

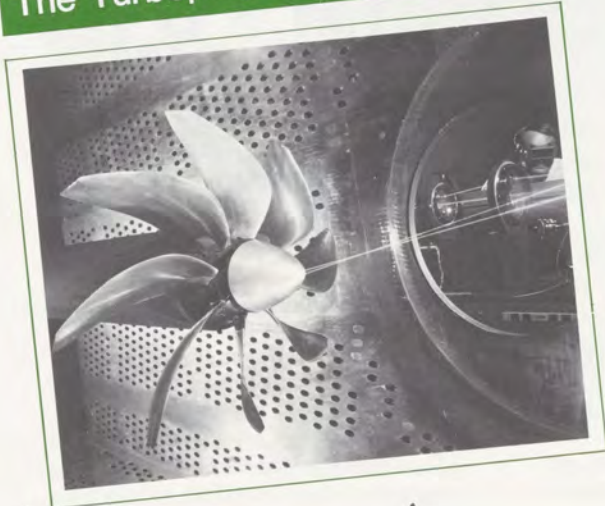
# World

April 1984  
Volume 14 Number 4



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

## The Turboprop Comes Of Age





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regional FAA public affairs officers:

Mark Weaver—Aeronautical Center  
Paul Steucke, Sr.—Alaskan Region  
Jon Ellis—Central Region  
Robert Fulton—Eastern Region  
Morton Edelstein—Great Lakes Region  
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Geraldine Cook—Southwest Region  
Vacant—Technical Center  
Barbara Abels—Western-Pacific Region



### Research Highlights

Heliport microwave landing system (MLS) testing is currently being conducted at the FAA Technical Center. The azimuth, elevation and precision distance-measuring equipment (DME) components of MLS have been collocated adjacent to the heliport.

Here, the agency's new-technology S-76 helicopter hovers over the pad,

with John Ryan at the controls and Jim Enias and Jack Sackett operating the airborne instrumentation. Scott Schollenberger and Buzz Liepe make adjustments to the ground components.

The testing is one facet of a comprehensive FAA effort to integrate helicopters into the National Airspace System and to promote the development of all-weather heliports.

*Photo by Michelle Cohen.*

Back cover: A new plane is getting a still newer engine. This Eastern Airlines Boeing 757 takes off from Renton, Wash., Municipal Airport carrying a pair of Rolls-Royce RB211-535E4 powerplants that promise better fuel efficiency. FAA certification waits on 370 hours of tests.

# 'Good Management Is Good Human Relations'

An Interview With the Agency's Human Resources Manager

**Q** Could you tell us in your own words just what is "human relations?"

**A** Human relations is how people interact or deal with one another. It occurs on all levels of the organization. Good management is good human relations. Poor human relations can be very debilitating for both individuals and the organization. If you have poor human relations, poor interactions, poor communications, you can expect lower productivity and less quality decisionmaking. Good human relations results in a more effective organization.

**Q** What can be done about remedying poor human relations in an organization?

**A** Some of the best-run companies like IBM and Delta Airlines have found a very solid connection between return on investment and their efforts in human relations. So, they collect information on a regular basis to identify existing problems and potential problems in human relations. The information is used as a basis for decisionmaking and corrective action. Management and employees sit down together and come up with a strategy to deal with the problems. This, I think, is a good approach.

**Q** Is the FAA taking a similar approach to dealing with human relations problems?

**A** Yes, as a matter of fact, we have several very sophisticated systems set up. Some noteworthy examples are the systems developed by the Western-Pacific and Great Lakes regions. Essentially, the process consists of this: An assessment is made of a facility that requests assistance. Then, based on the assessment information, particular issues are identified, and managers, employee groups and perhaps the human relations specialists sit down together and devise a strategy for improving things.



**As the Human Relations Program continues to grow as a force in FAA, it's time we all learned what it is and isn't. Here, Jerry Lavey of the Office of Public Affairs interviews James O. Boone, manager of the Human Resources Staff in the Office of the Administrator.**

**Q** Could you illustrate this general approach to problem solving with a specific example?

**A** A situation at the Washington ARTCC last year comes to mind. A group of employees wrote a letter to top management—the director of the Eastern Region, the FAA Administrator and the head of the facility—outlining several problems and concerns. With the help of the Human Relations (HR) committee, a study was conducted to find out more about the four or five problem areas cited in the letter. The HR committee presented its findings—in fact, the presentation was even videotaped. Then, management and employee groups devised a strategy agreeable to all. I understand that implementation of the strategy has been successful.

**Q** Can this approach be used to find out how things are going throughout the agency?

**A** I think so. We plan to send out a questionnaire this spring—in May or June—to every FAA employee (see page 11). The questionnaire is going to ask some very pointed questions about communications, employee participation, management in general, attitudes and the like. So, employees across the agency will have a chance to identify human relations areas where we are doing well and those where we may need to focus more attention. It's important to note that respondents will be guaranteed anonymity, so they need not pull any punches.

**Q** What is the role of the agency's human relations specialists?

**A** As outlined in the program directive, the HR specialists serve as consultants in the area of human relations to their respective regions or centers. They may be brought in to help prevent or solve specific human relations problems. In a broader sense, the specialists also help shape regional and national human relations strategies. Please note that I said "help"—human relations is not the sole responsibility of the HR specialists. It's the responsibility of everyone, and the HR specialists are there to provide their expertise, not to do the whole job themselves.



*In response to complaints about uneven heating at the Aeronautical Center, employees working through their Human Relations work groups and inter-divisional cooperation obtained space heaters and humidifiers where needed, such as this one comforting Janet Page in the Public Affairs office.*

**Q** What is your role in the operation of the Human Relations Program?

**A** I report directly to the Administrator and serve as his staff consultant in the area of human relations. As manager of the Human Resources Staff, I am more of a policymaker and strategist; however, I also serve as program manager for the HR specialists at the national level.

**Q** How much freedom do the HR specialists have to develop their own approaches?

**A** In the beginning, diversity was encouraged. While there is still much room for diversity, we are now moving toward a core system (see box) of principles, beliefs and strategies that will provide more cohesiveness and direction to the program.

