

**WOMEN IN  
AVIATION AND  
SPACE**

By

Dr. Sandra H. Flowers  
and  
Michael H. Abbott

**U.S. Department of Transportation  
Federal Aviation Administration**

ALABAMA AVIATION & TECHNICAL COLLEGE  
P.O. Box 1209 Ozar, AL 36361-1209

## Foreword

By Dr. Sandra H. Flowers and Mr. Michael H. Abbott

The Federal Aviation Administration, as part of its effort to plan for the future of air transportation, conducts an Aviation Education Program to inform students, teachers and the public about the nation's air transportation system. Aviation offers many varied opportunities for exciting and rewarding careers. Therefore, the FAA supports the development and dissemination of this brochure and others in the FAA Aviation Careers Series, to provide information that will be useful in making career decisions.

The purpose of *Women in Aviation and Space* is to provide women and girls with role models in a variety of aviation and aerospace career fields. The women who are profiled in this publication were nominated by aviation business and industry; government agencies (the Federal Aviation Administration, the National Aeronautics and Space Administration and the Hawaii Department of Transportation); general aviation societies and organizations (WhirlyGirls, Society of Women Engineers, General Aviation Manufacturers Association, National Association of Flight Instructors, Aircraft Owners and Pilots Association, the National Agricultural Aviation Association, Negro Airmen International and the American Association of Airport Executives); The Smithsonian Air and Space Museum; and the Armed Forces.

The 46 women featured here represent a variety of ages, different racial and ethnic backgrounds, and various geographic regions throughout the United States. They responded to questions about their work histories, families, training experiences, exciting aspects of their career, support organizations and future goals. They were also asked to provide tips on how women can successfully pursue an aviation or aerospace career.

We hope that reading about these successful women will be a source of inspiration to other women who wish to explore aerospace careers. We especially hope that young girls will learn the importance of math and science education to their future in these careers.



Mr. Michael H. Abbott, Special Projects Coordinator, And Dr. Sandra H. Flowers,  
Director of Institutional and Student Development, Alabama Aviation and Technical College, Ozark.

## Flight



Laura J. Goldsberry, (B.S., professional pilot technology, B.A., English),  
a Customs pilot based in Tucson, Ariz.

**Laura Goldsberry** is a federal officer and pilot for the U.S. Customs Service. She flies a Citation jet, used for intercepting and tracking suspect aircraft, and a UH-60 Blackhawk helicopter, used for transporting arrest teams and for assisting in a wide variety of law enforcement functions. She is also a training officer in single- and light twin-engine aircraft.

“As a Customs pilot,” says Laura, “I enjoy the diversity of flying both airplanes and helicopters--and the challenge of pursuing suspect aircraft through mountainous terrain (often at night without lights), then landing in makeshift runways, roads or dry lake beds to arrest the violators.” It was at a college career day sponsored by her high school that Laura found a brochure for a college with an aviation program. “I decided that was my cue. What was the point of having crazy dreams if you didn’t dare to make them come true?” She graduated from Purdue University, and later became the first female member of the university’s general flight technology department.

“Aviation can be combined with a multitude of other career fields, some yet to be discovered,” adds Laura. “Education is the first step, and helps develop self-assurance.”



Airline captain Shirley Shannon of Forest Falls, Calif.

**Shirly Shannon** flies as the captain of a Boeing 727 jet for Delta Airlines and is the company's first female to do so. When originally hired in 1976 by Western Airlines (which later merged with Delta), she was the nation's fourth female pilot to be hired by a major airline.

Her early flying jobs included a wide variety of experience. She flew passengers throughout the Hawaiian Islands in a single-engine airplane; was a civilian instructor pilot at the U.S. Army's Aviation School; was an airborne cowgirl who rounded up wild horses, flew the fences and found lost cattle; flew bodies for a mortuary; flew an air ambulance; flew sight-seeing tours in the Grand Canyon; flew for a commuter airline; and flew scientists over ground zero during underground bomb test explosions in Nevada.

Shirley is also a certified aircraft mechanic, having earned her FAA Airframe and Powerplant license from Alabama Aviation and Technical College. Among the many demands of being an airline captain, she includes being "physically healthy enough to withstand the rigors of disjointed sleep schedules, being away from home for many days at a time and heavy study requirements." She also includes "never, ever, being late for work."



Angelia M. Myles (B.S., criminal justice) a police helicopter pilot in Compton, CA.

**Angela Myles** is a police officer and helicopter pilot for Compton, CA, located within Los Angeles County. As a police officer for 11 years, she worked on patrol, narcotics and vice before training as a helicopter pilot. For the past five years, she has patrolled Compton from 500 feet in the air. Angelia thought the police academy was the hardest thing in the world that she would ever have to go through “until my first experience in a helicopter. The words ‘hard’ and ‘difficult’ took on a whole new meaning. But I was determined and I excelled.”

When she finished flight training, she became the first female African American helicopter pilot as well as the first female law enforcement helicopter pilot of the West Coast. Along the way, she picked up the nickname of “Ladyhawk” in the Compton Police Department.

Angelia loves her job. She says, “Where else can you play hide and seek with the high rise office buildings of downtown, and chase a fleeing vehicle at low altitudes or chase a crook until he is totally exhausted and your breathing hasn’t changed a bit?” To other women looking at aviation careers she advises, “Be positive, never limit yourselves or let anyone else detain, deter or distract you from your goals.”



Charter/corporate pilot Elaine Berryman (B.A., political science)  
of Seattle, Wash.

**Elaine Berryman** is a corporate pilot with an air charter company in the Pacific Northwest. She is the first telltale pilot ever hired by the company and now flies a variety of turbo-prop and executive jet aircraft throughout the U.S., Canada and Mexico.

"Although I had taken flying lessons after college I didn't consider it a career option until I saw a recruiting poster seeking potential military aviators--and it wasn't gender specific!" says Elaine. She applied for the U.S. Army Flight Program in 1985 was accepted and later earned her Army aviator wings as an honor graduate. During her five years in the military she was qualified in a variety of fixed- and rotary-wing aircraft. Although no longer on active duty Elaine continues her association with the military as a flight operations officer and U-21 pilot-in-command in the Oregon National Guard.

"I have been encouraged and supported in my aviation career and love of flying by my family--particularly my father whose 25-year flying career began in the Army Air Corps during World War II" says Elaine. From jumping out of helicopters and airplanes to flying them she adds, aviation is "a rewarding and endlessly varying profession.



Katherine A. (Kay) Brick (B.S., education; M.A., psychology), of Fallbrook, Calif., a pilot and aviation writer, administrator and lecturer.

**Kay Brick** serves as vice president of the Silver Wings Fraternity having retired from a multi-faceted aviation career that began during World War II. "It did not start as a dream come true" she says of her career "but developed as opportunities presented themselves." Kay taught physical education health and English for 13 years. While teaching she earned her pilot's license in 1941 and joined the Civil Air Patrol.

