

PROFESSIONAL AND SCIENTIFIC SOCIETIES

Aerospace Medical Association
National Aeronautics Association
National Aviation Education Association
Society of Air Safety Investigators
National Pilots Association
Aircraft Owners and Pilots Association
Space Science Board - National Research Council
Civil Air Patrol
NATO - Advisory Group for Aeronautical Research and Development
Society of Aerospace Engineers
Committee on Aviation, National Fire Protection Association
Survival and Flight Equipment Association
Aero Club of Washington; National Aviation Club
Joint Committee on Aviation Pathology
Aerospace Industrial Life Sciences Association
International Order of Accidentologists
System Safety Society
NASA/FAA Research Coordinating Committee

HONORS AND AWARDS

Air Line Pilots Assn. Award
Outstanding Service Awards - Flight Safety Foundation
Board Of Governors Commendation - 1978 FSF
Laura Tabor Barbour Air Safety Award
Numerous other Commendations from CAB, FAA, DOT, FBI, NASA, Industry,
Civic, Pilot, Dispatcher organizations; Assn. of Flight
Attendants; Army, Navy and Air Force; local Governments; and
Universities.

TRAINING /SEMINARS OF SIGNIFICANCE

"Project & Functional Management" Tustin Institute Of Technology
September 1969

"Human Factors Society Safety Symposium" Washington D.C. October 1973

"Flight Safety Foundation Int'l. Air Safety Seminar"

Washington, D.C.	October 1972
Montreaux, Switzerland	1969
Chandler, Arizona	1960
Ottawa, Canada	1977
Amsterdam, Netherlands	1975
Anaheim, California	1976
Caracas, Venezuela	1978
Williamsburg, Virginia	1974
Anaheim, California	1968
Mexico City, D.F.	1971

"Midair Collision Prevention" Joint Services Conference, Apple Valley,
California, March 1976

Aviation and Space Writers Conference, Denver, Colorado August 1976

Air Line Pilots Annual Safety Forums

Society Of Air Safety Investigators Annual Forums

Professional Pilots Seminars

Corporate and Business Pilot Safety Seminars

Airline/ Aircrew Safety Workshops

Alaska Air Safety Seminars, Anchorage/ Fairbanks 1977

Crash Survival School, Arizona State University, January 1972

Approach and Landing Forum, NTSB October 1972

SAE International Meetings - Training and Simulation

Aerospace Medical Assn. Meetings

Civil Aeromedical Assn. Meetings

21st Annual Air Traffic Controllers Assn. Meetings

"Managing Human Resources in the Federal Government" Washington, D.C.
November 1971

Orient Airlines Research Bureau Annual Air Safety Meetings, Taipei
and Hong Kong

National Aircraft Accident Investigation School

John J. Carroll

CONGRESSIONAL TESTIMONY

" Aviation Safety " U.S. House Of Representatives July 30, 1975
Subcommittee on Investigations and Review of the Committee on
Public Works and Transportation

" Crashworthiness - Crash Safety " U.S. House Of Representatives
July 31, 1974, House Science and Astronautics Subcommittee on
Aeronautics and Space Technology

" The State Of Aviation Safety " U.S. House of Representatives,
October 21, 1975, Subcommittee on Investigations and Review, Committee
on Public Works and Transportation

" Midair Collisions " U.S. House of Representatives, Subcommittee
on Government Activities and Transportation, House Government
Operations Committee - prepared for presentation July 23, 1975 and
presented to Committee Staff

John J. Carroll

PROFESSIONAL ARTICLES, NEWS, etc.

- " The Go - Team Goes To School" Air Line Pilot August 1971
- " Discovery May Slash Air Deaths by Fire" Miami News October 1, 1963
- " Chief Danger Seen In Other Planes" Dallas News July 23, 1971
- " Air Disaster Survivor Given Heroism Award" The Globe And Mail, Toronto
September 23, 1977
- " Human Survival In Aircraft Emergencies" NASA Engineering Study 1/23/67
- " Pilot's Story Under Hypnosis" San Francisco Chronicle July 5, 1965
- " Hypnosis Helps Air Crash Quiz" San Francisco Examiner July 5, 1965
- " Air Line Pilots Award To Carroll" Board Talk Vol.2, No.8 August 1971
- "How Safe Are The Skies ?" ABC-TV News Special, Jules Bergman Dec. 1974
One Hour Special on Ground Proximity Warning Indicators
- "Alaska Air Safety" Anchorage Channel 7 , 2- 12 minute live segments;
June 1, 2, 1977; 3-hours taped segments for continued
presentation on the Alaska Aviation Weather Shows for 1977

John J. Carroll

PROFESSIONAL/SCIENTIFIC/NEWS/MAGAZINE/ TV/ARTICLES & PUBLISHED INTERVIEWS

- " Airport Security " The Sunday Record 1/4/76
- " Risk Management " Airport Services Management March 1976
- " Securing The Skies " APACE Fall 1976
- " Accident Prevention " Airline Management June 1971
- " Safety Acknowledgements " Crosscheck May 1978
- " New Techniques For Air Accidents - Hypnosis and Narcosynthesis " U.S. Medicine July 1, 1965
- " To Reduce Future Disasters " (Narcosynthesis) The Houston Press 10/3/63
- " Human Factors in Aircraft Accidents " Broadcaster Vol.XXII No.42
November 21, 1962
- " Passenger Safety " Air Line Pilot September 1971
- " Stewardess Jump Seats " Air Line Pilot July 1971
- " Airport Zoning " Miami Herald August 19, 1970
- " Special Service Award " Delta Digest May 1976
- " First Professional Pilot Workshop " SSM Newsletter USC, Fall 1975
- " Carroll Returns to NTSB " SAFE Journal Vol 8 No 14, Winter 1978
- " Carroll Appointed to FSF " Business Aviation Dec. 16, 1974
- " Pro Pilots Success " Southern Aviation Times September 15, 1975
- " Flight Editorial " Flight Operations November 1975
- " Ten Minutes to Live " Readers Digest p.218, May 1967
- " Se Celebrara en Caracas Seminario Internacional " Notel Viasa Feb. 1978
- " Loud and Clear " Robert J. Serling p.447
- " Safety Last " Captain x p.282
- " Video Cockpit Recorder Telemetry " Airline Reports October 1, 1973
- " CAB Hypnosis " Air Progress Vol.17 NO.6, October 1965
- " New Accident Investigation Techniques " Aviation Daily Sept. 27, 1963
- " Safety, Noise Factor Considered in SST Plans " Alexandria Gazette
March 4, 1968
- " Cost Tradeoffs in Aviation " Aviation Week & Space Technology 10/27/75
- " Remaining Barrier to Air Safety " Aviation Daily October 23, 1975
- " Cabin Safety " Flightlog March - April, 1977 , p.12.
- " Males More Survivable in Civil Airline Crashes " U.S. Medicine 6/15/68
- " Carroll Appointed to SST Office " Aerospace Medicine March 1966

John J. Carroll

PUBLICATIONS, etc.

"Aviation Safety and Quality Control" Presented before the American Society of Quality Control, Lynchburg, Virginia, May 9, 1974

"Accident Investigation and Flight Attendant Safety" Presented before the Association of Flight Attendants Air Safety Training Seminar, June 8, 1975

PUBLICATIONS, etc.

"Developing the System for Air Navigation" Presented before the National Aviation System Planning Review Conference, Washington, D.C., May 23, 1973

"Obstructions to the Navigable Airspace" before the 1971 Air Line Pilots Association Annual Safety Forum, Dallas, Texas, July 1971

"Air Safety" before the Citizens Advisory Airpark Committee, Prince George County, Maryland, January 27, 1971

"Crash Protection In Survivable Accidents" FAA Study, March 1, 1968

"Crash Survival" Presented at Arizona State University, January 1972

"History of Accident Investigation" Presented before the Steward and Stewardess Division Annual Air Safety Seminar, Silver Springs, Maryland, June 1974

"System Safety in Air Transportation" Presented before the System Safety Society Conference, Arlington, Virginia, October 17-21, 1977

"Aircrew Safety" before the 4th Annual Airline/Aircrew Safety Workshop Keystone, Colorado, February 4, 1977

"Crash Injury - Crew and Occupant Protection" Before the 6th Scientific Session, Joint Committee on Aviation Pathology (JCAP) Ottawa, Canada, September 12, 1967

"Accidents, Crash Safety, Autopsies" presented before the 42nd Meeting of the Aerospace Medical Association Scientific Program, Houston, Texas, May 27, 1971

"Altitude Awareness" Presented before the Orient Airlines Research Bureau Second Annual Air Safety Seminar, Taipei, Taiwan, November 11, 1970

"Air Safety vs. Crash Safety" Presented before the Exxon Research Club, Florham Park, New Jersey, October 24, 1979

"Where Do We Stand In Safety ?" Presented before the International Air Safety Seminar, Montreaux, Switzerland, October 28, 1969

PUBLICATIONS, etc.

"SST Training Program Considerations" S.A.E. Journal, Presented before the National Aeronautic Meeting and the Third International Simulation and Training Conference, New York, N.Y. April 26, 1967

"Human Factors and the SST" Presented at the Second Symposium on Modern Concepts in Civil Aviation Medicine, Civil Aviation Medical Association, Oklahoma City, Oklahoma, October 12-14, 1967

"Overdesign For Safety" Presented at the Aviation Medical Seminar, Washington, D.C., December 5-7, 1966

"The United States' SST Program" Presented before a joint meeting of the AIAA, IEEE, GEEA, Daytona Beach, Florida May 18, 1967

"Safety Research Methodology" Human Factors Society, Washington, D.C., October 16, 1975

"Approach and Landing Accident Prevention", NTSB Report, October 1972

"Identification of The Most Critical Aviation Safety Problem Areas" NTSB Report, May 22, 1974

"The Experiment Perilous: Survival In Emergency Escape From Passenger Aircraft" Presented before the Aerospace Medical Association 41st Annual Meeting, St. Louis, Missouri April 28, 1970
.....also Published as an FAA Office Of Aviation Medicine Technical Manual AM-70-16, October 1970

"Jumbo Jet Evacuation Problems" Presented at the 5th Medical Research Committee Meeting, Oklahoma City, Oklahoma April 25, 1967

"SST Human Factors" Presented before the FAA Aviation Medical Seminar Washington, D.C., December 9, 1967

"U.S. Supersonic Transport System Safety Status" before the National Safety Council Congress, Chicago, Illinois, October 23, 1967

"Emergency Escape and Survival Factors in Civil Aircraft Fire Accidents" Presented before the Aerospace Medical Association 39th Annual Scientific Meeting, Bal Harbour, Florida May 6-8, 1968; and before the Air Line Pilots Assn. Air Safety Forum, Seattle, Washington July 7, 1968

PUBLICATIONS, etc.

"What The Pilot Sees During Landings in Low Visibility" before the 24th Annual International Air Safety Seminar, Mexico City, D.F., October 20, 1971, FSF Seminar Proceedings

"Accident Reports - Development and Use, Collection, Recording, Retrieval and Dissemination" Presented before the 1st International Forum, Society of Air Safety Investigators, Washington, D.C., November 4, 1970; SASI Journal

"Supersonic Safety" Presented at the Time/Concorde Meeting, Paris France by Gov. John H. Reed, February 7, 1969

"Accident Investigation Procedures" Air Line Pilots Safety Forum, Washington, D.C., July 1972

"Approach and Landing Accident Prevention" Presented before the Sixth 21st Air Force Safety Seminar, McGuire Air Force Base, New Jersey January 1973

"Investigating the Human Factors in Aircraft Accidents" National Fire Protection Association, June 1962

"Human Factors In Commercial Air Transportation" MATS Safety Seminar October 1962

"Plane Crash Research Leads Way To Lower Life Loss" Co-author, Society of Aerospace Engineers S.A.E. Journal April 1964

"SST Crash Emergency Escape Provisions - an SST Position" FAA Office of Supersonic Transport Development, October 17, 1966

"Concorde Status" (Classified Secret) November 17, 1966 (FAA)

"Tupolev Tu-144 Status" (Classified Secret) December 1966 (FAA)

"Post Crash Survival Considerations" S.A.E. Journal, April 1964

"Human Factors and The Supersonic Transport" Co-author, Presented before the Aerospace Medical Association, Las Vegas, Nevada, November 29, 1966

PUBLICATIONS, TECHNICAL PAPERS, BOOKS, MANUALS, AND SPEECHES OF
SIGNIFICANCE -- Partial listing

"A Review of U.S. Air Carrier Accidents in which Fatalities Resulted
From Fire Following Impact, 1952-1961" C.A.B., June 1962, Aviation
Bulletin #292, National Fire Protection Association.

