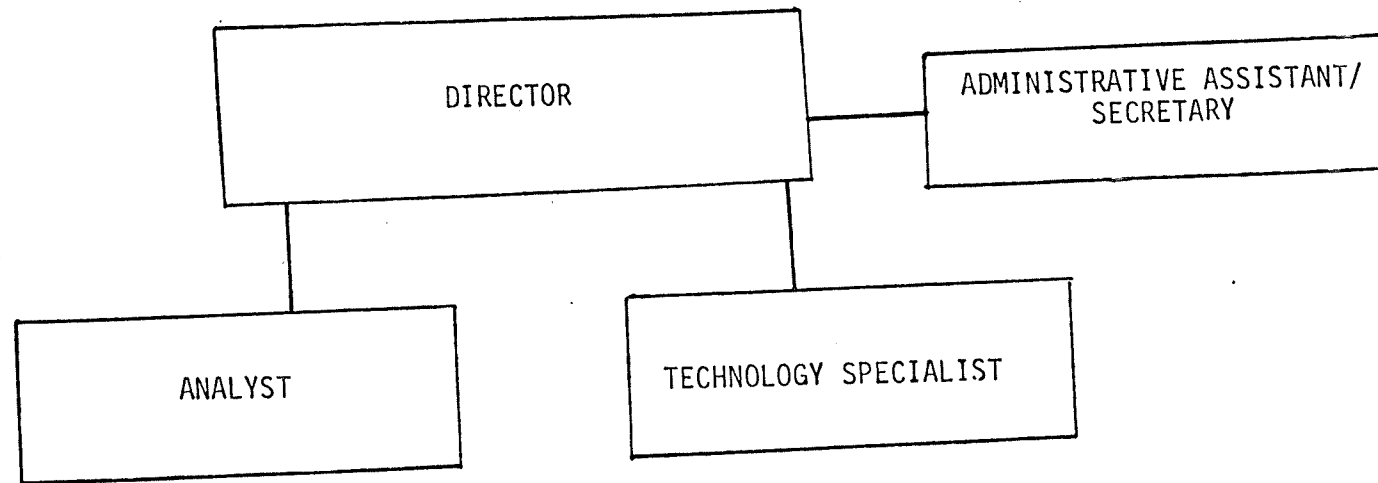
Near-infrared reflectance analysis is particularly well suited to chemical sensing because it operates on "as is" samples and yet has chemical specificity. The absorptions observed originate from vibrations of a relatively few chemical groups whose overtones and combination bands appear in the near infrared region. These groups are commonly found in natural and synthetic materials and their quantitation is possible at major component levels. Chemical sensing by near-infrared techniques does not usually require complete scanning since information for quantitation is found in select wavelength responses incorporated into a mathematical analytical expression. Correlation transformation between laboratory pre-analyzed samples (training set) and the optical data collected allows statistical wavelength selection and assignment of regression coefficients. The result is a select calibration for an analyte in a particular matrix or commodity. Quantitative chemical sensing occurs when the built-in computer of the near-infrared analyzer simultaneously calculates multiple component concentrations by solving prediction equations which use multiple wavelength intensity ratioed data for individual samples. Similarly, qualitative sensing information by discriminant analysis is obtained by use of a discrete wavelength multiterm function. Preselected wavelengths and dedicated preprogrammed microcomputers are ideal for numerous sensing and ultimately control functions.

Chemical sensing applied to "as is" material requires an analytical system which is tolerant of the sample as it exists. Thus, the analyte must be determined in the matrix in which it is found. This precludes concentration steps, dilution steps, sample purification or workup of any sort and particularly makes sophisticated analytical separations prior to monitoring impractical.

Direct absorption spectroscopic sensing, in some cases, fulfills the above requirements. In many cases, however, lack

FISCAL YEAR 1987 KANSAS DEPARTMENT OF ECONOMIC DEVELOPMENT

Office of Advanced Technology





# EXPENDITURES—DA 406R

## DIVISION OF THE BUDGET

### DEPARTMENT OF ADMINISTRATION, STATE OF KANSAS

AGENCY NAME \_\_\_\_\_  
 AGENCY—SUBAGENCY CODES \_\_\_\_\_ FUNCTION NO. \_\_\_\_\_  
 PROGRAM TITLE AND CODE Office of Advanced Technology \_\_\_\_\_  
 SUBPROGRAM TITLE AND CODE \_\_\_\_\_ 7419 \_\_\_\_\_  
 Gov. Recommend. Investment Redwood/Kreider