During World War II Kay was accepted into the Women Airforce Service Pilot (WASP) program and earned her military wings. During her two years in the military she flew a wide variety of fighter, bomber, trainer and cargo aircraft on ferry flights and tow target missions.

After the war, Kay got into the business of selling aircraft and ferrying aircraft from factories to the U.S. Canada and on one occasion, Australia. These opportunities provided many experiences for writing articles and stories for a variety of aviation publications.

"It is the era of the air," says Kay. "So many diverse opportunities exist for women today. The building blocks for women in aviation were laid 50 years ago. Now aspirants, your timing is right. GO FOR IT!"



Aerobatic pilot Patty Wagstaff, from Anchorage, Alaska.

**Patty Wagstaff**, the first woman to ever win the title of U.S. National Aerobatic Champion won the title in 1991 1992 and 1993 as well as the title of International Aerobatic Club champion in 1993.

Flying is a family occupation for Patty. Her husband taught her to fly and is himself president of the U.S. Aerobatic Foundation; her father is a retired 747 captain for Japan Airlines; and her sister is a 727 pilot for Continental Airlines in Guam. "I have always sought the help of the 'masters' and have been lucky to have had some fantastic coaching from the best in my field," says Patty.

Patty held a variety of jobs before settling into aviation: model, TV actress in Japan waitress diver and fisherperson, student of Eskimo culture office manager and economic developer. She left all this behind when she began flying. "One of the most enjoyable parts of my job are the people I have met " she says. "I have wonderful friends all over the world that I have met through aviation.

"I try to train every day during the aerobatic season, about eight months a year," continues Patty. "The training is really intense and physically demanding. Aerobatics is as athletic as any sport I have ever seen."



Maj. (Dr.) Rhonda L. Cornum (B.S., microbiology and genetics; Ph.D., biochemistry; MD.), a flight surgeon from Dayton, Ohio.

**Maj. (Dr.) Rhonda Cornum** is a U.S. Army flight surgeon currently serving in the urology residency program at Brook Army Medical Center in San Antonio, Tex. She became the focus of national news media when, during Operation Desert Storm, the UH-60 Blackhawk helicopter she was on was shot down behind enemy lines deep inside Iraq. Five crew members were killed, but Rhonda and two others survived with serious injuries and were taken prisoner.

Rhonda is the first female flight surgeon to ever go to war with an attack helicopter battalion. Since that time, she has published a book, *She Went to War*, describing her experiences.

Rhonda came into the Army to do metabolic and blood transfusion research. After four years she decided to go to medical school. She says, "I believe the three most important factors which will ensure success as a flight surgeon are: (1) you must enjoy taking care of people; (2) you should really love flying; and (3) you must support the mission of the military service you are in."



Evie L. Washington (B.S., psychology; M.S., supervision and management/business administration), an instructor pilot in Washington, D.C.

**Evie Washington** is a certified flight instructor and a board member of Opportunity Skyway, an organization which encourages women, disadvantaged and minority students interested in aviation. She is the first and only known black female currently working with both single and multi-engine flight instructor ratings in the Mid-Atlantic region. She also serves as a mission-rated and cadet orientation pilot with the Civil Air Patrol.

Much of her time is spent flying Opportunity Skyway students teachers and others on orientation flights. She also volunteers as a classroom and airplane flight instructor for the Aviation Careers Education (ACE) program camp for young people during the summer. This Camp is sponsored by the FAA Organization of Black Airline Pilots and Morgan State University. Other students fly with her through the experimental Aircraft Association's "Young Eagle Flight" program.

Evie's goals include getting a job flying for a government agency, a corporation or the airlines. "I would love to see more women in top management decision making positions in all areas of aviation and aerospace."

Evie's advice to young women: "Aim very very high! Set no limits on yourself and be your worst critic as well as your greatest supporter."



Lt. Angie D. Norman (B.A., sociology), Lt. Charlene P. Wagner (B.A., criminology and political science) and Chief Warrant Officer Two Cathy E. Jarrell (B.A., psychology)--the Army's first female attack helicopter pilots.

In July 1993 the U.S. Army graduated its first female attack helicopter pilots. Women had flown other types of Army aircraft since the 1970s but it was not until 1993 that Congress changed its policy and opened combat aircraft to women as well as men. Lt. Angie Norman and Chief Warrant Officer Two Cathy Jarrell were both selected to attend the AH-64 Apache qualification course. Lt. Charlene Wagner was selected to attend the AH-1 Cobra qualification course. All three completed their training in July 1993 and are currently serving as attack helicopter pilots in three separate organizations.

**Angie Norman** entered the Army Reserve in 1983 and served as a medical specialist with an Army evacuation hospital in Oklahoma City. While earning her bachelor's degree in sociology from Alabama A&M University she was also a Distinguished Military Graduate of the ROTC program. She was the first woman from her university to be selected for the new Army Aviation branch. After graduation she entered active duty and began flight school.

As a UH-1 Huey pilot, Angie was assigned to Fort Polk, La. There, she held positions as assistant logistics officer, platoon leader and company executive officer. Currently, she is the battalion intelligence officer and an Apache attack pilot with the 2/229 Attack Helicopter Battalion at Fort Rucker, Ala.

"I am not married " says Angie but I do have a very supportive family--and of course to your mother you are the most famous person in the world." Angie aspires to become a battalion commander some day and later a general officer. She advises other women "Study hard; nothing is out of your reach. Sometimes you have to set more than one goal in life; reach it and continue with the next one. Sooner or later you are bound to reach the stars."

**Charlene Wagner** earned her bachelor's degree from Purdue University in 1992. She was a Distinguished Military Graduate and an honor graduate of Purdue's ROTC program. Following graduation she entered active duty and began flight school. Midway through her training Charlene was selected to become a Cobra pilot and completed her training in that aircraft.

Charlene currently serves in Korea with an attack helicopter battalion. She is an active member in a number of organizations including Officers' Christian Fellowship and Army Aviation Association of America.

**Cathy Jarrell** entered active duty in 1990 and graduated from flight school in 1991. She served her first assignment as a UH-1 Huey pilot in Korea and after one year was transferred to Fort Campbell, Ky. While there she was selected to attend the AH-64 Apache course. Upon graduation she returned to Fort Campbell where she serves as an Apache attack pilot with 1/101 Attack Helicopter Battalion.

Cathy's future goals include becoming a helicopter instructor pilot or a maintenance officer. She encourages young women to "apply for Warrant Officer Flight Training. Army Aviation is an exciting and challenging career."



Zoe Ann Roach, a commercial cargo pilot in Honolulu, Hawaii.

**Zoe Ann Roach** is fully involved in aviation from two aspects. For the past 15 years she has been a full-time first flight attendant for Aloha Airliens, an inter-island carrier in Hawaii. She also holds an FAA commercial pilot certificate and flies cargo with a Part 135 carrier. She “fell in love with flying” the day she took a \$20/20 minute “Discovery Flight” in 1990. Zoe Ann was also very involved in promoting tourism in the islands as Miss Hawaii 1983.