**Q** What has been the biggest obstacle and frustration in trying to get a Human Relations Program off the ground?

Jim Boone (standing), manager of the Human Resources Staff, finishes a briefing at a strategic planning group meeting with (from the left) human relations specialists Bob Mitchell, Alaskan Region; Betsy Kirkhari, Western-Pacific Region; Don Saballus, Great Lakes Region; and Dr. Anne Harlan, New England Region.



## The FAA Human Relations Core System

### Definition—

The FAA Human Relations Core System specifies the necessary strategies and conditions (shown below) for increasing organizational effectiveness. This core system will be common to all regions, centers and headquarters to achieve the following results:

- Open, honest and accurate communications throughout the organization
- Appropriate employee participation throughout the organization
- Managerial excellence
- Cooperation and collaboration throughout the organization
- Effective management of organizational change
- Effective organizational structures

### Strategies—

The change strategies employed will vary according to regional needs but will include:

- Training

- Systems analysis
- Consultation
- Assessment
- Team building
- Publicity
- Education
- Learning experience
- Task forces

### Conditions—

In achieving these results, certain conditions are essential:

- Top management support
- Reinforcement of desired change
- Availability of resources
- Human Relations staff
- Access to external resources
- Learners becoming teachers of new strategies

### Foundations—

The Human Relations Core System is based on the following assumptions and beliefs:

- Employee participation in decision-making affecting their worklife builds greater commitment.
- True organizational change occurs through learners becoming teachers.
- Rewarding individual creativity in solving organizational problems enhances organizational effectiveness.
- Flexibility in policies and procedures results in creativity and a high-performance system.
- Empowering of individuals and treating them with respect and dignity results in high morale.
- Cooperation and collaboration is enhanced when team members have the appropriate skills and knowledge to achieve the goal.
- Conflict enhances synergism in groups when confrontation and negotiation skills are present.
- An understanding of the problems and potential contributions of others increases teamwork.

**A** We encountered the same problems that anyone finds in trying to change organizational culture. First, you have to make people aware of what you are trying to achieve and why. The next thing is to energize people and convince them that things can be changed and that they can make a difference. It's almost a chicken-and-egg problem. People have to believe they can do something but won't believe they can until they've actually had some success.

**Q** Can you give us examples of "success stories" where people have been able to change things for the better?

**A** Yes, I think the cooperation at the Oakland ARTCC in setting up an exercise facility is a good example. Another example is the SHARE program at the Boston ARTCC. SHARE stands for "Sharing Helps Achieve Recognized Excellence." It's designed to use the talents and experience of employees at the facility to improve the Center's effectiveness. The response to the program has been overwhelming—more than 200 people have volunteered to contribute their time and effort. People from Air Traffic and Airway Facilities, for example, are working together on teams; communications have improved across the board; and, in general, it's starting to make the Boston ARTCC a better place to work.

**Q** The human relations effort has been criticized because some people feel it concentrates too much on cosmetic rather than on substantive issues. Do you think that's a fair criticism?

**A** The program has resulted in both cosmetic and substantive changes. The mainstay focus of the human relations effort is on substantive issues—more employee participation in decisionmaking, professional training, true delegation of authority and all the core issues that most concern people. I believe that results in the substantive areas are the key to the success of the effort.

**Q** It has been said that employees will really begin accepting the Human Relations Program when they see who is being promoted to supervisory and managerial positions. Do you think that's fair?

**A** Yes, I think they should already be able to see progress in this area. Performance standards for supervisors and managers now have human relations as a major job element. And, those applying for supervisory/managerial positions must provide a statement listing their human relations skills, background and training and how these qualify them for the job they are seeking. We are also establishing a point system to give credit for courses and other kinds of human relations preparation.

**Q** What kinds of human relations qualities is the agency looking for in prospective managers?

**A** First, the agency is looking for intelligent people to promote as managers—not necessarily persons with academic degrees but persons with the ability to analyze and determine what is needed in particular circumstances . . . flexible managers who can deal with complexity and changing situations. We need managers with good communications skills who enjoy working with people, who are persuasive and are good at motivating people.

**Q** Is anything being done to recognize and reward these kinds of managers who are now in the FAA?

**A** We are establishing an awards program to recognize managers and employees who are outstanding in human relations. The first awards will be given this year. Eventually, I envision a formal awards program like the EEO awards ceremony. Already there are those who are becoming well known throughout the system for their efforts in human relations. The word gets around. And that's at least as important as a more formal award structure. Persons like Pat Laverne in Central Region, Gary Klinger in Great Lakes Region, Lorraine Harrison in New England, Cindy Zook from Washington headquarters and many others are becoming well known in this regard. We've asked these people frequently to come to Washington to help out on various projects and the regions have done the same.

**Q** What is being done to develop human relations skills among our current crop of supervisors and managers?

**A** For one thing, the Management Training School at Lawton has been totally restructured to place a strong emphasis on human relations and communications. In addition, assessment centers that emphasize human relations skills are used in some cases for selecting supervisors and managers from the GS-15 level up. Across the system, a large number of supervisors have taken the initiative by attending local college courses in human relations. It is a long-term effort, but I think we are making excellent progress.

**Q** This brings up the whole question of how much you can modify behavior. It is really possible?

**A** If the people in the organization are sincere, I think you can change behavior. However, you have to create an atmosphere within the organization to make that change happen. You do that by making it very clear what kinds of activities and behavior are valued and rewarded. When people have a clear understanding of what is expected of them, they tend to behave more favorably.

**Q** What about those who resist change? Can anything be done with them?



**A** I think you have to be creative in the way you handle this problem. The Human Relations Program is not designed to displace people; however, for these who strongly resist change, straightforward action may be required.

**Q** What do you think about giving employees an opportunity to evaluate their bosses?

**A** I personally think it would be a very good idea. In a broad sense, all employees will have an opportunity to assess all management levels with the questionnaire this spring. And there is some thinking about how that could be done on a more regular basis. It's not uncommon outside the government. When I was teaching in graduate school, the students filled out an assessment of professors, and that information was used to determine a professor's pay raise. Many corporations, especially the best run ones, also use this method of assessing to determine pay raises.

**Q** Why do you think some managers are unwilling to give employees more of a role in decision-making?

**A** I think there's considerable misunderstanding of participatory management—on both sides. Some managers think it means they must give up their right to make decisions. It doesn't mean that at all. And some employees think managers should allow employees to vote on decisions. That is also incorrect. Final decision-making is the responsibility of management; however, employees will be more apt to support a decision that they helped make.

A good example of this occurred in the Northwest Mountain Region. All employees in the regional office were asked to assist in the planning of the space layout in the new regional office building. Although it was a very complicated and involved effort, a layout—acceptable to all—was developed.



*Betsy Kirkhart, Western-Pacific Region human relations specialist, tries out a rowing machine in the Oakland, Calif., ARTCC's new Recreation Room. Spawned and funded by the OAK-AIR employee organization, the project came to fruition through the joint efforts of AT, AF, the Facility Advisory Board and the Human Relations Committee. The room has two rowing machines, two exercycles (ergometers), a seven-station universal weight set and a ping pong table.*

**Q** Do you think the strong emphasis on human relations will remain, or is it a passing fad that will change with administrators?

**A** Human relations as an integral part of management is here to stay. Many studies over the past five to 10 years have shown that the most productive and profitable companies considered the welfare of their employees to be their top priority. Socrates was purported to have said: "The best way to have the best wool is to take the best care of your sheep." Perhaps, we all could learn something from Socrates. ■

## An Olympian in the Family

An FAAer's Son Becomes a Champion Skier Quickly



“**M**eteoritic rise” is an apt journalistic phrase to describe Todd Boonstra's brief career in Nordic, or cross-country, skiing—from nothing to an Olympic contender.

Even his parents, Gordon and Marjorie, hadn't realized how rapidly he was coming along. But the word got around, and Gordon's co-workers at the Minneapolis ARTCC, where he's a computer display channel crew chief, are beaming with pride along with dad.

Only five years ago as a high school sophomore, Todd took up Nordic skiing as a way to keep fit during the off-season for track and cross-country running. In his first year, he made the varsity ski team and placed fourth in state competition. In his senior year in 1980, he won the state championship.

As a college freshman at the University of Minnesota at Duluth,

he pulled off a coup—he placed seventh in the National Collegiate Athletic Association (NCAA) cross-country race, one of two Americans to place that year. Most colleges where Nordic skiing is big import Norwegian skiers for their teams, explained Boonstra. In the 1982-83 season, now attending the University of Vermont, Todd moved up to third place in NCAA competition.

In February 1983, as the youngest member of the U.S. men's cross-country ski team, he won a bronze medal at the World University Games in Sofia, Bulgaria, the highest finish ever by an American.

“That's when he realized he could compete against world competition,” Todd's mother pointed out.

“Actually, I had initially projected 1988 as the year I hoped to qualify for the Olympics,” Todd said. Cross-country skiers usually don't peak until their late twenties.” But the medal in Bulgaria convinced him that perhaps he had a shot at the 1984 Olympics.

Todd began training hard with the U.S. ski team and in December qualified for the U.S. Nordic World Cup Team competitions in Germany and Austria, but illness kept him out of most of it. At the same time, he had the chore of trying to round up financial sponsors for an Olympic try. His efforts produced local public contributions, but no private ones.

This past January at qualifying races in Lake Placid, N.Y., he earned one of the seven team berths for the February Winter Olympic Games at Sarajevo, Yugoslavia—the second youngest member of the team.

In the 15-kilometer race, Todd placed fifty-fourth out of 91 participants, five minutes behind the gold medalist with a time of 46:36.5.

Now, he's girding up for the 1988 Winter Olympics in Calgary, Canada, simultaneously trying to develop his strength and an array of financial sponsors to help him represent the United States again.

Gordon Boonstra and his teammates at the center are supporting him, for they know a winner when they see one. As Todd's high school skiing coach, Phil Lundin, said, “Boonstra was a natural.” ■

## A Voice in the Future

Confidential Human Relations Survey Seeks Employee Input

**M**ost FAA employees will have an opportunity this spring to express their feelings about their jobs and the overall work environment, as well as about the agency and its management and policies. The confidentiality of survey responses will be protected.

The FAA plans call for the collection of information in two phases—all employees will receive an “FAA Employee Survey” this spring, following which a small percentage of employees at representative facilities will be interviewed by specially trained interviewers.

Among the aspects to be evaluated are job participation, communication, feedback on performance, supervisor competence, cohesiveness within work groups, how change is managed and other organizational issues. In addition to specific questions, a general comments section has been included to permit employees to make more specific comments on how they perceive their work environment.

Information gathered through this survey can be beneficial both to the agency and to individuals. Its scope is unusual in that every employee not covered by a union bargaining agreement will receive a questionnaire and that the results will be used to provide

feedback to both large and small organizational work units—branches, facilities, etc.

Employees within these units will be able to see not only how their feelings and opinions compare with those of their fellow workers but also how the feelings and opinions of their entire work unit compare with those of the overall work force.

To make this benefit possible, each person must complete the specific location identifier requested. Although this might appear to compromise the confidentiality of the responses, the following steps will be taken to ensure the privacy of all respondents:

First, questionnaire responses will be read by an optical scanner and entered into a computer for analysis. Information contained in the comments section, after being numerically coded, will be treated the same way.

Then, feedback on questionnaire responses will be presented only in summary form across the various job topics or across work groups, ensuring that it will be impossible to identify the responses of any single individual.

To further assure that privacy is not breached, feedback will only be summarized for work groups larger than 25 employees.

Finally, the anonymity of employee responses is being protected by mailing the questionnaire to the employee's residence, with an envelope provided to return the information directly to the researcher in charge of the project. If the location identifier is not

provided, however, the effectiveness and completeness of the resulting feedback will be severely hampered.

The second-phase interviews will be begun after the questionnaires have been returned. A team of specially trained interviewers will go to a representative number of facilities throughout the agency where some employees will be selected to participate in a structured interview session. While the content of their questions will be parallel to those in the questionnaire, the interviewers will permit employees to go into greater detail than was possible on a form. Once again, to ensure confidentiality, the responses will be coded and summarized without identifying the respondent or the facility. In return, the agency asks everyone to respond as openly and candidly as possible.

Overall agency results will be provided to all employees. Information gained from the survey and interviews will be used by management in planning for the future.

Employees can have a say in that future, and the opportunity will soon be in their mailboxes. ■

By Frank Clifford

A former writer for FAA and DOT offices of Public Affairs, now retired, he has also been published in military aviation magazines.



# The Turboprop Comes of Age

## Growth of Commuters, Fuel Prices Spur Renaissance

The turboprop in air carrier and business fleets never really went away, and it's coming back, too.

That's not a paradox; it's just that for a long time, the more glamorous jets got most of the attention, but changing times have made the turboprop an increasingly appealing alternative.

"A combination of factors pushed the development and growth of the propjet, or turboprop, into the background," says Charles L. Blake, who was chief energy advisor in FAA's Office of Environment and Energy and an aeronautical design engineer before retiring at the end of March.

"Most important among them was the sudden appearance and wide acceptance by both the industry and the public of the pure jet and, at the same time, a series of accidents involving structural failure in the Lockheed Electra, one of the earlier turboprops."

While the average air passenger perceived the turboprop as just another propeller plane from yesterday, both it and the jet are powered by turbine engines, with the former spinning a propeller geared off the turbine.

The late 1950s were a time of tran-



This full-scale mockup of the Gates-Piaggio GP-180 shows a canard control surface at the nose and air intakes denoting the turboprop engines. The company claims 400-knot speed, 2,100-nautical-mile range, 41,000-foot ceiling and fuel efficiency of 1 nm per pound.

sition for the air carriers from the reciprocating gasoline engine to the kerosene-fueled turbine. But jets were not all that new. An experimental jet had flown in Germany in 1939, and it was in the closing months of World War II that the Luftwaffe used a jet fighter with stunning effect against attacking bomber fleets.

Ironically, the British Royal Air Force, which suffered under these counter-attacks, had flown an experimental jet plane in 1941 but had none ready for combat during the war. And its own Sir Francis Whittle is credited with being the father of the jet engine.

But the British wasted no time after the war. They introduced the Comet jet in 1952 and the Viscount turboprop in 1953. In

the U.S., a Boeing military jet was certificated in multi at the 707 in 1958 and the Electra went into service in January 1959.

The jets flew higher, where the air was smoother, and faster at such altitudes, reaching 600 mph—150 mph faster than the Electra turboprop. Alas, they burned twice as much fuel as the turboprops, but no one cared in those days. The Middle East and our own Southwest were elbow-deep in oil, which was selling for \$2.59 a barrel.

To the flying public, the jet was sleek and fast and perceived as newer equipment.

But the tide is turning. Turboprops are joining the business, air taxi, commuter and regional airline aircraft fleets in impressive numbers for good



This was the first production prototype of the Lear Fan, a graphite-epoxy-composite-skinned turboprop that has the prop separate from the jet nacelle.



Also a 400-mph pusher turboprop with a canard is Beechcraft's Starship 1, which also carries drag-reducing winglets.

technical and economic reasons.

In 1976, there were 359 turboprops built. In 1981, this increased to 918, a 61 percent jump in five years. And the FAA is among the customers standing in line to buy.

"Because of their high operating costs, we plan to replace our entire

flight inspection fleet of 31 planes with 27 new aircraft, 25 of which will be turboprops," said Donald D. Snow, manager of the Fleet Programs and Plans Staff of the Aviation Standards National Field Office in Oklahoma City.

Delivery is expected to start this year. The modernized FAA flight inspection fleet will include 19 light twin turboprops and six larger special-mission turboprops with longer range to be used for "mass sampling" of several facilities on one mission. In addition, the agency will buy two long-range jets for flight inspection of U.S. military installations overseas. And there will be three more aircraft replaced with new-technology, high efficiency turboprops for use in training and research and development programs.

Broad specifications for the new turboprops include the ability to

operate at low altitudes for a majority of their time in service with increased endurance.

"Turboprops have distinct advantages for our purpose," Snow explained. "They are economical to operate, can land at smaller airports and will give us increased capability in obstacle verification, among other things."

Fuel saving is no small matter to the FAA, for the agency currently performs about 27,000 hours of flight inspection annually.

It's no small matter in commercial operations either. Operational economy is the reason most frequently cited for the increased demand for turboprops. After salaries, fuel is the next highest operating cost, having risen from that never-to-be-seen-again \$2.59 a barrel for crude oil to today's \$29 a barrel.

Designers have reduced fuel consumption by creating leaner and cleaner airplanes. They have made

widespread use of narrower, thinner wings that produce high lift and reduce fuel-stealing drag.

Wings of this kind, Blake says, need not have very pronounced sweepback to minimize drag at higher speeds. This, he explains, reduces the weight of structural material and the complexity of construction and, with it, fabrication cost and fuel consumption.

Weight reduction also enters into engine design. The amount of thrust from a pure jet depends to a large extent on the diameter of the tailpipe. With the turboprop, however, the same amount of thrust can be achieved with lower slipstream velocity because the diameter of the propeller, compared with the diameter of the tailpipe, is so much larger.

Another aspect of economy is in operations. Jets are notorious fuel spendthrifts at lower altitudes, the normal operating zone for commuter and regional airlines. Because of the relative shortness of each of the legs of their routes, such carriers needn't waste time and fuel getting to jet altitudes only to begin an immediate descent to a landing if they are flying turboprops. In addition, they make faster "block time"—that is, between the departure gate and the arrival gate—than do jets.

Further, fuel can be saved by the turboprop's nimble ground maneuverability and its need for less runway for takeoffs and landings.

On the landing approach, a turboprop pilot can decrease speed by



*This model of a commuter aircraft at NASA's Langley Research Center combines propfan-equipped turboprop engines with natural laminar flow control and a high-aspect-ratio wing for high fuel efficiency.*

changing propeller pitch while the engine is still turning at maximum revolutions—a safety factor. In the event of a waveoff, the pilot needs only to change pitch to go around.

According to FAA's Census of Civil Aviation 1982, there are now 636 turboprops in air carrier service, ranging from the 8- to 11-passenger Cessna C-441 to the 178-passenger Canadair CL-44.

The FAA has long had aircraft evaluation groups (AEGs) as part of the certification process for Boeing, Lockheed and Douglas large airliners. In recognition of the growing presence of turboprops, the agency recently opened an AEG in Kansas City, near the capital of light aircraft—Wichita—for aircraft under 12,500 pounds, which is the weight category of most air taxi and commuter aircraft.

A key factor in the growth of regional and commuter airlines and the accompanying increase in turboprop planes was the deregulation of the airlines in 1978. Major air carriers discontinued service at smaller, marginally profitable airports, leaving a void that is being filled by com-

muters and regionals. Even though the number of airports served is up and the passenger loading on these short-haul carriers has risen, the public is still slow to accept the turboprop when there's an alternative.

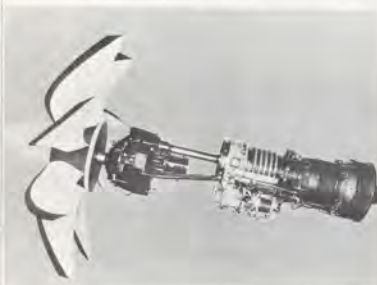
Writing in the February 1982

*Commuter Air*, veteran aviation writer Lou Davis urged the industry to publicize what he feels regular business travelers have known for a long time: "... [that] commuter [airlines] and hometown airports are convenient for the out-and-back-in-one-day business trip . . . they understand commuter aircraft are more efficient and economical on the short-haul runs and can be as safe as jets if not safer . . . that prop planes can land on fields not available to jets . . . that the modern-day turboprop is an advanced technology aircraft having all the basic features of the jet for instrument flight."

And even more-advanced turboprops are on the way. Some are refined versions of conventional designs. Others have pusher engines, aft main wings with a short forward wing—really the stabilizer and elevator—called a *canard* to increase positive lift, newer engine designs, greater use of composite materials

and main wing winglets, which convert drag-producing wingtip vortices into useful lift.

Among them are the single-engine, 14-passenger Cessna Caravan I and its twin-engine stablemate, the II; the high-speed Fairchild 400 and Piper Cheyenne IV, which sport counter-rotating propellers; the Gates-Piaggio GP-180 canard twin pusher; the OMAC 1, a single-engine pusher canard with winglets; the Y-tailed, pusherprop, all-composite-skinned Lear Fan; the also composite, canard, twin-pusher AVTEK 400 that carries winglets; and the similar-featured Beechcraft Starship 1.



*A Hamilton-Standard mockup of a nine-foot propfan mounted on a candidate gearbox and engine for NASA experiments. Fans and propfans are geared from the turbine.*

While far greater fuel efficiencies and new powerplants in general lie down the road, the turboprop itself will achieve greater heights through the research being conducted at the National Aeronautics and Space Administration's Lewis Research

Center in Cleveland. There, engineers, working in cooperation with United Technologies' Hamilton Standard Division, are reinventing the propeller.

The new propeller under investigation is called a propfan. It has eight to 10 thin blades of stainless steel and titanium alloy that are swept back, looking much like a child's pinwheel. NASA believes that a couple of turboprops with propfans could power an airliner at 25 percent less fuel.

Because of structural and dynamic problems in the design of the propfan, the engineers do not foresee operational advanced-design turboprops before the 1990s.

In fact, FAA's Blake questions how soon the industry would be willing to make the heavy investment in a totally new design, considering that now it takes about \$2 billion to produce a certificated airliner.

"However," Blake points out, "the Boeing 757 uses only 60 percent of the fuel that a 727 does. We have the potential to reduce fuel consumption by 40 percent or so in the next generation of aircraft and the same percentage in each succeeding generation. In my opinion, we will reach the point before too long when the industry can give serious attention to



*The thin-bladed, swept propfan under investigation by NASA holds the promise of delaying compressibility effects of propellers and the attendant drag rise and the noise-producing supersonic shock waves and vibration. This would permit reducing aircraft insulation and fuel use.*

cryogenic fuels—liquid natural gas and hydrogen—because of the high engine efficiency and lower structural weights that require small volumes of fuel."

In the meantime, turboprops are recarving out a role for themselves. Will they ever reach jet speeds? Not with present technology, but breakthroughs continue to occur.

Remember, the sound barrier was considered by many reputable aeronautical engineers to be an impregnable wall—until Capt. Chuck Yeager and *Glamorous Glennis*, the X-1, proved otherwise in 1947. ■

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.

## Aeronautical Center

- **Harold K. Everett**, supervisor of the Certification Section A, Airmen Certification Branch, promotion made permanent.
- **Paul J. Franklin**, supervisor of the Aircraft & Avionics Maintenance Section, Aircraft Services Branch, Aviation Standards National Field Office, promotion made permanent.
- **Donald J. Labrosse**, unit supervisor in the Avionics Maintenance Section, Aircraft & Avionics Maintenance Branch, Aviation Standards National Field Office, promotion made permanent.
- **Charles H. Smith**, supervisor of the Visuals Section, Audio-Visuals Branch, Management Services Division.
- **Joel C. Thomas**, manager of the Accounts Payable and Appropriations Accounting Branch, Accounting Division.

## Alaskan Region

- **Edward L. Bell**, area supervisor at the Anchorage Flight Service Station/International Flight Service Station, from the Northway FSS.
- **William D. Toppa**, manager of the Kenai FSS, from the King Salmon FSS.

## Central Region

- **Robert L. Anderson**, unit supervisor in the Omaha, Neb., Airway Facilities Sector Field Office, Grand Island, Neb., Airway Facilities Sector.
- **Marvin D. Beene**, manager of the Airframe Branch, Aircraft Certification Office, Wichita, Kan., promotion made permanent.
- **John C. Curtice**, manager of the Cleveland, Ohio, Manufacturing Inspection District Office.

- **Lloyd L. Edwards**, manager of the Propulsion Branch of the Wichita Aircraft Certification Office, promotion made permanent.
- **Eddie R. Jenkins**, supervisor of the Payroll Services Section, Accounting Control and Payroll Branch, Accounting Division, promotion made permanent.
- **Douglas R. Murphy**, correction: assistant manager, operations, Kansas City ARTCC.
- **Larry W. Wilson**, area supervisor at the Des Moines, Iowa, Flight Service Station, from the FAA Academy.

## Eastern Region

- **Richard J. Bowles**, assistant manager of the Syracuse, N.Y., Tower, from the Binghamton, N.Y., Tower.
- **Lester M. Jiggins**, unit supervisor in the Philadelphia Flight Standards District Office.
- **Henry L. Lewis**, assistant manager for technical support at the Charleston, W. Va., Airway Facilities Sector.
- **Robert B. Mendez**, manager of the New York Airports District Office.
- **Gerald Shipman**, manager of the Human Resources Planning & Recruitment Branch, Human Resources Division.

## Great Lakes Region

- **Lawrence S. Barnes**, manager of the Oshkosh, Wis., Tower, from the Flint, Mich., Tower.
- **Daniel M. Coleman**, manager of the Battle Creek, Mich., Tower, from the Fort Wayne, Ind., Tower.

- **James P. Crawford**, systems engineer at the Indianapolis, Ind., ARTCC Airway Facilities Sector, from the FAA Academy.
- **Jimmy D. Decker**, manager of the Appleton, Wis., Tower, from the FAA Academy.
- **Terry B. Eliason**, area supervisor at the Minneapolis, Minn., ARTCC, promotion made permanent.
- **William G. Ellesin**, area supervisor at the Akron-Canton, Ohio, Tower, promotion made permanent.
- **Wilbur G. Friend**, assistant manager of the Mitchell Field Tower, Milwaukee, Wis.

- **Robert A. Frink**, manager of the Port Columbus, Ohio, Tower, from the Chicago O'Hare Tower.
- **Barbara A. Gardner-Martin**, area supervisor at the Detroit City, Mich., Tower.
- **Edward M. Hynes**, area supervisor at the Traverse City, Mich., Flight Service Station, from the West Chicago FSS.
- **Kenneth E. Jackson**, assistant manager at the Chicago O'Hare Tower.
- **Robert J. Maxson, Jr.**, area manager at the Dayton Vandalia, Ohio, Tower.
- **Robert C. May**, area supervisor at the Detroit, Mich., Metro Tower, promotion made permanent.
- **Thomas W. McCune**, assistant systems engineer at the Cleveland ARTCC AF Sector.

- **George B. Meiners**, area supervisor at the Cincinnati, Ohio, FSS, from the Indianapolis FSS.
- **Gordon E. Musser**, manager of the South Bend Unit, St., Joseph County AF Sector Field Office, Indiana AF Sector.
- **Claude T. Pine**, assistant manager for technical support at the Aurora, Ill., AF Sector.

- **Joseph K. Puhala**, operations officer at the Dayton Vandalia Tower.
- **Derald F. Roberts**, assistant manager of the Dayton Vandalia Tower.
- **Richard J. Specht**, systems engineer in the Minneapolis ARTCC AF Sector, from the Fairbanks, Alaska, AF Sector.
- **Joseph F. Woodford**, area supervisor at the Minneapolis ARTCC, promotion made permanent.
- **Samuel F. Woods**, manager of the East St. Louis, Ill., Tower, from the Indianapolis Tower.

## Metro Washington Airports

- **Robert J. Graves**, supervisory police officer at the Washington National Airport Police Branch, from Dulles Airport.
- **Herbert C. Nunley**, supervisory police officer at the Dulles Airport Police Branch, from Washington National Airport.

## New England Region

- **Maureen F. Duffy**, supervisor of the Administrative Services Section, Material Management Branch, Logistics Division.
- **Robert T. Durgin**, area manager at the Bridgeport, Conn., Flight Service Station, from the Boston, Mass., FSS.
- **Leo A. Spencer**, area supervisor at the Bridgeport Tower, from the Danbury, Conn., Tower.
- **Edward J. Stanton**, assistant manager at the Bridgeport FSS, from the Windsor Locks, Conn., FSS.

## Northwest Mountain Region

- **Gary K. Bailey**, programs support officer at the Salt Lake City, Utah, Airway Facilities Sector.

- **John J. McLaughlin**, assistant manager at the Seattle, Wash., Flight Service Station.
- **Warren B. Porter**, manager of the Great Falls, Mont., FSS, from the Seattle FSS.
- **Marvin F. Rammelsberg**, supervisor of the Aircraft Modification Section, Western Aircraft Field Office in Hawthorne, Calif., from the Brussels, Belgium, Aircraft Certification Office.
- **Roy R. Ruff**, manager of the Denver, Colo., ARTCC AF Sector, from the Salt Lake City ARTCC AF Sector.

- **Charles R. Schulke**, area supervisor at the Billings, Mont., Tower, from the Casper, Wyo., Tower.
- **Buell C. Shaffer**, manager of the Pueblo, Colo., Tower, from the Denver Tower.
- **Wyman G. Shell**, manager of the Long Beach, Calif., Manufacturing Inspection District Office, Los Angeles Aircraft Certification Office.

## Southern Region

- **Earl E. Aery**, manager of the Hawkins Tower, Jackson, Miss., from the Atlanta International Tower.
- **James L. Alexander**, manager of the Lynch, Ky., Airway Facilities Sector Field Office in the Covington, Ky., AF Sector, from the Miami, Fla., Hub AF Sector.
- **William E. Branch**, manager of the Tri-City Airport Tower, Bristol, Tenn., from the Jackson, Miss., Tower.
- **Howard E. Burch**, manager of the Plans & Programs Branch, Air Traffic Division, from the Automation Staff.
- **Arthur J. Clark**, supervisor of the Radar Unit at the Memphis, Tenn., Hub AF Sector, promotion made permanent.
- **James D. Jefferson**, manager of the Florence, S.C., AF Sector Field Office,

Columbia, S.C., AF Sector, from the Covington, Ky., AF Sector.

- **James W. McQuigg**, assistant manager for plans and programs at the Jacksonville, Fla., ARTCC.
- **August T. Ruark**, assistant manager at the San Juan, Puerto Rico, International Flight Service Station.
- **Gary L. Slack**, manager of the Montgomery, Ala., AF Sector, from the Jacksonville Hub AF Sector.
- **Ronald J. Van Kuren**, area supervisor at the Isla Verde Tower, San Juan, from the West Columbia, S.C., Tower.

## Southwest Region

- **Frank Boone, Jr.**, manager of the El Paso, Tex., Tower, from the Operations Branch, Air Traffic Division.
- **Bobby J. Earthman**, manager of the Amarillo, Tex., Airway Facilities Sector Field Office, Albuquerque, N.M., AF Sector, from the Maintenance Operations Branch, Airway Facilities Division.
- **John P. Gorman**, manager of the Albuquerque Tower, from the San Antonio, Tex., Tower.
- **Arthur E. Gumtau**, assistant manager at the Oklahoma City, Okla., Tower.
- **James A. Horn**, area supervisor at the Fort Worth, Tex., ARTCC, from the Operations Branch, Air Traffic Division.
- **Burnis D. Horton**, supervisor of the Navigation & Landing Aids Section, Maintenance Operations Branch, AF Division.
- **Louis F. Moss**, assistant manager for technical support at the Houston, Tex., ARTCC AF Sector.
- **Frances A. Mulkey**, area supervisor at the Amarillo Tower.

■ **Charles A. Nathman**, assistant manager of the Maintenance Operations Branch, AF Division, from the Dallas-Ft. Worth Tower AF Sector.

■ **Patricia P. Osborn**, manager of the Santa Fe, N.M., Tower, from the Midland, Tex., Tower.

■ **Walter J. Price**, manager of the Baton Rouge, La., General Aviation District Office, from the regional Aeronautical Quality Assurance Field Office.

■ **Felix Saenz, Jr.**, area supervisor at the Hobby Field Tower, Houston, Tex., from the Houston Intercontinental Tower.

■ **John A. Seegers**, systems engineer at the Albuquerque ARTCC AF Sector.

■ **William L. Trusler**, area supervisor at the Lubbock Tex., Tower, from the Houston Intercontinental Tower.

■ **Tony G. Valerio**, manager of the Albuquerque AF Sector Field Office, promotion made permanent.

## Technical Center

■ **Mitchell Grossberg**, supervisor of the Advanced Planning & Requirements Section, Facility Engineering & Maintenance Branch, Facilities Division.

■ **Wayne R. Wolfe, Jr.**, supervisor of the Enroute Baseline/Design Section, National Program Development Branch, Procedures Division.

## Washington Headquarters

■ **Beauford A. Bancroft**, manager of the Airspace & Aeronautical Information Requirements Branch, Airspace-Rules & Aeronautical Information Division, Air Traffic Service.

■ **James Burns, Jr.**, manager of the National Flight Data Center.

■ **John J. Callahan**, manager of the Quality Control Branch, Quality Assurance Division, Air Traffic Service.

■ **Richard A. Clevenger**, manager of the Real Estate Branch, Material Management Div., Acquisition and Materiel Service.

■ **Michael R. Dunlap**, manager of the Aviation Safety Analysis System (ASAS) Program Office.

■ **Cyril H. Femrite**, manager of the Human Resources Branch, Resource Management Division, Air Traffic Service.

■ **Timothy G. Fleming**, manager of the Systems Branch, System Plans & Programs Division, Air Traffic Service.

■ **David E. Hodge**, manager of the Programs Branch, System Plans & Programs Division, Air Traffic Service.

■ **Peter N. Kovalick**, manager of the Human Relations & Communications Branch, Resource Management Division, Air Traffic Service.

■ **Wilbert A. Larson**, manager of the Requirements Branch, System Plans & Programs Division, Air Traffic Service.

■ **Paul J. Neumann**, manager of the Advanced Concepts Program, Systems Studies/Advanced Concepts Division, Systems Engineering Service.

## Retirees

Brown, Dwight S.—AC  
Castanien, Donald R.—AC  
Dubany, Claud W.—AC  
Gilbert, Quentin T.—AC  
Smith, John W.—AC  
Tucker, Clay F.—AC

McQueen, Rex W.—CE  
Moore, Ronald G.—CE  
Shangler, Anthony—CE  
Terrill, Lester L.—CE

Klotzbuecher, Catherine—CT  
Lewis, William—CT  
Ordille, Helen—CT

Brown, George W.—EA  
Contess, David—EA  
Kugler, George W., Jr.—EA  
Mattioli, Otto F., Jr.—EA  
McCartney, Cecil R.—EA  
Scott, Franklin T.—EA

Trochak, George C.—EA  
Wisner, Donald J.—EA

Armbruster, Selden F.—GL  
Balsis, Francis G.—GL  
Cirillo, Joseph A.—GL  
Conner, Charles A.—GL  
Culley, Terance D.—GL  
Czechowski, Richard C.—GL  
Derr, Paul T.—GL  
Gendreau, Charles A.—NE  
Dommin, Dale A.—GL  
Golbo, James H.—GL  
Goslin, John E.—GL  
Jacobs, Leon J.—GL  
Jacobson, Norris L.—GL  
Johnson, Charles R.—GL  
McCune, Jane R.—GL  
Miller, Bernard H.—GL  
Murk, Buddy L.—GL  
Nobach, Edward H.—GL  
Schmid, Paul J.—GL

Archer, Philip A.—NE  
Doherty, Michael W., Jr.—NE  
Lucas, Robert M.—NE  
Nawrocki, Boleslav T.—NE  
Ouellet, Adrian A.—NE  
Taylor, Ronald G.—NE  
Wiers, Irving A.—NE  
Willis, Elmer R.—NE

Apps, Richard E.—NM  
Hendy, Norman V.—NM  
Hodges, William B.—NM  
Kari, Paul A.—NM  
Mash, James—NM

Sorsby, Thomas B.—GL  
Stillwagon, Kenneth D.—GL  
Van Dake, Byron F.—GL  
Williams, Edward L.—GL  
Yocius, William G.—GL

Metzdorf, Charles A.—MA

Archer, Philip A.—NE  
Doherty, Michael W., Jr.—NE  
Lucas, Robert M.—NE  
Nawrocki, Boleslav T.—NE  
Ouellet, Adrian A.—NE  
Taylor, Ronald G.—NE  
Wiers, Irving A.—NE  
Willis, Elmer R.—NE

Apps, Richard E.—NM  
Hendy, Norman V.—NM  
Hodges, William B.—NM  
Kari, Paul A.—NM  
Mash, James—NM

■ **James I. Riddle**, manager of the Project Development Branch, General Aviation & Commercial Div., Office of Flight Operations, from the Baton Rouge, La., GADO.

■ **David B. Tuttle**, manager of the Requirements Identification & Analysis Program, Systems Requirements & Design Div., Systems Engineering Service, promotion made permanent.

## Western-Pacific Region

■ **Edward C. Arri**, assistant manager for plans and procedures at the Oakland, Calif., TRACON.

■ **Henry R. Barbachano**, area supervisor at the San Francisco Tower, from the San Jose, Calif., Municipal Tower.

■ **James W. Braithwaite**, area supervisor at the Burbank, Calif., Tower, promotion made permanent.

■ **Jerome R. Egan**, area supervisor at the San Francisco Tower, from the Oakland Tower.

■ **Patrick L. Hagemeister**, area supervisor at the Ontario, Calif., TRACON, from the Coast TRACON at the El Toro, Calif., Marine Corps Air Station.

■ **Melvin D. Haworth**, manager of the San Francisco Airway Facilities Sector, from the Fresno, Calif., AF Sector.

■ **Francis J. Jablonski, Jr.**, area supervisor at the Oakland ARTCC.

■ **Albert E. Jay**, assistant manager for airspace and procedures at the Honolulu, Hawaii, ARTCC.

■ **Homer R. King**, assistant manager for technical support in the Fresno AF Sector.

■ **Roy T. Kuratani**, crew chief in the Navigation/Landing Program Section, Establishment Engineering Branch, AF Division, at Hickam AFB, Hawaii.

■ **David R. Larsen**, group supervisor in the Navigation/Landing Program Section.

■ **Benjamin R. Marcelo**, manager of the Sacramento, Calif., Flight Service Station, from the Las Vegas, Nev., FSS.

■ **Billie R. McWhirter**, manager of the McClellan AFB, Calif., AF Sector Field Office (Radar/Communications), from the Mather AFB, Calif., AFSFO.

■ **Matiij Mirko**, unit supervisor in the Fresno AF Sector Field Office.

■ **Steven A. Pansky**, area supervisor at the Brackett Field Tower, La Verne, Calif., from the Burbank Tower.

■ **Roy J. Terasaki**, manager of the Mather AFB AF Sector Field Office, from the McClellan AFB AFSFO.

■ **Derald E. Vanderpool**, area supervisor at the Las Vegas Tower.

■ **Baysil B. Ward**, area supervisor at the Oakland ARTCC.

■ **Ronald Y. Yamamoto**, group supervisor in the Navigation/Landing Program Section at Hickam AFB, Hawaii.

Randle, Richard B.—NM  
Stewart, Shirley P.—NM  
Stickel, Fred J.—NM  
Sutton, Marvin L.—NM

Baldassare, James E.—SO  
Calvert, Raymond—SO  
Cheek, William L., Jr.—SO  
Davis, John Q., Jr.—SO  
Diaz, Arthur—SO  
Dow, John E.—SO  
Howard, Mary T.—SO  
Inman, James T.—SO  
Jaggers, Garland R.—SO  
Johnson, Pauline R.—SO  
Kaplan, Paul R.—SO  
Keller, Louis M.—SO  
Kennedy, Johnson C.—SO  
Martin, Kenneth P.—SO  
McNair, Ralph C.—SO  
O'Malley, Mary N.—SO  
Peterson, Joel W.—SO

Accardo, Sam J.—SW  
Bowers, Fred W.—SW  
Burgos, Jose G.—SW  
Cowser, John C.—SW  
Hanlon, John W., Jr.—SW  
Hardin, Bobby D.—SW  
Hovenkamp, Jean W.—SW  
Kelly, Timothy J.—SW  
Knight, Edwin D.—SW  
Krause, Walland E.—SW  
McAfee, Donald L.—SW  
Payne, Douglas D.—SW  
Pelton, Philip H.—SW  
Tepsic, Charles L.—SW

Pope, Wilson G.—SO  
Quick, Robert V.—SO  
Smith, Charlie L.—SO  
Ward, Clifford Z.—SO  
Warner, Kenneth D.—SO  
Waters, Keiffer L.—SO  
Williams, James B.—SO

Accardo, Sam J.—SW  
Bowers, Fred W.—SW  
Burgos, Jose G.—SW  
Cowser, John C.—SW  
Hanlon, John W., Jr.—SW  
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Knight, Edwin D.—SW  
Krause, Walland E.—SW  
McAfee, Donald L.—SW  
Payne, Douglas D.—SW  
Pelton, Philip H.—SW  
Tepsic, Charles L.—SW

Turley, Robert E.—SW  
Upton, William A.—SW  
Vance, Edward H.—SW  
Vinyard, J.V.—SW  
Wilson, Burnis E.—SW

Hartman Kathleen M.—WA  
Hosler, Harlan S.—WA  
Muney, James H.—WA  
Potosky, Norman—WA  
Roach, Jesse E.—WA  
Slover, John C.—WA

Campodonico, Edward F.—WP  
Eggen, Donald O.—WP  
Eubanks, John D.—WP  
McCarty, James E.—WP  
Palmer, Charles L.—WP  
Patterson, Robert A.—WP  
Rothhammer, Grant, Jr.—WP  
Siwa, John A.—WP  
Van Handel, Donald L.—WP  
Williams, Herbert O.—WP



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