OBJ. CODE	OBJECT OF EXPENDITURE	FY 19 85 ACTUAL	FY 19 86 ESTIMATE	DOB USE ONLY	FY 19 87	FY 19 87	FY 19 87	DOB USE ONLY
							Incr. over Gov.	Rec. ONLY
01	TOTAL SALARIES & WAGES	115,091	124,067		124,961	127,927	50,256	
05	COMMUNICATION	6,227	--		--	--	2,000	
05	FREIGHT & EXPRESS	6,363	--		--	--	--	
05	PRINTING & ADVERTISING	3,733	3,000		3,000	--	5,000	
05	RENTS	2,345	--		--	--	--	
05	REPAIRING & SERVICING	--	--		--	--	--	
05	TRAVEL & SUBSISTENCE	12,526	13,559		12,809	12,809	9,191	
05	FEES-OTHER SERVICES	1,733	7,000		8,675	8,675	5,325	
05	FEES-PROFESSIONAL SERVICES	850	--		--	--	30,000	
05	UTILITIES and Rent	--	--		--	--	--	
05	OTHER CONTRACTUAL SERVICES	332	1,325,406		50,000	860,000	550,000	
06	TOTAL CONTRACTUAL SERVICES	34,114	1,348,965		74,484	881,484	601,516	
10	CLOTHING	--	--		--	--	--	
10	FEED & FORAGE	--	--		--	--	--	
10	FOOD FOR HUMAN CONSUMPTION	5,935	--		--	--	--	
10	FUEL	--	--		--	--	--	
10	MAINT. MATERIALS, SUPPLIES, PARTS	44	--		--	--	--	
10	MOTOR VEHICLE PARTS, SUPPLIES	11	--		--	--	--	
10	PROFESSIONAL & SCIENTIFIC SUPPLIES	225	--		--	--	--	
10	STATIONERY & OFFICE SUPPLIES	674	--		--	--	--	
10	SCIENTIFIC RESEARCH SUPPLIES	--	--		--	--	--	
10	OTHER SUPPLIES, MATERIALS, PARTS	250	--		--	--	--	
11	TOTAL COMMODITIES	7,139	--		--	--	--	
15	TOTAL CAPITAL OUTLAY	1,060	3,985		6,615	--	2,885	
20	INSTITUTIONAL OR DEPT. DEBT	--	--		--	--	--	
25	TOTAL NONEXPENSE ITEMS	--	--		--	--	--	
30	SUBTOTAL—STATE OPERATIONS	157,404	1,477,017		206,060	1,009,411	654,657	
35	FEDERAL AID TO LOCAL UNITS	--	--		--	--	--	
35	STATE AID TO LOCAL UNITS	--	--		--	--	--	
36	TOTAL AID TO LOCAL UNITS	--	--		--	--	--	
37								
37								
37								
38	TOTAL OTHER ASSISTANCE, GRANTS AND BENEFITS	--	--		--	--	--	
40	TOTAL EXPENDITURES	157,404	1,477,017		206,060	1,009,411	654,657	
45	NUMBER OF FULL TIME POSITIONS	3.0	3.0		3.0	3.0	4.0	

**NARRATIVE INFORMATION - DA 400R**  
**DIVISION OF THE BUDGET**  
**DEPARTMENT OF ADMINISTRATION, STATE OF KANSAS**

AGENCY NAME KDED  
 AGENCY—SUBAGENCY CODES \_\_\_\_\_ FUNCTION NO. \_\_\_\_\_  
 PROGRAM TITLE AND CODE Office of Advanced Technology  
 SUBPROGRAM TITLE AND CODE 7419

EXPENDITURE JUSTIFICATION:

Budget Code 100: Salaries and Wages

Investment Budget

No increase was recommended.

Redwood/Kreider Recommendation (\$50,256)

The three existing staff positions, as well as a new position, would be unclassified. The new position would be devoted to assistance in setting up guidelines and procedures of the Corporation and working directly with companies seeking financial and/or technical assistance from the Corporation. It is recommended that there be one analyst for every twenty companies. The following salary scheme is proposed (assuming normal cost-of-living adjustments):

<u>Action</u>	<u>Position</u>	<u>Salary</u>	<u>Fringe</u>	<u>Total Salary &amp; Fringe</u>	<u>Total Salaries &amp; Fringe Increase</u>
New Position	Analyst (Range 29)	\$30,096	\$4,908	\$35,004	\$35,004
Reallocation	Technology Specialist (Range 27 to Range 32)	34,868	5,575	40,443	7,519
Reallocation	Administrative Assistant/ Secretary (Range 21)	20,376	3,872	24,248	<u>7,733</u>
					\$50,256

Budget Code 200: Communications

Redwood/Kreider Recommendation (\$2,000)

Resulting from the added position, telephone costs will increase \$1,500, mailing costs will increase \$180, and copying costs will increase \$320.