In 1992, when Hurricane Iniki destroyed much of the Island of Kauai, Zoe Ann assisted in recovery operations by flying sunrise-to-sunset flights to take emergency food and supplies to the island. “It looked like a war zone,” she recalls, but “it was a heart-warming experience” contributing to the relief of others.

Zoe Ann’s goal is to eventually “move from the cabin to the cockpit” with Aloha Airlines. “Now that I have my commercial ratings, the pilots look at me differently, my peers admire me and I appreciate pilots more.” For other women considering careers in aviation, she advises, “Commitment to flying is the essence of your career. You have to live it to stay in the field. Discipline yourself to the demands of flying. Commitment-don’t stop until you are finished.”



Diane C. Dawd (B.A., economics), a corporate helicopter pilot in White Plains, NY.

**Diane Dowd**, a corporate helicopter pilot flies a Sikorsky S-76 helicopter. Previously she flew helicopters on a variety of missions including medevac, powerline patrol frost prevention and instrument instruction. In July 1975, she became the first woman in the National Guard to complete flight training which she finished at the U.S. Army Aviation Center at Fort Rucker, Ala. Today she holds a helicopter airline transport pilot certificate as well as ratings in both single and multi-engine airplanes.

Diane also currently serves as president of the scholarship fund for the Whirly-Girls, an international organization of women helicopter pilots. The organization sponsors two scholarships annually to help women who want to become professional helicopter pilots finance their flight training. Diane believes that "support systems for women in the field of aviation are vital for our success. I look forward to the day when female professional pilots are common place. Dedication and a positive attitude are important factors when pursuing a career in aviation. There are always opportunities for good performers."

## Federal Government



Dr. Sheila Widnall (B.S., M.S. and Ph.D., aeronautics and astronautics)  
is Secretary of the Air Force in Washington, D.C.

**Dr. Sheila Widnall** is Secretary of the Air Force a position she assumed in August 1993. As the first woman to ever hold this title, she is responsible for all matters of the Air Force including recruiting, organizing, training administration, logistical support, maintenance and welfare of personnel. Previous associations with the Air Force have included serving on the USAF Academy Board of Visitors and on various advisory committees to the Military Airlift Command.

For 28 years, Dr. Widnall was on the faculty of Massachusetts Institute of Technology becoming an associate provost at the university in 1992. As a professor of aeronautics and astronautics, she is internationally known for her work in fluid dynamics specifically in the areas of aircraft turbulence and vortices. She is the author of some 70 publications.

"For me, my present role as Secretary of the Air Force is a dream come true," says Dr. Widnall. "It permits me to apply my engineering knowledge and my skills as an educator coupled with my admiration for the U.S. Air Force in an opportunity for service to my country." Dr. Widnall adds "I believe that women should pursue their interest in science and engineering. The future has a way of taking care of itself if one has the proper education that supports one's dreams."



Linda Hall Daschle, FAA deputy administrator in Washington, D.C.

**Linda Daschle** is the deputy administrator for the Federal Aviation Administration and is only the second woman ever to hold this position. She sees her challenge as keeping "an extremely complicated highly efficient system operating with fewer resources." This "system" includes everything from air traffic control to certifying the airworthiness of every aircraft manufactured in the U.S.

Linda began her career as a certified weather observer. Other key positions she has held include being the first woman senior vice president in charge of federal and environmental affairs for the American Association of Airport Executives and director of federal affairs at the Air Transport Association of America. She was also the first woman to direct the Civil Aeronautics Board's Office of Congressional Community and Consumer Affairs in Washington D.C.

Married to U.S. Senator Thomas A. Daschle of South Dakota, Linda says, "My husband and I work hard but we also make sure that we have private time at home with our family." She encourages other women to develop "a willingness to listen and take risks, an eye for detail and the ability to follow through on decisions."



Aviation educator and public affairs officer Sandra J. Campbell  
(B.A., communications and English; M.S., management)  
of Kansas City, Mo.

**Sandra Campbell** is public affairs officer for the Federal Aviation Administration's (FAA) central region, the first African American to hold this position.

"A highlight of my career has been the opportunity to promote awareness of aviation to young people through a dynamic aviation education program," says Sandra. She has conducted more than a hundred workshops in this effort. A sense of pride came over her when a young seventh grade boy whom she once helped send to a two-week summer flight program at Tuskegee Army Airfield was later the recipient of a college scholarship from the Tuskegee Airmen, Inc., and graduated from college with an aviation major.

Balancing a full-time career in the FAA with the demands of family life can be a challenge for some people, but Sandra says she took a participative approach with her family. "I sat down with them and explained how important it was to me to achieve my educational and career goals. They understood. I included my husband and my children in every aspect of my career and education." She adds, "You can be anything you want to be and do anything you want to do if you want it badly enough."



Ruth Ann Leverenz (B.A., mathematics and Latin; M.A., public administration) is an aviation budget director in Washington, D.C.

**Ruth Ann Leverenz**, budget director for the Federal Aviation Administration (FAA), is responsible for managing the preparation and execution of the FAA's nine-billion-dollar budget in support of the operation, maintenance, and modernization of the nation's air traffic control and navigation system as well as other key programs. Prior to being appointed the first woman to ever hold this position, she spent 20 years in a variety of budget analyst and management positions, primarily with the FAA. "I have found that the best budget analysts are those that have a questioning, analytical mind," says Ruth Ann.

Ruth Ann's husband also works for the FAA, "so he understands the nature of my work and how demanding it can be," she comments. To balance professional and family demands with their two active sons, "my husband and I have committed ourselves to activities that we can all do as a family.

"Women who want to advance need to do the best job they can in every job they hold as they work their way up the ladder," she adds. "They should find out as much as they can about the business of their agency or company by reading trade journals, visiting different parts of the business, and volunteering for detail assignments to task forces working on challenging issues that will stretch and broaden their knowledge."

## Space



Astronaut and physicist Dr. Kathryn Thornton (B.S., M.S. and Ph.D., physics) of Montgomery, Ala.

**Dr. Kathryn Thornton** has been a mission specialist on two space flights--the space shuttle Discovery in 1989 and the maiden flight of the space shuttle Endeavour in 1992. Since becoming an astronaut, she has had assignments in support of future payloads and flight software verification, and has served as a member of the vehicle integration test team. She has also supported numerous space shuttle flights as a capsule communicator at Johnson Space Center in Houston.

While in graduate school, she participated in nuclear physics research programs at Oak Ridge National Laboratory and the Space Radiation Effects Laboratory. Later, she was employed as a physicist at the U.S. Army Foreign Science and Technology Center.



Maj. Nancy Jane Sherlock (B.A., biological science; M.S., safety engineering) from Troy Ohio, is an astronaut and engineer.

**Maj. Nancy Jane Sherlock**, the Army's first female astronaut, served as a mission specialist aboard the Endeavour in 1993, recovering the European retrievable carrier satellite using the remote manipulator system.

