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College of Technology
Manhattan KS 66506

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FINAL REPORT

United States Air Force
Air Force Office of Scientific Research Grant 2

Kansas State University
Manhattan, Kansas, and Salina, Kansas

Grant #F49620-93-1-0509
Effective Date: September 1, 1993
Completion Date: February 29, 1996

Amount: 1 payment of $7,700,000

Grant Purpose: Aeronautical Training and Materials Research

Principal Investigators: Dr. Charles E. Reagan and Mr. Kenneth Barnard

Charles E. Reagan

Kenneth Barnard

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I. Executive Summary

Kansas State University has received a grant from the Air Force Office of Scientific Research for "Aeronautical Training and Materials Research" in the amount of $7,700,000. The general purposes of the grant were equipment support for pilot and mechanic training and for scientific research. The principle expenditures from the grant have been for new and refurbished aircraft for the University's training fleet. In particular, the University purchased one C-90A Beech King Air, four B-58 Beech Barons, and six F-33A Beech Bonanzas. These aircraft were new and were produced to meet Kansas State University's specifications. In addition, the University purchased one Beech F-33C Aerobatic Bonanza and 12 Beech B-24 Sundowners used. The used aircraft were refurbished, standardized, and painted to match the new fleet. In addition, significant amounts of avionics, computers, and other electronic equipment, engine testing equipment, and test engines were purchased for the Aviation Maintenance Technology Program. The third major expenditure was for a "Materials Fabrication and Coating Building," a 2,000-square-foot building to house the Avionics Laboratory and the Composite Fabrication and Non-Destructive Testing Laboratories.

Significant achievements in training: Kansas State University-Salina has a significant domestic pilot training program with an average of 80 pilot trainees at any one time. The Professional Pilot Training Program is FAA Part 141 certified and trains through the commercial license with ATP, multi-engine, and instructor ratings. The pilot training program is also Part 141 authorized to provide helicopter training through the commercial and instrument helicopter ratings. As a result of the this grant, the University was able to add a turbine transition program to its other pilot training courses. Through the use of simulators and aircraft purchased through this grant, the University is able to quickly convert military pilots to civilian ATP pilots familiar with one of the most popular corporate-type civilian airplanes, the King Air.

A second important element in our professional pilot training is our partnership with British Aerospace Training College in Prestwick, Scotland. In conjunction with BAe, we are authorized by the British CAA to provide training for CAA licenses and ratings at our campus in Salina. To date, BAe has brought three classes to Salina for their initial pilot training. Their training is finished then in Prestwick. This has provided extremely valuable experience to our instructors and has had a very positive influence on the curriculum and training in our FAA Professional Pilot Training Program.

Scientific research

Kansas State University is involved in many research projects, some of these projects are KSU-Salina projects alone, while others involve cooperation with The University of Kansas Department of Aeronautical Engineering and the National Center for Aviation Research at Wichita State University. Some representative scientific research programs are as follows: a Link Foundation Grant for the Investigation of Situational Awareness and in particular how pilots use their knowledge and skill to adapt to various flight situations. A second Link Foundation Grant on other aspects of situational awareness. Another example is a special Kansas State University Graduate School Incentive Grant for Cockpit Automation and Free Flight and a grant in

conjunction with The University of Kansas on "Experimental Investigation of the Effect of Squirrel on Mixing Enhancement of Supersonic Rectangular Jets." A summary of grants and proposals is included in this report.

Summary

During the extended grant period, Kansas State University has accomplished all of the purposes outlined in the proposal. With minor modifications of the budget as approved by AFOSR, all of the equipment that was proposed has been purchased in accordance with the original and revised schedules. A complete financial summary is also included in this report.

GRANT

UNITED STATES AIR FORCE

AIR FORCE OFFICE OF SCIENTIFIC RESEARCH
BUILDING 410, BOLLING AFB, D. C. 20332-6448

GRANT NO.	EFFECTIVE DATE	PURCHASE REQUEST NO.	PROJECT-TASK	PAGE 1 OF 3
F49620-93-1-0509	1 Sep 93	FQ8671-9301593	3484/AS	

GRANTEE

Kansas State University
2 Fairchild Hall
Manhattan KS 66506

AFOSR's CFDA #12.800

AUTHORITY
Public Law 102-172

AMOUNT
$7,700,000

DURATION (Months)
12

PRINCIPAL INVESTIGATOR
Dr Charles Reagan and Kenneth Barnard

ADMINISTRATIVE OFFICE	SPONSORING SCIENTIFIC OFFICE	PAYING OFFICE
AFOSR/PKA 110 Duncan Avenue Suite B115 Bolling AFB DC 20332-0001	AFOSR/NA 110 Duncan Avenue Suite B115 Bolling AFB DC 20332-0001	DAO-DE AFDW/FS (202) 767-4736 170 Luke Avenue Suite 280 Bolling AFB DC 20332-5113

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PKD (202) 767-4877

PROGRAM MANAGER *(Name, Organization, Telephone No.)*
DANIEL B FANT, MAJ, USAF
NA (202) 767-0471

RESEARCH TITLE
AERONAUTICAL TRAINING AND MATERIALS RESEARCH

ACCOUNTING AND APPROPRIATION DATA
9720400 1102 5K2 47B1 613484 AS 00000 61103D 503700 F03700 $7,700,000

PAYMENT SCHEDULE
One payment of $7,700,000 on or after 1 Sep 93.

TERMS AND CONDITIONS

Under authority enacted in the Defense Agencies RDT&E section of Title IV, Department of Defense Appropriations Act, 1992, P.L. 102-172, 105 Stat. 1150, 1167 (26 November 1991), as amended by Section 302, Rescinding Budget Authority, Fiscal Year 1992, P.L. 102-298, 106 Stat. 217, 226 (4 June 1992), the above amount is hereby granted by the Air Force Office of Scientific Research (AFMC), USAF, to Kansas State University for the acquisition of equipment as set forth in Kansas State University proposal dated 3 June 1993, as revised 23 July 1993.

In no event shall the amount of funds expended under this grant exceed $7,700,000. Kansas State University shall be responsible for any and all costs necessary to carry out the terms of this grant that exceed $7,700,000.

Title to all materials, supplies and expendable equipment purchased with grant funds will vest in the Grantee.

FOR THE GRANTEE		FOR THE UNITED STATES OF AMERICA	
SIGNATURE OF PERSON AUTHORIZED TO SIGN		SIGNATURE OF CONTRACTING OFFICER Marilyn J McKee	
NAME AND TITLE OF SIGNER *(Type or Print)*	DATE SIGNED	NAME OF CONTRACTING OFFICER *(Type or Print)* MARILYN J McKEE	DATE SIGNED 25 Aug 93

(Computer Generated)

AFSC FORM JUL 84 442

II. Description of Grant Purposes
Reference AFOSR Grant #F49620-93-1-0509,
"Equipment Support for Aeronautical Training and Materials Research.

I have enclosed information about our programs to include some background about the department, facilities and equipment. Our experience with British Civil Aviation Authority approved pilot training (two separate pilot contracts) coupled with our current affiliation with American Eagle airlines in developing the new FAR 66 Aviation Maintenance Training Transpost catagory (AMTT) certification curriculum and Air Midwest airlines using current airline check lists and procedures places our training a step above most other in the world. We have a Federal Aviation Administration (FAA) approved Part 141 pilot training college program that uses a standardized Beech aircraft fleet through King Air, and a Beech jet is available to round out the airline oriented training.

Background:
Kansas State University was established in 1863 as a land grant university. It currently has 21,000 students enrolled, of which 1,000 are international students. There are nine colleges within the University: 1)Agriculture, 2)Architecture, 3)Arts and Sciences, 4)Business Administration, 5)Education, 6)Engineering, 7)Human Ecology, 8)Technology, and 9)Veterinary Medicine. The College of Technology is located in Salina, sixty miles West of the main campus.

Facilities:
We, at the Salina campus, have $5.2 million of new construction now completed which included; 1)a new student living quarters (100 person), 2)student union/cafeteria, bookstore complex, 3)doubling the size of the Library/Resource Center, 4)expanding Engineering laboratories, 5)second dormintory to be completed fall 1997.

The Aeronautical facilities include:

1. Classroom/laboratory building constructed in 1990 and expanded in 1992. This 36,000 sq ft building is the Aero Center.
2. We use a 3,000 sq ft building adjacent to the Aero Center for additional offices and two laboratories for a CBT contract to develop 700 hours of computer based training for the AMTT curriculum.
3. Two U.S. Air force hangars used for B-47's and B-52 maintenance have been renovated and are used for aircraft storage and daily aircraft

maintenance for our pilot training program. These two hangars provide a total of 54,000 sq feet.

4. Just completed is a 2,500 sq ft building located next to the Aero Center that houses our composite, non-destructive testing, and avionics laboratories. New engine overhaul testing/run up, calibration and engine storage will also be part of this building's function.

The Aeronautical facilities are located on the airport ramp and adjacent to the active runways that support ILS, VOR, NDB, GPS instrument approaches with FAA operated control tower.

Support Services:

(1) Kansas State University-Salina Library/Resource Center

The Kansas State University-Salina Library/Resource Center has approximately 24,000 volumes. The library sub scribes to 300 periodicals and houses 444 professional videos.

Over the past several years a variety of technology has been added to the KSU-Salina library/resource center. Through the Kansas Regents Networks (KARNET) the library has computerized access and daily courier service to the following libraries: Emporia State University, Fort Hays State University, Kansas State University, University of Kansas, University of Kansas Medical Center and Wichita State University.

The KSU-Salina Library/Resource Center has CD-ROM databases available for customer use. They are the Kansas Library Catalog, ERIC, Applied Science and Technology Reader's Guide to Periodical Literature, Computer Select, Sheet Atlas USA, Groliers Academic America Encyclopedia, Microsoft Bookshelf, Newsbank, and two Proquest databases - Business Dateline and Research II.

The library/resource center provides access to Information Network of Kansas (INK) and Internet. Software available for customer use are WordPerfect and Excel.

The library/resource center houses the Federal Aviation Education Resource Center established in 1989. It contains free information in a variety of formats about aviation and space. Library staff members are available to help customers in use of the reference, research, and technology services of the library. The library/resource center has approximately 11,500 sq ft and seats sixty-four people. It also has a conference room and a distance education classroom.

(2) Veterans Affairs

The university is fully accredited by the Veterans Administration and operates under a contract whereby veterans and their dependents may obtain the benefits of educational assistance when eligible. The Professional Pilot flight training has VA approval for the aircraft use costs.

(3) Tele-Educational Support Services (TESS)

Kansas State University-Salina has a fully operational two-way interactive video electronic classroom. KSU-Salina is directly linked to the Electronic Communication Center (ECC) at Kansas State University, Manhattan with fiber optics.

(4) Computer Laboratory located in the Aero Facility

The computer lab consists of 486 DX 66 Hz Networks with CD-ROM, graphic work station, CBT and internet.

Equipment:

We have just added $7.7 million in equipment to our program. $5.2 million purchased aircraft and avionics. $2.5 million purchased new turbine engines, NDT equipment, composite equipment, special tools, instrumentation, and computer lab equipment. The computer lab has technical publication libraries & FAA publications. We have a computer based training electrical

curriculum (250 modules) and several aircraft CBT packaged software programs (King Air C-90A for example) that show detailed graphics (photo images) of the aircraft and its subsystems with motion and text for a good self passed learning system.

Capability:
We have experience in U.S. Military Technician training. We have provided Military Occupation Skill (MOS) training to aviation personnel in Kansas National Guard units when their units were upgraded to new aircraft. We also have trained many Air force technicians from McConnell Air force Base that were assigned to the B-1 bomber and KC-135 units. We focused mainly on the Federal Aviation Administration (FAA) requirements to bring the Air force level of training to meet the requirements of the FAA Airframe and Powerplant certificate standards.

We have contracted with Beechcraft to provide specific airframe, sheetmetal, and assembly training. We provided National Aeronautics and Space Administration (NASA) soldering for Beechcraft avionics harness assembly technicians.

We were told by Cessna in their search for a new single engine manufacturing facility that our training proposal was the one they preferred of all those submitted to them. The faculty are equally qualified and most have extensive military experience. The Aeronautical Department is made up of three sections: 1) Aviation Maintenance Technician, 2) Professional Pilot, and 3) Avionics.

Aviation Maintenance

We have a FAA approved FAR Part 147 (Airframe and Powerplant) program. About 2100 contact hours are identified in this Airframe and Powerplant (Aviation Maintenance Technician) curriculum and is presented in two years using the university's semester system. ie. sixteen week periods starting August and January each year. Summer eight or twelve week sessions are available.

In addition to the above technical subjects our students routinely opt for an Associate degree. This degree requires an additional sixteen college credits or 762 contact hours in the classroom. This Associate degree in Aviation Maintenance can be obtained in two years if the summer is utilized. The courses included in this two year program do not include composite and non-destructive testing. Both of these courses have been added to the four year degree option for our students. We routinely use airworthy aircraft in our aviation maintenance training.

Professional Pilot

We are approved under FAA FAR Part 141 and VA approved for benefits. The Ab-initio course uses a new Beech standardized fleet using B-58 Barons, F33A Bonanzas, and C-23 Sundowners. The C90A King Air and B-58 Baron have EFIS, GPS installed. The new C-90 is used for the prop-jet course. We have new Frasca and AST simulators; single engine, multi-engine with visual and multi-engine prop-jet with visual and B-737 capability. We are under a current contract with British Aerospace Flying College Limited (BAe), Prestwick, Scotland to do Civil Aviation Authority (CAA) pilot training as part of

BAe's approved flying program. We offer a four year FAA endorsed Airway Science Bachelor of Science degree in professional flight.

Avionics

We have an FAA Radio and Installation Repair Station license. This allows us to do all of our own repair, installation and warranty work on King (Allied Signal) avionics. The avionics program is a two year program. We have high industry demand for an avionics graduate with an airframe license.

Grants and Contracts

We have the equipment and expertise in a variety of areas that supports mutual grant and contract activities. The list below are areas where we have contributed or are conducting at present due to the AFOSR Grant #F4962-93-1-0509:

The Aeronautical Department at Kansas State University at Salina contributed substantially to cooperative research efforts that included researchers from academic departments at Kansas State University at Manhattan. The department's significant contribution reflects its continuing commitment to the goal of establishing a flight training program that integrates research findings with training to enhance flight safety and increase pilot proficiency. Researchers using the department's technologically advanced facilities have access to excellent flight simulation equipment, aviation maintenance work benches, avionics work benches, a highly proficient training staff and a large student pilot population. Presently, three research projects are utilizing these resources, and funding is pending for two research projects that would also involve utilization of the department's resources. An abstract of each of these five research projects is included. If the latter two projects receive funding, the cooperative research efforts to date will have generated approximately $193.7K, with nearly 52% (i.e., $100.2K) of these funds being contributed by extramural sources.

1. Training Situation Awareness: The Contribution of Task Invariant Components.
Sponsor: Link Foundation, Institute for Simulation and Training, University of Central Florida
Total Costs: $28.1K
Principal Investigators: Kurt M. Joseph and John Uhlarik
Abstract. This research project addresses an important phenomenon in complex work environments (e.g., aviation) known as situation awareness (SA). As it relates to the aviation domain, SA is a descriptive label that characterizes how pilots use their knowledge and skill to adapt to various flight situations. SA is examined by observing the interaction between the pilot and his/her environment. This interaction can be localized to the cockpit interface where, at any given moment, the pilot must interpret bits of information and make inferences about the state of his/her aircraft and the environment through which the aircraft is traveling. Incorrect interpretations and inferences can result in costly errors, and possibly loss of control by the pilot. Psychological measures that tap attention, memory, and the pilot's mental models of flight simulation situations are used to determine whether or not the pilot's behavior corresponds to a normative functional mapping of the relevant situation. Information gathered from these measures will then be used to provide better pilot training.

2. Pilots' Schemata and Their Effects on Situation Awareness.
Sponsor: Link Foundation, Institute for Simulation and Training, University of Central Florida.
Total Costs: $14.05K
Principal Investigators: Doreen Comerford and John Uhlarik
Abstract. This research project also investigates situation awareness (SA). Specifically, it uses PC-based flight simulations to analyze pilots' knowledge of flight information. A goal of this project is to demonstrate that pilots develop schemata, or mental structures, which are thought to be an important aspect of behaviors that are associated with SA. Essentially, a schema consists of variables, or associations between pieces of flight knowledge that are connected with control actions. These control actions are instantiated when a schema matches a specific flight situation. For example, a pilot who has executed hundreds of instrument landing system (ILS) approaches at familiar airports will probably have developed a schema of ILS approaches that can be used to guide his/her behavior when he/she attempts an ILS approach at an unfamiliar airport. In this case, the "ILS approach" schema is instantiated and a series of control actions are performed, which may include setting the localizer frequency in the channel selector, maintaining the prescribed glideslope, and familiarizing oneself with the missed approach procedure. The research project will involve analyses of interview protocols that are collected from expert pilots who, arguably, have the most valid schemata. The results of these analyses will be used to assess the schemata of naive and novice pilots.

3. Honeywell/NASA/Kansas Space Grant Consortium Project.
Sponsor: Honeywell Technology Center and NASA-Langley Research Center
Total Costs: $30K
Principal Investigator: John Uhlarik
Abstract. This research project will include experimental analyses of existing Honeywell electronic flight informtion system (EFIS) displays and newer EFIS displays, which contain an attitude direction indicator (ADI) that includes perceptual cues for terrain (e.g., terrain displayed using splay, compression, optical flow rates). The primary goal of the research will be to select a cue or set of cues that can be used to support terrain collision avoidance. This project will involve PC-based simulations that present existing and modified EFIS displays to pilots.

4. Cockpit Automation and Free Flight.
Sponsor: Kansas State University Graduate School Special Group Incentive Research Awards Program, Kansas State University
Total Costs: $93.4K
Principal Investigators: John Uhlarik, Garth Thompson, Peter Gorder, and Peter Kennedy
Abstract. The specific focus of this research includes topics associated with the costs and benefits of automation, especially as it applies to the rapidly evolving concept of free flight. Free flight represents a change from traditional air traffic control by shifting responsibility and autonomy for navigation and separation back to the cockpit, while not compromising safety. The basic notion is that all flight plans would be determined by the pilot based on self-determined criteria and independent of pre-defined airways or altitude profiles. Send and receive data link, combined with global positioning information, have the potential to provide algorithms for safe and efficient air traffic flow. The challenge will be to take those algorithms and develop graphic

displays that provide the pilot with adequate mental models that support situation awareness. Specifically, this research would examine the human factors issues during the design and analysis phases necessary to implement free flight, especially as it applies to general aviation. This effort would involve real-time, human-in-the-loop simulations that systematically study pilot and air traffic control behavior and their interactions. A primary goal of this research will be to support activities that lead to continuing extramural funding from NASA and FAA programs intended to support and develop the concept of free flight, especially as they apply to advanced flight systems for general aviation.

5. Air Traffic Decision Making in a Free Flight Environment for Pilots and Non-Pilots in Part-Task and Full-Mission Simulation.
Sponsor: Link Foundation, Institute for Simulation and Training, University of Central Florida
Total Costs: $28.1K
Principal Investigators: Doug Peterson and John Uhlarik
Abstract. This research project seeks to assess the air traffic decision making ability of pilots and non-pilots under various situations and simulated scenarios. Extensive testing in a controlled simulator environment will be required before a complete transition to free flight can be accomplished. This project intends to identify the key components required for acquiring an accurate mental model of current air-traffic situations, and then testing situation displays and pilot instruction as possible methods of improving air-traffic situation assessment and implementation of action. Like previous research in aviation, part-task simulation
will be required in the early stages of research. However, later stages of evaluation will use full-mission simulation to evaluate air-traffic avoidance decisions during flight. The assistance of experienced flight instructors and simulated traffic avoidance situations will be instrumental in determining how effectively accurate air traffic management can be accomplished by novices and student pilots. The end goal of this project is to recommend the type of training and displays needed for safe and efficient flight in the future.

6. Experimental investigation of the effect of swirl on mixing enhancement of supersonic rectangular jets.
Sponsor: University of Kansas
Principal Investigator: Janson French
Abstract. Free jets from four rectangular nozzle configurations and one circular nozzle were tested in a new facility. The new facility, consisting of a plenum with flow conditioners, allowed testing of a variety of free jet configurations at both subsonic and supersonic speeds. Properties of the free flow could be measured with a pitot pressure tube or with a hotwire anemometer. The five nozzle configurations included straight and notched rectangular nozzles with and without boundary layer swirl vanes, and an equivalent area circular nozzle. Pitot pressure measurements in the free flow were used to calculate fully expanded Mach number distribution along the centerline and in the normal plane at four downstream locations. Spreading rate and mass flow ratio were compared. Results showed that the jet which emerged from the unvaned notched rectangular nozzle spread faster in the direction of the small nozzle dimension, while the jet emanating from the vaned straight rectangular nozzle spread faster in the direction of the long nozzle dimension. The swirling boundary layers were found to result in more entrainment than their corresponding nonswirling counterparts, and the jets emerging from notched nozzles were found to spread faster than those from straight nozzles.

Other direct contracts/research/projects due to the AFOSR Grant:

1. National Institute Aviation Research cooperative efforts in composite structures and building components such as wing tips, vertical stabilizer caps, etc. using industry approved and experimental lay up methods.
3. Kanas State University Psychology department is currently doing training situation awareness: The Contribution of Task Invariant Components, Pilot's Schemata and their effects on Situation Awareness.
4. Honeywell/NASA/Kansas Grant Consortium project.
5. Cockpit automation and free flight sponsored by Kanas State University graduate school special group incentive research awards program, KSU.
6. E-Prom development is a contract with Aviation Simulation Technology. Developing approaches and route structure for simulators AST300 and AST300T.
7. Contributed to the NASA consortium aircraft design award won by the Kansas NASA Consortium.
8. Kansas University aeronautical engineering students annually attend a full day seminar offered by our department for a hands on experience, tours, orientation flights in aircraft and simulators, aircraft maintenance problems associated with aircraft designees, etc.
9. Non destructive testing equipment, laboratories, subject matter expertise of faculty allow courses in NDT and components to be offered as part of our four year program and enhances capabilities in research grants.
10. Current contract with NASA research to perform ozone hole studies and high altitude exhaust emission studies on their effect. We are providing all facilities, storage and support for this contract.
11. We are subcontracted with McDonnell Douglas who has a $70 million contract with the Malaysian government to establish an Aeronautical Training Center in Malaysia. KSU-Salina Aeronautical Department will train the instructors, provide the aviation maintenance technician curriculum, train the initial students, help development the equipment, facilities and operation of the training facility. We will provide subject matter expertise for developing a 700 hour Computer Based Training package, set up electronic two way video classrooms and multimedia electurn for delivery of classes and support to Malaysia from Salina, Kansas. Follow on development of speciality courses, transport category aviation maintenance technicians, digital electronics, etc. An articulation agreement for four year aeronautical engineering accredited to be established in Malaysia, follow on pilot training are also follow on projects.
12. We have conducted simulator market surveys and reports for IVAC through SGA (Stan Garst and Associates) a simulator company.
13. Raytheon used our aircraft for a production safety video on main spar inspection procedures.
14. Allied Signal performed envelope testing and video recording for safety flight procedures and the instrumentation there of.
15. We are looking at providing equipment and review flight envelope procedures for the NIAR aircraft seat safety in current projection aircraft.
16. Actively involved in the NSF grant to support Global Position Systems GPS and GIS research, curriculum development distributed to other colleges in U.S. and to provide on going expertise support.

17. Implemented FAA endorsed four year degrees in Airway Science in aircraft maintenance and Professional flight.
18. Conducted through UAA/University Aviation Associated/Ab-initio prop-jet training research in cooperation with Air Midwest.
19. Developing Airline Transport curriculum with America Eagle airlines.
20. Ongoing USAF training of technicians from McConnell Airforce Base and USA training of technicians from Fort Riley and MOS training for KSARNG.
21. Active in subject matter expertise and training and support for Kansas Highway Patrol (KHP) and Sheriff and city police for drug interdiction/enforcement flight activities.
22. Worked with Howard Smith, Kansas University, on structure research.
23. Analysis and development of Methodology for relating accidents and near accidents and near accidents and known maintenance error with NIAR, Behnam Bahr.

III. Environmental Assessments

KSU
KANSAS STATE UNIVERSITY

ENVIRONMENTAL ASSESSMENT

Equipment Support for Aeronautical Training and Materials Research
Air Force Office of Scientific Research

Kansas State University
College of Technology

February 21, 1995

Aeronautical Training and Materials Research

ENVIRONMENTAL ASSESSMENT

Grant to:

Kansas State University
Manhattan, KS 66506

Principal Investigators
Charles Reagan
Kenneth Barnard

This Environmental Assessment Prepared For:

U. S. Air Force Office of Scientific Research (AFMC)
Bolling Air Force Base, D.C.

This Environmental Assessment is a revision of the approved Environmental Assessment dated June 25, 1993.

Dr. Charles E. Reagan
For Kansas State University

Date

AFOSR

Date

Cover Sheet

Proposed actions: Kansas State University has proposed a grant of $7.7 million for laboratory equipment, technical training devices and training aircraft to equip and implement an innovative technical training and research program. This proposal has received approval from the Department of Defense. This environmental assessment fulfills the requirements of the National Environmental Protection Act and is done at the direction of the Air Force Office of Scientific Research.

Type of statement: Final Environmental Assessment

Lead agency: Kansas State University

For further information:
Dr. Charles E. Reagan
Executive Assistant to the President
Kansas State University
110 Anderson Hall
Manhattan, KS 66506-0112
913-532-6221

Abstract: The College of Technology, Kansas State University-Salina, is one of nine colleges of Kansas State University. The main campus and the Veterinary Medical campus are located in Manhattan, Kansas, sixty miles east of Salina. At the College of Technology, there are two principle areas of study: aeronautical studies and engineering technology. This grant will support all three parts of the aeronautical studies department: professional pilot training, aviation maintenance technology, and avionics technician.

This equipment will put the aeronautical studies department in a position to conduct and participate in cooperative research on human factors in aviation and in composite materials testing. Other portions of the equipment request will allow KSU-Salina to institute some innovative and advanced courses in non-destructive testing and the fabrication and repair of composite structures.

The training function of the equipment request will include simulators and aircraft for all stages of professional pilot training through the Airline Transport Rating. The College intends to develop a special ATP/Turbine Transition course designed to convert military pilots to civilian pilot qualifications suitable for commuter or corporate positions. The College offers international pilot training, in cooperation with British Aerospace. The College is approved for British CAA training and is prepared to train pilots to either the American FAA, the British CAA, or any combination of the two.

The equipment requested in this proposal will allow Kansas State University-Salina Aeronautical Studies to become the best university aviation program in the country.

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Chapter 1

Purpose and Need for Action

Chapter 1

Purpose and Need for Action

1.1 **Statement of Importance of Grant and Purposes in Proposal.** Kansas State University has proposed a grant of $7.7 million for laboratory equipment, technical training devices, and training aircraft to equip and implement an innovative technical training and research program. This proposal has already received approval from the U.S. Congress and the Department of Defense. The equipment in our proposal will expand an existing aeronautical studies program. Portions of the equipment will support an enlargement and equipping of our Avionics (aircraft, radio, and navigation) Training Program. Other parts of the equipment will allow us to expand and enhance our Aircraft Technician Training (A & P Mechanic Program). Finally, the training aircraft and simulators in the proposal will allow us to expand and improve our Professional Flight Training Program. All of this equipment will be at the Kansas State University-Salina campus located at the Salina Municipal Airport (former Schilling Air Force Base). The project will begin as soon as funds are received from the Department of Defense, but no later than September 30, 1993. The overall goal is to create the best university aviation program in the United States. The equipment in this Grant proposal is extraordinarily important in advancing the fundamental purposes of the Aeronautical Studies Department at Kansas State University-Salina. This equipment will be used in research and training.

Research:

There are three areas of research interest and capability at Kansas State University-Salina, which depend upon the receipt of the equipment in this Grant proposal: human factors, composites, and training curricula. We intend to use the simulators and standardized fleet and the available source of research subjects in human factors research. Researchers at Kansas State University have a special interest in situational awareness, cockpit displays, control layouts, and training schedules. In composite research, we will cooperate with the National Institute for Aviation Research at Wichita State University and the Department of Aeronautical Engineering at the University of Kansas. Some composite components will be put on fleet aircraft to test their reliability and endurance in an actual training environment. Other composite materials may be experimentally installed in engines, and then those engines run on our test cells to determine the suitability of those materials. A third area of special research interest is in pilot training curricula. Kansas State University-Salina is the only University training program that we know of that has CAA- as well as FAA-certified instructors, and the only program that we know of in the United States which has been approved by the CAA to give CAA training. This puts us in a perfect position to compare students that have gone through the FAA training program and have met FAA standards with those in the CAA program to see and document progress and competence at various stages of the training program.

Training:

The equipment in this Grant proposal is extremely important in advancing the training function of all three parts of the Aeronautical Studies program. Equipment in Schedules D and E will provide us with the equipment we need to establish a composite laboratory and a non-destructive testing laboratory. To be able to train students in handling and repairing and fabricating composite structures and in the non-destructive testing of composites will put Kansas State University at the forefront of aviation technician training. More and more aircraft are made up in part or wholly (e.g., Beech Starship) of composite materials. Yet very few aviation maintenance training schools are equipped and prepared to teach students how to deal with these materials. Schedule H, Avionics Stations, will allow us to complete our Avionics Teaching Laboratory. Our method of teaching avionics is different from what is frequently found. Our avionics students will repair avionics in actual flyable airplanes, will have experience in the installation and removal of avionics

from airplanes, and will get experience in trouble-shooting and ramp testing. Many students will choose to combine avionics with airframe licenses. The latter, airframe/avionics certified technicians, are in especially high demand as modern aircraft become increasingly controlled by computers and electronic devices.

The turboprop simulator and C-90A King Air will allow us to institute a new airline transport rating/turbine transition course for experienced pilots, such as military pilots to convert them to civilian ratings and proficiencies. Finally, with our spray paint facility, we will be in a position to teach our aviation technician students the proper techniques for painting aircraft and aircraft parts in an environment which meets OSHA and EPA regulations.

Most of the equipment in our proposal is similar to equipment and aircraft presently being used in the Aeronautical Studies Program. However, we also propose to build an engine test cell and to construct a pre-fabricated hangar to house a Non-Destructive Testing Laboratory, Composite Laboratory, Avionics Laboratory and Turbine Engine storage. This building will be called the "Materials Coating and Fabrication Building." In addition, the aircraft in the grant proposal will significantly expand the amount of flying done in the program.

This Environmental Assessment will principally address these three issues.

1.2 **Salina Airport Authority Environmental Assessment.** We have relied on the Salina Airport Authority Environmental Assessment (SAAEA) for descriptions of the current airport environment and projections of future operations and their environmental impact. The SAAEA is included in Appendix A.

1.3 **Remaining Decisions.** None

1.4 **Potential issues.** Potential environmental issues with respect to this equipment support package involve air quality, noise, hazardous waste and emissions, and operator safety. Other equipment in the proposal, such as avionics equipment, computers, simulators, and aviation technician laboratory equipment, are similar in type to equipment presently being used. This equipment poses no potential environmental concerns whatsoever.

1.5 **Organization of this Envirnmental Assessment.** The Aeronautical Studies Program at Kansas State University is certified by the Federal Aviation Administration under Federal Aviation Administration FAR Parts 141 and 147. The Avionics Program is an authorized Bendix/King Avionics Repair Station. Instructors in this program have all of the requisite FCC licenses and permits. Kansas State University has EPA permits for the handling of hazardous waste and has an approved environmental safety program, headed by Dr. John Lambert, a certified hazard control manager.

The balance of this environmental assessment will address potential environmental problems concerning:

I. Increased number of flights as a result of additional training aircraft;
II. Engine test cell and;
III. Materials Coating and Fabrication Building.

Chapter 2

Alternatives Including Proposed Action

Chapter 2

Alternatives Including the Proposed Action

2.1 **Introduction.** This chapter will describe the proposed action and any reasonable alternatives. Any potential environmental consequences of the alternatives will be discussed.

2.2 **Current KSU-S Aeronautical Programs at Salina Municipal Airport.** The aeronautical programs at Kansas State University-Salina, College of Technology, are located on the east side of the Salina Municipal Airport. The principal buildings are a new pilot training center and classroom building (15,000 square feet), an attached aviation laboratory building (21,000 square feet), and two large ex-Air Force hangars (27,000 square feet each). The aviation program has 368,000 feet of dedicated ramp space. The Salina Municipal Airport is currently used for aircraft based at the airport; a commuter airline (U.S. Air Express), flying BE 1900C aircraft; flight training for Kansas State University-Salina using single- and multi-engine, fixed-wing, piston aircraft and single-piston engine helicopters; instrument approach and take off and landing practice by F-16's from McConnell Air Force Base in Wichita, Kansas; practice instrument approaches and take off and landings by Wichita aircraft manufacturers, such as Beech, Learjet, and Cessna; and the servicing of transient aircraft at two fixed base operations. The east side of the airport is an industrial park housing a variety of manufacturing and light industrial companies, such as Holiday Mansion Boat Company, Tony's Pizza, Kansas National Guard, Salina Area Vocational Technical School, Kansas Highway Patrol, and others. The actions Kansas State University is proposing are all activities that are currently occurring in the Salina Municipal Airport Environment.

See the KSU-S campus map, Figure 2.2, for the location of the Kansas State University facilities, including the proposed location of the engine test cell and the Materials Coating and Fabrication Building. See the Salina Airport Authority Environmental Assessment in Appendix A for a detailed description of the Salina Airport Environment and data concerning operations.

KANSAS STATE UNIVERSITY at SALINA
COLLEGE OF TECHNOLOGY

A. Pilot Training/Classroom Building
B. Aeronautical Laboratory Building
C. East Hangar
D. West Hangar
E. Alternate Site Engine Test Cell
F. Preferred Site Engine Test Cell
G. Proposed Site Materials Coating and Fabrication Building
_._._._._. Limits of KSU/S ramp

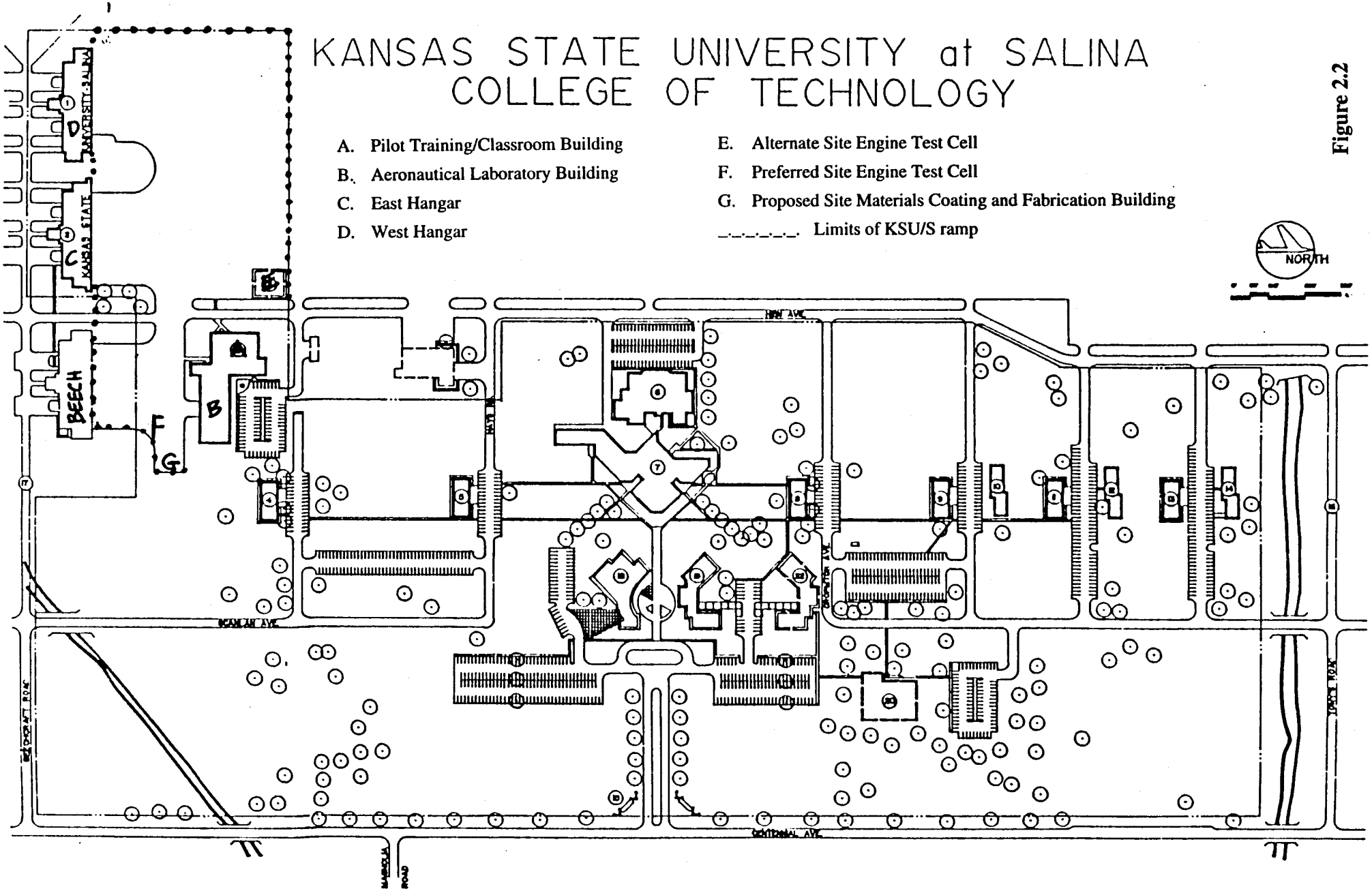


Figure 2.2

2.2.1 Proposed Action. Expansion of the Training Fleet. Our proposal calls for our training fleet to be expanded with the following aircraft:

1 C-90A King Air Turbo Prop
4 B-58 Baron Twin Engine Piston
6 F-33A Single Engine Piston Retractable
10 plus C-23 Sundowner Fixed Gear Fixed Pitch Single Engine Piston
3 Cessna C-150 Aerobat Aircraft

This fleet will approximately double the size of the Kansas State University-Salina professional pilot training fleet, which now consists of 23 single engine piston and multi-engine piston fixed wing aircraft and 3 single engine piston helicopters.

2.2.1.1 Alternative 1: Action as proposed.

2.2.1.2 Alternative 2: Modify proposal. *The training aircraft have been carefully selected for the present and future training needs of the Professional Pilot Program. The type and mix of aircraft have been selected after exhaustive consideration of all the other alternatives.*

2.2.1.3 Alternative 3: No action. *No action on the proposed aircraft purchase would have a severe effect on the professional pilot program's capacity to accomplish its mission. It would completely nullify the most significant portions of the grant intention to improve all phases of the aeronautical studies department.*

2.2.2 Proposed actions. Construction of the engine test cell in the preferred location.

2.2.2.1 Alternative 1: Construction of the engine test cell in a preferred location. *The location for the engine test cell was carefully selected to minimize the effects of noise on the classroom and laboratory environment and to use a site on the ramp which has been regularly used for the run-up of engines.*

2.2.2.2 Alternative 2: Location of the engine test cell northwest of the Pilot Training building. *The site was rejected because of the possible noise interfering with the teaching function of the building.*

2.2.2.3 Alternative 3: No action alternative. *This alternative is unacceptable since it is essential that engines rebuilt by students in lab courses be run and tested. Engines that are rebuilt for the training fleet must also be tested on calibrated instruments before being certified for service.*

2.2.3 Proposed Action. Construction of a prefabricated metal hangar for the completely self-contained Materials Coating and Fabrication Building. *This facility will be located on the east ramp, south of the Aviation Maintenance Technology Laboratory building. One advantage of this site is that it is near the AMT MLaboritory Building where engines, parts, and tools are readily available.*

2.2.3.1 Alternative 1: Facility located as proposed. *Many alternative sites for this structure were discussed and rejected because of planned uses of other portions of the ramp. The proposed site is the most convient from the piont of view of construction and use.*

2.2.3.2 Alternative 2: Construction of the Materials Coating and Fabrication Building in another location. Other sites on the ramp are unsuitable because of drainage and thickness of ramp (48" thick).

2.2.3.3 Alternative 3: No action. *This alternative is unacceptable because it is essential to our aeronautical programs to have adequate laboratories for Avionics, Composite Lay-up. Non-Destructive Testing and a secure storage area for our turbine engines.*

2.3 **Discussion of Alternatives.** The alternatives addressed above represent a range of reasonable alternatives. With respect to the selection of the engine test cell site and the Materials Coating and Fabrication Building, these were chosen because they best met our criteria of:

1. *How they fit in the overall use of the KSU-Salina ramp space.*
2. *Convenience to the Aviation Maintenance Technology Building and turbine engine storage area.*
3. *With respect to the engine test cell, would have any noise produced on the operation of the test cell in the same area as we now use for all pre-flight engine run-ups.*

2.4 **Environmental Effect of Alternatives.** The siting of the engine test cell and the Materials Coating and Fabrication Building has no environmental consequence, with the exception of noise from the test cell being farther away from the classroom and laboratory buildings if it is located in the site we have proposed.

Chapter 3

The Affected Environment

Chapter 3

The Affected Environment

3.1 Introduction. All of the equipment that we are proposing in our grant is similar in type to equipment presently being used in the Aeronautical Studies Department. Furthermore, all of the activities, including training flights, aviation technician laboratory work, aircraft repair and rebuilding, etc., are currently being conducted at KSU-S and at other locations on the Salina Municipal Airport.

3.2 KSU-S Description. The Kansas State University-Salina College of Technology campus is located on the east side of the Salina Municipal Airport in an industrial and business park, which goes virtually the whole length of the airport. (See enclosed map of airport area, Figure 3.2). Salina, Kansas, is located (N 38°47.50'; W 97° 39.06') approximately 170 miles west of Kansas City at the intersection of Interstate 70 and Interstate 135W. Kansas State University-Salina, College of Technology, is a college of Kansas State University. Principal programs are Engineering Technology (civil, chemical, electrical, mechanical, computer) and Aeronautical Studies (professional pilot, aviation maintenance, and avionics). There are 550 FTE students and 48 FTE faculty and administrators. The budget of the college if $4.9 million.

3.3 KSU-S Location. The pilot training center and aviation technical laboratories are marked A and B on the enclosed diagram of the KSU-Salina campus. The spray paint facility is identified as Location E; the engine test cell, Location F. (See map at 2.2, page 4)

3.4 Affected Environments

3.4.1 Noise. The number and type of operations at the Salina Municipal Airport are below the requirement for noise studies. See Appendix A, Salina Airport Authority Environmental Assessment (SAAEA page 13). The noise level in the industrial park is compatible with levels permitted for the uses in the park, such as truck engines, and other light machinery.

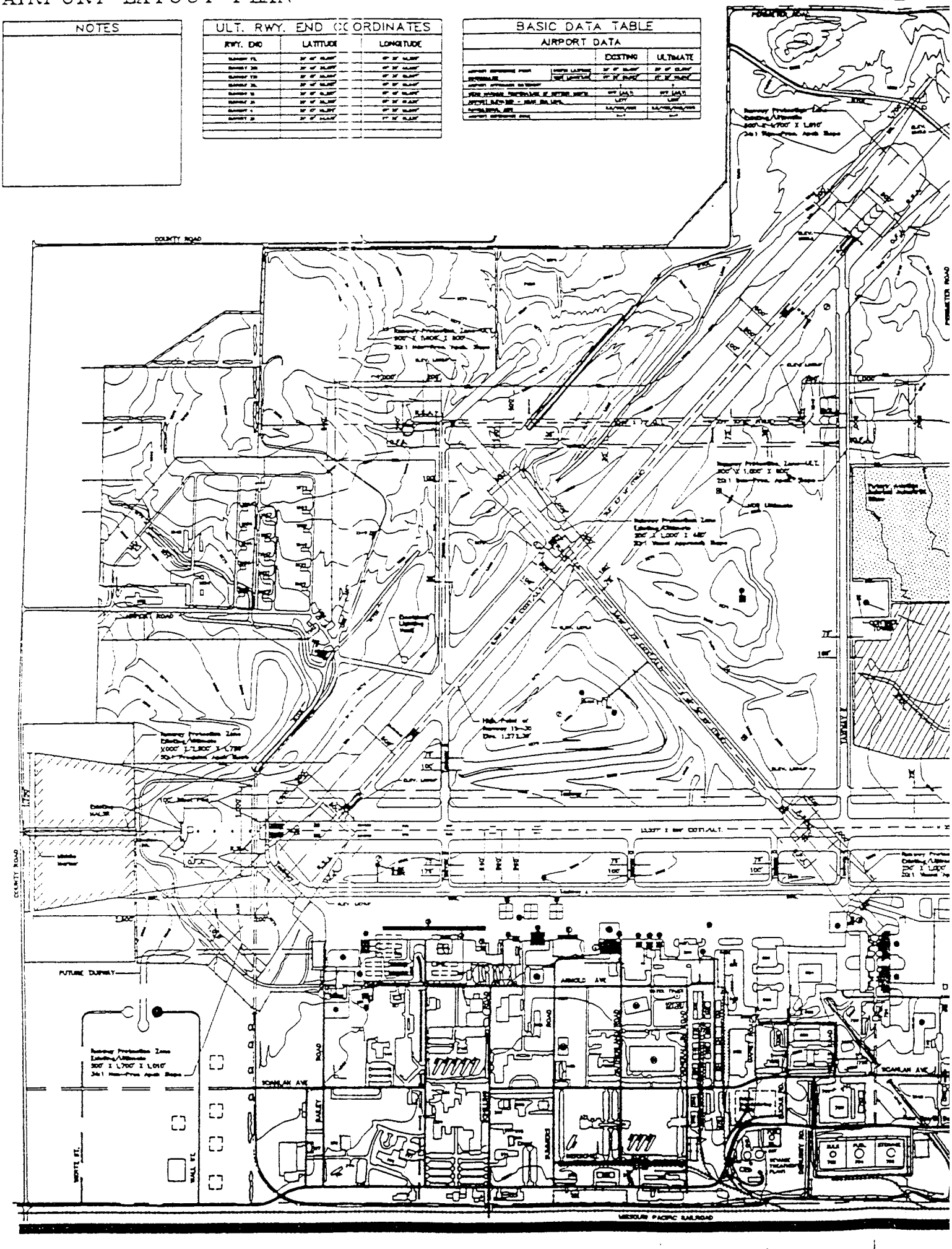
3.4.2 Air Quality. The Salina regional air quality is excellent and is an attainment status. See SAAEA page 19.

AIRPORT LAYOUT PLAN

NOTES

ULT. RWY. END COORDINATES		
RWY. END	LATITUDE	LONGITUDE

BASIC DATA TABLE		
AIRPORT DATA		
	EXISTING	ULTIMATE



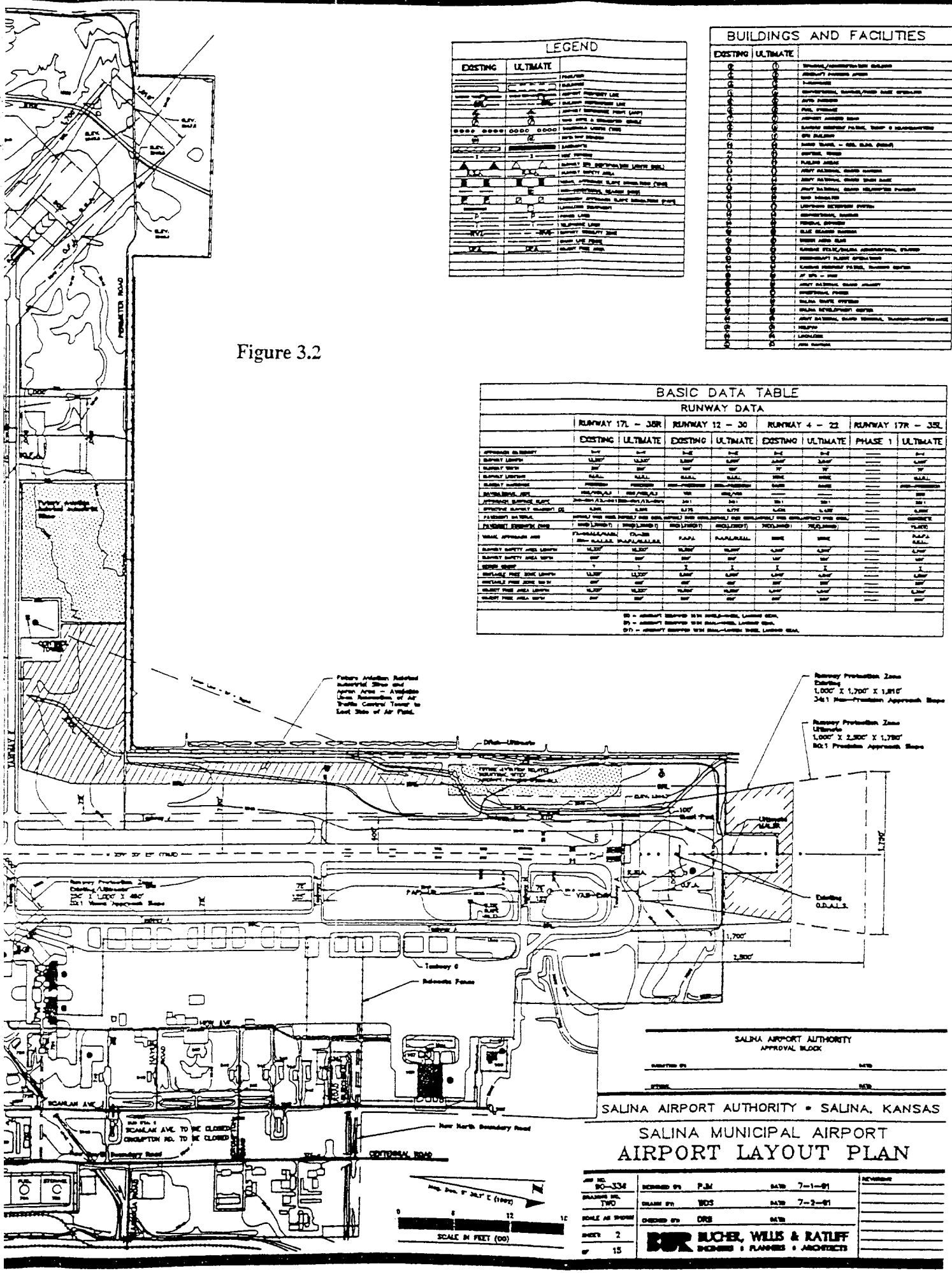

LEGEND
EXISTING
ULTIMATE
BUILDINGS AND FACILITIES
EXISTING
ULTIMATE
BASIC DATA TABLE
RUNWAY DATA
RUNWAY 17L - 35R
RUNWAY 12 - 30
RUNWAY 4 - 22
RUNWAY 17R - 35L
EXISTING
ULTIMATE
EXISTING
ULTIMATE
EXISTING
ULTIMATE
PHASE 1
ULTIMATE
PERIMETER ROAD
SCANLAN AVE. TO BE CLOSED
CRITTENDEN ROAD
SCALE IN FEET (00)
SALINA AIRPORT AUTHORITY
APPROVAL BLOCK
SALINA AIRPORT AUTHORITY • SALINA, KANSAS
SALINA MUNICIPAL AIRPORT
AIRPORT LAYOUT PLAN
BUCHER, WILLIS & RATLIFF
ENGINEERS • PLANNERS • ARCHITECTS

Figure 3.2

3.4.3 Hazardous Materials, Waste and Management Program. Kansas State University-Manhattan is permitted to dispose of hazardous wastes in accordance with 40CFR265.1(c)(4) and 40CFR265.11. The identification number is KSD980632772.

Currently, Kansas State University-Salina does not have a hazardous waste identification number because no such permit number was necessary to date. If hazardous waste is generated at KSU-Salina, an identification number for disposal will be obtained in accordance with 40CFR Part 265 and K.S.A. 65-3431, Article 31., 28-31-4(c), as amended.

No Storm Water Discharge Permits or Clean Air Permits have been requested or received, as no such permits have been required to date.

3.4.4 Utilities. When the Salina Airport Authority built the aeronautical laboratory addition and leased it to the State of Kansas, utilities to the site were upgraded and can easily handle the minimal additional demands of this project.

3.4.5 Archeological, Historical, and Cultural Resources. There are no archeological, historical, or cultural sites at the Salina Airport. There are no such sites at the KSU campus as a whole, nor on the ramp areas. (Cf. SAAEA, page 20)

Chapter 4

Environmental Consequences

Chapter 4

Environmental Consequences

4.1 Introduction. This section is organized under the headings of resources, such as air, water, etc. Each subsection will address a different resource and any effects our proposal will have on those resources.

4.2 Noise

4.2.1 Additional Aircraft

4.2.1.1 Alternative 1: Additional aircraft as proposed. *Additional aircraft will mean additional flights. These flights will produce additional noise, yet even with the anticipated number of additional flights, the Salina Airport will remain below the threshold for noise analysis and containment procedures.*

4.2.1.2 Alternative 2: Different mix of aircraft types. *Changing the mix of aircraft types, as long as turbo jet and fan jet engines are not used, will have no significant effect on noise beyond the additional flights.*

4.2.1.3 Alternative 3: No action. *No additional noise.*

4.2.2 Engine Test Cell

4.2.2.1 Alternative 1: Engine test cell and proposed location. *The engine test cell will produce some additional noise, but this noise will be less than that of an operating aircraft engine. At present engines are run-up and tested in aircraft with propellers. In the engine test cell, test paddles are used in place of propellers and, therefore, the level of noise is far lower than that of an operating aircraft engine. The test cell will be located on the ramp where pre-flight engine run-ups are normally made.*

4.2.2.2 Alternative 2: Engine test cell and alternative location. *The location will have no effect on the amount of noise produced by the test cell. Alternative locations would put the test cell too far from access to engine storage, tools, and necessary parts for engine testing.*

4.2.2.3 Alternative 3: No action. *No additional noise.*

4.2.3 Materials Coating and Fabrication Building

4.2.3.1 Alternative 1: Located as proposed. *Since the building is pre-fabricated, there will be no significant increase in short-term noise during construction. There is no noise of any significance produced in the laboratories in the building.*

4.2.3.2 Alternative 2: Alternative location for Materials Coating and Fabrication Building. *The location has no effect on the noise in the Materials Coating and Fabrication Building, which will be minimal in any case.*

4.2.3.3 Alternative 3: No action. *No effect on noise.*

4.3 Air Quality

4.3.1 Additional Aircraft

4.3.1.1 Alternative 1: Additional aircraft as proposed. *The increased number of flights with the additional aircraft will have no significant effect on the Salina Airport air quality. (See Cf. SAAEA page 19)*

4.3.1.2 Alternative 2: Different mix of aircraft types. *The type of aircraft that could plausibly be used in our training program all produce approximately the same emissions. Therefore, a different mix would not change the effect on air quality, which is minimal in any case.*

4.3.1.3 Alternative 3: No action. *No effect on air quality.*

4.3.2 Engine Test Cell

4.3.2.1 Alternative 1: Engine test cell in proposed location. *Engines being tested in an engine test cell will have the intake manifolds and exhaust manifolds of a production engine. Therefore, they will produce no more emissions than an operating aircraft engine. The test cell will be located in any open air area and take advantage of the prevailing southerly winds to dissipate an emissions produced in the test cell. Thus, the current air quality will not be affected by the operation of the test cell.*

4.3.2.2 Alternative 2: Engine test cell in alternative location. *The emissions from the engine test cell will be the same no matter what the location.*

4.3.2.3 Alternative 3: No action. *No effect on air quality.*

4.3.3 Pre-fabricated Hangar for Materials Coating and Fabrication Building

4.3.3.1 Alternative 1: Located as proposed. *The Materials Coating and Fabrication Building will have no effect on air quality since all of the emissions from the Composite Laboratory will be captured in dry filters and no solvents or paint particles will be emitted from the building. Air quality within the building will be protected by fans, and anyone in the Composite Laboratory will wear protective clothing.*

4.3.3.2 Alternative 2: Alternative location. *No effect on air quality inside or outside the Materials Coating and Fabrication Building.*

4.3.3.3 Alternative 3: No action. *No effect on air quality.*

4.4 Human Effects

4.4.1 Additional Aircraft

4.4.1.1 Alternative 1: Additional aircraft as proposed. *Additional training aircraft and training flights will have no adverse effect on human safety. The Salina Airport Tower and KSU-S officials have worked out an ingenious system of call signs that will allow for the safe separation of all training flights.*

4.4.1.2 Alternative 2: Different mix of aircraft types. *Different types of aircraft will have no difference in human effects.*

4.4.1.3 Alternative 3: No action. *No effects.*

4.4.2 Engine Test Cell

4.4.2.1 Alternative 1: Engine test cell located as proposed. *A concrete revetment will separate the operator of the engine test cell from the engine itself. The operator will have the controls for the engine and the calibrated instruments on his/her side of the revetment. The operator will use hearing protection. The test cell will be surrounded by a chain-link fence to prevent unauthorized admission.*

4.4.2.2 Alternative 2: Engine test cell in alternative location. *The safety of the operator would be the same no matter where the test cell is located.*

4.4.2.3 Alternative 3: No action. *No effect.*

4.4.3 Pre-fabricated Hangar for Materials Coating and Fabrication Building

4.4.3.1 Alternative 1: Located as proposed. *All workers in the Materials Coating and Fabrication Building will be properly trained in the use of composite materials, will wear protective clothing, and will be thoroughly briefed on all safety procedures.*

4.4.3.2 Alternative 2: Alternative location. *The location of the Materials Coating and Fabrication Building will have no effect on human safety.*

4.4.3.3 Alternative 3: No action. *No effect.*

4.5 Hazardous Materials and Waste Management

4.5.1 Additional Aircraft

4.5.1.1 Alternative 1: Additional aircraft as proposed. *Additional aircraft and additional flights will produce minimal waste problems. Used engine oil will be handled as it presently is by being stored in proper containers and then sold to oil recyclers.*

4.5.1.2 Alternative 2: Different mix of aircraft types. *The types of training aircraft used will have no significant effect on hazardous materials or waste.*

4.5.1.3 Alternative 3: No action. *No effect.*

4.5.2 Engine Test Cell

4.5.2.1 Alternative 1: Engine test cell located as proposed. *Engine test cell will not produce any hazardous materials or waste management problems.*

4.5.2.2 Alternative 2: Engine test cell in alternative location. *The location has no effect on the production of hazardous materials or waste, which are minimal or non-existent in any case.*

4.5.2.3 Alternative 3: No action. *No effect.*

4.5.3 Pre-fabricated Hangar for Materials Coating and Fabrication Building

4.5.3.1 Alternative 1: Location as proposed. *Dust from Composite Laboratory will be collected in filters attached to vacuum tables. Dust will be disposed of in accordance with applicable EPA requirements.*

4.5.3.2 Alternative 2: Alternative locations. *No matter what the location of the Materials Coating and Fabrication Building, the procedures for handling filters and waste will be the same. See Alternative 1.*

4.5.3.3 Alternative 3: No action. *No effect.*

4.6 Conclusion: The equipment in our grant proposal, including the additional aircraft, the engine test cell, and the Materials Coating and Fabrication Building, will have no deleterious effect on the environment nor on workers safety, provided they are installed, used, and operated in accordance with the plans described above.

Chapter 5

List of Preparers

Kansas State University

Chapter 5

List of Preparers

Dr. Charles E. Reagan:

Executive Assistant to the President. Ph.D. in philosophy. Commercial pilot, instrument rated in single-engine and multi-engine airplanes. Certified flight instructor for instruments and single-engine and multi-engine airplanes. Former commuter airline pilot, charter pilot, and flight instructor. Responsible for University's Aviation Transportation Department and liaison with Department of Aeronautical Studies.

Kenneth Barnard:

Department Head, Aeronautical Studies, College of Technology, Kansas State University-Salina. M.S., B.S., A & P Certificate, Airline Transport Rating, single-engine and multi-engine airplanes, helicopters; certified flight instructor, instruments, single-engine and multi-engine airplanes, helicopters. Former helicopter pilot for Rocky Mountain Helicopters and U.S. Army helicopter pilot from 1968 to 1972. Lt. Colonel, Aviation, U.S. Army Reserve.

John P. Lambert:

B.S. in chemistry, M.S. in radiological health, and Ph.D. in microbiology. He has experience in industrial hygiene, radiation safety, sanitation, bio-safety, and environmental health and safety at Kansas State University for 29 years. He is a Certified Hazard Control Manager and was a Certified Safety Executive from 1985-1991. Currently, he is a member of the Campus Safety Association, the National Environmental Health Association, the American Conference of Governmental Industrial Hygienists, and the Health Physics Society.

Chapter 6

List of Agencies, Organizations, and Persons

Chapter 6

List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent

U.S. Air Force Office of Scientific Research

Office of U.S. Senator Bob Dole

Salina Airport Authority

Chapter 7

Public Review and Comments

The following advertisement was published in the Manhattan Mercury and the Salina Journal on January 23 and 24, 1995.

The Manhattan Mercury

Tuesday, January 24, 1995

Legal Notices

NOTICE

Published in *The Manhattan Mercury* January 23, 1995; subsequently published January 24, 1995.
Kansas State University has received a grant for $7.7 million for laboratory equipment, technical training devices, and training aircraft to equip and implement an innovative technical training and research program. This grant has received approval from the Department of Defense. An Environmental Assessment has been prepared to fulfill the requirements of the National Environmental Protection Act and is done at the direction of the Air Force Office of Scientific Research (AFOSR). The approved Environmental Assessment has been modified to reflect certain changes in the grant program. In particular, a Materials Coating and Fabrication Building, housing a Composite Laboratory, Non-Destructive Testing Laboratory, an Avionics Laboratory, and a Turbine Engine Storage Area will replace a Spray-Paint Booth. This substitution will, in fact, lessen environmental impacts, which are, in any case, minimal.
Before issuing a Finding of No Significant Impact (FONSI), the AFOSR requires that the public be given 15 days to review and comment on the Environmental Assessment. Copies of the Environmental Assessment have been desposited with the Manhattan Public Library and may be obtained by calling or writing: Charles Reagan, Office of the President, Kansas State University, 110 Anderson Hall, Manhattan, KS 66506-0112 (913) 532-6221. Interested persons will have until the 6th day of February, 1995, to make comments and the Environmental Assessment before it is forwarded to the AFOSR.

The Salina Journal

January 24, 1995

SPECIAL NOTICES

NOTICE

Kansas State University has received a grant for $7.7 million for laboratory equipment, technical training devices, and training aircraft to equip and implement an innovative technical training and research program. This grant has received approval from the Department of Defense. An Environmental Assessment has been prepared to fulfill the requirements of the National Environmental Protection Act and is done at the direction of the Air Force Office of Scientific Research (AFOSR). The approved Environmental Assessment has been modified to reflect certain changes in the grant program. In particular, a Materials Coating and Fabrication Building, housing a Composite Laboratory, Non-Destructive Testing Laboratory, an Avionics Laboratory, and a Turbine Engine Storage Area will replace a Spray-Paint Booth. This substitution will, in fact, lessen environmental impacts, which are, in any case, minimal.

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No comments were received from the public.

Appendix A

Salina Airport Authority
Environmental Assessment

Kansas State University

ENVIRONMENTAL ASSESSMENT

SALINA MUNICIPAL AIRPORT

Salina, Kansas

Airport Development to 2010

Prepared For

SALINA AIRPORT AUTHORITY

Prepared By

BUCHER, WILLIS & RATLIFF
ENGINEERS • PLANNERS • ARCHITECTS

This Environmental Assessment becomes a Federal document when evaluated and signed by the responsible F.A.A. official.

_____ _____

Responsible F.A.A. Official **Date**

4. Project Need

The forecasted aircraft operations are based on local and itinerant operations. Local operations are performed by those aircraft which take off and land at the same airport and operate within the local vicinity of the airport. Itinerant aircraft operations are those in which the aircraft land or take off at one airport and have an origin or terminus of flight at another airport. Total operations forecasted to 2010 are 221,200, of which 50% are local and 50% itinerant.

Currently, the Salina Municipal Airport is operating at 50% capacity. By 2000, without recommended improvements, the airfield will experience near 100% capacity in terms of operations. To relieve the primary 17-35 runway, a new parallel runway is needed. The following projections indicate the forecasted future demands on the airfield based on expected increases in training programs at KSU-Salina's Aeronautical Studies Department. The operational purpose of this additional north-south runway would be to relieve the primary ILS runway of the large amount of training activity at the airport.

Table 1.1
Based Aircraft Forecast
Salina Municipal Airport
(Excluding Military)

Year	Single Engine	Multi-Engine	Turbo-Prop	Business Jet	Rotocraft Other	Total Aircraft Forecasted
1990*	96	15	4	1	9	125
1995	116	21	5	3	9	154
2000	123	25	6	5	10	169
2005	134	28	7	6	10	185
2010	142	31	8	8	12	201

*Actual

C. ALTERNATIVES

This section presents and evaluates alternatives which have been considered for this project. The following alternatives have been examined in order to ensure that the chosen alternative is the most effective and feasible project undertaken:

- No Action
- Service From Another Airport

1. No Action

Thorough attention is given to the recommended project when considering the consequences of no project occurring at all. The Salina Municipal Airport handles a significant number of training operations with the location of Kansas State University-Salina and the Kansas Army National Guard, Army Aviation Support Facility #2. By 1995, the airport will be at 86% of its operational capacity and will experience an airfield capacity problem during the planning period.

The forecast demand for aviation transportation at the Salina Municipal Airport warrants the construction of an additional runway. The no action alternative would result in a future capacity problem. Increases in training programs expected at KSU-Salina will double in the next five years. The addition of a north-south runway would relieve the primary runway of training activities and allow it to handle more larger aircraft.

In addition, the large financial investment placed in the facility over the past twenty years will not be protected without the recommended maintenance projects. These maintenance projects will prevent the airfield from deteriorating over time and preserve the usefulness of the airport.

2. Service From Another Airport

Two other airports are located near Salina. Burgers Valley Airport is located 11 miles north and 3.5 miles west of the Salina Airport. This airport is a low-capacity private-restricted field and is not equipped to handle the forecasted volume of air traffic at Salina. Silers Airport is located about 5.8 miles north and 6 miles east of the Salina

E. SPECIFIC IMPACT CATEGORIES

The following section briefly describes the impact, if any, the proposed project will have on specific environmental considerations.

1. Noise

An analysis of future aircraft noise levels was prepared for the Salina Municipal Airport area using the Federal Avaition Administration Integrated Noise Model (INM, Version 3.1). Noise around airports is a function of operational counts (activity) and aircraft mix. Aircraft operations at the Salina Municipal Airport are forecasted to total 167,700 operations annually by the year 1995 and 221,100 operations annually by the year 2010. It is estimated that in 2010 119,400 of these operations, or 54.0% will be performed by single-engine aircraft, 48,900 operations, or 22.1% will be performed by larger twin-engine and turboprop aircraft, 24,000 operations, or 10.8% will be performed by military jet operations and that 28,800 operations, or 13.0% will be performed by business jet aircraft.

Based on the above figures and an assumption of two percent nighttime operations, adjusted activity levels on the runway system will fall well above 90,000 adjusted propeller operations which has been established as the threshold for noise impact on adjacent areas. Business jet activity is also well above the 700 operations established for the threshold for noise impacts for this type of airport, therefore the resulting 65 DNL (Day-Night Levels) noise contours, are shown on Exhibit 3 for the year 1995 and Exhibit 4 for the year 2010. Associated flight tracks used to develope the noise contours are shown on Exhibit No's. 5 and 6 for 1995 and 2010 respectively. Detailed input file information on the noise modeling is shown in the Appendix for both 1995 and 2010 planning periods.

No significant negative impact is expected as these levels of activity result in cumulative noise levels of 65 DNL only in limited areas off of the west side of the airport property. This noise contour is associated with the large amount of fighter jet operations using the Salina airport in conjunction with the Smoky Hill Weapons Range. This small area outside the airport property will pose no significant impact on the surrounding area.

4. *Induced Social Impacts*

F.A.A. Order 5050.4A requires that major airport development proposals which produce the potential for secondary impacts on surrounding communities should describe and evaluate these impacts. Secondary or induced impacts include employment shifts, population shifts, shifts in demand for public services and changes in business and economic activity as influenced by airport development. The proposed airport project will not cause significant social impacts locally or in other communities. The proposed activity will be very localized in that it will primarily assist current users of the airport.

5. *Air Quality*

Determination of the need for an air quality analysis is made by a review of F.A.A. and State requirements and the number of forecast operations. F.A.A. Order 5050.4A requires that proposals for airport master plans make this determination. If the proposed project is in a state which does not have applicable indirect source review (ISR) requirements, then the projected airport activity levels are examined. The threshold for this requirement is 180,000 annual operations.

At Salina, there were 96,254 operations in 1990. By 2000, 185,900 annual operations are forecasted which is 103% of the minimum number of operations that require an air quality analysis. In years 2005 and 2010, operations will be 113% and 118.6% of this minimum.

Because the 180,000 operations at Salina is not expected to occur until the later 1990's, and current operations are only 54% of this minimum, an air quality analysis is not needed at this time. Futhermore, nearly 64% of the forecast operations will be produced by piston-type aircraft which contribute significantly less to an air quality problem than do turbine powered aircraft, therefore no problems are anticipated. Annual operations during the later 1990's will be reviewed to determine if air quality criteria should be evaluated to minimize impacts from increased operations.

6. *Water Quality*

Water quality considerations require special attention in the Environmental Assessment. Water quality impacts from airport construction at any of these sites are most likely to be in the form of nonpoint source pollution. In order to protect water quality at the site, certain safeguards will be necessary: adequate erosion control, especially during construction; storm water management to control the amount of runoff from the site; and an emergency plan for fuel spills.

The construction of a new 4,100' x 75' runway and a 4,100' x 35' taxiway will create more than 11 acres of impervious surface. The runway and taxiway will be designed to provide adequate slope and crown to allow stormwater drainage into the airport's existing airfield drainage system. Inlets will be located at various points along both the runway and the taxiway.

Proper construction practices must be employed to ensure that water quality is not threatened by construction site pollutants. Construction site activities will be guided by Kansas Department of Health and Environment (KDHE) report Management of Construction Activity Nonpoint Source Pollutants.

7. *Department of Transportation Act, Section 4(f) Land*

F.A.A. 505.4A requires that activities which require the use of "...any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance..." shall not be approved unless it can be shown that no reasonable alternative exists and all possible mitigation measures will be taken. No Section 4(f) lands are located in the area designated for the proposed airport project. There are no public parks, recreational areas, refuges or historic sites which will be affected by a new parallel runway at Salina Municipal Airport.

8. *Historic, Architectural, Archeological and Cultural Resources*

The Kansas State Historical society was contacted to confirm that the project would not disturb significant historical, archeological or architectural features. According to the Historical Society, there are no sites in the vicinity of the proposed runway project which are listed on the National Register of Historic Places, nor any historic site listed

KSU
KANSAS STATE UNIVERSITY

ENVIRONMENTAL ASSESSMENT

Equipment Support for Aeronautical Training and Materials Research
Air Force Office of Scientific Research

Kansas State University
College of Technology

Aeronautical Training and Materials Research

ENVIRONMENTAL ASSESSMENT

Grant to:

Kansas State University
Manhattan, KS 66506

Principal Investigators
Charles Reagan
Kenneth Barnard

This Environmental Assessment Prepared For:

U. S. Air Force Office of Scientific Research (AFMC)
Bolling Air Force Base, D.C.

June 5, 1993

Dr. Charles E. Reagan
For Kansas State University

Date

AFOSR

Date

SUMMARY

Kansas State University has proposed a grant of $7.7 million for laboratory equipment, technical training devices and training aircraft to equip and implement an innovative technical training and research program. This proposal has received approval from the Department of Defense.||This environmental assessment fulfills the requirements of the National Environmental Protection Act and is done at the direction of the Air Force Office of Scientific Research.

Background:

The College of Technology, Kansas State University-Salina, is one of nine colleges of Kansas State University. The main campus and the Veterinary Medical campus are located in Manhattan, Kansas, sixty miles east of Salina. At the College of Technology, there are two principle areas of study: aeronautical studies and engineering technology. This grant will support all three parts of the aeronautical studies department: professional pilot training, aviation maintenance technology, and avionics technician.

This equipment will put the aeronautical studies department in a position to conduct and participate in cooperative research on human factors in aviation and in composite materials testing. Other portions of the equipment request will allow KSU-Salina to institute some innovative and advanced courses in non-destructive testing and the fabrication and repair of composite structures.

The training function of the equipment request will include simulators and aircraft for all stages of professional pilot training through the Airline Transport Rating. The College intends to develop a special ATP/Turbine Transition course designed to convert military pilots to civilian pilot qualifications suitable for commuter or corporate positions. Through cooperative agreements with McDonnell Douglas Training Systems, the College offers international pilot training. In cooperation with British Aerospace, the College is approved for British CAA training and is prepared to train pilots to either the American FAA, the British CAA, or any combination of the two.

The equipment requested in this proposal will allow Kansas State University-Salina Aeronautical Studies to become the best university aviation program in the country.

TABLE OF CONTENTS

Note: The original grant request was itemized in 18 schedules, designated A through R. The majority of this equipment poses no environmental effects whatsoever. These schedules are grouped together in Chapter 1. The five schedules which represent equipment which may pose some environmental concern have been grouped together in Chapter 2.

Chapter 1

Purposes and Equipment Which Pose No Environmental Consequences

Section I

Purpose and Need for Action

Schedule B

Turbo Prop/Jet Flight Training Device:

The flight training device we have selected provides flight simulation experience in the turboprop type aircraft which will emulate the flight characteristics of the Beechcraft C-90A turboprop aircraft (purchase proposed under Beechcraft) Schedule C. There is an added feature of an insert modular unit to change the flight training device to a Jet configuration which is a valuable training feature to allow student training experience in Jet aircraft flight characteristics as well as the turboprop configuration. The flight training device features full visual display both day and night with navigation proms available for any geographical location desired. This equipment will provide advanced training to our Professional Flight students, which will complement their training experience as they compete for airline pilot positions.

Schedule E

Non-Destructive Testing:

One complete set of testing equipment will be used to introduce students to non-destructive testing procedures and demonstrations of actual inspection techniques. This equipment is used to test the structural integrity of composite structures.

Schedule F

Multi-engine Flight Training Device:

The flight training device allows for pilot training in an environment that peaks performance in a reduced amount of time. Procedures, flight techniques, emergency procedures, etc., are trained best in the flight training device prior to using valuable and expensive airplane training time in the air. Many procedures in the emergency realm can only be done in the flight training device and, of course, all procedures are 100 percent safe. The multi-engine trainer complements the single-engine training device addressed later in this proposal.

Schedule G

Turbine Engine/Equipment:

A requirement of the Federal Aviation Administration is for approved FAR, Part 147 Airframes and Powerplant schools to have one runable turbine engine. We have had to rely on small APU units or World War II type engines in the past because of budget restraints. This is our first and probably only opportunity to purchase relatively current engines. We have selected the Allison 250 and PT-6 as viable engines to provide the students with popular models with different design configurations. Two runable with nine like models that are not runable will be used for laboratory teardown/inspection techniques and training.

Schedule H

Avionics Stations (8):

Avionics involves the installation and repair of the electronic components in the aircraft dealing primarily with navigation and communication. This is a rapidly expanding field that has a tremendous shortage of well-qualified up-to-date technicians. This is a new degree program for the college and can only be offered as an outcome of the equipment required as outlined in Schedule H. We are receiving FAA certification as a King Avionics repair station and the eight equipped laboratory stations will provide the students enrolled in the program up-to-date experience in a wide open field of opportunity.

Schedule I

FRASCA
Single Engine Piston (2):

These are single engine piston flight training devices made by Frasca. They were part of an international British Civil Aviation Authority approved pilot training contract that was forced to close last year. The two flight training devices were on five year State of Kansas certificates of participation (loan) that have a balance of $115,000 if paid in full June 1992. We are using the units in our Professional Pilot program and intend to continue their use as we expand our capabilities. We propose paying off this certificate.

Schedule J

Computers:

We have a need to establish a computer network to schedule, track student flight hour progression, grades, accounting, parts, suppliers, etc. The computer system designed and proposed will provide those needs. It will, in addition, provide a graphics work station for state of the art classroom presentations. As we interface with the main campus, other universities and advance to electronic classrooms, this system will adapt and function with full compatibility.

Schedule K

Electronic Equipment:

These monies will purchase eight electronic training boards that will support three electronic courses in the Airframe and Powerplant Electronic Devices, and Navigation/Communication Aids. All three courses can utilize these training boards, which will allow flexibility in teaching circuitry. The boards can be adapted to the higher level courses thus providing excellent multiple use capability.

Schedule M

Administration (Ins)
Instructor Training:

The administration monies are proposed to be used for aircraft insurance. The aircraft fleet will require insurance coverage for hull and liability. The allotted amount will not cover a year's premium; however, we plan on recovering some costs through the revenue generated by the flight training charges to the students. Flight instructor training costs are also included in this category.

Schedule N

Equipment Support:

We asked Beechcraft to provide a list of parts, suppliers, and special equipment required to maintain the fleet of aircraft proposed in Schedule M. Schedule N lists most of these items. The maintenance support personnel increase will be paid by the department from aircraft flight revenue.

Schedule P

BEECH
B-55 Avionics/Paint (2):

The proper ratio of aircraft models to train 300 pilot students are: (17) B-23, (6) B-33A, (6) B-58. Notice the proposal has (4) B-58 aircraft. The other two planned aircraft are used B-55 model Beech Barons owned by KSU-Salina. We plan to renovate these two aircraft by outfitting them with the same instruments, avionics, and paint scheme as the new B-58 Barons to round out the fleet to (6) Barons.

Schedule Q

A & P Lab Equipment:

This equipment is needed to outfit the newly constructed hangar facility with the Federal Aviation Administration required ratio of equipment to student per laboratory section. Some equipment is upgraded, others provide additional like equipment to accommodate more students in the laboratory.

Schedule R

Supplemental Equipment:

This final schedule contains equipment that we intend to purchase if the equipment identified in Schedule A through Q can be purchased for less than planned. This schedule is a contingency only for that event.

Section II

Alternatives Including Proposed Action

Alternative 1: Action as proposed.

Alternative 2: No action.

The consequences of taking no action in the purchase of this equipment would be to nullify the intention of the Grant to significantly improve all of the Aviation Technology programs at Kansas State University-Salina. Taking no action on each particular Schedule would affect a different area of the Aeronautical Studies program in a negative way.

Alternative 3: Modify equipment purchases of uses.

The equipment in these Schedules has been carefully selected to maximize the improvement of the Aeronautical Studies programs.

Section III

Affected Environment

The equipment in these schedules will have no effect on the environment at Kansas State University-Salina or in the Salina area.

Section IV

Environmental Consequences

The equipment in the Schedules in this chapter will have no environmental consequences. All of this equipment supports programs which are presently in place and are similar in kind to equipment already being used in the Aeronautical Studies programs.

Chapter 2

Purposes and Equipment Which May Have Environmental Consequences

Section I

Purpose and Need for Action

Schedules C and O

Training Aircraft:

These schedules call for the purchase of 11 new and 10-13 used training aircraft. The new aircraft will be (1) Beech C-90A, (4) Beech B-58 Barons, (6) Beech F-33A Bonanzas, and a yet undetermined number of used C-23 Sundowners, and (3) used Cessna 150 Aerobats. All of these aircraft will be used in the Professional Pilot training program.

Schedule A

Turbine/Reciprocating Engine Test Cell:

The engine test cell will consist of four open concrete bays (revetments) with covered control panels mounted at either end. The test cell is equipped with portable engine mounts, calibrated engine instruments and appropriate fuel tanks and quick disconnect assemblies. The test cell is required to test run engines after overhaul and before the engine is installed on an airworthy aircraft. The test cell construction is estimated to cost $50,000. The balance of $200,000 is planned to purchase new and used engines to include engine parts for engine assembly. The completed engines are then test-run on the test cell facility before installing on the department's aircraft. The aircraft engines replaced from our flight training aircraft are then overhauled by the Airframe & Powerplant program. This process complements each other's operation.

Schedule D

Composite Laboratory:

Composites are the fastest growing area in aviation new construction procedures and techniques. The technology advancements have out-paced industries' efforts to train technicians on the proper lay up and fabrication practices. Moreover, the efforts to train technicians in the proper inspection and repair procedures is severely lacking. This lab was designed and the equipment was selected after careful consultation with Boeing, Beechcraft and Cessna aircraft manufacturers. We have an instructor who is Aircraft Manufacturer school trained and will take the lead on this important aircraft construction/repair field. Additional advanced instruction is advised and allocated as a separate requirement. The lab is proposed to be housed within the paint station facility to take advantage of the temperature, humidity control and dust/filtering requirements.

Schedule L

Paint Station:

We recently requested and received a complete painting "booth" (48 x 60 feet) from Beechcraft. Most of the allocated money will provide construction cost for a building to house the donated paint booth (it has to be housed within a protected structure). Some of the money is designated for painting equipment and supplies. Plans call for additional space in the structure to provide for aircraft paint stripping, detailing, and drying. A dual purpose is planned for this space to provide an adequate environment for the composite lab. The dust from the composites has to be filtered before exiting the building.

Section II

Alternatives Including Proposed Action

Alternative 1: Action as proposed.

Alternative 2: No action.

No action on these schedules would have a severe effect on the Professional Pilot Program's capacity to accomplish their mission. It would completely nullify the most significant portions of the Grant intention to improve all phases of the Aeronautical Studies Department.

Alternative 3: Modify proposal.

The training aircraft have been carefully selected for the present and future training needs of the Professional Pilot program. The type and mix of aircraft have been selected after exhaustive consideration of all the other alternatives. With respect to the turbine/reciprocating engine test cell, the design could be modified to meet any objections. With respect to the composite laboratory, the layout, equipment or design could be modified to meet any objection. With respect to Schedule L, the paint station, we believe that our current plan will meet all EPA requirements; we are prepared to modify our current plans if needed.

Section III

Affected Environments

Schedules C and O

Training Aircraft

Environments which may be affected by this equipment are air quality, environmental noise, and safety.

Schedule A

Turbine/Reciprocating Engine Test Cell

This test cell may pose concerns for noise pollution, emissions, and safety.

Schedule D

Composite Laboratory

Possible environmental effects would be on air quality within the laboratory.

Schedule L

Paint Station

Potential environmental effects would be air quality within the paint booth, noxious emissions from the paint booth air handling system, hazardous waste disposal and workers safety.

Section IV

Environmental Consequences

Schedules C and O

Training Aircraft

Current and proposed training aircraft will primarily use the Salina Municipal Airport. The Salina Airport Authority Environmental Assessment, which has been done for the Federal Aviation Administration and which is enclosed as an appendix to this assessment, says that "currently the Salina Municipal Airport is operating at 50 percent capacity. By 2000, without recommended improvements, the airfield will experience near 100 percent capacity in terms of operations. . . The following projections indicate the forecasted future demands of the airfield based on expected increases in training programs at KSU-Salina's Aeronautical Studies Department." (Page 7) When conducting their environmental assessment, the Salina Airport Authority included in expected operations those operations that would result from the training aircraft proposed in this Grant. Current and future use of training aircraft by KSU-Salina will have no significant effect on air or noise pollution in the Salina Airport environment. We have developed a system of call signs with the Salina Tower Controllers which will permit a significant increase in training sorties without degrading safety.

Schedule A

Turbine/Reciprocating Engine Test Cell

Engines used on the test cell will be equipped with all of the intake manifolds and filters and exhaust manifolds and mufflers that they would have if they were operating on an aircraft. Therefore, the emissions will be no greater than would occur if the engine were installed in an aircraft. The test cell will be built on a ramp area which is normally used for the run-up of aircraft engines. The noise from propeller driven engines will be less than the equivalent noise of an operating and installed aircraft engine because test paddles are used in place of propellers. Since most of the noise from a propeller engine is from the propeller tips, engines operated in the test cell will produce far less noise than on installed in operating aircraft engine. With respect to workers' safety, there will be a concrete block wall separating the operator of the engine test cell from the engine itself. The operator will have controls and all of the calibrated instruments on his/her side of the wall and so will be completely protected from the engine and test paddle. Furthermore, the entire area will be enclosed in a chain-link fence to prevent any unauthorized personnel from approaching the test cells.

Conclusion: the operation of the engine test cells will produce less noise and no more emissions than if these engines were installed on aircraft. Workers will be fully protected from any kind of failure from the engine and will wear the normal hearing protection used in ramp areas.

Schedule D

Composite Laboratory

The most significant potential environmental effect in the composite laboratory is from the dust produced when composite materials are cut, sanded, or filed. All of this work will be done on vacuum tables where any dust particles are vacuumed from the table and the air through a filtering system and into a containment canister. The contents of the canister will be disposed of in accordance with EPA requirements, if any. If needed, workers will wear dust masks and eye protection. Therefore, there should be no problem with air quality within the composite laboratory.

Schedule L

Paint Station

We will be using a DeVilbiss Spray Booth, Model DW-6005, to paint aircraft and parts as necessary. A two-horse power motor will drive the exhaust fan and provide 125 LFM air velocity across the face of the booth. The spray booth will conform to 29CFR1910.107(B)OSHA spray booth regulations. The vapors and mist will be collected on filters which, when replaced, will be collected by our hazardous waste program personnel for proper disposal. Similarly, the unused paint and paint cans will be handled by personnel from the University's hazardous waste program. Waste from paint stripping procedures will be collected and transferred to the hazardous waste program for proper disposal.

The spray painting of aircraft and parts is not a new activity at the Salina Municipal Airport. Beech Aircraft previously used the spray booth in their hangars at the Salina Municipal Airport. They have donated the spray booth to KSU-Salina.

Conclusion: The spray painting operation to be conducted by KSU-Salina should not have a deleterious effect on the environment. All instructors and students using the paint booth will be provided with and instructed in the use of proper protective clothing, nose and mouth masks, eye protection, and clean-up procedures.

Section V

Conclusion

Equipment in the schedules in this chapter will not have any deleterious effect on the environment nor on workers' safety, provided that they are installed, used, and operated in accordance with the plans described above.

Chapter 3

Statement of Importance of Grant and Purposes in Proposal

Importance of Grant and Purposes in Proposal

The equipment in this Grant Proposal are extraordinarily important in advancing the fundamental purposes of the Aeronautical Studies Department at Kansas State University-Salina. This equipment will be used in research and training.

Research:

There are three areas of research interest and capability at Kansas State University-Salina, which depend upon the receipt of the equipment in this Grant proposal: human factors, composites, and training curricula. We intend to use the simulators and standardized fleet and the available source of research subjects in human factors research. Researchers at Kansas State University have a special interest in situational awareness, cockpit displays, control layouts, and training schedules. In composite research, we will cooperate with the National Institute for Aviation Research at Wichita State University and the Department of Aeronautical Engineering at the University of Kansas. Some composite components will be put on fleet aircraft to test their reliability and endurance in an actual training environment. Other composite materials may be experimentally installed in engines, and then those engines run on our test cells to determine the suitability of those materials. A third area of special research interest is in pilot training curricula. Kansas State University-Salina is the only University training program that we know of that has CAA as well as FAA certified instructors, and the only program that we know of in the United States which has been approved by the CAA to give CAA training. This puts us in a perfect position to compare students that have gone through the FAA training program and have met FAA standards with those in the CAA program to see and document progress and competence at various stages of the training program.

Training:

The equipment in this Grant proposal is extremely important in advancing the training function of all three parts of the Aeronautical Studies program. Equipment in schedules D and E will provide us with the equipment we need to establish a composite laboratory and a non-destructive testing laboratory. To be able to train students in handling and repairing and fabricating composite structures and in the non-destructive testing of composites will put Kansas State University at the forefront of aviation technician training. More and more aircraft are made up in part or wholly (e.g., Beech Starship) of composite materials. Yet very few aviation maintenance training schools are equipped and prepared to teach students how to deal with these materials. Schedule H, Avionics Stations, will allow us to complete our Avionics Teaching Laboratory. Our method of teaching avionics is different from what is frequently found. Our avionics students will repair avionics in actual flyable airplanes, will have experience in the installation and removal of avionics from airplanes, will get experience in trouble-shooting and ramp testing, and many students will choose to combine avionics with airframe licenses. The latter, airframe/avionics certified technicians are in especially high demand as modern aircraft become increasingly controlled by computers and electronic devices.

The turboprop simulator and C-90A King Air will allow us to institute a new airline transport rating/turbine transition course for experienced pilots, such as military pilots to convert them to civilian ratings and proficiencies. Finally, with Schedule L, we will be in a position to teach our aviation technician students the proper techniques for painting aircraft and aircraft parts in an environment which meets OSHA and EPA regulations.

Chapter IV

List of Preparers

Kansas State University

Preparers

Dr. Charles E. Reagan:

Executive Assistant to the President. Ph.D. in philosophy. Commercial pilot, instrument rated in single-engine and multi-engine airplanes. Certified flight instructor for instruments and single-engine and multi-engine airplanes. Former commuter airline pilot, charter pilot, and flight instructor. Responsible for University's Aviation Transportation Department and liaison with Department of Aeronautical Studies.

Kenneth Barnard:

Department Head, Aeronautical Studies, College of Technology, Kansas State University-Salina. M.S., B.S., A & P Certificate, Airline Transport Rating, single-engine and multi-engine airplanes, helicopters; certified flight instructor, instruments, single-engine and multi-engine airplanes, helicopters. Former helicopter pilot for Rocky Mountain Helicopters and U.S. Army helicopter pilot from 1968 to 1972. Lt. Colonel, Aviation, U.S. Army Reserve.

Dr. John P. Lambert:

B.S. in chemistry, M.S. in radiological health, and Ph.D. in microbiology. He has experience in industrial hygiene, radiation safety, sanitation, biosafety, and environmental health and safety at Kansas State University for 29 years. He is a Certified Hazard Control Manager and was a Certified Safety Executive from 1985-1991. Currently, he is a member of the Campus Safety Association, the National Environmental Health Association, the American Conference of Governmental Industrial Hygienists, and the Health Physics Society.

Chapter V

List of Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent

Agencies, Organizations, and Persons to Whom Copies of the Statement are Sent

U. S. Air Force Office of Scientific Research

Office of U. S. Senator Bob Dole

Salina Airport Authority

Chapter VI

Appendix

ENVIRONMENTAL ASSESSMENT

SALINA MUNICIPAL AIRPORT

Salina, Kansas

Airport Development to 2010

Prepared For

SALINA AIRPORT AUTHORITY

Prepared By

BUCHER, WILLIS & RATLIFF
ENGINEERS • PLANNERS • ARCHITECTS

This Environmental Assessment becomes a Federal document when evaluated and signed by the responsible F.A.A. official.

_____ _____

Responsible F.A.A. Official Date

4. Project Need

The forecasted aircraft operations are based on local and itinerant operations. Local operations are performed by those aircraft which take off and land at the same airport and operate within the local vicinity of the airport. Itinerant aircraft operations are those in which the aircraft land or take off at one airport and have an origin or terminus of flight at another airport. Total operations forecasted to 2010 are 221,200, of which 50% are local and 50% itinerant.

Currently, the Salina Municipal Airport is operating at 50% capacity. By 2000, without recommended improvements, the airfield will experience near 100% capacity in terms of operations. To relieve the primary 17-35 runway, a new parallel runway is needed. The following projections indicate the forecasted future demands on the airfield based on expected increases in training programs at KSU-Salina's Aeronautical Studies Department. The operational purpose of this additional north-south runway would be to relieve the primary ILS runway of the large amount of training activity at the airport.

Table 1.1
Based Aircraft Forecast
Salina Municipal Airport
(Excluding Military)

Year	Single Engine	Multi-Engine	Turbo-Prop	Business Jet	Rotocraft Other	Total Aircraft Forecasted
1990*	96	15	4	1	9	125
1995	116	21	5	3	9	154
2000	123	25	6	5	10	169
2005	134	28	7	6	10	185
2010	142	31	8	8	12	201

*Actual

C. ALTERNATIVES

This section presents and evaluates alternatives which have been considered for this project. The following alternatives have been examined in order to ensure that the chosen alternative is the most effective and feasible project undertaken:

- No Action
- Service From Another Airport

1. No Action

Thorough attention is given to the recommended project when considering the consequences of no project occurring at all. The Salina Municipal Airport handles a significant number of training operations with the location of Kansas State University-Salina and the Kansas Army National Guard, Army Aviation Support Facility #2. By 1995, the airport will be at 86% of its operational capacity and will experience an airfield capacity problem during the planning period.

The forecast demand for aviation transportation at the Salina Municipal Airport warrants the construction of an additional runway. The no action alternative would result in a future capacity problem. Increases in training programs expected at KSU-Salina will double in the next five years. The addition of a north-south runway would relieve the primary runway of training activities and allow it to handle more larger aircraft.

In addition, the large financial investment placed in the facility over the past twenty years will not be protected without the recommended maintenance projects. These maintenance projects will prevent the airfield from deteriorating over time and preserve the usefulness of the airport.

2. Service From Another Airport

Two other airports are located near Salina. Burgers Valley Airport is located 11 miles north and 3.5 miles west of the Salina Airport. This airport is a low-capacity private-restricted field and is not equipped to handle the forecasted volume of air traffic at Salina. Silers Airport is located about 5.8 miles north and 6 miles east of the Salina

4. *Induced Social Impacts*

F.A.A. Order 5050.4A requires that major airport development proposals which produce the potential for secondary impacts on surrounding communities should describe and evaluate these impacts. Secondary or induced impacts include employment shifts, population shifts, shifts in demand for public services and changes in business and economic activity as influenced by airport development. The proposed airport project will not cause significant social impacts locally or in other communities. The proposed activity will be very localized in that it will primarily assist current users of the airport.

5. *Air Quality*

Determination of the need for an air quality analysis is made by a review of F.A.A. and State requirements and the number of forecast operations. F.A.A. Order 5050.4A requires that proposals for airport master plans make this determination. If the proposed project is in a state which does not have applicable indirect source review (ISR) requirements, then the projected airport activity levels are examined. The threshold for this requirement is 180,000 annual operations.

At Salina, there were 96,254 operations in 1990. By 2000, 185,900 annual operations are forecasted which is 103% of the minimum number of operations that require an air quality analysis. In years 2005 and 2010, operations will be 113% and 118.6% of this minimum.

Because the 180,000 operations at Salina is not expected to occur until the later 1990's, and current operations are only 54% of this minimum, an air quality analysis is not needed at this time. Futhermore, nearly 64% of the forecast operations will be produced by piston-type aircraft which contribute significantly less to an air quality problem than do turbine powered aircraft, therefore no problems are anticipated. Annual operations during the later 1990's will be reviewed to determine if air quality criteria should be evaluated to minimize impacts from increased operations.

IV. Financial Balance Sheets

SUMMARY PAGE
U. S. AIR FORCE F49620-93-1-0509DEF
09-01-93 TO 02-29-96

	APPROVED BUDGET*	EXPENDITURES
SCHEDULE A	$211,398.00	$211,398.32
SCHEDULE B	$170,000.00	$170,000.00
SCHEDULE C	$5,580,000.00	$5,580,000.00
SCHEDULE D	$89,377.00	$89,376.71
SCHEDULE E	$31,688.00	$31,688.14
SCHEDULE F	$85,700.00	$85,700.00
SCHEDULE G	$275,108.00	$275,108.07
SCHEDULE H	$251,021.00	$251,020.58
SCHEDULE I	$69,463.00	$69,463.00
SCHEDULE J	$183,796.00	$183,795.98
SCHEDULE K	$41,990.00	$41,990.00
SCHEDULE L	$217,582.00	$217,581.74
SCHEDULE M	$106,705.00	$106,705.45
SCHEDULE N	$153,303.00	$153,302.56
SCHEDULE O	$56,750.00	$56,750.00
SCHEDULE P	$143,904.00	$143,904.42
SCHEDULE Q	$32,215.00	$32,215.03
TOTAL	$7,700,000.00	$7,700,000.00

*INCLUDES BUDGET REVISIONS APPROVED ON AMENDMENTS P00001, P00002, AND P00004

[redacted] U.S. Air Force [redacted] 535837

SCHEDULE A FEB 12 1996

F49620-93-1-0509DEF

9-1-93 to 2-29-96

TURBINE TEST/RECIP ENGINE
TEST CELL $50,000

AVSCO (DISTRIBUTOR)
TELEDYNE CONTINENTAL MOTORS

QTY	DESCRIPTION	COST EACH	VENDOR TOTAI	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
4	TELEDYNE CONT 0-200A ENGINE	$10,876.00	$43,504.00		$43,177.72	$326.28		
1	CORE CHARGE	$5,000.00	$5,000.00		$20,000.00	($15,000.00)		Core charge for each
24	TELEDYNE CONT 0-200A CYLINDERS	$650.00	$15,600.00		$14,281.00	$1,319.00		
24	TELEDYNE CYLINDERS CORE CHARGE				$3,600.00	($3,600.00)		Core charge for each
1	TELEDYNE CONT 0-470L ENGINE	$15,269.00	$15,269.00			$15,269.00		
1	CORE CHARGE	$6,000.00	$6,000.00			$6,000.00		
1	TELEDYNE CONT IO-520BB ENGINE	$15,309.00	$15,309.00		$15,309.00	$0.00		
1	CORE CHARGE	$8,000.00	$8,000.00		$8,000.00	$0.00		
4	LYCOMING 0-320 CYLINDER KITS	$1,000.00	$4,000.00		$4,356.00	($356.00)		
1	LYCOMING 0-320E2A (PIPER) ENGI	$22,112.00	$22,112.00		$13,106.40	$9,005.60		
1	CORE CHARGE	$5,800.00	$5,800.00		$5,800.00	$0.00		
1	LYCOMING 0-360A4J ENGINE	$14,341.00	$14,341.00		$14,491.00	($150.00)		
1	CORE CHARGE	$6,000.00	$6,000.00		$6,000.00	$0.00		
4	LYCOMING 0-360 CYLINDER KITS	$1,000.00	$4,000.00		$4,440.98	($440.98)		
2	0360A4J OVERHAUL ENGINE				$21,007.00	($21,007.00)		
2	0360A4J ENGINE CORE CHARGE				$12,000.00	($12,000.00)		
	VENDOR TOTAL			$164,935.00	$185,569.10	($20,634.10)		
1	TEST CELL BUILDING/SETUP ETC. with Paint Booth	$50,000.00	$50,000.00			$50,000.00		
	PRIME TURBINES							
2	TURBINE ENGINE MOUNTS FROM KA				$1,000.00	($1,000.00)		
2	SETS OF ENGINE MOUNTS				$500.00	($500.00)		
2	GAS GENERATOR TACH INDICATORS				$560.00	($560.00)		
3	MODEL J-79 AIRCRAFT ENGINES - USED				$1,500.00	($1,500.00)		
1	MODEL J-60 AIRCRAFT ENGINE - USED				$500.00	($500.00)		
5	MODEL J-38 AIRCRAFT ENGINES - USED				$2,500.00	($2,500.00)		
	FREIGHT				$1,930.00	($1,930.00)		
1	ALLISON SIN 141102 AIRCRAFT ENGINE - USED				$1,000.00	($1,000.00)		
1	ALLISON SIN 141064 AIRCRAFT ENGINE - USED				$1,000.00	($1,000.00)		
	FREIGHT				$800.00	($800.00)		
2	AIRCRAFT ENGINES J-79 - USED				$2,008.00	($2,008.00)	SURPLUS PROP	(2) J-79 ENGINES
	TOTAL TEST CELL BLDG/SETUP, ETC.		$50,000.00		$13,298.00	$36,702.00		

SCHEDULE A (CONTINUED)					
OTHER MISC	$35,065.00	$35,065.00			$35,065.00
SNAP-ON-TOOL CORPORATION					
2 KRA59K 9-DRAWER CHEST FOR TEST CELL INSTRUMENTS AND TOOLS				$649.60	($649.60)
2 IN325 5-DRAWER ROLL CABINET				$672.00	($672.00)
AVSCO					
MISC. MANUALS, PARTS CATELOGS, AND SERVICE BULLETINS				$953.12	($953.12)
MISC. MANUALS, PARTS CATELOGS, AND SERVICE BULLETINS				$328.95	($328.95)
AVAILL, INC.					
3 646680CE-A6 CYLINDER ASSEMBLY				$2,400.00	($2,400.00)
1 46F12 CARBURATOR KIT				$44.16	($44.16)
1 46F11 CURBURATOR KIT				$44.16	($44.16)
5 639614 ROCKER ARM				$625.45	($625.45)
5 639615 ROCKER ARM				$682.85	($682.85)
1 530535 GEAR CAM				$677.17	($677.17)
1 35016 GEAR CRANK				$1,529.80	($1,529.80)
3 641543 SILK THREAD				$44.25	($44.25)
24 530213 ROD BOLT				$279.12	($279.12)
100 AN4-11A BOLT				$28.30	($28.30)
50 24521 BOLT				$253.00	($253.00)
100 22532 BOLT				$282.00	($282.00)
100 AN502-10-8 SCREW				$33.20	($33.20)
100 22537 SCREW				$129.00	($129.00)
250 646605 NUT 1/4"				$225.00	($225.00)
250 2439 NUT 5/16"				$72.50	($72.50)
24 24804 ROD NUT				$72.24	($72.24)
100 639292 COTTER PIN				$13.00	($13.00)
12 22534 BOLT				$45.72	($45.72)
500 2472 WASHER PLAIN 1/4"				$230.00	($230.00)
500 2475 WASHER PLAIN 7/16"				$95.00	($95.00)
500 2473 WASHER PLAIN 5/16"				$15.00	($15.00)
500 MS35338-44 LOCK WASHER				$13.00	($13.00)
500 MS35338-45 LOCK WASHER				$20.00	($20.00)
500 MS35338-47 LOCK WASHER				$43.00	($43.00)
16 646847 LIFTER				$1,934.40	($1,934.40)
50 534750 MAG GASKETTS				$26.00	($26.00)
FREIGHT				$4.66	($4.66)
FREIGHT				$22.32	($22.32)
FREIGHT				$29.51	($29.51)
FREIGHT				$13.74	($13.74)
TOTAL OTHER MISC		$35,065.00		$12,531.22	$22,533.78
Revised Budget		($30,969.00)			
Revised Budget		($7,633.00)			
TURBINE TEST/RECIP ENGINE TOTAL			$211,398.00	$211,398.32	($0.32)

SCHEDULE D
COMPOSITE LABORATORY

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	ATACS COMPANY							
3	HOT BONDER 8024-1	$8,958.60	$26,875.80		$26,760.00	$115.80		(2)8024-2 HotBonde
2	TURNKEY PACKAGE 8306	$328.05	$656.10		$1,312.20	($656.10)		PURCH 4 VS 2
2	HEAT BLANKET 9R09091R5	$61.56	$123.12		$238.00	($114.88)		PURCH 4 VS 2;9R0
2	HEAT BLANKET 9RO8201R5	$102.06	$204.12		$354.96	($150.84)		PURCH 4 VS 2;9R1
2	SOFTWARE PROG. & ADAPTER 830	$494.91	$989.82		$450.00	$539.82		PURCH 1 VS 2
2	THERMOCOUPLE WELDER 4025	$494.91	$989.82		$494.91	$494.91		PURCH 1 VS 2
2	VACUUM TRANSDUCER 4903	$168.80	$337.60			$337.60		
2	VACUUM GAUGE 4972	$88.78	$177.56			$177.56		
2	VACUUM LEAK DETECTOR 7700	$295.65	$591.30			$591.30		
2	PNEUMATIC DRILL AND ROUTER	$1,500.00	$3,000.00			$3,000.00		
8	4570 Plugs INSTALLED ON BLANKETS				$136.00	($136.00)	ATACS	
1	0810 Pacs:				$5,144.00	($5,144.00)	ATACS	
	INCLUDES (1) 0813 & (6) 0814							
	Shipping				$233.84	($233.84)	ATACS	
	VENDOR TOTAL			$33,945.24	$35,123.91	($1,178.67)		
1	PARTS BINS (GRAINGER)	$1,531.00	$1,531.00			$1,531.00		
2	BIN SHELVING (GLOBAL IND EQ)				$649.60	($649.60)	GLOBAL IND EQ	
2	BIN SHELVING (GLOBAL IND EQ)				$598.40	($598.40)	GLOBAL IND EQ	
1	HARDWARE (AVIALL)	$20,000.00	$20,000.00			$20,000.00		
				$21,531.00	$1,248.00	$20,283.00		
60	BENCHES WB-386 (254757)	$68.00	$4,080.00		$1,069.00	$3,011.00	GLOBAL IND EQ	
12	TRASH CANS 3559	$80.00	$960.00			$960.00		
111	STOOLS 624-BAM	$52.00	$5,772.00			$5,772.00		
6	INSTRUCTOR BENCH 655	$377.00	$2,262.00			$2,262.00		
4	VACUUMS (378214)	$530.00	$2,120.00		$1,871.20	$248.80	GLOBAL IND EQ	
9	STORAGE CABINETS				$1,594.00	($1,594.00)	GLOBAL IND EQ	
4	SHOP DESKS (254634)				$504.00	($504.00)	GLOBAL IND EQ	
20	SWIVEL CHAIRS (917121)				$1,376.00	($1,376.00)	GLOBAL IND EQ	
10	WORKBENCH TOPS (124435)				$1,980.00	($1,980.00)	GLOBAL IND EQ	
10	RISER (124440)				$950.00	($950.00)	GLOBAL IND EQ	
1	KEY CABINET				$47.60	($47.60)	GLOBAL IND EQ	
	SHIPPING				$466.66	($466.66)	GLOBAL IND EQ	
9	WIRE PANEL (180012)				$562.50	($562.50)	GLOBAL IND EQ	
1	WIRE PANEL (180020)				$40.40	($40.40)	GLOBAL IND EQ	
1	WIRE PANEL (180060)				$173.45	($173.45)	GLOBAL IND EQ	
1	CABINET (784100)				$431.70	($431.70)	GLOBAL IND EQ	
2	MAGNIFIER LAMP				$199.90	($199.90)	GLOBAL IND EQ	
1	DIGITAL SCALE				$270.50	($270.50)	GLOBAL IND EQ	
2	ANGLE CORNER POST				$32.00	($32.00)	GLOBAL IND EQ	
2	WALL CLIPS				$6.40	($6.40)	GLOBAL IND EQ	
	FREIGHT				$51.41	($51.41)	GLOBAL IND EQ	
	VENDOR TOTAL			$15,194.00	$11,626.72	$3,567.28		

COMPOSITE LAB (SCHEDULE D CONTINUED)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	PAN AMERICAN TOOL COMPANY							
5	BIT #12	$3.00	$15.00			$15.00		
25	COBALT BIT #40	$2.00	$50.00			$50.00		
20	BIT #1/4	$3.00	$60.00			$60.00		
5	BIT #10	$3.00	$15.00			$15.00		
18	MANDREL SET	$5.00	$90.00			$90.00		
5	BIT #11	$3.00	$15.00			$15.00		
50	WHEELS #21-381	$1.00	$50.00			$50.00		
6	BIT #20	$2.00	$12.00			$12.00		
90	CUT OFF WHEELS #21-380	$1.00	$90.00			$90.00		
25	BIT #21	$2.00	$50.00			$50.00		
49	WHEELS #21-383	$1.00	$49.00			$49.00		
50	WHEELS #21-376	$1.00	$50.00			$50.00		
25	BIT #30	$1.00	$25.00			$25.00		
						$0.00		
	VENDOR TOTAL			$571.00	$0.00	$571.00		
	SNAP-ON TOOL CORPORATION							
4	MICRO MT SET PMF115	$594.45	$2,377.80		$1,783.36	$594.44		
1	ELECTROTORK TQJE1400	$2,402.25	$2,402.25		$2,534.00	($131.75)		
1	TORQ TESTER TDT1000	$5,012.85	$5,012.85		$5,012.85	$0.00		
4	MAX CALIPER PMF132	$232.10	$928.40		$696.32	$232.08		
4	DIAL SET PMF 135	$90.20	$360.80		$270.60	$90.20		
4	CALIPER 6" PMF 134	$125.20	$500.80		$375.60	$125.20		
2	MICRO MT SET PMF 108	$589.10	$1,178.20		$883.66	$294.54		
10	OIL-1 PT IM6				$31.90	($31.90)	SNAP-ON	
10	BLOW GUN JT13				$61.10	($61.10)	SNAP-ON	
10	AIR FILTER AHR414A				$373.90	($373.90)	SNAP-ON	
10	DIE GRINDER AT130				$1,042.50	($1,042.50)	SNAP-ON	
	VENDOR TOTAL			$12,761.10	$13,065.79	($304.69)		
	CORROSION TECHNOLOGIES CORP							
1	PUMP SYSTEM ACF-50	$1,550.00	$1,550.00			$1,550.00		
3	CHEMICAL 20-LITRE CONTAINER	$475.00	$1,425.00			$1,425.00		
						$0.00		
	VENDOR TOTAL			$2,975.00	$0.00	$2,975.00		
	SNAP-ON TOOLS CORPORATION							
1	PLASMA CUTTER YA5550	$2,849.95	$2,849.95			$2,849.95		CANCELLED
10	A10 AIR DRILL AT835				$1,449.80	($1,449.80)	SNAP-ON	
10	BUR KIT VWB800B				$1,283.30	($1,283.30)	SNAP-ON	
	VENDOR TOTAL			$2,849.95	$2,733.10	$116.85		
1	COMPLETE COMPOSITE DUST COLLECTION SYSTEM CONSISTING OF (2) 4'X 8' DOWNDRAFT TABLES, (1) SEQUENTRAIRE MODEL CF8 AIR FILTERING UNIT COMPLETE WITH HOPPER, STRUCTURAL SUPPORTS, FAN, MOTOR, SILENCER , CONTROL & ALL NECESSARY CONNECTING DUCTWORK AND TRANSITIONS				$11,053.00	($11,053.00)	WEIDENMANN	
	FREIGHT				$380.00	($380.00)	WEIDENMANN	

COMPOSITE LAB (SCHEDULE D CONTINUED)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
2	FFC20 FRIGIDAIRE FREEZER TO STORE COMPOSITE MATERIALS + DELIVERY			$855.90	($855.90)	MID WEST TV	
2	12/CS SAFETY GOGGLES #7C220-D2			$60.00	($60.00)	CCP INDUSTRIES	
5	12 PAIR NEOPRENE-COATED LATEX GLOVES-SMALL			$95.00	($95.00)	CCP INDUSTRIES	
5	12 PAIR NEOPRENE-COATED LATEX GLOVES-MEDIUM			$95.00	($95.00)	CCP INDUSTRIES	
5	12 PAIR NEOPRENE-COATED LATEX GLOVES-LARGE			$95.00	($95.00)	CCP INDUSTRIES	
10	BOXES VINYL EXAMINATION GLOVES-SMALL			$80.00	($80.00)	CCP INDUSTRIES	
10	BOXES VINYL EXAMINATION GLOVES-MEDIUM			$80.00	($80.00)	CCP INDUSTRIES	
10	BOXES VINYL EXAMINATION GLOVES-LARGE			$80.00	($80.00)	CCP INDUSTRIES	
10	BOXES SOLVENT-RESISTANT NITRILE GLOVES-SMALL			$180.00	($180.00)	CCP INDUSTRIES	
10	BOXES SOLVENT-RESISTANT NITRILE GLOVES-MEDIUM			$180.00	($180.00)	CCP INDUSTRIES	
10	BOXES SOLVENT-RESISTANT NITRILE GLOVES-LARGE			$180.00	($180.00)	CCP INDUSTRIES	
1	300-50 LINT FREE WIPES			$200.00	($200.00)	CCP INDUSTRIES	
1	CARTRIDGE RESPIRATOR 12/CS SIZE SMALL			$179.40	($179.40)	CCP INDUSTRIES	
1	CARTRIDGE RESPIRATOR 12/CS SIZE MEDIUM			$179.40	($179.40)	CCP INDUSTRIES	
1	CARTRIDGE RESPIRATOR 12/CS SIZE LARGE			$179.40	($179.40)	CCP INDUSTRIES	
1	PREFILTERS			$112.50	($112.50)	CCP INDUSTRIES	
1	CARTRIDGE REPLACEMENT			$163.80	($163.80)	CCP INDUSTRIES	
	FREIGHT			$58.51	($58.51)	CCP INDUSTRIES	
2	CASES 41589-GA UTILITY BOTTLE (12 EA)			$41.30	($41.30)	CONSOL. PLASTICS	
6	32 GAL TRASH CAN 58224GA			$200.40	($200.40)	CONSOL. PLASTICS	
2	32 GAL TRASH CAN 58225GA			$66.80	($66.80)	CONSOL. PLASTICS	
2	EYE WASH 98439GA			$63.80	($63.80)	CONSOL. PLASTICS	
2	CARTONS STORAGE BAGS 13X15 90076GA			$290.80	($290.80)	CONSOL. PLASTICS	
4	DOLLY 58550GA			$176.00	($176.00)	CONSOL. PLASTICS	
	SHIPPING			$81.90	($81.90)	CONSOL. PLASTICS	
1	5 LB BAG SYLOID #244			$20.09	($20.09)	COPE PLASTICS	
1	4/1 GAL CANS POLYESTER RESIN #112			$79.04	($79.04)	COPE PLASTICS	
1	PINT LUPERSOL DDM-9			$6.73	($6.73)	COPE PLASTICS	
1	PINT PORTALL 3 MOLD RELEASE			$2.89	($2.89)	COPE PLASTICS	
128	yards 38 INCH COPE #5 FIBERGLASS			$396.80	($396.80)	COPE PLASTICS	
128	yards 38 INCH COPE #8 FIBERGLASS			$593.75	($593.75)	COPE PLASTICS	
1	COLOR PASTE RED #1470			$36.31	($36.31)	COPE PLASTICS	
3	COLOR PASTE WHITE #180			$33.54	($33.54)	COPE PLASTICS	
1	COLOR PASTE BLUE #3141			$12.58	($12.58)	COPE PLASTICS	
1	COLOR PASTE GREEN #2606			$13.10	($13.10)	COPE PLASTICS	
1	COLOR PASTE YELLOW #2311			$20.70	($20.70)	COPE PLASTICS	
4	COLOR PASTE BLACK #4640			$26.52	($26.52)	COPE PLASTICS	
10	1 1/2" TAPE			$150.90	($150.90)	COPE PLASTICS	
10	3" TAPE			$222.80	($222.80)	COPE PLASTICS	
5	6" TAPE			$219.45	($219.45)	COPE PLASTICS	
2	HEAT GUN MODEL HG-301A			$198.40	($198.40)	COPE PLASTICS	
	SHIPPING			$33.36	($33.36)	COPE PLASTICS	
1	72 LBS HS8171 PLASTIC FILM			$439.20	($439.20)	ASSOC INDUSTIES	
2	72 LBS HS800 PLASTIC FILM			$590.40	($590.40)	ASSOC INDUSTIES	
2	10 OZ BREATHER FABRIC			$256.00	($256.00)	ASSOC INDUSTIES	
2	4 OZ BREATHER FABRIC			$230.00	($230.00)	ASSOC INDUSTIES	
2	B100 PEL-PLY FILM			$1,560.00	($1,560.00)	ASSOC INDUSTIES	
	FREIGHT			$37.44	($37.44)	ASSOC INDUSTIES	

COMPOSITE LAB (SCHEDULE D CONTINUED)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
50	FASTENER DEMONSTRATION KITS				$366.50	($366.50)	CLICK BOND	
50	CLICK PATCH DEMONSTRATION KITS				$300.00	($300.00)	CLICK BOND	
	SHIPPING				$9.45	($9.45)	CLICK BOND	
SUBTOTAL					$21,263.86	($21,263.86)		
	R.G. MATHEW CO.							
5	12"X12', 110 VOLT, 720 WATTS, 6.5 AMP, 24" 18 GAGE SILICONE LEADS				$307.00	($307.00)	RG MATHEW CO	
2	12"X18', 110 VOLT, 1080 WATTS, 9.8 AMP, 24" 18 GAGE SILICONE LEADS				$165.40	($165.40)	RG MATHEW CO	
5	6"DIA., 110 VOLT, 141 WATTS, 1.28 AMP, 24" 18 GAGE SILICONE LEADS				$134.75	($134.75)	RG MATHEW CO	
3	12" DIA., 110 VOLT, 565 WATTS, 5.13 AMP, 24" 18 GAGE SILICONE LEADS				$184.20	($184.20)	RG MATHEW CO	
1	18" DIA., 110 VOLT, 1271.7 WATTS, 11.56 AMP., 24" 14 GAGE SIL. LEADS				$122.75	($122.75)	RG MATHEW CO	
	FREIGHT				$9.85	($9.85)	RG MATHEW CO	
	FIBRE GLAST							
1	FIBERGLASS REPAIRS				$0.65	($0.65)	FIBRE GLAST	
1	SURFACE PREP FOR ADHESION				$1.25	($1.25)	FIBRE GLAST	
1	MOLDING FIBERGLASS VIDEO				$34.95	($34.95)	FIBRE GLAST	
1	POLY RELEASE PEEL PLY				$34.55	($34.55)	FIBRE GLAST	
1	SEALANT TAPE, CASE OF 40 ROLLS				$204.05	($204.05)	FIBRE GLAST	
30	POROUS TEFLON CLOTH				$189.00	($189.00)	FIBRE GLAST	
10	FLASH TAPE				$275.00	($275.00)	FIBRE GLAST	
1	KIMWIPES EX-L WIPERS				$78.35	($78.35)	FIBRE GLAST	
1	KIMTOWELS WIPERS				$56.25	($56.25)	FIBRE GLAST	
1	1" NAT BRISTLE BRUSH GROSS				$38.80	($38.80)	FIBRE GLAST	
2	SQUEEGES				$16.40	($16.40)	FIBRE GLAST	
6	MEKP DISPENSER				$39.30	($39.30)	FIBRE GLAST	
1	MIXING STICKS 6" LONG(500)				$105.50	($105.50)	FIBRE GLAST	
10	CLAUSS, 9" BENT TRIMMERS				$254.50	($254.50)	FIBRE GLAST	
1	GLASS MICROSPHERES				$66.95	($66.95)	FIBRE GLAST	
2	3" KEVLAR TAPE				$79.90	($79.90)	FIBRE GLAST	
2	CLEAR EPOXY RESIN				$139.90	($139.90)	FIBRE GLAST	
2	EPOXY HARDENER				$139.90	($139.90)	FIBRE GLAST	
1	HIGH TEMP LAMINATING EPOXY				$134.95	($134.95)	FIBRE GLAST	
17	KEVLAR SECONDS 5 OZ X 60"				$301.75	($301.75)	FIBRE GLAST	
27	KEVLAR SECOND				$384.75	($384.75)	FIBRE GLAST	
1	UNIDIRECT 3" GRAPHITE TAPE				$53.05	($53.05)	FIBRE GLAST	
1	GRAPHITE FIBERS 1" TOW				$15.75	($15.75)	FIBRE GLAST	
10	ACETONE DISPENSER				$49.50	($49.50)	FIBRE GLAST	
1	WET FILM GEL COAT GAUGE				$8.75	($8.75)	FIBRE GLAST	
333	NYLON BAGGING FILM				$549.45	($549.45)	FIBRE GLAST	
1	GLOSSARY OF TERMS IN COMPOSITES				$4.55	($4.55)	FIBRE GLAST	
1	MOD HIGH MODULES COMPOSITES				$10.95	($10.95)	FIBRE GLAST	
1	STRUCTURAL COMPOSITE REPAIRS				$1.25	($1.25)	FIBRE GLAST	
1	FUNDAMENTALS OF FIBERGLASS				$4.55	($4.55)	FIBRE GLAST	
1	REPAIR THE FIBERGLASS BOAT				$0.65	($0.65)	FIBRE GLAST	
1	SAFETY IN COMPOSITES				$1.25	($1.25)	FIBRE GLAST	
1	FIBERGLASSING POLYSTY FOAM				$0.65	($0.65)	FIBRE GLAST	
1	MOLDING FIBERGLASS				$4.55	($4.55)	FIBRE GLAST	
	FREIGHT				$109.83	($109.83)	FIBRE GLAST	
					$4,315.33	($4,315.33)		
		($0.29)						
	Budget Revision	($450.00)						
COMPOSITE LAB TOTAL		$89,377.00		$89,376.71		$0.29		

SCHEDULE E

NON-DESTRUCTIVE TESTING

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	NORTH STAR IMAGING, INC. ZETEC							
1	ULTRA. FLAW DET. KBI USK7S	$6,790.00	$6,790.00		$9,000.00	($2,210.00)		Purchased 2; lower price
1	SONOTRACE 40 UT COUPLANT	$17.00	$17.00		$17.00	$0.00		
1	SONOTRACE 30 UT COUPLANT	$60.00	$60.00		$60.00	$0.00		
1	SONOTRACE ULTRAGEL II UT COUP	$28.00	$28.00		$28.00	$0.00		
1	FLAW DET. TRANSDUCER KIT	$680.00	$680.00		$680.00	$0.00		
1	AWS WELD TRANSDUCER KIT	$615.00	$615.00		$615.00	$0.00		
1	TRANSDUCER KIT	$725.00	$725.00		$725.00	$0.00		
1	NOVA 100D GAGE	$1,300.00	$1,300.00		$0.00	$1,300.00		
1	LMD-1 TRANSDUCER CABLE	$65.00	$65.00		$0.00	$65.00		
1	MINI TRANSDUCER DF-505	$305.00	$305.00		$0.00	$305.00		
1	HI-POWER TRANSDUCER DV-208	$360.00	$360.00		$0.00	$360.00		
1	STANDARD TRANSDUCER DV-506	$275.00	$275.00		$0.00	$275.00		
1	STRESS-TEL T-MIKE EZ	$1,440.00	$1,440.00		$1,440.00	$0.00		
1	MINI-TRANSCUDER 3/16" 5MHZ	$247.00	$247.00		$247.00	$0.00		
1	HIGH RESOLUTION TRANS. .250"X5MH	$288.00	$288.00		$288.00	$0.00		
	SHIPPING				$26.14	($26.14)	North Star	
	SHIPPING				$43.00	($43.00)	North Star	
4	EDDY CURRENT TRAINING PACKAGE #1				$6,500.00	($6,500.00)		
1	EDDY CURRENT TRAINING PACKAGE #2				$3,514.00	($3,514.00)		
	SHIPPING				$100.00	($100.00)		
	VENDOR TOTAL			$13,195.00	$23,283.14	($10,088.14)		
	EDDY CURRENT INSTRUMENT							
1	MIZ-22	$7,095.00	$7,095.00		$7,095.00	$0.00	ZETEC	
1	OPTIONAL EQUIPMENT FOR MIZ-22	$1,310.00	$1,310.00		$1,310.00	$0.00	ZETEC	
	VENDOR TOTAL			$8,405.00	$8,405.00	$0.00		
	Budget Revision			$10,114.00				
	Budget Revision			($26.00)				
	NON-DESTRUCTIVE TESTING TOTAL			$31,688.00	$31,688.14	($0.14)		

SCHEDULE G

TURBINE ENGINE/EQUIPMENT

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	AVOTEK							
5	ALLISON 250 TEARDOWN E49	$16,675.00	$83,375.00		$83,375.00	$0.00		
1	ALLISON 250 RUNNABLE E48	$25,875.00	$25,875.00		$25,875.00	$0.00		
1	PT-6 ON STAND E43	$62,100.00	$62,100.00		$55,200.00	$6,900.00	Prime Turbines	PURCH 2 VS 1
4	PT-6 TEARDOWN E45+FREIGHT	$20,125.00	$80,500.00		$81,500.00	($1,000.00)		
1	HEARING PROTECTION FOR LABS	$3,000.00	$3,000.00			$3,000.00		
1	THRUST REVERSER				$9,913.00	($9,913.00)	AVOTEK	
	VENDOR TOTAL			$254,850.00	$255,863.00	($1,013.00)		
	SNAP-ON TOOL CORPORATION							
1	ENGINE ANALIZER MT3000AKR17	$21,326.00	$21,326.00			$21,326.00		CANCELLED
6	KSUSCT+OP+OP INSTRUCTOR MAINT				$16,052.34	($16,052.34)		
15	SHEETS FM1000RD FOAM				$772.50	($772.50)	SNAP-ON	
15	SHEETS RIDGEBASE FOAM				$934.95	($934.95)	SNAP-ON	
3	PBT4X20 ENGINE HYDR TABLE				$895.05	($895.05)	SNAP-ON	
3	PBT2120 TABLE DRAWER				$295.23	($295.23)	SNAP-ON	
	VENDOR TOTAL			$21,326.00	$18,950.07	$2,375.93		
	PRATT & WHITNEY CANADA, INC							
	PT6-60A MAINT. MANUAL				$155.00	($155.00)		
	PT6-60A PARTS CATELOG				$140.00	($140.00)		
	VENDOR TOTAL				$295.00	($295.00)		
	Revised Budget			($1,068.00)				
	TURBINE ENGINES/EQUIPMENT TOTAL			$275,108.00	$275,108.07	($0.07)		

SCHEDULE H

REPAIR STATION ADDITIONAL EQUIPMENT

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
1	NAV/ILS BENCH TEST SET	$12,495.00	$12,495.00		$7,800.00	$4,695.00	EDMO DIST	
1	TXP/DME BENCH TEST SET	$8,795.00	$8,795.00		$8,000.00	$795.00	MEMPHIS GROUP	
1	RADAR BENCH TEST SET	$18,249.00	$18,249.00		$18,615.00	($366.00)	MEMPHIS GROUP	
1	PAD FOR RD-301 10 DB	$182.00	$182.00		$40.00	$142.00	MEMPHIS GROUP	
1	MODE S TXP PORTABLE TEST SET	$11,249.00	$11,249.00			$11,249.00		
1	NAV/ILS PORTABLE TEST SET	$9,595.00	$9,595.00			$9,595.00		
1	SPECTRUM ANALYZER TO 1.3 GHZ	$7,195.00	$7,195.00		$7,195.00	$0.00	DALLAS AVION	
1	OSCILLOSCOPE, 100 MHZ	$2,995.00	$2,995.00		$8,590.00	($5,595.00)	DALLAS AVION	PURCH 2;TEK2247A SCOPE
1	COUNTER TO 520 MHZ	$580.00	$580.00			$580.00		
1	HANDHELD DMM	$99.00	$99.00			$99.00		
1	POWER METER, PEAK READING	$325.00	$325.00			$325.00		
1	DUMMY LOAD, 25 W	$93.00	$93.00			$93.00		
1	ADF LOOP SHIELDED TEST BOX	$1,645.00	$1,645.00			$1,645.00		
1	ADF LOOP SIMULATOR PANEL	$2,295.00	$2,295.00			$2,295.00		
1	RF ATTEN - 6DB, BNC CONN.	$50.00	$50.00			$50.00		
1	MIC TEST SET	$379.00	$379.00		$569.00	($190.00)	MEMPHIS GROUP	
1	AUDIO WATTMETER	$895.00	$895.00		$900.00	($5.00)	MEMPHIS GROUP	
1	BOMAR PREC. TRACK SELECTOR	$1,364.00	$1,364.00			$1,364.00		
1	LIGHT AVIONICS TEST PANEL	$386.00	$386.00			$386.00		
1	DME 190 TEST HARNESS	$75.00	$75.00			$75.00		
1	COM 810/811 HARNESS	$74.00	$74.00			$74.00		
1	NAV 824/825 HARNESS	$106.00	$106.00			$106.00		
1	MARK 12D HARNESS	$111.00	$111.00			$111.00		
1	KMA-20 HARNESS	$142.00	$142.00			$142.00		
1	KR-85 HARNESS	$155.00	$155.00			$155.00		
1	KX-170A/B, 175A/B HARNESS	$279.00	$279.00			$279.00		
1	KR-86 HARNESS	$129.00	$129.00			$129.00		
1	KX-155/165, KI204/206 HARNESS	$194.00	$194.00			$194.00		
1	KY-196 HARNESS	$169.00	$169.00			$169.00		
1	RT-528 HARNESS	$132.00	$132.00			$132.00		
1	RT-385/485 HARNESS	$132.00	$132.00			$132.00		
1	VHF-251 HARNESS	$65.00	$65.00			$65.00		
1	VIR-351 HARNESS	$133.00	$133.00			$133.00		
1	POWER SUPPLY, 0-30 VDC, 10A	$695.00	$695.00		$695.00	$0.00	DALLAS AVION	32V-25AM
1	KGS inverter 50 vh 400 hz	$552.00	$552.00		$560.00	($8.00)	DALLAS AVION	
1	BENCH STATIC GROUNDING KIT	$75.00	$75.00			$75.00		
1	GREENLEE HOLE PUNCHES	$110.00	$110.00			$110.00		
1	GREENLEE 3801 1/2" ROUND CHASSIS PUNCH				$38.00	($38.00)	ELECTR SUPPLY	
1	GREENLEE 3803 5/8" ROUND CHASSIS PUNCH				$43.00	($43.00)	ELECTR SUPPLY	
1	GREENLEE 3805 3/4" ROUND CHASSIS PUNCH				$47.00	($47.00)	ELECTR SUPPLY	
1	GREENLEE 3807 7/8" ROUND CHASSIS PUNCH				$55.00	($55.00)	ELECTR SUPPLY	
1	GREENLEE 3809 1" ROUND CHASSIS PUNCH				$25.00	($25.00)	ELECTR SUPPLY	
1	GREENLEE 3811 1 1/8" ROUND CHASSIS PUNCH				$43.00	($43.00)	ELECTR SUPPLY	
1	GREENLEE 3814 1 1/4" ROUND CHASSIS PUNCH				$25.00	($25.00)	ELECTR SUPPLY	
1	RIGHT ANGLE DRILL ADAPT.	$125.00	$125.00			$125.00		

REPAIR STATION ADDITIONAL EQUIPMENT (SCHEDULE H CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
1	IFR TRACKING GEN (A7550-02)				$1,695.00	($1,695.00)	DALLAS AVION	
1	IFT FM/AM/SSB RECEIVER (A7550-04)				$525.00	($525.00)	DALLAS AVION	
1	LINE STRETCHER				$400.00	($400.00)	EDMO DIST	
1	USED LORAN TEST SET				$3,200.00	($3,200.00)	EDMO DIST	
4	SCOPE PROBE 100 MHZ				$340.00	($340.00)	MEMPHIS GROUP	
1	BIRD 8085 QC-N 50W RF LOAD 1 GHZ				$93.00	($93.00)	ELECTR SUPPLY	
1	BIRD 5C 5W, 100-250 MHZ ELEMENT				$58.00	($58.00)	ELECTR SUPPLY	
1	BIRD 25C 25W, 100-250MHZ ELEMENT				$58.00	($58.00)	ELECTR SUPPLY	
1	BIRD 100C 100W, 100-250 MHZ ELEMENT				$58.00	($58.00)	ELECTR SUPPLY	
1	BIRD 50H 50W, 2-30 MHZ ELEMENT				$72.00	($72.00)	ELECTR SUPPLY	
1	B&K DIGITAL LCR METER				$265.00	($265.00)	ELECTR SUPPLY	
3	UNGAR 4024 VACUUM DESOLDERING UNIT				$1,755.00	($1,755.00)	ELECTR SUPPLY	
2	IDEAL STRIPMASTER 45-187 WIRE				$240.00	($240.00)	ELECTR SUPPLY	
1	LOAD/COUPLER FOR RD-301A (AVIONICS RADIO)				$850.00	($850.00)	DAVE'S 2-WAY	
1	RD-194 1/4 W CC/FILM RESISTOR ASSORTMENT				$49.95	($49.95)	OMNITRON ELEC	
1	RK-193 1/2 W CC/FILM RESISTOR ASSORTMENT				$29.95	($29.95)	OMNITRON ELEC	
1	CDK-300 DISC CAPACITOR ASSORTMENT				$29.95	($29.95)	OMNITRON ELEC	
1	CTK-60 TANTALUM CAPACITOR ASSORTMENT				$29.95	($29.95)	OMNITRON ELEC	
1	CRK-100 ELECTROLYTIC CAPACITOR ASSORTMENT				$29.95	($29.95)	OMNITRON ELEC	
	FREIGHT				$25.00	($25.00)	OMNITRON ELEC	
	Small Tools for Avionic Lab Use: Drawer line, sockets, taps, tape, hex keys, pliers, drill bits, nutdrivers, hammers, etc.				$288.56	($288.56)	Sears	
SUBTOTAL				$82,319.00	$63,332.31	$18,986.69		

REPAIR STATION ADDITIONAL EQUIPMENT (SCHEDULE H CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	STUDENT WORKSTATION EQUIPMENT							
	* NAV/ILS PORTABLE TEST SET							
	* TXP/DME PORTABLE TEST SET							
8	HANDHELD DVM	$99.00	$792.00		$891.00	($99.00)	ELECTR SUPPLY	9 VS 8
8	FET VOM	$75.00	$600.00		$477.00	$123.00	ELECTR SUPPLY	9 VS 8
8	POWER METER	$210.00	$1,680.00		$1,625.00	$55.00	MEMPHIS GROUP	5 VS 8
8	DUMMY LOAD TO 25 W	$93.00	$744.00			$744.00		
8	ELEMENTS FOR WATTMETER	$58.00	$464.00			$464.00		
8	AUDIO OSCILLATOR	$240.00	$1,920.00		$1,920.00	$0.00	ELECTR SUPPLY	
8	OSCILLOSCOPE 100 MHZ	$1,450.00	$11,600.00		$12,770.00	($1,170.00)	ELECTR SUPPLY	
8	RF SIGNAL GEN 100 KHZ-140 MH	$2,600.00	$20,800.00			$20,800.00		
8	COUNTER TO 520 MHZ	$580.00	$4,640.00			$4,640.00		
8	LOOP SIMULATOR PANEL	$2,295.00	$18,360.00		$16,800.39	$1,559.61	EDMO DIST	9 VS 8
8	RF ATTEN, 34 DB, BNC CONN	$100.00	$800.00			$800.00		
8	RF ATTEN, 6 DB, BNC CONN,	$50.00	$400.00		$650.00	($250.00)	EDMO DIST	10 VS 8
8	FLAG/DEVI METER BOXES	$281.00	$2,248.00			$2,248.00		
8	LIGHT AVIONICS TEST PANEL	$386.00	$3,088.00		$3,664.00	($576.00)	MEMPHIS GROUP	
8	COM 810/811 HARNESS	$74.00	$592.00		$952.00	($360.00)	MEMPHIS GROUP	
8	NAV 824/825 HARNESS	$106.00	$848.00			$848.00		
8	MK-12D HARNESS	$111.00	$888.00		$1,288.00	($400.00)	MEMPHIS GROUP	
8	KR-86 HARNESS	$129.00	$1,032.00			$1,032.00		
8	KX-155/165, KI204/206 HARNESS	$194.00	$1,552.00		$2,264.00	($712.00)	MEMPHIS GROUP	
8	POWER SUPPLY 0-30V, 10A	$695.00	$5,560.00		$3,600.00	$1,960.00	EDMO DIST	
8	BASIC STUDENT TOOL SET	$95.00	$760.00			$760.00		
8	STUDENT WORKBENCH/STOOL	$275.00	$2,200.00			$2,200.00		
	FREIGHT				$170.32	($170.32)	EDMO DIST	
8	DEVIATION /W. RESISTORS				$200.00	($200.00)	EDMO DIST	
8	FLAG/W. RESISTORS				$200.00	($200.00)	EDMO DIST	
8	X1/X2 SWITCHES W/RESISTORS				$48.00	($48.00)	EDMO DIST	
40	LINAIRE CONNECTORS				$240.00	($240.00)	EDMO DIST	
	FREIGHT				$14.15	($14.15)	EDMO DIST	
7	LOAD/COUPLER FOR RD-310A + DUMMY LOAD				$8,230.96	($8,230.96)	MEMPHIS GROUP	
8	TEXCA FP50-34BNCRF ATTENUATORS				$640.00	($640.00)	MEMPHIS GROUP	16 ATTENUATORS
8	DEVIATION METERS				$1,032.00	($1,032.00)	EDMO DIST	
8	FLAG METERS				$1,032.00	($1,032.00)	EDMO DIST	
8	KR-85 HARNESS				$1,712.00	($1,712.00)	MEMPHIS GROUP	
	SHIPPING				$200.00	($200.00)	MEMPHIS GROUP	
10	AESOPS 30157 24X18" STATIC TBL MAT				$400.00	($400.00)	ELECTR SUPPLY	
10	AESOPS 30198 WRIST STRAP/COIL CORD				$180.00	($180.00)	ELECTR SUPPLY	
8	OPTOELECTRONICS 8040A				$4,632.00	($4,632.00)	DALLAS AVION	
2	OPTOELECTRONICS 3000A				$558.00	($558.00)	DALLAS AVION	
8	BUD C-1585LG BOX OF METERS				$226.80	($226.80)	DALLAS AVION	
	Freight				$16.26	($16.26)	DALLAS AVION	
8	UNGAR 9800 SOLDERING IRON HOLDERS				$144.00	($144.00)	ELECTR SUPPLY	
8	UNGAR 455 REFILL SOLDERING SPONGES				$0.00	$0.00	ELECTR SUPPLY	CANCELLED
2	UNGAR 1095 HEAT GUN				$90.00	($90.00)	ELECTR SUPPLY	
3	UNGAR 1080 HEAT GUN REDUCER				$15.30	($15.30)	ELECTR SUPPLY	
3	UNGAR 1082 HEAT GUN REFLECTOR				$15.00	($15.00)	ELECTR SUPPLY	
	TOTAL COST (8 BENCHES)			$81,568.00	$66,898.18	$14,669.82		

REPAIR STATION ADDITIONAL EQUIPMENT (SCHEDULE H CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	* IFR NAV-401L							
	HAVE 2 SETS, BUY 6 NEW	$8,595.00	$51,570.00	$51,570.00	$58,851.50	($7,281.50)	EDMO DIST	
	* IFR ATC-600A							
	HAVE 1 SET, BUY 7 NEW	$5,995.00	$41,965.00	$41,965.00	$38,607.01	$3,357.99	DALLAS AVION	PURCH 6
1	ADF LOOP SHIELD BOX	$1,645.00	$1,645.00	$1,645.00	$3,290.00	($1,645.00)	DALLAS AVION	PURCH 2
1	INV., 115/26VAC 100VA	$1,000.00	$1,000.00	$1,000.00		$1,000.00		
3	X-BAND LOAD/COUPLER	$792.00	$2,376.00	$2,376.00		$2,376.00		
18	SWIVEL CHAIR				$1,238.40	($1,238.40)	GLOBAL IND EQ	
8	WORKBENCH TOP				$1,584.00	($1,584.00)	GLOBAL IND EQ	
8	POWER CENTER RISER				$876.00	($876.00)	GLOBAL IND EQ	
1	WALL RACK				$36.75	($36.75)	GLOBAL IND EQ	
4	BIRD 8080 RF LOAD				$392.00	($392.00)	DALLAS AVION	
4	BIRD 25C ELEMENT				$244.00	($244.00)	DALLAS AVION	
5	ADF LOOP TEST PLATE				$300.00	($300.00)	DALLAS AVION	
	SHIPPING				$58.16	($58.16)	DALLAS AVION	
	SHIPPING				$466.67	($466.67)		
	SHIPPING				$200.00	($200.00)		
SUBTOTAL				$98,556.00	$106,144.49	($7,588.49)		
2	KING RADIO KX-155/KI-208				$4,390.00	($4,390.00)	GULF COAST	
2	KING RADIO KR-87 SYSTEM				$5,390.00	($5,390.00)	GULF COAST	
1	SIGTRONICS INTERCOM SYSTEM SPA-400				$159.00	($159.00)	GULF COAST	
	SHIPPING				$22.00	($22.00)	GULF COAST	
1	GARMIN 55AVD HANDHELD W/DATABASE				$1,150.00	($1,150.00)	GPS WORLD SUPP	
5	A300A SPORTYS TRANSCEIVER				$1,825.00	($1,825.00)	SPORTY'S PILOT	
5	3932A HEADSET ADAPTER				$90.00	($90.00)	SPORTY'S PILOT	
5	3920A METAL BELT CLIP				$47.50	($47.50)	SPORTY'S PILOT	
	SHIPPING				$12.95	($12.95)	SPORTY'S PILOT	
SUBTOTAL					$13,086.45	($13,086.45)		
1	LA-2018 HARNESS FOR KX-170 RADIO				$413.25	($413.25)	LINAIRE	
1	LA-2019 HARNESS FOR KR-86 RADIO				$223.25	($223.25)		
1	LDF-2206 HARNESS FOR KR-87 RADIO				$377.15	($377.15)		
1	LA-2025 HARNESS FOR KY-96/196 RADIO				$280.25	($280.25)		
1	LAA-1110 HARNESS FOR KMA-24				$261.25	($261.25)		
	SHIPPING				$4.00	($4.00)		
SUBTOTAL					$1,559.15	($1,559.15)		
Revised Budget				($11,334.00)				
Revised Budget				($88.00)				
TOTAL LAB COST				$251,021.00	$251,020.58	$0.42		

J-1

21	NETWORK WORKSTATIONS 486DX2/66 VESA MB W/256K CACHE PENTIUM SOCKET W/8 SLOTS INTEL 486DX/66 CPU CPU COOLING FAN 16MB 70ns SIMMS EVER EC 373 MINI TOWER CASE 200 WATT UL POWER SUPPLY KOUWELL AT I/O 2S / 1P / 1G PORTS TEAC 5 1/4 1.2MB FLOPPY DRIVE TEAC 3 1/2 1.44MB FLOPPY DRIVE MAXTOR 120MB IDE HARD DRIVE VESA IDE HD/FD I/O W/2MB CACHE FOCUS 5001 KEYBOARD DIAMOND STEALTH 1MB VESA VIDEO CARD NEC 15" 4FGe MONITOR MICROSOFT BUS MOUSE D-LINK DE-220CT ETHERNET CARD 2400 BAUD INTERNAL MODEM SHIPPING BOX W/FOAM	$3,298.00	$69,258.00		$69,258.00	$0.00		
10	MICROFISH /FAA TESTING LAB 486DX66 VESA MB W/256K CACHE PENTIUM SOCKET W/8 SLOTS INTEL 486DX2-66 CPU CPU COOLING FAN 16 MB 70ns SIMMS EVER EC 373 MINI TOWER CASE 200 WATT UL POWER SUPPLY KOUWELL AT I/O 2S / 1P / 1G PORTS TEAC 5 1/4 1.2MB FLOPPY DRIVE TEAC 3 1/2 1.44MB FLOPPY DRIVE MAXTOR 120MB IDE HARD DRIVE VESA IDE HD/FD I/O W/2MB CACHE FOCUS 5001 KEYBOARD DIAMOND STEALTH 1MB VESA VIDEO CARD NEC 15" 4FGe MONITOR MICROSOFT BUS MOUSE D-LINK DE-220CT ETHERNET CARD SHIPPING BOX W/FOAM	$3,269.00	$32,690.00		$32,690.00	$0.00		
					$1,150.00	($1,150.00)		SHIPPING
35	TOTAL FOR SUPREME COMPUTERS		$135,198.00	$135,198.00	$136,348.00	($1,150.00)		SUB TOTAL

SCHEDULE J (CONTINUED)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
	J-2							
2	NOVELL NETWARE 4.0 50 USER	$3,400.00	$6,800.00		$6,730.00	$70.00	SUPREME	
	TOTAL FOR KU			$6,800.00	$6,730.00	$70.00		
	KU (HERB HARRIS) LAWRENCE, KANSAS TEL 913-864-0100							
	J-3							
1	NOVELL 4.0 MANUALS	$150.00	$150.00		$355.85	($205.85)	LITHOPRO	NOVELL NO LONGER CARRIES
1	NOVELL NETWARE 4 MANUAL				$39.95	($39.95)	WALDEN BOOK CO	
1	NETWARE 4 MANUAL				$27.95	($27.95)	WALDEN BOOK CO	
1	LANTASTIC 5 MANUAL				$29.95	($29.95)	WALDEN BOOK CO	
	DISCOUNT				($14.68)	$14.68	WALDEN BOOK CO	
	TOTAL		$150.00	$150.00	$439.02	($289.02)		
	J-4							
ARTISOFT								
1	LANTASTI FOR NETWARE 500 USE	$291.42	$291.42		$291.42	$0.00		
1	LANTASTI 5.0 AI 500 USER	$2,043.42	$2,043.42		$2,043.42	$0.00		
					$11.48	($11.48)		SHIPPING
	TOTAL FOR ARTISOFT		$2,334.84	$2,334.84	$2,346.32	($11.48)		

ARTISOFT INC.
691 EAST RIVER ROAD
TUCSON, AZ 85745
TEL 602-670-7000
FAX 602-670-7359
FEIN: 999-036634
TAX ID 860-446453

SCHEDULE J (CONTINUED)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
	J-5							
5	MS-DOS 6.0 10 PACKS	$350.00	$1,750.00		$2,105.00	($355.00)	SOFTWARE PLUS	
1	MS-WIN FOR WORK GROUPS SERV	$41.61	$41.61		$41.61	$0.00	SOFTWARE PLUS	
10	MS-WIN 3.1 FOR WORK GROUPS 5I	$156.75	$1,567.50		$1,510.00	$57.50	SOFTWARE PLUS	
5	WORDPERFECT 5.2 FOR WINDOW:	$69.87	$349.35		$475.00	($125.65)	SOFTWARE PLUS	WP 6.0
1	PARADOX 4.0 SERVER	$164.66	$164.66		$164.66	$0.00	SOFTWARE PLUS	
5	PARADOX 4.0 10 PACK	$462.00	$2,310.00		$2,280.00	$30.00	SOFTWARE PLUS	
1	COREL DRAW 3 CD-ROM W/CLIP A	$125.00	$125.00		$124.00	$1.00	SOFTWARE PLUS	
1	COREL DRAW 4.0 CD-ROM	$369.00	$369.00		$369.00	$0.00	SOFTWARE PLUS	
1	WORDSCAN PLUS OCR	$395.00	$395.00		$395.00	$0.00	SOFTWARE PLUS	
1	LOTUS 123 FOR WINDOWS SERVE	$165.00	$165.00		$81.50	$83.50	SOFTWARE PLUS	
5	LOTUS 123 FOR WINDOWS 10 PAC	$440.00	$2,200.00		$2,175.00	$25.00	SOFTWARE PLUS	
1	ALDUS PAGEMAKER 5.0	$115.00	$115.00		$115.50	($0.50)	SOFTWARE PLUS	
1	CENTRAL POINT PC TOOLS 8.0	$71.96	$71.96		$50.66	$21.30	SOFTWARE PLUS	
1	NORTON UTILITIES	$54.00	$54.00		$54.00	$0.00	SOFTWARE PLUS	
1	MS-OFFICE FOR WINDOWS	$457.00	$457.00		$457.00	$0.00	SOFTWARE PLUS	
1	LOTUS FREELANCE SERVER	$87.12	$87.12		$87.12	$0.00	SOFTWARE PLUS	
1	LOTUS FREELANCE 10 USER	$440.00	$440.00		$440.00	$0.00	SOFTWARE PLUS	
1	HIJAAK FOR WINDOWS	$92.00	$92.00		$92.00	$0.00	SOFTWARE PLUS	
2	PROCOMM PLUS	$63.65	$127.30		$126.00	$1.30	SOFTWARE PLUS	
	TOTAL FOR SOFTWARE PLUS		$10,881.50	$10,881.50	$11,143.05	($261.55)		

SOFTWARE PLUS
13025 OLIVE BLVD
St. LOUIS, MISSOURI 63141
TEL 800-324-7638
FAX 314-434-0524
FEIN 36-3265489

SCHEDULE J (CONTINUED)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
		J-6						
COMPUTER AND CONTROL SOLUTIONS								
1	IMAGE Q AUTHERING SOFTWARE	$295.00	$295.00		$295.00	$0.00		
1	SHADOW PRO VIDEO DATABASE	$225.00	$225.00		$225.00	$0.00		
1	A ITECH VIDEOSURGE W/PHOTO	$1,095.00	$1,095.00		$1,095.00	$0.00		
1	JVC HIRES GR-SZ1 SVHS CAMCOI	$1,895.00	$1,895.00		$1,695.00	$200.00		
3	TV/BRIDGE PRO	$895.00	$2,685.00		$2,685.00	$0.00		
1	AUTODESK ANIMATOR PRO	$699.00	$699.00		$699.00	$0.00		
1	AUTODESK 3-D STUDIO	$2,695.00	$2,695.00		$2,695.00	$0.00		
1	JVC SVHS VCR FOR EDITING	$499.00	$499.00		$499.00	$0.00		
					$38.00	($38.00)		FREIGHT
	TOTAL FOR C & C SOLUTIONS		$10,088.00	$10,088.00	$9,926.00	$162.00	SUB TOTAL	

COMPUTER & CONTROL SOLUTIONS
1510 STONE RIDGE DRIVE
STONE MOUNTAIN, GA 30083
TEL: 404-491-1131
TEL: 800-795-3525
FAX: 404-493-7033
FEIN:

		J-7						
2	HP LASERJET 4 SI MX	$4,174.00	$8,348.00		$8,198.00	$150.00	DATA SALES	
2	HP LASERJET 4	$1,214.00	$2,428.00		$2,428.00	$0.00	DATA SALES	
1	HP PAINTJET XL 300 COLOR	$2,099.00	$2,099.00		$2,099.00	$0.00	DATA SALES	
1	HP SCANJET COLOR	$1,349.00	$1,349.00		$999.00	$350.00	DATA SALES	REC'D $200 REBATE
5	PANASONIC 2124	$319.95	$1,599.75		$1,599.75	$0.00	DATA SALES	
1	SINGLE IN-LINE MEMORY MODULES C2066A 8-MEGABYTE MEMORY SIMM				$489.00	($489.00)	DATA SALES	
1	MEMORY EXPANSION BOARD C1650A 2 SIMM SLOTS, 0 MB INSTALLED				$129.00	($129.00)	DATA SALES	
1	HP NETWORK PERIPHERAL INTERFACE CARDS J2337A JET DIRECT CARD FOR NOVELL NETWARE ETHERNET				$420.00	($420.00)	DATA SALES	
	TOTAL FOR DATA SALES		$15,823.75	$15,823.75	$16,361.75	($538.00)	SUB TOTAL	

DATA SALES
15 NORTH ADAMS
HUTCHINSON, KANSAS 67501
TEL 316-665-3710
FAX 316-665-0793
FEIN 48-0874992

SCHEDULE J (CONTINUED)

QTY	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
	J-8							
1	INSTALLATION HARDWARE	$2,023.91	$2,023.91				LOCAL PURCHASE	
	COAX CABLE							
	BNC CONNECTORS							
	TERMINATORS							
	TOTAL FOR LOCAL PURCHASE		$2,023.91			$2,023.91		
	LOCAL PURCHASES AS FOLLOWS:							
	SALINA NUT AND BOLT, INC.							
300	TAMPER RESISTANT HARDWARE				$88.20	($88.20)		
3	TAMPER RESISTANT KEY				$6.68	($6.68)		
	WATERS TRUE VALUE					$0.00		
3	OUTLET STRIP				$35.97	($35.97)		
12	OUTLET STRIP				$179.88	($179.88)		
3	25 FT TRITAP CORD				$59.97	($59.97)		
1	25 FT TRITAP CORD				$19.99	($19.99)		
1	25 FT EXTENSION CORD				$6.99	($6.99)		
100	FT CABLE				$38.00	($38.00)		
50	FT CABLE				$19.00	($19.00)		
	ELECTRONICS OF SALINA					$0.00		
6	BNC (50) TERMINAL				$47.16	($47.16)		
	TOTAL FOR LOCAL PURCHASES		$2,023.91	$2,023.91	$501.84	$1,522.07		
	Revised Budget			$496.00				
	TOTAL SCHEDULE J			$183,796.00	$183,795.98	$0.02		

SCHEDULE K
ELECTRONIC EQUIPMENT

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	DEPCO, INC.							
5	CES CA9306 ANALOG CAI SYS	$5,300.00	$26,500.00			$26,500.00		
5	CES 101 LAB ACCESSORIES KIT	$275.00	$1,375.00			$1,375.00		
1	CES 303 SERVO-SYNCHRO MODULE	$1,800.00	$1,800.00			$1,800.00		
5	CES 4708 DUAL TRACE SCOPES	$900.00	$4,500.00			$4,500.00		
10	CAI INTERFACE ENHANCEMENT MODEL CES 4161				$7,300.00	($7,300.00)	DEPCO	
10	RELAY MODULE MODEL CES 318				$750.00	($750.00)	DEPCO	
10	POWER TRANSFORMER MODULE MODEL CES 306				$950.00	($950.00)	DEPCO	
10	AVIATION ELECTRONICS TRAINING EQP MODEL ED-LAB 4160				$32,000.00	($32,000.00)	DEPCO	
2	COMMUNICATIONS MODULES SET; INCLUDES TEXT/LAB MANUALS AND SHIPPING				$990.00	($990.00)	DEPCO	
	VENDOR TOTAL			$34,175.00				
	less Department funds			($1,175.00)				
	Revised Budget KB 7/22/93			$8,990.00				
	TOTAL SCHEDULE K			$41,990.00	$41,990.00	$0.00		

SCHEDULE L
PAINT STATION

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	TOTAL PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	DIRECT SAFETY EQUIPMENT COMPANY							
2	AIR PUMP 03-302	$1,715.00	$3,430.00			$3,430.00		
2	HOSE 50 FT 03-554	$129.95	$259.90			$259.90		
10	OUTLET FILTER 03-304	$13.05	$130.50			$130.50		
10	INLET FILTER 03-303	$7.65	$76.50			$76.50		
10	PAINT SPRAY PREFILTER 03-507	$9.90	$99.00			$99.00		
6	AIR RESPIRATOR 03-327	$66.26	$397.56			$397.56		
10	FULL FACE RESPIRATOR 03-553	$176.92	$1,769.20			$1,769.20		
3	LENS COVER 03-330	$67.75	$203.25			$203.25		
10	REPLACEMENT HOOD 03-331	$15.75	$157.50			$157.50		
	AVSCO							
2	PAINT SYSTEMS	$900.00	$1,800.00			$1,800.00		
2	SPRAY SYSTEMS CX-9	$795.00	$1,590.00			$1,590.00		
12	FILTERS	$100.00	$1,200.00			$1,200.00		
	AVIALL							
2	BATTERY CHARGER RF80-K	$6,712.00	$13,424.00		$14,250.00	($826.00)		PURCH 1
	Freight				$557.87	($557.87)		
	DIRECT SAFETY EQUIPMENT COMPANY							
100	AIR HOSE 03-572	$3.00	$300.00			$300.00		
200	AIR HOSE 03-159	$3.00	$600.00			$600.00		
	AVSCO							
20	STRIPPER T5351	$120.40	$2,408.00			$2,408.00		
20	T5351 TURCO CLEANER 5/GAL	$109.10	$2,182.00			$2,182.00		
100	REDUCER T10003 1/GAL	$44.00	$4,400.00			$4,400.00		
1	POWER CLEANER	$7,142.00	$7,142.00			$7,142.00		
40	PAINT 1/GAL AVERAGE	$175.00	$7,000.00			$7,000.00		
	DIRECT SAFETY EQUIPMENT COMPANY							
5	FLAMABLE CABINET 11-512	$333.14	$1,665.70			$1,665.70		
5	FLAMABLE CABINET 12 GAL 11-337	$406.23	$2,031.15			$2,031.15		
50	NEOPRENE GLOVE 07-571	$9.80	$490.00			$490.00		
200	DISPOSABLE COVERALLS 05-314	$5.25	$1,050.00			$1,050.00		
20	LATEX GLOVE 07-217	$8.05	$161.00			$161.00		
	SNAP-ON TOOLS CORPORATION							
1	PAINT GUN CLEANER PGC500	$1,121.25	$1,121.25		$0.00	$1,121.25		RETURNED
1	PARTS WASHER PBC55	$4,274.25	$4,274.25		$4,274.25	$0.00		
PAINT BOOTH AND STRIPPING BAY			$123,491.24			$123,491.24		
Revised Budget			$10,000.00					
	ARCHITECTURE SERVICES				$890.00	($890.00)	KSU FACILITIES	
	BLUEPRINTS				$632.50	($632.50)	TOPEKA BLUE PRINT	
	PROFESSIONAL ENGINEERING SERVICES				$5,108.00	($5,108.00)	ORAZEM & SCALORA ENGG	
	DELIVERY FOR BID SPECS				$152.00	($152.00)	PONY EXPRESS	
	ENGINEERING SERVICES				$11,840.00	($11,840.00)	KEN EBERT	
	LEGAL ADVERTISEMENT				$121.96	($121.96)	SALINA JOURNAL	
	DELIVERY FOR BID SPECS				$25.24	($25.24)	PONY EXPRESS	
	BLUE PRINTS AND SPECS + MISC				$126.50	($126.50)	TOPEKA BLUE PRINT	
	ENGINEERING SERVICES				$420.00	($420.00)	ORAZEM & SCALORA ENGG	
	BLUE PRINTS AND SPECS +MISC				$746.40	($746.40)	TOPEKA BLUE PRINT	
	DELIVERY FOR BID SPECS				$109.25	($109.25)	PONY EXPRESS	
	MATERIALS FABRICATION AND COATINGS BLDG				$158,007.00	($158,007.00)	SALINA	
	MATERIALS FABRICATION AND COATINGS BLDG				$17,263.07	($17,263.07)	SALINA	
1	52592 AIR COMPRESSOR 5 HP 80 GAL				$1,249.00	($1,249.00)	GRAINGER	
2	52418 REGULATOR				$134.48	($134.48)	GRAINGER	
5	6W944 AIR HOSE 25'				$80.35	($80.35)	GRAINGER	
5	6W945 AIR HOSE 50'				$107.30	($107.30)	GRAINGER	
1	4F323 HV/LP SYSTEM				$755.00	($755.00)	GRAINGER	
3	62562 ANGLER DIE GRINDER				$379.95	($379.95)	GRAINGER	
1	42431 SPRAY GUN				$77.56	($77.56)	GRAINGER	
10	4F863 HOLDERS				$86.50	($86.50)	GRAINGER	
500	4F858 DISC				$185.00	($185.00)	GRAINGER	
Revised Budget			$24,728.00					
PAINT STATION TOTAL				$217,582.00	$217,579.18	$2.82		

SCHEDULE M

			BALANCE	
BUDGET	$106,705.00			
INSURORS AND INVESTORS INC.		$18,286.00		
INSURORS AND INVESTORS INC.		$1,791.00		
INSURORS AND INVESTORS INC.		$57,849.00		
ARABIS TRAINING		$4,380.00		PILOT TRAINING
INSURORS AND INVESTORS INC.		$19,473.00		
AMERICAN EXPRESS		$1,423.00		PILOT TRAINING
TERRYL KELLEY		$663.75		PILOT TRAINING
TERRYL KELLEY		$2,162.40		PILOT TRAINING
TERRYL KELLEY		$677.30		PILOT TRAINING
TOTAL	$106,705.00	$106,705.45	($0.45)	

SCHEDULE N
EQUIPMENT SUPPORT

QTY	DESCRIPTION	COST EACH	VENDOR TOTAI	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
	AVIALL							
2	PILOT 1550P40	$4.95	$9.90		$0.00	$9.90		
1	OIL CAN CUTTER CT-470	$100.80	$100.80		$100.80	$0.00		
1	ADAPTER CT-470-2	$18.22	$18.22		$18.22	$0.00		
1	BRAKE RIVET TOOL A403	$11.66	$11.66		$0.00	$11.66		
2	VOLT CABLE TESTER 35	$75.20	$150.40		$0.00	$150.40		
2	MAGNETO TIME LIGHT E50	$86.65	$173.30		$173.30	$0.00		
1	AERO ANGLE II KS5507	$405.00	$405.00		$405.00	$0.00		
1	AJS JACK SET AJS	$1,808.00	$1,808.00		$1,808.00	$0.00		
1	JACK 02-0300-0100	$7,050.00	$7,050.00		$7,050.00	$0.00		
	SHIPPING FOR JACK				$111.77	($111.77)	ROADWAY EXPRESS	
	ADDITIONAL SHIPPING				$301.98	($301.98)	NW TRANSPORT	
2	ALTERNATOR 649305R	$1,661.52	$3,323.04		$3,323.04	$0.00		
2	CORE CHARGE	$323.00	$646.00		$644.00	$2.00		
8	CYLINDER 0-200A	$512.31	$4,098.48		$0.00	$4,098.48		
8	CORE CHARGE	$300.00	$2,400.00		$0.00	$2,400.00		
6	CYLINDER IO-520	$1,291.30	$7,747.80		$0.00	$7,747.80		
6	CORE CHARGE	$300.00	$1,800.00		$0.00	$1,800.00		
6	CYLINDER IO-550	$1,291.30	$7,747.80		$0.00	$7,747.80		
6	CORE CHARGE	$300.00	$1,800.00		$0.00	$1,800.00		
4	CYLINDER COMP. SET IO-360	$1,190.00	$4,760.00		$0.00	$4,760.00		
6	COUNTER SINK 133SP	$43.81	$262.86		$93.46	$169.40		
2	CUTTER AT418D	$18.46	$36.92		$18.46	$18.46		PURCH 1
4	PILOT 1550P30	$4.95	$19.80		$0.00	$19.80		
6	TIRE 7.00X6 6PLY	$104.27	$625.62		$625.62	$0.00		
6	TIRE 6.50X6 8 PLY	$113.03	$678.18		$650.10	$28.08		
2	BRAKE ASSY. 303-05403	$243.60	$487.20		$519.60	($32.40)		
2	BRAKE ASSY 030-09303	$280.35	$560.70		$523.20	$37.50		PURCH 1
4	BATTERY A-25	$60.17	$240.68		$60.17	$180.51		
4	BATTERY 1-35	$72.22	$288.88		$75.22	$213.66		
2	BATTERY A-242	$156.28	$312.56		$167.49	$145.07		
2	WHEEL ASSY 40-128	$348.00	$696.00		$807.60	($111.60)		
	SHIPPING				$7.84	($7.84)		
2	WHEEL ASSY 40-83A	$234.00	$468.00		$468.00	$0.00		
2	WHEEL ASSY 40-87A	$159.60	$319.20		$319.20	$0.00		
2	STARTER	$532.28	$1,064.56		$330.78	$733.78		PURCH 1
3	TUBE BENDERS	$21.26	$63.78		$0.00	$63.78		
1	TUBE CUTTER 374-FC	$15.95	$15.95		$15.95	$0.00		
1	FLARING TOOL 212FBT	$49.95	$49.95		$0.00	$49.95		
2	OIL SEAL TOOL 5209	$79.95	$159.90		$0.00	$159.90		
1	TOWBAR TR3R	$298.00	$298.00		$0.00	$298.00		
1	CHECKMATE TOOL 9500	$4,281.42	$4,281.42		$4,281.42	$0.00		
1	IO-550 REMANUFAC ENGINE	$18,330.00	$18,330.00		$0.00	$18,330.00		
1	CORE CHARGE	$9,000.00	$9,000.00		$0.00	$9,000.00		
2	ALTERNATOR 646845R	$1,459.92	$2,919.84		$1,459.92	$1,459.92		PURCH 1
2	CORE CHARGE	$324.00	$648.00		$324.00	$324.00		
1	VACUUM PUMP 212CW	$303.34	$303.34		$303.34	$0.00		
1	CORE CHARGE	$100.00	$100.00		$100.00	$0.00		
1	VACUUM PUMP 442CW12	$866.67	$866.67		$866.67	$0.00		
1	CORE CHARGE	$200.00	$200.00		$200.00	$0.00		
4	MAGNETO 6310	$327.73	$1,310.92		$655.46	$655.46		PURCH 2
4	CORE CHARGE	$150.00	$600.00		$300.00	$300.00		
	SUBTOTAL THIS PAGE ONLY		$89,259.33		$27,109.61	$62,149.72		

SCHEDULE N - EQUIPMENT SUPPORT (CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTAI	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
4	MAGNETO 4301				$1,310.92	($1,310.92)	AVAIL	
	CORE CHARGE				$600.00	($600.00)	AVAIL	
2	653445A4STL				$2,928.92	($2,928.92)	AVAIL	
2	653445A4STL CORE CHARGE				$600.00	($600.00)	AVAIL	
2	653445A5STL				$2,928.92	($2,928.92)	AVAIL	
2	653445A5STL CORE CHARGE				$600.00	($600.00)	AVAIL	
2	CYLINDER KITS O5K21120CKP				$2,400.00	($2,400.00)	AVAIL	
	SHIPPING				$0.00	$0.00	AVAIL	
1	PN550 Hotsy Hot Pressure Washer				$2,895.00	($2,895.00)	Superior Service Co. Inc.	
1	Reel Quick Hose Reel				$295.00	($295.00)	"	
1	STEEL SUMP WITH DRAIN VALVE				$589.00	($589.00)	GLOBAL IND EQ	
4	ROTARY PUMPS				$139.80	($139.80)	GLOBAL IND EQ	
4	DRIP TRAYS				$165.20	($165.20)	GLOBAL IND EQ	
1	FIRST AID KIT				$27.35	($27.35)	GLOBAL IND EQ	
	FREIGHT				$38.35	($38.35)	GLOBAL IND EQ	
	FREIGHT				$161.19	($161.19)	GLOBAL IND EQ	
	FREIGHT				$136.23	($136.23)	AVAIL	
	FREIGHT				$13.82	($13.82)	AVAIL	
	FREIGHT				$19.40	($19.40)	AVAIL	
5	MUFFLER 8300-3				$1,406.25	($1,406.25)	AVAIL	
5	MUFFLER 8300-4				$1,325.00	($1,325.00)	AVAIL	
5	RISER 8300-13				$455.35	($455.35)	AVAIL	
5	CLAMP 568-06				$110.50	($110.50)	AVAIL	
5	SHROUD 8300-5				$0.00	$0.00	AVAIL	
5	CLAMP 221-5				$315.75	($315.75)	AVAIL	
5	TAILPIPE 8300-7				$750.00	($750.00)	AVAIL	
5	TAILPIPE 8300-8				$0.00	$0.00	AVAIL	
1	HOSE MANDEL KIT 3-12 2717				$454.91	($454.91)	AVAIL	
1	HOSE MANDEL KIT 16-32 2715				$345.35	($345.35)	AVAIL	
	SHIPPING				$3.89	($3.89)		
1	CLEVELAND CONVERSION KIT 199-90				$3,397.20	($3,397.20)	AVAIL	
1	RISER 8300-14				$91.07	($91.07)	AVAIL	
4	SHROUD 8300-27				$340.00	($340.00)	AVAIL	
1	FREIGHT				$33.81	($33.81)	AVAIL	
1	FREIGHT				$0.00	$0.00	AVAIL	
3	10-4894 CARBURATOR				$1,860.00	($1,860.00)	AVAIL	
3	CORE CHARGE				$1,200.00	($1,200.00)	AVAIL	
3	237 STARTER				$414.00	($414.00)	AVAIL	
3	CORE CHARGE				$300.00	($300.00)	AVAIL	
3	00316 ALTERNATOR				$576.00	($576.00)	AVAIL	
3	CORE CHARGE				$576.00	($576.00)	AVAIL	
3	S200B12 LEADS				$360.00	($360.00)	AVAIL	
32	REM40E SPARK PLUGS				$456.96	($456.96)	AVAIL	
1	8159 CABLE TENSION				$442.08	($442.08)	AVAIL	
3	211CC VACUUM PUMP				$946.11	($946.11)	AVAIL	
3	CORE CHARGE				$300.00	($300.00)	AVAIL	
1	11-10040 MAG WRENCH				$195.00	($195.00)	AVAIL	
1	11-3284-2 MAG CRIMP TOOL				$571.20	($571.20)	AVAIL	
1	11-6924-1 MAGNETO PRESSING TOOL				$264.00	($264.00)	AVAIL	
1	11-702-1 MAG PULLER				$292.50	($292.50)	AVAIL	
1	11-10192 MAGNETO REMOVAL TOOL				$472.50	($472.50)	AVAIL	
1	11-7073 MAG NEEDLE				$216.00	($216.00)	AVAIL	
1	11-7074 MAG DRIFT TOOL				$54.00	($54.00)	AVAIL	
1	11-8150-1 MAG TIMING KIT				$49.50	($49.50)	AVAIL	
1	11-8465 MAGNETO ROTOR HOLDING TOOL				$225.00	($225.00)	AVAIL	
	SUBTOTAL AVIALL THIS PAGE ONLY		$0.00		$34,649.03	($34,649.03)		

SCHEDULE N - EQUIPMENT SUPPORT (CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTAI	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
1	11-8474 MAG TIMING LIGHT				$369.00	($369.00)		
1	11-8627 MAG SPRING FEEDING TOOL KIT				$225.00	($225.00)		
1	11-8822 MAGNETO OVERHAUL TOOL				$125.00	($125.00)	AVAIL	
1	IO550C ENGINE PARTS MANUAL				$50.00	($50.00)	AVAIL	
1	IO550C ENGINE OVERHAUL MANUAL				$60.00	($60.00)	AVAIL	
1	IO520BB ENGINE PARTS MANUAL				$50.00	($50.00)	AVAIL	
1	IO520BB ENGINE OVERHAUL MANUAL				$60.00	($60.00)	AVAIL	
1	X40000 BENDIS MANUAL				$105.00	($105.00)	AVAIL	
1	08-4040-4000 TANK WASHER				$438.00	($438.00)	AVAIL	
1	ACK-2 LUBE KIT				$363.60	($363.60)	AVAIL	
4	O5K21104 CYLINDER FOR 0360A4J&K ENGINE				$4,400.00	($4,400.00)	AVAIL	
4	CORE CHARGES				$0.00	$0.00	AVAIL	
1	PDT286B HEATER TESTER				$1,852.44	($1,852.44)	AVAIL	
1	11-6604-1000 RECTIFIER GROUND POWER UNIT				$3,401.00	($3,401.00)	AVAIL	
1	DC400A FUEL QTY TESTER INCLUDES 101-00802 MODUAL FOR KING AIR				$4,491.00	($4,491.00)	AVAIL	
1	TT1000A TURBINE ENGINE TEMPERATURE TEST SET				$2,358.00	($2,358.00)	AVAIL	
1	2311F PRESSURE TESTER				$810.00	($810.00)	AVAIL	
	SHIPPING				$0.00	$0.00	AVAIL	
	SHIPPING				$70.94	($70.94)	AVAIL	
	SHIPPING				$28.43	($28.43)	AVAIL	
	SHIPPING				$10.27	($10.27)	AVAIL	
	SHIPPING				$14.94	($14.94)	AVAIL	
	SHIPPING				$6.77	($6.77)	AVAIL	
	SHIPPING				$2.75	($2.75)		
	SHIPPING				$7.70	($7.70)	AVAIL	
1	11-702-1 MAG PULLER - RETURNED!				($191.00)	$191.00	AVAIL	RETURN CREDIT
1	11-7073 MAG NEEDLE - RETURNED!				($191.25)	$191.25	AVAIL	RETURN CREDIT
1	AIRCRAFT WINDOW				$102.60	($102.60)	AVAIL	
1	AIRCRAFT WINDOW				$45.00	($45.00)	AVAIL	
6	AIRCRAFT WINDSHIELD				$2,440.80	($2,440.80)	AVAIL	
10	LAMPS (AIRCRAFT BULBS)				$124.20	($124.20)	AVAIL	
11	SCAT TUBING				$31.13	($31.13)	AVAIL	
22	SCAT TUBING				$62.26	($62.26)	AVAIL	
2	BRAKE DISC				$151.20	($151.20)	AVAIL	
1	PKG CHERRY MAX RIVETS				$50.35	($50.35)	AVAIL	
1	PKG CHERRY MAX RIVETS				51.19	($51.19)	AVAIL	
10	PKG CHERRY MAX RIVETS				$329.60	($329.60)	AVAIL	
5	PKG CHERRY MAX RIVETS				$170.85	($170.85)	AVAIL	
	SHIPPING				$30.99	($30.99)	AVAIL	
	SHIPPING				$12.00	($12.00)	AVAIL	
	SHIPPING				$6.98	($6.98)	AVAIL	
	CORE CHARGE				$230.00	($230.00)	AVAIL	
	SUBTOTAL AVIALL THIS PAGE ONLY			$0.00	$22,756.74	($22,756.74)		
	VENDOR TOTAL			$89,259.33	$84,515.38	$4,743.95		