DOB USE ONLY

**ARRATIVE INFORMATION - DA 400R**  
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**DEPARTMENT OF ADMINISTRATION, STATE OF KANSAS**

AGENCY NAME KDED  
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SUBPROGRAM TITLE AND CODE 7419

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Budget Code 220: Printing and Advertising

Investment Budget

No increase was recommended.

Redwood/Kreider Recommendation (\$5,000)

Additional funds (\$1,800) would be needed to publish a new brochure on the Corporation, as well as increase advertising (\$2,600) for the annual exposition and producing additional conference brochures(\$600).

Budget Code 250: Travel and Subsistence

Investment Budget

No increase was recommended.

Redwood/Kreider Recommendation (\$9,191)

Significantly increased demands for travel will be generated as the number of investment opportunities increases. Much of the time of the Analyst would be spent in studying applicants and working with private venture capitalists. Additional travel will also be required with respect to several proposals to federal agencies.

Budget Code 260: Fees--Other Services

Investment Budget

No increase was recommended.

Redwood/Kreider Recommendation (\$5,325)

An additional \$4,325 to enhance the annual exposition and \$1,000 to increase the university/industry colloquium series.

DOB USE ONLY

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AGENCY NAME KDED  
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DOB USE ONLY

Budget Code 270: Fees--Professional Services

Redwood/Kreider Recommendation (\$40,000)

\$30,000 of this represents the estimated major spin-off cost of transforming the Office of Advanced Technology into the Kansas Technology Enterprise Corporation, primarily involved in the cost of developing a business plan for the Corporation itself, administrative and legal fees in setting up the proper investment mechanism, and services of the investment banking community in acquiring the capital pool.

Budget Code 290: Other Contractual Services

Investment Budget (\$860,000)

\$610,000 would continue the current funding level for the Research Matching Grant Program. \$190,000 would establish a matching fund for the federal SBIR program (four \$47,500 grants), in which \$50,000 in federal funds are granted to small firms to stimulate product development with potential for job creation. \$60,000 would fund an industrial liaison office representing all Regents' institutions and operated in conjunction with the Kansas Industrial Extension Service.

Redwood/Kreider Recommendation (\$550,000)

\$430,000 over the Governor's Recommendation, with increased levels for all four contractual service programs funded in that Recommendation:

- (1) an additional \$240,000 for Research Matching Grants will meet growing demand and stimulate more large grant proposals. In the first eight months of FY 86, \$656,889 in grants have been approved (some with carryover funds from FY 85) as more industries are becoming familiar with the program;
- (2) additional \$10,000 for the SBIR program to allow for four \$50,000 grants (commensurate with the federal grant level) rather than four \$47,500 grants;
- (3) with an additional \$300,000 technology transfer linking academic research to Kansas industry would be greatly enhanced through the expansion of the industry liaison program each funded at a level of \$100,000 to KU, WSU, and a "circuit rider" representing the remaining Regents' institutions funded at \$60,000.

# NARRATIVE INFORMATION - DA 400R

DIVISION OF THE BUDGET

DEPARTMENT OF ADMINISTRATION, STATE OF KANSAS

AGENCY NAME KDED

AGENCY—SUBAGENCY CODES \_\_\_\_\_ FUNCTION NO. \_\_\_\_\_

PROGRAM TITLE AND CODE Office of Advanced Technology

SUBPROGRAM TITLE AND CODE 7419

## Department Request (\$111,000)

\$111,000 for FY 87 MTDI assessments and \$30,000 for unfunded FY 86 MTDI assessments. MTDI (Midwest Technology Development Institute) is a consortium of nine states formed to develop research partnerships among leading academic and industrial research programs to gain a competitive edge in technological development in international markets. Kansas is developing one such partnership in aircraft design and manufacturing, and will seek to form programs in drug design, materials fabrication, and agricultural processing.

DOB USE ONLY

# CAPITAL OUTLAY—DA 416R

DIVISION OF THE BUDGET

DEPARTMENT OF ADMINISTRATION, STATE OF KANSAS

AGENCY NAME KDED  
 AGENCY—SUBAGENCY CODES \_\_\_\_\_ FUNCTION NO. \_\_\_\_\_  
 PROGRAM TITLE AND CODE Office of Advanced Technology  
 SUBPROGRAM TITLE AND CODE \_\_\_\_\_