After graduating from college, Nancy was neuropathology research assistant at Ohio State's medical school. Later, upon entering the Army, she was a distinguished graduate in the Air Defense Artillery course and an honor graduate in the Army's helicopter flight training program. As a military aviator, she has logged more than 2700 flying hours in nine different aircraft.

"Without a doubt," she Nancy, "this (being an astronaut) is the best job in world. The first time I viewed the earth from space, I was captivated by the majestic view."



Physicist, engineer and astronaut Dr. Ellen Ochoa (B.S., physics; M.S., electrical engineering; Ph.D., electrical engineering) of La Mesa, Calif.

**Dr. Ellen Ochoa**, mission specialist on the Discovery in April 1993, conducted atmospheric and solar studies to understand the effect of solar activity on Earth's climate and environment. As a physicist and engineer, she has worked in optical research and processing, obtaining three patents for inventions in these areas.

"I enjoy the variety of my job," say Ellen. "In one week, I might participate in a flight simulation to train flight controller, attend meetings as the astronaut representative on robotics issues, travel to another NASA center for training on a flight experiment, fly in a T-38 and scuba in the underwater facility for spacewalk training."

Ellen adds, "Only you put limitations on yourself about what you can achieve, so don't be afraid to reach for the stars."



Dr. Bonnie J. Dunbar (B.S. and M.S., ceramic engineering; Ph.D., biomedical engineering), an astronaut, scientist and engineer from Sunnyside, Wash.

**Dr. Bonnie Dunbar**, NASA astronaut, was the first woman engineer at Rockwell Space Division and the first woman assigned to spacelab flight. She is a veteran of three space flights which collectively logged for more than 761 hours in space.

Bonnie has been recognized as the Rockwell International Engineer of the Year and the University of Houston Distinguished Engineering Alumna. Most recently, she received the AAES National Engineering Award.

As for the future, Bonnie wants to help "put men and women on the moon and Mars." She recommends that young women interested in aerospace careers not lose their vision, stating, "Let adversity be a challenge and an opportunity to strengthen character."



Astronaut and physicist Dr. Linda Godwin (B.S., mathematics; B.S., M.S., and Ph.D., physics) from Jackson, Mo.

**Dr. Linda Godwin** is a NASA astronaut and deputy chief of the astronaut office at the Johnson Space Center in Houston. She became an astronaut in 1985 and was part of a five-person crew which flew on the space shuttle Atlantis in April 1991.

Although being a private pilot is not required for a mission specialist astronaut, Linda learned to fly while attending graduate school.

According to Linda, "All astronauts are pilots, engineers, scientists or doctors--or a combination of these. Once we become astronauts we begin to learn about science and engineering outside of our original disciplines."

Linda encourages young women who are interested in becoming astronauts to obtain "a strong educational background in mathematics and science."



Lt. Col. Eileen M. Collins (B.A., mathematics and economics; M.S., operations research; M.A., space systems management) of Elmira, NY., is an astronaut and pilot

**Lt. Col. Eileen Collins** is the first woman ever selected to be a space shuttle pilot. In the Air Force, she was a T-38 instructor pilot and C-141 aircraft commander. To date she has flown more than 4,000 hours in 30 types of aircraft. "I find the space shuttle simulator training to be the most challenging because we practice multiple unexpected hardware malfunctions," says Eileen. Her first mission is scheduled for January 1995.

She met her airline pilot husband in the military where they flew C-141s together. Their mutual love for flying has been part of the cement that has bonded their relationship all these years. It is especially important, says Eileen, "to work well as a team, to get along with all co-workers. You will have bumps on the road along the way. Take every disappointment in your career as an opportunity for something new and better in the future."

## Education/Training



Aviation educator Patricia J. Ryan (B.S., elementary education; M.S., instructional technology) of Ormond Beach, Fla.

**Patricia Ryan** is director of the FAA Aviation Education Teacher Resource Center at Embry-Riddle Aeronautical University (ERAU) in Florida. She designs, develops and conducts aviation and aerospace educational programs for kindergarten through 12th grade. At ERAU she developed a computer-assisted aviation career exploration laboratory.

"Planting seeds of encouragement to be productive citizens of tomorrow is a major part of my youth programs' goals," says Patricia. "Using aviation and aerospace to capture the interest to motivate children is illustrated by my theme AIM HIGH. (A = aviation & aerospace; I = interest; M = motivation)." In 1992 Patricia was selected as the A. Scott Crossfield Aerospace Education Teacher of the Year by the National Congress on Aviation & Space Education. In the future, she hopes to assist in the establishment of the first Starbase youth program in Florida.

Patricia encourages young women to "focus on the task and not on the individuals involved. Use a team approach if appropriate to gain success in a given task." She also adds, "Explore non-traditional female vocations. Develop a 'can-do' attitude."



Peggy Baty (B.S., aviation administration; M.Ed., aerospace education; Ed.D., educational administration and supervision), an aviation college administrator in Columbia, Ill.

**Dr. Peggy Baty** is associate vice president and academic dean of Parks College of Saint Louis University. She was introduced to the exciting world of aviation in 1977 when her husband took her for her first airplane ride. Since then she has achieved a number of "firsts" in her career: first female flight instructor hired at the Marion County Airport in Jasper Tenn.; first female chairperson of the aviation department of Georgia State University; and first female dean and associate vice president at Parks College.

As an educator and accomplished aviator her credibility in the aviation education community is well known and admired. She holds a commercial instrument certificate in both single- and multi-engine airplanes as well as certified flight and ground instructor certificates and heli copter rating.

"My primary contribution to aviation has been the founding and directing of the annual International Women in Aviation Conference," says Peggy. The conference included some 600 participants from 40 states and three foreign countries in 1993. "Be active and involved while you are in school," she continues. "If there is an aviation organization in your area--join it! If you are willing to volunteer your time and talent to help others, conduct yourself in a professional manner, and are not afraid to ask questions you will go far."



Melva L. Jackman (B.S., elementary education; M.S., educational administration; Ed.D., education), an educator in Hollis, NY.

**Melva Jackman** is president of the New York Chapter of NAI, Black Wings in Aviation. She is the first woman to hold this position and has served in this capacity since 1990. NAI is a national organization of African American pilots dedicated to bringing aviation and aerospace information and training opportunities to minority communities.

Her professional training is in education. She has been an elementary school teacher in New York City for more than 20 years, much of that time having served as an aerospace education specialist.

In 1974 Melva began flight training with NAI. Today she holds an FAA commercial pilot's certificate with instrument rating. She also owns her own airplane, which she has been flying since 1975. One of her major achievements was making a single-engine flight in 1985 from New York to Trinidad, West Indies in commemoration of the historic Pan-American Goodwill Flight conducted in 1934 by founding members of NAI.

Melva's future goal is "to take part in the development and operation of a nonprofit institution that provides pilot training and promotes aerospace career training opportunities for young African Americans in the New York area."



