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Volume 19

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June 1979

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United States Air Force Academy
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DEPARTMENT OF AERONAUTICS

PUBLICATIONS

Captain Howard M. Brilliant

"Predicted and Measured Maximum Instantaneous Distortion for Flight and Wind Tunnel Model Data for a Mixed-Compression Inlet"

NASA Conference Publication 2054 from The Proceedings of the YF-12 Experiments Symposium, Vol I, Dryden Flight Test Center, Edwards, CA, 13-15 September 1978

Co-authors: Carol A. Bauer and Robert A. Davis, Dryden Flight Research Center

A method was recently developed for estimating probable maximum instantaneous compressor face total pressure distortion. The advantage of this method is that it requires fewer total pressure measurements to be made. In the present study, the same method was applied to the YF-12C mixed-compression inlet using data obtained from YF-12C flight tests and from wind tunnel tests of both full-scale and one-third-scale inlet models. Values estimated by the method investigated were found to be within 20 percent of the measured values for the three sets of data examined.

Captain Eugene A. Rose, III

"What's a Tweet?"

The Navigator, Vol XXV, No 2, Summer 1978
Aerospace Safety, Vol 35, No 10, October 1978 (reprinted)

A description of the T-37 phase of navigator training conducted by the Air Force at Mather AFB, CA, is given. A general course description, fundamental elements of instruction, and instructional techniques of the author are included. Major areas covered include clearing, crew coordination and checklist usage, radio procedures, wind analysis, time control, UFR map reading, and prioritization of tasks.

Captain Eric J. Jumper

"Transient Analysis of a Laser Supported Detonation Wave Using Whitham's Rule"

Physics of Fluids, April 1978, p. 549

Analysis is made of a laser supported detonation wave using Whitham's rule. The C_+ characteristic is developed for absorption of laser energy immediately behind a shock wave. The characteristic is then coupled with the Rankine-Hugoniot equations relating conditions across the shock. In this way an equation for predicting the transient shock strength is obtained. The result is compared to experiment and to steady state laser supported detonation theory. The result of this comparison is that the derived equation does duplicate the transient response of the experiment and (when allowed to run to steady state) it does agree with many of the characteristics of the steady state theory.

"Images of Coins on a Burial Cloth?"

The Numismatist, July 1978, p. 1349

Co-authors: Captain John P. Jackson, USAFA/DFP, and Mr. Kenneth Stevenson, Jr., IBM, New Orleans, LA

The paper describes the possibility of coin images on the face of the image of a man on the Shroud of Turin. The History of the Shroud is traced as well as a summary of recent scientific work on the Shroud including work up to July of 1978.

"Wind Tunnel Testing of Scaled Hang Gliders"

Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 2

Co-authors: CIC M. C. Kargul and G. R. Schlotterbeck, USAF Academy

This report examines the feasibility of aquiring accurate aerodynamic characteristics for hang gliders using scaled models in a wind tunnel. First, the paper discusses the results of a literature search, next the parameters and equations applicable to collection and interpretation of data collected in the wind tunnel, and finally the results of wind tunnel tests conducted in the USAFA 2' x 3' subsonic wind tunnel.

"An Intuitive Look at Viscous Flow"

Aeronautics Digest - Fall 1978, USAFA-TR-79-1, p. 21

This paper discusses viscous flow based on some simple observations of a fictitious experiment. The experiment is a contrived apparatus which simulates impulsive start motion of a flat plate in an at-rest fluid bath. Based on the observations, predictions about the nature of boundary layer phenomena are made and compared to the Exact Blasius solution of a boundary layer on a flat plate.

Major John P. Retelle, Jr.

"Unsteady Boundary Layer Flow Reversal in a Longitudinally Oscillating Flow"

Frank J. Seiler Research Laboratory, SRL-TR-0006, August 1978

Measurements of boundary layer flow reversal made in a wind tunnel on a stationary NACA 0012 air foil immersed in a longitudinally oscillating subsonic flow are described. A split-film sensor provided flow reversal data in regions above the airfoil surface throughout the period of flow oscillation. It is shown that boundary layer flow reversal on a stationary airfoil in an oscillating free stream responds to changes in the flow unsteadiness in a manner similar to the flow reversal observed during the onset of dynamic stall on an airfoil oscillating in pitch.

"Experimental Measurement of Sailplane Towrope Loads"

Aeronautics Digest - Fall 1978, USAFA-TR-79-1, p. 17

Co-author: CIC F. H. Zeitz, USAF Academy

Sailplane towrope loads were measured in flight using an instrumented towplane tow hook and two trainer sailplanes. The measured loads reflect both the good and bad performance of student pilots on calm soaring days, but do not include the effects of strong turbulence or rotor activity. Additional data on the influence of towrope age, as well as current practices of placing knots in ropes, should be of interest to soaring clubs and other flight instruction activities. It was found that, even for the most violent maneuvers tested, the towrope loads were less than 15 percent of the measured towrope breaking strength, and less than 34 percent of the gross weight of the Schweitzer 2-33 glider. The results are meant to provide a baseline of experimental data as background for possible alterations of the Federal Aviation Administration regulations on required towrope strengths.

"Harmonic Optimization of a Periodic Flow Wind Tunnel"

Aeronautics Digest - Fall 1978, USAFA-TR-79-1, p. 103

Co-author: Dr. Donald A. Kennedy, University of Colorado, Boulder, CO

Numerous methods have been used to generate axial gusting in wind tunnels. Attempts to increase the amplitude of velocity oscillations about a mean velocity have usually resulted in increasing the harmonic content of the power spectrum of the free stream velocity. This work describes a wind tunnel modification which was specifically designed to produce a sinusoidal perturbation to the mean velocity which was free from unwanted higher harmonic effects. Velocity perturbations

were produced by rotating vanes mounted downstream of the tunnel test section. A flow bypass mechanism provided harmonic supression which could be optimized for the various combinations of velocity-oscillation amplitude and frequency used in unsteady flow experiments. Depending on the flow conditions, results showed that the second harmonic power amplitude could be greatly suppressed and that higher harmonics could not be detected.

Lieutenant Colonel Roger W. Gallington

"Power Augmentation of Wing-in-Ground Effect (WIG) Craft"

Proceedings of the Wing in Ground Effect Technology Workship, Air Force Dynamics Laboratory and Foreign Technology Division, September 1978

The simple idea of directing the efflux of forward-mounted engines under the wing to provide lift at zero speed was suggested by the design of Russian craft as a solution to two historical WIG design problems--namely large thrust required for take-off from water and hydrodynamic impacts during the take-off run. Recent progress and understandings were summarized and the remaining uncertainties were discussed.

"Flow Quality Improvements in the USAFA Trisonic Tunnel"

Proceedings of the 51st Semiannual Meeting of the Supersonic Tunnel Association, Valencia, CA, April 1979

Co-authors: Mr. Milton W. Davis, Major Steve E. Icardi and Major John A. Wright, USAF Academy, CO

The design and results of modifications which reduced pressure fluctuations by a factor four were discussed.

"Confidence in Fundamentals"

Aeronautics Digest - Fall 1978, USAFA-TR-79-1, p. 125

The technical performance of recent engineering graduates may be limited by a lack of confidence in fundamentals. This contention is supported here by three real engineering problems requiring only undergraduate knowledge for their solutions, which the author doubts many recent graduates could solve with sufficient confidence to direct the activities of others to implement the solutions. A means of building confidence during educational programs by systematic comparisons between different approaches to the same problem is suggested.

Major Steve E. Icardi

"Pressure Data From the Open Port Flight Test Without APT Input Window"

Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 70

Ground and flight tests were conducted with the Airborne Laser Laboratory to demonstrate operation of the Airborne Pointing and Tracking (APT) System in the open port configuration with the input window removed. Preliminary calculations were performed to insure that a rapid decompression would not occur when the APT eyelid was opened against a pressure gradient and that the air flow through the APT would not cause damage to equipment or harm personnel. The preliminary estimates proved conservative. The measured dynamic loading inside the APT was low and the cabin pressure transients were relatively slow and did not degrade flight or test crew performance.

"The Theoretical Basis and Experimental Application of the Analogy Between Mass and Heat Transfer"

Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 100

This paper outlines the theoretical basis for the analogy between mass and heat transfer. It discusses an experimental method for estimating temperatures in flows by relating them to the measurement of mass concentrations of a trace gas in the flow.

Captain James R. Williams

"A Simple Model of Temperature Gradient Metomorphism"

Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 58

Increasing winter mountain travel by skiers, snow mobilers, and climbers means an increasing exposure to avalanches. Slab avalanches, the most important source of winter hazard in the mountains, occur when the stresses in the snowpack exceed the strengths of the anchors holding it in place. The major anchor is the shear strength between the snowpack and the surface beneath it. Any layer with a weak shear strength is a potential sliding surface for a slab avalanche. Temperature gradient metamorphism is one of the primary mechanisms by which weak layers are produced in the snowpack. A simple model is proposed which explains the mechanism of temperature gradient metamorphism and gives qualitative results which agree with observations.

Major Richard C. Oliver

"Design Procedure for Coupling Savonius and Darrieus Wind Turbines"

Aeronautics Digest - Fall 1978, USAFA-TR-79-1, p. 90

Co-author: CIC P. R. Nixon, USAF Academy, CO

A design procedure for a combined Savonius and Darrieus Wind Turbine System is presented and demonstrated. Individual system characteristics are described and discussed. System characteristics are combined and procedures prescribed to design either maximum power output or minimum starting time systems. Generalizations are provided for system design when specific test data does not exist and a possible application of the resulting system is described.

"Convective Heat Transfer Augmentation by Combined Techniques"

Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 87

Current Air Force developments in lasers and advanced propulsive systems have demonstrated the requirements for high rates of heat transfer. Many augmentative techniques exist and this paper reports on the experimental evaluation of a combination of two of the most promising convective techniques, nucleate boiling and surface promoters. Results indicate that these techniques can be used in concert, with additive effects; no detrimental effects were noted in the range investigated.

Lieutenant Colonel Fred H. Porter, III

"Takeoff Ground Roll Performance Model"

Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 27

An acceleration-during-takeoff-roll model is developed using two unknowns, a takeoff drag coefficient and a rolling friction coefficient. The unknown coefficients are then estimated using linear regression on acceleration versus velocity data obtained from four different takeoffs with varying thrust, weight and environmental conditions. Finally the model is used to predict acceleration, time and distance as a function of ground velocity for standard thrust, weight and environmental conditions.

Dr. David L. Kohlman

"Drag Reduction Through Higher Wing Loading"

Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 14

Drag reduction of typical light aircraft is discussed in this paper. The principle means of drag reduction can be achieved by reducing the wing area, thus reducing parasite drag. Reducing wing area naturally involves other modifications if the aircraft is expected to have the same or better performance. The modification constraints and related configuration changes are addressed here, such as reduced span or chord, full span Fowler flaps, and the use of the recently developed general aviation airfoil developed by Whitcomb.

Captain Michael M. Tower

"Aerodynamics of a Tumbling Reentry Vehicle"

Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 2

Co-authors: CIC Bertram Connoy and CIC Steven H. Slick, USAF Academy, CO

Experimental wind tunnel data is presented for a right conical blunt nosed model at angles of attack of 90°, 135°, and 180°, through a mach number range of 1.2 to 3.0. The axial and normal force coefficients obtained from the tunnel data acquisition system are converted to lift and drag coefficients and extends the theoretical data published by the National Aeronautics and Space Administration, NASA, beyond the zero to 90° range. The results of this paper could be included in the aerodynamic routines of a ballistic trajectory reentry vehicle computer code for more accurate trajectory predictions of a tumbling reentry vehicle.

Dr. G. David Huffman

"Flow Field Characterization of Flow Direction and MACH Number Probes Using Slender Body Theory"

Aeronautics Digest - Fall 1978, USAFA-TR-79-1, p. 39

Slender body theory has been used to model the flow field past a flow direction and Mach number probe at an angle of attack and a sideslip angle. An expression has been derived for the body surface pressure coefficient. This has been converted into angular and static pressure coefficients which are evaluated for a specific sensor geometry. These expressions are employed in the quantification of misalignment effects. Finally, the velocity expressions are used to visualize the three-dimensional flow past a cone probe at an angle of attack and a sideslip angle.

Major James D. Lang

"Technique for Vorticity Measurement in Unsteady Flow"

AIAA Journal, April 1979, p. 387. Extended abstract in Aeronautics Digest - Spring 1978, USAFA-TR-78-6, p. 126

Co-authors: Captain J. E. Keesee and Captain M. S. Francis, F. J. Seiler Research Lab, CO

A technique is described for determining spatial vorticity distributions in nonstationary fluid flows exhibiting a periodic, time-varying, mean velocity field. The method requires the integration of velocity field data about a spatial array of closed contours to to infer the distribution of vorticity using the generalized definition of circulation. A digital data acquisition scheme is suggested for the handling and processing of large quantities of data encountered in typical applications. The method was used to determine the flow characteristics in portions of an unsteady separated region generated by an oscillating spoiler on an airfoil surface. Several data display alternatives are discussed.

"Aerodynamic Characteristics of an Unsteady Separated Flow"

AIAA paper Number 79-0283, Proceedings of the 17th Aerospace Sciences Meeting, New Orleans, LA, January 1979. Extended abstract in Aeronautics Digest - Fall 1978, USAFA-TR-79-1, p. 144

Co-authors: Captain M. S. Francis, Captain J. E. Keesee, F. J. Seiler Research Lab; and Captain G. W. Sparks and Captain G. E. Sisson, USAF Academy, CO

The results of experiments in which an unsteady separating flow was generated on the surface of an airfoil immersed in a subsonic wind tunnel freestream are discussed. An investigation of the global ensemble averaged vorticity field generated by oscillations of a fence-type spoiler located on one surface of the airfoil has confirmed the presence of a dynamically evolving vortex-like structure bearing a strong resemblance to the one encountered in classical dynamic stall. The growth and development of the shear layer region is characterized through iso-vorticity contour maps at select phase points during the motion cycle. A detailed description of flow field behavior is provided for several values of the dimensionless spoiler frequency and freestream Reynolds number. The correlation of these results with corresponding surface pressure measurements is also presented.

PRESENTATIONS

Major John P. Retelle, Jr.

"A Laser Doppler Velicometer System to Investigate Unsteady Flow Separation"

Co-authors: Captain G. W. Sparks, Jr., USAF Academy, CO; and Captain J. E. Keesee, Captain M. S. Francis and Captain J. M. Lind, F. J. Seiler Research Lab.

Presented at the 25th International Instrumentation Symposium, Anaheim, CA, 7-10 May 1979, and

Presented at the Subsonic Aerodynamics Testing Association Meeting, Los Angeles, 15 February 1979

Lieutenant James C. West (USN)

"Determination of Transonic Compressor Flow Field by Synchronized Sampling of Stationary Fast Response Transducers"

Presented at the winter annual meeting of the American Society of Mechanical Engineers, San Francisco, CA, 10-15 December 1978

DEPARTMENT OF ASTRONAUTICS AND COMPUTER SCIENCE

PUBLICATIONS

Captain Wesley L. Cooper

"The Ups and Downs of Raised Computer Flooring"

Installation Management Review (ACM SIGCOSIM), Vol 7, No. 1, June 1978

A general specification for procurement of raised computer flooring, the article itemizes several nationally recommended and required standards necessary to insure acquisition of a safe, durable floor system. Load ratings, fire resistance, electrical grounding/pass-through methods, and installation parameters are addressed. Some of the management decisions required for a comprehensive acquisition are also discussed.

Major Lawrence E. Druffel

"A Generator Set for Representing All Automorphisms of a Graph"

SIAM Journal of Applied Mathematics, Vol 34, No. 3, May 1978

Co-authors: D. C. Schmidt and Da-Lun Wang, Vanderbilt University

This paper proposed a generator set for the automorphisms of a graph which defines the number of automorphisms. The generator set requires $\dot{0}(n^3)$ space for its representation.

"Visual Demonstration of Program Execution"

SIGCSE/CSA Technical Symposium on Computer Science Education, SIGCSE Bulletin, Vol 10, No. 1, February 1978

Co-authors: Major Kenneth L. Krause, Department of Astronautics and Computer Science; C1C Russell B. Kline, Second Lieutenant Gary D. Hamor, USAF Academy, Colorado

The paper describes a system which provides a visual demonstration of the structure and flow of an ALGOL program. The program is displayed on a CRT and executed interpretively, highlighting each statement prior to execution and showing the result of the statement after execution. The primary use of the system is to demonstrate program operation in a classroom environment.

Major Leonard R. Kruczynski

"Aircraft Navigation with the Limited Operational Phase of the NAVSTAR Global Positioning System"

Journal of the Institute of Navigation, Vol 25, No. 2, Summer 1978

In 1980, the NAVSTAR Global Position System (GPS) will be in the limited operational phase. During this phase, a GPS user will not generally be able to determine his position using satellite measurements only. This paper describes the simulation of an aircraft navigation technique which uses the limited operational phase GPS and barometric altimeter measurements.

DEPARTMENT OF BEHAVIORAL SCIENCES AND LEADERSHIP

PUBLICATIONS

Major John M. Bermudez

Effect of Peripherally Presented Visual Signals on Pilot Performance During Flight Simulation

Aerospace Medical Research Laboratory Technical Report 78-120, June 1978

Co-authors: Lt Col Jock C. H. Schwank, Captains Thomas M. Longridge, Jr., Bruce A. Smith, Thomas M. McCloy, United States Air Force Academy, Colorado

This study investigated the ability of pilots to attend to peripherally presented attitude information via LED displays while simultaneously engaging in foveal processing of an instrument array during a complex maneuver in a flight simulator. Overall, the results suggest that peripheral displays are at least as effective as compass dials for monitoring purposes, and such displays might prove useful as adjunct training aids which also improve safety.

Proceedings, Psychology in the Department of Defense, 6th Annual Symposium

United States Air Force Academy Technical Report 78-13, June 1978

Co-editors: Captains William H. Clover, Lee J. Dahle, Richard L. Hughes, Donnell M. Washington, United States Air Force Academy, Colorado

These printed proceedings included papers and presentations that deal with a wide range of psychology and research on behavior: Personnel, Women, Training, Human Factors Engineering, Organizational Development, Simulation, Performance, Leadership, Attrition, and Stress.

Major John M. Bermudez

The USAF Academy How-To-Study Program: A Handbook for Volunteer Counselors

Frank J. Seiler Research Laboratory Technical Report 79-ØØØ3, 1 April 1979

Co-authors: Nita Huelf, Captain Mark Nataupsky, United States Air Force Academy, Colorado

General counseling tips are provided as background information for How-To-Study counselors. Information is presented to identify students with possible auditory perception difficulties. There are a series of nine lesson plans to guide student counseling. Key emphasis is placed on awareness of time spent studying and on time management techniques. Other lessons focus on more specific information such as note-taking skills and test-taking strategies.

"Pilot Performance During Flight Simulation With Peripherally Presented Visual Signals"

Presented at the 22nd Annual Human Factors Society Meeting, October 1978, Detroit Michigan, and published in Proceedings.

Co-authors: Lieutenant Colonel Jock C. H. Schwank, Captains Bruce A. Smith, and Dickie A. Harris, United States Air Force Academy, Colorado

(See Lieutenant Colonel Jock C. H. Schwank)

Captain William H. Clover

"Can We Learn Anything About Interviewing Real People From 'Interviews' of Paper People? Two Studies of the External Validity of a Paradigm"

Organizational Behavior And Human Performance, Vol 22, 1978

Co-authors: Charles D. Gorman, USAF Occupational Measurement Center; Michael E. Doherty, Bowling Green State University

Two investigations of the external validity of the paper-people analog are presented. One, a laboratory study, the other a field study, compared judgments based on interviews with judgments based on resume's (paper-people). Sufficient data were generated to draw the conclusion that the paper-people paradigm of interview research does not provide information which generalized to actual interviews.

Proceedings, Psychology in the Department of Defense, 6th Annual Symposium

USAF Academy Technical Report 78-13, June 1978

Co-editors: Major John M. Bermudez, Captains Lee J. Dahle, Richard L. Hughes, Donnell M. Washington, United States Air Force Academy, Colorado

(See Major John M. Bermudez)

Captain Lee J. Dahle

Proceedings, Psychology in the Department of Defense, 6th Annual Symposium

United States Air Force Academy Technical Report 78-13, June 1978

Co-editors: Major John M. Bermudez, Captains William H. Clover, Richard L. Hughes, Donnell M. Washington, United States Air Force Academy, Colorado

(See Major John M. Bermudez)

Captain Mickey R. Dansby

"Theories of Leadership"

Presented at the Sixth Psychology in the Department of Defense Symposium, 20 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

This paper examined three approaches to leadership (personal, situational, and interactional) and reviewed current trends in leadership theory.

"Leader Effectiveness as a Function of Leader's Sex and Leadership Style"

Dissertation Abstracts International, 1979; presented to the Graduate Council of the University of Florida, March, 1979

This paper examines the effects of leader's sex and leadership style on leader effectiveness for both male-oriented and female-oriented tasks. The results are examined in light of Fiedler's Contingency Theory of Leadership and with respect to current findings in leadership research.

Captain David C. Gillman

"Sex Integration of the United States Air Force Academy: Changing Roles for Women"

Published in the Armed Forces And Society, August 1978

Co-authors: Dr Lois B. DeFleur, Washington State University, and Captain William Marshak, United States Air Force Academy, Colorado

This paper summarized data gathered from the beginning months of sex-integration of the USAF Academy. Issues of institutional "maleness" and tradition, upper-class cadet orientations, entering male and female cadet orientations and profiles, and basic cadet training (BCT) were addressed with an epilogue concerning those cadets in the class of 1980 completing the first academic year.

"Cadet Beliefs, Attitudes and Interactions During the Early Phases of Sex-Integration"

Published in Youth and Society, December 1978

Co-author: Dr Lois B. DeFleur, Washington State University

An examination of Air Force Academy cadet beliefs, attitudes and interaction patterns during the early phases of sex integration was made in this publication. The initial Academy setting was first addressed, then the interrelationships between attitudes, beliefs and behavior were identified with an emphasis on beliefs about squadron life, attitudes toward women's roles and informal behavior among male and female cadets.

Captain Dickie A. Harris

"Pilot Performance During Flight Simulation With Peripherally Presented Visual Signals"

Presented at the 22nd Annual Human Factors Society Meeting, October 1978, Detroit Michigan, and published in Proceedings.

Co-authors: Lieutenant Colonel Jock C. H. Schwank, Major John M. Bermudez, Captain Bruce A. Smith, United States Air Force Academy, Colorado

(See Lieutenant Colonel Jock C. J. Schwank)

Major Richard L. Hughes

"Electromyographic Biofeedback In the Desensitization of Test Anxiety"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in Proceedings.

Systematic desensitization has been only somewhat effective in improving the performance of test-anxious subjects. It was hypothesized that this was attributable to insufficient levels of muscular relaxation obtained with verbal relaxation procedures and that electromyographic biofeedback would lead to deeper levels of relaxation and improved performance scores among test-anxious subjects. Contrary to expectations, but consistent with previous studies using verbal relaxation techniques, biofeedback did not lead to performance improvement. However, subjects did report significantly less test anxiety following biofeedback.

"Is The Little Professor 'Right?"

Transactional Analysis Journal, 8(2), 1978

This paper notes parallel developments in transactional analysis and physiological psychology. The intuitive, creative, and nonverbal 'Little Professor' sounds much like the information-processing which is characteristic of the right cerebral hemisphere; and the logical, analytical adult sounds much like the information-processing which is characteristic of the left hemisphere.

Proceedings, Psychology in the Department of Defense, 6th Annual Symposium

United States Air Force Acadmy Technical Report 78-13, June 1978

Co-editors: Major John M. Bermudez, Captains William H. Clover, Lee J. Dahle, Donnell M. Washington, United States Air Force Academy Colorado

(See Major John M. Bermudez)

Lieutenant Colonel Jefferson M. Koonce

"Predictive Validity of Flight Simulators as a Functions of Simulator Motion"

Human Factors, 1979, 21, 215-223.

Ninety multi-engine instrument rated pilots were assigned to no motion, sustained linear scaled down analog motion, and washout motion in a GAT II simulator to determine the effects of degree of motion upon the predictive validity of flight simulators. Five instrument and five contact maneuvers were flown in the simulator followed by flight in a Piper Aztec aircraft. On each mission performances were recorded by two observers with exceptionally high inter-observer reliability. Although no motion resulted in poorer performance in the simulator, There were no differences in the groups' performances in the aircraft. The basic sustained motion system gave the best predictive validity coefficient (0.911).

Captain Thomas M. Longridge, Jr.

Effect of Peripherally Presented Visual Signals on Pilot Performance During Flight Simulation

Aerospace Medical Research Laboratory Technical Report, 78-120, June 1978

Co-authors: Major John M. Bermudez, Lt Col Jock C. H. Schwank, Captains Bruce A. Smith, Thomas M. McCloy, United States Air Force Academy, Colorado

(See Major John M. Bermudez)

"An Analysis of Personal and Institutional Variables Associated with BCT and 4th Class Year USAF Academy Attrition"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-author: Lt Colonel Valentin W. Tirman, Jr., United States Air Force Academy, Colorado

Based on a recommendation by the General Accounting Office, a longitudinal study of attrition at the USAF Academy was initiated. This report addresses attrition in Basic Cadet Training and during the 4th class year. It was concluded that attrition in Basic Cadet Training is largely a function of personal characteristics of the individual, rather than demotivational aspects of training. While personal characteristics continue to play a role in 4th class year attrition, a major difference was evident in the impact of the training environment. The latter was observed to play a significant role in 4th class year attrition, in contrast to the BCT findings.

Captain Thomas M. Longridge, Jr.

Personal and Environmental Factors Contributing to BCT and Fourth Class Year Attrition

United States Air Force Technical Report, 78-2, March 1978

Co-author: Lieutenant Colonel Valentin W. Tirman, Jr., United States Air Force Academy, Colorado

This longitudinal study on Air Force Academy attrition found that BCT attrition may be reduced by improved candidate selection procedures. Attrition during the 4th class academic year is more influenced by environmental factors. Suggested changes are provided and deal with training goals, upperclass leadership style, feedback, and length of the 4th class training year.

Captain Thomas M. McCloy

Effect of Peripherally Presented Visual Signals on Pilot Performance During Flight Simulation

Aerospace Medical Research Laboratory Technical Report, 78-120, June 1978

Co-authors: Major John M. Bermudez, Lt Col Jock C. H. Schwank, Captains Thomas M. Longridge, Bruce A. Smith, United States Air Force Academy, Colorado

(See Major John M. Bermudez)

Captain G. Andrew Mickley

"Blood Pressure and Behavior of Male and Female Rats are Differentially Altered Immediately after Exposure to Ionizing Radiation"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Sufficiently large doses of ionizing radiation produce an early transient incapacitation (ETI) characterized by akinesia and a decrement in motivated behaviors. The etiology of this disorder is unclear but acute hypotension often accompanies the behavioral symptoms. Since administration of estrogens has been shown to prolong the survival of irradiated mice, behavioral and physiological differences between the sexes during this acute ETI were investigated. Females out performed males on an active avoidance task. In this same time period, males exhibited an acute hypotension while female blood pressure increased. Female rats may be more radioresistant than males.

"Movement Induced in Cataleptic Rats: Differential Effects Produced by Electrical Stimulation of the Lateral Hypothalaums, Substantia Nigra, and Reticular Formation"

Psychopharmacology, Vol 57, 1978, 145-149

Co-author: Dr Herman Teitelbaum, Armed Forces Radiobiology Research Institute, Bethesda, MD

Drug-induced catalepsy can be countered by electrical stimulation of selective brain sites.

"Persistence of Lateral Hypothalamic-Mediated Behaviors after a Supralethal Dose of Ionizing Radiation"

Aviation, Space, And Environmental Medicine, Vol 49, No. 7, 1978, 868-873

Co-author: Dr Herman Teitelbaum, Armed Forces Radiobiology Research Institute, Bethesda, MD

Electrical stimulation of the lateral hypothalamus can relieve the early transient incapacitation associated with exposure to a supra lethal dose of radiation.

"Role of the N. Accumbens in Morphine Induced Locomotor Activity in the C57/Bl Mouse"

Neuroscience Abstracts, 1978, Vol 4, 136

Co-author: Dr Herman Teitelbaum and Paul Giammatteo, Armed Forces Radiobiology Research Institute, Bethesda, MD

N. Accumbens appears to play a critical functional role in the production of morphine-induced hyperactivity in this mouse species.

Captain Mark Nataupsky

The USAF Academy How-To-Study Program: A Handbook for Volunteer Counselors

Frank J. Seiler Research Laboratory Technical Report, 79-ØØØ3, April 1979

Co-authors: Major John M. Bermudez, Nita Huelf, United States Air Force Academy, Colorado

(See Major John M. Bermudez)

Lieutenant Colonel William E. Rosenbach

"Similarities of Men and Women in Perceptions of Their Work and Their Affective Responses: An Empirical Test"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-author: Lieutenant Colonel Valentin W. Tirman, Jr., United States Air Force Academy, Colorado

Female and male workers described characteristics of their job as well as satisfaction with the job itself and related aspects. As expected, the men and women did not differ in their perception of their work or their affective response to it. The only significant difference between the two groups was their satisfaction with pay.

"Relationship Between Age, Organizational Structure, and Job Satisfaction for Female Workers"

Southwest Academy of Management Proceedings, 1979

Sixty-nine semi-skilled female assembly workers described their perception of organizational structure and job satisfaction. Age was unrelated to job satisfaction; structural dimensions were negatively related to job satisfaction except for autonomy. Results also indicated that age did not moderate the relationship between dimension of structure and job satisfaction.

"Perception of Job Characteristics and Affective Outcomes for Women and Men"

Sex Roles, Vol 5, No 3, 1979

The attitude of 123 men and women about job dimensions and affective outcome were assessed. Few differences existed between women's and men's perceptions of their jobs. Conclusions of the study were that differences that exist in work attitude are artifacts of hierarchical position and self-role stereotyping that will disappear when women are allowed to move into jobs that are characterized by high levels of intrinsic job dimensions.

Lieutenant Colonel Jock C. H. Schwank

"Pilot Performance During Flight Simulation With Peripherally Presented Visual Signals"

Presented at the 22nd Annual Human Factors Society Meeting, October 1978, Detroit Michigan, and published in Proceedings.

Co-authors: Major John M. Bermudez, Captains Bruce A. Smith, and Dickie A. Harris, United States Air Force Academy, Colorado

This report is a culmination of two experiments, involving 48 male pilot trainees, that investigated the effectiveness of three types of instrument displays during flight in a GAT-1 simulator. Both experiments showed that there was no decrement in pilot performance during a complex instrument maneuver, involving normal and peripheral displays. These results are consistent with a dual theory of visual processing and the notion of non-obtrusive prompting.

Effect of Peripherally Presented Visual Signals on Pilot Performance During Flight Simulation

Aerospace Medical Research Laboratory Technical Report, 78-120, June 1978

Co-authors: Major John M. Bermudez, Captains Thomas M. Longridge, Bruce A. Smith, Thomas M. McCloy, United States Air Force Academy, Colorado

(See Major John M. Bermudez)

"Visual Processing: The Effects Of Peripheral Heading Cues In Flight"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-authors: Captain Bruce A. Smith and Mark F. Godfrey, United States Air Force Academy, Colorado

(See Captain Bruce A. Smith)

Captain Lawrence O. Short

"Values of Air Force Academy Cadets: A Comparative Study"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April, 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-authors: Major Gerald L. Jones and Risdon J. Westen, United States Air Force Academy, Colorado

The values of American military personnel are under close public scrutiny. Public concern involves the military services in general and the service academies in particular. This concern was shared by the authors of this study and led them to investigate two areas: the values of Air Force Academy cadets compared to their civilian counterparts and the values of fourth class AFA cadets (freshmen) compared to first class cadets (seniors). In this preliminary study it was decided to investigate three areas: Area I - The longitundinal shift in values of entering AFA cadets; Area II - The values of senior AFA cadets compared to students in civilian colleges; and Area III - The shift in values of cadets during their four years at the AFA.

Captain Bruce A. Smith

"Visual Discrimination Pretraining of a UPT Landing Maneuver"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-authors: Bernell J. Edwards and Douglas C. Weyer, Human Resources Laboratory, Williams Air Force Base, Arizona

The objective of the present study was to develop and evaluate the pretraining of visual skills involved in the final turn landing pattern. Three phases were required (1) development and validation of a visual discrimination pretraining strategy, (2) application of the strategy to determine transfer effectiveness for both the simulated and real time environments of T-37 training, and (3) evaluation of the strategy for broadest possible impact in flying training. The program and test were revised and validated using instructor pilots and naive casual students awaiting entrance into UPT at Williams Air Force Base.

Captain Bruce A. Smith

"The Development And Analysis Of The F-15 Flight Simulator Computer Scoring Algorithm"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-authors: Lieutenants David W. Evans and Michael J. McDonald, United States Air Force Academy, Colorado

Since the F-15 flight simulator was designed to be an aid to the Instructor Pilot (IP)-student relationship, it is necessary for computer evaluations to correlate with IP evaluations of the student's performance. In this light, measures must not only assess the degree to which objectives are met and the most salient characteristics of performance, but do so in such a manner that they agree with IP interpretation of the maneuver. This study was to fulfill that requirement, and to recommend adjustments in parameter scoring and parameter tolerances in order to improve correlations with IP and computer scores.

"Visual Processing: The Effects Of Peripheral Heading Cues In Flight"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-authors: Lt Colonel Jock C. H. Schwank and Mark F. Godfrey, United States Air Force Academy, Colorado

This report is a summary of two experiments involving 48 male pilot trainees, that investigated the effectiveness of using peripheral light displays to indicate heading during flight in a GAT-1 simulator. Both experiments showed no significant difference in heading errors between the normal round dial display and the peripheral lights, and both showed that when using the peripheral lights the pilots made more attempts to correct the heading. In the second experiment, a secondary task (digit cancelling), did not change the performance relationship across the displays. These results are consistent with the theory of separate processing for foveal and peripheral vision.

Lieutenant Colonel Valentin W. Tirman Jr.

Personal And Environmental Factors Contributing To BCT And 4th Class Year Attrition

United States Air Force Academy Technical Report, 78-2, March 1978

Co-author: Captain Thomas M. Longridge, United States Air Force Academy, Colorado

(See Captain Thomas M. Longridge, Jr.)

"Similarities of Men and Women in Perceptions of Their Work and Their Affective Responses: An Empirical Test"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-author: Lieutenant Colonel William E. Rosenbach, United States Air Force Academy, Colorado

(See Lieutenant Colonel William E. Rosenbach)

"An Analysis of Personal and Institutional Variables Associated with BCT And 4th Class Year USAF Academy Attrition"

Presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado, and published in the Proceedings.

Co-Author: Captain Thomas M. Longridge, Jr., United States Air Force Academy, Colorado

(See Captain Thomas M. Longridge, Jr.)

Captain Donnell M. Washington

Proceedings, Psychology in the Department of Defense, 6th Annual Symposium

United States Air Force Academy Technical Report 78-13, June 1978

Co-editors: Major John M. Bermudez, Captains William H. Clover, Lee J. Dahle, Richard L. Hughes, United States Air Force Academy, Colorado

(See Major John M. Bermudez)

Colonel John W. Williams, Jr.

"Dual Career Military Families"

Military Families - Adaptation to Change, Praeger Press, 1978

This book chapter focuses on a family situation in which both partners are on active duty in the military. Literature on dual-career families in the United States is reviewed and information on the growing number of such families is presented. The results of a questionnaire and interviews with many of the couples is discussed in detail.

"Alternate Family Styles in the Military"

Presented at the Military Operations Research Society meeting in Davenport, Rhode Island, in December 1978.

This paper points up some new family types now found in the military. Information was presented on single-parent, dual-career families and unmarried parent families.

PRESENTATIONS

Captain William H. Clover

"Organizational Development in the DoD: Process or Structure?"

Panel presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado

Co-chairman: Lieutenant Colonel William E. Rosenbach, United States Air Force Academy, Colorado

(See Lieutenant Colonel William E. Rosenbach)

Lieutenant Colonel Eugene H. Galluscio

"The Expanding Role of Women in the Military"

Panel presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado

Co-chairman: Captain David D. Gillman, United States Air Force Academy, Colorado

Historically, with a few notable exceptions, women in the military have filled a few selected positions which have been traditionally recognized as "women's" jobs in the civilian sector. In recent years, there has been an increasing trend to utilize women, both officer and enlisted, in job roles which have traditionally been filled only by men. The members of this panel, representing the three branches of the military, are all deeply involved in the planning and implementaiton of programs to increase the utilization of women in a wide spectrum of career fields.

"The Effect of Visual Field and Response Mode on Serial and Gestalt Processing"

Presented at the Seventh Annual Meeting of the International Neuropsychological Society, January 1979

Co-author: Lieutenant Daniel Plavney, United States Air Force Academy, Colorado

Forty male subjects, selected for strong dextral preference, were presented a Gestalt matching task and a sequential task requiring serial processing. Tachistoscopic procedures were used to insure presentation in one visual hemisphere. Manual reaction time results indicate a right hemisphere superiority for both tasks, but the bite switch reaction times showed a clear superiority for the left hemisphere. Error scores produced a left hemisphere superiority for the sequential task for both response modes.

Captain David C. Gillman

"Anxiety and Stress During Combat Oriented Training: A Comparison of Male and Female Academy Cadets"

Presented at the Western IUS Conference, Monterey, California, May, 1979

Co-authors: Captain Dickie A. Harris and Lieutenant Steve Hampton, United States Air Force Academy, Colorado

After a summary of the literature on sex-related stress differences, this paper discussed a study comparing male and female cadet emotional state differences during a combat-oriented SERE training experience. Given the limitations of sample and treatment generalizibility, the results suggest that women perceive themselves as more anxious, stressed, depressed, fatigued, and guilty, and less extroverted than men both prior to and after a combat-related stress condition.

"The Expanding Role of Women in the Military"

Panel presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado

Co-chairman: Lieutenant Colonel Eugene H. Galluscio, United States Air Force Academy, Colorado

(See Lieutenant Colonel Eugene H. Galluscio)

"The Effects of Integrating Females Into A Previously All-Male Initiation Rite - A Case Study of the United States Air Force Academy"

Presented at the Western Social Science Symposium, Denver, Colorado, April, 1978

Co-author: Captain Dean H. Wilson, United States Air Force Academy, Colorado

(See Captain Dean H. Wilson)

Lieutenant Colonel William E. Rosenbach

"Organizational Development in the DoD: Process or Structure?"

Panel presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado

Co-chairman: Captain William H. Clover, United States Air Force Academy, Colorado

Organizational Development (OD) is a rapidly growing behavioral science/management approach for solving organizational problems and dealing with change. The panel examined the application of OD in the Department of Defense, and addressed the viability of process versus structural approaches.

"Issues in Organizational Development and Effectiveness in the Military Services"

Panel presented at the 86th Annual Meeting of the American Psychological Association, Toronto, Canada, August 1978

A panel discussion of OD/OE programs in all the services focused on the various approaches and their continued good health conclusion were that more hard performance data need to be collected and considerably more empirical research needs to be performed. Compared to private industry OD practioners, the military are involved in a scale of operations that is impressive in the magnitude as well as results.

"Participative Work Redesign in Air Force Combat Support Units"

Work Redesign in the Public Sector: A Symposium, 38th Annual Meeting of Academy of Management, San Francisco California, August 1978

Empirical results of work redesign research conducted in Air Force combat support units were presented. Results of socio-technical studies in the FAA and orthodox job enrichment results in AFLC were also presented. Conclusions were that implementation strategies need to be better developed.

Lieutenant Colonel Jock C. H. Schwank

"A Multi-Disciplinary View of Leadership in the Institutional-Occupational Framework"

Panel presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado

Co-Chariman: Captain B. Don Sullivan, United States Air Force Academy, Colorado

This panel discussed problems of contemporary leadership in the military in light of issues raised by Dr. Charles Moskos' model of Institutionalism versus Occupationalism including some essential differences in management philosophies and techniques in an institutional environment versus an occupational environment.

Captain B. Don Sullivan

"A Multi-Disciplinary View of Leadership in the Institutional-Occupational Framework"

Panel presented at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado

Co-Chariman: Lieutenant Colonel Jock C. H. Schwank, United States Air Force Academy, Colorado

(See Lieutenant Colonel Jock C. H. Schwank)

Colonel John W. Williams, Jr.

"A Multi-Disciplinary View of Leadership in the Institutional-Occupational Framework"

Panel presentation at the Sixth Symposium, Psychology in the Department of Defense, 21 & 22 April 1978, United States Air Force Academy, Colorado

This presentation discussed problems of contemporary leadership in the military in light of issues raised by Dr. Charles Moskos' model of Institutionalism versus Occupationalism including some essential differences in management philosophies and techniques in institutional environment versus an occupational environment.

Captain Dean H. Wilson

"The Effects of Integrating Females Into A Previously All-Male Initiation Rite - A Case Study of the United States Air Force Academy"

Presented at the Western Social Science Symposium, Denver, Colorado, April, 1978

Co-author: Captain David C. Gillman, United States Air Force Academy, Colorado

This presentation discussed the integration of women into the USAF Academy by focusing on Basic Cadet Training (BCT). As an initiation rite, BCT has always been an all-male activity, and the introduction of females violated some of the basic premises of such a ritual. The ramification of those changes were measured in the context of a socio-anthropological study.

DEPARTMENT OF CHEMISTRY AND BIOLOGICAL SCIENCES

PUBLICATIONS

Lt Colonel Hugh T. Bainter

"Comparison of Stress Responses in Male and Female Cadets at the the United States Air Force Academy"

Technical Report - FJSRL-TR-78-0015

(See Lt Colonel Orwyn Sampson)

Major John B. Bomar, Jr.

"Comparison of Stress Responses in Male and Female Cadets at the United States Air Force Academy"

Technical Report - FJSRL-TR-78-0015

(See Lt Colonel Orwyn Sampson)

Major William J. Cairney

"Developmental Effects of Hyperbaric Oxygen on Selected Human Pathogenic Fungi in Culture"

Dissertation Abstracts International 38(9):4063B-4064B, March 1978

The effects of hyperbaric oxygen were investigated on the growth and development of seven human pathogenic fungi, including four dermatophytes, two systemic pathogens, and one mucous membrane pathogen. Results show that all organism analyzed were inhibited or retarded within human oxygen tolerance limits, suggesting that compression chamber therapy might be of use in treatment of diseases caused by these organisms.

"Effect of Hyperbaric Oxygen on Certain Growth Features of Candida albicans"

Aviation, Space and Environmental Medicine 49(8):956-958.

Candida albicans, isolated from an adult female with recurring candidiasis, was tested in vitro for macroscopic and microscopic growth features at varying hyperbaric oxygen levels and at various exposure times and intervals. Thr organism was found to be inhibited within a pressure/time range well tolerated by human subjects, suggesting that hyperbaric oxygen might be used

successfully in treating human candidiasis. Overall experimental results provide an in vitro basis for use of compression chamber therapy in candidiasis treatment.

Captain Elroy A. Flom

"An Analysis of Airborne Particulate Level Reduction Resulting from Paving of Gravel Roads"

Technical Report - FJSRL-TR-78-0012

Co-author: 2nd Lt Stephen J. Thompson

Gravel utilized as surfacing material for secondary roads in El Paso County, Colorado contains microscopic particulates. The particulates, agitated into an airborne state by automobiles, represent a potentially hazardous air pollutant to the public. The airborn particulate level observed as a result of paving Ehrich Street, Colorado Springs, Colorado was reduced 1700 times by weight. The remaining airborned particulate matter is believed to be carried to the Ehrich Street area by mountain winds from Rampart Range.

Lt Colonel Orwyn Sampson

"Comparison of Stress Responses in Male and Female Cadets at the United States Air Force Academy"

Technical Report - FJSRL-TR-78-0015

Co-authors: Lt Colonel Hugh T. Bainter and Major John J. Bomar, Jr.

Forty-eight women cadets in the Class of 1980 were studied during their initial training period at the United States Air Force Academy. Hematological and serological parameters were examined over the 43-day period. The analyses were carried out using least squares first and second order curve fits. This computational procedure is described. All but 8 of the 24 variables exhibited significant change over the study period. Implications of these changes are discussed in terms of potential causal factors. The study provides valuable baseline data for future analyses.

2nd Lt Stephen J. Thompson

"An Analysis of Airborne Particulate Level Reduction Resulting from Paving of Gravel Road"

Technical Report - FJSRL-TR-78-0012

(See Captain Elroy A. Flom)

Captain Ronald E. Watras

"A Study to Maximize the Learning Experience in the Physical Chemistry Laboratory"

Published Doctor of Arts dissertation, University of Northern Colorado, 1979

This study was conducted to: (1) develop and evaluate a set of curriculum materials designed to teach physical chemistry concepts in a laboratory setting, a portion of which was designed to teach these concepts exclusive of the lecture part of the course, and (2) design the materials to maximize the learning experiences in the laboratory. An extensive review of the literature showed that although there have been efforts to improve learning abilities in many areas of chemistry, little or no results have been found in improving student's learning abilities in the physical chemistry laboratory.

The materials were implemented, continually evaluated, and revised based on oral and written evaluations of the students, oral and written evaluations of the instructors, and oral and written evaluations of the major adviser. This process was repeated through four revisions. As part of the evaluation process, student questionnaires were evaluated at the end of each fall, winter, and spring quarter starting in the fall of 1976 and ending in the spring of 1979. Another part of the evaluation was the use of ACS examination questions to determine the effectiveness of the materials. Student response to the materials was very favorable, but the results of the ACS testing were not as favorable. From these two results, it was concluded (paraphrasing Bent 1975) that this study tried to improve learning in a physical laboratory setting and in trying to improve learning, learning was improved.

PRESENTATIONS

Major William J. Cairney

"All You Ever Wanted to Know About Running at High Altitude--and Less"

Peak to Peak Marathon Symposium, Estes Park, Colorado, 12 June 1978

DEPARTMENT OF CIVIL ENGINEERING, ENGINEERING MECHANICS AND MATERIALS

PUBLICATIONS

Captain Paul D. Copp

"Independent Structural Analysis of the Azimuth Bearing Replacement Proposed for the New Boston, New Hampshire Tracking Station"

Prepared for the USAF Satellite Control Facility, Sunnyvale AFS, CA

(See Captain Mark S. Ewing)

Captain Anthony Eden

"The Application of Thermography to Large Arrays of Solar Energy Collectors"

Solar Energy, The Journal of International Solar Engineering Society, Vol 21, No. 6, Feb 1979

Co-author: 2nd Lt Robert G. Mansfield

Experimental results of thermography applied to the evaluation of flat plate liquid collector efficiency are presented. The results indicated that thermography can be used to quickly detect flow balancing and flow obstruction problems that can be encountered in solar collector operation. Due to the relatively high expense associated with use of thermographic equipment however, their application for these purposes would necessarily be limited to large arrays of collectors.

"Third Interim Technical Report on the USAFA Solar Test House - Design Parameters"

CEEDO-TR-78-32, September 1978

Co-author: Capt John T. Tinsley, USAF Academy, Colorado

This report describes the continuing performance of the first retrofit solar heated facility in the USAF. Data presented in the report shows the improvement to the efficiency of the solar system's ability to supply thermal energy to the structure. The changes in operational parameters which accounted for this improved performance are discussed in detail. The various parameters used to originally design the solar system are analyzed and shown to be valid for this application.

"Performance of the USAF Academy Solar Test House - A Retrofit Application"

Presented at and published in Conference Proceedings - Solar Heating and Cooling Systems Operational Results, Colorado Springs, Colorado, 28 Nov-1 Dec, 1978.

Co-author: Capt John T. Tinsley, USAF Academy, CO

Presentation discussed the performance of the USAFA Solar Test House since the start of operational research in December 1975. The results presented illustrate the effects of the various parameters on system performance including storage tank mass, collector inclination variations, collector fluid flows and control temperatures. In addition, thermographic studies for spotting collector system problem areas are discussed. Finally, start-up problems and solutions are evaluated.

Captain Mark S. Ewing

"Independent Structural Analysis of the Azimuth Bearing Replacement Proposed for the New Boston, New Hampshire Tracking Station"

Prepared for the USAF Satellite Control Facility, Sunnyvale AFS, CA

Co-author: Capt Paul D. Copp, USAF Academy, CO

This report is the summary of a computer-aided analysis of the structural integrity of a 60 foot diameter satellite tracking antenna during replacement of a worn bearing. The antenna, lifting structure and foundation were predicted to safely withstand the expected loading.

Major Thomas E. Kullgren

"Quarter Elliptical Cracks Emanating From Holes in Plates"

Journal of Engineering Materials and Technology, Vol 100, No. 2, pp 144-149, April 1978.

Co-authors: F. W. Smith, Colorado State University; Major Gary P. Ganong, USAF Weapons Laboratory, Kirtland AFB, New Mexico.

The finite element-alternating method is used to find mode-one stress intensity factors along the border of a quarter-elliptical crack in a three-dimensional body. Problems considered include single corner cracks at unloaded fastener holes in plates.

"The Finite Element- Alternating Method Applied to Benchmark No. 2"

International Journal of Fracture, Vol 14, pp 319-322, Dec 1978.

Co-author: F. W. Smith, Colorado State University

The finite element-alternating method is applied to Benchmark Problem No. 2 as established by a conference on three-dimensional fracture analysis held in Columbus, Ohio, 24-26 April 1976. Mode-one stress intensity factors and crack opening displacements are presented for the specified case.

"Part-Elliptical Cracks Emanating From Open and Loaded Holes in Plates"

Journal of Engineering Materials and Technology, Vol 101, No. 1, pp 12-17, January 1979. Also presented at the ASME Winter Annual Meeting, San Francisco, CA, December 1978.

Co-author: F. W. Smith, Colorado State University

The finite element-alternating method is used to find mode-one stress intensity factors and crack opening displacements for a variety of problems. Single semi-elliptical and double quarter-elliptical cracks adjacent to both open and loaded fastener holes in plates are considered.

"USAF Academy Vertical Axis Wind Turbine Development Program"

Presented at and published in the Proceedings of the DOE Small Wind Energy Conversion Systems Workshop, Boulder, CO; Feb 1979.

Co-authors: Major Dennis W. Wiedemeier and Captain John T. Tinsley, USAF Academy, CO.

The design, fabrication, and field testing of the USAF Academy small vertical wind turbine are described.

"Static Fracture Testing of PMMA Plates Having Flawed Fastener Holes"

Presented at the Society for Experimental Stress Analysis Spring Meeting, San Francisco, CA, May 1979.

Co-author: F. W. Smith, Colorado State University

A series of static fracture experiments on PMMA plates containing surface cracks near holes is described and results are compared with theoretical predictions.

Lieutenant Colonel Dwayne D. Piepenburg

"Test and Evaluation of Split Ring Shear Connectors in Laminated Wood and Laminated Wood Bolts"

SRL-TR-79-0002, March 1979

Procedures are developed to establish the strength of 4 inch diameter beveled TECO split-ring shear connectors in PERMALI laminated wood gusset plate material. Specimens were tested to failure and results presented as functions of loading conditions and specimen geometry.

Major Will Stackhouse

"Design and Development of a Walking Mechanism Adapted to Sit and Climb Steps"

Thesis submitted for the degree of Doctor of Philosophy, Oxford University, Oxford, England, January 1978.

This thesis outlined the case for platform-type lower limb prosthetic devices, introduced the "Duckling" lower limb prosthesis as developed, and explained in detail how this walking machine was adapted, in two prototypes, to sit and climb steps. The adaptation involved the addition of two pairs of manually controlled hydraulic actuators, one pair at the knees and the other pair at the hips. The prostheses achieved a good standard of walking and sitting. Suggestions for future improvements and developments were included in the text.

Captain John T. Tinsley

"USAF Academy Vertical Axis Wind Turbine Development Program"

Presented at and published in the Proceedings of the DOE Small Wind Energy Conversion Systems Workshop, Boulder, CO, Feb 1979.

(See Major Thomas E. Kullgren)

"Third Interim Technical Report on the USAFA Solar Test House - Design Parameters"

CEEDO-TR-78-32, September 1978

(See Captain Anthony Eden)

"Performance of the USAF Academy Solar Test House - A Retrofit Application"

Presented at and published in Conference Proceedings - Solar Heating and Cooling Systems Operational Results, Colorado Springs, Colorado, 28 Nov-1 Dec, 1978.

(See Captain Anthony Eden)

Major George W. Watt

"A Comparison of Reference Electrodes in Molten Sodium Sulfate"

Presented at and published in the Proceedings of the Second International Symposium on Molten Salts, Electrochemical Society, Pittsburg, PA, Oct 78.

Four different electrodes have been investigated in molten sodium sulfate. The electrodes are (1) a Pt foil immersed in the melt; (2) a silver wire in a mixture of 10 m/o Ag_2SO_4, enclosed in a mullite tube; (3) a Pt-wire immersed in Na_2SO_4 in a mullite tube over which an equilibrated mixture of $SO_3/SO_2/O_2$ is passed; (4) a Pt-wire in oxygen inside a calcia-stabilized sirconia tube. These electrodes respond to changes in O_2-activities and O^{2-}-activities or both, and the EMF's of the six cells that can be formed between them are being investigated as a function of gas-phase composition above the melt and acid/base properties in the melt.

Major Dennis W. Wiedemeier

"USAF Academy Vertical Axis Wind Turbine Development Program"

Presented at and published in the Proceedings of the DOE Small Wind Energy Conversion Systems Workshop, Boulder, CO, Feb 1979.

(See Major Thomas E. Kullgren)

DEPARTMENT OF ECONOMICS, GEOGRAPHY AND MANAGEMENT

PUBLICATIONS

Colonel L. D. Badgett

"Preferential Tariff Reductions: The Philippine Response, 1900-1940"

Journal of International Economics 8 (1978), pp. 79-92

The U. S.-Philippine preferential tariff relation (PTR) is examined to determine whether the growth of three major Philippine processing activities can be attributed to the PTR and whether the PTR provided the Philippines with benefits of important magnitude. The PTR is shown to have been a significant determinant of Philippine production of the products and of the geographic distribution of their export. The preference subsidy was not large in relation to total Philippine export revenue, although it was sufficiently large to suggest that at least two of the processing activities would not have developed without preference.

"Defense, Dualism, and Technology in the Soviet Union"

Integrating National Security and Trade Policy: The United States and the Soviet Union, 1978 Senior Conference Final Report, USMA, 6 (1978), pp. 63-81

The concepts of economic "size" and economic "burden" are distinguished and applied to comparisons of the U. S. and Soviet economies and defense sectors. In this context, the relevance of the index-number problem is discussed. Finally, although the technological shortcomings of the Soviet economy in general are admitted, technological dualism is suggested as a phenomenon distinguishing the Soviet civil and defense production sectors in a way relevant to the Soviet ability to adapt, diffuse, and embody foreign technology of relevance to the military.

Major Jeffrey D. Baker

"Specific and General Training: A Study of Air Force Academy Graduate Promotion and Attrition"

Ph.D. dissertation, University of North Carolina, Chapel Hill, North Carolina, May 1979

The human capital investment process is dichotomized into general and specific training. In any period, the individual must decide on the amount and mix of schooling. The individual's decision impacts on both his future earnings and his tenure with a particular firm.

A unique data set was used to test the differential impact that each training form has on earnings and job longevity. In the enhancement of earnings, the theoretical results do not favor either specific or general training. Past research has yielded a similar conclusion and has been unable to substantiate the superiority of either investment form. The data used to test the current model yield a clear earnings' differential that favors specific investments. Specific training is more important than general training on the individual's subsequent earnings. The training mix is also important to job tenure. The theoretical and empirical results yield two important conclusions. First, the sensitivity of attrition to the investment mix increases as one approaches the expected termination point of the current job. More specific investment is thus likely to extend the expected termination point as the latter is approached. Two, a larger value of human capital stock positively impacts on the relationship between the expected job tenure and the training mix. Both the timing and mix of investment activities have been found to be important variables in the earnings equation. Similarly, these considerations are crucial to job mobility. The insights provided by this research should facilitate policy makers in their understanding of the human capital investment process and assist them in policy formulation more consistent with organizational goals.

Lieutenant Colonel F. Theodore Helmer

"Contractor Management Evaluation"

Proceedings, 2nd Aerospace Division Conference, AIIE, Long Beach, California, January 1978

This report provides the reader with a conceptual model for evaluating a contractor's management potential during source selection. The model is not a definitive outline of what must be done; rather, a discussion of a number of the variables that ought to be considered. The reader can then include only those variables most relevant to the task at hand. A checklist of variables under each topic is included in the report, with examples of a numerical scoring system, a color-coded evaluation system, and a descriptive adjective evaluation system.

"A Methodology for Nursing Salary Forecasting"

USAFA-TR-78-10, USAF Academy Technical Report, February 1978

Co-author: Lt Paul D. Levy

The cost of health care has been spiraling for years, and the pressures to increase efficiency are becoming greater. This study

presents several models capable of evaluating and relating hospital budgets to workloads. Specifically, we have developed models for forecasting nursing salary expenses in the OB/GYN ward, the Medical/Surgical ward, and for total nursing salary expenses. These models can be used for budgeting, measuring efficiency, and controlling nursing salary expense. The methodology can be applied to other wards within the hospital for monthly and yearly nursing salary predictions.

"Municipal Pension System Evaluation and Optimization"

Journal of Municipal Management, Spring 1978, and Proceedings, American Institute for Decision Sciences, March 1979.

Co-author: Shirley F. Olson

This study looks at municipal pension systems with an in-depth analysis of the future costs of present services. Using modern operations research techniques, it helps municipal managers make better decisions about the future.

"The Evaluation and Utilization of Tanker/Cargo Aircraft"

USAFA-TR-78-7, USAF Academy Technical Report, February 1978

The optimal utilization of future tanker/cargo aircraft for a variety of tanker missions with all combinations of fighter aircraft and a myriad of destinations creates a complex operations research program. The computer program "Tankerdecision" is capable of evaluating range versus payload information provided by the RAND "FARM" computer program. The output includes fighter deployment costs, feasibility studies and resulting payloads for various combinations of tanker/cargo, fighter, tanker, and cargo aircraft. The Tankerdecision output would be extremely useful in evaluating alternative tanker/cargo aircraft based upon cost and performance.

"Rising Health Care Costs - The Hospital Dilemma"

Colorado Business Review, Volume LI, Number 9, September 1978

Co-author: Dr. James D. Suver, University of Colorado, Colorado Springs

This article emphasizes the need to reduce health care costs and discusses some of the corrective action necessary to lower costs. Topics such as unnecessary demand, the cost of government regulations, and the intensity of care are discussed.

"A Case Study of Information Gathering for Policy Decisions in Public Schools"

Journal of Educational Research, Volume 72, Number 1, September/October 1978

Co-author: Lieutenant Colonel Robert L. Taylor, Department of Economics, Geography and Management

School administrators often find themselves responding to the voices of small, but vocal, interest groups that do not represent the needs and perceptions of the constituency. In this study, a comprehensive survey of client-systems in a medium-sized public school district is reported, with emphasis on how data on perceptions and needs can be gathered. The study shows how the data were used to influence policy decisions, and clearly defines the obligation that decision-makers have for making better-informed and responsive decisions in the public sector.

Major Gregory G. Hildebrandt

"Strategic Stockpiling and Substitution"

USAFA-TR-78-3, USAF Academy Technical Report, January 1978

Co-author: Lt John P. Bloom, Jr.

This report analyzes the strategic stockpiling methodology used by the Federal Preparedness Agency. A number of limitations of the existing approach are discussed. For example, the basic planning approach does not consider the likelihood of an emergency. This omission is justified only if substitution is not possible. Yet, there is evidence that the economy is capable of a flexible response to an emergency. Thus, an approach is suggested which explicitly accounts for the likelihood of an emergency. Currently, the demand for strategic materials is estimated using a model of a peacetime market economy with only a limited allowance made for substitution in production. The estimates of the supply of strategic materials may also be inadequate as the current procedure ignores the use of a price mechanism to activate increases in supply. A major conclusion is that the variegated nature of strategic materials seems to imply that a more detailed analysis of each material's demand and supply characteristics be accomplished before a stockpile decision is made.

Major William A. Mitchell

"Change After an Earthquake Disaster in Western Anatolia"

USAFA-TR-78-5, USAF Academy Technical Report, January 1978

Co-author: Captain C. Taylor Barnes

Planned development has led to relatively rapid changes in rural Turkey. Based on field research in Turkey, this report examines and describes some of the changes which occurred when an unplanned disruptive natural force confronted a rural area of a developing country. Detailed relative change over a three-year period between a village damaged by the 1970 Gediz earthquake and an undamaged village in the same region is analyzed, followed by an interpretation of surrogates of change from a group of thirty-four earthquake damaged villages and thirteen undamaged "control" villages.

"Predicting Casualties and Damages Caused by Earthquakes in Turkey: A Preliminary Report"

USAFA-TN-78-2, USAF Academy Technical Note, March 1978

Co-authors: Major Richard Wolniewicz and John F. Kolars

Inaccurate information about the dimensions of an earthquake disaster can result in further casualties and add to the trauma of an already complex human adjustment problem. Governments in disaster-prone countries need a mechanism by which casualties and damages can be estimated almost immediately after the destructive event. Mismanagement of the disaster can be minimized with accurate information. This research was designed to provide a model for use by Turkish and American authorities in responding to earthquake disasters. Specifically, the objective was to construct a model which would estimate the casualties and damages minutes after an earthquake in Turkey. The model was to determine and verify the need for international and United States government relief efforts. Dependent variables were "deaths" and "damages." Independent variables were magnitude, epicentral location, population density, number of people within 25 miles of an epicenter, and location. A three-part model is suggested, which, after refinement with more data, could be used to predict houses destroyed. Further research on micro-zonation of geological foundations is essential.

"Future Patient Demand in the USAF Academy, Colorado Hospital Catchment Area"

USAFA-TN-78-6, USAF Academy Technical Note, April 1978

Co-authors: Major A. Paul Tribble and Captain C. Taylor Barnes

In 1977, the USAFA Hospital Commander was informed that OB/GYN services could be curtailed at the Fort Carson Hospital in 1978. Because of the proximity locations of the Academy and Fort Carson Hospitals, the former could be expected to absorb a portion of the workload of the latter if such a curtailment occurred. The present study assesses the potential impact on the USAFA Hospital in the event of the curtailment. The conclusions are: 1) The greatest relative impact on OB/GYN care would be felt during July, August, and December of each year; 2) If patients from the Fort Carson Hospital were to use the USAFA Hospital in the numbers indicated in a Fort Carson Hospital patient survey, the upper levels of supply at the USAFA Hospital for all categories of OB/GYN care would be surpassed. Further, the present study examines the demographic characteristics of the USAFA and Fort Carson Hospital Catchment Areas and projects future patient demand by age, sex, and acute condition through 1985 for each facility.

"Air Power and the Support of Mekong River Convoys"

American Aviation Historical Journal, Volume 23, Number 2, Summer 1978, pp. 90-98

This article discusses the protective aerial coverage that was provided by the United States, Cambodian and Republic of Vietnam forces during the critical first eight months of 1971. The Mekong River Convoy program originated as a short-term effort to ensure continuing arrival of POL into Phenom Penh. The entire operation tested USAF ability to overcome communications and coordination problems. During the operation, only one tug and one barge were destroyed, out of 640 commercial vessels that made the round trip. Over 2,240 sorties were flown in direct support of the operation. Strike aircraft attacked 23 times.

"Environment, Disaster and Recovery: A Longitudinal Study of the 1970 Gediz Earthquake in Western Turkey"

USAFA-TR-78-11, USAF Academy Technical Report, November 1978

Co-author: Lt Timothy H. Miner

On March 28, 1970, an earthquake of Richter magnitude 7.1 occurred near the town of Gediz in western Turkey. One thousand and eighty six people were killed and 1,265 were injured in the disaster. The earthquake had a disastrous effect in 313 villages and towns, demolishing 14,852 homes and damaging 5,105 others. Soon after the emergency phase, the Turkish government implemented a vast relief, recovery and reconstruction program which included rebuilding the town of Gediz and building 9,099 houses throughout the damaged area. This report is a comprehensive analysis of the disaster from its beginning through the summer of 1978. It is the first longitudinal study of an earthquake disaster in Turkey.

"Analyzing and Modelling Natural Disasters: Implications for Recovery From Nuclear Disasters (U)"

Secret Report, USAFA-TR-79-3, USAF Academy Technical Report, April 1979

Co-authors: Lt Colonel William J. Weida and Lt Timothy H. Miner

This research addresses the questions, "Can a comparison be made between recovery from a nuclear disaster and recovery from a natural disaster?" and if so, "What comparisons can be made concerning nuclear disaster recovery when natural disaster recovery is examined in the Peoples' Republic of China and the Soviet Union?" The report examines the nature of nuclear and natural disasters and identifies common recovery elements. It further models the recovery effort from several earthquakes on a temporal basis. The model is based on an S-shaped growth curve. PRC and USSR earthquakes are examined in light of the model. The report concludes with an argument for comparing the recovery from a nuclear event and recovery from various natural disasters. Insights from the examination of natural disaster recovery in the PRC and USSR are provided. Contains a significant bibliography.

Captain Robert E. Pizzi

"ERISA - Its Effects on Reporting and Disclosure for Pension Funds"

Proceedings of the Tenth Annual American Institute of Decision Sciences Convention, 30 October-November 1, 1978

This paper examined the impact that the Employment Retirement Income Security Act would have on present and future accounting procedures employed to track pension funds. The paper also examined how the Act affected the safeguarding of the investment of pension monies.

"Replacement Cost Accounting; Its Possible Effects on Government Contracts"

Proceedings of the Seventh Annual Procurement Research Symposium, 8-10 June 1978

This paper examined the alleged inability of the present government accounting procedures to adequately account for replacing materials and machinery during periods of inflation. The paper suggests a mechanism for accounting for this inflation that could be built into future government contracts.

Major Charles L. Smith

"Energy Atlas of Montana"

USAFA-TN-78-3, USAF Academy Technical Note, March 1978

Co-authors: Major John G. Christenson and MSgt John R. Wagner

Presents the locational aspects of the energy resources available in Montana. Resources include coal, oil and gas, uranium, oil shale, and water. The location of power plants and power transmission lines are also indicated as are those for water resources.

"Energy Atlas of Utah"

USAFA-TN-78-4, USAF Academy Technical Note, March 1978

Co-authors: Major John G. Christenson and MSgt John R. Wagner

Presents the locational aspects of the energy resources available in Utah. Resources include coal, oil and gas, uranium, oil shale, and water. The location of power plants and power transmission lines are also indicated as are those for water resources.

"Energy Atlas of Wyoming"

USAFA-TN-78-5, USAF Academy Technical Note, March 1978

Co-authors: Major John G. Christenson and MSgt John R. Wagner

Presents the locational aspects of the energy resources available in Wyoming. Resources include coal, oil and gas, uranium, oil shale, and water. The location of power plants and power transmission lines are also indicated as are those for water resources.

Lieutenant Colonel Robert L. Taylor

"A Longitudinal Analysis of Technical Communication in Research and Development"

Journal of Technology Transfer 1 (2), 1977 (Printed in 1978), pp. 17-31.

A unique longitudinal study of the technical communication patterns of 184 engineers in a high technology research and development laboratory centers in the activities of technology gatekeepers. This two-step flow of technical information follows the literature as well as results from prior studies. Gatekeepers span the organizational boundary in the transfer of technology from outside the laboratory, while facilitating the distribution of technical information to colleagues within the organization. Sociometric data are analyzed over a five-year period with respect to changing organizational structures, new technical assignments and alterations in group composition. Despite these dynamic changes, the data reveal consistent results in gatekeeper identification and technical information flows.

"The Mike Moore Case"
"A Difficult Decision"
"The First Rating"

Cases appearing in Wendell L. French, John E. Dittrich and Robert A. Zawacki, The Personnel Management Process: Cases on Human Resources Administration (Boston: Houghton Mifflin Company, 1978), pp. 145-146; 177-178; 227-228.

"A Model for MBO in the Air Force"

USAFA-TR-78-1, USAF Academy Technical Report, January 1978

Co-author: Lt Robert D. Eskridge

Presented in this paper is a philosophy of MBO which has received widespread acceptance in the Air Force. The steps of the MBO process; goal setting, action planning, self-control, and periodic reviews are all discussed with the goal of establishing a viable MBO program. Some of the potential pitfalls of implementing MBO are also discussed, along with suggested methods of coping with the problems. The paper concludes with a summary of specific advantages of a good MBO program. An annotated bibliography is included to serve as a guide to current MBO literature.

"Collaborative Goal Setting in Performance Appraisal: A Field Experiment"

Public Personnel Management, 7:3 (May-June 1978), pp. 162-170

Co-Author: Robert A. Zawacki

An organization's performance appraisal and development system (PADS) was changed to measure the effects of collaborative goal

setting. Subjects were divided into experimental and control groups. Pretest and posttest measures revealed significant differences in perceived involvement, feedback, and attitudes between groups with the experimental group feeling more involved, more satisfied with the PADS, and receiving more positive feedback.

"Identifying Criteria for Performance Appraisal Decisions"

The Journal of Management Studies (October 1978), pp. 255-264

Co-author: William D. Wilsted

Appraising employee performance has long been regarded as an important part of the management function, for purposes of salary administration and recognizing future management potential. More recently, performance appraisal has been recognized for its value as one of several tools available to organizations for employee motivation. Central to such programmes as "Management by Objectives," for example, is the motivational value of participatively developed goals, clearly communicated and supported with a clear and accurate perception by the subordinate regarding the criteria to be applied in appraising his performance against those goals. Indeed, what is perceived by individuals is often more important than "reality" in influencing behavior. Selective filtration by superiors and subordinates depends on the trust established, and serves to set expectations for performance in the work environment. Individuals function on the basis of perceptions. Accurate perceptions of the performance appraisal criteria by those being evaluated is essential to the motivational objectives of appraisal. Yet, even in the most formal rating programmes, the ratee's perception of appraisal criteria often varies widely from that actually employed.

"A Case Study of Information Gathering for Policy Decisions in Public Schools"

The Journal of Educational Research, 72:1 (September-October 1978), pp. 23-28.

Co-author: Lt Colonel F. Theodore Helmer

School administrators often find themselves responding to the voices of small, but vocal, interest groups that do not represent the needs and perceptions of the constituency. In this study, a comprehensive survey of client-systems in a medium-sized public school district is reported, with emphasis on how data on perceptions and needs can be gathered. The study shows how the data were used to influence policy decisions, and clearly defines the obligation that decision makers have for making better informed and responsive decisions in the public sector.

"Professional Development - A Report"

HQ USAF Academy, Colorado, August 1978, 68 pp.

This report suggests a four-year integrated curriculum of professional development at the USAF Academy. Five programs are melded into a single theme: academic preparation, aviation experience, military training, physical fitness training and professional ethics. A systems model provides a perspective with topic areas identified for all four years of education and training.

"Program Planning and Implementation"

In Lester Bittel, ed., Handbook of Professional Management (New York: McGraw-Hill, 1979), pp. 1009-1116.

This article provides a concise summary of PERT and other program planning techniques for the practicing manager. Step-by-step guidelines are provided to help the reader understand and apply planning tools for large-scale programs in organizations.

"Don't Hesitate . . . Communicate"

The Secretary, February 1979, pp. 12, 14, 28-30.

Co-author: Mrs. Jean Brewer

This article presents a dialogue between a boss and secretary with a focus on building a good work team. Topics discussed are getting to know each other, teamwork, communication, the secretary as a professional, taking the initiative, and goal-setting. The authors conclude that success on the job is based upon skill, attitude, frame of mind, and working style.

"Colorado Springs in the 1990s: A Perspective for Education"

Report prepared for Colorado Springs School District Number Eleven and published as a USAFA-TN-79-3, USAF Academy Technical Note, March 1979

Seven prominent citizens from the City of Colorado Springs developed a scenario generation exercise to provide a forecast of the education needs in the next twelve to fifteen years. The economic, political, social, technological, and ecological environments are forecast with the summary providing specific implications for education.

"Leadership in the 1980s: Theory and Applications for the Military Manager--A Review and Annotated Bibliography"

USAFA-TR-79-2, USAF Academy Technical Report, March 1979

Co-author: Lt Philip A. Farrell

This report categorizes and summarizes current leadership theory and trends. A brief historical perspective is presented to establish a common base for the discussion of current well-documented leadership theories. The bulk of the report is a comprehensive annotated bibliography covering the years 1974-1978. Seventy-eight books and separately published papers, as well as 121 articles, are listed to aid the reader in his further study of leadership.

"Perceptions of Interim and Long-Term Alternatives for School District Number Twenty"

Report published by the School Board, April 1979

Co-authors: Janet Johnston and Mark Kinna

A comprehensive survey of attitudes and perceptions of residents in the Air Academy School District on alternatives to school overcrowding was conducted in March-April 1979. Nearly half of the 5,200 households in the district responded with a variety of opinions on year-round schools, split sessions, and a bond issue referendum for new school construction.

"The Business Policy Approach to Strategic Planning: An Annotated Bibliography"

USAFA-TN-79-4, USAF Academy Technical Note, May 1979

Co-authors: Lt Michael Frey and Lt James Rowland

Seventeen books and fifty-three articles on strategic, long-range planning are reviewed. Only current articles with implications for Air Force strategists are included in the bibliography.

Major A. Paul Tribble

"Analysis of Crime in Manitou Springs, Colorado (1976-June 1977)"

USAFA-TN-78-1, USAF Academy Technical Note, January 1978

Co-author: Major Charles L. Smith

This report is concerned with the characteristics of crimes, victims, and criminals for Part I (felonies) and Part II (misdemeanors) crimes committed in Manitou Springs, Colorado, between 1 January 1976 and 30 June 1977. Further, a section is included on the geographic aspects of crime in Manitou Springs. Included in this section is an analysis of the residences of criminals by places of occurrence of their crimes, military involvement in crimes, and the distribution of various types of felony crimes.

Lieutenant Colonel William J. Weida

"The R&D Cost Process"

Proceedings of the 40th MORS, Naval Postgraduate School, Monterey, California, March 1978

A model which predicts time-phased expenditures in Research and Development was shown to be applicable to a wide-range of R&D projects.

"A Model for Management of USAFA Cadet Uniform Inventory"

USAFA-TN-78-9, USAF Academy Technical Note, August 1978

Co-authors: Lt Steven D. Clark and Lt William K. Frey

A more efficient way of calculating uniform requirements was found. This method was then used to decrease distinctive uniform inventories prior to the issue of regular Air Force officer uniforms.

"Forecasting Retail Sales in AAFES"

USAFA-TN-78-8, USAF Academy Technical Note, August 1978

Co-authors: Lt James Rowland and Lt Steven Clark

This model predicts quarterly retail sales in all AAFES stores. Sales were found to be almost completely related to sales in the same quarter of the previous year.

"R&D Costing"

Proceedings of the 41st MORS, Washington, D.C., August 1978

A general model to predict R&D expenditures was developed. This model was shown to be applicable to all areas of Air Force Research and Development.

"Determing Government Disbursements From Normalized Spending Patterns"

USAFA-TR-79-4, USAF Academy Technical Report, May 1979 (Requested by SAF/FM)

Co-authors: Lt James Rowland and Lt Steven Clark

These models are the culmination of an attempt to model the disbursement and reimbursement process in the Air Force. Data from every major treasury code category were gathered and investigated. It was determined that total yearly disbursements and reimbursements in each category possessed so many random effects that accurate modelling was not possible. However, when the data was separated into fiscal year monies in each treasury code category, the ability to model the data changed completely. The fiscal year disbursement and reimbursement data showed that, in each case, monies were expended in an S-shaped, cumulative expenditure pattern over the spendout period. Forecasts from these separate fiscal year curves were then combined to establish the forecast outlays in each treasury code category by month. To fit the S-shaped fiscal curves, a method of splitting the curve at its inflection point and fitting both halves separately was developed. The end result was the construction of successful models for forecasting monthly outlays in every treasury code category of Air Force spending.

PRESENTATIONS

Major Richard J. Hampton

"Socioeconomic Objectives--An Examination of Their Impact on Civil Agencies and the Department of Defense"

Presented to the Eighth Annual DOD Acquisition Research Symposium, Newport, Rhode Island, 3 May 1979

Lieutenant Colonel F. Theodore Helmer

"Nursing Cost Prediction for Budgeting and Control"

Co-author: James D. Suver, University of Colorado, Colorado Springs

Presented at the Hospital Management Systems Society Annual Meeting, Biloxi, Mississippi, February 1978

Major Gregory G. Hildebrandt

"Observable Preference for Public Goods"

Presented at the California Institute of Technology, William Bennett Munro Memorial Seminar and Lecture Series, The Rand Corporation Economics Department Seminar, University of California at San Diego Economics Seminar, UCLA Workshop in Mathematical Economic Theory and Econometrics, and the University of Colorado at Colorado Springs during March 1978

"An Econometric Study of Aerial Interdiction in Southern Laos: 10 October 1970-30 June 1971"

Presented at the Rand Corporation Economics Department Seminar, March 1978

"Performance Incentives and Planning Under Uncertainty"

Presented at the Conference on Incentives in Eastern Europe, Wayne State University, November 1978

Major William A. Mitchell

"Predicting the Human Impact of an Earthquake Disaster"

Presented to the 75th Annual Meeting of the Association of American Geographers, Philadelphia, April 1979

"Post Disaster Recovery After Seven Years: Old and New Gediz"

Presented to the 74th Annual Meeting of the Association of American Geographers, New Orleans, April 1978

"Harmonic Analysis of Precipitation in Turkey"

Co-author: Allan E. Randall

Presented to the Western Social Science Association Annual Meeting, Denver, Colorado, 29 April 1978

"Predicting Casualties and Damages Caused by Earthquakes in Turkey"

Co-authors: Major Richard Wolniewicz and John F. Kolars

Presented to The Government of Turkey, Earthquake Research Institute, Ankara, Turkey, June 1978

"Perspectives on Turkey"

Presented to the Geographic Division of the Central Intelligence Agency, Washington, D.C., September 1978

"Seven Years After Disaster: Old and New Gediz in Light of Kates' and Pijawka's Model"

Presented at the Annual Association of American Geographers, New Orleans, April 1978

Captain Robert E. Pizzi

"Implementing an MBO System for Fiscal Managers"

Presented to the Colorado Fiscal Managers' Association, Denver, Colorado, March 1978

"Replacement Cost Accounting: Its Possible Effects on Government Contracts"

Presented at the Seventh Annual Procurement Research Symposium, 8-10 June 1978

"Management Styles" and "Assertiveness Training"

Presented to the Food Service Management Course, Brooks AFB, June 1978

"Performance Appraisal" and "Personal Awareness"

Presented at the Physiological Training Officer Symposium and Training Course, Brooks AFB, June 1978

"Preparing a Budget for Equal Opportunity Programs"

Presented to the 9th Annual National Training Conference of Federally Employed Women, Inc., Denver, Colorado, July 1978

"Organizational Communications"

Presented to the faculty and staff at the University of Colorado, Colorado Springs, September 1978

"ERISA--Its Effects on Reporting and Disclosure for Pension Funds"

Presented at the Tenth Annual American Institute of Decision Sciences Convention, 30 October-1 November 1978

"Developing Your Potential"

Presented to the American Business Women's Association, Colorado Springs, Colorado, April 1979

Major Stephen H. Russell

"The Economics of Defense Spending"

Presented to the Army Command and General Staff College, Fort Leavenworth, Kansas, 16-17 January 1979

Major Charles L. Smith

"The Utilization of Side-Looking Airborne Radar (SLAR) in the Analysis of Karst Topography"

Co-author: Major A. Paul Tribble

Presented at the National Convention, Association of American Geographers, New Orleans, April 1978

Lieutenant Colonel Robert L. Taylor

"Hello - Is Anyone Out There?"

Presented to the Credit Women International, Broadmoor, Colorado Springs, Colorado, February 1978

"The USAF Academy Leadership and Management Curricula"

Presented to the 1st Annual LME Workshop, Maxwell AFB, Alabama, April 1978

"Improving Your Communication Skills"

Presented to the Public Utilities Division, City of Colorado Springs, Colorado Springs, Colorado, May 1978

"The USAF Academy Management Curriculum"

Presented to the Senior Service College Management Symposium, Ft. Leslie J. McNair, D.C., July 1978

"Communication and Motivation - Your Two Most Important Tools"

Presented to the National Workshop of Federally Employed Women, Inc., Denver, Colorado, July 1978

"You, Your Job, and Your Future"

Workshop for Civil Service secretaries, USAF Academy, Colorado, July 1978

"Giants in Management: Jim Webb of NASA"

Presented at the Management History Division, 38th Annual Meeting of the Academy of Management, San Francisco, 9-13 August 1978

"Organizational Climate Study"

Presented to the Public Utilities Division, City of Colorado Springs, Colorado Springs, Colorado, August 1978

"How Am I Doing, Boss?"

Presented to the Pikes Peak Chapter, National Secretaries Association, Colorado Springs, Colorado, September 1978

"Sergeant's Administrative Workshop"

Presented to the Utah Peace Officers Standards and Training Workshop Salt Lake City, Utah, September and May 1978

"Top Management Workshop"

Presented to the police chiefs and captains, Utah Peace Officer Standards and Training, Salt Lake City, Utah, October 1978

"Management Challenges of the 80s"

Workshop presented for junior officers, USAF Academy, Colorado, November 1978

"Professional Development - A Model"

Presented to the DOD Human Resources Development Conference, Monterey, California, November 1978

"Management Workshop for Dentists"

Co-author: Lt Colonel F. Theodore Helmer

Presented at the USAF Academy, Colorado, November 1978 and January 1979

"Doing Your Best"

A management workshop for secretaries, USAF Academy, Colorado, February 1979

"Performance Appraisal"

Presented to the Air Force OER Working Group (AFMPC/MPCZ), Randolph AFB, Texas, March 1979

"Time Management"

Presented to top managers "SUPERMAN" group, Tinker AFB, Oklahoma, March 1979

"Communication and Motivation--Your Two Most Important Tools"

Presented to the Federal Women's Program, Ft. Belvoir, Virginia, April 1979

"Communication," "Building a Work Team," "Performance Control" and "Management Styles"

Presented to the 1979 Air Force Dietitians Workshop, Brooks AFB, Texas, April 1979

"Time Management"

Presented to the Federally Employed Women, Colorado Springs, Colorado, May 1979

"Motivation"

Presented to the Rocky Mountain Consumer Credit Conference, Denver, Colorado, May 1979

Lieutenant Colonel William J. Weida

"R&D Costing"

Presented to the Best Working Paper Session, 41st MORS, Washington, D.C., June 1978

"Economic Analysis of the Hot Lunch Program"

Presented to the District Eleven School Board, Colorado Springs, Colorado, February 1978

"The Church in the Environment of the 1980s"

Presented to the National Association of Church Business Administrators, May 1979

(In each of the following cases, papers were written and presented to the requesting agency. Due to the topic sensitivity and needs of the requesting agency, no publication was possible.)

"Ground Based Screening (GBS) Study"

Requested by USAFA/DO, USAF Academy, Colorado, April-September 1978

"Cadet Medical School Study"

Requested by OASD/MRA&L(PM), Washington, D. C., April 1978

"Computer Management Information System for the Simulator SPO"

Requested by ASD/SD24B, Wright-Patterson, September 1978

"Analysis of the Air Force Base Closure Model"

Co-authors: Captain Stanley Griffis and Major Stephen Burrell

Requested by SAF/MI, Washington, D. C., June 1978

"Aviation Science (T-43) Cost Analysis"

Requested by USAFA/CW, USAF Academy, Colorado, April 1979

"Budget Forecast for the F-16"

Requested by ASD, Wright-Patterson, March 1979

Major Jeffrey D. Baker

"Communications and You"

Presented to the South Central Area Association of the Colorado School Food Service Association, Colorado Springs, Colorado, October 1978

DEPARTMENT OF ELECTRICAL ENGINEERING

PUBLICATIONS

Lt Colonel Robert W. Burton

"Real Time Infrared Detection of Surface Current Density Distributions"

Proceedings of 8th European Microwave Conference, Paris, France, September 1978.

The detection and accurate measurement by probes of surface current density distributions is a tedious and costly experimental process. A technique for the rapid measurement of the magnitude of these distributions by an infrared scanner is presented. By utilizing the small but significant I^2R heating effects of the surface current on antennas and scatterers with prepared surfaces, thermal distributions are measured and quantized into various color levels and presented on a color-TV monitor. The measurements and color quantized results are compared with actual probe measurements.

"Surface Currents and Charges on a Cross Formed by an Electrically Thick Cylinder and a Flat Plate in a Normally Incident, Plane-Wave Field"

Co-authors: R. W. P. King and D. J. Blejer

Accepted for publication in Radio Science

With the aid of graphs a detailed description is given of the experimentally determined distributions of the currents and charges induced by a normally incident plane electromagnetic wave on all of the surfaces of a metal cross formed by a vertical tubular cylinder and a horizontal flat plate. The cylinder is a wavelength in circumference and 1.75λ high over a large ground plane. The horizontal plate consists of two equal arms that extend 0.75λ from the surface of the cylinder; it is 0.2125λ wide and 0.0255λ thick. It is centered at a height of 1.25λ from the ground plane. The distributions are compared with the corresponding ones on crossed tubular cylinders and on isolated cylinders.

"Applications of the Infrared Detection of Surface Currents"

Co-author: C. V. Stewart

Accepted for presentation and publication in Proceedings of International IEEE/Symposium and National Radio Science Meeting, June 1979, Seattle, Washington

A method has been developed that permits the rapid measurement of the magnitudes of charge and surface current distributions using an infrared scanner. Thermal distributions due to I^2R heating are detected and displayed on a color video monitor. The technique described here should be particularly useful in research concerned with the reduction of aircraft radar cross sections or EMP effects. The feasibility of using these methods on scale model aircraft and composite materials is explored.

"A Word About the Electromagnetic Pulse (EMP) and a New Measurement Technique"

Graduate seminar presented University of Colorado, May 1979, Boulder, Colorado

The crossed-dipole receiving antenna is the principal model used in the analysis of Electromagnetic Pulse effects on aircraft. Investigations into the charge and current density distributions on the crossed dipole have led to a breakthrough in measurement techniques by which the thermal heating from currents and charges are detected in real time through the use of a color quantized infrared camera.

Captain Joseph J. Pollard

"Interface of the Silent 700 (Model 743) to the EAI 8400"

USAFA-TR-78-8, Final Report, Summer Research, August 1978

An RS-232C interface is developed for the Electronic Associates Incorporated 8400 Mod II Hybrid Computing System. Data conversion from ASCII to BCD occurs in the interface. Register entry capability available on the original equipment is retained as is the capability to return to the original system configuration using an International Business Machine (IBM) Selectric Data Terminal. A Texas Instruments Silent 700 Model 743 Data Terminal is used as the new RS-232C device.

"A Single Board Microprocessor System for Educational and Research Applications"

USAFA-TR-78-9, Final Report, Faculty Research, August 1978

A single board microprocessor system is developed for application as a training aid at the United States Air Force Academy. The system has a Z-80 CPU, 2K RAM, 2K EPROM, 2 eight-bit parallel input ports and 2 eight-bit parallel output ports as well as a keyboard/display interface. The system consumes less than 1 ampere at 5 volts and can be constructed for less than $250.00. An edge connector is provided to allow expansion to larger system capabilities which might be required by research projects. Total packaged system size is less than 7"x10"x5".

"Hardware Interface of the AM9511 to 8080 Based Systems"

Co-author: Lt Teddy O. Mundelein

A technical paper presented in January 1979 to the MIMI 79 at Anaheim, California

The AM9511 Arithmetic Processor Unit is interfaced to the 8080A using hardware controllers to enhance data transfer and processing rates. Difficulties and peculiarities of the interface are discussed along with a comparison to AMD's Direct Memory/Interrupt driven interface. Examples are presented to compare and contrast a standard floating point arithmetic package with the enhanced automatic controller interface.

Major Albert J. Rosa

"Integrated Laboratory Experience"

Proceedings of the 1978 Conference in Frontiers in Education, October 1978

Paper describes the Electrical Engineering Department's 5-semester laboratory program. The three-fold purpose of the program is to meet educational goals, provide integration and connections between courses and experiments, and enable some means of evaluating a student's affective domain behavior.

"Circuits and Signals - An Introduction to Linear and Interface Circuits"

November 1978

Co-author: Colonel Roland E. Thomas

A new approach to circuit analysis stressing interfacing of circuits along with classical circuit and signal analysis. The operational-amplifier or op-amp is introduced as the premier linear integrated circuit. It is employed throughout the text as a linear element much as resistors, capacitors and inductors were used in more classical texts.

Major Clayton V. Stewart

"The Classification of Radar Targets Having Periodically Amplitude Modulated Signatures"

Proceedings of the Non-Cooperative Target Recognition Workshop, Rome Air Development Center, Griffiss AFB, NY, 2-5 October 1978

An algorithm that may be used for the classification of periodically amplitude modulated targets is presented. The data base used to test the algorithm is derived from radar returns from vehicles moving at various velocities and aspect angles. The received radar signal is considered to be a time series that is a function of target type, range, velocity, orientation, and voice. Classification is implemented in the frequency domain; short-time spectra are computed using the Fast Fourier Transform. The radar signatures are classified using both linear discriminant and nearest neighbor classifiers, and performance is presented for two, three, five, and six class cases using single and sequential looks.

"Application of the Infrared Detection of Surface Currents"

Co-author: Lt Colonel Robert W. Burton

Proceedings of the National Radio Science Meeting, University of Washington, Seattle, Washington, 18-22 June 1978.

A method has been developed that permits the rapid measurement of the magnitudes of charge and surface current distribution using an infrared scanner. Thermal distributions due to I^2R heating are detected and displayed on a color video monitor. The technique described should be particularly useful in research concerned with the reduction of aircraft radar cross sections or electromagnetic pulse effects.

Colonel Roland E. Thomas

"Circuits and Signals - An Introduction to Linear and Interface Circuits"

November 1978

Co-author: Major Albert J. Rosa

(See Major Albert J. Rosa)

DEPARTMENT OF ENGLISH

PUBLICATIONS

Captain Leo Finkelstein, Jr.

"The Calendrical Rite of the Ascension to Power: Generic Inquiry into Twentieth-Century Presidential Inaugural Addresses"

PhD dissertation completed for Rensselaer Polytechnic Institute, Troy, NY, May, 1978

Air Force Effective Writing Course

Co-editor: Major Thomas Murawski

Three 10-minute films that set Air Force writing standards. Part 1: Organizing Your Ideas; Part 2: Speaking on Paper; Part 3: Solving Special Problems. Project completed March, 1979

Major James C. Gaston

London Poets on the American Revolution. Troy, NY: Whitson Press, 1979

Contributor to the Annual Bibliography of English Language and Literature of the Modern Humanities Research Association

Volume 53, 1978

Major James A. Grimshaw, Jr.

"Le Mot Juste: Hazel Motes' Name"

Notes on Modern American Literature, 3:2 (Spring, 1979), Item 14

Contributor to the Annual Bibliography of English Language and Literature of the Modern Humanities Research Association

Volume 53, 1978

Captain Raymond C. Harlan

"Ogres, Princes, and Fools"

Play produced by the Fort Carson Little Theatre, 9-10 February 1979

"Chicken Farmer"

Poem in New Mexico Humanities Review, 1 (May 1978), p. 15

"Integrity"

Poem which was first place in Arizona State Poetry Society Annual Contest, November 1978. Published in The Sandcritters, 13 (Winter 1979), p. 38

"Negation"

Poem in New Mexico Humanities Review, 2 (Spring 1979), p. 48

Captain Perry D. Luckett

"The Mind and Matter of Maxwell Anderson"

PhD dissertation completed for the University of North Carolina, Chapel Hill, January, 1979

"Maxwell Anderson's Winterset and Some Early Eliot Poems"

North Dakota Quarterly (Winter 1979)

Captain Jennings R. Mace

"Human Nature and Four Humorists of the Old Southwest: Hooper, Lewis, Warren, and Harris"

PhD dissertation completed for the University of North Carolina, Chapel Hill, March, 1979

Major William E. McCarron

"Confessions of a Working Technical Editor"

The Technical Writing Teacher, 6:1 (Fall 1978), pp 5-8

"Beware of Word Processing Jargon"

Words, 7:2 (Fall 1978), pp. 12 and 14

"The Paperwork Air Force: Adapting Air Force Writing to Air Force Needs"

Education Journal, AFROTCP 53-1, Vol. 21 AY 1978-79, pp. 12-15

Review of Writing in an Age of Technology

The Technical Writing Teacher, 6:2 (Winter 1979), p. 74

Major Thomas A. Murawski

Air Force Effective Writing Course

Co-editor: Captain Leo Finkelstein

Three 10-minute films that set Air Force writing standards. Part 1: Organizing Your Ideas; Part 2: Speaking on Paper; Part 3: Solving Special Problems. Project complete March, 1979

Captain James S. O'Rourke

"The Air Mail Emergency of 1934: The Heisenberg Principle Exemplified in Journalism"

Journalism History (Summer 1979)

Captain Daniel L. Sales

"Ethos, Pathos, and Logos"

Supplemental handout for English 212

Colonel Jack M. Shuttleworth

The Practical Writer: Paragraph to Theme. New York: Holt, Rinehart and Winston, 1979

Co-authors: Major Edward P. Bailey and Captain Philip Powell

Contributor to the Annual Bibliography of English Language and Literature of the Modern Humanities Research Association

Volume 53, 1978

Major Victor L. Thacker

"Herman Melville and the Art of Leadership"

PhD dissertation completed for the University of North Carolina, Chapel Hill, March, 1979

Major William J. Wallisch, Jr.

"Back to See the Wizard"

Journal of General Education, 30:4 (Winter 1979), pp. 299-300

"Using Television Technology to Teach English"

Do It Newsletter, AFRP 50-5, No. 1 (April 1979), pp. 8-9

PRESENTATIONS

Major Donald E. Ahern

"Irony and 'Gentilesse' in Chaucer's 'Squire's Tale'"

Paper delivered at the Rocky Mountain Medieval and Renaissance Association Convention, Salt Lake City, UT, 22 April 1978

"Old English Paleography as a Humanities Discipline"

Paper delivered at the Rocky Mountain Medieval and Renaissance Association Convention, Flagstaff, AZ, 21 April 1979

USAFA Executive Writing Course

Mather AFB, CA, 16 Jan 78; Kirtland and Cannon AFBs, NM, 6-8 Feb 78; Brooks AFB, TX, 5-6 Jun 78; HQUSAF (Washington DC), 11-12 Sep 78; McClellan AFB, CA and Hill AFB, UT, 9-11 Apr 79; Naval Data Automation Command and HQ Army/Adjutant General (Washington DC), 29-31 May 79

Captain Edwin F. Cummings, Jr.

"Where Have All the Heroes Gone?"

Address to Dartmouth Alumni Group, Denver, CO, February 1979

Co-presenter: Captain Donald A. Keal

Lieutenant Colonel Arthur G. Elser

USAFA Executive Writing Course

Air Staff (Washington, DC), 11-12 Sep 78; Defense Contract Administrative Services (Cleveland, OH), 23-24 Oct 78

Captain Leo Finkelstein, Jr.

USAFA Executive Writing Course

Lowry AFB, CO, 23 and 27 Oct 78; Defense Contract Administrative Services (Burlington, MA), 13-14 Nov 78

Major James C. Gaston

"John Burgoyne's 'Lord of the Manor:' Eighteenth-Century Precursor of Musical Comedy"

Paper delivered at the Annual Convention of the South Central Society for Eighteenth-Century Studies, Norman, OK, 23 March 1979

USAFA Executive Writing Course

HQ USAFA, 9 Feb 78; Randolph AFB, TX, 18-21 Sep 78; Bergstrom AFB, TX, 29-30 Jan 79; Tinker AFB, OK, 29-30 May 79

Major James A. Grimshaw, Jr.

Panelist, "All the King's Men: A Reassessment"

Scholarly paper delivered at Modern Language Association Convention, New York, New York, December 1978

Captain Raymond C. Harlan

Panel Leader, "Orphans of the Storm: Running a College-level Theatre Program Without a Theatre Major or Theatre Department"

Program leader at the Rocky Mountain Theatre Conference, January 1979

Captain Donald A. Keal

"Where Have All the Heroes Gone?"

Address to Dartmouth Alumni Group, Denver, CO, February 1979

Co-presenter: Captain Edward F. Cummings, Jr.

Captain Claude F. Haraway

USAFA Executive Writing Course

Lowry AFB, CO, 23 and 28 Oct 78; Barksdale AFB, LA, 4-5 Dec 78; McClellan AFB, CA and Hill AFB, UT, 9-10 Apr 79

Captain Perry D. Luckett

USAFA Executive Writing Course

HQ ADCOM, CO, 9 Feb 79; HQ PACAF, HI, 19-22 Feb 79

Captain Jennings R. Mace

USAFA Executive Writing Course

National Symposium of Military Comptrollers (Denver, CO), 24 May 79; Tinker AFB, OK, 29-30 May 79

Captain Curtis J. Martin

"Black Literature and the Military Mind"

Paper delivered at the National Council of Teachers of English Annual Convention, Kansas City, Missouri, November 1978

USAFA Executive Writing Course

HQ USAFA, CO, 15 Jun 79; Kirtland AFB, NM, 5 Feb 79; McGuire AFB, NJ, 23-24 Apr 79

Major William E. McCarron

"Sir Thomas Browne: A Case for the Good Physician"

Paper delivered at the Rocky Mountain Medieval and Renaissance Association Convention, Flagstaff, AZ, 21 April 1979

USAFA Executive Writing Course

Andrews AFB, MD, 28-30 Aug 78; Defense Contract Administrative Services (Burlington, MA), 13-14 Nov 78.

Major Thomas A. Murawski

USAFA Executive Writing Course

Randolph AFB, TX 23-25 Jan 78; HQ DLA (Cameron Station, VA) and Air Staff (Washington, DC), 20-23 Mar 78; Langley AFB, VA 5-9 Jun 78; Air Force Services Office (Philadelphia, PA), 26 Jun 78; Armed Forces Staff College (Norfolk, VA), 14-15 Aug 78; Andrews AFB, MD, 28-30 Aug 78; Lowrey AFB, CO, 16 and 23 Oct 78; HQ USAFA, CO, 5 Dec 78; HQ USAFA, CO, 15 Jan 79; Randolph AFB, TX, 22-25 Jan 79; HQ ADCOM, CO, 9 Feb 79; HQ PACAF, HI, 19-22 Feb 79; Maxwell and Gunter AFBs, AL, 16-17 Apr 79. National Symposium of Military Comptrollers (Denver, CO), 24 May 79. Naval Data Automation Command and HQ Army/Adjutant General (Washington, DC), 29-31 May 79

Captain William E. Newmiller

"How to Start a Campus Television Station"

Co-presenter: Major William J. Wallisch, Jr.

Speech delivered to the Rocky Mountain Intercollegiate Press Convention in Colorado Springs, CO, April, 1979

Colonel Jack M. Shuttleworth

USAFA Executive Writing Course

Scott AFB, IL, 1-4 May 78; Armed Forces Staff College (Norfolk, VA), 14-15 Aug 78; Armed Forces Staff College (Norfolk, VA), 8-9 Feb 79; McGuire AFB, NJ, 23-24 April 79

Major Dennis J. Stanley

USAFA Executive Writing Course

HQ, USAFA, 9 Feb 78; Lackland AFB, TX, 27 Feb-1 Mar 78; Offutt AFB, NB, 10-11 April 78; Air Force Services Office (Philadelphia, PA), 26 Jun 78; HQ DLA (Cameron Station, VA), 21-24 Aug 78; HQ USAFA, 4 Dec 78; Defense Personnel Support Center (Philadelphia, PA), 19-20 Mar 79; Maxwell and Gunter AFBs, AL, 16-17 April 79

Major Victor L. Thacker

USAFA Executive Writing Course

Lowry AFB, CO, 23 and 27 Oct 78; National Symposium of Military Comptrollers, (Denver, CO), 24 May 79

Captain Michael J. Torreano

USAFA Executive Writing Course

Lowry AFB, CO, 15 Feb 78; Langley AFB, VA, 5-9 Jun 78; HQ Alaskan Air Command, 2-4 Oct 78; Defense Contract Administrative Services (Cleveland, OH), 23-24 Oct 78; Kelly AFB, TX, 15-16 Jan 79; Defense Personnel Support Center (Philadelphia, PA), 19-20 Mar 79

Major William J. Wallisch, Jr.

"Bringing the Real World to the Classroom Through Television: The Air Force to its Academy"

Paper delivered to the College Composition and Communications Convention, Denver, CO, 31 March 1978

"How to Start a Campus Television Station"

Co-presenter: Captain William Newmiller

Speech delivered to the Rocky Mountain Intercollegiate Press Convention in Colorado Springs, CO, April, 1979

"Using Television to Teach Technical Writing"

Paper delivered to the International Technical Communications Conference, Los Angeles, CA, 16 May 1979

USAFA Executive Writing Course

Scott AFB, IL, 1-4 May 78; Lowry AFB, CO, 15 May 78; Randolph AFB, TX, 18-21 Sep 78; Randolph AFB, TX, 22-25 Jan 79; Kirtland AFB, NM, 5 Feb 79; Armed Forces Staff College (Norfolk, VA), 8-9 Feb 79.

Lieutenant Colonel Michael A. Whitehorn

USAFA Executive Writing Course

Carswell and Kelly AFBs, TX, 30 Jan-1 Feb 78. Lackland AFB, TX, 27 Feb-1 Mar 78; Brooks AFB, TX, 5-6 Jun 78; HQ Alaskan Air Command, 2-4 Oct 78; Kelly AFB, TX, 15 and 17 Jan 79

Lieutenant Colonel David C. Whitlock

USAFA Executive Writing Course

Mather AFB, CA, 16 Jan 78; Kirtland and Cannon AFBs, NM, 6-8 Feb 78; HQ DLA (Cameron Station, VA), 21-24 Aug 78; Barksdale AFB, LA, 4-5 Dec 78; Bergstrom AFB, TX, 29-30 Jun 79

DEPARTMENT OF FOREIGN LANGUAGES

PUBLICATIONS

None

PRESENTATIONS

Captain Frank W. Kyriopoulos

"The Arab World"

First United Methodist Church, Colorado Springs, Colorado

"The Arab World"

Horace Mann Junior High School, Colorado Springs, Colorado

"The Arab World"

Church at Woodmoor, Monument, Colorado

Major Claude O. Proctor, Jr.

"Russia and the Soviet Union"

Lewis-Palmer High School, Monument, Colorado, 27 April 1979

Major Peter Puhl

"German Educational System"

Pilot Club, Colorado Springs, Colorado, 27 November 1978

Captain Lewis S. Wallace, Jr.

"Contemporary Life in the Soviet Union"

South Junior High School, Colorado Springs, Colorado, 27 April 1979

DEPARTMENT OF HISTORY

PUBLICATIONS

Captain Charles L. Aldrich

"People's War," Modern Warfare and Scoiety (History 202 text produced by DFH, USAFA, 1978).

Review of T. E. Lawrence by Desmond Stewart. Infantry, January-February 1979.

Lt Colonel Donald R. Baucom

"The Mechanization of Land Warfare," Modern Warfare and Society (History 202 text produced by DFH, USAFA, 1978).

Review of Jane's World Armoured Fighting Vehicles by Christopher F. Foss, Air University Review, March-April 1979.

Captain Donald M. Bishop

"An American-Korean Diplomatic Mission in Sri Lanka, 1884," (with Edward P. Brynn). The Ceylon Journal of Historical and Social Studies, Vol. 6 (New Series), No. 2.

"Changing Discipline and the Noncommissioned Officer," Sergeants, September 1978.

"The Press and the Tet Offensive: A Flawed Institution Under Stress," Air University Review, November-December 1978.

"The Korean War, 1950-1953," Modern Warfare and Society (History 202 text produced by DFH, USAFA, 1978).

"The Korean War and Civil-Military Relations in Relations in America," Modern Warfare and Society (History 202 text produced by DFH, USAFA, 1978).

Reviews of:

Korean Phoenix: A Nation From the Ashes by Michael Keon. Military Review, October 1978.

Crisis in Command: Mismanagement in the Army by Richard A. Gabriel and Paul Savage. Air Force, October 1978.

The Art and Science of Psychological Operations: Case Studies of Military Applications by Ronald de McLaurim, et. al, eds. Air University Review, January-February 1979.

Bernardo de Galvez by Jose Rodulfo Boeta. Military Review, April 1979.

Arab and American Cultures edited by George N. Atiyeh. Air University Review, May-June 1979.

Major Harry Borowski

"Nothing Can Stop the Air Force Academy," The Retired Officer, June 1979.

Review of The Tibbets Story by Paul Tibbets. Air Force Magazine, April 1979.

Edward P. Brynn, FSO

"An American-Korean Diplomatic Mission in Sri Lanks, 1884," (with Captain Donald M. Bishop), The Ceylon Journal of Historical and Social Studies, Vol 6. (New Series), No. 2.

"Europe in the 19th Century," Europe and the World Since 1500, DFH, USAFA, 1978.

Review of Ghana's First Republic, 1960-1966, The Pursuit of the Political Kingdom by Trevor Jones. Air University Review, September-October 1978.

Colonel Philip D. Caine

"Pre-Modern Japan," Europe and the World Since 1500, DFH, USAFA, 1978.

Major Elliott V. Converse, III

"The Lower Middle Classes in the French Revolution," Europe and the World Since 1500, DFH, USAFA, 1978.

Captain E. Richard Downes

Review of The Overthrow of Allende and the Politics of Chile, 1964-1976 by Paul E. Sigmund. Air University Review, May-June 1979.

Major Robert C. Ehrhart

Editor, Modern Warfare and Society (History 202 text produced by DFH, USAFA, 1978).

Author of the following articles in Modern Warfare and Society:

"War in Western Civilization"
"The American Civil War: Overview"
"The American Civil War: Analysis"
"Precursors of Twentieth Century Warfare"
"European Armies Between the Wars"
"The U.S. in Vietnam, 1954-1964"
"The U.S. in Vietnam, 1965-1975"
"The U.S. in Vietnam: Analysis"

Review of V was for Victory: Politics and American Culture During World War II by John Blum. Air University Review, July-August 1978.

Captain Walter T. Hitchcock

Review of Rise, and Fight Again by Charles Bracelen Flood. Air University Review, March-April 1979.

Colonel Alfred F. Hurley

Review of Bridge Across the Sky by Richard Collier. Army, September 1978.

Review of Legacy of Flight by Richard Hallion. American Historical Review, November 1978.

Major Alan M. Osur

Review of Black Americans in World War II by A. Russell Buchanan. Naval War College Review, February 1979.

Historical Abstracts for ABC/CLIO.

Major E. Paul Semmens

Review of Brassey's Artillery of the World edited by Shelford Bidwell. Air University Review, March-April 1979.

Major John F. Shiner

"Birth of the GHQ Air Force," Military Affairs, October 1978.

"General Benjamin Foulois and the 1934 Air Mail Disaster," Aerospace Historian, December 1978.

"Benjamin Foulois: Air Power Pioneer," Air Force Magazine, April 1979.

"The Military Professional in America," Modern Warfare and Society (History 202 text produced by DFH, USAFA, 1978).

Major David N. Spires

"Europe Before the Renaissance: The Middle Ages," Europe and the World Since 1500, DFH, USAFA, 1978.

PRESENTATIONS

Captain Charles L. Aldrich

"Chinese Perspectives in Selected Western Literature 1915-1930"

NEH Summer Seminar for College Teachers, June-August 1978

"Economic Development and Foreign Trade in the People's Republic of China 1945-1958"

Western Social Science Association Annual Conference, April 1979

"Nature and Goals of the United States Air Force Academy"

Zebulon Pike Chapter, National Society Daughters of the American Revolution, October 1978

"The 'Two China' Question"

East Junior High School, April 1979

"Chinese Culture-Yesterday and Today"

South Junior High School, May 1979

Captain Donald M. Bishop

"Koreans in America"

University of Colorado, Colorado Springs, October 1978

Colonel Phlip D. Caine

"The American Revolution: War of the Weak"

National War College, October 1978

"Topics on Strategic Thought to 1945"

National War College, March 1979

"The USAF Academy: The First 25 Years"

CRISYS Symposium, USAF Academy, January 1979

Captain E. Richard Downes

"The Panama Canal Zone"

Torch Club, Colorado Springs, June 1978

Major Roger Fosdick

"George Washington"

Colorado Scoeity of the Sons of the American Revolution, February 1979

Captain Dennis Hall

"Battle of Britain"

Wasson High School, October 1978

Colonel Alfred F. Hurley

"The USAFA History Program"

Department of History, Kansas State University, November 1978

Major Alan M. Osur

"Human Relations"

Class of 1980, USAFA, 1979

Lt Colonel Carl W. Reddel

"Transition from Peachtime to Wartime"

Workshop on The Soviet Military District in Peace and War: Manpower, Manning, and Mobilization. Deputy Directorate for Long Range Planning and OSD/Net Assessments, April 1979

Lt Colonel Jon A. Reynolds

"Linebacker II"

Western Social Sciences Association Annual Meeting, April 1979

"Unconventional Warfare"

Monument Hill Sertoma Club

"Guerrilla Warfare"

Pikes Peak Sertoma Club, January 1979

"Guerrilla Warfare"

Sunrise Sertoma Club, April 1979

Squadron Leader Malcolm Shaw

"Battle of Britain"

Army War College, March 1979

"Battle of Britain"

Wasson High School, March 1979

Major John F. Shiner

"Strategic Bombing and World War II"

Utah State University, February 1979

Captain David Tretler

"Battle of Gettysburg"

Russell Jr. High School, March 1979

DEPARTMENT OF LAW

PUBLICATIONS

None

PRESENTATIONS

Major Robert J. Wilson, Jr.

"Estate Programming"

USAFA Hospital, 10 October 1978

"Estate Programming"

CW Staff, 23 October 1978

Major Edwin F. Hornbrook

"Life Insurance"

USAFA Hospital, 17 October 1978

"Wills and Trusts"

USAFA Hospital, 24 October 1978

Major Phillip A. Johnson

"Personal Estate Planning"

Luke AFB, Arizona, 4-6 October 1978

"Estate Planning"

CW Staff, 24 October 1978

"Current Constitutional Issues"

Rhodes Scholar Candidates, USAFA, 11 November 1978

Colonel Marcos E. Kinevan

"Personal Estate Planning"

National War College, Ft. McNair, Washington, D.C., 25 May 1979

Colonel Richard R. Lee

"Personal Estate Planning"

Air War College, Maxwell AFB, Alabama, 18 October 1978

"Personal Estate Planning"

Professional Personnel Management Course, Air University, Maxwell AFB, Alabama, 13 April 1979

DEPARTMENT OF MATHEMATICAL SCIENCES

PUBLICATIONS

Captain Bruce R. Anderson

"Photon Statistics in Two-Mode Lasers"

MS Thesis, Air Force Institute of Technology, December 1978

The evolution of the first and second moments of the photon density distribution for a two-mode laser system was studied by proposing appropriate transition rate expressions and using the Kubo equations developed for a Chapman-Kolmogorov system. A numerical analysis technique was used in solving the rate equations and computer plots were generated for various combinations of laser parameter values. Anomalously large fluctuations, similar to those occurring in single-mode lasers, were observed during photon buildup of the modes. When only one mode was oscillating, a photon buildup in the non-lasing mode was seen to cause similar fluctuations in the lasing mode. In all cases, these fluctuations were accompanied by a strong linear relationship between the modes.

Captain Lawrence R. Davis

"Digital Control of Power System Simulator"

Proceedings of the 1978 Control of Power Systems Conference and Exposition, March 1978

Co-author: John E. Fagan, University of Oklahoma

The purpose of the paper is to present one aspect of a continuing research program on the development of an education and research facility at the University of Oklahoma for the study of digital real time control of a power system. The paper presents the results of the integration of a Digital Equipment PDP 11T34 computer system with full graphic support to a specially designed Power System Simulator.

Captain Robert F. Donohue, Jr.

"Adaptive Estimation of Life Distributions Based on the Family of Logarithmic t Distributions"

MS Thesis, Air Force Institute of Technology, December 1978

This paper explores the problem of fully adaptive robust estimation using small sample sizes. Four techniques of robust estimation are used to determine which technique produces the "best" estimate of the three parameters of the log t distribution. Kurtosis, both biased and unbiased, a method based on Hogg's Q, and a method similar to Resek's percentile ratios are the techniques used. A Monte Carlo analysis is used to compare the various techniques. Finally, the applicability of the fully adaptive techniques are demonstrated by applying them to sample data to show they can accurately estimate the desired parameters.

Major Brian E. Esterby

"Seismic Network Evaluation Through Simulation"

Technical Report, USAFA-TR-78-12, December 1978

Co-author: Lt Colonel Jay D. Sherman and Major Joseph C. H. Smith

(See Lt Col Jay D. Sherman)

Captain Wayne T. Graybeal

"A Statistical Methodology for Constructing Synthetic Test Workloads"

PhD Dissertation, Texas A&M University, May 1979

A statistical methodology is proposed to aid in the construction of computer systems workloads for use in performance evaluation studies. This methodology includes selecting a period of actual system activity pertinent to the evaluation study; selecting a set of descriptions which adequately reflect the demand placed on the system; scaling the reflected values of these descriptor variables; applying principal components analysis to isolate the effects of intercorrelations and possibly reducing the dimension of the feature space; clustering the transformed resource demand vectors using a weighted non-hierarchical clustering algorithm; and replacing the real jobs in the mix with synthetic jobs with appropriately set parameter levels. The feasibility of the methodology is illustrated with a detailed case study using data collected from the Aurdahl 470/V6 at Texas A&M University.

Major Daniel W. Litwhiler, Jr.

"Police Briefing Stations: A Location Problem"

AIIE Transactions, Vol II, No. 1, March 1979

Co-author: Adel A. Aly, University of Oklahoma

The paper presents a successful application of location theory in the public sector. The problem involved development of a reliable technique to assist the Oklahoma City Police Department in selecting the locations of two police briefing stations to supplement an existing police headquarters. Difficulties encountered in applying "textbook methods" to solve an actual problem and how they were resolved are discussed. Accordingly, data collection, model development, and solution techniques are also presented. Quantitative results of a test application are included. Final site selection was based upon results of this study and other qualitative factors such as zoning requirements, land availability, political considerations, potential growth and environmental impact.

"Large Region Location Problems"

Computers and Operations Research, 1979

Co-author: Adel A. Aly, University of Oklahoma

This study is concerned with finding a point on the sphere which minimizes the weighted sum of the distances to M given destination points on the sphere. Two algorithms are presented and theoretical results concerning the reduction of the search region are developed. In the literature, location problems are confined to the Euclidean space, mainly location on a plane and location on a network. The discovery that the Earth was essentially spherical created problems for cartographers that are still being investigated today. It is well known that there exists no isometric (length-preserving) transformation from a sphere to the plane. This eliminates the possibility of a transformation so that Euclidean geometry can be used to measure spherical distances. Transformations on the non-Euclidean spherical space are combined with efficient solution techniques in E'. An example problem illustrates the possible magnitude of error due to a planar assumption for a non-Euclidean space. Due to the nature of the problem (non convexity) a local optimum is obtained. Some computational experience is reported.

Major John D. Maybee

"Efficient Branch-and-Bound Algorithms for Permutation Problems"

PhD Dissertation, University of Michigan, August 1978

This work establishes a methodology for design and development of efficient branch-and-bound algorithms. Computer CPU time is used as the efficiency criterion and the work is directed at problems requiring the optimization of a function of a permutation. Concepts can be extended to general branch-and-bound algorithms.

Captain Mary S. McCully

"Alcohol Misuse: Definitions, Criteria, and Characteristics"

MS Thesis, Air Force Institute of Technology, December 1978

Numerous studies in the past decade have reported that the typical alcoholic and alcohol abusers are single, low ranking, less educated men. This report demonstrates that the reason for these conclusions is not that the aggregate of misusers necessarily reflect those characteristics, but because the criteria and instruments used in the studies presupposes those kinds of people.

Lt Colonel Charles R. Mitchell

"M/M/1 Queues with Inter-Dependent Arrival and Service Processes"

Naval Research Logistics Quarterly, March 1979

Co-author: A. S. Paulson, Rensselaer Polytechnic Institute

We study via simulation an M/M/1 queueing system with the assumption that a customer's service time and the interarrival interval separating his arrival from that of his predecessor are correlated random variables from a bivariate exponential distribution. It is shown that positive correlation reduces the mean and variance of the total waiting time and negative correlation has the opposite effect. By using spectral analysis and a nonparametric test applied to the sample power spectra associated with certain simulated waiting times the effect is shown to be statistically significant.

Major Salvatore J. Monaco

"Schuler Tuned Vertical Indicating System"

Journal of Guidance and Control, Nov-Dec 1978, Vol 1., p. 413-419

Co-author: D. R. Audley, Frank J. Seiler Research Laboratory and
S. Okubo, Okubo Instruments

The paper addressed the questions of concept and design and discusses test results on a research model of a single-axis, gyroless, vertical indicating system which tracks the motion of the local gravity vector. This system was developed in a research program to demonstrate the feasibility of using it in a low-cost, high-reliability, medium-accuracy navigator.

Captain David A. Nelson

"An Adaptive Finite-Difference Method for Solving the Sturm-Liouville Problem"

PhD Dissertation, The Pennsylvania State University, May 1978

An adaptive finite-difference method, i.e., a method in which the final mesh of grid points depends on the solution, is developed for solving the Sturm-Liouville problem. The non-uniform discretization and the resulting matrix problem are explored in detail with respect to convergence results, error estimates and mesh refinement criteria. The method is compared to a current initial value method and shown to be superior in terms of greater accuracy and speed.

Major Nelson S. Pacheco

"A Continuous Time Storage Model with Markov Net Inputs"

PhD Dissertation, Colorado State University, May 1979

A model for a dam is considered in which the net input rate (input minus output) follows a finite-state continuous-parameter Markov chain. The cumulative dam contents are given by the integral of the Markov chain, suitably modified to allow for the analysis of the unrestricted contents process, the semi-infinite dam, and the finite dam. For the unrestricted contents process, the range is analyzed as a way of determining preliminary dam sizing information. The Laplace transform of the distribution of the range is obtained, and explicit inversion is performed in special cases. The method of invariant imbedding, used extensively in astrophysics and in neutron transport theory, is applied to the analysis of passage-time distributions. When the release rate is constant, the method yields first-order non-linear differential equations with initial conditions obtained from the easily derived behavior of a dam with zero capacity. Some possible correlation functions for the increments of the cumulative input process are examined when the underlying Markov chain is stationary. A functional central limit theorem for the unrestricted contents is proved, establishing weak convergence to the Wiener process in D(0,00).

Captain John M. Rabins

"Study of the Correlation Between Degradation of Kiton Red S Laser Dye and Degradation of Laser Energy Under Flash Conditions"

MS Thesis, Air Force Institute of Technology, December 1978

Presented at the 11th Central Regional Meeting of the American Chemical Society, 7-9 May 1979

The laser dye Kiton Red S dissolved in ethanol was degraded under flashlamp excitation in a dye laser. Data obtained with infrared spectral analysis were used to construct plots of dye concentration versus shot number. From these plots the degradation reaction was found to be zeroth order in Kiton Red S. A rate equation was determined. Laser energy was monitored in order to allow for a comparison between laser degradation and dye degradation. The effect of both different oxygen concentrations and different excitation wavelengths on the reaction rate was observed. Based upon the experimental results a reaction mechanism was proposed. Two photoreaction products were postulated, one which absorbs laser radiation, and another which is reactive with the triplet dye molecules.

Lt Colonel Jay D. Sherman

"Seismic Network Evaluation Through Simulation"

Technical Report, USAFA-TR-78-12, December 1978

Co-authors: Major Brian E. Esterby and Major Joseph C. H. Smith

The United States operates and maintains a network of seismic stations designed for monitoring underground nuclear tests. This network must detect, accurately locate and identify seismic signals emanating from explosions. A method of evaluating networks and component stations has been designed that simulates each component of the underground nuclear monitoring process: detection, location and identification. This algorithm can be used to compare the effectiveness of different networks and stations at different source locations throughout the world. The report also documents a newly developed procedure to plot network capability contours.

Major Joseph C. H. Smith

"Seismic Network Evaluation Through Simulation"

Technical Report, USAFA-TR-78-12, December 1978

Co-authors: Lt Colonel Jay D. Sherman and Major Brian E. Esterby

(See Lt Colonel Jay D. Sherman)

Major Samuel B. Thompson, Jr.

"An Experiment in Individualized Mastery Learning of College Calculus"

PhD Dissertation, University of Colorado, July 1978

An individualized mastery instructional system similar to the Keller plan was compared to a conventional lecture-discussion-recitation system on a variety of criterion variables including mathematics achievement and fail rate in the comparison course and subsequent math courses; math reading comprehension, facilitation of performance in other disciplines, student study time, faculty time required for instructional system operation, preference of students and instructors, and student propensity for continued math-related studies. The comparison spanned two years and was carried out under controlled conditions in a balanced experimental design involving random assignments of 840 students and 12 instructors. Data were analyzed with multivariate and univariate covariance procedures. Results were mixed with no overall achievement differences but statistically significant difference in other variables.

PRESENTATIONS

Captain Robert F. Donohue, Jr.

"Adaptive Estimation of Life Distributions Based on the Family of Logarithmic t Distributions"

Institute of Mathematical Statistics, 30 July-16 August 1979, Washington, D.C.

Co-author: Prof Albert H. Moore

This paper explores the problem of fully adaptive robust estimation using small sample sizes. Four techniques of robust estimation are used to determine which technique produces the "best" estimate of the three parameters of the log t distribution. Kurtosis, both biases and unbiased, a method based on Hogg's Q, and a method similar to Resek's percentile ratios are the techniques used. A Monte Carlo analysis is used to compare the various techniques. Finally, the applicability of the fully adaptive techniques are demonstrated by applying them to sample data to show they can accurately estimate the desired parameters.

Lt Colonel Charles R. Mitchell

"Statistical Analysis of Demand and Leadtime Data for an Air Force EOQ Inventory System"

Presented at the Military Applications Section of TIMS/ORSA, May 1979

Co-author: Lt Colonel Robert A. Rappold

Several probability models exist to describe the total units demanded for an economic order quantity (EOQ) type item during the stock replenishment time frame (called leadtime). In this paper both demand and leadtime are assumed to be random variables and we empirically study their marginal and joint probability distributions. We show how the geometric-Poisson and negative binomial distributions fit observed demands when leadtime is constant. Research into an applicable distribution for the leadtime is continuing. Data from a large Air Force base supply account are used.

Lt Colonel Robert A. Rappold

"Statistical Analysis of Demand and Leadtime Data for an Air Force EOQ Inventory System"

Presented at the Military Applications Section of TIMS/ORSA, May 1979

Co-author: Lt Colonel Charles R. Mitchell

(See Lt Colonel Charles R. Mitchell)

Major Samuel B. Thompson, Jr.

"Experimental Design for Instructional System Comparisons"

American Mathematics Association of Two Year Colleges National Meeting, Atlanta, Georgia, October 1977

"PSI in Calculus: Results of an Experiment at the U.S. Air Force Academy"

Presented at Colorado-Wyoming-Kansas Mathematics Conference, USAFA, Colorado, September 1978

"A Comparison of PSI and Behaviorally-Oriented Conventional Instruction in College Calculus"

Presented at Fifth National Conference on Personalized Instruction, Washington, D.C., May 1979

Presented at American Mathematics Association of Two Year Colleges National Meeting, Houston, Texas, October 1978

Presentations at workshops on math labs and individualized instruction in college mathematics sponsored by Addison-Wesley Publishing Company.

"Some Innovations for Individualized Mastery Learning"

Denver, Colorado, February 1978

"PSI in College Mathematics"

San Diego, CA, April 1978, in conjunction with the National Council of Teachers of Mathematics National meetings: Washington, D.C. January 1979; Morgantown, WV, February 1979; Albuquerque, NM, March 1979; Anaheim, CA, March 1979; Oakland, CA, March 1979

DEPARTMENT OF PHILOSOPHY AND FINE ARTS

PUBLICATIONS

None

PRESENTATIONS

Major Arthur L. Barnes

"American Music from 1700 - 1900"

History Department, USAF Academy, CO, 1 March 1979

Captain Michael N. Biggs

"Professional Ethics"

Pueblo/Colorado Springs Chapter of the National Secretaries Association, Pueblo, CO, 14 November 1978

Major John W. Bois

"Human Rights"

Baptist Student Conference of Colorado, USAF Academy, CO, 13 and 14 October 1978

"Hinduism"

Air Academy High School, USAF Academy, CO, 13 December 1978

Major William H. Stayton

"Nature of Man"

Black Forest Baptist Church Study Group, Colorado Springs, CO, 16 November 1978

"Buddhism"

Air Academy High School, USAF Academy, CO, 12 December 1978

"Indian, Chinese, and Japanese Buddhism"

History 343 Course, USAF Academy, CO, 22 January 1979

"Islam: Muhammed and His Religion"

History 372 Course, USAF Academy, CO, 23 February 1979

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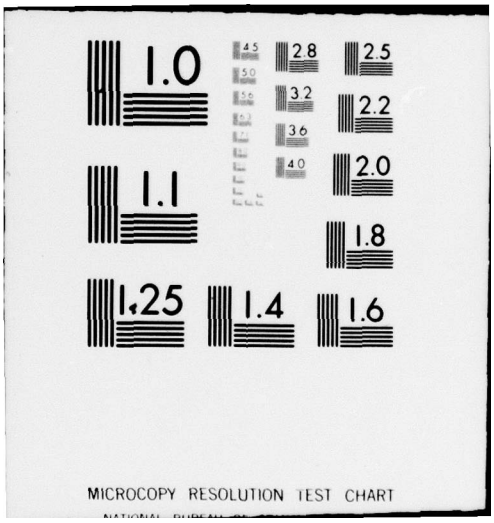
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"Eastern Religion Basic Concepts"

Divine Redeemer Catholic Church, Colorado Springs, CO, 17 April 1979

"Hinduism"

Divine Redeemer Catholic Church, Colorado Springs, CO 24 April 1979

"Buddhism"

Divine Redeemer Catholic Church, Colorado Springs, CO, 1 May 1979

"Transcendental Meditation"

Divine Redeemer Catholic Church, Colorado Springs, CO 8 May 1979

Colonel Malham M. Wakin

"Managerial Integrity"

Advanced Personnel Management School, Maxwell AFB, AL, 23 June 1978

"Scientific Method"

Political Science 349 Course, USAF Academy, CO, 16 and 17 August 1978

"The Relevance of Greece"

History 101 Course, USAF Academy, CO, 18 and 21 August 1978

"The Military Profession"

Lecture to scholarship candidates, USAF Academy, CO, 28 August 1978

"Ethics and the Military Profession"

Presentation to all students and staff, USAFA Preparatory School, USAF Academy, CO, 8 September 1978

"Nature of Man"

Two-hour lecture and two-hour panel discussion for the Inter-American Defense College, Washington, DC, 11 September 1978

"Ethics for Commanders"

Base Commanders Management Course, Maxwell AFB, AL,
21 September 1978

"Managerial Integrity"

Advanced Personnel Management Course, Maxwell AFB, AL,
22 September 1978

"Ethics and Government"

Regional meeting of American Society of Public Administration,
Colorado Springs, CO, 29 September 1978

"Ethics and the Military Profession," Part I

Officer Squadron Professional Ethics Advisors, USAF Academy,
CO, 12 October 1978

"Ethics and the Military Profession," Part II

Officer Squadron Professional Ethics Advisors, USAF Academy,
CO, 26 October 1978

"Professional Ethics in Medicine"

Fall meeting of DOD Medical Region IV, USAF Academy, CO,
26 October 1978

"War and Morality," Part I

Squadron Professional Ethics Advisors, USAF Academy, CO,
9 November 1978

"War and Morality," Part II

Squadron Professional Ethics Advisors, USAF Academy, CO,
30 November 1978

"Islam"

Air Academy High School, USAF Academy, CO, 5 December 1978

"Managerial Integrity"

Advanced Personnel Management Course, Maxwell AFB, AL,
11 and 12 January 1979

"The Chaplain's Ethical Role"

Chaplain's School Course, Maxwell AFB, AL, 10-12 January 1979

"National Leadership and Questions of Value"

National Prayer Breakfast, F. E. Warren AFB, WY, 31 January 1979

"Islam"

Political Science Course 478, USAF Academy, CO, 8 March 1979

"Managerial Integrity"

Advanced Personnel Management Course, Maxwell AFB, AL, 16 March 1979

"Managerial Ethics"

Colorado Springs Administration Management Society, Colorado Springs, CO, 17 April 1979

"Excellence"

Graduation Address for the Community College of the Air Force, USAF Academy, CO, 24 April 1979

"Ethics and the Military Profession"

Armed Forces Staff College, Norfolk, VA, 9 April 1979

"The Role of Ethics in the Military Profession"

Two four-hour workshops for Commanders, Chaplains, and Sergeant-Majors for the Army Signal Corps Schools at Fort Gordon, GA, 14 and 15 May 1979

"Professional Ethics"

Mathematical Sciences Department Workshop, USAF Academy, CO, 21 May 1979

"The Ethical Issues Facing Military Chaplains"

Addressed 70 Seminarians at the AF Chaplains' School, Maxwell AFB, AL, 15 June 1979

"Managerial Integrity"

Advanced Personnel Management School, Maxwell AFB, AL, 15 June 1979

Major Kenneth H. Wenker

"Managerial Ethics"

Army Health Services Command, Personnel Management for Executives Conference No. 53, San Antonio, TX, 31 July 1978

"Managerial Ethics"

Army Health Services Command, Personnel Management for Executives Conference No. 54, Lake Charles, LA, 21 September 1978

"Ethics of Command"

Management for Hospital Commanders' Course at Sheppard AFB, TX, 24 October 1978

"Managerial Ethics"

Army Health Services Command, Personnel Management for Executives Conference No. 55, San Antonio, TX, 10 January 1979

"Managerial Ethics"

Army Health Services Command, Personnel Management for Executives Conference No. 56, Colorado Springs, CO, 28 March 1979

DEPARTMENT OF PHYSICS

PUBLICATIONS

Captain Wayne J. Anderson

"Flux and Fluence Dependence of Implantation Disorder in GaAs Substrates"

Journal of Applied Physics, Vol 49, page 4568

Co-author: Y. S. Park

A previously presented technique of measuring radiation damage using electroreflectance measurement is used to detect disorder dependencies for light and heavy ions as a function of flux and fluence. The results of the electroreflectance measurements of damage in ion-implanted GaAs show clearly that the radiation-enhanced and thermal-annealing processes depend upon the energy density and damage concentration in the crystal.

Captain Ronald G. Fraass

"Use of a Metal-Nitride-Oxide-Semiconductor as the Detector for a Radiation Dosimeter"

AFWL-TR-78-87, Air Force Weapons Laboratory Technical Report

IEEE Transaction on Nuclear Science, Vol NS-25, No. 6, December 1978

A method of radiation dosimetry using a Metal-Nitride-Oxide-Semiconductor (MNOS) transitor as the detector was developed and partially evaluated.

A MNOS dosimeter is shown capable of measuring doses from 10 k rads to 4 M rads. Repeatability indicates a precision of $\pm$ 1% of measured dose from 200 k rads to 4 M rads (Si).

Determination of dosage with the system is indirect and requires the use of calibration curves.

Discrete, non-stepped gate NMOS transistors are recommended.

Captain Bobby Turman

"Analysis of Lightning Data from the DMSP Satellite"

Journal of Geophysical Research, Vol 83, page 5019, 20 October 1978

A lightning detector, consisting of 12 silicon photodiodes, each with a field of view of 700 x 700 km on the earth, has been flown on a Defense Meteorological Satellite Program satellite. Peak amplitude of the lightning flash was digitized within a range of 16 discrete levels, and the largest amplitude observed within a 1-s sample interval was recorded. Approximately 10,000 lightning flashes were analyzed. The frequency of occurrence of peak lightning power within the range 10^8 - 10^{10} W has been obtained. The median power level was 1 x 10^9 W, and about 2% of the lightning flashes had peak power greater than 10^{10} W. These data are compared to similar results from a ground-based experiment. Lightning flash rate per unit area of cloud cover in a storm complex was 4 x 10^{-5} s^{-1} km^{-2}. The long term flash rate per unit surface area on the earth was 6 x 10^{-8} s^{-1} km^{-2}, but this value may be biased toward high rates by the method of selecting the data base.

"Lightning Detection from Space"

American Scientist, Vol 67, p 321, May 1979

Intensive efforts have been made to understand and tame thunderstorms, but many of their dynamic and electrical processes remain unclear. One deficiency in our knowledge has been a lack of information on a global scale. Recently, a series of experiments have tested the feasibility of detecting lightning flashes with satellite sensors and using this information to monitor thunderstorms. The results promise to give atmospheric scientists a global perspective on lightning and thunderstorm activity and offer a possible means of providing early warning of severe storms.

PRESENTATIONS

Captain Wayne J. Anderson

"Research Opportunities in the USAF"

Presentation to Science and Engineering Colloquium, Utah State University, 29 March 1979

Several research projects being emphasized by the Air Force were discussed including laser development, solid state technology, and particle beam technology. The role of an Air Force officer as a scientist was explained with several examples from my own career.

Captain Ronald G. Fraass

"Use of Metal-Nitride-Oxide-Semiconductor as the Detector for a Radiation Dosimeter"

Presented to IEEE Annual Conference on Nuclear and Space Radiation Effects, July 1978

A method of radiation dosimetry using a Metal-Nitride-Oxide-Semiconductor (MNOS) transitor as the detector was developed and partially evaluated.

A MNOS dosimeter is shown capable of measuring doses from 10 k rads to 4 M rads. Repeatability indicates a precision of $\pm$ 1% of measured dose from 200 k rads to 4 M rads (Si).

Determination of dosage with the system is indirect and requires the use of calibration curves.

Discrete, non-stepped gate MNOS transistors are recommended.

Lt Colonel Edward A. Peterson

"Conduct of Program Review"

Presentation to joint American Physical Society--American Association of Physics Teachers, Winter Meeting, New York, 1 February 1979

All physics departments should continuously evaluate their programs to see if they are meeting both the needs of their students and the needs of the organizations employing their graduates. Such evaluations can be of limited utility and are often quite parochial when conducted solely from resources within the department. By conducting a formal Program Review, inputs can be obtained by former students, graduate schools, employers, and former faculty as well as from present students and faculty. These inputs can serve not only to validate present activities, but also can point to future activities the department may pursue. The Program Review conducted by the Phsyics Department at the U.S. Air Force Academy in November 1977 will be discussed as an example of the value of such a review.

Captain Henry L. Pugh

"ESR Investigations of the Thermal Decomposition of Energetic Materials"

Presentation to Naval Research Laboratory Colloquium, Washington, D.C., 6 March 1979

Captain Pugh discussed ongoing research at Frank J. Seiler Research Laboratory (FJSRL) in the area of thermochemical decomposition mechanisms of energetic materials, including TNT and the important nitramine propellants RDX and HMX. Analyses are now in progress to identify the radical species involved and the reaction mechanisms of TNT decomposition. Captain Pugh reviewed experimental and analytical techniques currently being used at FJSRL for kinetics studies and radical and mechanism identification in the energetic materials area.

Lt Colonel Robert C. Schaller

"Volunteers"

Air Force Youth Activities Workshop, Peterson AFB, Colorado, 22-24 May 1979

A fifty minute presentation on the role the volunteer plays in all youth activities programs.

Captain Bobby Turman

"A Review of Satellite Lightning Experiments"

Presentation to NASA Workshop on the Need for Lightning Observations from Space, Tullahoma, Tennessee, February 1979

Over the past five years a series of satellite optical experiments have been conducted to investigate terrestrial lightning. These experiments have been designed to gather statistical information about the optical waveform of lightning, measure occurrence rates, demonstrate the feasibility of detecting lightning from space platforms, and study possible applications for satellite lightning sensors. This paper reviews these experiments, presents some of the results, and discusses some ideas for future satellite systems.

DEPARTMENT OF POLITICAL SCIENCE

PUBLICATIONS

Captain Robert J. DeSutter

Proceedings - Twenty-First Air Force Academy Assembly, editor, May 1979

Captain Ralph A. Froehlich

"Recent Trends in Administration and Congressional Attitudes Impacting on Reentry Technology"

An unpublished paper prepared for the Program Director, ABRES, Winter 1978-1979

The paper focuses on goals and positions of the Carter Administration and the Congressional Armed Services and Appropriations Committees which could affect the general direction of future research and development of advanced reentry systems. The paper is based entirely on published statements and open Congressional testimony, and it does not address classified or particularly technical issues.

Captain Richard J. Latham

"Modernization in the PLA: Air Power as a Case Study"

Presented to the Western Conference of the Association of Asian Studies, Tucson, Arizona, 12-15 October 1978

Lt Colonel John D. Macartney (Visiting Professor at National War College, 1978-1979)

"The Presidency and Congress"

A reading for the Defense Strategy Seminar held in June 1979 at National Defense University for reserve and national guard O-7s and O-8s.

Captain John F. Reichart

"National Security Advice to the President: A Comparative Case Study Analysis of the Structural Variables in Decisionmaking"

An unpublished dissertation for PhD requirement, Ohio State University, Columbus, Ohio, Spring 1979

Major John D. Szostak, Jr.

"Independent European Program Group (IEPG)"

An unpublished paper prepared for OSD/ISA, August 1978

This paper provides an examination of the IEPG, focusing on its status and potential impact on NATO.

Major Paul R. Viotti

"Overhauling the Retirement and Compensation System"

Association of Graduates Magazine, Winter (February) 1979

This article examines proposals to change the military retirement and active duty pay systems.

"Politics and Money: The Construction, Maintenance, and Transformation of International Monetary Regimes"

An unpublished dissertation for PhD requirement, University of California at Berkeley, Summer 1978

PRESENTATIONS

Lt Colonel Curtis G. Cook

"Ideological Origins of the American Revolution"

Presented to Newcomers' Orientation, USAFA, August 1978

"U.S. Constitutional Development"

Presented to Rhodes Scholarship Seminar, USAFA, November 1978

"The Duties of a Politico-Military Affairs Officer"

Presented to Cadet Forum Club Seminar, USAFA, 24 January 1979

Captain Joseph F. Czarkowski

"CAIE in Academia"

Presented to students at Colorado Women's College, Denver, Colorado, February 1979

Major Frank J. Dellermann

"Dissent in the Soviet Union"

Presented to Parents Without Partners, Colorado Springs, Colorado, 15 September 1978

Captain Mark G. Ewig

"Problems in the Middle East Today"

Presented to two groups at Faith United Presbyterian Church, Colorado Springs, Colorado, 22 October 1978

"Political Solution in the Middle East"

Presented to Air Intelligence Center class, Lowry AFB, Colorado, 9 and 27 March 1979

Captain Richard C. Fast

"NATO Standardization"

Presented to Cadet Forum Club Seminar, USAFA, 10 March 1979

Captain Schuyler Foerster

"Political Analysis of Soviet Intentions"

Presented to USAFA Symposium on Defense Policy Issues, USAFA, 1 February 1978

"Elements of Soviet Power - Strengths and Weaknesses"

Presented to Air Command and Staff College Seminar, USAFA, February 1978

Lt Colonel Michael A. Freney

"NATO Problems and Prospects"

Presented to visitors from Air Intelligence Training Center, USAFA, February and March 1978

Presented to Air War College Seminar, USAFA, April 1978

"The Shifting Global Balance"

Presented to members of the Lions Club, Colorado Springs, March 1979

Major George C. Gibson

"Strategic Balance and Arms Control Talks"

Presented to Air Command and Staff College Seminar, USAFA, April 1978

"U.S. Security Interests in Asia"

Presented to group of civic leaders, Denver, Colorado, April 1978

FSO-4 Roger G. Harrison

"The Armed Forces in Society"

Presented to Department of English Brown Bag Seminar, USAFA, 17 January 1978

"The Morality of Arms Sales"

Presented to Study Group, 1st Presbyterian Church, Colorado Springs, Colorado, 22 January 1978

Major Terry L. Heyns

"Political Influences and Soviet Negotiations"

Presented to Air Intelligence Training Center class, Lowry AFB, Colorado, February 1979

Captain James M. Keagle

"Energy Policy for the 1980s"

Presented to Altrusa Club, Pueblo, Colorado, October 1978

"Metaphor of the Western Hemisphere in U.S. Foreign Policy"

Presented to National Defense Colloquium, USAFA, February 1979

"Hazardous Materials"

Presented to El Paso County Fire Department, Colorado Springs, Colorado, May 1979

Captain David C. Kozak

"Local Political Participation"

Presented at Symposium on Growth and Government in El Paso County, Colorado College, Colorado Springs, Colorado, May 1979

Lt Colonel Kenton E. Lammers

"Dilemma of World Energy"

Presented to Great Decisions Discussion Group, Faith Presbyterian Church, Colorado Springs, Colorado, 12 March 1978

"The Politics of Energy"

Presented to Physics 496 class, USAFA, May 1978

Captain Richard J. Latham

"China After Mao: The New Political Climate"

Presented to Air Intelligence Training Center class, Lowry AFB, Colorado, 22 February 1979

"The Role of Congress in Intelligence Oversight"

Presented to the Colloquium on Intelligence, Colorado College, Colorado Springs, Colorado, 9 May 1979

Lt Colonel John D. Macartney

"The President as Commander-in-Chief and Chief Diplomat"

Panel presentation at the 10th Annual National Student Symposium sponsored by the Center for the Study of the Presidency and held at the Hyatt Regency Hotel, Washington D.C., 28 April 1979

Captain Harold W. Maynard

"The Role of the Military in Arms Limitations"

Presented to Inter-University Seminar on Armed Forces and Society, Dallas, Texas, March 1978

Captain Roger I. Pinnell

"Contemporary Terrorism"

Presented to group of American Association of University Women, Colorado Springs, Colorado, 14 November 1978

"Theories and Practices of Contemporary Terrorists"

Presented to Colorado Springs Police Department, April-May 1979

Colonel Ervin J. Rokke

"Strategic Forces: The End of the Road?"

Presented to the National Security Education Seminar at Irvington, Virginia, December 1978

"Strategic Forces and SALT"

Presented at the Third Airpower Symposium, Air University, Maxwell AGB, Alabama, February 1979

LCDR Theodore G. Stier

"The Code of Conduct"

Presented to 17th Cadet Squadron, USAFA, 14 September 1978

Major John D. Szostak, Jr.

"NATO's Long Term Defense Plan"

Presented to visitors from Armed Forces Intelligence Training Center, USAFA, 9 June 1978

"NATO: Organization and Current Strategy"

Presented to Air Command and Staff College Seminar, USAFA, November 1978

Captain John A. Wahlquist

"Current Political Scene in Africa"

Presented to group of American Association of University Women, Pueblo, Colorado, 13 January 1979

DIRECTORATE OF ACADEMY LIBRARIES

PUBLICATIONS

Mrs. Betty Fogler

"U.S. Government publications in the Academy Library"

Library Reference Guide No. 4, Revised January 1979

Mr. Douglas Johnson

"Chemistry series" - Reprinted December 1978

A list of monographic series in the chemical sciences compiled as a handout for chemistry classes.

"How to use periodical indexes and abstract journals"

Library Reference Guide No. 6, Revised January 1979

"Literature searching - Chemistry and Life Sciences", Revised December 1978

A listing of guides and services useful to students to conduct a search of the chemical or life science literature.

Miss Florence Klemm

"Applied ethics"

Bibliography, June 1978

Book review of Border towns of the Navajo Nation, by Aaron Yava

Colorado Libraries, Vol 3, December 1977, pp. 38

Contributor to indexing in Air University Library Index to Military Periodicals, 1978 and 1979

"How to find book reviews"

Library Reference Guide No. 2, Revised June 1979

"Philosophy of ethics"

Bibliography, May 1978

Mrs. Betsy Kysely

"Air power and warfare"

Library Special Bibliography No. 59, September 1978

"Ethics of corporate conduct"

Library Special Bibliography No. 58, March 1978

Miss Suzanne Lincoln

"Computerized bibliographic search service"

Library Reference Guide No. 9

"Improving energy efficiency"

Library Special Bibliography No. 60, April 1979

Capt Pamela Sexton

"Target bearing"

Interceptor, Vol. 20, No. 7, July 1978, pp. 5-11

PRESENTATIONS

Miss Suzanne Lincoln

"Impacts of on-line searching: problems and future trends"

Paper presented at the Military Librarian's Workshop, Kirtland Air Force Base, 31 October 1978