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OBJECT CODE	ITEM DESCRIPTION	ON HAND	UNIT COST	FY 19		LEVEL A ESTIMATED EXPENDITURES	FY 19		LEVEL B ESTIMATED EXPENDITURES	FY 1987		Redwood/Kreider Recommendation	DOB USE ONLY	
				QUANTITY			QUANTITY			QUANTITY				
				R	N		R	N		R	N			
413	Panasonic Typewriter w/memory capacity & service contract would provide greater efficiency in preparing letters, reports & minutes which frequently require several drafts; also, would help prepare letters that are similar that go to different people but have specific things changed in each letter; some items are sent out on a monthly basis and it would be helpful to have them stored on memory.	0	1,750							1		1,750		
413	Sharp Calculator would be required for the Analyst position.	2	225								1		225	
413	Graphics Plotter (Diablo) for composing graphics in-house for analysis and presentation.	0	900								1		900	
	TOTAL CAPITAL OUTLAY												2,885	





# KANSAS ADVANCED TECHNOLOGY COMMISSION

Ronald Ryan, Chairman

## 1985 ANNUAL REPORT

Phillips V. Bradford, Director

The Kansas Advanced Technology Commission (KATC) was created by the 1983 Legislature for the purpose of developing, promoting, and coordinating programs to enhance the development of technology-based industry in Kansas. In its second year of operation, the KATC is making a significant impact on the Kansas economy in a number of ways. The KATC administers the Research Matching Grant Program and serves in an advisory capacity to the Board of Regents in the process of developing Centers of Excellence.

The Research Matching Grant Program is designed to stimulate high tech development by utilizing university research expertise to meet industrial needs and potentials. State funds are invested in projects at Regents institutions, with matching support from the sponsoring industrial firms. By selectively investing state funds as seed money for projects which have promising potential for job creation, the KATC has maximized the return on the State's investment.

The majority of grants are being supported by Kansas companies seeking to develop or apply a new technology. In some cases new companies have been formed in Kansas to produce a product developed through a matching grant.

The Centers of Excellence program is also in its second year of operation, with support from the state as well as private sector. Again, the focus is university/industry coordination; however, the Centers of Excellence concentrate on specific disciplines or areas of technology in which Kansas is at or near the "cutting edge."

The economic impact of most research projects will occur in two to four years, although a number of projects have already led to the establishment of new jobs. Highlights of the program to date include:

\* Agriculture—Economic potential in the commercial baking machinery industry includes expansion of a major manufacturer into Kansas. A remote sensing firm will expand its operation by ten employ-

ees due to the development of a new imaging capability, while Kansas farmers will benefit from access to detailed crop condition information. A Kansas manufacturer of farm machinery and the Kansas farmer in general will benefit from a micro-processor controlled tractor engine and continuously variable transmission designed for unprecedented fuel efficiency.

\* Aviation—Keeping the Kansas aircraft industry state-of-the-art is a key focus of the KATC. A new firm will be established to manufacture a power supply system for electromagnetic wing de-icing. New mathematical techniques applied to computer graphics will be developed to aid in aircraft design, and the use of artificial intelligence to recognize battlefield targets will help to keep Kansas aircraft manufacturers at the cutting edge of technology. Another project will investigate the effects of chemicals

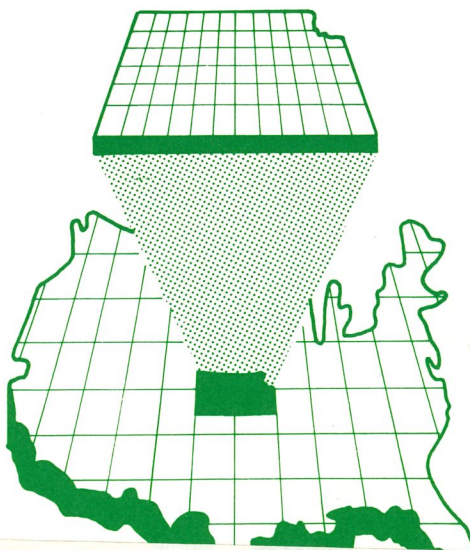
on degradation of newly designed composite materials, an area in which several Wichita companies are advancing. An artificially-intelligent avionics system is also being developed which would create up to forty jobs if successful.

\* Biotechnology—A chemiluminescent system is being developed to analyze parts per trillion of bioactive substances in the body and in the environment. If the analytical capabilities are developed successfully, a major build-up of biotech and pharmaceutical R & D firms will occur in Kansas.

\* Computers and Electronics—A revolutionary supercomputer system is under development, with an excellent economic development potential. A shorter term project will seek the development of a microcomputer-based portable module for utility billing, with potential for significant employment in manufacturing. A digital electronic metal detector may put a Kansas firm at the top of this expanding market, while an optical disk storage/retrieval subsystem could create substantial employment in one of Kansas' most innovative computer firms. A microcomputer-based wheelchair is in the final stages of development, while a new system for optical fiber testing offers Kansas a chance to capitalize on one of the fastest growth markets of the 1980's.