"New Investigative Techniques" Presented before the 16th Annual
Convention, National Business Aircraft Association, Sept. 25, 1963

"A Study of Aircraft Cockpit Safety" Co-author, C.A.B., Oct. 1, 1964

"An Analysis of Aircraft Cockpit Safety" " " undated

"Jet-Transport Cockpit Review" C.A.B. Sept. 16, 1964

"Accident Prevention - Crash Safety" Proceedings of the 3rd Annual
Symposium on Modern Concepts in Civil Aviation Medicine, San Antonio,
Texas, September 27, 1968

"Pitfalls -- Barometric Altimetry" Presented before the 15th Annual
Corporate Aircraft Safety Seminar, San Antonio, Texas, May 12-13, 1970

"Low Visibility Approaches" Presented before the 5th Technical and
Air Safety Forum, Canadian Air Line Pilots Association, Montreal,
September 20, 1972

"Civil Aircraft Accident Investigation" Before the U.S. Joint Services
13th Aviation Safety Conference, San Bernardino, California, April
22-26, 1974

"It May Make The Difference" - Crash Safety Considerations, Presented
before the U.S. Army Aviation Safety Symposium, Fort Campbell,
Kentucky, March 19, 1962

"Investigation of A Recent Air Carrier Disaster Involving Inflight
Violence" Aerospace Medical Association, April 20, 1966

"Inflight Violence" Journal of Flying Physicians, Vol. 11, No. 1,
January 1967

"The Safety Attitude" Presented before the 1962 Military Airlift
Command Safety Seminar, Scott Air Force Base, Illinois Nov. 14, 1962

PUBLICATIONS, TECHNICAL PAPERS, BOOKS, MANUALS, AND SPEECHES OF SIGNIFICANCE --Partial Listing

"Crash Injury Investigators Manual" - a textbook - Cornell University
1958, '59, '60, '61.

"Handbook for Aircraft Accident Investigators" Aviation Crash Injury Research, April 1962

"Investigation Manual - Aviation" U.S. NTSB August 4, 1980

"Program Of Instruction", Aviation Crash Injury Investigators School Flight Safety Foundation, 1960

"Consolodated Notes on Aircraft Safety" 110pp. unpublished, frequently referenced in scientific literature. 1963

"Principles of Crash Injury Investigation", Ohio State University, October 1959

"Braniff DC-7C Accident, Miami, Florida, March 1958" A Special Report for the Air Line Pilots Association, November 1958

"U.S. Army H-21C Shawnee Helicopter Accident, Big Meadows, Virginia, December 2, 1959" February 1960 (co-author)

"U.S. Army HU-1A Bell 'IRIQUOIS' Helicopter Accident, East Saint Louis, Illinois, October 21, 1959" January 1960

"U.S. Army U-1A DeHavilland 'Otter' Accident, Fort Carson, Colorado, June 16, 1959" February 1960

"Crash Injury Analysis" - a textbook - AvCIR Flight Safety Foundation January 1961

"U.S. Army L-21 Boundary Layer Control Experimental Aircraft Accident, Starkville, Mississippi, April 27, 1960" August 1960

"U.S. Army YHC-1B 'Chinook' Mockup Evaluation" September 1960

"Crash Injury Evaluation - U.S. Army AC-1 DeHavilland 'Caribou'" October 1960 (co-author)

"Simulated Drop Test - U.S. Army H-25 Piasecki Mule" October 16, 1960

"Experimental Research - U.S. Army H-25 Helicopter Drop Test, October 22, 1960" December 30, 1960 (co-author)

"U.S. Army HU-1A Bell 'Iriquois' Accident, Fort Carson, Colorado, June 9, 1960" December 1960

"Army Aviation Safety - Crash Injury, Crashworthiness" December 30, 1960 Flight Safety Foundation (co-author)

"U.S. Army YHU-1D Bell 'Iriquois' Helicopter Mockup Evaluation, January 1961" February 1961

"U.S. Army National Guard H-23 Hiller Helicopter Accident, Phoenix, Arizona" July 1961

"Post Crash Survival Considerations - Aircraft Crash Fire Prevention, Fire Fighting, Rescue, and Emergency Escape" Civil Aeronautics Board September 1961

THE INSTITUTE FOR SAFETY ANALYSIS, INC.

WASHINGTON, D. C. • ROCKVILLE, MARYLAND

TELEPHONE (301) 424-3060

MAILING ADDRESS
451 HUNGERFORD DRIVE
SUITE 610
ROCKVILLE, MARYLAND 20850

BERT BRENNER PH.D.
SIDENT

CURRICULUM VITAE

Elwood T. Driver

EDUCATION

B.S. (Mathematics)	New Jersey State College	1942
M.A. (Safety)	New York University	1946

Additional Coursework (non-degree):

Safety Engineering, University of Southern California	1964
Safety Engineering, University Washington	1965
Aircraft Accident Investigation, Arizona State University	1980

PROFESSIONAL REGISTRATIONS

Certified Safety Professional, State of Illinois
Professional Engineer (Safety), State of California

WORK EXPERIENCE

1978 - 1981	Vice Chairman and Board Member, National Transportation Safety Board (Appointed by President Carter with advice and consent of the Senate.)
1967 - 1978	Associate Administrator for Rule Making (Acting); Director, Office of Crashworthiness; Director, Office of Crash Avoidance, National Highway Traffic Safety Administration, U.S. Department of Transportation
1962 - 1967	Chief, System Safety Engineering and Management, Minuteman Division, Autonetics, North American Aviation, Anaheim, California
1942 - 1962	Career Officer (Command Pilot), U.S. Air Force
1958 - 1962	--Deputy Director of Personnel, Field Training Wing, Chanute Air Force Base, Illinois
1957 - 1958	--Director of Special Services, Far East Logistic Forces, Tachikawa, Japan
1955 - 1957	--Commander, Showa Air Base, Japan

1952 - 1955--Director of Safety, Far East Air
Logistics Forces, Japan

1948 - 1952--Chief, Safety Engineering and
Education, Directorate of Safety,
Headquarters U.S. Air Force,
Pentagon, Washington, D.C.

1942 - 1948--Commander, 100th Fighter Squadron,
Lockbourne Air Force Base, Ohio;
Director, Ground Training School,
Tuskegee, Alabama; Flight Commander,
99th Fighter Squadron, European
Theatre

PROFESSIONAL EXPERIENCE

Mr. Driver is a systems safety expert with a broad range of experience in transportation safety (e.g., aviation, automotive, marine, hazardous materials, and pipeline), industrial safety, and related fields. A representative listing of his professional activities in government and private industry is as follows:

National Transportation Safety Board

Directed operations of the Agency in investigation of approximately 210 major aviation, railroad, highway, pipeline, marine, and hazardous materials accidents; in determining probable cause(s) of these accidents; and in recommending corrective actions.

Supervised approximately 350 professional accident investigators, technicians, professional engineers, and support personnel.

Officiated at and/or participated in approximately 86 Public Board meetings on accident cause determinations, appeals for certificate denials, and enforcement cases.

Directed numerous on-scene investigations of aircraft major accidents; subsequently officiated (as Chairman) at Public Hearings.

U.S. Department of Transportation, National Highway Traffic Safety Administration

Directed the development and implementation of numerous Federal Motor Vehicle Safety Standards, as directed in the provisions of the National Traffic and Motor Vehicle Safety Act of 1966 (P.L. 89-563).

Established and maintained direct working liaison with domestic and foreign automotive industry executives (automobile, truck, trailer, and special-purpose vehicles).

North American Aviation

Directed and managed the system safety engineering program of all safety matters pertaining to the Minuteman Intercontinental Ballistic Missile.

Provided technical safety advice to design engineering and operational engineering groups in this missile system.

U.S. Air Force (Safety-Related Assignments)

Directed and managed the safety program for the Far East Air Logistics Forces in the (non-flying) safety fields pertaining to industrial operations, transportation, hazardous materials, chemical/fuel, and environmental controls.

Directed and managed the U.S. Air Force worldwide ground (i.e., non-flying) safety education and training program.

PROFESSIONAL SOCIETIES

System Safety Society, Fellow

American Society of Safety Engineers, Professional Member

APPOINTMENTS (TECHNICAL)

Chairman, General Aviation Committee, National Safety Council

Member, Advisory Committee, Board of Certified Safety

Professionals

National President, System Safety Society

National Vice President, System Safety Society

Member, Panel on Advanced Air Transport Technology and Airport

Air Traffic Control System, Office of Technology Assessment,

U.S. Congress

APPOINTMENTS (NON-TECHNICAL)

President and Member of the Board, Tuskegee Airmen, Inc., D.C.

Member, Board of Directors, Federal Executive Institute Alumni Association

Member, Board of Directors, Howard University, METCOM, D.C.

Member, U.S. Coast Guard Auxiliary (Power Squadron)

Member, Retired Officers Association

OTHER QUALIFICATIONS

Single- and multi-engine aircraft pilot ratings; land-instrument ratings; commercial pilot rating; Command pilot; over 4000 flying hours.

Operations Officer, U.S. Coast Guard Auxiliary (Flotilla 29).

REPRESENTATIVE TECHNICAL PRESENTATIONS

What the National Transportation Safety Board's Investigations Have Disclosed," Hazardous Materials Advisory Committee, Washington, D.C.; June 1978

"Traffic Records--The Challenge of Today and Tomorrow," Fourth National Forum of Traffic Records Systems, Rochester, New York; July 1978

The National Transportation Safety Board (NSTB) Safety Objectives Program, "General Aviation Crashworthiness," 16th Annual Survival and Flight Equipment Association (SAFE) Symposium, San Diego, California; October 1978

"Accident and Liability Prevention--A Government Point of View." Panel Discussion at 16th Annual SAFE Symposium, San Diego, California, October 1978

"Greater Challenges--Greater Cooperation." National Association of Governors' Highway Safety Representatives and the National Association of Women Highway Safety Leaders, Lake Tahoe, Nevada; October 1978

"NTSB Organization and Function," Slide Presentation, Commuter Airline Association of America Conference, Chicago, Illinois; October 1978.