Kathleen Kasler (B.A., education and fine arts), an aviation training developer in Albuquerque, N.M.

**Kathleen Kasler** is the courseware manager for the MH-53J and MH-60G helicopter special operations training programs, McDonnell Douglas Aerospace Services Co. She has been working in the military aviation training industry since 1980 producing courseware and training materials that are used to support the academic simulation and flight training for military aircrews throughout the world.

Kathleen's career has focused on the mechanical production of aviation materials. "The product must always maintain currency with the aircraft mission and crewmember requirements," she says. "As the industry grows there is a continuous evolution of creative methods and efficient ways to combine technology and instructional techniques. Our goal is to produce the safest most qualified and capable crewmember possible.

"Similar to a career in the military working on these contracts requires personnel to produce the courseware on location at the weapons system training facility," she continues. "This is exciting to me because I have been able to live in many different parts of the country and will continue to travel as future opportunities present themselves." Kathleen adds, "I would like to see more women in this field."

## Engineering



Aircraft structural engineer Ann L. Kolarik (B.S., aerospace engineering) of Wichita, Kan.

**Ann Kolarik** is the group engineer of the Beechjet stress group, Beech Aircraft Corp. Earlier she worked on the Beech Starship program with responsibilities that included detail stress analysis of the fuselage structure, defining test requirements for certification maintaining the data base of graphite/epoxy materials and composite research development and testing. She is the first woman to become a group engineer in the company.

"The world of aircraft design certification and manufacture is full of challenge and excitement," says Ann. "You get an adrenaline rush when a test is completed successfully, feelings of accomplishment when you beat a deadline, apprehension when you give your first presentation to a company vice president." In her engineering management position, Ann leads a team effort. "I like seeing the people that work for me receive recognition for a job well done."

"Any woman who completes schooling in a male-dominated field," continues Ann, "will have experienced a gamut of emotions and situations that help prepare her for the work situation. The difference is that in the workplace there is money on the line: the company's product, the company's profit, and your salary."



Elfreda T. Chang (B.S.E., chemical engineering; M.S., chemistry; Ph.D., physical chemistry) is a chemical engineer in Los Angeles, Calif.

**Dr. Elfreda Chang** is a senior engineering specialist in the propulsion department of the engineering and technology group at The Aerospace Corp. For more than 25 years she has been a major contributor to the improvement of liquid rocket engine propellants for use in operational satellite and launch vehicle propulsion systems. She was the first woman with a Ph.D. hired in Aerospace's laboratory operations, where she conducted research (basic and applied) on thermodynamic properties of high-temperature materials and liquid propellants.

Writing, documenting and the basic technical disciplines such as chemistry physics and mathematics are essential in her field of work. "In the early part of my career at Aerospace," says Elfreda, "I enjoyed having the opportunity to pursue basic research design experiments/test apparatus conduct the experiments and use the results to solve on-going problems." In 1980, Elfreda was named Aerospace Woman of the Year. In 1991 she became the first recipient of the Society of Women Engineers' Resnik Challenger Medal.

Elfreda recommends that young women pursue a field in which they enjoy working. Women must learn "to be very credible in their work to develop computer skills, and to not try to take on too many large projects at the same time."



Chicagoan Debra P. Beteet (B.S., material science and engineering; M.S., mechanical engineering), an aviation mechanical engineer.

**Debra Beteet** is a senior project engineer in the aerospace and defense sector at Highes Aircraft Co. She is responsible for the system mechanical engineering function for the F/A-18 program as well as the radar rack product design for several other aircraft. Overall, Debra's budgetary responsibility is approximately \$15 million.

After earning her bachelor's and master's degrees in engineering fields, Debra worked as a staff engineer at IIT Research Institute and later as an engineer specialist and group leader for Northrop Corp.'s defense systems division. "I believe that my parents' and teachers' encouragement was essential for me as I became interested in and sustained my interest in science. I was encouraged to look at engineering by my high school counselor," she says.



Aerospace engineer manager Nelda K. Lee (B.S., aerospace engineering), who lives in St. Louis, Mo.

**Nelda Lee** is manager of F-15 flight test engineering with McDonnell Douglas Aircraft Corp., the first woman to be assigned to this position. She is responsible for the flight test organizations in St. Louis, Edwards Air Force Base and Eglin Air Force Base.

In 1969, Nelda began her aviation career in McDonnell's structure and mechanical design department and was assigned to the DC-10 wing torque box design group. Later, she became the first woman at McDonnell to teach fellow teammates how to design the graphite-epoxy skin plies for the F/A-18 using Computer-Aided Design Drafting (CADD).

A pilot herself, Nelda holds a commercial multi-engine instrument airplane certificate, as well as a helicopter rating. A "dream come true" happened in 1980 when she had the opportunity to fly in the F-15 Eagle. A favorite pastime is "teaching and sharing aviation with all ages through my professional clowns 'Plane Jane' and 'Ethel Eggbeater.'"

One of the enjoyable aspects of her job, says Nelda, "is participation in the development and advancement of teammates. It is rewarding to witness the desire and commitment of young engineers when they are given an opportunity to stretch their capabilities and to progress."

## Airport Management



Assistant airport manager Tracy L. Williams (B.S., professional aeronautics) of Concord, Calif.

**Tracy Williams** is assistant manager of airports for Buchanan Field and Byron Airport in California. She is responsible for the day-to-day operation safety and security of the two general aviation facilities. Tracy is the first woman and the first African American to be placed in a managerial position at these airports.

Tracy spent six years on active duty in the Air Force. Later, while working on a night assembly line job, she did volunteer work by day at the airport. Tracy presented the airport manager with an intern ship proposal which allowed her to gain hands-on experience in airport management. This eventually led to a full -time position at the airport. Today, she is an accredited airport executive (AAE).

Tracy advises young women to "find out as much about the [aviation] field as possible by talking to people who are actively involved [and by contacting] professional or trade associations."



Airport manager and flight examiner Evelyn B. Johnson of Morristown, Tenn.

**Evelyn Johnson** is the airport manager for Moore-Murrell Airport in Morristown, Tennessee. She is also the chief flight instructor for Morristown Flying Service. At age 83, she is still adding to the more than 52,000 flying hours she has accumulated and 9,000 flight exams she has administered.

For 20 years she was the sole owner and operator of Morristown Flying Service.

In 1983, Evelyn was appointed to the Tennessee Aeronautics Commission by the state governor. A biography of this unique aviatrix, *Mama Bird*, was recently published.

To younger women considering a career in aviation Evelyn advises, "Go for it girls! You can make a place for yourselves in aviation. It takes determination and hard work. Do not give up!"



Airport authority manager Suzette E., Robinson (B.S., physics) of Indianapolis, IN.

**Suzette E. Robinson** is manager of technical support for the Indianapolis Airport Authority. "The most enjoyable, exciting and challenging part of my job is its diversity." She is the environmental compliance, grant administration, planning capital improvement and Disadvantaged Business Enterprise officer for the five airports and one heliport owned by the Airport Authority. She was the first minority female to be accredited as an airport executive by the American Association of Airport Executives. She is also a lieutenant in the U.S. Naval Reserve.