\* Energy and Natural Resources—An ionizing-radiation detection and monitoring system will allow industry to develop and market radiation detection equipment. Another project seeks to identify the source and geological nature of the newly-discovered hydrogen reservoir in Central Kansas, with great potential for development in the chemical industry.

A commercial scale gasifier will create jobs in manufacturing as well as in fuel preparation. A microprocessor aided ethanol fermentation system will create jobs and improve markets for Kansas grains.





# GRANTS STIMULATE UNIVERSITY/INDUSTRY COOPERATION

INSTITUTION	PROJECT	INDUSTRIAL SPONSOR(S)	STATE \$	INDUSTRY \$
Kansas State University	Design and Development of a Commercial Wood Chip Gasifier	Buck Rogers Co., Inc.	\$19,123	\$ 28,684
	Spline Function Representation of Objects	Boeing Military Airplane Company	79,310	118,967
	Microwave Technology for Processing Brown-and-Serve Bakery Products	Bettendorf Stanford	10,000	15,000
	Radiation Detection and Monitoring	Kansas Gas & Electric	35,268	52,902
	Assessment of Crop Condition by Remote Sensing	Earth Resource Data Corporation	20,000	30,000
	Characteristics of Real Time Knowledge Based System Structures	Boeing Military Airplane Company	6,632	9,948
	Graphics Modelling & Computer-Aided Optical Synthesis of Kinematic Systems	Phillips Petroleum Co.	4,667	7,000
Pittsburg State University	Microprocessor Controlled Pilot Scale Production of Ethanol by Zymomonas Mobilis	Wade Energy Research and Development, Inc.	6,000	9,000
	Portable Microprocessor Module for Utility Billing	Energy Technology Labs, Inc.	6,600	10,340
University of Kansas	Optimization of Analytical Chemiluminescent System	Oread Laboratories, Inc.	60,000	90,000
	Extension of Microcomputer-Based Wheelchair System	Kantronics, Inc.	10,000	15,000
	Advanced Metal Detection by Microprocessor	Kantronics, Inc.	11,200	16,800
	Evaluation of the Origin and Resource Potential of Hydrogen in Natural Gas from Central Kansas	Phillips Petroleum Co.	5,330	8,000
	Optical Disk Storage System	Tallgrass Technologies	36,190	54,285
Wichita State University	Power Supply and Sequencing Unit for a General Aviation Electro-Impulse De-icing System	Electrodelta, Inc/Aerotech, Inc.	12,000	18,000
	Evaluation Scheme for Testing Optical Fibers and Coupling Devices	NCR Corporation	4,492	6,739
	Preliminary Aircraft Configuration Synthesis and Evaluation System	Boeing Military Airplane Company	25,648	48,963
	Target Recognition with Object Interference	Boeing Military Airplane Company	5,077	11,341
	Degradation of Mechanical Properties of Advanced Composite Materials Exposed to Aircraft Service Environment	Boeing Military Airplane Company	11,700	25,380
	Assistance in the Design and Development of a VLIW Supercomputer System	EBNEK, Inc.	17,881	38,946

## SUMMARY OF FY 85 GRANTS BY INSTITUTIONS

UNIVERSITY	# GRANTS	STATE \$	INDUS-TRIAL \$	TOTAL \$
Kansas State University . . . . .	7	175,000	262,501	437,501
Pittsburg State University . . . . .	2	12,600	19,340	31,940
University of Kansas . . . . .	5	122,720	184,085	306,805
Wichita State University . . . . .	6	76,798	149,369	226,167
<b>TOTAL . . . . .</b>	<b>20</b>	<b>\$387,118</b>	<b>\$615,295</b>	<b>\$1,002,413</b>