"The NTSB Role in the Marine Mode and an Overview of the NTSB Organization and Functions," Marine Safety Management Seminar, Yorktown, Virginia; October 1978

"The Dilemma of Acceptable Safety Risk," Annual Meeting of the American Society of Mechanical Engineers, San Francisco, California; December 1978

"Chemical Safety, Sales, and Purchasing," The Sales Association of the Chemical Industry and the Chemical Buyers Group of the Purchasing Management Association of New Jersey, Totowa, New Jersey; October 1979

"Overview of NTSB Organization and Function," Slide Presentation;
"The Failure Mechanism of the DC-10 Pylon," Fourth Annual Symposium on Advanced Failure Analysis, Los Angeles, California; October 1979

"Overview of NTSB Organization and Function," Slide Presentation;
"Summary of DC-10 Accident Investigation," General Motors Corporation Urban Forum, Detroit, Michigan; October 1979

"NTSB Responsibilities and Interfaces With the USCG," Marine Safety Management Seminar, U.S. Coast Guard Reserve Training Center, Yorktown, Virginia; October 1979

"The Safety Board--What It Is and What It Does," Embry Riddle Aeronautical University, Daytona Beach, Florida; February 1980

"NTSB Overview," Slide Presentation; "NTSB Views on the Airport Development Aid Program," 2nd Annual Inter-Airport Facilities Conference, Seattle, Washington; March 1980

"NTSB Overview," Slide Presentation; "Information on Collision Avoidance Systems and Microwave Landing Systems," Association of Independent Aviation Insurers, Denver, Colorado; March 1980

"Remarks on the Details and Results of a Special Study (NTSB) Dealing with Light-Twin Engine Aircraft Accidents Following Engine Failure," Southern New Jersey Section, American Institute of Aeronautics and Astronautics, Atlantic City, New Jersey; May 1980

"Evaluating Dangerous Goods Emergency Responses with Time/Loss Analyses," Technical Paper, 6th International Symposium Packaging and Transportation of Radioactive Materials, West Berlin, Germany; November, 1980

REPRESENTATIVE CONGRESSIONAL TESTIMONY

Airport and Airways Trust Fund Program. Subcommittee on Oversight on Ways and Means, House of Representatives; May 5, 1978

Hearing on Liquid Energy Gas. Committee on Commerce, Science, and Transportation, U.S. Senate; August 21, 1978

Airport and Airways Trust Fund: Airport Development Aid Program. Subcommittee on Oversight of the Committee on Ways and Means, House of Representatives; September 21, 1978

FAA Certification Procedures. Government Activities and Transportation Subcommittee; September 26, 1978

CUYAHOGA Sinking. Subcommittee on Coast Guard and Navigation of the Committee on Merchant Marine and Fisheries, House of Representatives; February 28, 1979

Proposals to Increase the Amount of Controlled Air Space. Subcommittee on Public Works and Transportation, House of Representatives; March 20-21, 1979

Reauthorization of the Hazardous Materials Transportation Act of 1974. Senate Commerce Committee; April 24, 1979

Aviation Safety: Interior Compartment Materials. Subcommittee on Oversight and Review of the Committee on Public Works and Transportation, House of Representatives; April 25-26, 1979

Reauthorization of the Hazardous Transportation Act of 1974. House Public Works and Transportation Committee, Subcommittee on Surface Transportation and Aviation; May 7, 1979

American Airlines DC-10 Accident. House Subcommittee on Investigations and Oversight, Committee on Science and Technology, House of Representatives; July 17, 1979

DIRECTOR OF ON-SCENE INVESTIGATIONS (Representative List)

Inlet Marine Aviation - Lear 25. Anchorage, Alaska; December 4, 1978

American Airlines - DC-10. Chicago, Illinois; April 25, 1979

Western Airlines - DC-10. Mexico City, Mexico; October 31, 1979

Down East Airlines - DHC-6. Owlshead, Maine; May 31, 1979

United Airlines - DC-8. Portland, Oregon; December 28, 1978

National Airlines Boeing - B-727. Escambia Bay, Pensacola, Florida; May 10, 1978

Convair 540 Turbo Prop. Kalamazoo, Michigan; July 25, 1978

CHAIRMAN OF PUBLIC HEARINGS (Representative List)

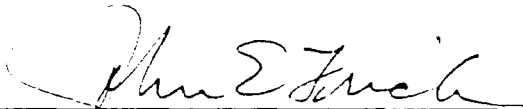
- Aviation: Columbia Pacific Airlines - Beech 99
Richland, Washington; March 1978
- North Central Airlines - DC-9/Cessna Citation
LaGuardia, New York; June 29, 1978
- American Airlines - DC-10
Chicago, Illinois; August 1979
- Special Commuter Airline Investigation
Board Member En Banc
Washington, D.C.; June 28, 1980
- Cascade Airlines
Spokane, Washington; April 7, 1981
- Pipeline: Union Light, Heat & Power Company
Fort Mitchell, Kentucky; December 2, 1980
- Railroad: Safety Effectiveness Evaluation of Rapid Rail
Transit
Board Member
Washington, D.C.; July 28, 1980
- Marine: Tampa Bay Bridge Accident
Tampa, Florida; February 1980
- Special Investigation of U.S. Coast Guard Ship,
CUYAHOGA, Sinking
Yorktown, Virginia; February 26, 1979

CERTIFICATE OF SERVICE

I hereby certify that I caused a true copy of the foregoing to be hand-delivered, this the 15th day of July, 1983, to the following:

Carroll E. Dubuc, Esquire
Finley, Kumble, Wagner, Heine,
Underberg & Casey
1120 Connecticut Avenue, N.W., Suite 1000
Washington, D. C. 20036

Bruce Bagni, Esquire
United States Department of Justice
521 Twelfth Street, N.W., Room 1100
Washington, D. C. 20530



Complete

Guide

Liver Menu



JAMES W. TURNBOW, PH.D.

PROFESSOR OF ENGINEERING

ARIZONA STATE UNIVERSITY
ENGINEERING RESEARCH CENTER
TEMPE, ARIZONA 85281

TELEPHONE
(602) 965-3427
(602) 965-3858

ARIZONA STATE UNIVERSITY

James W. Turnbow
Professor of Engineering

Degrees:

Ph. D.	University of Texas, 1959
M.S.E.M.	University of Texas, 1952
B.S.M.E.	Texas Technological College, 1940

Academic Experience:

1971-	Director Crash Injury Investigators School, Arizona State University
1959-	Arizona State University, Professor
1948-59	University of Texas, Assistant Professor
1948	Texas Technological College, Student Instructor
1940-41	Oklahoma A. & M. College, Instructor

Industrial Experience:

5/44-9/47	North American Aviation, Design Engineer
7/41-4/44	U. S. Army, Captain, Ordnance Department

Consulting Experience:

1972-	Aviation and Automotive Accident Investigation for various legal firms
1/72	Consultant to Sikorsky Aircraft, Stratford, Connecticut
9/60-6/69	Consultant to the Flight Safety Foundation, AvSER Div., Phoenix, Arizona
9/54-9/59	Balcones Research Center, University of Texas, Research Engineering

Awards, Scholarships, and Honor Societies:

Tau Beta Pi	Honor ME Graduate, Texas Tech
Alpha Chi	Honor Military Graduate, Texas Tech
Convair Excellence in Teaching Award, U. of Texas	Sigma Xi Member

Membership in Scientific and Professional Societies:

Registered Professional Engineer, Texas and Arizona

Principal Areas of Research and Teaching Interest:

Dynamics, Vibration, Impact, Space Mechanics, Aviation and Automotive Safety

Principal Publications:

"Cushioning for Air Drop, Part I," (with other authors). Published for the Quartermaster Food and Container Institute for the Armed Forces, Chicago, Illinois, July 1955, 80 pp.

"Cushioning for Air Drop, Part II, Air Drop Cost Analysis," (with C. C. Steyer). Quartermaster Food and Container Inst. for the Armed Forces, Chicago, Ill., April 1956, 37 pp. Unscheduled presentations of portions of this work were presented by Dr. Turnbow at two meetings: (a) Aerial Delivery Research Contractors Coordination Meeting at the Midwest Research Inst., Kansas City, Mo., Jan., 1956, and (b) The Aerial Delivery Research Symposium at Fort Lee, Virginia, April 1956.

"Cushioning for Air Drop, Part III, Characteristics of Paper Honeycomb under Dynamic Loading," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 1956, 9 pp.

"Cushioning for Air Drop, Part VII, Characteristics of Foamed Plastics under Dynamic Loading," Quartermaster Research and Engineering Command, Natick, Massachusetts, March 1957, 14 pp.

"High-Velocity Impact Cushioning, Part I, Drop-Test Facilities and Instrumentation," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 26, 1957, 31 pp.

"High-Velocity Impact Cushioning, Part II, Energy-Absorbing Materials and Systems," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 26, 1957, 41 pp.

"Properties of Materials at High Strain Rates, Part III, Material Properties and Wave Propagation," The Sandia Corporation, Albuquerque, New Mexico, January 5, 1959, 174 pp.

"High-Velocity Impact Cushioning, Part IV, The Effect of Moisture Content and Impact Velocity on Energy-Absorption Characteristics of Paper Honeycomb," Quartermaster Research and Engineering Command, Natick, Massachusetts, May 1, 1959, 40 pp.

"High-Velocity Impact Cushioning, Part V, Energy-Absorption Characteristics of Paper Honeycomb," Quartermaster Research and Engineering Command, Natick, Massachusetts, May 25, 1959, 106 pp.

"Application of Cushioning to Complex Structures," Aerial Delivery Impact Conference, Balcones Research Center, The U. of Texas, June 1959.

"The Energy-Dissipating Characteristics of Airbags," Quartermaster Research and Engr. Command, Natick, Mass., August 18, 1959, 52 pp.



Principal Publications: (continued)

- "Strain Rate Effects on the Stress-Strain Characteristics of Alum. and Copper," Midwestern Conf. on Fluid and Solid Mechanics, September 11, 1959, The University of Texas, Austin, Texas.
- "U.S. Army H-25 Helicopter Drop Test," U. S. Army TRECOM Contract DA-44-177-T6-624 (with Chance Vought Aircraft Corp.), December 15, 1960.
- "Army Aviation Safety," Final Report U.S. Army TRECOM Contract DA-44-177-T6-624 (with other authors), Dec. 30, 1960.
- "U.S. Army H-25 Helicopter Drop Test," 10/22060, TREC Tech. Report 60-76, AvCIR-2-TR-125, Aviation Crash Injury Research, Phoenix, Arizona, March 15, 1961.
- "A Dynamic Crash Test of an H-25 Helicopter," SAE Report 517A, Aviation Crash Injury Research, Phoenix, Arizona, April 1962, AvCIR 61-21.
- "Dynamic Crash Tests of Fixed-Wing and Rotary-Wing Aircraft as Related to Seat Design," Rothe, V.E. and Turnbow, J.W., AvCIR Technical Report 62-15, Aviation Crash Injury Research, Phoenix, Arizona, October 1962.
- "Military Troop Seat Design Criteria," Turnbow, J.W., Rothe, V.E., Bruggink, G.M. and Roegner, H.R., TRECOM Technical Report 62-79, U.S. Army Transportation Research Command, Fort Eustis, Virginia, November 1962.
- "Discussion of Postcrash Fire Problem," AvCIR Paper 62-30, Aviation Crash Injury Research, Phoenix, Arizona, Dec. 1962.
- "Crew Seat Design Criteria for Army Aircraft," Roegner, H.F. and Turnbow, J.W., TRECOM Technical Report 63-4, AvCIR 62-20, U.S. Army Transportation Research Command, Fort Eustis, Virginia, February 1963.
- "Dynamic Test of an Aircraft Litter Installation," Weinberg, L.W.T. and Turnbow, J.W., TRECOM Technical Report 63-3, AvCIR 62-63, U.S. Army Transportation Research Command, Fort Eustis, Virginia, March 1963.
- "Dynamic Test of a Commercial-Type Passenger Seat Installation in an H-21 Helicopter," June 1963, TRECOM Technical Report 63-24, AvCIR 62-25, U.S. Army Transportation Research Command, Fort Eustis, Virginia, June 1963.
- "Dynamic Test of an Experimental Troop Seat Installation in an H-21 Helicopter," Turnbow, J.W., Robertson, S.H., and Carroll, D.F., TRECOM Technical Report 63-7, U.S. Army Transportation Research Command, Fort Eustis, Va., Nov. 1963.
- "Theory, Development and Test of a Crash Fire-Inerting System for Reciprocating Engine Helicopters," Turnbow, J.W., Robertson, S.H., and Carroll, D.F., TRECOM Technical Report 63-49, U.S. Trans. Research Command, Ft. Eustis, Va., Dec. 1963.
- "A Review of Crashworthy Seat Design Principles," Turnbow, J.W. and Haley, J.L., Soc. of Autom. Engrs. Rep. #851A, New York, N.Y., April 1964.
- "Safety Engineering for Crash Injury Prev." Turnbow, J.W., Avery, J.A. and Haley, J.L., Soc. of Autom. Engrs. Paper, July 1964.
- "Survivability Seat Design Dynamic Test Program," (with L.W.T. Weinberg), USAAVLABS Tech. Rep. 65-43, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1965, 115 pp.
- "Crash Survival Eval. of the OH-4A Helicopter," (with others), AvSER M65-5, Aviation Saf. Engg. & Research, Phoenix, 1965, 36pp.
- "Crash Survival Eval. of the OH-4A Helicopter," (with others), AvSER M65-9, Aviation Saf. Engg. & Research, Phoenix, 6/8/65, 44pp.
- "Full Scale Dynamic Crash Test of a Small Observation Type Helicopter," Test No.'s 21 and 22, (with others), USAAVLABS Tech. Report 66-32, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1965, 39 pp.
- "Aircraft Fuel Tank Design Criteria," (with S.H. Robertson), USAAVLABS Technical Report 66-24, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 105 pp.
- "Helmet Design Criteria for Improved Crash Survival," (with others) USAAVLABS Technical Report 65-44, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 121 pp.
- "Impact Test Methods for Helmets, Supp. I to Helmet Design Criteria for Improved Crash Survival," USAAVLABS Tech. Report 65-44A, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 18 pp.
- "Test Results-Hemispherical Specimens, Supp. II to Helmet Design Criteria for Improved Crash Survival," (with J.L. Haley, Jr.), USAAVLABS Technical Report 65-44B, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Va., 1966, 17 pp.
- "Impact Test Methods and Retention Harness Criteria for U.S. Army Aircrewman Protective Headgear," (with J.L. Haley, Jr.), USAAVLABS Technical Rep. 66-29, U.S. Army Aviation Materiel Lab., Ft. Eustis, Va., 1966, 45 pp.
- "Crash Survival Eval. OH-6 Helicopter," (with J.L. Haley, Jr.) AvSER M67-3, Phoenix, Aviation Saf. Engg. & Res., 1967, 48 pp.
- "Crashworthiness Study for Passenger Seat Design-Analysis & Testing of Aircraft Seats," (with others), AvSER 67-4, Aviation Safety Engineering and Research, Phoenix, Arizona, 1967, 42 pp.
- "Floor Accelerations and Passenger Injuries in Aircraft Accidents," (with J.L. Haley, Jr.) USAAVLABS TR 67-16, U.S. Army Aviation Materiel Laboratories, Ft. Eustis, Va., May 1967, 46 pp.
- "Crash Survival Design Guide," (with others) USAAVLABS Technical Report 67-22, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, August 1967, 291 pp.
- "Crashworthiness of Aircrew Protective Armor," (with others) TR 68-57-CM, U.S. Army Natick Lab., Natick, MA, April 1968, 80 pp.
- "Total Reaction Force Due to an Aircraft Impact into a Rigid Barrier," (with J.L. Haley, Jr.) AvSER TR 68-3, Aviation Safety Engineering and Research, Phoenix, Arizona, April 1968, 17 pp.
- "An Evaluation of Armored Aircrew Crash Survival Seats," (with others) AvSER TR 68-4, Aviation Safety Engineering and Research, Phoenix, Arizona, May 1968, 81 pp.
- "Crashworthiness Study for Passenger Seat Design," (with others) NSR 33-026-0003, Nat'l Aero. & Space Adm., June 1968, 171 pp.
- "Tension and Damping Effects on Vibrating Strings," (with others) K002641, National Science Found., Feb. 1969, 230 pp.
- "The Basic Principles of Mechanics as Applied to Automotive Impact," Proceedings of UCLA Medical Seminar, June 16-27, 1969, 30 pp.
- "The Effects of Tension on Vibrating Strings," (with F.D. Norvelle) K002641, National Science Foundation, February 1970, 246 pp.
- "Preliminary Impact Speed and Angle Criteria for Design of a Nuclear Airplane Fission Product Containment Vessel," (with others), NASA Technical Memorandum TMX-2245, National Aeronautics and Space Admin., Washington, D.C., May 1971, 36 pp.
- "Response of a Seat-Passenger System to Impulsive Loading," (with J.A. Collins), Proceedings of Symposium on the Dynamic Response of Structures, Pergamon Press, 1972.

ARIZONA STATE UNIVERSITY

James W. Turnbow
Professor of Engineering

Degrees:

Ph. D.	University of Texas, 1959
M.S.E.M.	University of Texas, 1952
B.S.M.E.	Texas Technological College, 1940

Academic Experience:

1971-	Director Crash Injury Investigators School, Arizona State University
1959-	Arizona State University, Professor
1948-59	University of Texas, Assistant Professor
1948	Texas Technological College, Student Instructor
1940-41	Oklahoma A. & M. College, Instructor

Industrial Experience:

5/44-9/47	North American Aviation, Design Engineer
7/41-4/44	U. S. Army, Captain, Ordnance Department

Consulting Experience:

1972-	Aviation and Automotive Accident Investigation for various legal firms
1/72	Consultant to Sikorsky Aircraft, Stratford, Connecticut
9/60-6/69	Consultant to the Flight Safety Foundation, AvSER Div., Phoenix, Arizona
9/54-9/59	Balcones Research Center, University of Texas, Research Engineering

Awards, Scholarships, and Honor Societies:

Tau Beta Pi	Honor ME Graduate, Texas Tech
Alpha Chi	Honor Military Graduate, Texas Tech
Convair Excellence in Teaching Award, U. of Texas	Sigma Xi Member

Membership in Scientific and Professional Societies:

Registered Professional Engineer, Texas and Arizona

Principal Areas of Research and Teaching Interest:

Dynamics, Vibration, Impact, Space Mechanics, Aviation and Automotive Safety

Principal Publications:

"Cushioning for Air Drop, Part I," (with other authors). Published for the Quartermaster Food and Container Institute for the Armed Forces, Chicago, Illinois, July 1955, 80 pp.

"Cushioning for Air Drop, Part II, Air Drop Cost Analysis," (with C. C. Steyer). Quartermaster Food and Container Inst. for the Armed Forces, Chicago, Ill., April 1956, 37 pp. Unscheduled presentations of portions of this work were presented by Dr. Turnbow at two meetings: (a) Aerial Delivery Research Contractors Coordination Meeting at the Midwest Research Inst., Kansas City, Mo., Jan., 1956, and (b) The Aerial Delivery Research Symposium at Fort Lee, Virginia, April 1956.

"Cushioning for Air Drop, Part III, Characteristics of Paper Honeycomb under Dynamic Loading," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 1956, 9 pp.

"Cushioning for Air Drop, Part VII, Characteristics of Foamed Plastics under Dynamic Loading," Quartermaster Research and Engineering Command, Natick, Massachusetts, March 1957, 14 pp.

"High-Velocity Impact Cushioning, Part I, Drop-Test Facilities and Instrumentation," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 26, 1957, 31 pp.

"High-Velocity Impact Cushioning, Part II, Energy-Absorbing Materials and Systems," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 26, 1957, 41 pp.

"Properties of Materials at High Strain Rates, Part III, Material Properties and Wave Propagation," The Sandia Corporation, Albuquerque, New Mexico, January 5, 1959, 174 pp.

"High-Velocity Impact Cushioning, Part IV, The Effect of Moisture Content and Impact Velocity on Energy-Absorption Characteristics of Paper Honeycomb," Quartermaster Research and Engineering Command, Natick, Massachusetts, May 1, 1959, 40 pp.

"High-Velocity Impact Cushioning, Part V, Energy-Absorption Characteristics of Paper Honeycomb," Quartermaster Research and Engineering Command, Natick, Massachusetts, May 25, 1959, 106 pp.

"Application of Cushioning to Complex Structures," Aerial Delivery Impact Conference, Balcones Research Center, The U. of Texas, June 1959.

"The Energy-Dissipating Characteristics of Airbags," Quartermaster Research and Engr. Command, Natick, Mass., August 18, 1959, 52 pp.



Principal Publications: (continued)

- "Strain Rate Effects on the Stress-Strain Characteristics of Alum. and Copper," Midwestern Conf. on Fluid and Solid Mechanics, September 11, 1959, The University of Texas, Austin, Texas.
- "U.S. Army H-25 Helicopter Drop Test," U. S. Army TRECOM Contract DA-44-177-T6-624 (with Chance Vought Aircraft Corp.), December 15, 1960.
- "Army Aviation Safety," Final Report U.S. Army TRECOM Contract DA-44-177-T6-624 (with other authors), Dec. 30, 1960.
- "U.S. Army H-25 Helicopter Drop Test," 10/22060, TREC Tech. Report 60-76, AvCIR-2-TR-125, Aviation Crash Injury Research, Phoenix, Arizona, March 15, 1961.
- "A Dynamic Crash Test of an H-25 Helicopter," SAE Report 517A, Aviation Crash Injury Research, Phoenix, Arizona, April 1962, AvCIR 61-21.
- "Dynamic Crash Tests of Fixed-Wing and Rotary-Wing Aircraft as Related to Seat Design," Rothe, V.E. and Turnbow, J.W., AvCIR Technical Report 62-15, Aviation Crash Injury Research, Phoenix, Arizona, October 1962.
- "Military Troop Seat Design Criteria," Turnbow, J.W., Rothe, V.E., Bruggink, G.M. and Roegner, H.R., TRECOM Technical Report 62-79, U.S. Army Transportation Research Command, Fort Eustis, Virginia, November 1962.
- "Discussion of Postcrash Fire Problem," AvCIR Paper 62-30, Aviation Crash Injury Research, Phoenix, Arizona, Dec. 1962.
- "Crew Seat Design Criteria for Army Aircraft," Roegner, H.F. and Turnbow, J.W., TRECOM Technical Report 63-4, AvCIR 62-20, U.S. Army Transportation Research Command, Fort Eustis, Virginia, February 1963.
- "Dynamic Test of an Aircraft Litter Installation," Weinberg, L.W.T. and Turnbow, J.W., TRECOM Technical Report 63-3, AvCIR 62-63, U.S. Army Transportation Research Command, Fort Eustis, Virginia, March 1963.
- "Dynamic Test of a Commercial-Type Passenger Seat Installation in an H-21 Helicopter," June 1963, TRECOM Technical Report 63-24, AvCIR 62-25, U.S. Army Transportation Research Command, Fort Eustis, Virginia, June 1963.
- "Dynamic Test of an Experimental Troop Seat Installation in an H-21 Helicopter," Turnbow, J.W., Robertson, S.H., and Carroll, D.F., TRECOM Technical Report 63-7, U.S. Army Transportation Research Command, Fort Eustis, Va., Nov. 1963.
- "Theory, Development and Test of a Crash Fire-Inerting System for Reciprocating Engine Helicopters," Turnbow, J.W., Robertson, S.H., and Carroll, D.F., TRECOM Technical Report 63-49, U.S. Trans. Research Command, Ft. Eustis, Va., Dec. 1963.
- "A Review of Crashworthy Seat Design Principles," Turnbow, J.W. and Haley, J.L., Soc. of Autom. Engrs. Rep. #851A, New York, N.Y., April 1964.
- "Safety Engineering for Crash Injury Prev." Turnbow, J.W., Avery, J.A. and Haley, J.L., Soc. of Autom. Engrs. Paper, July 1964.
- "Survivability Seat Design Dynamic Test Program," (with L.W.T. Weinberg), USAAVLABS Tech. Rep. 65-43, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1965, 115 pp.
- "Crash Survival Eval. of the OH-4A Helicopter," (with others), AvSER M65-5, Aviation Saf. Engg. & Research, Phoenix, 1965, 36pp.
- "Crash Survival Eval. of the OH-4A Helicopter," (with others), AvSER M65-9, Aviation Saf. Engg. & Research, Phoenix, 6/8/65, 44pp.
- "Full Scale Dynamic Crash Test of a Small Observation Type Helicopter," Test No.'s 21 and 22, (with others), USAAVLABS Tech. Report 66-32, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1965, 39 pp.
- "Aircraft Fuel Tank Design Criteria," (with S.H. Robertson), USAAVLABS Technical Report 66-24, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 105 pp.
- "Helmet Design Criteria for Improved Crash Survival," (with others) USAAVLABS Technical Report 65-44, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 121 pp.
- "Impact Test Methods for Helmets, Supp. I to Helmet Design Criteria for Improved Crash Survival," USAAVLABS Tech. Report 65-44A, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 18 pp.
- "Test Results-Hemispherical Specimens, Supp. II to Helmet Design Criteria for Improved Crash Survival," (with J.L. Haley, Jr.), USAAVLABS Technical Report 65-44B, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Va., 1966, 17 pp.
- "Impact Test Methods and Retention Harness Criteria for U.S. Army Aircrewman Protective Headgear," (with J.L. Haley, Jr.), USAAVLABS Technical Rep. 66-29, U.S. Army Aviation Materiel Lab., Ft. Eustis, Va., 1966, 45 pp.
- "Crash Survival Eval. OH-6 Helicopter," (with J.L. Haley, Jr.) AvSER M67-3, Phoenix, Aviation Saf. Engg. & Res., 1967, 48 pp.
- "Crashworthiness Study for Passenger Seat Design-Analysis & Testing of Aircraft Seats," (with others), AvSER 67-4, Aviation Safety Engineering and Research, Phoenix, Arizona, 1967, 42 pp.
- "Floor Accelerations and Passenger Injuries in Aircraft Accidents," (with J.L. Haley, Jr.) USAAVLABS TR 67-16, U.S. Army Aviation Materiel Laboratories, Ft. Eustis, Va., May 1967, 46 pp.
- "Crash Survival Design Guide," (with others) USAAVLABS Technical Report 67-22, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, August 1967, 291 pp.
- "Crashworthiness of Aircrew Protective Armor," (with others) TR 68-57-CM, U.S. Army Natick Lab., Natick, MA, April 1968, 80 pp.
- "Total Reaction Force Due to an Aircraft Impact into a Rigid Barrier," (with J.L. Haley, Jr.) AvSER TR 68-3, Aviation Safety Engineering and Research, Phoenix, Arizona, April 1968, 17 pp.
- "An Evaluation of Armored Aircrew Crash Survival Seats," (with others) AvSER TR 68-4, Aviation Safety Engineering and Research, Phoenix, Arizona, May 1968, 81 pp.
- "Crashworthiness Study for Passenger Seat Design," (with others) NSR 33-026-0003, Nat'l Aero. & Space Adm., June 1968, 171 pp.
- "Tension and Damping Effects on Vibrating Strings," (with others) K002641, National Science Found., Feb. 1969, 230 pp.
- "The Basic Principles of Mechanics as Applied to Automotive Impact," Proceedings of UCLA Medical Seminar, June 16-27, 1969, 30 pp.
- "The Effects of Tension on Vibrating Strings," (with F.D. Norvelle) K002641, National Science Foundation, February 1970, 246 pp.
- "Preliminary Impact Speed and Angle Criteria for Design of a Nuclear Airplane Fission Product Containment Vessel," (with others), NASA Technical Memorandum TMX-2245, National Aeronautics and Space Admin., Washington, D.C., May 1971, 36 pp.
- "Response of a Seat-Passenger System to Impulsive Loading," (with J.A. Collins), Proceedings of Symposium on the Dynamic Response of Structures, Pergamon Press, 1972.

ARIZONA STATE UNIVERSITY

James W. Turnbow
Professor of Engineering

Degrees:

Ph. D.	University of Texas, 1959
M.S.E.M.	University of Texas, 1952
B.S.M.E.	Texas Technological College, 1940

Academic Experience:

1971-	Director Crash Injury Investigators School, Arizona State University
1959-	Arizona State University, Professor
1948-59	University of Texas, Assistant Professor
1948	Texas Technological College, Student Instructor
1940-41	Oklahoma A. & M. College, Instructor

Industrial Experience:

5/44-9/47	North American Aviation, Design Engineer
7/41-4/44	U. S. Army, Captain, Ordnance Department

Consulting Experience:

1972-	Aviation and Automotive Accident Investigation for various legal firms
1/72	Consultant to Sikorsky Aircraft, Stratford, Connecticut
9/60-6/69	Consultant to the Flight Safety Foundation, AvSER Div., Phoenix, Arizona
9/54-9/59	Balcones Research Center, University of Texas, Research Engineering

Awards, Scholarships, and Honor Societies:

Tau Beta Pi	Honor ME Graduate, Texas Tech
Alpha Chi	Honor Military Graduate, Texas Tech
Convair Excellence in Teaching Award, U. of Texas	Sigma Xi Member

Membership in Scientific and Professional Societies:

Registered Professional Engineer, Texas and Arizona

Principal Areas of Research and Teaching Interest:

Dynamics, Vibration, Impact, Space Mechanics, Aviation and Automotive Safety

Principal Publications:

"Cushioning for Air Drop, Part I," (with other authors). Published for the Quartermaster Food and Container Institute for the Armed Forces, Chicago, Illinois, July 1955, 80 pp.

"Cushioning for Air Drop, Part II, Air Drop Cost Analysis," (with C. C. Steyer). Quartermaster Food and Container Inst. for the Armed Forces, Chicago, Ill., April 1956, 37 pp. Unscheduled presentations of portions of this work were presented by Dr. Turnbow at two meetings: (a) Aerial Delivery Research Contractors Coordination Meeting at the Midwest Research Inst., Kansas City, Mo., Jan., 1956, and (b) The Aerial Delivery Research Symposium at Fort Lee, Virginia, April 1956.

"Cushioning for Air Drop, Part III, Characteristics of Paper Honeycomb under Dynamic Loading," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 1956, 9 pp.

"Cushioning for Air Drop, Part VII, Characteristics of Foamed Plastics under Dynamic Loading," Quartermaster Research and Engineering Command, Natick, Massachusetts, March 1957, 14 pp.

"High-Velocity Impact Cushioning, Part I, Drop-Test Facilities and Instrumentation," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 26, 1957, 31 pp.

"High-Velocity Impact Cushioning, Part II, Energy-Absorbing Materials and Systems," Quartermaster Research and Engineering Command, Natick, Massachusetts, August 26, 1957, 41 pp.

"Properties of Materials at High Strain Rates, Part III, Material Properties and Wave Propagation," The Sandia Corporation, Albuquerque, New Mexico, January 5, 1959, 174 pp.

"High-Velocity Impact Cushioning, Part IV, The Effect of Moisture Content and Impact Velocity on Energy-Absorption Characteristics of Paper Honeycomb," Quartermaster Research and Engineering Command, Natick, Massachusetts, May 1, 1959, 40 pp.

"High-Velocity Impact Cushioning, Part V, Energy-Absorption Characteristics of Paper Honeycomb," Quartermaster Research and Engineering Command, Natick, Massachusetts, May 25, 1959, 106 pp.

"Application of Cushioning to Complex Structures," Aerial Delivery Impact Conference, Balcones Research Center, The U. of Texas, June 1959.

"The Energy-Dissipating Characteristics of Airbags," Quartermaster Research and Engr. Command, Natick, Mass., August 18, 1959, 52 pp.



Principal Publications: (continued)

- "Strain Rate Effects on the Stress-Strain Characteristics of Alum. and Copper," Midwestern Conf. on Fluid and Solid Mechanics, September 11, 1959, The University of Texas, Austin, Texas.
- "U.S. Army H-25 Helicopter Drop Test," U. S. Army TRECOM Contract DA-44-177-T6-624 (with Chance Vought Aircraft Corp.), December 15, 1960.
- "Army Aviation Safety," Final Report U.S. Army TRECOM Contract DA-44-177-T6-624 (with other authors), Dec. 30, 1960.
- "U.S. Army H-25 Helicopter Drop Test," 10/22060, TREC Tech. Report 60-76, AvCIR-2-TR-125, Aviation Crash Injury Research, Phoenix, Arizona, March 15, 1961.
- "A Dynamic Crash Test of an H-25 Helicopter," SAE Report 517A, Aviation Crash Injury Research, Phoenix, Arizona, April 1962, AvCIR 61-21.
- "Dynamic Crash Tests of Fixed-Wing and Rotary-Wing Aircraft as Related to Seat Design," Rothe, V.E. and Turnbow, J.W., AvCIR Technical Report 62-15, Aviation Crash Injury Research, Phoenix, Arizona, October 1962.
- "Military Troop Seat Design Criteria," Turnbow, J.W., Rothe, V.E., Bruggink, G.M. and Roegner, H.R., TRECOM Technical Report 62-79, U.S. Army Transportation Research Command, Fort Eustis, Virginia, November 1962.
- "Discussion of Postcrash Fire Problem," AvCIR Paper 62-30, Aviation Crash Injury Research, Phoenix, Arizona, Dec. 1962.
- "Crew Seat Design Criteria for Army Aircraft," Roegner, H.F. and Turnbow, J.W., TRECOM Technical Report 63-4, AvCIR 62-20, U.S. Army Transportation Research Command, Fort Eustis, Virginia, February 1963.
- "Dynamic Test of an Aircraft Litter Installation," Weinberg, L.W.T. and Turnbow, J.W., TRECOM Technical Report 63-3, AvCIR 62-63, U.S. Army Transportation Research Command, Fort Eustis, Virginia, March 1963.
- "Dynamic Test of a Commercial-Type Passenger Seat Installation in an H-21 Helicopter," June 1963, TRECOM Technical Report 63-24, AvCIR 62-25, U.S. Army Transportation Research Command, Fort Eustis, Virginia, June 1963.
- "Dynamic Test of an Experimental Troop Seat Installation in an H-21 Helicopter," Turnbow, J.W., Robertson, S.H., and Carroll, D.F., TRECOM Technical Report 63-7, U.S. Army Transportation Research Command, Fort Eustis, Va., Nov. 1963.
- "Theory, Development and Test of a Crash Fire-Inerting System for Reciprocating Engine Helicopters," Turnbow, J.W., Robertson, S.H., and Carroll, D.F., TRECOM Technical Report 63-49, U.S. Trans. Research Command, Ft. Eustis, Va., Dec. 1963.
- "A Review of Crashworthy Seat Design Principles," Turnbow, J.W. and Haley, J.L., Soc. of Autom. Engrs. Rep. #851A, New York, N.Y., April 1964.
- "Safety Engineering for Crash Injury Prev." Turnbow, J.W., Avery, J.A. and Haley, J.L., Soc. of Autom. Engrs. Paper, July 1964.
- "Survivability Seat Design Dynamic Test Program," (with L.W.T. Weinberg), USAAVLABS Tech. Rep. 65-43, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1965, 115 pp.
- "Crash Survival Eval. of the OH-4A Helicopter," (with others), AvSER M65-5, Aviation Saf. Engg. & Research, Phoenix, 1965, 36pp.
- "Crash Survival Eval. of the OH-4A Helicopter," (with others), AvSER M65-9, Aviation Saf. Engg. & Research, Phoenix, 6/8/65, 44pp.
- "Full Scale Dynamic Crash Test of a Small Observation Type Helicopter," Test No.'s 21 and 22, (with others), USAAVLABS Tech. Report 66-32, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1965, 39 pp.
- "Aircraft Fuel Tank Design Criteria," (with S.H. Robertson), USAAVLABS Technical Report 66-24, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 105 pp.
- "Helmet Design Criteria for Improved Crash Survival," (with others) USAAVLABS Technical Report 65-44, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 121 pp.
- "Impact Test Methods for Helmets, Supp. I to Helmet Design Criteria for Improved Crash Survival," USAAVLABS Tech. Report 65-44A, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, 1966, 18 pp.
- "Test Results-Hemispherical Specimens, Supp. II to Helmet Design Criteria for Improved Crash Survival," (with J.L. Haley, Jr.), USAAVLABS Technical Report 65-44B, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Va., 1966, 17 pp.
- "Impact Test Methods and Retention Harness Criteria for U.S. Army Aircrewman Protective Headgear," (with J.L. Haley, Jr.), USAAVLABS Technical Rep. 66-29, U.S. Army Aviation Materiel Lab., Ft. Eustis, Va., 1966, 45 pp.
- "Crash Survival Eval. OH-6 Helicopter," (with J.L. Haley, Jr.) AvSER M67-3, Phoenix, Aviation Saf. Engg. & Res., 1967, 48 pp.
- "Crashworthiness Study for Passenger Seat Design-Analysis & Testing of Aircraft Seats," (with others), AvSER 67-4, Aviation Safety Engineering and Research, Phoenix, Arizona, 1967, 42 pp.
- "Floor Accelerations and Passenger Injuries in Aircraft Accidents," (with J.L. Haley, Jr.) USAAVLABS TR 67-16, U.S. Army Aviation Materiel Laboratories, Ft. Eustis, Va., May 1967, 46 pp.
- "Crash Survival Design Guide," (with others) USAAVLABS Technical Report 67-22, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, August 1967, 291 pp.
- "Crashworthiness of Aircrew Protective Armor," (with others) TR 68-57-CM, U.S. Army Natick Lab., Natick, MA, April 1968, 80 pp.
- "Total Reaction Force Due to an Aircraft Impact into a Rigid Barrier," (with J.L. Haley, Jr.) AvSER TR 68-3, Aviation Safety Engineering and Research, Phoenix, Arizona, April 1968, 17 pp.
- "An Evaluation of Armored Aircrew Crash Survival Seats," (with others) AvSER TR 68-4, Aviation Safety Engineering and Research, Phoenix, Arizona, May 1968, 81 pp.
- "Crashworthiness Study for Passenger Seat Design," (with others) NSR 33-026-0003, Nat'l Aero. & Space Adm., June 1968, 171 pp.
- "Tension and Damping Effects on Vibrating Strings," (with others) K002641, National Science Found., Feb. 1969, 230 pp.
- "The Basic Principles of Mechanics as Applied to Automotive Impact," Proceedings of UCLA Medical Seminar, June 16-27, 1969, 30 pp.
- "The Effects of Tension on Vibrating Strings," (with F.D. Norvell) K002641, National Science Foundation, February 1970, 246 pp.
- "Preliminary Impact Speed and Angle Criteria for Design of a Nuclear Airplane Fission Product Containment Vessel," (with others), NASA Technical Memorandum TMX-2245, National Aeronautics and Space Admin., Washington, D.C., May 1971, 36 pp.
- "Response of a Seat-Passenger System to Impulsive Loading," (with J.A. Collins), Proceedings of Symposium on the Dynamic Response of Structures, Pergamon Press, 1972.

RESUME

NAME: Charlie D. Turner, Jr.

ADDRESS:

PHONE: Home-
Office-(9A)- 737-2369

DEGREES: Ph.D. Aerospace Engineering
V.P.I. and State University
August, 1980

M.S. Aerospace and Ocean Engineering
V.P.I. and State University
December, 1976

B.S. Aerospace Engineering
University of Alabama
June, 1971

POSITIONS: July 1981 to present
Assistant Professor
Dept. of Mechanical and Aerospace Engineering
North Carolina State University
Raleigh, North Carolina

August 1980 to January 1981
Adjunct Professor
Dept. of Aeronautical Engineering
Wichita State University
Wichita, Kansas

May 1979 to July 1981
Structural Dynamics Engineer and F.A.A.
Designated Engineering Representative
Structural Dynamics Group
Beech Aircraft Corporation
Wichita, Kansas

November 1978 to May 1979
Group Leader Dynamics
Dynamics and Loads Group
Cessna Aircraft Company
Wichita, Kansas

June 1971 to October 1978
Aerospace Engineer
Loads and Dynamics Section
AFATL/DLJCS
Eglin A.F.B., Florida

PROFESSIONAL
INTERESTS:

1. Aircraft aeroelasticity and flight flutter testing.
2. Analytical and experimental structural dynamics.
3. Structural optimization.
4. Loads and stress analysis.
5. Flight Mechanics

PROFESSIONAL
AND

HONOR SOCIETIES: University of Alabama AIAA Student Section:
Vice-Chairman, Student Paper Award,
Outstanding Student Award.

University of Alabama Tau Beta Pi
University of Alabama Sigma Gamma Tau
Jacksonville State University Phi Mu Chi Beta

Wichita AIAA Section:
Council Member, Chairman Structural Dynamics
committee, Member Seventh Annual General
Aviation Technologyfest Committee,
Structural Dynamics Session Chairman for
Seventh Annual General Aviation Techno-
logyfest, Member Eighth Annual Techno-
logyfest Committee.

REPORTS AND
PAPERS:

"Static and Dynamic Stability of a Tractor
Trailer Truck," August, 1970, sponsored by
the National Science Foundation.

CAL (Captive Aircraft Loads) Series General
User's Manual, July, 1975.

F-4 CAL User's Manual-User's Manual for the
F-4 Aircraft, July, 1975.

A-7 CAL User's Manual-User's Manual for
the A-7 Aircraft, July, 1975.

"The Study of the Effect of Store Aero-
dynamics on Wing/Store Flutter," Ph.D.
Dissertation, V.P.I. and State University,
1980.

"The Effect of Store Aerodynamics on Wing/
Store Flutter," Fifth Aircraft/Stores
Compatibility Symposium, St. Louis, Mo.,
September, 1980.

"A Study of the Effect of Control Surface Aerodynamics on Flutter Analyses" Proceedings of the Conference on Finite Element Methods and Technology, Los Angeles, Calif., March, 1981.

"A Study of the Effect of Store Aerodynamics on Wing/Store Flutter" Proceedings of the AIAA/ASME/AHS Dynamics Specialist Conference, Atlanta, Ga., April, 1981.

JOB

RESPONSIBILITIES:

June, 1971-September, 1975

Developed a series of computer programs for the F-4 and A-7 aircraft that would take as inputs a mission profile and store aerodynamics to calculate the aircraft/pylon interface loads. Set up and carried out a wind tunnel test program using the F-4 aircraft and a flight test program using the F-4 and A-7 aircrafts to validate the computer programs.

June, 1975-October, 1978

Developed for the Air Force the flutter analysis capability on the F-4E slated aircraft and on the F-15 aircraft.

November, 1978-May, 1979

Reviewed analytical and experimental aeroelastic capability of Cessna Wallace in view of improving these capabilities. Used COSMIC and M\$C NASTRAN to study the fatigue/aeroelastic problem encounter on 441-006 aircraft. Developed a dynamic model of the Model 650 using NASTRAN.

May, 1979-July, 1981

Working with the M\$C Corporation, developed an aerodynamic matrix modification technique to be used in aeroelastic analysis. Analytical and experimental modal analysis on a Model G90. Preliminary flutter analysis on the Model G90, the Model 1900 commuter, and the Model 250. Analytical modal and flutter analysis of a composit stabilizer.

RESUME

NAME: Charlie D. Turner, Jr.

ADDRESS:

PHONE: Home-
Office-(919)- 737-2369

DEGREES: Ph.D. Aerospace Engineering
V.P.I. and State University
August, 1980

M.S. Aerospace and Ocean Engineering
V.P.I. and State University
December, 1976

B.S. Aerospace Engineering
University of Alabama
June, 1971

POSITIONS: July 1981 to present
Assistant Professor
Dept. of Mechanical and Aerospace Engineering
North Carolina State University
Raleigh, North Carolina

August 1980 to January 1981
Adjunct Professor
Dept. of Aeronautical Engineering
Wichita State University
Wichita, Kansas

May 1979 to July 1981
Structural Dynamics Engineer and F.A.A.
Designated Engineering Representative
Structural Dynamics Group
Beech Aircraft Corporation
Wichita, Kansas

November 1978 to May 1979
Group Leader Dynamics
Dynamics and Loads Group
Cessna Aircraft Company
Wichita, Kansas

June 1971 to October 1978
Aerospace Engineer
Loads and Dynamics Section
AFATL/DLJCS
Eglin A.F.B., Florida

PROFESSIONAL
INTERESTS:

1. Aircraft aeroelasticity and flight flutter testing.
2. Analytical and experimental structural dynamics.
3. Structural optimization.
4. Loads and stress analysis.
5. Flight Mechanics

PROFESSIONAL
AND

HONOR SOCIETIES: University of Alabama AIAA Student Section:
Vice-Chairman, Student Paper Award,
Outstanding Student Award.

University of Alabama Tau Beta Pi
University of Alabama Sigma Gamma Tau
Jacksonville State University Phi Mu Chi Beta

Wichita AIAA Section:
Council Member, Chairman Structural Dynamics
committee, Member Seventh Annual General
Aviation Technologyfest Committee,
Structural Dynamics Session Chairman for
Seventh Annual General Aviation Techno-
logyfest, Member Eighth Annual Techno-
logyfest Committee.

REPORTS AND
PAPERS:

"Static and Dynamic Stability of a Tractor
Trailer Truck," August, 1970, sponsored by
the National Science Foundation.

CAL (Captive Aircraft Loads) Series General
User's Manual, July, 1975.

F-4 CAL User's Manual-User's Manual for the
F-4 Aircraft, July, 1975.

A-7 CAL User's Manual-User's Manual for
the A-7 Aircraft, July, 1975.

"The Study of the Effect of Store Aero-
dynamics on Wing/Store Flutter," Ph.D.
Dissertation, V.P.I. and State University,
1980.

"The Effect of Store Aerodynamics on Wing/
Store Flutter," Fifth Aircraft/Stores
Compatibility Symposium, St. Louis, Mo.,
September, 1980.

"A Study of the Effect of Control Surface Aerodynamics on Flutter Analyses" Proceedings of the Conference on Finite Element Methods and Technology, Los Angeles, Calif., March, 1981.

"A Study of the Effect of Store Aerodynamics on Wing/Store Flutter" Proceedings of the AIAA/ASME/AHS Dynamics Specialist Conference, Atlanta, Ga., April, 1981.

JOB
RESPONSIBILITIES:

June, 1971-September, 1975

Developed a series of computer programs for the F-4 and A-7 aircraft that would take as inputs a mission profile and store aerodynamics to calculate the aircraft/pylon interface loads. Set up and carried out a wind tunnel test program using the F-4 aircraft and a flight test program using the F-4 and A-7 aircrafts to validate the computer programs.

June, 1975-October, 1978

Developed for the Air Force the flutter analysis capability on the F-4E slated aircraft and on the F-15 aircraft.

November, 1978-May, 1979

Reviewed analytical and experimental aeroelastic capability of Cessna Wallace in view of improving these capabilities. Used COSMIC and MSC NASTRAN to study the fatigue/aeroelastic problem encounter on 441-006 aircraft. Developed a dynamic model of the Model 650 using NASTRAN.

May, 1979-July, 1981

Working with the MSC Corporation, developed an aerodynamic matrix modification technique to be used in aeroelastic analysis. Analytical and experimental modal analysis on a Model G90. Preliminary flutter analysis on the Model G90, the Model 1900 commuter, and the Model 250. Analytical modal and flutter analysis of a composite stabilizer.

John Edwards -

^{partial}
Trial Testimony - 5/21/80

^{partial}
Trial Testimony - 5/31/80

Deposition - ()

William Timm

Trial Testimony - 3-18-80

Trial Testimony - 5-12-80

James Turnbow

Deposition - 8 Oct. 81

Report "Analysis of 'G' Levels

Associated with the C-5A

Accident near Saigon - April 4,

1975

- Distribution Pattern (4 April 75)

- Description of events - ()

- James attitude ()

Personnel location - ()

DEFT. EX. ~~DD~~ - # 2

DATE: 10/31/81 Turner

REPORTER: ALBERT J. GASDOR

Various pictures

two reels of motion
pictures

Index to Plaintiff's Deposition Vol. I

Friday - 16 Oct. 81
at 0900

Second call - 19 Oct. 81
about 1520 -

Dr. Milse Cohen - 24 Oct. 81
30 Oct. 81

Lockheed Report No. LG145-40-2-2
30 Sept. 1988

Internal Loads Analysis Aft Fuselage

Lockheed Report No. LG14554-12-1
Inertial Loads Report.

RESUME

NAME: Charlie D. Turner, Jr.

ADDRESS:

PHONE: Home-
Office-(9A)- 737-2369

DEGREES: Ph.D. Aerospace Engineering
V.P.I. and State University
August, 1980

M.S. Aerospace and Ocean Engineering
V.P.I. and State University
December, 1976

B.S. Aerospace Engineering
University of Alabama
June, 1971

POSITIONS: July 1981 to present
Assistant Professor
Dept. of Mechanical and Aerospace Engineering
North Carolina State University
Raleigh, North Carolina

August 1980 to January 1981
Adjunct Professor
Dept. of Aeronautical Engineering
Wichita State University
Wichita, Kansas

May 1979 to July 1981
Structural Dynamics Engineer and F.A.A.
Designated Engineering Representative
Structural Dynamics Group
Beech Aircraft Corporation
Wichita, Kansas

November 1978 to May 1979
Group Leader Dynamics
Dynamics and Loads Group
Cessna Aircraft Company
Wichita, Kansas

June 1971 to October 1978
Aerospace Engineer
Loads and Dynamics Section
AFATL/DLJCS
Eglin A.F.B., Florida

PROFESSIONAL
INTERESTS:

1. Aircraft aeroelasticity and flight flutter testing.
2. Analytical and experimental structural dynamics.
3. Structural optimization.
4. Loads and stress analysis.
5. Flight Mechanics

PROFESSIONAL
AND

HONOR SOCIETIES: University of Alabama AIAA Student Section:
Vice-Chairman, Student Paper Award,
Outstanding Student Award.

University of Alabama Tau Beta Pi
University of Alabama Sigma Gamma Tau
Jacksonville State University Phi Mu Chi Beta

Wichita AIAA Section:
Council Member, Chairman Structural Dynamics
committee, Member Seventh Annual General
Aviation Technologyfest Committee,
Structural Dynamics Session Chairman for
Seventh Annual General Aviation Techno-
logyfest, Member Eighth Annual Techno-
logyfest Committee.

REPORTS AND
PAPERS:

"Static and Dynamic Stability of a Tractor
Trailer Truck," August, 1970, sponsored by
the National Science Foundation.

CAL (Captive Aircraft Loads) Series General
User's Manual, July, 1975.

F-4 CAL User's Manual-User's Manual for the
F-4 Aircraft, July, 1975.

A-7 CAL User's Manual-User's Manual for
the A-7 Aircraft, July, 1975.

"The Study of the Effect of Store Aero-
dynamics on Wing/Store Flutter," Ph.D.
Dissertation, V.P.I. and State University,
1980.

"The Effect of Store Aerodynamics on Wing/
Store Flutter," Fifth Aircraft/Stores
Compatibility Symposium, St. Louis, Mo.,
September, 1980.

"A Study of the Effect of Control Surface Aerodynamics on Flutter Analyses" Proceedings of the Conference on Finite Element Methods and Technology, Los Angeles, Calif., March, 1981.

"A Study of the Effect of Store Aerodynamics on Wing/Store Flutter" Proceedings of the AIAA/ASME/AHS Dynamics Specialist Conference, Atlanta, Ga., April, 1981.

JOB
RESPONSIBILITIES:

June, 1971-September, 1975

Developed a series of computer programs for the F-4 and A-7 aircraft that would take as inputs a mission profile and store aerodynamics to calculate the aircraft/pylon interface loads. Set up and carried out a wind tunnel test program using the F-4 aircraft and a flight test program using the F-4 and A-7 aircrafts to validate the computer programs.

June, 1975-October, 1978

Developed for the Air Force the flutter analysis capability on the F-4E slated aircraft and on the F-15 aircraft.

November, 1978-May, 1979

Reviewed analytical and experimental aeroelastic capability of Cessna Wallace in view of improving these capabilities. Used COSMIC and M\$C NASTRAN to study the fatigue/aeroelastic problem encounter on 441-006 aircraft. Developed a dynamic model of the Model 650 using NASTRAN.

May, 1979-July, 1981

Working with the M\$C Corporation, developed an aerodynamic matrix modification technique to be used in aeroelastic analysis. Analytical and experimental modal analysis on a Model G90. Preliminary flutter analysis on the Model G90, the Model 1900 commuter, and the Model 250. Analytical modal and flutter analysis of a composit stabilizer.

B I O G R A P H I C A L D A T A

ROBIN I. WELCH

EDUCATION

Ph.D. Wildland Resource Science, University of
 California, Berkeley, 1971
M.S. Forestry, University of California, Berkeley, 1956
B.S. Forestry, University of California, Berkeley, 1955

PROFESSIONAL EXPERIENCE

Research and Management

November 1981 - Present

Operations Research Specialist at Lockheed Missiles and Space Company, Sunnyvale, California. Principal assignment involves technical support and project management in remote sensing applications and research for advanced systems programs with emphasis in computer aided image analysis.

1977 - September 1981

Contractor at National Aeronautics and Space Administration, Ames Research Center, in technology transfer of remote sensing data in Western Regional Applications Program (WRAP). This activity provided technical training in the application of sophisticated remote sensing technology using satellite, aircraft and ground data for 14 western states. Served on Multispectral Resource Sampler (MRS) Workshop Committee, Colorado State University, June 1979.

1975 - 1977

Associate Research Scientist, Remote Sensing Center, Visiting Associate Professor, Range Science Department, Texas A&M University. Staff assignments included managing programs in agricultural remote sensing and Landsat II study of rangeland resource inventory, consulting with NASA scientists on devising methods for inventorying wheat crops on a worldwide basis in the Large Area Crop Inventory Experiment (LACIE) and assisting in obtaining and analyzing remote sensing data for aquatic plant monitoring, agricultural crop assessment and coastal zone management. Taught graduate course in remote sensing of earth resources. Managed Active Microwave Users Workshop, Houston, Texas, August 1976.

PROFESSIONAL EXPERIENCE (Continued)

Research and Management (Cont'd)

1970 - 1975

Assistant to the Director, Earth Satellite Corporation, Berkeley office. Responsible for office management, research planning and management, training programs for both foreign and U.S. remote sensing courses (2-week and 2 - 1/2-month short courses), flight operations, project and office accounting and sales activities. Served as co-investigator on ERTS and Skylab projects for agricultural crop inventory and yield studies, and in forest insect detection on ERTS images. Served as project manager on EPA spill prevention project using multiband remote sensing, kelp inventory for Pacific Gas & Electric thermal outfall monitoring on California coast, project to select sites for underwater parks on California coast by remote sensing for California Department of Parks and Recreation, and on several training courses in remote sensing of earth resources. Served as consultant in Argentina, Greece and Guatemala for remote sensing planning projects. Served as photo pilot.

1966 - 1970

Senior research engineer at Stanford Research Institute, Menlo Park, California. Served as project leader in multispectral research and photo interpretation for long range planning of military reconnaissance, and in the use of remote sensing in water pollution and water resource studies. Provided guidance in defining remote sensing requirements for Alaska natural resource studies and environmental planning. Contributed to projects on urban analysis, transportation planning, coastal zone management, agricultural inventory and economic analysis of the remote sensing industry. Served as research photo pilot.

1963 - 1966

Research engineer at Mark Systems, Inc. of Santa Clara, California. Served as project leader in multispectral research and photo interpretation for military and natural resource studies specializing in agricultural crop inventory and yield estimation. Involved in one of the first space photo interpretation projects for Athena re-entry tests. Developed photo-optical instrumentation specifications and design. Served as research photo pilot.

PROFESSIONAL EXPERIENCE (Continued)

Research and Management (Cont'd)

1956 - Present

President of Airview Specialists Corporation. Assignments include managing projects in applying advanced remote sensing technology; teaching image analysis, data collection and system operation; research and development of advanced aircraft and spacecraft remote sensing systems, image interpretation systems and applications; special projects in inventory and analysis of natural resources with emphasis in vegetation, water, marine, urban and wildland investigations; and extensive experience in service to industrial businesses in agriculture, rangeland, forestry, geologic, urban and utility areas as well as military reconnaissance activities. These activities have been conducted in North, Central and South America, Middle East, Far East, Africa, South East Asia, Australia, Mediterranean, South Pacific, Soviet Union, Europe and Asia. Served as corporate photo pilot.

PUBLICATIONS

See attached list.

MILITARY

1951 - 1953

U.S. Air Force, Jet Flighter Pilot. Honorable discharge (Disability retirement).

PUBLICATIONS OF ROBIN I. WELCH

Contribution to Chapter 2 in Manual of Photo Interpretation. American Society of Photogrammetry. 1960.

Aerial Photography as a Basis for Determining Fruit and Nut Tree Acreages. A paper for the State of California Department of Agriculture. 1962.

Remote Detection of Minefields. Final Report and Manual. U.S. Army Corps of Engineers. 1962.

Photo Interpretation Keys for Classification of Agricultural Crops. Final Report. U.S. Army Corps of Engineers. 1963.

Biochemical Warfare Analysis by Aerial Reconnaissance. Unpublished paper. 1965.

Penetration of Camouflage Materials by Photographic Techniques. Final Report. U.S. Army. 1965.

The Use of Aerial Photography in Agricultural Crop Analysis and Yield Determination. Technical Publication TB-1, Mark Systems, Inc., Santa Clara, California. 1965.

An Evaluation of Agricultural Crops by Remote Sensing. Final Report (Classified). U.S. Government. 1966.

Detecting Chlorosis of Vegetation by Aerial Photography. Final Report. U.S. Army Corps of Engineers. 1967.

Remote Sensing Systems in Water Control Programs. Paper presented at Third Annual Conference on Remote Sensing of Air and Water Pollution, Sacramento, California. 1967.

Development of a Psychophysical Photo Quality Measure. Final Report. U.S. Army Personnel Research Office. 1968.

Remote Sensing Techniques for Planning, Evaluation, and Monitoring Agricultural Crops. Working paper, Stanford Research Institute. 1968.

Remote Sensing in California Water Resource Management. Paper presented at the American Society of Photogrammetry Annual Meeting, published proceedings. March 1968.

Remote Sensing. Stanford Research Institute Journal, No. 19. March 1968.

Detecting Oil Slicks on Water by Multiband Aerial Photography. Stanford Research Institute. Final Report to Chevron Research Corp. 1969.

The Use of Remote Sensing in Water Resource Management. Stanford Research Institute R&D project. (Ph.D. Dissertation) 1969.

The Use of Color Aerial Photography in Water Resource Management. Paper presented at Photo Exposition 1969, New York Coliseum, published proceedings. June 11, 1969.

The Use of Remote Sensing in Water Resource Management. Paper presented at Eutrophication and Biostimulation Assessment Workshop, Berkeley, California, published proceedings. June 21, 1969.

The Use of Remote Sensing in Alaska Water Resource Management. Symposium proceedings, Remote Sensing in Alaska. December 1969.

An Environmental Monitoring Program for the Sacramento-San Joaquin Delta and Suisun Bay. State Water Resources Control Board, final report, the Resources Agency, State of California, Sacramento, California, Stanford Research Institute, Menlo Park, California. May 1970.

Use of Aerial Remote Sensing in Water Resource Management. Lecture for Ecology 201C, The Changing Biosphere, University of California, Davis. May 12, 1970.

Remote Sensing in Hydrology. Paper presented at University of California, Riverside. July 27, 1970.

The Use of Remote Sensing in Providing the Environment and Location of Leisure Facilities. Paper presented at Conference on the Economics of Leisure, Denver, Colorado. October 26, 1970.

The Use of Remote Sensing in Hydrology in Argentina. Draft for publication in government sponsored scientific journal in Argentina. November 1970.

Case Studies in Water Pollution Detection by Remote Sensing--Multispectral Approach. Paper presented at Institute on Remote Sensing of Environmental Pollution, University of Wisconsin, Madison, Wisconsin. November 4, 1970.

The Use of Remote Sensing in Natural Resources and Pollution Control. Paper presented to class on Environment and Pollution at York University, Toronto, Canada. November 5, 1970.

Monitoring Earth Resources from Aircraft and Spacecraft, Chapter 7. National Aeronautics and Space Administration. NASA SP-275. 1971.

Evaluating Growing Conditions and Crop Yields in Agriculture by Remote Sensing. Paper given at the Third Biennial Workshop, Color Aerial Photography in the Plant Sciences and Related Fields, University of Florida, Gainesville, Florida. March 2, 3, 4, 1971.

Remote Sensing: Environment, Ecology, Pollution, Conservation, Development and Resources. Town Hall Reporter. May 1971. Proceedings of Environmental Engineering, Mileau Information Service. July 1971.

A Feasibility Demonstration of an Aerial Surveillance Spill Prevention System (with Allan D. Marmelstein and Paul M. Maughan). Published by the Office of Research and Monitoring, Environmental Protection Agency. January 1972.

Remote Sensing: Aerial Aid for the Water Resource Planner. Modern Government. Servicios Publicos. August 1972.

A Demonstration of the Usefulness of Ektachrome Infrared Aerial Photography to Inventory Kelp on the California Coast at Three Selected Locations: Diablo Canyon, Davenport and Mendocino. Final Report to Pacific Gas and Electric Company. Co-author Steven L. Wert. October 1972.

Applications of Remote Sensing in Studying Effects of Engineering Works on the Environment. Institute of Transportation and Traffic Engineering Conference Proceedings, University of California. October 1972.

Aerial Spill Prevention Surveillance During Sub-Optimum Weather. EPA-R2-73-243. U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C. September 1973.

A Comparison of Skylab and ERTS Data for Agricultural Crop and Natural Vegetation Interpretation (with L.R. Pettinger and C.E. Poulton). Paper presented to AIAA/AGU Conference on Scientific Experiments of Skylab, AIAA Paper No. 74-1219, Huntsville, Alabama. October 30-November 1, 1974.

A Scheme for the Uniform Mapping and Monitoring of Earth Resources and Environmental Complexes. An Assessment of Natural Vegetation, Environmental and Crop Analogs. Co-author Charles E. Poulton. Final Report to Goddard Space Flight Center, Greenbelt, Maryland. 1975.

Water Resources Assessment. Co-author, Chapter 19, Manual of Remote Sensing. American Society of Photogrammetry. 1975.

Remote Sensing for Land and Resource Management in the South and Southwest. Author/Editor, Conference Proceedings. Remote Sensing Center, Texas A&M University. September 28-29, 1976.

Analyst Interpreter Keys, Vol. I and Vol. II, Large Area Crop Inventory Experiment (LACIE). Consulting Author/Editor. Johnson Space Center, Houston, Texas. January 1977.

Conference of Remote Sensing Educators (CORSE-78) Proceedings - Author/Editor. NASA Ames Research Center, Western Regional Applications Program, June 1979.

- Poulton, C. E. and Robin I. Welch. 1979-1981. Digital Analysis of Landsat Data - The Woodside Quadrangle:
Introduction and Background Information
Exercise 1: Familiarization and Use of Line Printer Output
Exercise 2: Clustering and Classification using an Unsuper-
vised Approach (with Dave Morse)
Exercise 4: Verification and Accuracy Check
Simulated Field Trip and Image Familiarization Slide/Tape
- Poulton, C. E. and Robin I. Welch. 1979. Ground Data Verification Methods - Laboratory Exercise
- Poulton, C. E. and Robin I. Welch. 1980. Visual Interpretation of Remote Sensing Photography/Imagery (A Self-Study Module)
- Poulton, C. E. and Robin I. Welch. 1980. Where Remote Sensing Fits in Resource Planning, Development and Management: What the Administrator Needs to Know or Appreciate
- Poulton, C. E. and Robin I. Welch. 1980. Remote Sensing; What Is It?
- Poulton, C. E. and Robin I. Welch. 1980. Preparing Aerial Photographs for Stereo Interpretation, Measurement and Data Transfer
- Poulton, C. E. and Robin I. Welch. 1980. Determination of Information Classes - Legends and Mapping Guidelines
- Poulton, C. E. and Robin I. Welch. 1980. Visual Interpretation of Landsat Images, Highlight and Conventional Aerial Photography - Laboratory Exercise
- Poulton, C. E. and Robin I. Welch. 1980. Work Flow in Remote Sensing Applications: A Conceptualization Leading to the Design of an Integrated System to Acquire Information
- Welch, Robin I. and C. E. Poulton. 1979. The Basic Physics of Remote Sensing, Matter and Energy Relationships
- Welch, Robin I. and C. E. Poulton. 1979. Glossary - Common Terms and Acronyms
- Welch, Robin I. and C. E. Poulton. 1979. Ground Data Verification Methods
- Welch, Robin I. and C. E. Poulton. 1979. Remote Sensing Systems - Photographic and Imaging, Active and Passive
- Welch, Robin I. and C. E. Poulton. 1980. Geometry of Aerial Photographs (Measurements, Displacements, Distortions)
- Welch, Robin I. and C. E. Poulton. 1980. History of Remote Sensing
- Welch, Robin I. and C. E. Poulton. 1981. Image Interpretation Keys and Aids

LECTURES AND PAPERS

Remote Sensing in Alaska Mineral Exploration, testimony presented to Yukon-Taya Commission, Juneau, Alaska, April 1970.

Remote Sensing--A Window Into our Environment, invited lecture to College of Engineering, University of California, Berkeley, January 29, 1971.

Invited testimony on Coastline Preservation in Monterey County, AB 1471, Paul Priolo, Chairman, April 23, 1971.

Remote Sensing, paper presented to Oceanography, Natural Resources, and Systems & Technology Sections, Colonel T. R. Gillenwaters, Vice Chairman, published in Town Hall Reporter, May 1971.

Use of Remote Sensing in Agriculture, invited lecture presented on the occasion of the visit of Dr. Robert Chandler, Director of Rice Institute, Philippines, to the Ames Research Center, May 21, 1971.

Remote Sensing Data Acquisition Systems, lecture given at San Jose State College, August 11, 1971.

Waste Management Planning and Pollution Detection in the Urban Environment, invited paper presented at University of Wisconsin, Madison, Wisconsin, October 1971.

Environmental Considerations in Coastal Zone Planning, lecture presented to the State of California, November 1971.

Sensing Land Pollution, invited paper presented to AIAA Symposium on Sensing of Environmental Pollutants, Palo Alto, California, November 8, 1971.

Photo Interpretation Report on Underwater Park and Recreation Use of Shoreline Area from Partington Cove North to Mouth of Big Sur River, Special Report for Department of Parks and Recreation, State of California, January 1972.

An Aerial Surveillance Spill Prevention System, presented at EPA Conference on Spill Prevention, Houston, Texas, March 1972.

Remote Sensing: Environment, Ecology, Pollution, Conservation, Development, and Resources, lecture presented at MIS, April 1972.

Estimating Rice Crop Production by ERTS-1 Imagery, presented at NASA, Goddard, Greenbelt, Maryland, October 29, 1973.

The Use of Remote Sensing in Water Resource Management, presented at the Conference on Resource Evaluation through Remote Sensing and Satellite Imagery, sponsored by Idaho Department of Water Resources and Idaho Water Resources Research Institute, Boise, Idaho, July 23, 1974.

Remote Sensing in Agricultural Crop Production Analysis, Special Seminar presented at Texas A&M University, College of Agriculture, Department of Soil and Crop Sciences, College Station, Texas, November 1, 1974.

Remote Sensing Short Course, University of Texas, August 18-20, 1976.

Water and Environmental Engineering, Session Chairman, American Society of Photogrammetry Semi-annual Meeting, Seattle, Washington, October 1, 1976.

A Bird's-eye View of a Water-level Problem, Marina Management and Operational Seminar, A Sea Grant Advisory Program, Austin, Texas, October 20, 1976.

Remote Sensing Lecture, National Conference of State Legislators, New Orleans, Louisiana, September 12-13, 1977.

Remote Sensing Lecture, National Conference of State Legislators, Aspen, Colorado, September 23-24, 1977.

Remote Sensing Lectures, State of Hawaii personnel, Honolulu, September 29-30, 1977.

Remote Sensing Lectures, State of Montana personnel, Helena, October 26, 1977.

Remote Sensing Lecture, National Conference of State Legislators, Lake Tahoe, California, November 8-9, 1977.

Remote Sensing Lecture, San Diego State University faculty, November 21, 1977.

Remote Sensing Short Course, State of Hawaii personnel, Hilo and Honolulu, December 12-14, 1977.

Remote Sensing Short Course, State of Montana personnel, Helena, January 24-25, 1978.

Remote Sensing Lecture, Landsat Education Conference, Santa Maria, California, March 3, 1978.

Remote Sensing Lecture, Earth Resources and Remote Sensing, College of San Mateo, March 15, 1978.

Lectures, Remote Sensing Training Course Modules - NASA Western Regional Applications Program, Ames Research Center:

The Basic Physics of Remote Sensing, Matter and Energy Relationships, March 1979.
Ground Data Verification Methods, April 1979.
Image Interpretation Keys and Aids, April 1979.

Water and The People. Paper prepared for Proceedings, Fall Convention, American Society of Photogrammetry, September 1979.

Remote Sensing Lectures - Western Regional Applications Program (WRAP) - Training Courses (Continued)

Helena, Montana Department of Fish and Game, August 21-25, 1978

Humboldt State University Faculty, Arcata, CA September 11-15, 1978

California Department of Forestry, Ames Research Center, October 2-6, 1978

U. S. Forest Service, Ames Research Center, January 29-February 2, 1979

Colorado State University, Fort Collins, January 9-11, 1980

Staff Training at Ames Research Center, January 7, 1980

Association of Bay Area Governments (ABAG) - California Department of Forestry, Ames Research Center, March 3-6, 1980

State and Federal Agencies involved in Eruption of Mt. Saint Helens Survey, Olympia, Washington, July 30-August 1, 1980

Electric Power Research Institute (EPRI), Ames Research Center, October 20, 1980

Pre-VICAR Training Course, Ames Research Center, October 23-24, 1980

Landsat in the National Water Use Program, Ames Research Center, Nov. 4-7, 1980

Staff Training, Ames Research Center, December 8-10, 1980

NASA U-2 and Landsat Coverage of Mount Saint Helens Eruption, Eastern Washington University, Cheney, Washington, May 17-18, 1981

Remote Sensing for Public Utility Industry, Ames Research Center, Sept. 24-25, 1981