SCHEDULE N - EQUIPMENT SUPPORT (CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
	WW GRAINGER							
3	STORAGE CABINET 3W044	$221.21	$663.63		$0.00	$663.63		
4	WORK BENCH 4A335	$119.27	$477.08		$0.00	$477.08		
1	FLAMABLE CABINET 4T196	$525.30	$525.30		$0.00	$525.30		
1	FIRST AID 4A418	$24.95	$24.95		$0.00	$24.95		
2	FAN 24" 7C524	$218.84	$437.68		$0.00	$437.68		
1	BALL GAUGE 3T167	$37.80	$37.80		$0.00	$37.80		
1	784100 CABINET				$431.70	($431.70)	GLOBAL IND EQ	
1	452928 KEY CABINET				$47.60	($47.60)	GLOBAL IND EQ	
1	254757 BENCH				$106.90	($106.90)	GLOBAL IND EQ	
1	12440 RISER				$95.00	($95.00)	GLOBAL IND EQ	
24	235000 PART SHELVES				$3,394.80	($3,394.80)	GLOBAL IND EQ	
2	183034GY STORAGE CABINET				$710.00	($710.00)	GLOBAL IND EQ	
1	235186 STOCK TRUCK				$126.30	($126.30)	GLOBAL IND EQ	
1	233530 DRUM TRUCK				$175.00	($175.00)	GLOBAL IND EQ	
4	23021BN EXECUTIVE CHAIR				$271.80	($271.80)	GLOBAL IND EQ	
1	501192 MAINTENANCE PLATFORM				$525.00	($525.00)	GLOBAL IND EQ	
1	500999BN SWIVAL CHAIR W/ARMS				$95.40	($95.40)	GLOBAL IND EQ	
1	50996B (SET OF 4) CASTERS				$16.00	($16.00)	GLOBAL IND EQ	
	SHIPPING				$466.67	($466.67)	GLOBAL IND EQ	
	VENDOR TOTAL			$2,166.44	$6,462.17	($4,295.73)		

SCHEDULE N - EQUIPMENT SUPPORT (CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
	SNAP-ON TOOL CORPORATION							
1	AIR COMPRESSOR AC580H	$2,662.00	$2,662.00		$0.00	$2,662.00		CANCELLED
1	PMF108 MICRO MT SET				$441.83	($441.83)	SNAP-ON TOOLS	
1	PMF105 MICROMETER				$146.10	($146.10)	SNAP-ON TOOLS	
1	PMF 106 MICROMETER				$151.73	($151.73)	SNAP-ON TOOLS	
1	ACT3000 FREON SYSTEM				$2,683.37	($2,683.37)	SNAP-ON TOOLS	
1	HYD. PRESS CG570BHYKSU	$6,751.50	$6,751.50		$3,220.00	$3,531.50	SNAP-ON TOOLS	CG473HY
1	AT155-3 CUTTER				$7.55	($7.55)	SNAP-ON-TOOLS	
1	AT100B DIE GRINDER				$104.25	($104.25)	SNAP-ON-TOOLS	
1	AT110 ANGLE HEAD GRINDER				$134.25	($134.25)	SNAP-ON-TOOLS	
1	YA7341 BONNET CLEANER				$5.21	($5.21)	SNAP-ON-TOOLS	
1	AT450P7 AIR POLISHER				$224.25	($224.25)	SNAP-ON-TOOLS	
1	PMF136 DIAL INDICATOR				$98.96	($98.96)	SNAP-ON-TOOLS	
1	JC26 CREEPER				$74.96	($74.96)	SNAP-ON-TOOLS	
1	JC27 CREEPER				$74.25	($74.25)	SNAP-ON-TOOLS	
1	SHANK SET				$171.10	($171.10)	SNAP-ON-TOOLS	
1	GA294 SOLVENT SPRAYER				$40.05	($40.05)	SNAP-ON-TOOLS	
1	JCH30 HIGH BACK CREEPER				$63.71	($63.71)	SNAP-ON-TOOLS	
1	BB100A BRAKE BLEEDER				$102.49	($102.49)	SNAP-ON-TOOLS	
1	K661 TOOL BOX				$1,797.00	($1,797.00)	SNAP-ON-TOOLS	
1	SCALES				$274.62	($274.62)	SNAP-ON-TOOLS	
1	ACT1520 VACUUM				$311.25	($311.25)	SNAP-ON-TOOLS	
1	ACT9500 MANIFOLD GAUGES				$104.95	($104.95)	SNAP-ON-TOOLS	
1	YA704 ONE TON CRANE HOIST				$1,424.25	($1,424.25)	SNAP-ON-TOOLS	
1	AT155 CUTTER TOOL				$93.75	($93.75)	SNAP-ON-TOOLS	
1	TAP DIE SET TD9902	$435.20	$435.20		$0.00	$435.20		
2	HEAT GUN ET1600	$93.00	$186.00		$0.00	$186.00		
2	ENGINE HOIST YA704	$1,899.00	$3,798.00		$0.00	$3,798.00		
1	DRILL BITS DBKSU115	$323.45	$323.45		$0.00	$323.45		
1	PMF108S MICROMETER	$1,178.20	$1,178.20		$0.00	$1,178.20		
1	TEL GAGE SET PMF119	$81.20	$81.20		$0.00	$81.20		
1	REFRIGERANT RECOVERY & RECYCLING CERTIFICATION				$20.00	($20.00)	MACS	
9	MECHANICS CERTIFICATIONS				$135.00	($135.00)	MACS	
	VENDOR TOTAL			$15,415.55	$11,904.88	$3,510.67		
	US INDUSTRIAL TOOL & SUPPLY							
1	RIVET GUN KIT TP176	$295.00	$295.00		$360.00	($65.00)		
1	CYLINDER WRENCH TP2882K	$44.00	$44.00		$62.00	($18.00)		
1	TP726K RIVNUT TOOL				$138.95	($138.95)	US IND TOOL	
1	TP46K 90 DEGREE ATTACHMENT				$87.50	($87.50)	US IND TOOL	
1	TP47 SNAKE				$120.00	($120.00)	US IND TOOL	
1	TP448 CRANKCASE SPLITTER				$401.35	($401.35)	US IND TOOL	
1	BENDIX MAG ASSEMBLY FIXTURE TOOL				$0.00	$0.00	US IND TOOL	CANCELLED
1	TP226 TACH CHECK TOOL				$26.95	($26.95)	US IND TOOL	
1	TP246A BATTERY CHARGER				$370.00	($370.00)	US IND TOOL	
	FREIGHT				$5.21	($5.21)	US IND TOOL	
	FREIGHT				$24.68	($24.68)	US IND TOOL	
	VENDOR TOTAL			$339.00	$1,596.64	($1,257.64)		

SCHEDULE N - EQUIPMENT SUPPORT (CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	COMMENTS
	MASSCO							
1	FLOOR MACHINE	$1,800.00	$1,800.00		$3,865.00	($2,065.00)		
1	STEAM UPHOLSTERY CLEANER	$2,787.00	$2,787.00		$2,797.00	($10.00)		
4	Gallons of Cleaner				$83.00	($83.00)	MASSCO	
1	Spotter Sampler Kit				$71.00	($71.00)	MASSCO	
12	Pints of defoamer				$75.96	($75.96)	MASSCO	
12	Pints of Deoderizer				$66.00	($66.00)	MASSCO	
55	Gallons of Orange D'stroyer Cleaner				$409.05	($409.05)	MASSCO	
	VENDOR TOTAL			$4,587.00	$7,367.01	($2,780.01)		
	UNITED BEECHCRAFT							
1	WRENCH 50-590014	$1,206.18	$1,206.18		$1,027.00	$179.18		
1	WRENCH TS11176-10	$613.56	$613.56		$0.00	$613.56		CANCELLED
1	WRENCH TS1222-3	$867.72	$867.72		$1,012.95	($145.23)		
1	WRENCH TS1222-4	$1,056.03	$1,056.03		$1,012.95	$43.08		
1	TS1222-8	$867.72	$867.72		$1,140.95	($273.23)		
1	BARON EXHAUST	$987.20	$987.20		$1,033.60	($46.40)		
1	BARON EXHAUST	$1,020.80	$1,020.80		$1,068.80	($48.00)		
1	BARON EXHAUST	$918.90	$918.90		$962.10	($43.20)		
1	BARON EXHAUST	$856.80	$856.80		$897.60	($40.80)		
1	REGULATOR	$109.80	$109.80		$115.20	($5.40)		
2	EGT PROBE	$143.60	$287.20		$0.00	$287.20		
1	CHT PROBE	$106.65	$106.65		$106.65	$0.00		Cylheadtemp Bulb
1	WRENCH 50-590012	$244.94	$244.94		$208.50	$36.44		
1	WRENCH TS11176-10	$613.56	$613.56		$642.48	($28.92)		
2	WRENCH 3/4 HEX NUT	$967.42	$1,934.84		$739.00	$1,195.84		ONLY NEED ONE
1	WRENCH 7/8 HEX BOLT	$1,089.26	$1,089.26		$899.00	$190.26		
1	TOW PINS	$26.80	$26.80		$0.00	$26.80		
2	REGULATOR	$122.00	$244.00		$0.00	$244.00		
	VARIOUS MANUALS/CATALOGS	$1,282.00	$1,282.00		$1,264.00	$18.00		
	VARIOUS MANUALS/CATALOGS				$370.00	($370.00)		
	VARIOUS MANUALS/CATALOGS				$130.50	($130.50)		
	F33 BONANZA AIRCRAFT PARTS CATALOG				$103.50	($103.50)		
	FREIGHT				$11.22	($11.22)		
	FREIGHT				$0.00	$0.00		
	LESS ADJUSTMENT		($1552.80)		$0.00	($1552.80)		
1	BUSHING				$3.31	($3.31)		
1	MIXTURE CONTROL KIT				$335.25	($335.25)		
1	CONTROL ASSEMBLY				$35.10	($35.10)		
1	TACHOMETER SHAFT				$37.35	($37.35)		
1	CABLE				$94.90	($94.90)		
1	CABLE				$65.00	($65.00)		
1	BUSHING				$108.80	($108.80)		
1	CABLE				$86.77	($86.77)		
1	CABLE				$85.15	($85.15)		
1	MIXTURE CONTROL KIT				$335.25	($335.25)		
2	BEARING				$89.10	($89.10)		
2	GROMMET				$3.20	($3.20)		
4	BEARING ASSEMBLY				$296.40	($296.40)		

SCHEDULE N - EQUIPMENT SUPPORT (CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	
1	VALVE ASSEMBLY				$241.82	($241.82)		
1	PITOT TUBE				$167.02	($167.02)		
2	BOLT				$1.70	($1.70)		
4	LORD MOUNT				$159.00	($159.00)		
1	PIN				$2.40	($2.40)		
4	BUSHING				$108.80	($108.80)		
4	BOLT				$11.68	($11.68)		
4	BOLT				$7.04	($7.04)		
2	BOLT				$0.60	($0.60)		
3	ROD END				$42.12	($42.12)		
4	DOUBLER				$57.84	($57.84)		
4	BUSHING				$32.32	($32.32)		
1	CONTROL				$34.42	($34.42)		
1	CABLE				$50.85	($50.85)		
1	CABLE				$46.57	($46.57)		
1	CONTROL				$48.15	($48.15)		
4	MASTER CYLINDER				$507.60	($507.60)		
1	HINGE				$18.52	($18.52)		
1	HINGE				$34.45	($34.45)		
2	HINGE				$52.00	($52.00)		
2	BUSHING				$48.10	($48.10)		
	FREIGHT				$108.41	($108.41)		
	VENDOR TOTAL			$12,781.16	$16,102.99	($3,321.83)		
	AIRCRAFT ACCESSORIES							
1	PROPELLER 406	$7,870.00	$7,870.00		$0.00	$7,870.00		CANCELLED
1	PROPELLER 512	$9,558.00	$9,558.00		$0.00	$9,558.00		CANCELLED
2	STARTER GEAR CLUTCH C-150				$640.00	($640.00)	AEROTECH	
2	STARTER GEAR CLUTCH CORE				$200.00	($200.00)	AEROTECH	
	FREIGHT				$8.00	($8.00)	AEROTECH	
	VENDOR TOTAL			$17,428.00	$848.00	$16,580.00		
	SOS							
1	READER PRINTER	$1,895.00	$1,895.00		$3,536.00	($1,641.00)	Salina Blueprint	
	VENDOR TOTAL			$1,895.00	$3,536.00	($1,641.00)		

SCHEDULE N - EQUIPMENT SUPPORT (CONT.)

QTY	DESCRIPTION	COST EACH	VENDOR TOTAL	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (If Different)	
	ATP							
1	LIGHT A/C	$8,265.00	$8,265.00		$8,265.00	$0.00		LIBRARY
1	REVISION	$3,130.00	$3,130.00		$3,130.00	$0.00		RENEWAL
1	REVISION				$1,170.00	($1,170.00)		
	VENDOR TOTAL			$11,395.00	$12,565.00	($1,170.00)		
	Century Instrument Corporation							
2	AIRSPEED				$290.00	($290.00)		
2	DIAL				$30.00	($30.00)		
2	ALTIMETER				$180.00	($180.00)		
2	DIAL				$40.00	($40.00)		
1	BLIND ENCODER				$195.00	($195.00)		
	SHIPPING				$12.00	($12.00)		
					$747.00	($747.00)		
	ALL SYSTEM AIRCRAFT PARTS CO.							
3	AIRSPEED INDICATOR				$1,133.49	($1,133.49)		
	SHIPPING				$24.00	($24.00)		
	LINCOLN FARM SUPPLY, INC							
1	YAMAHA 1700 2 WHEEL DRIVE TRACTOR TUG				$4,000.00	($4,000.00)		
1	SHIBAURA 14 HORSE POWER 2 WHEEL DRIVE TRACTOR TUG				$2,500.00	($2,500.00)		
					$7,657.49	($7,657.49)		
	Adjustment			-0.48				
	Revised Budget			($1,963.00)				
	EQUIPMENT SUPPORT TOTAL			$153,303.00	$153,302.56	$0.44		

SCHEDULE O

		BALANCE
BUDGET-Purchase Cessna 150's		$56,750.00
(1) 1967 Cessna 150 from Pickle	$13,500.00	$43,250.00
(1) 1977 Cessna 150 from Henderson	$15,000.00	$28,250.00
(1) 1975 Cessna 150 from Whitington	$14,750.00	$13,500.00
(1) Cessna 150L from Johns	$13,500.00	$0.00

SCHEDULE P

			BALANCE
(1) Beechcraft F-33C Aerobatic Bonanza Purchased as proposed	$125,000.00	$125,000.00	$0.00

Painting and Upgrading	$32,248.00		
Revised Budget	($13,344.00)		
Kings Avionics - Radios for airplanes + shipping		$5,667.64	$13,236.36
Kings Avionics- Parts, Radios, and Labor		$13,236.78	($0.42)
Total	$143,904.00	$143,904.42	($0.42)

SCHEDULE Q

AIRFRAME AND POWERPLANT EQUIPMENT

QT	DESCRIPTION	COST EACH	VENDOR TOTA	TOTAL COST	AMOUNT PAID	DIFFERENCE	VENDOR (IF DIFFERENT)	COMMENTS
	SNAP-ON TOOLS CORPORATION							
1	TIG WELDER CKSRE5A	$2,397.75	$2,397.75		$2,502.87	($105.12)	BROWN WELDING	HAS WARRANTY!
2	HYDRAULIC PRESS LG4;	$3,220.00	$6,440.00		$3,220.00	$3,220.00		
1	HYDRAULIC JACK STANI	$635.00	$635.00		$476.63	$158.37		
1	ALTERNATOR GENERAT	$1,635.00	$1,635.00		$857.81	$777.19		
1	ASS7512PG LEAD SET (EQ FOR TESTER)				$82.50	($82.50)		
1	BALANCER	$4,299.25	$4,299.25		$0.00	$4,299.25		RETURNED
19	BUCKING BAR AS270	$41.00	$779.00		$615.00	$164.00		
20	BUCKING BAR AS736	$54.50	$1,090.00		$817.60	$272.40		
20	BUCKING BAR AS763	$32.00	$640.00		$480.00	$160.00		
20	BUCKING BAR AS7505-1	$63.00	$1,260.00		$945.00	$315.00		
1	NDT STATION	$13,195.00	$13,195.00		$0.00	$13,195.00		
	(2) ZB-100 Blacklight				$820.00	($820.00)	North Star	
2	106TMU C/FLEX SET				$196.20	($196.20)	SNAP ON TOOLS	
1	PPB30K PUNCH SET				$35.14	($35.14)	SNAP ON TOOLS	
1	PPB826 PIN PUNCH				$19.88	($19.88)	SNAP ON TOOLS	
1	PPB1012 PIN PUNCH				$23.81	($23.81)	SNAP ON TOOLS	
2	PMF108 MICROMETER MT SET				$883.66	($883.66)	SNAP ON TOOLS	
2	PMF105 MICROMETER SET				$292.20	($292.20)	SNAP ON TOOLS	
2	PMF106 MICROMETER SET				$303.46	($303.46)	SNAP ON TOOLS	
4	PMF124 SM HOLE SET				$140.56	($140.56)	SNAP ON TOOLS	
1	PMF115 MICROMETER MT SET				$445.84	($445.84)	SNAP ON TOOLS	
3	PMF DIAL SET				$202.95	($202.95)	SNAP ON TOOLS	
4	PMF119 TELE GAGE SET				$243.60	($243.60)	SNAP ON TOOLS	
1	GAN8508-6A CROWFOOT				$8.21	($8.21)	SNAP ON TOOLS	
1	GAN8508-7A CROWFOOT				$8.21	($8.21)	SNAP ON TOOLS	
1	GAN8508-8A CROWFOOT				$8.21	($8.21)	SNAP ON TOOLS	
1	GAN8508-9A CROWFOOT				$8.21	($8.21)	SNAP ON TOOLS	
1	208GAN CROWFOOT SET				$86.96	($86.96)	SNAP ON TOOLS	
1	321GAN CROWFOOT SET				$508.14	($508.14)	SNAP ON TOOLS	
1	304AHSK H/SPAN SET				$141.23	($141.23)	SNAP ON TOOLS	
1	304APSK P/SPAN SET				$156.08	($156.08)	SNAP ON TOOLS	
1	AFS482 SPANNER WR				$18.45	($18.45)	SNAP ON TOOLS	
1	AFS483 SPANNER WR				$22.95	($22.95)	SNAP ON TOOLS	
1	AFS484 SPANNER WR				$30.23	($30.23)	SNAP ON TOOLS	
1	208FDHY SOCKET SET				$59.30	($59.30)	SNAP ON TOOLS	
1	GTEL8 SPLINE SOCKET				$11.85	($11.85)	SNAP ON TOOLS	
1	GTEL7 SPLINE SKT				$11.85	($11.85)	SNAP ON TOOLS	
1	GTEL9 SPLINE SKT				$11.85	($11.85)	SNAP ON TOOLS	
1	GTEL10 SPLINE SKT				$11.85	($11.85)	SNAP ON TOOLS	
1	TESU8 FLEXSOCKET				$25.69	($25.69)	SNAP ON TOOLS	
1	TESU10 FLEXSOCKET				$30.94	($30.94)	SNAP ON TOOLS	
1	205FES SPL SOCKET SET				$51.56	($51.56)	SNAP ON TOOLS	
1	FEL120 SPLINE SKT				$14.25	($14.25)	SNAP ON TOOLS	
1	FEL140 SPLINE SKT				$14.25	($14.25)	SNAP ON TOOLS	
1	FEL180 SPLINE SKT				$16.39	($16.39)	SNAP ON TOOLS	
1	FEL200 SPLINE SOCKET				$16.39	($16.39)	SNAP ON TOOLS	

AIRFRAME AND POWERPLANT EQUIPMENT (SCHEDULE Q CONT.)

1 205FESU SET		$124.76	($124.76)	SNAP ON TOOLS
1 SCES608A WRENCH SET		$235.33	($235.33)	SNAP ON TOOLS XDES608A FLEX WRENCH SE
1 A257 BUSHING DR SET		$276.11	($276.11)	SNAP ON TOOLS
1 A57Q BUSHING DR SET		$201.56	($201.56)	SNAP ON TOOLS
1 PR36 PLIERS KIT		$17.85	($17.85)	SNAP ON TOOLS
1 PR50A PLIER SET		$68.74	($68.74)	SNAP ON TOOLS
1 PRC87 SNAP RING PLIER		$54.71	($54.71)	SNAP ON TOOLS
1 PR43 PLIER SET		$135.15	($135.15)	SNAP ON TOOLS
1 PR405 PLIER SET		$44.55	($44.55)	SNAP ON TOOLS
1 PRH404 PLIER SET		$61.31	($61.31)	SNAP ON TOOLS
1 326TSW 1/2 DR SH/DP		$259.65	($259.65)	SNAP ON TOOLS
1 HBN120 FILE KIT		$89.25	($89.25)	SNAP ON TOOLS
2 FBL325A FEELER GAGE		$25.28	($25.28)	SNAP ON TOOLS
2 FB6B026 BLADE		$2.48	($2.48)	SNAP ON TOOLS
2 FB6B027		$2.48	($2.48)	SNAP ON TOOLS
2 FB6B028 BLADE		$2.48	($2.48)	SNAP ON TOOLS
2 FB6BO29 BLADE		$2.48	($2.48)	SNAP ON TOOLS
2 FB6B030 BLADE		$2.48	($2.48)	SNAP ON TOOLS
2 FB6B032 BLADE		$3.16	($3.16)	SNAP ON TOOLS
2 FB6B035 BLADE		$2.48	($2.48)	SNAP ON TOOLS
2 FB6B040 BLADE		$2.48	($2.48)	SNAP ON TOOLS
1 FH607BK FLEX WRENCH SET		$240.15	($240.15)	SNAP ON TOOLS
1 CX605 WRENCH SET		$113.96	($113.96)	SNAP ON TOOLS
1 SBX605 BOX WRENCH SET		$102.68	($102.68)	SNAP ON TOOLS
1 DB129B BIT SET		$95.18	($95.18)	SNAP ON TOOLS
2 208FTAXSY DRIVER SET		$102.38	($102.38)	SNAP ON TOOLS
1 234GFC CROWFOOT SET		$473.55	($473.55)	SNAP ON TOOLS
1 212FUY SOCKET SET		$227.20	($227.20)	SNAP ON TOOLS
6 MX 507230 100W B/L Bulb		$288.00	($288.00)	North Star
2 ZA-59R ZYGLO Kit		$220.00	($220.00)	North Star
2 ZA-60R ZYGLO Kit		$180.00	($180.00)	North Star
2 SK-3 SPOTCHECK Kit		$170.00	($170.00)	North Star
(2) SK-S SPOTCHECK Kit		$150.00	($150.00)	North Star
(1) Leak Detection Kit		$450.00	($450.00)	North Star
1 ICV-122OK Compact Video Inspection		$3,975.00	($3,975.00)	North Star
1 Video Typewriter		$450.00	($450.00)	North Star
Shipping		$29.30	($29.30)	North Star
1 SONOTRACE 40 UT COUPLANT		$17.00	($17.00)	North Star
1 SONOTRACE 30 UT COUPLANT		$60.00	($60.00)	North Star
1 SONOTRACE ULTRAGEL II UT COUP		$28.00	($28.00)	North Star
1 FLAW DET. TRANSDUCER KIT		$680.00	($680.00)	North Star
1 TRANSDUCER		$725.00	($725.00)	North Star
1 STRESS-TELL T-MIKE EZ		$1,440.00	($1,440.00)	North Star
1 MINI-TRANSCUDER 3/16" 5 MHZ		$247.00	($247.00)	North Star
1 HIGH RESOLUTION TRANS. .250"5		$288.00	($288.00)	North Star
1 WELD STANDARD		$550.00	($550.00)	ZETEC
1 CROSS PT		$193.00	($193.00)	ZETEC
1 PLUS PT		$193.00	($193.00)	ZETEC
1 DETACHABLE SPOT PROBE		$96.00	($96.00)	ZETEC
1 CONDUCTIVITY PROBE		$547.00	($547.00)	ZETEC
1 BOLT HOLE PROBE		$1,355.00	($1,355.00)	ZETEC
10 DIGITAL MULTIMETER MODEL CES4025		$650.00	($650.00)	CES INDUSTRIES
2 TROUBLESHOOTING LEADS B MODEL CES 329B		$190.00	($190.00)	CES INDUSTRIES
2 ANALOG TROUBLESHOOTING ASSEMBLY B MODEL CES 261B		$790.00	($790.00)	CES INDUSTRIES
FREIGHT		$406.10	($406.10)	HYMAN FREIGHTWAYS
Revised Budget	($156.00)			
AIRFRAME AND POWERPLANT EQUIPMENT TOTAL	$32,215.00	$32,215.03	($0.03)	