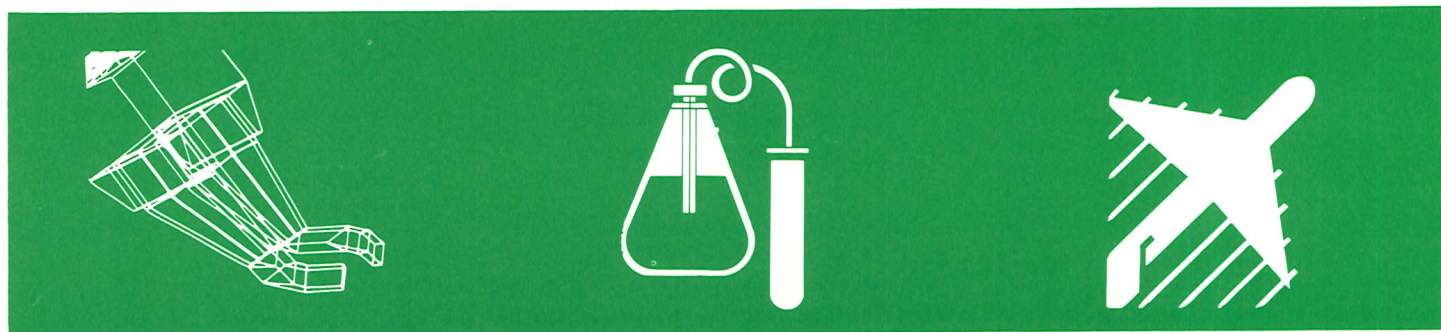


# CENTERS OF EXCELLENCE MAKE SIGNIFICANT ADVANCEMENTS

In 1985, the State of Kansas continued support for "Centers of Excellence" at Kansas State University, The University of Kansas, and Wichita State University. The program is designed to enhance the Kansas economy utilizing academic programs

which are at the leading edge of research and have potential for job creation in Kansas. \$168,000 in state funds was allocated to each Center, matched 50% by industrial funds. This is a longer term program in

which the "high technologies of the future" which have potential to impact the Kansas economy are being developed. The following summary provides a look at the progress of the three Centers.



## Kansas State University: Center for Artificial Intelligence and Automated Control Systems

The Center for Artificial Intelligence and Automated Control Systems focuses on the development of advanced control systems for the revolutionary changes occurring in the manufacturing, design, and service industries. Several significant advancements have been made during the Center's first year of operation, with the primary benefits to aircraft and farm machinery manufacturers. These developments include control strategies for robots and other articulated devices, stereoscopic vision for robotic control, computer control of tractor engines and continuously variable transmissions, and means of converting two dimension engineering design drawings to three dimensional computer-aided design data.

In addition to generating new technology, the Center holds seminars and training sessions to transfer new developments to Kansas companies.

The Center has also worked with academic and industrial scientists on industrially-sponsored research projects in the areas of wood chip gasification, radiation detection, and graphics modelling.

Contact: Dr. J. Garth Thompson, Director, Center of Excellence in Computer-Controlled Automation, Durland Hall, Kansas State University, Manhattan, Kansas 66506, Phone (913) 532-5610.

## University of Kansas: Center for Bioanalytical Research

The Center for Bioanalytical Research focuses its efforts on exploratory research leading to the development of sophisticated bioanalytical methods for the pharmaceutical and biotechnology industries. As these industries have begun to identify new, potent chemicals with potential for therapeutic applications, it is becoming critical to be able to measure minute quantities of such chemicals. Current bioanalytical capabilities severely limit the ability to develop these chemicals into marketable drugs. The Center is already the leading research group in the world in this area. With strong private sector and government support, the Center is already employing 25 scientists and technicians.

The initial goal of the Center is to develop detection capabilities up to 1,000 times greater than is currently possible. Research breakthroughs will be exploited by Oread Laboratories, a wholly owned subsidiary of the KU Endowment Association, with two patent applications having already been filed. If the Center's research is successful, Kansas could experience a major build-up of biotech and pharmaceutical research and production facilities.

Contact: Dr. Theodore Kuwana, Director, Center for Bioanalytical Research, 2099 Constant Avenue, University of Kansas, Lawrence, Kansas 66046, Phone (913) 864-5140.

## Wichita State University: Center for Productivity Enhancement

The Center for Productivity Enhancement focuses on transferring new technology to manufacturing operations in four areas of technology: advanced composite materials, computer-aided design and manufacturing (CAD/CAM), robotics, and digital electronics.

During its first year of operation, the Center has assembled a state-of-the-art CAD lab and has conducted four training courses for engineers in the aircraft industry. A robotics lab will be completed this summer while an international search is being conducted for a director in the area of artificial intelligence. Exploratory research at the Center is primarily in the area of composite materials for lighter and more versatile aircraft.

The economic impact of the Center lies in keeping Kansas firms at the leading edge of manufacturing and materials technology, critical to the aircraft industry. The Center is also working with companies in general manufacturing, electronics, and computers, and works in conjunction with the Small Business Development Center in providing engineering assistance to clients.

Contact: Dr. Richard Graham, Director, Center for Productivity Enhancement, Wichita State University, Campus Box 146, Wichita, Kansas 67208; Phone (316) 689-3525.



## TECH EXPO SUCCESSFUL

The KATC, in conjunction with KDED, the Overland Park Chamber of Commerce, Southwestern Bell Telephone, and AT&T Information Systems, held the second annual "Kansas Technology Exposition & Conference" on April 18-19, 1985, at the Overland Park Marriott. The conference provided valuable insights on developing, acquiring, and applying technology, and was attended by 300 people.