In 1987, Suzette began her career as an airport operations supervisor for Chicago Midway Airport. She is currently working as an intelligence analyst in the U.S. Naval Reserve.

Suzette encourages other women considering a career in aviation to "be patient, be visible and have a love of aviation."

## Aircraft Maintenance/Air Traffic Control



Selena D. MacFadden-Kurasz, an aircraft mechanic in Daleville, Ala.

**Selena MacFadden-Kurasz** is an aircraft maintenance supervisor with DynCorp, a company under contract to maintain all of the helicopters used in flight training at the U.S. Army Aviation Warfighting Center, Fort Rucker, Ala. Her interest in aviation developed while in high school. Upon graduation, she joined the Army and became a helicopter mechanic, receiving training and experience on a variety of aircraft.

After leaving military service, Selena was immediately hired as an aircraft mechanic by the Army Aviation Center's maintenance contractor, then Sikorsky Support Service, Inc. She distinguished herself by "good old-fashioned hard work, dedication, and a positive attitude." Today, she works on the two most complex helicopters in the Army: the AH-64 Apache attack helicopter and the OH-58D Kiowa, a night-fighting scout helicopter. "I take a lot of pride in ensuring that those student pilots and instructor pilots have safe aircraft in which to train," she says.

While working for the contractor, Selena attended Alabama Aviation and Technical College, where she earned her FAA Airframe and Powerplant certificate. "Get all the education you can get," says Selena, adding, "The sky is the limit--GO FOR IT!"



Dayle A. Buschkotter of Laguna Niguel, Calif., is an air traffic controller and President of Whirly-Girls.

**Dayle Buschkotter**, supervisory air traffic controller at John Wayne/Orange County Airport in California, says, "As a teenager, I used to watch the planes land and take off at Los Angeles International Airport (LAX), never dreaming that a woman could be either a pilot or controller." While in college she learned to fly and began to look into air traffic control as a career option. In 1979, Dayle qualified as an air traffic controller, and has since worked at several different airports in southern California, including eight years at LAX. When she's not working her favorite pastimes include flying and going to air shows around the country!

The future continues to hold new goals for Dayle. She's working to become an air traffic control tower manager and hopes to work someday in airport operations as an airport manager. "You are only limited by your ambition and your imagination," says Dayle. "Dreams are not impossible to achieve, but no one is going to hand you a life, a career or an adventure. Be inquisitive, try everything and look for adventure and inspiration every day. There are no problems, only opportunities!"

## Business/Manufacturing



Patricia W. Malone, an aviation manager in Marietta, Ga.

**Pat Malone** is the manager for regulatory compliance in the flight operations department of Delta Airlines. She provides liaison between flight operations and the FAA. She is also a resource in her areas of expertise to Delta's flight training, pilot ground training, flight standards flight control and safety departments as well as Delta's 9000 line pilots.

Pat's entrance into the world of aviation began during World War II when she was a link instrument training instructor in the U.S. Navy training fighter pilots in instrument flight procedures. Following the war she was a civilian instructor for the U.S. Air Force. Her association with Delta began in 1972 and has reflected a consistent record of progression in responsibility with the company over the years.

Her many years of teaching are a source of great satisfaction to Pat. "Every white hair on my head is a stripe on some pilot's sleeve somewhere in the world."

As she looks forward to retirement from Delta in 1994, Pat plans to continue working as a consultant. She advises other women looking for a career in aviation to learn to dream a little--think out side the squares," and keep in mind that one of the keys to success is Education! Education! Education!"



Aviation Senior Vice President Helen L. Newman (B.A., history) of Washington, D.C.

**Helen Newman** is senior vice president with Gulfstream Aerospace Corp., responsible for government operations and international marketing. She joined Gulfstream in 1981 and established the company's first office in Washington D.C. Prior to this, she was a legislative assistant to the Speaker of the U.S. House of Representatives. Her experience with Congress was invaluable later as she established a successful congressional relations program in Washington for Gulfstream.

One of the things that Helen is "especially proud of [is] the fact that the U.S. Army Air Force Navy Coast Guard NASA and the Department of Transportation all operate Gulfstream aircraft." Her own ingenuity and initiative have been very instrumental in this accomplishment. In 1992 Helen became the first woman in the company to be designated Salesperson of the Year.

"Women are proving every day that they can do anything in the aviation/aero space field--and do it very well," says Helen. They must "always work twice as hard as anyone else and never, never, never give up!"



Cassandra Bosco (B.A., history and psychology) is an aviation public relations manager in Washington, D.C.

**Cassandra Bosco** is manager of communications for the National Business Aircraft Association (NBAA). She considers herself “very fortunate” to be able to work in public relations within the aviation industry, a career that she has enjoyed for more than 10 years.

Her responsibilities include media relations and publications. “Probably the most exciting part of my job,” she says, is the NBAA Annual Meeting and Convention, which has more than 17,00 attendees and 600 exhibitors. For this event, Cassandra runs the press room, schedules press conferences for exhibitors, coordinates the annual press breakfast and writes scripts for speeches and appearances by staff/board members on television.

For students considering a career in aviation public relations, she recommends getting a college degree in journalism or communications, and emphasizes the importance of skills in writing, speaking and computers. “I also recommended that students go to industry shows and meet people. Internships are also very valuable--they not only provide excellent work experience and contacts in the industry, but they also give you an idea of what skills will be required in the work place.”



Joyce M. Coleman (B.S., chemistry), an airline staff vice president in Hoboken, NJ.

**Joyce Coleman** is staff vice president-customer relations for Trans World Airlines. She is the first woman and African American to hold this position in the company as well as the first to become a vice president.

Her career with TWA began in 1968 as a flight attendant. Along the way, she gained recognition for her achievements in demanding supervisory and management positions, culminating in her current responsibility for maintaining the highest customer satisfaction possible throughout the airline. In 1993, she was inducted into the New York YWCA Academy of Women Achievers.

“The most enjoyable and challenging aspects of my job involve creative problem solving, which often encompasses the creation of new systems in a team environment,” she says. Among the keys to success in her field, she includes “a disciplined and objective mind, good organizational and communication skills, fair-mindedness and an analytical perspective.” In addition to getting a solid education and practical business experience in the aviation industry, Joyce encourages young women to “have a mentor, someone who believes in you and supports your efforts to learn and excel.”



Aviation manufacturer Gayle Gorman Freeman (B.A., business administration) of Mansfield, Ohio

**Gayle Gorman Freeman** is president of Manairco, Inc., a company which manufactures airport and heliport lighting equipment. She is also the chief executive officer of MAPCO, a company that manufactures aircraft galley and component parts. Gayle is the first woman to hold both of these positions.

"I am trained in both business management and aviation," she says. "Being a pilot has helped me dramatically in my ability to communicate with people about airport lighting." Gayle is qualified to fly airplanes, helicopters and gliders. In fact, her entire family are pilots--father, mother, brother and husband. "When I was seven," says Gayle, "my mother received her helicopter training, and I was her first passenger. Twenty years later, when I received my helicopter rating, she was my first passenger."

One of the more enjoyable things Gayle does is visit schools in her helicopter and talk with students about careers in aviation. "Most young people are still surprised to see a woman fly the helicopter." She adds, "when my husband and I fly into an airport and I have been [flying] in the left seat people still ask him questions about the airplane!"



Brenda Colbert of Wichita, Kan., is an aircraft manufacturing foreman.

**Brenda Colbert** works as a manufacturing foreman for Beech Aircraft Corp., managing departments that include subassembly, custom assembly, and precision assembly. She began working with Beech as an hourly employee doing sheet metal assembly and metal bonding.

As a foreman, she is on the edge of an innovative wave to reduce the cost of building an aircraft. "The most rewarding part of my job is when I've taken on a department that has problems and turned it into a smooth operation by guiding my subordinates and showing them that we, together as a team can accomplish any thing," she says.

Brenda has a unique solution to the challenge of combining career and family--her husband is also a manufacturing foreman at Beech. "We use each other as sounding boards for ideas or innovations as well as personal matters," she says. Some day she hopes "to be the first woman in the company promoted to the position of general foreman."

She advises other women starting or changing their careers, "Stand firm in your beliefs because the more you accomplish, the easier it will be for the next woman to follow."



Aviation trainer and company president Martha King (B.A., comparative literature) of San Diego, Calif.

**Martha King** is president of King Schools, Inc., the world's largest aviation video-training company. Along with her husband, John she co-founded King Schools more than 19 years ago. "My work involves researching and creating course material for 11 aviation programs, appearing on -camera for video courses, creating direct marketing ads and mailing programs to sell courses, and managing a business with 75 employees," Martha explains.

Martha has all the FAA pilot certiti cates through airline transport pilot, including type-ratings in the Cessna Citation and in Learjets. "John and I trade places in the captain's seat of a Citation 500 jet, and use the airplane to attend conventions and other meetings related to general aviation. He has encouraged me in every way to expand my horizons and tackle challenges that make me grow."

"Probably the most challenging part of my job is the research and quick learning required in developing and updating the many aviation programs we produce," says Martha. Her sound advice for others just starting out: "You should approach your career with the philosophy of 'What can I do for others?'" She adds, "As a women [in the aviaiton field], you will receive help and encouragement at every step--you just need to get started!"



Agricultural pilot, educator and business manager Ruthanne Koch of Arriba, Colo.

**Ruthanne Koch** manages Koch Operations, Inc., an aerial application (crop dusting) business. Although she is a certified aerial pesticide applicator, Ruthanne concentrates on managing the business while her husband does the aerial spraying. Together they started and have run the business for more than 11 years. Although they share the duties of field scouting customer consultation and field mapping, Ruthanne does all of the job cost analysis, billing, inventory, application records and accounting.

"I became involved in agricultural aviation as a teenager when I began working summers for an aerial applicator who worked off the airstrip on our farm," says Ruthanne. Her work included ground support for spray planes (such as flagging, mixing and loading agri -chemicals), service and light maintenance of equipment.

Since 1988, she has devoted much of her off-season time to various public relations and educational projects for Women of the National Agricultural Aviation Association. Among these were the development of secondary-level curriculum guides for educators to use when introducing students to the agricultural aviation industry. She also co-wrote and served as technical advisor for an educational video titled Agriculture's Air Force. "Every day that we fly and do our part for production agriculture, we help keep food on the table at a reasonable cost," says Ruthanne.

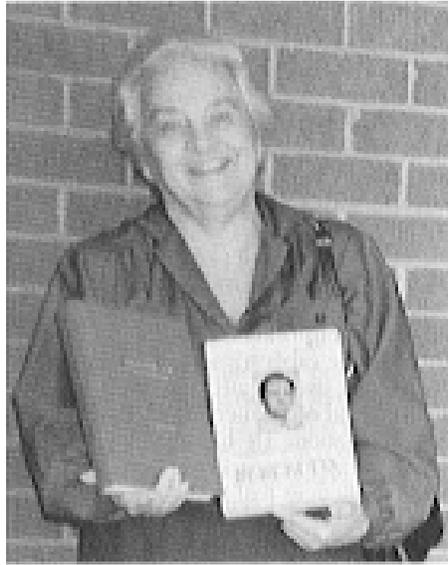
## The Arts In Aviation



Aviation artist Kristin Hill (B.A., fine arts) lives in Lancaster, Penn.

**Kristin Hill** is a free-lance aviation artist who creates oil paintings "which capture the beauty and spirit of flight expressing artistically its inspirational and memorable moments." After graduating with a fine arts major from Mary Washington College, she completed her first commissioned painting that same year for the Sperry Co. Her career has included mainly commissioned work and she has completed more than 200 oil paintings. "Aviation was always a natural and welcome part of my life," says Kristin, "having grown up in a family aviation business where my father was a fixed base operator." Much of Kristin's inspiration derives from her first-hand flight experiences in hot air balloons, gliders, biplanes, World War II fighters and bombers, aerobatic planes, modern fighter jets and general aviation aircraft.

"It is a career which requires responsibility yet offers freedom and satisfaction," she says. "Creative application of the material gathered is challenging and exciting as ideas are developed for the painting. Knowing that others enjoy and are inspired by a painting is rewarding."



Dr. Vera Rollo (B.A. and M.A., American history; Ph.D., education development)  
is an aviation historian, author and publisher.

**Dr. Vera Rollo** is publisher and owner of the Maryland Historical Press. The many books and articles she has written about aviation and the people who make aviation stem from her own activity as a pilot and instructor pilot. Having logged over 4000 hours in light airplanes, she has also earned a multi-engine and a seaplane rating. In 1964, Vera founded a publishing company. She spent many years as a light plane editor for a national magazine in Washington D.C., and wrote two books for use in college classrooms: Aviation Law and Aviation Insurance. She was the first woman to become associate professor of aviation at Wilmington College in Delaware. Her latest book Burt Rutan: Reinventing the Airplane, has received wide acclaim among aviation enthusiasts. To other women starting careers, Vera advises, "Never quit! Be wary of discouraging words from envious people. Do a good job and do what you love to do--flying, writing, living."

## Aviation Education Offices

### FAA Headquarters

Mr. Phillip S. Woodruff, AHT-100  
Aviation Education FTL  
Aviation Education Officers:  
Cesar Collantes  
Latisha Ferguson  
Larry Lackey  
Margaret Powell  
Andrew Robinson  
Sharon Thorne  
Patsy Vicks  
Terry White  
Tanya Yiasemides  
DOT/NASSIF Building  
Room PL-100  
Office of Training & Higher Educ.  
400 7th Street, SW  
Washington, DC 20590  
(202)366-7503  
(202)366-3786 fax

### Aeronautical Center

Mr. Robert Hoppers, AMC-5  
Room 356, Headquarters Bldg.  
P.O. Box 25082  
Oklahoma City, OK 73125  
(405)954-7500  
(405)954-4551 fax

### Technical Center

Ms. Carleen Genna, ACM-120  
Atlantic City International Airport  
Human Resource  
Management Division  
Atlantic City, NJ 08405  
(609)485-6630  
(609)485-4391 fax

### Center for Management Development

Mr. Larry Hedman, AMD-240  
4500 Palm Coast Parkway SE  
Palm Coast, FL 32137  
(904)446-7126  
(904)446-7201 fax

### Alaskan Region

Ms. Mary Lou Dordan, AAL-5B  
222 West 7th Avenue, Box 14  
Achorage, AK 99513-7587  
(907)271-5293  
(907)276-7261 fax  
State: Alaska

### Central Region

Ms. Maria Navarro, ACE-12  
601 East 12th Street  
Federal Building, Room 1501  
Kansas City, MO 64106  
(816)426-5836  
(816)426-3091 fax  
States: Iowa, Kansas, Missouri and  
Nebraska

### Eastern Region

Mr. Jim Szakmary, AEA-61  
JFK International Airport  
Federal Building #111  
Jamaica, NY 11430  
(718)553-1056  
(718)553-0058 fax  
States: Delaware, District of  
Columbia, Maryland, New Jersey,  
New York, Pennsylvania, Virginia  
and West Virginia

### Great Lakes Region

Mr. Lee Carlson, AGL-14B  
O'Hare Lake Office Center  
2300 East Devon Avenue  
Des Plaines, IL 60018  
(708)294-7042  
(708)294-7642 fax  
States: Illinois, Indiana, Michigan,  
Minnesota, North Dakota, Ohio,  
South Dakota and Wisconsin

### New England Region

Ms. Sheila Bauer, ANE-45  
12 New England Executive Park  
Burlington, MA 01803  
(617)238-7378  
(617)238-7007 fax  
States: Connecticut, Maine, New  
Hampshire, Rhode Island, Vermont  
and Massachusetts

### Northwest Mountain Region

Mr. Herman Payton, ANM-14A  
1601 Lind Avenue SW  
Renton, WA 98056  
(206)227-2079  
(206)227-1010 fax  
States: Colorado, Idaho, Montana,  
Oregon, Utah, Washington and  
Wyoming

### Southern Region

Mr. Joe Sidney, ASO-17.4  
1701 Columbia Avenue  
College Park, GA 30337  
(404)305-5386  
(404)305-5312 fax  
States: Alabama, Florida, Georgia,  
Kentucky, Mississippi, North  
Carolina, Tennessee, Puerto Rico  
and the Virgin Islands

### Southwest Region

Ms. Debra Myers, ASW-18  
2601 Meachum Boulevard  
Ft. Worth, TX 76193-0018  
(817)222-5804  
(817)222-5924 fax  
States: Arkansas, Louisiana, New  
Mexico, Oklahoma and Texas

### Western-Pacific Region

Ms. Sandi Couverley, AWP-17F  
P.O. Box 92007  
Worldway Postal Center  
Los Angeles, CA 90009  
(310)297-0556  
(310)297-0706 fax  
States: Arizona, California, Nevada  
and Hawaii

## Acknowledgements

This material is based upon work supported by the Federal Aviation Administration, and the National Science Foundation (Grant number ESI-9054572). Any opinions, findings, conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the Federal Aviation Administration or the National Science Foundation.

The following individuals also provided support for the development of this publication:

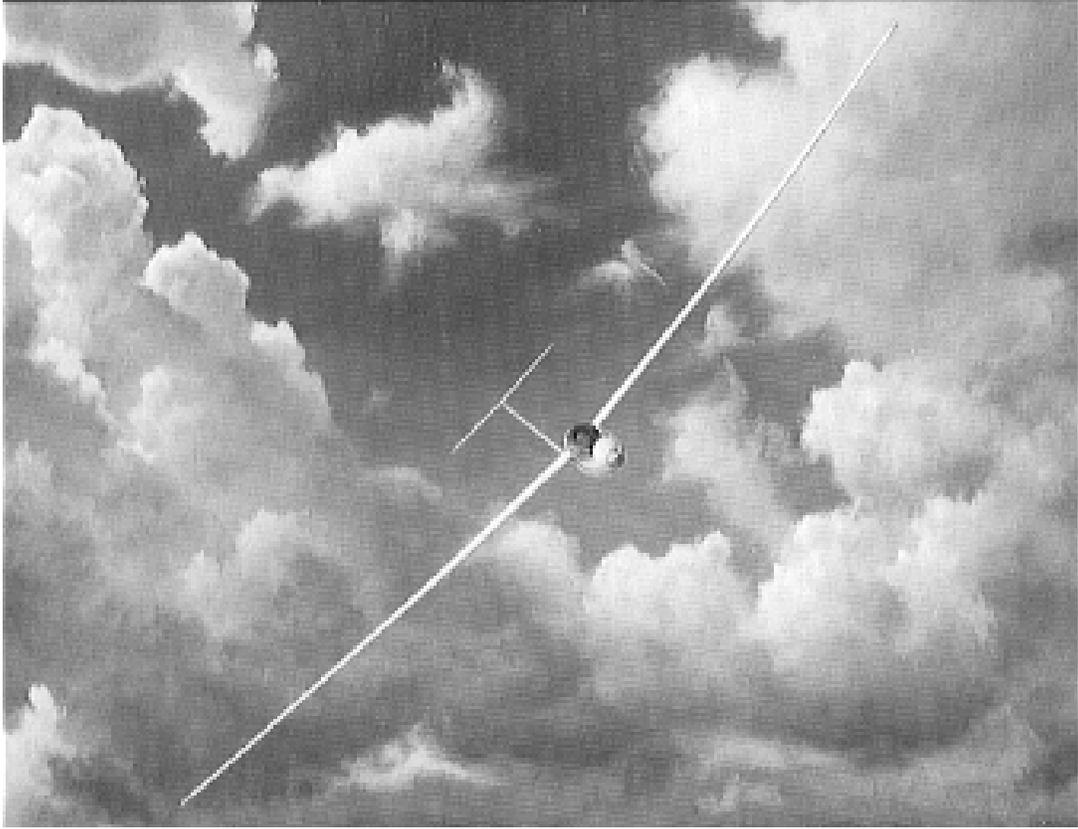
Mr. Phillip S. Woodruff, Division Manager  
Aviation Education Division  
Federal Aviation Administration

Dr. Shirley H. Woodie, President  
Alabama Aviation and Technical College

Dr. Fred Gainous, Chancellor  
Alabama College System

Members, Alabama State Board of Education

Designed by Ellis-Harper Advertising, Inc.;  
Auburn, AL



Kristin Hill's painting  
*Cloud Dancer.*