U.S. Department of Transportation
Federal Aviation Administration

FAA World

July 1987
Volume 17 Number 7

NMAC Publicity Distorts Safety Picture

By John G. Leyden

It turned out to be one of those good news/bad news situations . . . but without a funny punch line.

In 1985, FAA completely overhauled its procedures for handling near midair collision (NMAC) reports because of admitted "cracks" in the old system that had led to under-reporting of incidents. Among other things, the agency vested responsibility for NMAC reports in a single office (the Office of Aviation Safety), established strict deadlines for filing reports and completing investigations, ordered quarterly audits of all reports at the regional level and created in-house and inter-agency task groups to review NMAC data and recommend corrective action.

The result was more complete NMAC reporting which, in turn, led to better use of the data to develop new safety programs to reduce potential airspace conflicts. These include on-going educational, procedural and regulatory efforts. That's all for the good.

But there was a downside to all of this, too. Anyone who reads the newspapers or watches the evening news on television knows what that is. NMAC reports seem to have replaced actual accidents as the primary measure of aviation safety in the public mind. Certainly the numbers have become a potent weapon in the hands of FAA critics.

FAA's assistant Administrator for Public Affairs, Stephen Hayes, calls NMACs the agency's "number one public educational challenge at the present time."

"The integrity of the air transportation system has been called into question by the exaggeration and misinterpretation of data on near midair collisions, operational errors, runway incursions, flight delays, etc.," he says. "Moreover, it's a story that feeds on itself. For example, a wire story about an incident in one part of the country generates media calls from many other areas of the country requesting localized data. And these stories, in turn, spark additional queries and so on.

"I would estimate that we in Public Affairs are spending more than half our time dealing with this problem," he says. "It can be very frustrating because the public is getting a very distorted view of aviation safety."

A 25-year FAA veteran, Mr. Leyden is manager of the Public & Employee Communications Division, Office of Public Affairs.

NMACs are the agency's number one public educational challenge.

The irony of the situation is that the aviation safety record has never been better. The decade of the 1980s has been the safest in the history of air transportation. And the record continues to improve.

Last year was one of the best safety years ever. The major airlines flew 6.4 million flights and carried over 400 million passengers without losing a single one. Commuter airlines had their best record since the National Transportation Safety Board (NTSB) began tracking this segment in the 1970s. And general aviation saw its fatality rate drop again for the fourth year in a row.

These trends have continued in 1987. Through April, the preliminary count of fatalities for all segments of aviation was 264. That's a 3.6 percent improvement from the same period in 1986.

Conversely, the number of near midair collision reports from pilots has continued to increase. The number went from 758 in 1985 to 840 in 1986, an increase of 10.8 percent. Through June 1 of this year, the total was 396, up from 318 for the same period last year.

The question which no one can answer definitively is just how much these num-

(continued on page 10)

A People Manager in a Technical Environment

By Edward J. Lynch

"My greatest thrill in aviation, without a doubt, is night carrier flying, and you'll get the same answer from anyone else who's done it. It takes the greatest amount of teamwork there is in aviation."

Larry Hecker considers night carrier flying a reflection of his approach to management as well as to aviation. The FAA's new Deputy Administrator-designate devoted his professional career to training pilots, culminating as vice president of flight operations for Western Airlines. He managed 1,400 pilots, 2,400 flight attendants and a support staff of

(continued on page 11)

A special assistant in the Office of Public Affairs, Mr. Lynch served with several other government agencies before coming to FAA and did frequent free-lance writing. He has published articles and book reviews on many public policy issues.

In This Issue

FAA *World*

July 1987

Secretary of Transportation
Elizabeth H. Dole
FAA Administrator
Donald D. Engen
Assistant Administrator—Public Affairs
Stephen D. Hayes
Manager—Public & Employee Communications Div.
John G. Leyden
Editor
Leonard Samuels
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FAA WORLD is published monthly for the employees of the Department of Transportation/Federal Aviation Administration and is the official FAA employee publication. It is prepared by the Public and Employee Communications Division, Office of Public Affairs, FAA, 800 Independence Ave., S.W., Washington, D.C. 20591. Articles and photos for FAA WORLD should be submitted directly to regional FAA public affairs officers:

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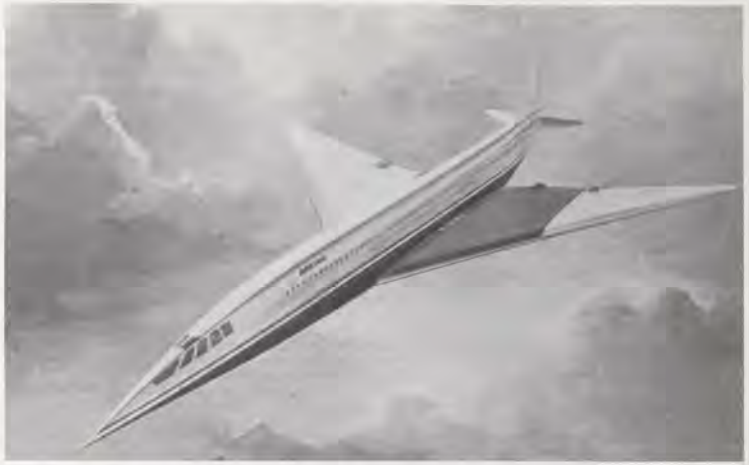
Paul Strucke, Sr.—Alaskan Region
Robert Raynesford—Central Region
Peter A. Nelson—Eastern Region
Morton Edelstein—Great Lakes Region
Mike Ciccarelli—New England Region
Richard Meyer—Northwest Mountain Region
Jack Barker—Southern Region
Geraldine Cook—Southwest Region
Anthony Willett—Technical Center
Barbara Abels—Western-Pacific Region



The Orient Express: By Charles Spence

The Shape of the 21st Century

"Orient Express, cleared to Tokyo direct, climb to and maintain 100,000 feet, squawk 1995 on the transponder, contact Denver Departure 120.5. . . . For noise abatement purposes, take an indefinite gatehold."

The first part of this mythical air traffic clearance could become a reality early in the 21st century under a program initiated by President Reagan in his 1986 inaugural address. The President called for the development of a hypersonic aircraft capable of flying up to 25 times the speed of sound in order to retain the nation's traditional leadership in the aerospace field.

Before the airplane ever leaves the gate, however, a number of major questions about the aircraft's environmental compatibility will have to be resolved. These include sonic boom, exhaust emissions and airport noise—in short, the same issues that helped to kill the FAA-run supersonic transport (SST) development program more than a decade ago. They have not gone away in the interim.

Officially, the hypersonic transport project is known as the National Aerospace Plane, or NASP (not to be confused with FAA's National Airspace System Plan, which uses the same set of initials). However, it was quickly dubbed "The Orient Express," because most experts believe its primary utilization would be on the long-haul routes serving the Pacific basin.

The "Orient Express" could be anything from a Mach 5 to a Mach 25 vehicle (approximately 3,800 mph to more than 19,000 mph). But some experts point out that there is little travel time advantage above a Mach 5 or 6. At Mach 5, an airplane could fly from New York to London in under an hour and a half. At Mach 6, a transpacific flight that now takes more than 13 hours could be completed in about two hours.

But to get to a Mach 5 or 6, commercial transports might take a circuitous route—first being developed as the so-called transatmospheric aircraft and spinning off the technology to produce an airliner in a more conventional speed range.

As envisioned by its proponents, the transatmospheric aircraft would take off from airports instead of launching pads, accelerate to a low orbit and descend for landing at another airport. As well as having defense and civilian transport potential, some see this as a practical and less-expensive alternative to the space shuttle for traveling to and from orbiting space stations and for deploying satellites.

However, achieving this goal will require major technological advances, including new propulsion systems and new metals or composites. The job of solving these problems has been entrusted to the National Aeronautics and Space Administration (NASA) and the Department of Defense, reflecting the critical space and defense roles of the proposed new airplane/spacecraft.

An aviation free-lance writer, Mr. Spence was the senior vice president for public relations at the Aircraft Owners and Pilots Association and served 15 years with Hearst newspapers.

NASA currently has five aerospace companies working to "mature" the technology and produce conceptual designs of the vehicle. Two others are under contract to produce preliminary concepts of propulsion systems. NASA expects the present number of contractors to be reduced to two or three by this fall and to have the present stage of technology exploration completed by 1989.

If these efforts prove out and a decision is made to move into the next stage of the project, the Air Force will take over the lead role. Many will remember that FAA played a similar role in the abortive attempt to develop a supersonic transport (SST) in the 1960s and early 1970s.

Although FAA is not directly involved in the initial development phase, it already has begun thinking about the job of certificating a Mach 5 or Mach 6 transport for commercial use and planning for the impact it would have on our airport and airways system. (See "The Future Is Now at Tech Center" below.)

Last fall, the Battelle Institute held a conference that brought together many experts in the field of supersonic and hypersonic flight. They concluded that, optimistically, there may be a market for about 400 Mach 5 transports by the year 2000.

FAA's Associate Administrator for Policy and International Aviation Al Blackburn believes these projections may be too optimistic. "By 1995, we will have some information out of a flight test program that will give us some guides for the myriad details that the FAA must look into before an aircraft like the Orient Express could become a reality," he says.

"We might have enough by the year 2000 to do all the analysis, tradeoffs and computations."

An aeronautical engineer and former test pilot, Blackburn notes that it requires seven to eight years, for instance, for a manufacturer to bring out a new transport aircraft, even when just advancing a present design. That's without trying to develop new fuels, new materials and new aerodynamic shapes, much less facing the environmental concerns.

These concerns include sonic booms, the effect of exhaust emissions on the ozone layer and airport noise, Blackburn says. During the SST debate, he adds, the public was greatly concerned about the sonic booms, but more from an emotional standpoint of being startled than from the actual noise.

At that time, it was pretty well established, Blackburn says, that the public might accept a 0.3-pound-per-square-foot boom. Boeing and Douglas at the time indicated the best they could do would be 0.9 pound per square foot.

Although there are qualified experts who say it is possible to produce a "boomless" supersonic aircraft, even this will not relieve the environmental pressures. There is still the worry over the ozone layer. Many scientists and environmental groups are showing increasing concern over the hole in the ozone which is developing over the Antarctic.

Regardless of the effects of high cruising speeds, airport noise is another major hurdle which the proposed planes will face. An FAA advance notice of proposed rule making was issued by FAA last November to solicit public comment on what noise levels might be generally acceptable. So far, the comments indicate any noise above the current standards set for "Stage Three" aircraft—like the Boeing 767 and the McDonnell Douglas MD-80—would not be tolerated.

Only the city of Denver, which is planning a new airport, speaks in favor of a new aircraft concept. However, city officials caution that noise levels should not be above the present Stage Three, and no sonic booms should be permitted over the continental United States.

Denver's planned airport is one of five or six similar facilities that will be needed in various locations in the U.S. to accommodate the Orient Express, Blackburn suggests. The Denver facility will have 11 runways up to 16,000 feet in length.

Six or seven of these super airports strategically located in the U.S. would provide the hubs of the future, with no community being more than 500 miles away from a point served by an Orient Express.

Although there is a long and complex way to go before the Orient Express goes into regular commercial service, if at all, the predictions for the year 2005 or even 2010 are nearer than most persons realize. It is a span of time similar to when technology went from the comic strips of Buck Rogers to real jet-propulsion flying belts, earth orbits and landing on the moon.

At least four other countries are working on projects similar to the Orient Express. France, Great Britain, Japan and Germany all are involved in the quest for speed. But the realities of the situation are such that many believe that the limited commercial market may force some sort of international partnership.

"We can't afford to have two programs going," Blackburn states, conceding that in today's international climate, this may be difficult to avoid.

Economics will be the driving force dictating the whens, wheres and hows, Blackburn believes. "These things will happen. It will be an evolutionary process. The airports needed by these aircraft will have been developed anyway, and when the technology is ready, it will come." ■

The Future Is Now At the Tech Center By Natalie Reed

The "Orient Express" is only one facet of aviation's future that occupies Al Lupinetti, the Chief Scientist at the FAA Technical Center in Atlantic City, N.J. The 25-year FAA veteran also is concerned with the new generations of subsonic aircraft and with the advanced rotorcraft designs that will impact on FAA operations in the 21st century.

To get a better handle on that future, Lupinetti's office recently conducted an informal aviation technology survey among aerospace manufacturers. Its purpose, he said, is to determine the coming technology behind future civilian transport designs.

"By determining what these technical trends are and analyzing what they might mean, the FAA can plan better for long-term requirements in essential services," Lupinetti added.

But technology isn't the only factor that will shape aviation's future, according to Tech Center senior analyst Jacques Press, who is compiling the survey. Aviation's future also will be influenced by other nations competing with American aviation and by an increasing demand for commercial travel, he said.

Even more critical, perhaps, is flight efficiency, or economy. In the future, Press said, not only will manufacturers strive for significant reductions in engine fuel consumption but also they will seek to cut the consumer's flying time and cost at least in half by means of aircraft speed and size.

Press said that the futuristic designs focused on by government and industry consist of three major categories:

- Rotorcraft, including tilt-rotor and x-wing, to meet increases in the urban short-haul commuter market.
- Subsonic, supersonic and hypersonic aircraft to meet short, intermediate and long-haul requirements, and
- Transatmospheric vehicles, which will be rocket-launched and capable of girdling the earth in perhaps 90 minutes for special requirements.

The key to seeing such designs materialize is, of course, the development of advanced technology in propulsion, aerodynamics, advanced materials and flight and control systems, which is now under way. When breakthroughs occur, Press says, FAA must be ready with corresponding supporting services.

"Although it is difficult to give a series of precise requirements, it will be possible to produce a good overview of what is expected from the FAA by the year 2000," Press said.

Of specific concern to the FAA will be the air traffic control system's ability to handle the high-technology aircraft of the future. For instance, flow control will have to permit minimum delays to insure full performance of all aircraft classes, both supersonic and subsonic. Exclusive routes for high-speed transport will be necessary to satisfy their requirements. Further, airspace and altitude requirements will be a special consideration. Most of today's aircraft fly below 40,000 feet, whereas some future aircraft are expected to fly above—and beyond—100,000 feet.

In terms of communications, navigation and surveilance systems, the use of satellites will play an important role in expediting all flights, particularly intercontinental.

According to Press, there is a need to examine such information analytically in order to maintain a perspective.

"For instance, are we going to have 1,000 transatmospheric vehicles?" Press asks. "Probably not, because they are very expensive to build and operate. Chances are they will only be used for limited, strategic purposes. There might be one or two transatmospheric aircraft and many subsonic airliners and rotorcraft," Press said.

"Further we must be aware of the environmental hazards such future technology might entail. Major concerns would be noise, sonic boom and ozone-layer depletion," Press added.

"The purpose of the survey is not to make decisions or value judgments on transatmospheric aircraft hurtling through space at Mach speeds, nor is it just to illustrate future design. The purpose is to analyze technology trends to predict how FAA service can best be used to support aviation in the future." ■

Technical Center chief scientist Al Lupinetti (left) and senior analyst Jacques Press consider the implications of advanced technology.

On detail to the Technical Center's Office of Public Affairs from the Engineering Division, Miss Reed is a former reporter and free-lance writer.

People

Aeronautical Center

■ **Jimmie E. Cox,** unit supervisor, Avionics Maintenance Section, Aircraft & Aviation Maintenance Branch, Aircraft Maintenance & Engineering Div., Aviation Standards National Field Office, promotion made permanent.

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■ **Catherine S. Hedglen,** unit supervisor, Navigation/Communications Section, Airway Facilities Branch, FAA Academy.

■ **Jerry A. Hupcus,** unit supervisor, Aircraft Maintenance Section, Aircraft & Aviation Maintenance Branch, promotion made permanent.

■ **Gene E. Johnson,** unit supervisor, Operations Section, Supply Management Branch, FAA Depot.

■ **Wilbert U. Koski,** unit supervisor, General Operations and Airspace Systems Section, Aviation Standards Branch, FAA Academy, promotion made permanent.

■ **Owen H. Magruder, Jr.,** supervisor Airworthiness Section, Aviation Standards Branch, FAA Academy.

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■ **Thomas S. Denny,** manager, Augusta, Ga., Tower.

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Washington Headquarters

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■ **Percy D. Willis, Jr.,** supervisor, Flight Procedures/Airspace Section, National Flight Data Center, Airspace Rules & Aeronautical Information Division, Air Traffic Operations Service.

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■ **Richard D. Frank,** manager, Redding, Calif., Tower.

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■ **Thomas W. Perkins,** area supervisor, San Francisco Tower, promotion made permanent.

■ **Duane C. Rakotz,** manager, Palomar Airport Tower, Carlsbad, Calif.

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■ **Austin A. Smith,** assistant manager, Golden Gate AF Sector, Hayward, Calif.

■ **David A. Smith,** assistant manager, Edwards Air Force Base RAPCON.

■ **Stephen A. Tison,** area supervisor, Los Angeles ARTCC.

■ **Francita M. Vandiver,** area supervisor, Los Angeles Tower.

The information in this feature is extracted from the Personnel Management Information System (PMIS) computer. Space permitting, all actions of a change of position and/or facility at the first supervisory level and branch managers in offices are published. Other changes cannot be accommodated because there are thousands each month.

Retirees

Adamson, Buddy A.—AC
Dunbar, William E.—AC
Ewing, Donald M.—AC
Galloway, Jean H.—AC
Searcy, William G.—AC
Williams, Jimmy E.—AC

Hale, George, D.—AL
Merritt, Henry C.—AL
Thakkar, Neil E.—AL

Free, C.E., Jr.—CE
Kershaw, Gerald R.—CE
Murray, Richard R.—CE
Skobust, Earl W.—CE

Boland, Thomas A.—CT

Bates, George V.—EA
Calkins, John L.—EA
Collins, William L., Jr.—EA
Corbett, Francis J.—EA
Crocker, Bryan M.—EA
Cushman, Hudson D.—EA
Dishart, Edward L.—EA
Dougherty, Frank J., Jr.—EA
Fraunfelter, Richard N.—EA
Grantland, Robert A.—EA
Greenlee, Donald J.—EA
Johnston, James Edward—EA
Kramer, Harold L.—EA
Mangone, Anthony, Jr.—EA
Miller, Elvin B.—EA

Moscatiello, Louis—EA
Palcovic, John G.—EA
Schehr, Arthur H.—EA
Shemaka, George A.—EA
Zawacki, Victor A.—EA

Conley, Robert L.—GL
Jespersen, Frode C.—GL
Jones, William B.—GL
Keen, Leonard S.—GL
Lackner, Emanuel L.—GL
Mc Clelland, Robert C.—GL
Metz, Melvin L., Jr.—GL
Paetzold, Bernard W.—GL
Rennen, Robert D.—GL
Renz, Greig M.—GL
Scofield, John F.—GL
Sherman, Thomas Willard—GL
Storch, George R.—GL
Worden, Benjamin P.—GL

Carroll, James P.—NE
Curtis, Gerald D.—NE
Pinault, Raymond R.—NE

Bird, Charles R.—NM
Hilton, Alfred J.—NM
Jordan, Robert D.—NM
Kuhn, John H.—NM
Ross, Harold C.—NM
Shultz, Richard L.—NM
Southam, Melvin G.—NM
Spofford, Earl A.—NM
Squires, Ramon L.—NM
Westhoff, Robert A.—NM
Zaremba, George C.—NM

Blackwelder, John B.—SO
Gamel, James R.—SO
Hawkins, Raymond G.—SO
Jolly, Charles L.—SO
Jones, Ernest H., Jr.—SO
Kattan, Jacqueline H.—SO
Kilgore, James E.—SO
Lawless, Robert E.—SO
Lowrimore, Roy H., Jr.—SO
Mills, Bobbie—SO
Roach, James D.—SO
Wallace, Thomas R.—SO

Gordon, Ralph E.—SW
King, Charles Edward—SW
Riley, Frank A.—SW

Castle, Paul E.—WA
Feldman, Dennis S.—WA
Gimmia, Leo V.—WA
Hunt, Lloyd—WA
Peterson, Paul W.—WA

Blue, Albert A.—WP
Chun, Edwin K.S.—WP
Clayton, Edwin R.—WP
King, Lorraine S.—WP
Munson, Rudolf—WP
Polhamus, James A.—WP
Richner, Sheldon L.—WP

Better Efficiency, Communications Hallmark of Winners

ATC Facilities of the Year

Memphis, Tenn., ARTCC

Memphis Center controller (from foreground) Steve Mullis and Gilbert Armbruster are assisted by Lisa Casey in operating at one of the West Area sectors.

Traffic management coordinators (from the left) Walter Tribble, Rick Stephens and Mel Wilson work in the Memphis Traffic Management Unit, which is combined in a complex with the Central Weather Service Unit and watch supervisor.

An East Area team briefing at the Memphis ARTCC. From the left are David Newby, Richard Payne, Pat Kliewer, Eleanor Haimsohn, Pete Ritchhart and Glenn Kneeland, discussing operations with area supervisor Bud David (right).

Amidst growing traffic loads in 1986, the air traffic facilities that were selected for Facility of the Year awards continued to improve their operational efficiency and build higher levels of morale.

Despite a 10 percent increase in operations over the previous year, the creation of a hub operation at the Nashville airport and a 15 percent increase in its airspace, the Memphis, Tenn., Air Route Traffic Control Center recorded a 19 percent drop in operational errors and deviations. According to the center, this equated to one error per 58,620 aircraft handled.

Memphis' attention to human factors also shone. Through increased training efforts, 22 new full-performance-level controllers were produced, while overtime was reduced 18 percent, or $110,000. The center's success rate in training was 98 percent. At the same time, no use-or-lose annual leave was lost by employees.

In a commitment to exceed the goals of the human relations program, increased emphasis was given to a full array of meetings, bulletins, communications via "alphabet groups," briefings on benefits, a candid exchange of information on contracting out and a telephone hotline to squelch rumors.

The top nonradar tower was at Providence, R.I. This facility continued its string of operational-error-free years to five, although it had a substantial growth in traffic, its primary runway was closed for construction during the peak summer months, it had an assault by a hurricane, it faced the construction of a new tower and other terminal areas and the installation of a Category II instrument landing system, and it negotiated a noise curfew.

With the Providence manager's efforts described by evaluators as producing an environment that enhances communications, it was not surprising that all of those answering the 1986 Employee Attitude Survey indicated a freedom to express ideas to local management. Add to this both the virtual absence of overtime and low usage of sick leave.

As with all successful facilities, system user meetings were held frequently and visits by pilots and the public were encouraged.

The Dallas-Fort Worth tower, winner in the radar tower category, also reduced operational errors, averaging one error for every 126,408 operations, although it handled more than one million instrument operations last year.

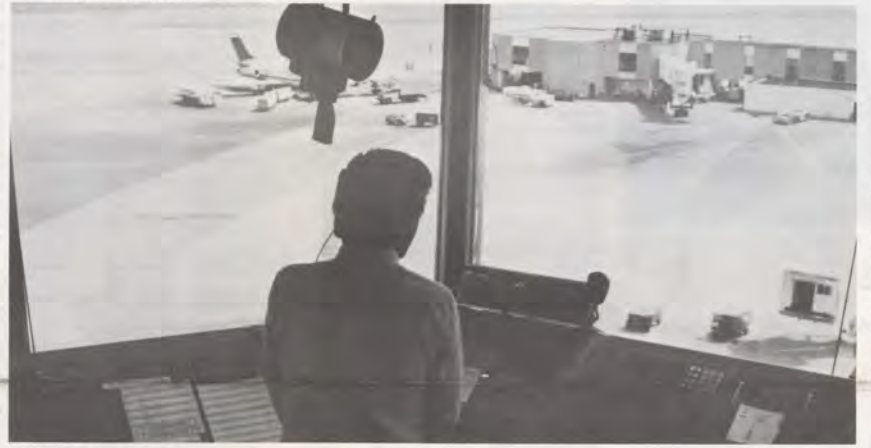
Good communications and heavy employee involvement resulted in high morale. The excellence of controller suggestions to employee groups and the outstanding staff work of these groups, for example, resulted in the facility concurring in 96 percent of the suggestions forwarded.

Another indicator for Dallas-Fort Worth was the reduction in sick leave use by 28 percent and in overtime by 54 percent.

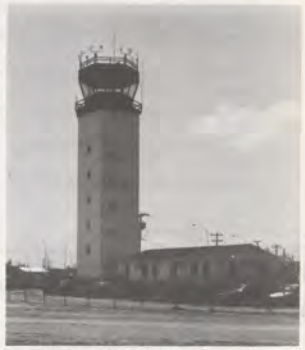
The Chicago Flight Service Station at DuPage Airport, which took the Facility of the Year honors in its category, is no more, having become the automated flight service station 75 miles away in Kankakee, Ill. As it worked toward the move, the station provided 804,949 flight services, while offering specialist and supervisor training in Model I automated equipment and the interfacility communications switching system (ICSS), providing employee briefings on the facilities and amenities of the Kankakee area and while accommodating house-hunting trips.

The winners continue to show the best of a common can-do attitude. ■

Providence, R.I., ATCT



A controller overlooks the ramp at Providence's T.F. Green State Airport.



Providence's tower is a modular, turnkey type with a separate base building.

Dallas-Fort Worth ATCT

In the Dallas-Fort Worth TRACON, supervisor Bill Fedowitch monitors air traffic controllers (from the left) Pat Spellman, handling feeder west; Gerald Boyd, handling arrivals sector 2; and Curtis Wolfe, handling arrivals sector 1.

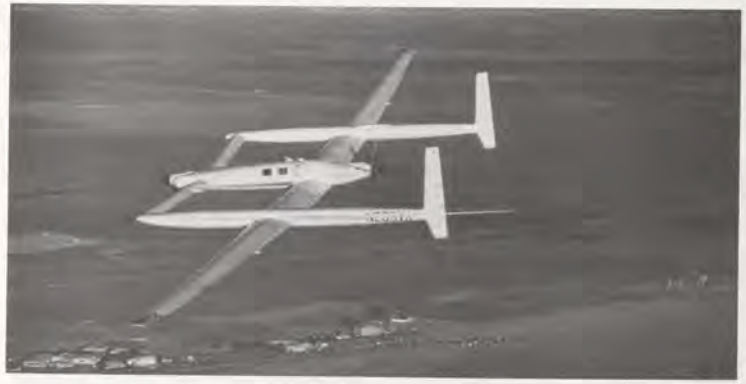
Air traffic assistant Mike Saupp handles clearance delivery at a console located in the center of the Dallas-Fort Worth tower cab.

Chicago FSS

Chicago FSS enroute Flight Advisory Service (EFAS) specialist Paul Vogel provides a pilot with a weather update and radar information.

Training specialist Cheryl A. Crowley prepares a video presentation for a team-briefing session at the Chicago FSS.

Specialist Gary Elliot enters TWEB (transcribed weather broadcast) and PATWAS (pilots automatic telephone weather answering service) information at the Chicago FSS at DuPage Airport.



Voyager heads for the California coast after taking off from Edwards Air Force Base on its nonstop round-the-world flight.

The Pioneers

Across the Years, the Technology Changes, Not the Spirit

By Richard K. Smith

With characteristic modesty so often shown in television appearances following their nonstop round-the-world flight in *Voyager*, Dick Rutan and Jeana Yeager probably would be the last people on earth to suggest comparisons between themselves and Charles Lindbergh.

After all, as aviation legends go, Lindbergh is in a class by himself, the passage of 60 years not having dimmed his memory but only added to the special aura that surrounds his name.

Still, comparisons are inevitable and by no means completely unwarranted. The flights of the *Spirit of St. Louis* and the *Voyager* reflected the highest levels of personal commitment, physical courage, mental toughness and basic flying skill. It is these qualities that help set aviation apart from humankind's more prosaic activities.

Both flights also set new records, but not necessarily the records that most people assume. For example, Lindbergh was not the first person to fly across the Atlantic Ocean but the 91st. Between May 1919 and May 1927, there were 11 transatlantic flights—four across the South Atlantic with 12 men and seven across the North Atlantic with 78 men. Three of these North Atlantic flights were by airships with large crews.

Lindbergh was the first to fly nonstop from North America to continental Europe in a heavier-than-air airplane. Moreover, he did it alone.

And Dick Rutan and Jeana Yeager 59 years later in the *Voyager* were not the first to circumnavigate the globe in an airplane, but were the first to do it nonstop. And they did it without refueling.

Lindbergh's *Spirit of St. Louis* was a variant of the Ryan M-2 mail-plane. The *Spirit*'s flyaway price was $10,580 (which had the purchasing power of about $158,700 in 1987 dollars). Only 62 days passed between the signing of a contract and April 28, 1927, when the airplane made its first proving flight. Its design and construction involved 850 manhours.

Voyager took 40 months from conception to first flight. Because of volunteerism and materials donations, its cost can only be estimated upward of $2 million, but, for comparison, its construction involved more than 22,000 manhours.

The *Spirit*'s fabric-covered fuselage was a framework of welded steel tubing; its strut-braced wing structure was made of spruce and covered by cotton fabric, materials validated by the Wright Brothers. A non-retractable landing gear with thin, high-pressure tires and the engine's uncowled cylinders seemed calculated to maximize aerodynamic drag. In 1927, the *Spirit of St. Louis* was more representative of a "yesterday's" airplane than a cutting edge on any new technology.

Not so with the *Voyager*. It made effective use of high-aspect-ratio wings and a canard wing, and it was one of the earliest aircraft to be made entirely of composite materials.

However, in the *Spirit*'s day, European engineers were dazzled by the performance of the airplane's Wright J-5 engine. During the flight of 33 hours and 30 minutes, this efficient seven-cylinder unit of 778 cubic inches had not missed a beat. After landing, the *Spirit of St. Louis* still had 85 gallons of fuel on board. If Lindbergh had chosen to overfly Paris, he had enough fuel to fly across Europe to somewhere in western Russia.

Unlike the *Voyager* crew, Lindbergh had certain monetary incentives for making his transatlantic crossing. In 1919, a New York hotel owner named Raymond Orteig had posted a $25,000 prize (the equivalent of $375,000 in 1987 dollars) for the first nonstop flight from New York to Paris or from Paris to New York.

There was no similar prize awaiting Rutan and Yeager. Indeed, the task of raising money to finance the flight was almost as challenging as building the plane. They are still paying off their debts.

The Lindbergh flight was undisputably more dangerous than that of Rutan-Yeager. By the eve of Lindbergh's takeoff, six men had been killed, numerous others injured, four airplanes destroyed and others wrecked in pursuit of the Orteig prize.

In the midst of all this excitement, Lindbergh, took off from the Ryan factory in San Diego and flew to St. Louis to meet with his half-dozen financial backers. Before the New York newspapers could get his name spelled correctly, he was off to Paris at 7:52 a.m. of May 20th.

The following night, everyone knew how to spell "Lindbergh." He had won the Orteig prize and also set a world nonstop distance record.

Yet in the midst of the Lindbergh adulation—only two week later—Clarence Chamberlin, with Charles Levine as a passenger, broke the Lindbergh record by flying nonstop from New York almost to Berlin. Who but aviation buffs remembers Chamberlin's flight?

The news media called him "Lucky Lindy" and he hated it. But there was some truth to it. His takeoff was predicated on the sketchiest of favorable weather forecasts, and he had the good fortune to find a corridor through the North Atlantic's weather.

To a certain extent, the same could be said of Rutan and Yeager. Although weather mapping and forecasting had improved dramatically in the ensuing nearly three-score years, it could not ensure smooth flying for nine days and the entire circumference of the earth, although they carried a weather terminal on board. They endured one typhoon, a few thunderstorms and many hours of sickening turbulence.

The Lindbergh hysteria is owed to the romantic appeal of one man alone, succeeding in the face of impossible odds. The news media loved him. Radio was now reaching millions of homes and newsreels were impacting the new generation of movie-goers. The making of a legend was under way.

Stripped of all the "hype," Lindbergh's accomplishment cannot be demonstrated to have had any effect on the development of aviation. It may have fired the imagination and spurred aviation development, but that would have happened anyway.

The idea for the *Voyager* was generated at a March 1981 luncheon in Mojave, Calif., between Dick Rutan and his younger brother Burt. They discussed the possibility of achieving aviation's "last great first"—an unrefueled nonstop flight around the world.

Burt was well known among aeronautical engineers for his revival of the airplane's canard configuration in home-builder kits and his determined and artful exploitation of composite materials to combine minimum structural weight with maximum strength.

The discussion was spontaneous speculation. No one had posted a prize for such a flight, nor was there an airplane design tucked away in any drawer that might be modified for such a flight. But if anyone could design such an airplane, it was Burt Rutan.

To be sure, by the 1970s, major aircraft manufacturers were using honeycomb and sandwich techniques and composite materials in their airplanes, but usually among lightly stressed subassemblies. But Rutan was using this technology to build whole airplanes. They were small craft, but some were highly stressed aerobatic machines. He thought a specialized airplane with global range was possible, but finding the money to build it was another matter.

Fortunately, key manufacturers did donate materials. Others loaned equipment and there were private donations. Subassemblies were worked up in Burt Rutan's facility in Mojave, which was less a factory than a shop. Many of his skilled employees volunteered their time. As word got around, other engineers and technicians from the nearby Los Angeles aircraft industry volunteered. Some were retirees; the employed came on weekends.

Meanwhile, Dick Rutan, a retired Air Force colonel and experienced pilot, worked on flight plans. For a co-pilot, he selected his friend Jeana Yeager, a versatile aviator in her own right.

To raise cash for day-to-day expenses, they sold *Voyager* T-shirts, baseball caps and belt buckles. "Memberships" in the flight were sold, and Dick and Jeana hit the lecture circuit.

Because of the *Voyager*'s 110.8-foot wingspan—two feet greater than a Boeing 727—space for assembly became a problem. The management of Mojave's airport loaned them Hangar 77, which became the *Voyager* project's headquarters and locus for the 40-some volunteers who "moonlighted" the airplane's construction. The *Voyager* was rolled out in the summer of 1984, representing 22,000 manhours of labor, and made its first flight on June 22.

In July 1986, Dick, Jeana and the *Voyager* spent 111 hours flying back and forth for 11,857 miles along the California coast, setting a new world's record for endurance.

Still, no corporation or organization stepped forward to sponsor the world flight.

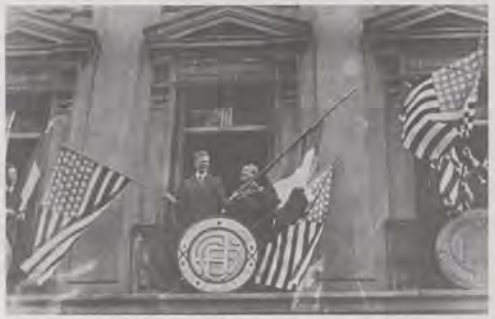
In December, the two pilots took the *Voyager* around the world nonstop, as their flight path was dutifully tracked on the evening television news. Takeoff was from Edwards Air Force Base on December 14. Nine days later, they had covered 25,012 miles and landed back at Edwards.

The news media made the inevitable comparisons with Lindbergh, for the most part ignoring the 179-day globe-circling flight of U.S. Army aircraft in 1924, the 21-day circumnavigation of the *Graf Zeppelin* in 1929 and the subsequent circuits of Wiley Post and Howard Hughes.

However, except for both being magnificent personal achievements, the flights of 1927 and 1986 had little in common. The primary impact of Lindbergh's flight was psychological and often is credited with giving new impetus to the growth of aviation. The *Voyager* crew had to deal with a much more blasé public that has become accustomed to space flight and seeing men walk on the moon. Still, the flight provided a dramatic demonstration of versatile and novel but proven aerostructure techniques. It also provided a marvelous demonstration of the reliability of the new, very-high-compression Teledyne-Contental IOL-200 engine that pushed the *Voyager* through its global circuit.

But whether Lindbergh or Chamberlin or any of the others were essentially making do with existing technology or had the latest equipment, they possessed one element that was and always would be indispensable for pioneers: the courage to dare, to risk their lives and fortunes to expand man's horizons. ■

Pilots Dick Rutan and Jeana Yeager stand before the history-making Voyager. Together with designer Burt Rutan, they were awarded the prestigious Collier Trophy by the National Aeronautic Association for achieving aviation's "last great first."



Charles Lindbergh was the toast of Paris following his transatlantic solo flight. Here, he is at the Aero Club de France with U.S. Ambassador Myron Herrick on May 11, 1927.

THE STATS COMPARED

	Spirit of St. Louis	Voyager		Spirit of St. Louis	Voyager
Max. Takeoff Wt.	5,250	11,326	Rear Engine	—	Teledyne-Continental IOL-200
Empty Weight	2,150	1,858		—	
Useful Load	3,100	9,468		—	
Ratio	59:41	83:17	Dry Weight, pounds	—	194
			No. of Cylinders	—	4
No. Fuel Tanks	5	17	Displacement, cu. in.	—	200
Total Capacity, gallons	450	1,489	Configuration	—	Horiz. Opposed
Fuel, pounds	2,750	8,934	Cooling	—	Liquid
Fuel as % Max. Takeoff Wt.	52.3	78.8	Horsepower	—	110
Fuel as % Useful Load	88.7	94.3	Pounds per Horsepower	—	1.76
No. of Engines	1	2	Total Horsepower	225	240
			Power Loading @Max.		
Fwd. Engine	Wright J-5C	Teledyne-Continental O-240	Takeoff Wt., lb/hp	23.3	40.6
			Wingspan, ft.	46.0	110.8
Dry Weight	510	246	Span Loading @Max.		
No. of Cylinders	9	4	Takeoff Wt., lb/hp	114.1	102.2
Displacement, cu. in.	788	240	Wing Area, sq. ft.	319	363
Configuration	Radial	Horiz. Opposed	Wing Loading, @Max.		
Cooling	Air	Air	Takeoff Wt., lb/sq. ft.	16.4	31.2
Horsepower	225	130			
Pounds per Horsepower	2.26	1.89			

An aviation historian, Dr. Smith is the American literary editor of Air International *and taught the history of flight at Embry-Riddle Aeronautical University in Washington, D.C., and at the University of Maryland's Department of Engineering.*

NMAC *continued from page 1*

bers reflect an absolute increase in incidents and how much is due to better and more complete reporting. For example, most of the increase in NMAC reports in 1986 was in the so-called "no hazard" category. That means that FAA investigators in each case determined that there never really was a danger of a midair collision. That could indicate that all the publicity about NMACs is prompting pilots to report marginal incidents they might previously have ignored.

Director of Aviation Safety William Hendricks is one who questions the meaning of the NMAC statistics. He notes that the increase in hazardous incidents in 1985 and 1986 is largely offset by the gain in flying activity.

"I mention this comparison not to alleviate or diminish the potential hazard, but only to point out that we are not, in fact, showing a significant increase in meaningful occurrences," he says. "Even one NMAC is one too many."

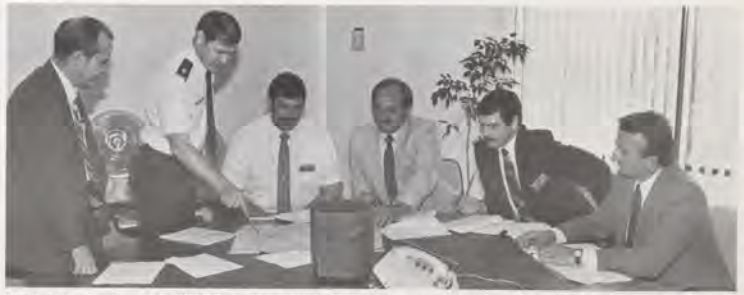
One of the problems in assessing the significance of raw NMAC data is the rather open-ended nature of the NMAC definition. Contrary to popular belief, there is no minimum "miss" distance required to file a report. Any involved pilot or flight crewmember may declare a near collision if he or she believes an incident has occurred, and the report goes into the NMAC data base. FAA investigates each report and categorizes it by circumstance and distance as "critical," "potential" or "no hazard". These categories are defined as follows:

Critical—A collision was avoided by chance rather than by any action by the pilots. Less than 100-foot separation would be considered critical, but some incidents with as much as one-half mile separation have been judged to be in this category.

Potential—A collision might have occurred if no action had been taken by either pilot. Generally, the aircraft involved are within 500 feet of each other, but this is not a hard and fast rule.

No Hazard—The direction and altitude would have made a midair collision improbable regardless of evasive action.

The subjective nature of NMAC reporting is illustrated by the fact that FAA seldom receives reports from the pilots of both involved aircraft. That happened only twice in 840 incidents last year. There probably are numerous explanations for this, such as the failure of one pilot to see the other airplane or a fear of FAA enforcement action if a report is filed. But another reason has to be that frequently the two pilots involved see the same situation differently.



During the weekly meeting of the NMAC Review Team, Charles Hoch (left), manager, Safety Analysis Div. (ASF-200), looks on as members of the team identify a location of NMAC activity. From the left are Maj. Dub Splawn, aviation safety liaison, ASF-200; Ron Hathcock, air traffic evaluator, Office of Air Traffic Evaluations and Analysis (AST-100); Bobby Norris, air traffic evaluator, AST-100; John Farrell, program analyst, Safety Programs Div. (ASF-300); and Gabe Bruno, aviation safety inspector (operations), General Aviation and Commercial Div., Office of Flight Standards. A member not pictured is Ben Tollison, manager, Evaluations Staff, Office of Flight Standards.

A case in point was a June 9 incident at the Tampa, Fla., airport, where the reporting pilot put the "miss" distance at 100 feet vertical and horizontal, and the non-reporting pilot estimated it at 500 feet and one-quarter mile.

Even experienced pilots sometimes misjudge the situation. For example, in mid-April, the pilot of an airline jet flying out of Burbank, Calif., reported missing a light aircraft by only 300–500 feet. The story ran on both the AP and UPI wires and appeared in newspapers all over the country under such attention-grabbing headlines as, "Four Near-Collisions in 10 Hours." Overnight, the Burbank TRACON did a radar "dump" and found the two aircraft never got closer than 1,200 feet, which was legal separation under the circumstances.

Professional pilots, in fact, file the great majority of NMAC reports, which may reflect a better understanding of ATC rules and procedures than the average general aviation pilot and a desire to exhibit compliance with those requirements. Approximately 66 percent of all reports come from pilots with a commercial or airline transport pilot's certificate. This is true despite the fact that at least one general aviation aircraft is involved in about 84 percent of all NMAC incidents.

Another factor that complicates the evaluation of NMAC data is that there appears to be no correlation between these reports and actual midair collisions. Bill Hendricks notes that the number of NMAC reports have varied from year to year, but the number of midairs has remained fairly constant.

"Over the past 10 years, midair collisions have averaged about 27 per year, of which about 16 involve fatalities," he says. "In fact, these figures have remained about the same over the last 20 years."

Through April 1987, this trend has continued. Although NMAC reports are up, actual midairs are down. There were a total of eight during the first four months of the year, compared with 10 during the same period in 1986.

One of the current NMAC myths is that the number of incidents are running at record levels. That is simply not true. In 1959, when traffic levels were far lower than they are today, the agency received over 1,100 NMAC reports.

Moreover, in 1968, the agency instituted a special immunity program for pilots filing NMAC reports in order to encourage full reporting of these incidents. The program had the full support of the aviation user groups and was given wide publicity. The result was 2,230 NMAC reports that year, of which about half were classified as "no hazard" after investigation.

The program was continued for another three years with less publicity, and the number of reports fell off sharply to about 1,400 in each of those years. When the immunity provision was dropped in 1972, the number dropped down to the pre-program levels. Incidentally, data collected during that program led to the establishment of terminal control areas (TCAs) at major airports, along with other airspace improvements.

This experience again suggests that publicity about NMAC incidents directly influences the number of reports filed with FAA. That may be one reason for the sharp increase in "no hazard" incidents in 1986 and 1987.

Certainly one of the most unfortunate aspects of the current NMAC controversy is the completely unjustified "black eye" it has given the ATC system. As one critic said, it proves the ATC system is "on the ragged edge of disaster."

However, the great majority of NMAC reports involve incidents where one or both aircraft are flying under visual flight rules (VFR) and, thus, are operating outside the air traffic control system. Approximately 60 percent of all NMAC reports involve one VFR and one IFR (instrument flight rules) aircraft, 33 percent two VFR aircraft, and only seven percent two IFR aircraft. The ATC system, of course, provides separation only between IFR aircraft and issues advisories on VFR traffic as workload permits.

But the public not only misunderstands the ATC function, it also fails to appreciate the role of pilots in the system. Bill Hendricks points out that ATC is a "redundant system, with both pilots and air traffic controllers providing separation whenever possible. The redundancy provides for the pilot to be the stop-gap in the event of a system oversight or controller mistake."

Paradoxically, numerous NMAC reports are generated despite the fact that controllers have provided pilots with traffic advisories . . . and in some cases because they have. One such incident occurred May 15 when a Los Angeles approach controller issued a VFR traffic advisory to a Boeing 767 jet. Although the airline pilot *never saw the other aircraft*, he filed a NMAC report based on the information provided by the controller.

Charles Hoch reviews a printout of the previous day's NMAC report that had been entered into the NMAC data base by computer specialist Anna Johnson.

FAA carefully reviews all NMAC reports in order to spot any . . . developing trends.

Another case in point—also in May and also in California, where 25 percent of all NMAC reports are filed—involved an airline pilot who received "five or six" traffic advisories but reportedly never disengaged his autopilot until he spotted the other aircraft and was given a heading by ATC. He then made an evasive maneuver, injuring a female passenger. He filed a NMAC report, estimating the minimum separation distance at 50 to 100 feet.

However, the fact that less than five percent of all NMACs involve ATC errors is hardly grounds for complacency. A midair collision between an airliner operating IFR and another aircraft flying VFR—such as occurred over Cerritos, Calif., last year—has the same consequences as one involving two controlled flights.

One thing the NMAC statistics do highlight is the continuing problem of assuring safety where there is a mix of IFR and VFR traffic. FAA programs designed to deal with this have included the establishment of positive control airspace above 18,000 feet where VFR flights are banned and the creation of terminal control ares (TCAs) and airport radar service areas (ARSAs) where VFR operators are subject to special requirements. Yet another example is the requirement for Mode C, or altitude-reporting transponders, for flights above 12,500 feet MSL.

Following the Cerritos midair between an Aeromexico jet and a small private airplane on Aug. 31, 1986, FAA did a comprehensive study of the TCA concept, which produced 40 recommendations for improvements in such areas as education, enforcement, procedures and equipment requirements. Many of these already have been implemented or are in the process of implementation. Effective Dec. 1, 1987, for example, Mode C transponders will be required in all 23 TCAs, not just the nine currently designated as Group I TCAs. In addition, the agency has initiated rulemaking to increase TCA standardization and further expand the requirement for carriage of Mode C equipment to cover all flights within 30 miles of the TCA airport.

The long, drawn-out search for a workable airborne collision-avoidance system also seems to be nearing completion. Three airlines will begin an operational evaluation of the Traffic Alert and Collision Avoidance System (TCAS II) this summer, and the agency plans to issue a notice of proposed rulemaking at the end of the summer that would require this equipment on all air carrier jets.

Meanwhile, work continues to develop an even more sophisticated version—TCAS III—that will provide pilots with horizontal escape maneuvers as well as the vertical maneuvers provided by TCAS II.

In addition to these broad-based efforts, FAA carefully reviews all NMAC reports in order to spot any commonalities or developing trends that might require *ad hoc* action or a quick fix. A special NMAC Review Group composed of Aviation Safety, Aviation Standards and Air Traffic personnel meets every Tuesday at 10 a.m. for this purpose.

Earlier this year, the review group discovered a "potentially high threat area" north of Los Angeles where numerous military training routes intersected that had produced a number of near collisions between Air Force and general aviation aircraft. One member called it "a NMAC situation just waiting to happen." FAA quickly contacted the Air Force Safety Center and got the entry point for one of the routes moved 20 miles within the boundary of a Military Operations Area.

In another case, the team noted five NMAC reports in six months from B-52 pilots flying a military training route in Arizona. It then initiated a joint FAA-Air Force educational effort to alert both military and general aviation pilots to the problem.

There appears to be no correlation between NMAC reports and actual midair collisions.

FAA also has established a NMAC Interagency Task Group that meets every six months to review trends and focus on significant factors that may influence the number of NMAC reports. Among recommendations already acted on are the expansion of the Mode C requirement and the production of new educational materials to improve pilot techniques for spotting other aircraft in flight.

Hendricks thinks that these efforts clearly reflect FAA's concern for the NMAC problem and demonstrate that the current near hysteria in some quarters is uncalled for. "When you examine the facts concerning the operation of the air transportation system, you may come up with a different perspective than what you see and hear in the media," he notes. "This is not to say there are not hot spots in the system, but these deficiencies have to be identified and corrected, and that is exactly what we are doing." ■

People Manager *continued from page 1*

180 people who operated 91 aircraft serving 61 cities. Hecker firmly believes, "The FAA must continue with the objective of a strong team to maintain the absolute safety of flight." He adds, "We must make certain that each manager cares deeply for our working partners, the employees."

Hecker quickly returns to the human dimension when discussing every aspect of both management and aviation. He has accumulated more than 20,000 hours flying transport aircraft, especially jumbo jets. However, if given his favorite airplane for one flight, he'd take an F-18.

"That's on the leading edge of technology, and there's something wonderful about flying such a complex piece of equipment." But doesn't the sheer technological sophistication of it take away from the human dimension of flight? Hecker doesn't even blink. "Not a bit," he retorts. "Who manages the system? Who monitors it? It sure doesn't program itself." He continues, "People really are any organization's greatest resource. Advances in technology only strengthen human control. The human hand is especially important, because computers

can perform programmed functions, but they can't think."

Born May 7, 1923, Hecker enlisted in the Navy in 1943 and was discharged in 1953 as a lieutenant commander. He worked for Trans World Airlines until 1982, with much of the time devoted to flight training.

From 1974 through 1978, he served on a special assignment in Saudi Arabia, where he became general manager of flight operations. He found the international experience extremely rewarding because it demonstrated the great opportunities to forge bonds between people through aviation. He remarked to FAA WORLD, "There are no national boundaries for aircraft, and the boundaries between the FAA and its companion agencies should be as small as possible, especially when we're discussing the American continents."

His international interests are strongly supported by his wife, Clare, the daughter of a career army officer who was born in the Philippines. Captain Hecker has six grown children and is awaiting his eighth grandchild later this year.

Hecker looks forward to the challenges of public service with the FAA. He observed, "We absolutely must address the agency's fundamental needs. We need to strengthen communications links to enable employees to participate as much as possible in decisions that affect their working conditions."

He worked with labor organizations at both TWA and Western and remarked that participative management proved effective for him before. "When we've had problems, I've gone to union representatives, explained the circumstances and found ways to resolve conditions before they became serious problems.

"In the short time I've been at the FAA, I've admired the enormous talent and ingenuity of the people working here, and I'm dedicated to making the best possible use of that great talent to serve the American flying public." ■

Federal Notebook

TO HATCH OR DEHATCH IS THE QUESTION

Hearings have been held on a pair of bills designed to reform the Hatch Act introduced by Rep. William Clay (D-Mo). The bills would permit voluntary partisan political particpation by federal employees on their own time, including seeking office, and would bar them from political coercion or solicitation of their co-workers. The two bills will be merged into one.

Union leaders generally favor the changes, but Office of Personnel Management Director Constance Horner believes it would have a chilling effect, particularly in small towns where partisanship would be highly visible. She also believes there could be silent compliance to political considerations at work.

THRIFT PLAN NOTES

The rate of return for accounts in the employee thrift plan rose to 8-5/8 percent during June, 1/4 percent higher than in May.

Be forewarned: One of the big thrift plan advantages is that contributions are excluded not only from federal income tax but from state and local income taxes--that is, except in Pennsylvania.

TAX EQUITY FOR ANNUITIES

For the fourth year in a row, Rep. Bruce Vento (D-Minn) has introduced a bill (HR 1938) to place federal annuities on an equal tax footing with Social Security payments--that is, tax-free on a base amount. Budgets and deficits being what they are...

LEAVE SHARING BILL INTRODUCED

As an Office of Personnel Management test on leave sharing gets under way, Rep. Frank Wolf (R-Va) has introduced a bipartisan-supported bill to permit employees to donate sick and annual leave to co-workers facing medical or family emergencies who have not earned enough leave or who have exhausted their leave accounts. The bill also would look into the idea of rewarding outstanding performance with additional leave.

PAY AND LOST PAY

The Administration again is expected to ask Congress for legislation mandating direct deposit of federal pay to financial institutions. Issuing checks costs far more than the three cents of an electronic funds transfer. And mailing checks can lead to loss or theft.

The Supreme Court has refused to hear an appeal by the National Treasury Employees Union seeking the full pay comparability increases that were capped in 1980, 1981, 1983 and 1985. NTEU contended that the Pay Comparability Act contained a legislative veto since ruled unconstitutional. The lower court refused to void the entire act because of an illegal clause.

In the not-surprising department, a General Accounting Office study pointed out that federal employees and retirees have contributed to national debt reduction to the extent of $69.8 billion. This includes $43 billion in pay reductions, $4.4 billion in revisions to health benefits, $4.3 billion in Medicare erosion and $16 billion in cost-of-living losses.

And the Congressional Research Service reports that federal annuities have kept up with inflation but have fallen behind Social Security benefits and that federal pay has not kept pace with benefits under either "annuity" system or with military pay.

IS ANYONE LISTENING?

Says a report of the Twentieth Century Fund, a non-profit foundation: "If we want a superior civil service, we must enhance the regard and respect accorded our civil servants. We will not enjoy excellence in government if we look upon civil servants as time-servers and deride the ideal of public service. But we will be rewarded if we acknowledge the great value of public service and make known to our career professionals that we expect great things of them."

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