William C. Norris, Chairman of the Board and CEO of Control Data Corporation, delivered the keynote address. The conference also included an outlook for high tech in Kansas by Dr. Phil Bradford, Director of the KATC, and Dr. John Walsh, Chief Scientist for Boeing Military Airplane Company. Workshops were held on university/industry research, venture capital, company start-up, protection of new ideas and inventions, and federal grant programs.

Exhibits were displayed by fifty Kansas companies and research organizations, with products ranging from advanced computer hardware to robotic wire and cable assembly.

## MIDWEST TECHNOLOGY CONSORTIUM

Kansas is part of the newly-formed Midwest Technology Development Institute

(MTDI), a nine-state consortium created to expand technological cooperation between the Midwest and other countries. Dr. Phil Bradford, Director of the Kansas Advanced Technology Commission, serves as Vice Chairman-Technology for the MTDI.

The institute will enhance existing academic research strengths through governmental and industrial funding, and will market new technologies internationally.

## RESEARCH PARKS ANNOUNCED

Both Manhattan and Lawrence have announced new research parks which will provide an environment for high tech industry. In Manhattan, the Technipark is being developed by the KSU Foundation and will provide an attractive atmosphere for research, education, and professional activities. The Kansas Wheat Commission is the first tenant of the 38-acre park, located west of the KSU campus adjacent to the U.S. Grain Marketing Research Laboratory.

Located at the west edge of Lawrence, the 296-acre University Corporate and Research Park is being developed by Robert Billings. Kohlman Systems Research will be the first tenant of the park, which will also capitalize on university resources.

## LEGISLATIVE ISSUES FOR 1986

The KATC will propose several initiatives for 1986, based on the needs and potentials of Kansas technology-related industries and entrepreneurs, academic institutions, and a review of state high tech programs.

- \* Establish a "High Technology Public Authority" to effect the formation of technology-based industry. The Authority would manage a venture capital fund capitalized by private sources, operate incubator facilities, and solicit joint university-industry research contracts and grants.
- \* Continued support for Centers of Excellence and the Research Matching Grant Program.
- \* Establish a state fund to match federal Small Business Innovation Research grants to Kansas researchers and companies, in order to stimulate technological innovation in small firms. A state fund would enhance the process of commercialization within Kansas.
- \* Designate industrial liaison representatives at each of the research universities for the purpose of improving research and academic ties to industry.

## KANSAS HAS SOLID HIGH TECH BASE

Led by the aircraft industry, Kansas has a solid base in high technology, ranking tenth among states in percentage of employment in high technology industries. Other high tech industries are flourishing in Kansas, including communications equipment, software, medical instruments, pharmaceuticals and biologicals, com-

puters, research and testing labs, electrical equipment, and scientific instruments.

Technology-based industries continued to grow in 1984, primarily in the areas of communications equipment and scientific equipment. A breakdown of the number of new firms, expansions, and jobs created in presented below.

<i>Manufacturing Category</i>	<i># New Firms</i>	<i># Expansions</i>	<i>New Jobs</i>
Biologicals; Chemicals; Plastics; Pharmaceuticals	1	2	13
Industrial & Electronic Machinery; Communications Equipment	10	6	1,458
Aircraft & Parts; Motor Vehicles	0	2	0
Engineering, Scientific & Medical Equipment	4	4	244
Computer & Office Machines	2	0	4
TOTAL GROWTH—1984	17	14	1,719

# SBIR Awards

- FEDERAL GRANTS UNDER THE SBIR ACT FOR:
  - SMALL INNOVATIVE BUSINESSES ENGAGED IN RESEARCH
  - NEW PRODUCTS OR SERVICES TO PROVIDE ECONOMIC GROWTH AND EMPLOYMENT IN THE U.S.A.

- GRANTS -- NOT LOANS, NOT EQUITY --

REQUIREMENT IS FOR RESEARCH RESULTS AND PRODUCT DEVELOPMENT EFFORTS UNDER CONTRACTUAL FORMAT

- TWO PHASES --

PHASE I: FEASIBILITY STUDY - \$50,000

PHASE II: PROTOTYPE DEVELOPMENT - \$500,000

SBIR GRANTS ARE AWARDED:

- TO SMALL COMPANIES, NOT TO UNIVERSITIES, RESEARCH FOUNDATIONS, OR GOVERNMENTAL AGENCIES.
- ON A COMPETITIVE BASIS. THE COMPANY'S PROPOSALS ARE EVALUATED BY A PRESTIGIOUS NATIONAL TECHNOLOGICALLY ASTUTE PANEL OF SCIENTISTS AND BUSINESS LEADERS. IN ORDER TO RECEIVE AN SBIR GRANT AWARD, A COMPANY MUST BE THE BEST OF THOSE AT OR AHEAD OF THE LEADING EDGE OF TECHNOLOGY IN THEIR FIELDS.
- WITH EXPECTATIONS THAT THE COMPANY WILL MAKE USE OF OPPORTUNITIES TO WORK CLOSELY WITH ACADEMIC INSTITUTIONS, NATIONAL LABORATORIES, OR LARGE CORPORATE CUSTOMERS AND SUPPLIERS.
- BY NUMEROUS FEDERAL AGENCIES, DOE, DOD, DOT, HHS, ETC., ACCORDING TO RELEVANCY, WITH APPROPRIATE VARIANCES (SECURITY FOR DOD, GMP FOR HHS, ETC.)

## STATE ROLES IN SBIR AWARDS

- MATCHING PHASE I AWARDS - \$50,000 EACH

PROVIDED BY 18 STATES WITH VARYING REQUIREMENTS

- OPERATION MUST REMAIN IN STATE DURING PHASE II
- COMPANY MUST APPLY FOR PHASE II
- FUNDS ONLY FOR PHASE II APPLICATION, NOT FOR EQUIPMENT
- CAPS ON NUMBER OF MATCHING AWARDS

- MATCHING PHASE II AWARDS - \$500,000

PROVIDED ONLY BY ARKANSAS

- SBIR QUALIFIED PROJECTS ARE OFTEN HIGHLY MOBILE AND CAN BE EASILY RELOCATED
- STATE ADMINISTRATIVE COSTS ARE VERY LOW, USUALLY LIMITED TO MONITORING
- ATTRACTS VENTURE CAPITAL TO THE STATE

KNOWN SBIR AWARDEES IN KANSAS

- COMPUTER AND INFORMATION SCIENCES, INC. (913)537-0613  
2316 ANDERSON AVE., MANHATTAN, KS 66502  
CONTACT: DR. PAUL FISHER, PRESIDENT

DEVICES FOR EFFECTING VERBAL COMMANDS TO COMPUTER

- INTERNATIONAL MICRO IMAGES, INC. (913)485-2305  
RT. 4, BOX 339, MANHATTAN, KS 66502  
CONTACT: DR. JOHN W. SAGARTZ, PRESIDENT  
OR: DR. FRANK A. TILLMAN

DIGITAL TRANSMISSION OF MICROSCOPIC HISTOPATH IMAGES

- OREAD LABORATORIES (913)749-0034  
2065 CONSTANT AVE., WEST CAMPUS, UNIVERSITY OF KANSAS,  
LAWRENCE, KS 66046  
CONTACT: DR. HOWARD MOSSBERG, PRESIDENT

REAGENTS AND METHODS FOR PEPTIDE ANALYSIS

<u>COMPANY</u>	<u>SBIR AWARDS</u>	<u>CURRENT EMPLOYMENT</u>	<u>1990 EMPLOYMENT</u>
CIS	I & II	35	300
IMI	I	4	200
OL	I	~10	350

# Industrial Liaison

for  
Kansas Universities

- Purpose and Function.
- Economic Development Role.
- Organization.
- Budget and Goals.

## **Purpose and Function:**

1. To convey the resources of the university to corporate and industrial firms.
  - A. Research contracts
  - B. Instructional programs
  - C. Faculty Consultants
  - D. Consortia projects
2. To convey the needs of corporate and industrial firms to the university.
  - A. To the relevant areas of the university.
  - B. In an acceptable programmatic format.
3. To negotiate the arrangements between the university and corporations.
4. To advocate the benefits of such arrangements to the parties involved.
5. To enhance the level of private support for the university.
6. To enhance the productivity and competitiveness of Kansas industry.



## **Economic Development Role:**

1. It is a direct benefit to corporations comparable to similar programs in competing states.
2. It serves as an attractant for faculty who are skilled at working with corporations.
3. It provides jobs for Kansas university graduates.
4. It opens new business growth opportunities for companies in Kansas.
5. It brings added funds into the universities directed to programs of most interest to Kansas corporations.

## Budget and Goals:

Industrial Liaison Office at each of the three major universities.

Salary of Liaison Officer:	\$ 45,000
Fringe Benefits:	9,000
Salary, Secretary:	13,000
Fringe Benefits:	2,600

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Total Salaries+fringes      \$ 69,600

Travel:	20,000
Telephone:	5,000
Office Supplies:	5,000
Printing:	10,000
Work/study helpers:	10,400

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TOTAL      \$ 120,000

X 3 =      360,000

Engineering Extention      40,000

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State TOTAL      \$ 400,000

GOAL: Generate income of at least \$ 400,000 in the form of indirect costs (overhead) on new contracts for research and instructional services from corporations for the universities.

# Organization:

