U.S. Department of Transportation
Federal Aviation Administration

FAA World

July 1989
Volume 19 Number 7

Jet Flight Hits the Big 50

By Richard K. Smith

Fifty years ago—on Sunday, Aug. 27, 1939—a small airplane went screaming off the Heinkel Flugzeugbau's airfield on the Baltic coastal plain at Marienehe, Germany, circled the field and landed. The short flight had to be terminated prematurely because a sea gull had been ingested into the engine intake. Still, the test pilot, Erich Warsitz, and all the observers were pleased by this first flight of the world's first jet airplane.

The airplane was the Heinkel He.178, a diminutive, shoulder-wing flying machine of 4,400 pounds with an all-metal monococque fuselage and a wing of stressed plywood. A wooden wing in the first jet plane was a bit of a paradox, but the He.178's only function was to serve as a flight vehicle to validate its HeS–3b turbojet engine.

The first jet flight was the brainchild of 28–year-old Hans von Ohain. In 1932, as a student at the University of Gottingen, he flew as a passenger on a Lufthansa airliner and was appalled by the noise and vibration that filled the

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Dr. Smith is a noted aviation historian and a previous contributor to FAA World.

In This Issue

Fast Radar Boosts Airport Capacity

Somebody is doing something about flight delays.

The Federal Aviation Administration, with the strong support of the aviation community and the U.S. Congress, is pursuing a broad range of hi-tech approaches to increasing existing airport capacity at the same time that it is working to promote new airport development.

By Anees Adil

Of the various technical programs, none is more promising than the demonstration of a new precision-approach-radar monitoring system at the Raleigh-Durham, NC, Airport. It would allow aircraft to make more efficient use of closely spaced parallel runways and converging runways during bad weather, when two-thirds of all flight delays occur.

The agency also has a related program in progress at the Memphis, TN, Airport, using a different system for monitoring traffic (see box). Both are part of the Precision Runway Monitor (PRM) Program.

The Raleigh-Durham demonstration program got underway this summer and is expected to run for about one year. If successful, the system will be upgraded and become a permanent fixture at the airport. Implementation at other airports could be expected to follow. In all, FAA has identified 12 locations that could immediately benefit from the use of the Raleigh-Durham, Memphis or a similar system. There is the potential for 50–100 airports to benefit ultimately from the program.

One of the major problems currently facing many fast-growing airports, like Raleigh-Durham and Memphis, is the

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Mr. Adil is a staff member in the Advanced System Acquisition Service and program manager for the Raleigh and Memphis program for closely spaced parallel runways.

FAA World

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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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Faster Radar

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sharp reduction in runway acceptance rates during periods of bad weather when visual approaches are restricted or prohibited. Capacity can be cut by as much as 50 percent under instrument flight rule (IFR) conditions, depending on the airport layout.

For example, at Raleigh-Durham, the 3,500-foot spacing between the airport's parallel runways permits simultaneous approaches as long as pilots can ensure safe separation through visual contact. However, in IFR weather, FAA requires a minimum distance of 4,300 feet between runways for parallel approaches. The IFR standard provides an additional margin of safety and ensures that one aircraft will not blunder unseen into the approach path of another.

The idea behind this demonstration is that IFR parallel operations can be conducted safely on runways separated by less than 4,300 feet if controllers are provided with precise, rapid updates on aircraft position. Thus, any course deviation can be detected quickly and corrective action taken to put the errant pilot back on track before he or she can pose a hazard to other air traffic.

The Raleigh-Durham system achieves this objective through the use of an electronically scanning radar capable of updating aircraft targets as often as two times a second, compared with once every five seconds for conventional airport surveillance radars.

The highly accurate equipment also can monitor lateral (left-right) aircraft movements to within a few feet at distances many miles from the runway. Controllers are alerted to course deviations by automated visual and aural alarms on their displays.

Perhaps the most distinctive physical feature of this system is a 17-foot-diameter circular antenna positioned 90 feet above the airport surface. This is a phased-array antenna, which means it

Anees Adil, Quick Scan's program manager, checks out the equipment at the North Carolina airport.

remains stationary while the radar beam is steered electronically in a 360-degree sweep.

The Raleigh-Durham system also features high-resolution color displays and a "desk-top" simulator that serves as a link with remote aircraft simulators at the FAA Aeronautical Center in Oklahoma City and at the American Airlines training center in Dallas-Ft. Worth. American has been deeply involved in the demonstration from the start because of its plans to develop Raleigh-Durham as a major hub airport.

Former FAA Administrator Donald Engen can take credit for initiating the program, having approved the concept in August 1986. It was enthusiastically applauded by the aviation industry. Due in large measure to industry efforts, the Congress subsequently agreed to provide $5 million for fast-track airport capacity programs. It named the new airport surveillance system as a prospective candidate program, and a contract with a project management firm was signed in April 1987.

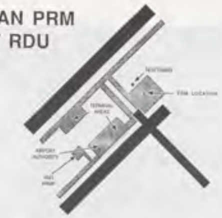
A major milestone in the Raleigh-Durham project was achieved in April 1988 when the 77-foot-high radar tower

was erected at the airport between the parallel runways. The antenna system, displays and other components were delivered in March 1989.

In this same period, the program also began to evolve from one designed solely to improve IFR parallel runway operations to one which can apply to IFR converging operations and other multiple approaches. The name of the system changed accordingly to reflect its expanded scope—i.e., from "parallel runway monitor" to "parallel and converging runway monitor" to "precision runway monitor" to "Quick Scan airport surveillance system."

The Raleigh-Durham demonstration now is in the initial proof-of-performance phase. The agency expects to

E-SCAN PRM AT RDU



begin the actual data-collection effort this fall, with eventual participation by all elements of the aviation industry. Through the use of simulation techniques, the demonstration team will look not only at the Raleigh-Durham runway configuration but also at very closely spaced parallels down to 2,500-foot separation. In the final phase, team members also will evaluate the requirements for conducting IFR approaches to converging runways.

FAA controllers who have had experience with parallel approaches at various airports around the country will be brought in to work with the demonstration team. The agency also is recruiting volunteer airline crews to fly the simulators at the FAA and American Airlines training facilities that will be linked to Raleigh-Durham by telephone or satellite. Simulator crews will receive and respond to controller instructions as if flying an actual aircraft.

The success of the Raleigh-Durham and Memphis demonstration programs will pave the way for more than a score of airports with closely spaced parallel runways to implement these systems. Moreover, once a standard is established, many of the major airports can begin to plan new parallel runways on existing airport land and provide near-term options for increasing airfield capacity up to 100 percent, compared to the best configuration today.

One measure of the results will be substantial cost savings for airline operators due to fewer delays. For example, FAA estimates that operational use of precision-approach-radar monitoring systems would reduce delays at 10 target airports by 250,000 aircraft hours in the year 2000. That translates into a total of more than $400 million annually in fuel and other savings.

Still, the ultimate winner will be airline travelers, who may come to feel the tide has finally turned in their favor. ■

Seventy-seven feet of steel reach skyward at the Raleigh-Durham Airport to cradle the high tech Quick Scan radar.

Another Way To Skin a Cat

The Memphis demonstration program got underway in August 1988 and is scheduled to continue until late spring 1990. One of the major differences between it and the demonstration at the Raleigh-Durham Airport is the design of the antenna system. Unlike Raleigh-Durham, which uses a fixed phased-array antenna, Memphis employs a rotating pair of five-foot open-array beacon antennas mounted back to back. This provides traffic updates every 2.4 seconds, or double the rate of conventional radar antennas.

Both programs have the same objective, however—that is, to define the technical characteristics of a radar runway-monitoring system that will permit more efficient utilization of closely spaced and converging runways during instrument conditions.

Like Raleigh-Durham, the Memphis demonstration will be evaluated through flight-simulation techniques using actual airline crews and a cross-section of veteran FAA controllers. There also will be flight demonstrations involving aircraft from FAA, Federal Express, Northwest Airlines and other carriers, as well as from the general aviation community.

The Quick Scan radar tower is a close neighbor to the airport control tower. The bright red circular radar measures 17 feet in diameter.

Photos by Roger Myers

Jet Flight

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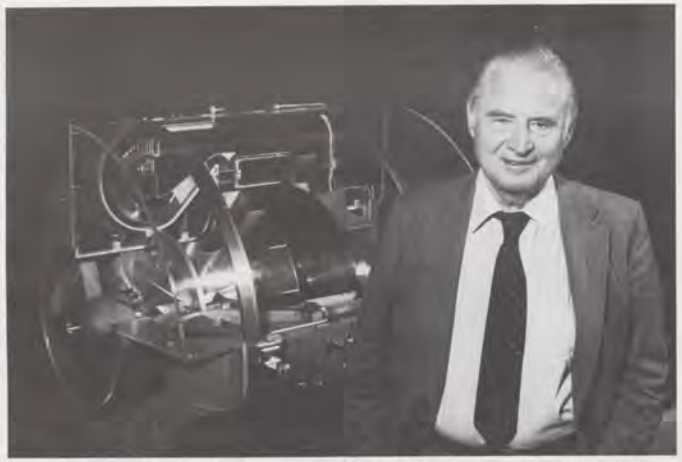
cabin and shattered what should have been the serene elegance of flight. Instead of a series of explosions providing the energy for flight, it occurred to Ohain that the engine power should be a steady thermodynamic flow.

Clearly, such a flow would be found in a turbine engine. But in the 1930s, gas turbines were very few and limited to large industrial installations. The term ''gas turbine'' provoked images of a huge machine anchored in tons of concrete. Nevertheless, Ohain went ahead with calculations based on the lightweight requirements of an airplane.

Besides simplicity, the gas turbine was superior to the piston engine on the point of thrust to weight. Whereas the piston engine required a propeller to translate power to thrust, the turbojet is a self-contained unit of pure thrust. Although the turbojet's fuel consumption seemed shockingly high, the weight of additional fuel was neatly traded off against the lightness of the engine and the final result was a 40% increase in speed.

Aware that abstract figures were not enough, Ohain designed and built a working model engine to demonstrate its principles, dividing his time between that project and finishing a Ph.D. in physics at the university. Meanwhile, one of his professors, R.W. Pohl, took an interest in the primitive turbojet, saw that the project required industrial support, and offered Ohain a connection to a manufacturer of his choice.

Ohain was skeptical about established aero engine manufacturers, who probably could come up with ten thousand reasons why a turbojet was premature or simply could not be adapted to an airplane. Instead, he looked to a sponsor who wanted to fly faster, a builder of airplanes, and he chose the Heinkel Flugzeugbau.



Hans von Ohain poses with a model of the turbojet engine that ushered in the jet age 50 years ago. Now in his late 70s, he resides in Dayton, OH.

Ernst Heinkel was a ''natural'' for the jet engine. He had a reputation for being unorthodox, somewhat difficult and for doing the unusual. By the mid-1930's, his airplanes were synonymous with speed in the air. But Heinkel also wanted to expand into manufacturing engines like his arch rival, the Junkers company. Ohain's turbojet promised him an early engineering foundation for what was clearly the aero engine of the future.

In April 1936, Ohain signed on with Heinkel, and a year later had a prototype engine running on a test bench. Early problems with the design of a combustion chamber were eventually resolved and, during 1938, the HeS–3 turbojet made numerous flights as a successful auxiliary power plant aboard a He.118 dive bomber.

Although Heinkel kept the company's turbojet work a secret, word of it inevitably leaked out after Ohain applied for a patent in 1937. The patent search also revealed the prior ideas of other jet engine pioneers, including the Britisher George Whittle who patented a turbojet similar to Ohain's in 1930. But in an era dominated by fabric-covered biplanes, these inventions were premature, demanding entirely new types of airplanes. It was not until the early 1930s that streamlined, all-metal monoplane aerostructures started to come into existence that could make effective use of jet propulsion.

The first jet to see combat in World War II—the twin-engine Messerchmitt Me.262—arrived too late to affect the outcome of the war.

The Whittle engine eventually was developed, but the British inventor had no Ernst Heinkel to support his efforts. As a result, a Whittle engine did not power an airplane until 1941.

Even in Germany, the higher echelons of the Air Ministry showed little or no interest in jet propulsion or the gas turbine. It was the middle level engineering staff in the Luftminsterium

bureaucracy that recognized it as an idea whose time had come. A small office devoted to jet propulsion was created under Helmut Schelp. He was the person who subsequently orchestrated the development of the jet engine in Germany. It was not an easy task.

With Germany preparing for war, the manufacturers of aero engines already felt overloaded by work on conventional piston engines and did not want the burden of gas turbine development. Nevertheless, in 1938, Schelp convinced Junkers Motoren (Jumo), BMW's Flugmotorenbau, and the Brandenburgerische Motorenwerke (Bramo) to accept development contracts. The Junkers contract ultimately resulted in the Jumo 004; it was not only the world's first production axial flow jet engine, it introduced many design innovations that remain basic to the gas turbine.

Because of the rising war fever in Berlin—the first flight of the Heinkel He.178 occurred just one week before the German legions stormed into Poland—Heinkel had great difficulty luring any of the Air Ministry's officialdom to Marienehe to witness the inaugural flight. Even after watching the event, top officials still did not grasp the significance of what they had seen. Only the engineering people saw the jet's true potential.

Still, Heinkel was given a contract for a jet fighter—the twin-jet He.280, with a weight of 9,500 pounds and a top speed of 550 mph. The He.280 first flew in April 1941 and, despite some early teething problems, could have been put into production in 1941 and been available in squadron strength by the summer of 1943. Since it was dramatically superior to anything in the Allied inventory, it probably would have defeated the American daylight bombing offensive against Germany.

But the German Air Ministry was holding out for something better. The He.280 was cancelled in favor of the Messerchmitt Me.262 jet fighter which did not fly until July 1942 and was not available in numbers until October 1944. Although far superior to the He.280, the Me.262 was much too late to have any influence on the war's outcome.

The British did not fly a jet airplane until May 15, 1941—the Gloster-Whittle E.28/39. It was a simple flight test vehicle similar to the Heinkel He.178 of 1939. No American saw a jet airplane until a party of Army Air Force officers examined the E.28/39 in the summer of 1941. The origins of the turbojet in the United States were subsequently built on British experience.

Although it is often said that development of the jet engine was the result of World War II, this is only a fractional truth. Hans von Ohain's work, the HeS-3b engine, and the little Heinkel He.178 were not inspired by war but by the forces that have always driven aviation progress—the desire to fly faster and more efficiently. ■

The diminutive Heinkel He.178 made the first jet flight on August 27, 1939, on Germany's Baltic coast.

FAA World Editor Retires

You may have noticed already the familiar name of Len Samuels missing from the magazine's masthead.

On June 16, he took up his red pen for the last time and edited his final article for *FAA World*. After almost 18 years as editor of the magazine, he was ready to focus on overcoming some persistent back problems that have severely limited his mobility in recent years.

Coming to the *World* in July 1971, when the magazine was only seven months old, Samuels directed the production of more than 200 issues before his retirement. Under his editorship, *World* received a first place award for both content and design from the National Association of Government Communicators. The NAGC's ''Blue Pencil Award'' is given annually to recognize outstanding examples of government publications.

Known by his colleagues for his careful attention to detail as well as for the scenes of ski slopes on his office walls, Samuels leaves much of himself at the agency in the publications he produced over the years.

''Editing *FAA World* is different from editing other magazines,'' he said. ''We address a multiplicity of audiences in each issue, not unlike a *Saturday Evening Post* or a *Readers Digest*. We're dealing with some 50,000 readers with different personal tastes, split along regional and social lines, in different professional disciplines, working in a large community like an ARTCC or alone at a remote site. And each audience thinks we give too much attention to another.

''While we try to balance our content and keep all these audiences, we must remember that they often are not seeking *FAA World* as they would a news stand publication of their own choosing,'' he continued. ''We have a harder job of capturing and sustaining the interest of this readership, but it is necessary to work at keeping open this line of communication between agency management and its employees.''

Prior to joining FAA, Samuels worked for the U.S. Information Agency as a Foreign Service staff specialist. He also had worked in Southeast Asia as a ''conduit between public affairs officers and printers for all kinds of publications.'' He worked for various general and trade magazines, including *Popular Mechanics*, before entering government service.

Paragons of Performance

Increased services and increased productivity marked the air traffic facilities that landed the national Air Traffic Facility of the Year awards for 1988.

As usual the awards were made in four categories: Dallas-Fort Worth, Texas, Tower as the terminal radar facility; Yakima, Wash., Tower as the nonradar control facility; the Minneapolis, Minn., ARTCC in the center category; and the Lansing, Mich., Automated Flight Service Station (AFSS) as the flight service station of the year.

The Yakima Tower, which provides nonradar approach control services to IFR flights and traffic advisories to VFR aircraft within a 25-mile radius, encompassing two airport traffic areas and 10 uncontrolled airports, added 33 percent more airspace to its territory in 1988. This helped to minimize delays between departures and arrivals at the same time that the tower had no involvement in any operational incidents.

Despite its small staff, Yakima mounted an aggressive aviation-education program, which included more than 100 hours of volunteered time that led to 1,100 people being introduced to FAA and the air traffic system.

The Dallas-Fort Worth Tower was found cooking on all burners, crossing the one-million mark in instrument operations while it installed a new radar system, implemented a new ARTS IIIA program, suffered only the briefest disruption during a facility fire and was heavily involved in planning and designing the new DFW Metroplex Plan for enhancing future capacity and flexibility.

While the Minneapolis Center was increasing its level of service, it reduced its operational errors by 46 percent over the previous year. The institution of an automated operations-tracking program helped reduce overtime by 53 percent. The ARTCC also launched an ambitious aviation-education program, which included many speeches, creating television segments for local TV and public broadcasting and briefing 3,100 pilots in Operation Raincheck programs.

The Lansing AFSS was no slouch in this department, as well, providing speakers to activities that briefed more than 1,500 pilots, facility tours to 128 aviation groups and continuing support to the Lansing Community College's Aviation Department.

The AFSS provided a total of more than 300,000 personalized and recorded pilot weather briefings but kept user delays to an average of 24 seconds—one of the lowest in the nation. It also provided over 1,400 hours of classroom instruction and over 4,000 hours of OJT training to specialists as a result of the consolidation of three stations with itself.

Photos by S. Michael McKean

Dallas-Fort Worth ATCT

Controllers in the DFW TRACON are (from the left) John Sullivan, feeder west; Steve Kaine, arrival radar; Don Lloyd, arrival radar; Rudy Reyes, feeder east; and Dale Slaton, departure radar.

Working the DFW tower cab are (left to right) Jeff Peace, local control east; Jodi Grant, flight data air traffic assistant; Bob Lezon, ground control east; Richard Woodard, clearance delivery air traffic assistant; and area supervisor Bill Eudaley.

Air traffic assistants at the TRACON's flight-strip printers are Tom Worley (left) and Gary Brazeal.

Providing support at DFW are (from the left) secretary Betty Sewell, administrative officer Carolyn Davis and administrative support clerk Vi Perez.

Working the Dallas North satellite radar in the DFW TRACON is ATCS Roy ''Corky'' Spillner, about to turn 63, reported to be the oldest level 5 controller in the FAA.

Minneapolis ARTCC

Controllers Mel Luvigson (left), Rich Green and Barry White (observing) pause for the photo flash.

Manning the Center Weather Service Unit (CWSU) are Bob Christensen (left) and Rich Kessler.

The center's executive support consists of T&A clerk Sharon Wilson (left) and administrative assistant Marilyn Briesacher.

Orville Putzier, Jim Maness and Preston ''Butch'' Banning (from left) comprise the Military Staff, one of five staffs at the center.

Minneapolis ARTCC's personnel office consists of (from left) Pat Hennen, Darlene Pfahning, Penne Schuldt and Marlys Hillmer.

Lansing, MI, AFSS

Training specialist David Jackson helps the station maintain a high level of proficiency.

Model 1 automated equipment was commissioned at Lansing AFSS in December 1986.

ATCS Jeff Bittner works an inflight position during a busy period.

Paragons of Performance

All-hands meetings are frequent at Lansing. Manging one here are (from the left) area manager Tim Bailey, facility manager David Shattler, administrative assistant Karen Sell and assistant facility manager William Perkette.

Pictured are facility support troops at Lansing. They include clerk-typist Judy Burch (left), secretary Tammy Graham and administrative assistant Karen Sell.

Yakima, WA, ATCT

Controllers Gerald Strang, Thad Faussett, Daniel Potts and Roy Rutherford (from left) pause for camera.

Yakima tower manager John Keller presides over a small but productive facility.

These photos represent the entire full-performance-level complement at Yakima. Here (from the left) are ATCSs Richard Thomas, Gene Brown and Mark Smith.

The final trio here are (left to right) ATCS Jeffrey Bennett, area supervisor Michael Schuett and ATCS Douglas Bubb.

A Little Hot Air Was All It Took

By Dennis Schwartz

Early one morning last May, the control tower at Detroit's Metropolitan Airport broadcast a surprising announcement to pilots: A hot air balloon was operating in the middle of the airport.

This unusual development was the first, and certainly most unique, in a series of events leading to the projected commissioning of a new multimillion dollar control tower at Detroit Metro in the spring of 1991.

Normally, a hot air balloon flight has nothing to do with planning a control tower. But at Detroit, it played a key role, saving thousand of dollars and giving engineers an important perspective on the future facility.

The responsibility for the design and construction of new control towers in the Great Lakes Region resides with the Establishment Engineering Branch (AGL-450) of the Airway Facilities Division. Once Congress approves funds for a new tower and a project assignment is received, our engineering staff begins the process of finding a suitable location for the new tower at the designated airport. The process involves representatives of the Airports, Air Traffic, Flight Standards, Logistics, and Airway Facilities divisions.

Many factors are taken into account in selecting a tower site, the most important being complete visibility from the tower cab of all controlled aircraft movement areas, as well as airborne traffic patterns and runway approaches. Visibility can be affected by large hangars, terminal buildings, trees, navigational aid structures, and even tails of parked aircraft.

The initial step is a paper study to determine a tower location and control cab height that will provide the required visibility and meet other siting requirements. Then, an Air Traffic and Airway Facilities team visits the airport to make an on-site evaluation. Observations are made at the proposed tower cab floor level, normally with a crane. Panoramic photographs also are taken to insure that visibility from the tower will be acceptable.

Detroit Metro presented several problems with respect to making these vital observations. The planned tower is a new design with cab floor heights ranging from 204 feet to 300 feet above ground level (compared to 167 feet at Chicago O'Hare). Cranes capable of reaching these heights are not readily available. They also are time-consuming to erect and very expensive to rent.

In considering various alternatives to a crane, the idea of using a hot air balloon evolved and discussions with balloonists proved the idea practical, efficient, and inexpensive. Thus "Operation Ascent," as it was later designated, became a reality.

Civil engineer Bill Maki coordinated the entire effort. The balloon and ground crew were provided by Ted Gauthier, owner of the Balloon Depot in Pontiac, MI. He also acted as pilot.

Preliminary preparations involved a myriad of details, including locating three tether points at the proposed tower site equally spaced around the tower centerline and out to a distance of approximately 200 feet. The tethers were to keep the balloon positioned over the centerline.

The morning of May 26 dawned bright and clear, just as forecasted, with winds less than 5 knots. Representatives of local newspapers and television stations were already on hand. Detroit Airway Facilities Sector vehicles were positioned at the tether points for anchoring the tether lines. The balloon was inflated and by 6 a.m., Al Russell and John Converse from the Detroit tower were making the first observations. Several more ascents were made and photographs taken before the operation ended at 7 o'clock. Operation Ascent had proved to be a total success.

Although the hot air balloon was not as stable as a crane, it was more than adequate. Moreover, using a balloon resulted in an estimated savings of $6,000 to $8,000 when compared to the cost of renting a crane.

Our observations confirmed the acceptability of the proposed tower site with a cab floor height 204 feet above the ground. This will make the new Detroit tower the tallest in the country. Construction is scheduled to begin next August with commissioning set for April 1991. ■

The writer is the Supervisor, Terminal Environmental Engineering Unit in the Great Lakes Airway Facilities Division.

Al Russel and John Converse from the Detroit Metro tower get a preview of what controllers will see at the airport when the new tower opens in the spring of 1991.

Ground crewmembers inflate the balloon used in "Operation Ascent" to assess the height requirements for a new tower at Detroit Metro Airport.

People

Aeronautical Center

■ **Sharon E. Feland,** manager, Labor Relations & Occupational Safety Branch, Human Resource Management Div., promotion made permanent.

■ **Robert M. Guinn, Jr.,** supervisor, Automation Section, Airway Facilities Branch, FAA Academy.

■ **Owen H. Magruder, Jr.,** manager, Maintenance Support Branch, Regulatory Support Div., from Washington Headquarters.

■ **Donald E. Schein,** supervisor, Information Management Section, Operational Systems Branch, Regulatory Support Div.

Alaskan Region

■ **Robert J. Bransky,** manager, Establishment Branch, Airway Facilities Div.

■ **David C. Champion,** asst. manger for automation, Kenai AFSS, Anchorage, from Anchorage ARTCC.

■ **William E. Chord, Jr.,** asst. manager, Anchorage ATCT, from Air Traffic Div.

■ **Charles D. Gray,** asst. manager for training, Anchorage ARTCC, promotion made permanent.

■ **James A. Nelson, Jr.,** maintenance mechanic foreman, North Alaska AFS, Fairbanks, from Little Rock AFS.

Central Region

■ **Burt E. Bailey,** unit supervisor, Salina, KS, AFSFO, Wichita, KS, AFS.

■ **Alan C. Bowling,** area supervisor, Columbia, MO, AFSS, promotion made permanent.

■ **Curtis W. Endsley,** area supervisor, Kansas City, MO, International Airport ATCT, from Houston, TX, Intercontinental Airport ATCT.

■ **Richard L. Holdman,** area supervisor, Olathe, KS, ARTCC, promotion made permanent.

■ **Peter H. Hopkins,** unit supervisor, Olathe, KS, AFS, promotion made permanent.

■ **Ivan F. Hunt,** manager, Olathe, KS, ARTCC, from Kansas City, MO, ATCT.

■ **Joseph G. Korb,** area supervisor, Columbia, MO, AFSS, promotion made permanent.

■ **Felton R. Lancaster,** section supervisor, Planning Branch, Air Traffic Div., from Olathe, KS, ARTCC.

■ **Michael Mollohan,** area supervisor, Wichita, KS, ATCT, promotion made permanent.

■ **David E. Sapp,** unit supervisor, Forbes AFB, KS, AFSFO, Wichita AFS, promotion made permanent.

■ **Lawrence P. Smith,** area supervisor, St. Louis TRACON, Berkeley, MO, promotion made permanent.

Eastern Region

■ **Donald A. Barnes,** unit supervisor, Baltimore AFSFO, Capital AFS, promotion made permanent.

■ **Kathleen Bergen,** staff officer, Public Affairs & Planning Staff.

■ **Vito J. Borrello,** asst. manager, New York TRACON, Garden City, from Long Island MacArthur Airport ATCT, Islip.

■ **John T. Brame,** area supervisor, Washington Center, Leesburg, VA, promotion made permanent.

■ **William R. Carver,** area supervisor, Dulles, VA, ATCT, from Baltimore, MD, ATCT.

■ **James L. Church,** area supervisor, Washington Center, Leesburg, VA.

■ **Francis T. Earhardt,** area supervisor, Washington Center, Leesburg, VA.

■ **Donald R. Gregory,** area supervisor, Washington Center, Leesburg, VA.

■ **Kermit W. Hall,** manager, Elkins, WV, FSS, promotion made permanent.

■ **Arthur G. Haugh,** asst. manager for program support, AFS-New York ARTCC, MacArthur Airport, from Airway Facilities Div.

■ **Patricia Healey,** supervisor, Employee Benefits Section, Employee Benefits & Classification Branch, Human Resource Management Div.

■ **Janice R. Hilmer,** asst. manager/programs, New York AFSS, Islip, NY, promotion made permanent.

■ **Richard C. Jones,** area supervisor, Washington Center, Leesburg, VA, promotion made permanent.

■ **Loretta M. Kusk,** administrative officer, Airway Facilities Div., from Logistics Div.

■ **Michael Joseph McCormick,** area supervisor, Philadelphia International Airport ATCT, promotion made permanent.

■ **William J. McGovern, Jr.,** area manager, Leesburg, VA, AFSS.

■ **Edward J. McKenna,** manager, Ithaca, NY, ATCT, from Buffalo, NY, ATCT.

Great Lakes Region

■ **George F. Ackley,** area supervisor, Mansfield-Lahm Airport, ATCT, OH, from Akron-Canton Airport, ATCT, OH.

■ **Ronald G. Adair,** area supervisor, Chicago, IL, ZAU ARTCC, promotion made permanent.

■ **Howard A. Brady,** unit supervisor, Minneapolis-St. Paul, MN, Air Carrier District Office (ACDO), from Frankfurt, Germany.

■ **Vincent A. Bridgeforth,** asst. manager for technical support, Chicago AFS, from Airway Facilities Division.

■ **David R. Brizendine,** area supervisor, Indianapolis, IN, ZID ARTCC, from FAA Academy.

■ **Brigitte A. Brooks,** area supervisor, Toledo, OH, ATCT, from Detroit, MI, Metro Airport ATCT.

■ **Cathleen R. Bruner,** area supervisor, ZID ARTCC, Indianapolis, IN, promotion made permanent.

■ **James R. Callahan,** manager, Dane County Airport, Madison, WI, from General Mitchell Field ATCT, Milwaukee, WI.

■ **Gary M. Duemling,** area supervisor, ZID ARTCC, Indianapolis, IN.

■ **Michael K. Farrell,** area supervisor, Princeton, MN, AFSS.

■ **Ralph D. Forrest,** AF watch supervisor, Chicago AFS, from Airway Facilities Div.

■ **Larry L. Hall,** area supervisor, Mansfield-Lahm Airport, ATCT, OH, from Cleveland Hopkins Airport, ATCT, OH.

■ **Richard F. Hill,** manager, Bloomington-Normal, ATCT, IL, from Moline, IL, Quad-City Airport ATCT.

■ **Paul R. Infanti,** area supervisor, Chicago ZAU ARTCC, from Albuquerque, NM, ARTCC.

■ **Thomas S. Johnson,** unit supervisor, Wisconsin AFS, Green Bay.

■ **Daniel J. Kuhn,** area supervisor, Chicago O'Hare ATCT, from Aurora Municipal Airport ATCT, Sugar Grove, IL.

■ **Timothy J. McCann,** area supervisor, Chicago ZAU ARTCC, promotion made permanent.

■ **John T. Mullen,** area supervisor, Indianapolis ZID ARTCC.

■ **Ronald W. Peterson,** area supervisor, Greater Rockford Airport (IL) ATCT, from Chicago ZAU ARTCC.

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■ **Michael A. Astorino,** area supervisor, Quonset Point, RI, TRACON, from Bradley ATCT, Windsor Locks, CT.

■ **H. Cully Beasley III,** area supervisor, Otis ATCT, Falmouth, MA, promotion made permanent.

■ **Stephen A. Craig,** area supervisor, Burlington, VT, AFSS, promotion made permanent.

■ **Martin R. McColgan,** manager, Cummington, MA, AFSFO, Windsor Locks, CT, AFS 817, promotion made permanent.

■ **Kathleen F. McDonald,** area supervisor, Lawrence, MA, ATCT, promotion made permanent.

■ **Joseph W. Perrone,** area supervisor, Bradley ATCT, Windsor Locks, CT, promotion made permanent.

■ **Edward E. Pinelle,** unit supervisor, Manchester, NH, AFSFO, Windsor Locks, CT, AFS 817, from Nashua, NH.

■ **Robert B. Snow,** unit supervisor, Falmouth, MA, AFSFO, Boston, MA, AFS 820, promotion made permanent.

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■ **William T. Anker, Jr.,** area supervisor, Peterson Field ATCT, Colorado Springs, from Denver, CO.

■ **Michael H. Borfitz,** manager, Denver Aircraft Certification Office, Aurora, CO, promotion made permanent.

■ **Daniel A. Boyle,** manager, Municipal ATCT, Salt Lake City, UT, from Portland.

■ **Lester R. Briggs,** unit supervisor, Portland, OR, FSDO 64, Hillsboro, OR.

■ **Kathleen Child,** area supervisor, McMinville, OR, AFSS, from Sheridan, WY, FSS.

■ **Michael A. Dasovich,** supervisor, NAV/COM Construction Engineering Section, Establishment Branch, Airway Facilities Div., promotion made permanent.

■ **Carl P. Dean,** manager, Stapleton ATCT, Denver, CO.

■ **Donald R. Hughes,** manager, Boise, ID, AFSS, from Seattle.

■ **Richard M. Jensen,** group supervisor, Salt Lake City ARTCC, promotion made permanent.

■ **Richard J. Mathews,** area supervisor, Seattle-Tacoma, WA, ATCT, from Los Angeles ATCT.

■ **Collet E. McElroy,** manager, Flight Test Branch, Seattle Aircraft Certification Office (ACO).

■ **Vernon F. Morgan,** asst. manager for program support, Portland, OR, AFS.

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■ **Pamela C. Berger,** area supervisor, Miami, FL, ARTCC, promotion made permanent.

■ **Edwin Berrios-Pacheco,** asst. manager for automation, San Juan CERAP, promotion made permanent.

■ **Dan G. Burns,** area supervisor, Hampton, GA, ARTCC.

■ **Edward J. Clore,** traffic management unit supervisor, Miami, FL, ARTCC.

■ **Arthur T. Crook,** area supervisor, Hampton, GA, ARTCC, promotion made permanent.

■ **Stephen T. Elkins,** unit supervisor, Atlanta, GA, Civil Aviation Security Field Office, promotion made permanent.

■ **James H. Geeslin,** manager, Anniston, AL, AFSFO, Montgomery, AL, AFS, from Brunswick, GA.

■ **Patricia A. Graham,** area supervisor, Standiford Field ATCT, Louisville, KY, from Miami International ATCT.

■ **Deloris A. Henry,** manager, Mc Comb, MS, FSS, from Lansing, MI, AFSS.

■ **Rodney Hoyt,** area supervisor, Atlanta International Airport ATCT, promotion made permanent.

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 to branch manager in offices are published. Other changes usually cannot be accommodated because there are thousands each month.

■ **Kip B. Johns,** area supervisor, West Palm Beach ATCT, from Memphis, TN, ATCT.

■ **William L. Johnson, Jr.,** area supervisor, Greater Cincinnati Airport ATCT, Hebron, KY.

■ **Michael A. Mac Iver,** manager, Gulfport, MS, AFSFO, Jackson AFS, promotion made permanent.

■ **James A. Miceli,** area manager, Greater Cincinnati Airport ATCT, Hebron, KY.

■ **Johnny L. Morrow,** area supervisor, Montgomery, AL, ATCT, from Atlanta.

■ **James O. Ortiz,** unit supervisor, N. Florida FSDO, Jacksonville, from O'Hare ACDO, IL.

■ **Gary K. Perkins,** section supervisor, Miami, FL, FSDO.

■ **William K. Richardson,** unit supervisor, North Carolina FSDO, Winston Salem.

Southwest Region

■ **Roy L. Allen,** unit supervisor, Houston, TX, FSDO, promotion made permanent.

■ **Eric D. Bries,** supervisor, Policy & Procedures Group, Rotocraft Standards Staff, Aircraft Certification Div., promotion made permanent.

■ **Norberto R. Da Silva,** team supervisor, Houston FSDO.

■ **Fred J. Fox,** maintenance mechanic foreman, Austin, TX, AFSFO II, Austin AFS, promotion made permanent.

■ **Thomas P. Germino, Jr.,** principal maintenance inspector, Dallas/Ft. Worth FSDO.

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■ **Robert A. Hughes,** supervisor, Terminal Section, Operations Branch, Air Traffic Div.

■ **Lane E. Jensen,** asst. manager, Little Rock, AR, RAPCON, from San Juan CERAP.

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■ **Tommy L. Jones,** asst. systems engineer, Houston, TX, ARTCC (AFS), promotion made permanent.

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■ **Carl W. Reed,** area supervisor, Houston ARTCC, promotion made permanent.

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■ **Glen H. Schroeder,** team supervisor, Dallas/Ft. Worth FSDO.

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■ **Caesar A. Caiafa,** manager, Airport Technology Branch, Airports Div.

■ **James Thomas,** technical program manager, ATC Technology Branch, Concepts Analysis Div.

■ **John L. Wiley,** manager, Advanced Systems Technology Branch, Concepts Analysis Div.

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■ **Barbara W. Butts,** chief, Services Staff, Contracts Div., Logistics Service.

■ **Kenneth V. Byram,** deputy manager, Ground to Air Systems Div., Advanced System Acquisition Service.

■ **Murry E. Camp,** manager, Real Estate Branch, Materiel Management Div., Logistics Service.

■ **Lauraline Clark,** team supervisor, Advance Automation Branch, Contracts Div., Logistics Service.

■ **Micheline A. Conn,** team supervisor, Systems Operation Branch, Contracts Div., Logistics Service.

■ **Donald E. Deering,** section supervisor, Aircraft Interfacility & Safety Branch, Contracts Div., Logistics Service.

■ **Marion B. Dittman,** manager, Certificate Management Branch, Field Programs Div., Flight Standards Service, from Great Lakes Region.

■ **Victor E. Foose,** manager, Frequency Engineering Branch, Spectrum Engineering Div., Systems Maintenance Service, promotion made permanent.

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■ **Rex A. Baker,** area supervisor, Riverside, CA, ATCT, from Palm Springs ATCT.

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■ **James R. Carey,** manager, Grand Canyon, AZ, ATCT, from Twin Falls, ID, ATCT.

■ **David W. Ceballos,** area supervisor, Executive Airport ATCT, Sacramento, CA, from TRACON, McClellan AFB, Sacramento.

■ **Ruskin I. Cerretti,** area supervisor, Hayward, CA, ATCT, from Oakland, CA, ATCT.

■ **Norman E. Cyphers, Jr.,** area supervisor, TRACON, McClellan AFB, Sacramento, from TRACON, Phoenix, AZ.

■ **Bruce J. Greer,** manager, Palmdale, CA, ATCT, from Air Traffic Div.

■ **Gary W. Hobbs,** area supervisor, Los Angeles ARTCC, promotion made permanent.

■ **Harold T. Holifield,** area supervisor, Los Angeles ARTCC, promotion made permanent.

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■ **Leslie C. Jackson,** area supervisor, Oakland ARTCC, promotion made permanent.

■ **Lawrence J. Jacobson,** area supervisor, ATCT/TRACON, Burbank, CA, from New York TRACON, Garden City.

■ **Karl E. Kraus,** manager, Edwards AFB, CA, AFSO, Los Angeles AFS, promotion made permanent.

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■ **William N. Rodenhurst,** manager, Bucholz ATCT, Marshall Islands, from Honolulu ATCT.

■ **Wilburn D. Spring,** asst. manager, Prescott, AZ, AFSS, from Lancaster, CA, FSS.

■ **John A. Svoboda,** operations chief, San Diego, CA, AFS.

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FAA Pilot and Engineer Lauded for B747 Flight Test

By Mac McElroy

A Boeing 747-400 touches down at Moses Lake, WA, after a flight test conducted by FAAers Don Wilson (left in the insert) and Berk Greene.

FAA Pilot Berk Greene and Flight Test Engineer Don Wilson of the Seattle Aircraft Certification Office Flight Test Branch have been formally recognized for participation in a U.S. national record flight on a Boeing 747-400.

Flying out of Moses Lake, WA, on June 27, 1988, the team conducted a takeoff at 892,450 lbs. gross weight. A certificate from the National Aeronautic Association (NAA), which represents the Federation Aeronautique Internationale in the United States, cites the takeoff as "the greatest mass lifted to 2,000 meters for a C-1 class landplane."

An NAA official formally witnessed the takeoff. It was part of the 747-400 certification program, for which Greene and Wilson were FAA flight test project leaders.

The author is Flight Test Manager at the Seattle Aircraft Certification Office.

U.S. Department of Transportation

Federal Aviation Administration

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FAA World

July 1989
Volume 19 Number 7

Jet Flight Hits the Big 50

By Richard K. Smith

Fifty years ago—on Sunday, Aug. 27, 1939—a small airplane went screaming off the Heinkel Flugzeugbau's airfield on the Baltic coastal plain at Marienehe, Germany, circled the field and landed. The short flight had to be terminated prematurely because a sea gull had been ingested into the engine intake. Still, the test pilot, Erich Warsitz, and all the observers were pleased by this first flight of the world's first jet airplane.

The airplane was the Heinkel He.178, a diminutive, shoulder-wing flying machine of 4,400 pounds with an all-metal monocoque fuselage and a wing of stressed plywood. A wooden wing in the first jet plane was a bit of a paradox, but the He.178's only function was to serve as a flight vehicle to validate its HeS–3b turbojet engine.

The first jet flight was the brainchild of 28–year-old Hans von Ohain. In 1932, as a student at the University of Gottingen, he flew as a passenger on a Lufthansa airliner and was appalled by the noise and vibration that filled the

(Continued on page 4)

Dr. Smith is a noted aviation historian and a previous contributor to FAA World.

In This Issue

Fast Radar Boosts Airport Capacity

Somebody is doing something about flight delays.

The Federal Aviation Administration, with the strong support of the aviation community and the U.S. Congress, is pursuing a broad range of hi-tech approaches to increasing existing airport capacity at the same time that it is working to promote new airport development.

By Anees Adil

Of the various technical programs, none is more promising than the demonstration of a new precision-approach-radar monitoring system at the Raleigh-Durham, NC, Airport. It would allow aircraft to make more efficient use of closely spaced parallel runways and converging runways during bad weather, when two-thirds of all flight delays occur.

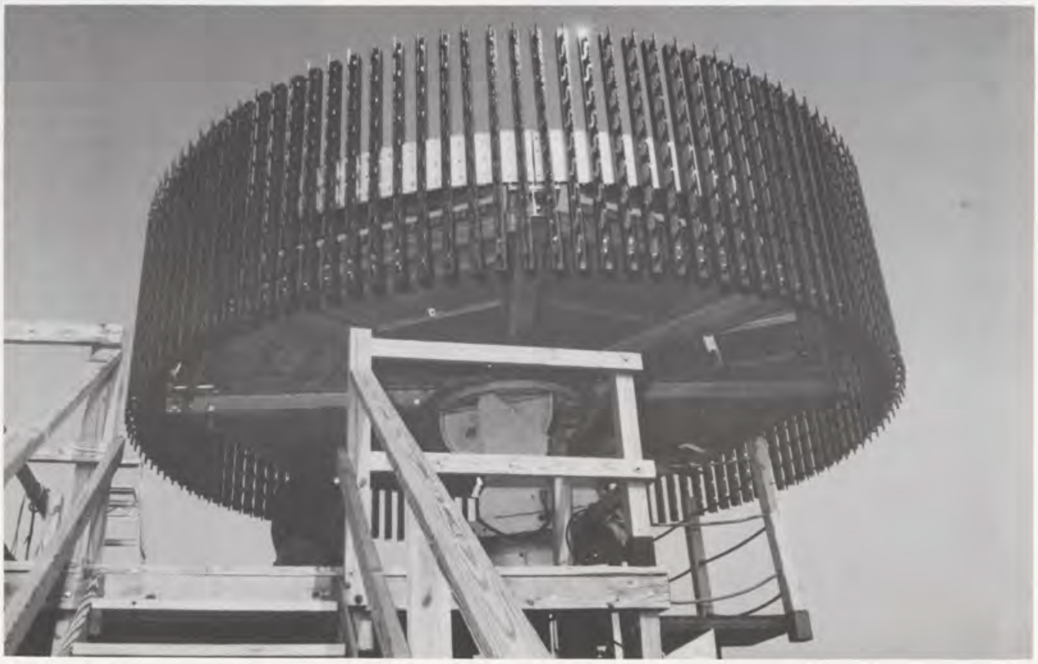
The agency also has a related program in progress at the Memphis, TN, Airport, using a different system for monitoring traffic (see box). Both are part of the Precision Runway Monitor (PRM) Program.

The Raleigh-Durham demonstration program got underway this summer and is expected to run for about one year. If successful, the system will be upgraded and become a permanent fixture at the airport. Implementation at other airports could be expected to follow. In all, FAA has identified 12 locations that could immediately benefit from the use of the Raleigh-Durham, Memphis or a similar system. There is the potential for 50–100 airports to benefit ultimately from the program.

One of the major problems currently facing many fast-growing airports, like Raleigh-Durham and Memphis, is the

(Continued on page 2)

Mr. Adil is a staff member in the Advanced System Acquisition Service and program manager for the Raleigh and Memphis program for closely spaced parallel runways.



FAA World

July 1989

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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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Faster Radar

continued from page 1

sharp reduction in runway acceptance rates during periods of bad weather when visual approaches are restricted or prohibited. Capacity can be cut by as much as 50 percent under instrument flight rule (IFR) conditions, depending on the airport layout.

For example, at Raleigh-Durham, the 3,500-foot spacing between the airport's parallel runways permits simultaneous approaches as long as pilots can ensure safe separation through visual contact. However, in IFR weather, FAA requires a minimum distance of 4,300 feet between runways for parallel approaches. The IFR standard provides an additional margin of safety and ensures that one aircraft will not blunder unseen into the approach path of another.

The idea behind this demonstration is that IFR parallel operations can be conducted safely on runways separated by less than 4,300 feet if controllers are provided with precise, rapid updates on aircraft position. Thus, any course deviation can be detected quickly and corrective action taken to put the errant pilot back on track before he or she can pose a hazard to other air traffic.

The Raleigh-Durham system achieves this objective through the use of an electronically scanning radar capable of updating aircraft targets as often as two times a second, compared with once every five seconds for conventional airport surveillance radars.

The highly accurate equipment also can monitor lateral (left-right) aircraft movements to within a few feet at distances many miles from the runway. Controllers are alerted to course deviations by automated visual and aural alarms on their displays.

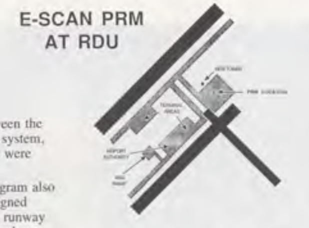
Perhaps the most distinctive physical feature of this system is a 17-foot-diameter circular antenna positioned 90 feet above the airport surface. This is a phased-array antenna, which means it remains stationary while the radar beam is steered electronically in a 360-degree sweep.

Anees Adil, Quick Scan's program manager, checks out the equipment at the North Carolina airport.

The Raleigh-Durham system also features high-resolution color displays and a "desk-top" simulator that serves as a link with remote aircraft simulators at the FAA Aeronautical Center in Oklahoma City and at the American Airlines training center in Dallas-Ft. Worth. American has been deeply involved in the demonstration from the start because of its plans to develop Raleigh-Durham as a major hub airport.

Former FAA Administrator Donald Engen can take credit for initiating the program, having approved the concept in August 1986. It was enthusiastically applauded by the aviation industry. Due in large measure to industry efforts, the Congress subsequently agreed to provide $5 million for fast-track airport capacity programs. It named the new airport surveillance system as a prospective candidate program, and a contract with a project management firm was signed in April 1987.

A major milestone in the Raleigh-Durham project was achieved in April 1988 when the 77-foot-high radar tower



was erected at the airport between the parallel runways. The antenna system, displays and other components were delivered in March 1989.

In this same period, the program also began to evolve from one designed solely to improve IFR parallel runway operations to one which can apply to IFR converging operations and other multiple approaches. The name of the system changed accordingly to reflect its expanded scope—i.e., from "parallel runway monitor" to "parallel and converging runway monitor" to "precision runway monitor" to "Quick Scan airport surveillance system."

The Raleigh-Durham demonstration now is in the initial proof-of-performance phase. The agency expects to begin the actual data-collection effort this fall, with eventual participation by all elements of the aviation industry. Through the use of simulation techniques, the demonstration team will look not only at the Raleigh-Durham runway configuration but also at very closely spaced parallels down to 2,500-foot separation. In the final phase, team members also will evaluate the requirements for conducting IFR approaches to converging runways.

Seventy-seven feet of steel reach skyward at the Raleigh-Durham Airport to cradle the high tech Quick Scan radar.

FAA controllers who have had experience with parallel approaches at various airports around the country will be brought in to work with the demonstration team. The agency also is recruiting volunteer airline crews to fly the simulators at the FAA and American Airlines training facilities that will be linked to Raleigh-Durham by telephone or satellite. Simulator crews will receive and respond to controller instructions as if flying an actual aircraft.

The success of the Raleigh-Durham and Memphis demonstration programs will pave the way for more than a score of airports with closely spaced parallel runways to implement these systems. Moreover, once a standard is established, many of the major airports can begin to plan new parallel runways on existing airport land and provide near-term options for increasing airfield capacity up to 100 percent, compared to the best configuration today.

One measure of the results will be substantial cost savings for airline operators due to fewer delays. For example, FAA estimates that operational use of precision-approach-radar monitoring systems would reduce delays at 10 target airports by 250,000 aircraft hours in the year 2000. That translates into a total of more than $400 million annually in fuel and other savings.

Still, the ultimate winner will be airline travelers, who may come to feel the tide has finally turned in their favor. ■

Another Way To Skin a Cat

The Memphis demonstration program got underway in August 1988 and is scheduled to continue until late spring 1990. One of the major differences between it and the demonstration at the Raleigh-Durham Airport is the design of the antenna system. Unlike Raleigh-Durham, which uses a fixed phased-array antenna, Memphis employs a rotating pair of five-foot open-array beacon antennas mounted back to back. This provides traffic updates every 2.4 seconds, or double the rate of conventional radar antennas.

Both programs have the same objective, however—that is, to define the technical characteristics of a radar runway-monitoring system that will permit more efficient utilization of closely spaced and converging runways during instrument conditions.

Like Raleigh-Durham, the Memphis demonstration will be evaluated through flight-simulation techniques using actual airline crews and a cross-section of veteran FAA controllers. There also will be flight demonstrations involving aircraft from FAA, Federal Express, Northwest Airlines and other carriers, as well as from the general aviation community.

The Quick Scan radar tower is a close neighbor to the airport control tower. The bright red circular radar measures 17 feet in diameter.

Photos by Roger Myers

Jet Flight

continued from page 1

Hans von Ohain poses with a model of the turbojet engine that ushered in the jet age 50 years ago. Now in his late 70s, he resides in Dayton, OH.

cabin and shattered what should have been the serene elegance of flight. Instead of a series of explosions providing the energy for flight, it occurred to Ohain that the engine power should be a steady thermodynamic flow.

Clearly, such a flow would be found in a turbine engine. But in the 1930s, gas turbines were very few and limited to large industrial installations. The term "gas turbine" provoked images of a huge machine anchored in tons of concrete. Nevertheless, Ohain went ahead with calculations based on the lightweight requirements of an airplane.

Besides simplicity, the gas turbine was superior to the piston engine on the point of thrust to weight. Whereas the piston engine required a propeller to translate power to thrust, the turbojet is a self-contained unit of pure thrust. Although the turbojet's fuel consumption seemed shockingly high, the weight of additional fuel was neatly traded off against the lightness of the engine and the final result was a 40% increase in speed.

Aware that abstract figures were not enough, Ohain designed and built a working model engine to demonstrate its principles, dividing his time between that project and finishing a Ph.D. in physics at the university. Meanwhile, one of his professors, R.W. Pohl, took an interest in the primitive turbojet, saw that the project required industrial support, and offered Ohain a connection to a manufacturer of his choice.

Ohain was skeptical about established aero engine manufacturers, who probably could come up with ten thousand reasons why a turbojet was premature or simply could not be adapted to an airplane. Instead, he looked to a sponsor who wanted to fly faster, a builder of airplanes, and he chose the Heinkel Flugzeugbau.

Ernst Heinkel was a "natural" for the jet engine. He had a reputation for being unorthodox, somewhat difficult and for doing the unusual. By the mid-1930's, his airplanes were synonymous with speed in the air. But Heinkel also wanted to expand into manufacturing engines like his arch rival, the Junkers company. Ohain's turbojet promised him an early engineering foundation for what was clearly the aero engine of the future.

In April 1936, Ohain signed on with Heinkel, and a year later had a prototype engine running on a test bench. Early problems with the design of a combustion chamber were eventually resolved and, during 1938, the HeS-3 turbojet made numerous flights as a successful auxiliary power plant aboard a He.118 dive bomber.

Although Heinkel kept the company's turbojet work a secret, word of it inevitably leaked out after Ohain applied for a patent in 1937. The patent search also revealed the prior ideas of other jet engine pioneers, including the Britisher George Whittle who patented a turbojet similar to Ohain's in 1930. But in an era dominated by fabric-covered biplanes, these inventions were premature, demanding entirely new types of airplanes. It was not until the early

The first jet to see combat in World War II—the twin-engine Messerchmitt Me.262—arrived too late to affect the outcome of the war.

1930s that streamlined, all-metal monoplane aerostructures started to come into existence that could make effective use of jet propulsion.

The Whittle engine eventually was developed, but the British inventor had no Ernst Heinkel to support his efforts. As a result, a Whittle engine did not power an airplane until 1941.

Even in Germany, the higher echelons of the Air Ministry showed little or no interest in jet propulsion or the gas turbine. It was the middle level engineering staff in the Luftminsterium

bureaucracy that recognized it as an idea whose time had come. A small office devoted to jet propulsion was created under Helmut Schelp. He was the person who subsequently orchestrated the development of the jet engine in Germany. It was not an easy task.

With Germany preparing for war, the manufacturers of aero engines already felt overloaded by work on conventional piston engines and did not want the burden of gas turbine development. Nevertheless, in 1938, Schelp convinced Junkers Motoren (Jumo), BMW's Flugmotorenbau, and the Brandenburgerische Motorenwerke (Bramo) to accept development contracts. The Junkers contract ultimately resulted in the Jumo 004; it was not only the world's first production axial flow jet engine, it introduced many design innovations that remain basic to the gas turbine.

Because of the rising war fever in Berlin—the first flight of the Heinkel He.178 occurred just one week before the German legions stormed into Poland—Heinkel had great difficulty luring any of the Air Ministry's officialdom to Marienehe to witness the inaugural flight. Even after watching the event, top officials still did not grasp the significance of what they had seen. Only the engineering people saw the jet's true potential.

Still, Heinkel was given a contract for a jet fighter—the twin-jet He.280, with a weight of 9,500 pounds and a top speed of 550 mph. The He.280 first flew in April 1941 and, despite some early teething problems, could have been put into production in 1941 and been available in squadron strength by the summer of 1943. Since it was dramatically superior to anything in the Allied inventory, it probably would have defeated the American daylight bombing offensive against Germany.

But the German Air Ministry was holding out for something better. The He.280 was cancelled in favor of the Messerchmitt Me.262 jet fighter which did not fly until July 1942 and was not available in numbers until October 1944. Although far superior to the He.280, the Me.262 was much too late to have any influence on the war's outcome.

The British did not fly a jet airplane until May 15, 1941—the Gloster-Whittle E.28/39. It was a simple flight test vehicle similar to the Heinkel He.178 of 1939. No American saw a jet airplane until a party of Army Air Force officers examined the E.28/39 in the summer of 1941. The origins of the turbojet in the United States were subsequently built on British experience.

Although it is often said that development of the jet engine was the result of World War II, this is only a fractional truth. Hans von Ohain's work, the HeS-3b engine, and the little Heinkel He.178 were not inspired by war but by the forces that have always driven aviation progress—the desire to fly faster and more efficiently. ■

The diminutive Heinkel He.178 made the first jet flight on August 27, 1939, on Germany's Baltic coast.

FAA World Editor Retires

You may have noticed already the familiar name of Len Samuels missing from the magazine's masthead.

On June 16, he took up his red pen for the last time and edited his final article for *FAA World*. After almost 18 years as editor of the magazine, he was ready to focus on overcoming some persistent back problems that have severely limited his mobility in recent years.

Coming to the *World* in July 1971, when the magazine was only seven months old, Samuels directed the production of more than 200 issues before his retirement. Under his editorship, *World* received a first place award for both content and design from the National Association of Government Communicators. The NAGC's "Blue Pencil Award" is given annually to recognize outstanding examples of government publications.

Known by his colleagues for his careful attention to detail as well as for the scenes of ski slopes on his office walls, Samuels leaves much of himself at the agency in the publications he produced over the years.

"Editing *FAA World* is different from editing other magazines," he said. "We address a multiplicity of audiences in each issue, not unlike a *Saturday Evening Post* or a *Readers Digest*. We're dealing with some 50,000 readers with different personal tastes, split along regional and social lines, in different professional disciplines, working in a large community like an ARTCC or alone at a remote site. And each audience thinks we give too much attention to another.

"While we try to balance our content and keep all these audiences, we must remember that they often are not seeking *FAA World* as they would a news stand publication of their own choosing," he continued. "We have a harder job of capturing and sustaining the interest of this readership, but it is necessary to work at keeping open this line of communication between agency management and its employees."

Prior to joining FAA, Samuels worked for the U.S. Information Agency as a Foreign Service staff specialist. He also had worked in Southeast Asia as a "conduit between public affairs officers and printers for all kinds of publications." He worked for various general and trade magazines, including *Popular Mechanics*, before entering government service.

Paragons of Performance

Increased services and increased productivity marked the air traffic facilities that landed the national Air Traffic Facility of the Year awards for 1988.

As usual the awards were made in four categories: Dallas-Fort Worth, Texas, Tower as the terminal radar facility; Yakima, Wash., Tower as the nonradar control facility; the Minneapolis, Minn., ARTCC in the center category; and the Lansing, Mich., Automated Flight Service Station (AFSS) as the flight service station of the year.

The Yakima Tower, which provides nonradar approach control services to IFR flights and traffic advisories to VFR aircraft within a 25-mile radius, encompassing two airport traffic areas and 10 uncontrolled airports, added 33 percent more airspace to its territory in 1988. This helped to minimize delays between departures and arrivals at the same time that the tower had no involvement in any operational incidents.

Despite its small staff, Yakima mounted an aggressive aviation-education program, which included more than 100 hours of volunteered time that led to 1,100 people being introduced to FAA and the air traffic system.

The Dallas-Fort Worth Tower was found cooking on all burners, crossing the one-million mark in instrument operations while it installed a new radar system, implemented a new ARTS IIIA program, suffered only the briefest disruption during a facility fire and was heavily involved in planning and designing the new DFW Metroplex Plan for enhancing future capacity and flexibility.

While the Minneapolis Center was increasing its level of service, it reduced its operational errors by 46 percent over the previous year. The institution of an automated operations-tracking program helped reduce overtime by 53 percent. The ARTCC also launched an ambitious aviation-education program, which included many speeches, creating television segments for local TV and public broadcasting and briefing 3,100 pilots in Operation Raincheck programs.

The Lansing AFSS was no slouch in this department, as well, providing speakers to activities that briefed more than 1,500 pilots, facility tours to 128 aviation groups and continuing support to the Lansing Community College's Aviation Department.

The AFSS provided a total of more than 300,000 personalized and recorded pilot weather briefings but kept user delays to an average of 24 seconds—one of the lowest in the nation. It also provided over 1,400 hours of classroom instruction and over 4,000 hours of OJT training to specialists as a result of the consolidation of three stations with itself.

Photos by S. Michael McKean

Dallas-Fort Worth ATCT

Controllers in the DFW TRACON are (from the left) John Sullivan, feeder west; Steve Kaine, arrival radar; Don Lloyd, arrival radar; Rudy Reyes, feeder east; and Dale Slaton, departure radar.

Working the DFW tower cab are (left to right) Jeff Peace, local control east; Jodi Grant, flight data air traffic assistant; Bob Lezon, ground control east; Richard Woodard, clearance delivery air traffic assistant; and area supervisor Bill Eudaley.

Air traffic assistants at the TRACON's flight-strip printers are Tom Worley (left) and Gary Brazeal.

Providing support at DFW are (from the left) secretary Betty Sewell, administrative officer Carolyn Davis and administrative support clerk Vi Perez.

Working the Dallas North satellite radar in the DFW TRACON is ATCS Roy "Corky" Spillner, about to turn 63, reported to be the oldest level 5 controller in the FAA.

Minneapolis ARTCC

Controllers Mel Luvigson (left), Rich Green and Barry White (observing) pause for the photo flash.

Manning the Center Weather Service Unit (CWSU) are Bob Christensen (left) and Rich Kessler.

The center's executive support consists of T&A clerk Sharon Wilson (left) and administrative assistant Marilyn Briesacher.

Orville Putzier, Jim Maness and Preston "Butch" Banning (from left) comprise the Military Staff, one of five staffs at the center.

Minneapolis ARTCC's personnel office consists of (from left) Pat Hennen, Darlene Pfahning, Penne Schuldt and Marlys Hillmer.

Lansing, MI, AFSS

Training specialist David Jackson helps the station maintain a high level of proficiency.

Model 1 automated equipment was commissioned at Lansing AFSS in December 1986.

ATCS Jeff Bittner works an inflight position during a busy period.

Paragons of Performance

All-hands meetings are frequent at Lansing. Manging one here are (from the left) area manager Tim Bailey, facility manager David Shattler, administrative assistant Karen Sell and assistant facility manager William Perkette.

Pictured are facility support troops at Lansing. They include clerk-typist Judy Burch (left), secretary Tammy Graham and administrative assistant Karen Sell.

Yakima, WA, ATCT

Controllers Gerald Strang, Thad Faussett, Daniel Potts and Roy Rutherford (from left) pause for camera.

Yakima tower manager John Keller presides over a small but productive facility.

These photos represent the entire full-performance-level complement at Yakima. Here (from the left) are ATCSs Richard Thomas, Gene Brown and Mark Smith.

The final trio here are (left to right) ATCS Jeffrey Bennett, area supervisor Michael Schuett and ATCS Douglas Bubb.

A Little Hot Air Was All It Took

By Dennis Schwartz

Early one morning last May, the control tower at Detroit's Metropolitan Airport broadcast a surprising announcement to pilots: A hot air balloon was operating in the middle of the airport.

This unusual development was the first, and certainly most unique, in a series of events leading to the projected commissioning of a new multimillion dollar control tower at Detroit Metro in the spring of 1991.

Normally, a hot air balloon flight has nothing to do with planning a control tower. But at Detroit, it played a key role, saving thousand of dollars and giving engineers an important perspective on the future facility.

The responsibility for the design and construction of new control towers in the Great Lakes Region resides with the Establishment Engineering Branch (AGL-450) of the Airway Facilities Division. Once Congress approves funds for a new tower and a project assignment is received, our engineering staff begins the process of finding a suitable location for the new tower at the designated airport. The process involves representatives of the Airports, Air Traffic, Flight Standards, Logistics, and Airway Facilities divisions.

Many factors are taken into account in selecting a tower site, the most important being complete visibility from the tower cab of all controlled aircraft movement areas, as well as airborne traffic patterns and runway approaches. Visibility can be affected by large hangars, terminal buildings, trees, navigational aid structures, and even tails of parked aircraft.

The initial step is a paper study to determine a tower location and control cab height that will provide the required visibility and meet other siting requirements. Then, an Air Traffic and Airway Facilities team visits the airport to make an on-site evaluation. Observations are made at the proposed tower cab floor level, normally with a crane. Panoramic photographs also are taken to insure that visibility from the tower will be acceptable.

Detroit Metro presented several problems with respect to making these vital observations. The planned tower is a new design with cab floor heights ranging from 204 feet to 300 feet above ground level (compared to 167 feet at Chicago O'Hare). Cranes capable of reaching these heights are not readily available. They also are time-consuming to erect and very expensive to rent.

In considering various alternatives to a crane, the idea of using a hot air balloon evolved and discussions with balloonists proved the idea practical, efficient, and inexpensive. Thus "Operation Ascent," as it was later designated, became a reality.

Civil engineer Bill Maki coordinated the entire effort. The balloon and ground crew were provided by Ted Gauthier, owner of the Balloon Depot in Pontiac, MI. He also acted as pilot.

Preliminary preparations involved a myriad of details, including locating three tether points at the proposed tower site equally spaced around the tower centerline and out to a distance of approximately 200 feet. The tethers were to keep the balloon positioned over the centerline.

The morning of May 26 dawned bright and clear, just as forecasted, with winds less than 5 knots. Representatives of local newspapers and television stations were already on hand. Detroit Airway Facilities Sector vehicles were positioned at the tether points for anchoring the tether lines. The balloon was inflated and by 6 a.m., Al Russell and John Converse from the Detroit tower were making the first observations. Several more ascents were made and photographs taken before the operation ended at 7 o'clock. Operation Ascent had proved to be a total success.

Although the hot air balloon was not as stable as a crane, it was more than adequate. Moreover, using a balloon resulted in an estimated savings of \$6,000 to \$8,000 when compared to the cost of renting a crane.

Our observations confirmed the acceptability of the proposed tower site with a cab floor height 204 feet above the ground. This will make the new Detroit tower the tallest in the country. Construction is scheduled to begin next August with commissioning set for April 1991. ■

Ground crewmembers inflate the balloon used in "Operation Ascent" to assess the height requirements for a new tower at Detroit Metro Airport.

Al Russel and John Converse from the Detroit Metro tower get a preview of what controllers will see at the airport when the new tower opens in the spring of 1991.

The writer is the Supervisor, Terminal Environmental Engineering Unit in the Great Lakes Airway Facilities Division.

People

Aeronautical Center

■ **Sharon E. Feland,** manager, Labor Relations & Occupational Safety Branch, Human Resource Management Div., promotion made permanent.

■ **Robert M. Guinn, Jr.,** supervisor, Automation Section, Airway Facilities Branch, FAA Academy.

■ **Owen H. Magruder, Jr.,** manager, Maintenance Support Branch, Regulatory Support Div., from Washington Headquarters.

■ **Donald E. Schein,** supervisor, Information Management Section, Operational Systems Branch, Regulatory Support Div.

Alaskan Region

■ **Robert J. Bransky,** manager, Establishment Branch, Airway Facilities Div.

■ **David C. Champion,** asst. manger for automation, Kenai AFSS, Anchorage, from Anchorage ARTCC.

■ **William E. Chord, Jr.,** asst. manager, Anchorage ATCT, from Air Traffic Div.

■ **Charles D. Gray,** asst. manager for training, Anchorage ARTCC, promotion made permanent.

■ **James A. Nelson, Jr.,** maintenance mechanic foreman, North Alaska AFS, Fairbanks, from Little Rock AFS.

Central Region

■ **Burt E. Bailey,** unit supervisor, Salina, KS, AFSFO, Wichita, KS, AFS.

■ **Alan C. Bowling,** area supervisor, Columbia, MO, AFSS, promotion made permanent.

■ **Curtis W. Endsley,** area supervisor, Kansas City, MO, International Airport ATCT, from Houston, TX, Intercontinental Airport ATCT.

■ **Richard L. Holdman,** area supervisor, Olathe, KS, ARTCC, promotion made permanent.

■ **Peter H. Hopkins,** unit supervisor, Olathe, KS, AFS, promotion made permanent.

■ **Ivan F. Hunt,** manager, Olathe, KS, ARTCC, from Kansas City, MO, ATCT.

■ **Joseph G. Korb,** area supervisor, Columbia, MO, AFSS, promotion made permanent.

■ **Felton R. Lancaster,** section supervisor, Planning Branch, Air Traffic Div., from Olathe, KS, ARTCC.

■ **Michael Mollohan,** area supervisor, Wichita, KS, ATCT, promotion made permanent.

■ **David E. Sapp,** unit supervisor, Forbes AFB, KS, AFSFO, Wichita AFS, promotion made permanent.

■ **Lawrence P. Smith,** area supervisor, St. Louis TRACON, Berkeley, MO, promotion made permanent.

Eastern Region

■ **Donald A. Barnes,** unit supervisor, Baltimore AFSFO, Capital AFS, promotion made permanent.

■ **Kathleen Bergen,** staff officer, Public Affairs & Planning Staff.

■ **Vito J. Borrello,** asst. manager, New York TRACON, Garden City, from Long Island MacArthur Airport ATCT, Islip.

■ **John T. Brame,** area supervisor, Washington Center, Leesburg, VA, promotion made permanent.

■ **William R. Carver,** area supervisor, Dulles, VA, ATCT, from Baltimore, MD, ATCT.

■ **James L. Church,** area supervisor, Washington Center, Leesburg, VA.

■ **Francis T. Earhardt,** area supervisor, Washington Center, Lessburg, VA.

■ **Donald R. Gregory,** area supervisor, Washington Center, Leesburg, VA.

■ **Kermit W. Hall,** manager, Elkins, WV, FSS, promotion made permanent.

■ **Arthur G. Haugh,** asst. manager for program support, AFS–New York ARTCC, MacArthur Airport, from Airway Facilities Div.

■ **Patricia Healey,** supervisor, Employee Benefits Section, Employee Benefits & Classification Branch, Human Resource Management Div.

■ **Janice R. Hilmer,** asst. manager/programs, New York AFSS, Islip, NY, promotion made permanent.

■ **Richard C. Jones,** area supervisor, Washington Center, Leesburg, VA, promotion made permanent.

■ **Loretta M. Kusk,** administrative officer, Airway Facilities Div., from Logistics Div.

■ **Michael Joseph McCormick,** area supervisor, Philadelphia International Airport ATCT, promotion made permanent.

■ **William J. McGovern, Jr.,** area manager, Leesburg, VA, AFSS.

■ **Edward J. McKenna,** manager, Ithaca, NY, ATCT, from Buffalo, NY, ATCT.

Great Lakes Region

■ **George F. Ackley,** area supervisor, Mansfield-Lahm Airport, ATCT, OH, from Akron-Canton Airport, ATCT, OH.

■ **Ronald G. Adair,** area supervisor, Chicago, IL, ZAU ARTCC, promotion made permanent.

■ **Howard A. Brady,** unit supervisor, Minneapolis-St. Paul, MN, Air Carrier District Office (ACDO), from Frankfurt, Germany.

■ **Vincent A. Bridgeforth,** asst. manager for technical support, Chicago AFS, from Airway Facilities Division.

■ **David R. Brizendine,** area supervisor, Indianapolis, IN, ZID ARTCC, from FAA Academy.

■ **Brigitte A. Brooks,** area supervisor, Toledo, OH, ATCT, from Detroit, MI, Metro Airport ATCT.

■ **Cathleen R. Bruner,** area supervisor, ZID ARTCC, Indianapolis, IN, promotion made permanent.

■ **James R. Callahan,** manager, Dane County Airport, Madison, WI, from General Mitchell Field ATCT, Milwaukee, WI.

■ **Gary M. Duemling,** area supervisor, ZID ARTCC, Indianapolis, IN.

■ **Michael K. Farrell,** area supervisor, Princeton, MN, AFSS.

■ **Ralph D. Forrest,** AF watch supervisor, Chicago AFS, from Airway Facilities Div.

■ **Larry L. Hall,** area supervisor, Mansfield-Lahm Airport, ATCT, OH, from Cleveland Hopkins Airport, ATCT, OH.

■ **Richard F. Hill,** manager, Bloomington-Normal, ATCT, IL, from Moline, IL, Quad-City Airport ATCT.

■ **Paul R. Infanti,** area supervisor, Chicago ZAU ARTCC, from Albuquerque, NM, ARTCC.

■ **Thomas S. Johnson,** unit supervisor, Wisconsin AFS, Green Bay.

■ **Daniel J. Kuhn,** area supervisor, Chicago O'Hare ATCT, from Aurora Municpal Airport ATCT, Sugar Grove, IL.

■ **Timothy J. McCann,** area supervisor, Chicago ZAU ARTCC, promotion made permanent.

■ **John T. Mullen,** area supervisor, Indianapolis ZID ARTCC.

■ **Ronald W. Peterson,** area supervisor, Greater Rockford Airport (IL) ATCT, from Chicago ZAU ARTCC.

New England Region

■ **Michael A. Astorino,** area supervisor, Quonset Point, RI, TRACON, from Bradley ATCT, Windsor Locks, CT.

■ **H. Cully Beasley III,** area supervisor, Otis ATCT, Falmouth, MA, promotion made permanent.

■ **Stephen A. Craig,** area supervisor, Burlington, VT, AFSS, promotion made permanent.

■ **Martin R. McColgan,** manager, Cummington, MA, AFSFO, Windsor Locks, CT, AFS 817, promotion made permanent.

■ **Kathleen F. McDonald,** area supervisor, Lawrence, MA, ATCT, promotion made permanent.

■ **Joseph W. Perrone,** area supervisor, Bradley ATCT, Windsor Locks, CT, promotion made permanent.

■ **Edward E. Pinelle,** unit supervisor, Manchester, NH, AFSFO, Windsor Locks, CT, AFS 817, from Nashua, NH.

■ **Robert B. Snow,** unit supervisor, Falmouth, MA, AFSFO, Boston, MA, AFS 820, promotion made permanent.

Northwest Mountain Region

■ **William T. Anker, Jr.,** area supervisor, Peterson Field ATCT, Colorado Springs, from Denver, CO.

■ **Michael H. Borfitz,** manager, Denver Aircraft Certification Office, Aurora, CO, promotion made permanent.

■ **Daniel A. Boyle,** manager, Municipal ATCT, Salt Lake City, UT, from Portland.

■ **Lester R. Briggs,** unit supervisor, Portland, OR, FSDO 64, Hillsboro, OR.

■ **Kathleen Child,** area supervisor, McMinville, OR, AFSS, from Sheridan, WY, FSS.

■ **Michael A. Dasovich,** supervisor, NAV/COM Construction Engineering Section, Establishment Branch, Airway Facilities Div., promotion made permanent.

■ **Carl P. Dean,** manager, Stapleton ATCT, Denver, CO.

■ **Donald R. Hughes,** manager, Boise, ID, AFSS, from Seattle.

■ **Richard M. Jensen,** group supervisor, Salt Lake City ARTCC, promotion made permanent.

■ **Richard J. Mathews,** area supervisor, Seattle-Tacoma, WA, ATCT, from Los Angeles ATCT.

■ **Collet E. McElroy,** manager, Flight Test Branch, Seattle Aircraft Certification Office (ACO).

■ **Vernon F. Morgan,** asst. manager for program support, Portland, OR, AFS.

Southern Region

■ **Pamela C. Berger,** area supervisor, Miami, FL, ARTCC, promotion made permanent.

■ **Edwin Berrios-Pacheco,** asst. manager for automation, San Juan CERAP, promotion made permanent.

■ **Dan G. Burns,** area supervisor, Hampton, GA, ARTCC.

■ **Edward J. Clore,** traffic management unit supervisor, Miami, FL, ARTCC.

■ **Arthur T. Crook,** area supervisor, Hampton, GA, ARTCC, promotion made permanent.

■ **Stephen T. Elkins,** unit supervisor, Atlanta, GA, Civil Aviation Security Field Office, promotion made permanent.

■ **James H. Geeslin,** manager, Anniston, AL, AFSFO, Montgomery, AL, AFS, from Brunswick, GA.

■ **Patricia A. Graham,** area supervisor, Standiford Field ATCT, Louisville, KY, from Miami International ATCT.

■ **Deloris A. Henry,** manager, Mc Comb, MS, FSS, from Lansing, MI, AFSS.

■ **Rodney Hoyt,** area supervisor, Atlanta International Airport ATCT, promotion made permanent.

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 to branch manager in offices are published. Other changes usually cannot be accommodated because there are thousands each month.

■ **Kip B. Johns,** area supervisor, West Palm Beach ATCT, from Memphis, TN, ATCT.

■ **William L. Johnson, Jr.,** area supervisor, Greater Cincinnati Airport ATCT, Hebron, KY.

■ **Michael A. Mac Iver,** manager, Gulfport, MS, AFSFO, Jackson AFS, promotion made permanent.

■ **James A. Miceli,** area manager, Greater Cincinnati Airport ATCT, Hebron, KY.

■ **Johnny L. Morrow,** area supervisor, Montgomery, AL, ATCT, from Atlanta.

■ **James O. Ortiz,** unit supervisor, N. Florida FSDO, Jacksonville, from O'Hare ACDO, IL.

■ **Gary K. Perkins,** section supervisor, Miami, FL, FSDO.

■ **William K. Richardson,** unit supervisor, North Carolina FSDO, Winston Salem.

Southwest Region

■ **Roy L. Allen,** unit supervisor, Houston, TX, FSDO, promotion made permanent.

■ **Eric D. Bries,** supervisor, Policy & Procedures Group, Rotocraft Standards Staff, Aircraft Certification Div., promotion made permanent.

■ **Norberto R. Da Silva,** team supervisor, Houston FSDO.

■ **Fred J. Fox,** maintenance mechanic foreman, Austin, TX, AFSFO II, Austin AFS, promotion made permanent.

■ **Thomas P. Germino, Jr.,** principal maintenance inspector, Dallas/Ft. Worth FSDO.

■ **John G. Gillespie, Jr.,** area supervisor, Corpus Christi, TX, RAPCON, promotion made permanent.

■ **Sandra L. Hansen,** unit supervisor, Houston, TX, CASFO.

■ **Robert A. Hughes,** supervisor, Terminal Section, Operations Branch, Air Traffic Div.

■ **Lane E. Jensen,** asst. manager, Little Rock, AR, RAPCON, from San Juan CERAP.

■ **Francis J. Johns,** deputy manager, Air Traffic Div., from Denver, CO, ATCT.

■ **Tommy L. Jones,** asst. systems engineer, Houston, TX, ARTCC (AFS), promotion made permanent.

■ **Howard A. Lewis, Jr.,** area supervisor, Corpus Christi, TX, RAPCON, from San Antonio, TX, RAPCON.

■ **Stephen G. Madick,** area supervisor, Ft. Worth ARTCC.

■ **Richard V. Mashburn,** asst. systems engineer, Albuquerque ARTCC AFS.

■ **William H. Meyer,** systems engineer, Albuquerque ARTCC AFS.

■ **Carl A. Minnich,** traffic management unit supervisor, Albuquerque, NM, ARTCC.

■ **Carl W. Reed,** area supervisor, Houston ARTCC, promotion made permanent.

■ **Eloy P. Santillanes,** unit supervisor, Albuquerque AFS, Farmington, NM.

■ **Glen H. Schroeder,** team supervisor, Dallas/Ft. Worth FSDO.

Technical Center

■ **George C. Apostolakis,** technical program manager, System Design & Transition Branch, Automation Div.

■ **Caesar A. Caiafa,** manager, Airport Technology Branch, Airports Div.

■ **James Thomas,** technical program manager, ATC Technology Branch, Concepts Analysis Div.

■ **John L. Wiley,** manager, Advanced Systems Technology Branch, Concepts Analysis Div.

Washington Headquarters

■ **Matthew E. Asai,** team supervisor, ATC Automation/Flight Information Branch, Contracts Division, Logistics Service.

■ **Barbara W. Butts,** chief, Services Staff, Contracts Div., Logistics Service.

■ **Kenneth V. Byram,** deputy manager, Ground to Air Systems Div., Advanced System Acquisition Service.

■ **Murry E. Camp,** manager, Real Estate Branch, Materiel Management Div., Logistics Service.

■ **Lauraline Clark,** team supervisor, Advance Automation Branch, Contracts Div., Logistics Service.

■ **Micheline A. Conn,** team supervisor, Systems Operation Branch, Contracts Div., Logistics Service.

■ **Donald E. Deering,** section supervisor, Aircraft Interfacility & Safety Branch, Contracts Div., Logistics Service.

■ **Marion B. Dittman,** manager, Certificate Management Branch, Field Programs Div., Flight Standards Service, from Great Lakes Region.

■ **Victor E. Foose,** manager, Frequency Engineering Branch, Spectrum Engineering Div., Systems Maintenance Service, promotion made permanent.

Western-Pacific Region

■ **Rex A. Baker,** area supervisor, Riverside, CA, ATCT, from Palm Springs ATCT.

■ **Michael H. Biggers,** area supervisor, Ontario, CA, ATCT.

■ **Aaron I. Boxer,** area supervisor, Los Angeles ARTCC, Palmdale, promotion made permanent.

■ **James R. Carey,** manager, Grand Canyon, AZ, ATCT, from Twin Falls, ID, ATCT.

■ **David W. Ceballos,** area supervisor, Executive Airport ATCT, Sacramento, CA, from TRACON, McClellan AFB, Sacramento.

■ **Ruskin I. Cerretti,** area supervisor, Hayward, CA, ATCT, from Oakland, CA, ATCT.

■ **Norman E. Cyphers, Jr.,** area supervisor, TRACON, McClellan AFB, Sacramento, from TRACON, Phoenix, AZ.

■ **Bruce J. Greer,** manager, Palmdale, CA, ATCT, from Air Traffic Div.

■ **Gary W. Hobbs,** area supervisor, Los Angeles ARTCC, promotion made permanent.

■ **Harold T. Holifield,** area supervisor, Los Angeles ARTCC, promotion made permanent.

■ **Gregory R. Hollebeke,** area supervisor, Tucson ATCT, from Fullerton, CA, ATCT.

■ **Leslie C. Jackson,** area supervisor, Oakland ARTCC, promotion made permanent.

■ **Lawrence J. Jacobson,** area supervisor, ATCT/TRACON, Burbank, CA, from New York TRACON, Garden City.

■ **Karl E. Kraus,** manager, Edwards AFB, CA, AFSO, Los Angeles AFS, promotion made permanent.

■ **Davidson Luehring,** unit supervisor, Honolulu FSDO, promotion made permanent.

■ **John J. Lyons,** area supervisor, Oakland, CA, ARTCC, Fremont, CA, promotion made permanent.

■ **James G. McOmber,** chief, Air Security Branch, Civil Aviation Security Div.

■ **Patricia A. Meza,** area supervisor, Salinas, CA, FSS, from Oakland, CA, FSS.

■ **Donald B. Mullin,** manager, La Verne, CA, ATCT, from the Ontario, CA, TRACON.

■ **Bruce F. Peterson,** asst. manager, traffic management, Oakland ARTCC, Fremont, CA.

■ **Donald W. Ralph,** asst. manager, programs, Miramar TRACON–NAS, San Diego.

■ **Thomas A. Rea,** asst. manager, El Toro, CA, TRACON, Santa Ana, from John Wayne Airport ATCT.

■ **William N. Rodenhurst,** manager, Bucholz ATCT, Marshall Islands, from Honolulu ATCT.

■ **Wilburn D. Spring,** asst. manager, Prescott, AZ, AFSS, from Lancaster, CA, FSS.

■ **John A. Svoboda,** operations chief, San Diego, CA, AFS.

Retirees

AERONAUTICAL CENTER
Betty H. Daugherty
Victor J. Doering
Lloyd M. Ellis
Frank W. Ely
Francis W. Petersen
Russell T. Randall
Simon Vladovich
Roy T. Womack

ALASKAN REGION
Richard A. Haycraft
William L. Noblett
Richard C. Strassel

CENTRAL REGION
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Nathan C. Blydenburgh
Maxine E. Duncan
Alta A. Hamilton
Joseph T. Jackson
Ralph O. Jorgenson
John S. Parker, Jr.
Dennis H. Stroot

EASTERN REGION
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Eugene C Breiner
Joseph J. Brogan
Thomas M. Finch
Doris Mesdonick
Robert A. Ranke
Catherine A. Rebuh
Harriet L. Weidner
Bobby L. Wells
Frederick C. Wuestner

GREAT LAKES REGION
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Ramon T. Chung
Willard A Cooper
Robert L. Hall
Theodore F. Moran
Frederick P. Schuetz
Georgia R. Smith
Rolland G. Turcotte
Robert J. Wagner
Gerald D. Williams
Norbert F. Zawaski, Jr.

NEW ENGLAND REGION
Arline J. Barrett
Daniel J. Bogumil
Edward F. Curran
Edward J. Koen
Ronald C. Seppala
Raymond M. Willhite

NORTHWEST MOUNTAIN REGION
Lawson Dowell
Ray S. Lansbery
Lawrence L. Purtschi
Antonio P. Rego
Robert D. Shepherd
Alton W. Smith
W. Harold Upton
James M. Walker
Homer E. Wilburn

SOUTHERN REGION
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Robert L. Allen
Gary D. Bender
Casper Brown
Sonny B. Brown
Howard E. Burch
Charles E. Clayton
Van D. Evans
Young E. Fitzpatrick
George A. Goodman
David E. Graham
John W. Harrell
Lawton T. Hill
George F. Hobgood, Jr.
Harold T. Ianney
Fabarn L. Jennings
Kenneth C. King
Joseph F. Lunder, Jr.
Phillip B. Martin
William M. Messick
Joe R. Peters
Hollis D. Phelps III
Paul Raymond
John H. Todd, Jr.
Ellen G. Tucker
Kenneth R. Underwood
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SOUTHWEST REGION
Roy E. Abel
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Lawrence Hall
Morris L. Womack

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Robert B. Frack
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Donald Gulberg
James S. Miura
Richard Z. Miyashiro
Edward D. Schleif
John M. Ward
Jack L. Woods

JULY 89

FAA Pilot and Engineer Lauded for B747 Flight Test

By Mac McElroy

A Boeing 747-400 touches down at Moses Lake, WA, after a flight test conducted by FAAers Don Wilson (left in the insert) and Berk Greene.

FAA Pilot Berk Greene and Flight Test Engineer Don Wilson of the Seattle Aircraft Certification Office Flight Test Branch have been formally recognized for participation in a U.S. national record flight on a Boeing 747-400.

Flying out of Moses Lake, WA, on June 27, 1988, the team conducted a takeoff at 892,450 lbs. gross weight. A certificate from the National Aeronautic Association (NAA), which represents the Federation Aeronautique Internationale in the United States, cites the takeoff as "the greatest mass lifted to 2,000 meters for a C-1 class landplane."

An NAA official formally witnessed the takeoff. It was part of the 747-400 certification program, for which Greene and Wilson were FAA flight test project leaders.

The author is Flight Test Manager at the Seattle Aircraft Certification Office.

U.S. Department of Transportation
Federal Aviation Administration

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Federal Aviation Administration

FAA World

July 1989
Volume 19 Number 7

Jet Flight Hits the Big 50

By Richard K. Smith

Fifty years ago—on Sunday, Aug. 27, 1939—a small airplane went screaming off the Heinkel Flugzeugbau's airfield on the Baltic coastal plain at Marienehe, Germany, circled the field and landed. The short flight had to be terminated prematurely because a sea gull had been ingested into the engine intake. Still, the test pilot, Erich Warsitz, and all the observers were pleased by this first flight of the world's first jet airplane.

The airplane was the Heinkel He.178, a diminutive, shoulder-wing flying machine of 4,400 pounds with an all-metal monococque fuselage and a wing of stressed plywood. A wooden wing in the first jet plane was a bit of a paradox, but the He.178's only function was to serve as a flight vehicle to validate its HeS-3b turbojet engine.

The first jet flight was the brainchild of 28-year-old Hans von Ohain. In 1932, as a student at the University of Gottingen, he flew as a passenger on a Lufthansa airliner and was appalled by the noise and vibration that filled the

(Continued on page 4)

Dr. Smith is a noted aviation historian and a previous contributor to FAA World.

In This Issue

Fast Radar Boosts Airport Capacity

Somebody is doing something about flight delays.

The Federal Aviation Administration, with the strong support of the aviation community and the U.S. Congress, is pursuing a broad range of hi-tech approaches to increasing existing airport capacity at the same time that it is working to promote new airport development.

By Anees Adil

Of the various technical programs, none is more promising than the demonstration of a new precision-approach-radar monitoring system at the Raleigh-Durham, NC, Airport. It would allow aircraft to make more efficient use of closely spaced parallel runways and converging runways during bad weather, when two-thirds of all flight delays occur.

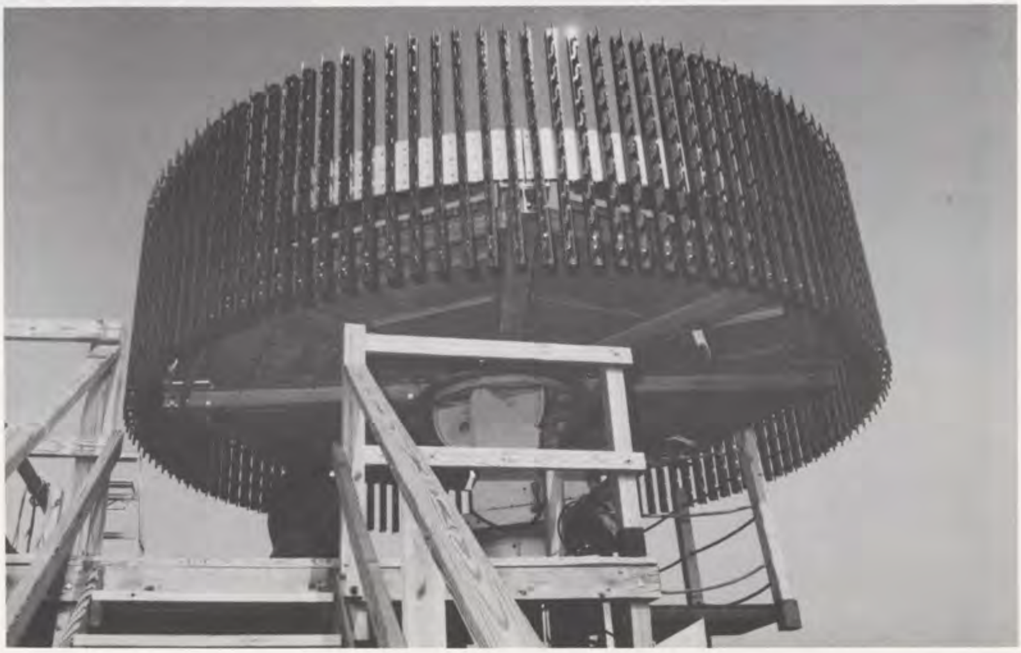
The agency also has a related program in progress at the Memphis, TN, Airport, using a different system for monitoring traffic (see box). Both are part of the Precision Runway Monitor (PRM) Program.

The Raleigh-Durham demonstration program got underway this summer and is expected to run for about one year. If successful, the system will be upgraded and become a permanent fixture at the airport. Implementation at other airports could be expected to follow. In all, FAA has identified 12 locations that could immediately benefit from the use of the Raleigh-Durham, Memphis or a similar system. There is the potential for 50–100 airports to benefit ultimately from the program.

One of the major problems currently facing many fast-growing airports, like Raleigh-Durham and Memphis, is the

(Continued on page 2)

Mr. Adil is a staff member in the Advanced System Acquisition Service and program manager for the Raleigh and Memphis program for closely spaced parallel runways.



FAA World

July 1989

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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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Faster Radar

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sharp reduction in runway acceptance rates during periods of bad weather when visual approaches are restricted or prohibited. Capacity can be cut by as much as 50 percent under instrument flight rule (IFR) conditions, depending on the airport layout.

For example, at Raleigh-Durham, the 3,500-foot spacing between the airport's parallel runways permits simultaneous approaches as long as pilots can ensure safe separation through visual contact. However, in IFR weather, FAA requires a minimum distance of 4,300 feet between runways for parallel approaches. The IFR standard provides an additional margin of safety and ensures that one aircraft will not blunder unseen into the approach path of another.

The idea behind this demonstration is that IFR parallel operations can be conducted safely on runways separated by less than 4,300 feet if controllers are provided with precise, rapid updates on aircraft position. Thus, any course deviation can be detected quickly and corrective action taken to put the errant pilot back on track before he or she can pose a hazard to other air traffic.

The Raleigh-Durham system achieves this objective through the use of an electronically scanning radar capable of updating aircraft targets as often as two times a second, compared with once every five seconds for conventional airport surveillance radars.

The highly accurate equipment also can monitor lateral (left-right) aircraft movements to within a few feet at distances many miles from the runway. Controllers are alerted to course deviations by automated visual and aural alarms on their displays.

Perhaps the most distinctive physical feature of this system is a 17-foot-diameter circular antenna positioned 90 feet above the airport surface. This is a phased-array antenna, which means it

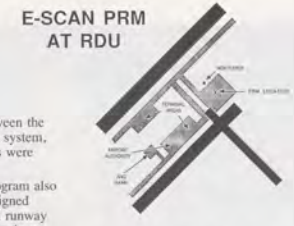
Anees Adil, Quick Scan's program manager, checks out the equipment at the North Carolina airport.

remains stationary while the radar beam is steered electronically in a 360-degree sweep.

The Raleigh-Durham system also features high-resolution color displays and a "desk-top" simulator that serves as a link with remote aircraft simulators at the FAA Aeronautical Center in Oklahoma City and at the American Airlines training center in Dallas-Ft. Worth. American has been deeply involved in the demonstration from the start because of its plans to develop Raleigh-Durham as a major hub airport.

Former FAA Administrator Donald Engen can take credit for initiating the program, having approved the concept in August 1986. It was enthusiastically applauded by the aviation industry. Due in large measure to industry efforts, the Congress subsequently agreed to provide $5 million for fast-track airport capacity programs. It named the new airport surveillance system as a prospective candidate program, and a contract with a project management firm was signed in April 1987.

A major milestone in the Raleigh-Durham project was achieved in April 1988 when the 77-foot-high radar tower



was erected at the airport between the parallel runways. The antenna system, displays and other components were delivered in March 1989.

In this same period, the program also began to evolve from one designed solely to improve IFR parallel runway operations to one which can apply to IFR converging operations and other multiple approaches. The name of the system changed accordingly to reflect its expanded scope—i.e., from "parallel runway monitor" to "parallel and converging runway monitor" to "precision runway monitor" to "Quick Scan airport surveillance system."

The Raleigh-Durham demonstration now is in the initial proof-of-performance phase. The agency expects to

Seventy-seven feet of steel reach skyward at the Raleigh-Durham Airport to cradle the high tech Quick Scan radar.

begin the actual data-collection effort this fall, with eventual participation by all elements of the aviation industry. Through the use of simulation techniques, the demonstration team will look not only at the Raleigh-Durham runway configuration but also at very closely spaced parallels down to 2,500-foot separation. In the final phase, team members also will evaluate the requirements for conducting IFR approaches to converging runways.

FAA controllers who have had experience with parallel approaches at various airports around the country will be brought in to work with the demonstration team. The agency also is recruiting volunteer airline crews to fly the simulators at the FAA and American Airlines training facilities that will be linked to Raleigh-Durham by telephone or satellite. Simulator crews will receive and respond to controller instructions as if flying an actual aircraft.

The success of the Raleigh-Durham and Memphis demonstration programs will pave the way for more than a score of airports with closely spaced parallel runways to implement these systems. Moreover, once a standard is established, many of the major airports can begin to plan new parallel runways on existing airport land and provide near-term options for increasing airfield capacity up to 100 percent, compared to the best configuration today.

One measure of the results will be substantial cost savings for airline operators due to fewer delays. For example, FAA estimates that operational use of precision-approach-radar monitoring systems would reduce delays at 10 target airports by 250,000 aircraft hours in the year 2000. That translates into a total of more than $400 million annually in fuel and other savings.

Still, the ultimate winner will be airline travelers, who may come to feel the tide has finally turned in their favor. ■

Another Way To Skin a Cat

The Memphis demonstration program got underway in August 1988 and is scheduled to continue until late spring 1990. One of the major differences between it and the demonstration at the Raleigh-Durham Airport is the design of the antenna system. Unlike Raleigh-Durham, which uses a fixed phased-array antenna, Memphis employs a rotating pair of five-foot open-array beacon antennas mounted back to back. This provides traffic updates every 2.4 seconds, or double the rate of conventional radar antennas.

Both programs have the same objective, however—that is, to define the technical characteristics of a radar runway-monitoring system that will permit more efficient utilization of closely spaced and converging runways during instrument conditions.

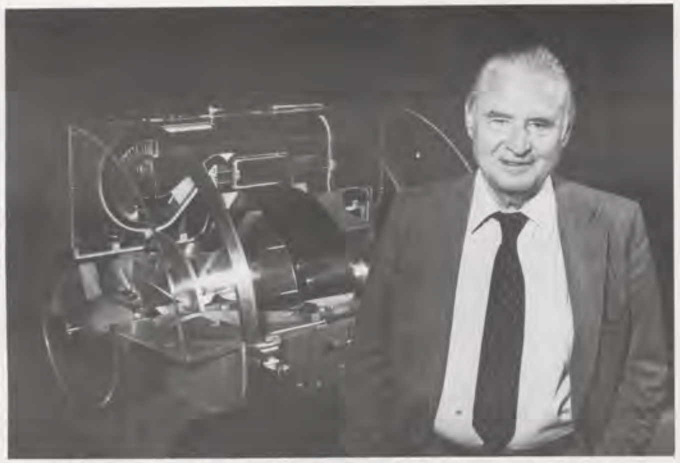
Like Raleigh-Durham, the Memphis demonstration will be evaluated through flight-simulation techniques using actual airline crews and a cross-section of veteran FAA controllers. There also will be flight demonstrations involving aircraft from FAA, Federal Express, Northwest Airlines and other carriers, as well as from the general aviation community.

The Quick Scan radar tower is a close neighbor to the airport control tower. The bright red circular radar measures 17 feet in diameter.

Photos by Roger Myers

Jet Flight

continued from page 1



Hans von Ohain poses with a model of the turbojet engine that ushered in the jet age 50 years ago. Now in his late 70s, he resides in Dayton, OH.

cabin and shattered what should have been the serene elegance of flight. Instead of a series of explosions providing the energy for flight, it occurred to Ohain that the engine power should be a steady thermodynamic flow.

Clearly, such a flow would be found in a turbine engine. But in the 1930s, gas turbines were very few and limited to large industrial installations. The term "gas turbine" provoked images of a huge machine anchored in tons of concrete. Nevertheless, Ohain went ahead with calculations based on the lightweight requirements of an airplane.

Besides simplicity, the gas turbine was superior to the piston engine on the point of thrust to weight. Whereas the piston engine required a propeller to translate power to thrust, the turbojet is a self-contained unit of pure thrust. Although the turbojet's fuel consumption seemed shockingly high, the weight of additional fuel was neatly traded off against the lightness of the engine and the final result was a 40% increase in speed.

Aware that abstract figures were not enough, Ohain designed and built a working model engine to demonstrate its principles, dividing his time between that project and finishing a Ph.D. in physics at the university. Meanwhile, one of his professors, R.W. Pohl, took an interest in the primitive turbojet, saw that the project required industrial support, and offered Ohain a connection to a manufacturer of his choice.

Ohain was skeptical about established aero engine manufacturers, who probably could come up with ten thousand reasons why a turbojet was premature or simply could not be adapted to an airplane. Instead, he looked to a sponsor who wanted to fly faster, a builder of airplanes, and he chose the Heinkel Flugzeugbau.

Ernst Heinkel was a "natural" for the jet engine. He had a reputation for being unorthodox, somewhat difficult and for doing the unusual. By the mid-1930's, his airplanes were synonymous with speed in the air. But Heinkel also wanted to expand into manufacturing engines like his arch rival, the Junkers company. Ohain's turbojet promised him an early engineering foundation for what was clearly the aero engine of the future.

In April 1936, Ohain signed on with Heinkel, and a year later had a prototype engine running on a test bench. Early problems with the design of a combustion chamber were eventually resolved and, during 1938, the HeS–3 turbojet made numerous flights as a successful auxiliary power plant aboard a He.118 dive bomber.

Although Heinkel kept the company's turbojet work a secret, word of it inevitably leaked out after Ohain applied for a patent in 1937. The patent search also revealed the prior ideas of other jet engine pioneers, including the Britisher George Whittle who patented a turbojet similar to Ohain's in 1930. But in an era dominated by fabric-covered biplanes, these inventions were premature, demanding entirely new types of airplanes. It was not until the early

The first jet to see combat in World War II—the twin-engine Messerchmitt Me.262—arrived too late to affect the outcome of the war.

1930s that streamlined, all-metal monoplane aerostructures started to come into existence that could make effective use of jet propulsion.

The Whittle engine eventually was developed, but the British inventor had no Ernst Heinkel to support his efforts. As a result, a Whittle engine did not power an airplane until 1941.

Even in Germany, the higher echelons of the Air Ministry showed little or no interest in jet propulsion or the gas turbine. It was the middle level engineering staff in the Luftminsterium

bureaucracy that recognized it as an idea whose time had come. A small office devoted to jet propulsion was created under Helmut Schelp. He was the person who subsequently orchestrated the development of the jet engine in Germany. It was not an easy task.

With Germany preparing for war, the manufacturers of aero engines already felt overloaded by work on conventional piston engines and did not want the burden of gas turbine development. Nevertheless, in 1938, Schelp convinced Junkers Motoren (Jumo), BMW's Flugmotorenbau, and the Brandenburgerische Motorenwerke (Bramo) to accept development contracts. The Junkers contract ultimately resulted in the Jumo 004; it was not only the world's first production axial flow jet engine, it introduced many design innovations that remain basic to the gas turbine.

Because of the rising war fever in Berlin—the first flight of the Heinkel He.178 occurred just one week before the German legions stormed into Poland—Heinkel had great difficulty luring any of the Air Ministry's officialdom to Marienehe to witness the inaugural flight. Even after watching the event, top officials still did not grasp the significance of what they had seen. Only the engineering people saw the jet's true potential.

Still, Heinkel was given a contract for a jet fighter—the twin-jet He.280, with a weight of 9,500 pounds and a top speed of 550 mph. The He.280 first flew in April 1941 and, despite some early teething problems, could have been put into production in 1941 and been available in squadron strength by the summer of 1943. Since it was dramatically superior to anything in the Allied inventory, it probably would have defeated the American daylight bombing offensive against Germany.

But the German Air Ministry was holding out for something better. The He.280 was cancelled in favor of the Messerchmitt Me.262 jet fighter which did not fly until July 1942 and was not available in numbers until October 1944. Although far superior to the He.280, the Me.262 was much too late to have any influence on the war's outcome.

The British did not fly a jet airplane until May 15, 1941—the Gloster-Whittle E.28/39. It was a simple flight test vehicle similar to the Heinkel He.178 of 1939. No American saw a jet airplane until a party of Army Air Force officers examined the E.28/39 in the summer of 1941. The origins of the turbojet in the United States were subsequently built on British experience.

Although it is often said that development of the jet engine was the result of World War II, this is only a fractional truth. Hans von Ohain's work, the HeS-3b engine, and the little Heinkel He.178 were not inspired by war but by the forces that have always driven aviation progress—the desire to fly faster and more efficiently. ■

The diminutive Heinkel He.178 made the first jet flight on August 27, 1939, on Germany's Baltic coast.

FAA World Editor Retires

You may have noticed already the familiar name of Len Samuels missing from the magazine's masthead.

On June 16, he took up his red pen for the last time and edited his final article for *FAA World*. After almost 18 years as editor of the magazine, he was ready to focus on overcoming some persistent back problems that have severely limited his mobility in recent years.

Coming to the *World* in July 1971, when the magazine was only seven months old, Samuels directed the production of more than 200 issues before his retirement. Under his editorship, *World* received a first place award for both content and design from the National Association of Government Communicators. The NAGC's "Blue Pencil Award" is given annually to recognize outstanding examples of government publications.

Known by his colleagues for his careful attention to detail as well as for the scenes of ski slopes on his office walls, Samuels leaves much of himself at the agency in the publications he produced over the years.

"Editing *FAA World* is different from editing other magazines," he said. "We address a multiplicity of audiences in each issue, not unlike a *Saturday Evening Post* or a *Readers Digest*. We're dealing with some 50,000 readers with different personal tastes, split along regional and social lines, in different professional disciplines, working in a large community like an ARTCC or alone at a remote site. And each audience thinks we give too much attention to another.

"While we try to balance our content and keep all these audiences, we must remember that they often are not seeking *FAA World* as they would a news stand publication of their own choosing," he continued. "We have a harder job of capturing and sustaining the interest of this readership, but it is necessary to work at keeping open this line of communication between agency management and its employees."

Prior to joining FAA, Samuels worked for the U.S. Information Agency as a Foreign Service staff specialist. He also had worked in Southeast Asia as a "conduit between public affairs officers and printers for all kinds of publications." He worked for various general and trade magazines, including *Popular Mechanics*, before entering government service.

Paragons of Performance

Increased services and increased productivity marked the air traffic facilities that landed the national Air Traffic Facility of the Year awards for 1988.

As usual the awards were made in four categories: Dallas-Fort Worth, Texas, Tower as the terminal radar facility; Yakima, Wash., Tower as the nonradar control facility; the Minneapolis, Minn., ARTCC in the center category; and the Lansing, Mich., Automated Flight Service Station (AFSS) as the flight service station of the year.

The Yakima Tower, which provides nonradar approach control services to IFR flights and traffic advisories to VFR aircraft within a 25-mile radius, encompassing two airport traffic areas and 10 uncontrolled airports, added 33 percent more airspace to its territory in 1988. This helped to minimize delays between departures and arrivals at the same time that the tower had no involvement in any operational incidents.

Despite its small staff, Yakima mounted an aggressive aviation-education program, which included more than 100 hours of volunteered time that led to 1,100 people being introduced to FAA and the air traffic system.

The Dallas-Fort Worth Tower was found cooking on all burners, crossing the one-million mark in instrument operations while it installed a new radar system, implemented a new ARTS IIIA program, suffered only the briefest disruption during a facility fire and was heavily involved in planning and designing the new DFW Metroplex Plan for enhancing future capacity and flexibility.

While the Minneapolis Center was increasing its level of service, it reduced its operational errors by 46 percent over the previous year. The institution of an automated operations-tracking program helped reduce overtime by 53 percent. The ARTCC also launched an ambitious aviation-education program, which included many speeches, creating television segments for local TV and public broadcasting and briefing 3,100 pilots in Operation Raincheck programs.

The Lansing AFSS was no slouch in this department, as well, providing speakers to activities that briefed more than 1,500 pilots, facility tours to 128 aviation groups and continuing support to the Lansing Community College's Aviation Department.

The AFSS provided a total of more than 300,000 personalized and recorded pilot weather briefings but kept user delays to an average of 24 seconds—one of the lowest in the nation. It also provided over 1,400 hours of classroom instruction and over 4,000 hours of OJT training to specialists as a result of the consolidation of three stations with itself.

Photos by S. Michael McKean

Dallas-Fort Worth ATCT

Controllers in the DFW TRACON are (from the left) John Sullivan, feeder west; Steve Kaine, arrival radar; Don Lloyd, arrival radar; Rudy Reyes, feeder east; and Dale Slaton, departure radar.

Working the DFW tower cab are (left to right) Jeff Peace, local control east; Jodi Grant, flight data air traffic assistant; Bob Lezon, ground control east; Richard Woodard, clearance delivery air traffic assistant; and area supervisor Bill Eudaley.

Air traffic assistants at the TRACON's flight-strip printers are Tom Worley (left) and Gary Brazeal.

Providing support at DFW are (from the left) secretary Betty Sewell, administrative officer Carolyn Davis and administrative support clerk Vi Perez.

Working the Dallas North satellite radar in the DFW TRACON is ATCS Roy ''Corky'' Spillner, about to turn 63, reported to be the oldest level 5 controller in the FAA.

Minneapolis ARTCC

Controllers Mel Lavigson (left), Rich Green and Barry White (observing) pause for the photo flash.

Manning the Center Weather Service Unit (CWSU) are Bob Christensen (left) and Rich Kessler.

The center's executive support consists of T&A clerk Sharon Wilson (left) and administrative assistant Marilyn Briesacher.

Orville Putzier, Jim Maness and Preston ''Butch'' Banning (from left) comprise the Military Staff, one of five staffs at the center.

Minneapolis ARTCC's personnel office consists of (from left) Pat Hennen, Darlene Pfahning, Penne Schuldt and Marlys Hillmer.

Lansing, MI, AFSS

Training specialist David Jackson helps the station maintain a high level of proficiency.

Model 1 automated equipment was commissioned at Lansing AFSS in December 1986.

ATCS Jeff Bittner works an inflight position during a busy period.

Paragons of Performance

All-hands meetings are frequent at Lansing. Manging one here are (from the left) area manager Tim Bailey, facility manager David Shattler, administrative assistant Karen Sell and assistant facility manager William Perkette.

Pictured are facility support troops at Lansing. They include clerk-typist Judy Burch (left), secretary Tammy Graham and administrative assistant Karen Sell.

Yakima, WA, ATCT

Controllers Gerald Strang, Thad Faussett, Daniel Potts and Roy Rutherford (from left) pause for camera.

Yakima tower manager John Keller presides over a small but productive facility.

These photos represent the entire full-performance-level complement at Yakima. Here (from the left) are ATCSs Richard Thomas, Gene Brown and Mark Smith.

The final trio here are (left to right) ATCS Jeffrey Bennett, area supervisor Michael Schuett and ATCS Douglas Bubb.

A Little Hot Air Was All It Took

By Dennis Schwartz

Early one morning last May, the control tower at Detroit's Metropolitan Airport broadcast a surprising announcement to pilots: A hot air balloon was operating in the middle of the airport.

This unusual development was the first, and certainly most unique, in a series of events leading to the projected commissioning of a new multimillion dollar control tower at Detroit Metro in the spring of 1991.

Normally, a hot air balloon flight has nothing to do with planning a control tower. But at Detroit, it played a key role, saving thousand of dollars and giving engineers an important perspective on the future facility.

The responsibility for the design and construction of new control towers in the Great Lakes Region resides with the Establishment Engineering Branch (AGL-450) of the Airway Facilities Division. Once Congress approves funds for a new tower and a project assignment is received, our engineering staff begins the process of finding a suitable location for the new tower at the designated airport. The process involves representatives of the Airports, Air Traffic, Flight Standards, Logistics, and Airway Facilities divisions.

Many factors are taken into account in selecting a tower site, the most important being complete visibility from the tower cab of all controlled aircraft movement areas, as well as airborne traffic patterns and runway approaches. Visibility can be affected by large hangars, terminal buildings, trees, navigational aid structures, and even tails of parked aircraft.

The initial step is a paper study to determine a tower location and control cab height that will provide the required visibility and meet other siting requirements. Then, an Air Traffic and Airway Facilities team visits the airport to make an on-site evaluation. Observations are made at the proposed tower cab floor level, normally with a crane. Panoramic photographs also are taken to insure that visibility from the tower will be acceptable.

Detroit Metro presented several problems with respect to making these vital observations. The planned tower is a new design with cab floor heights ranging from 204 feet to 300 feet above ground level (compared to 167 feet at Chicago O'Hare). Cranes capable of reaching these heights are not readily available. They also are time-consuming to erect and very expensive to rent.

In considering various alternatives to a crane, the idea of using a hot air balloon evolved and discussions with balloonists proved the idea practical, efficient, and inexpensive. Thus "Operation Ascent," as it was later designated, became a reality.

Civil engineer Bill Maki coordinated the entire effort. The balloon and ground crew were provided by Ted Gauthier, owner of the Balloon Depot in Pontiac, MI. He also acted as pilot.

Preliminary preparations involved a myriad of details, including locating three tether points at the proposed tower site equally spaced around the tower centerline and out to a distance of approximately 200 feet. The tethers were to keep the balloon positioned over the centerline.

The morning of May 26 dawned bright and clear, just as forecasted, with winds less than 5 knots. Representatives of local newspapers and television stations were already on hand. Detroit Airway Facilities Sector vehicles were positioned at the tether points for anchoring the tether lines. The balloon was inflated and by 6 a.m., Al Russell and John Converse from the Detroit tower were making the first observations. Several more ascents were made and photographs taken before the operation ended at 7 o'clock. Operation Ascent had proved to be a total success.

Although the hot air balloon was not as stable as a crane, it was more than adequate. Moreover, using a balloon resulted in an estimated savings of $6,000 to $8,000 when compared to the cost of renting a crane.

Our observations confirmed the acceptability of the proposed tower site with a cab floor height 204 feet above the ground. This will make the new Detroit tower the tallest in the country. Construction is scheduled to begin next August with commissioning set for April 1991. ■

Al Russel and John Converse from the Detroit Metro tower get a preview of what controllers will see at the airport when the new tower opens in the spring of 1991.

Ground crewmembers inflate the balloon used in "Operation Ascent" to assess the height requirements for a new tower at Detroit Metro Airport.

The writer is the Supervisor, Terminal Environmental Engineering Unit in the Great Lakes Airway Facilities Division.

People

Aeronautical Center

■ **Sharon E. Feland,** manager, Labor Relations & Occupational Safety Branch, Human Resource Management Div., promotion made permanent.

■ **Robert M. Guinn, Jr.,** supervisor, Automation Section, Airway Facilities Branch, FAA Academy.

■ **Owen H. Magruder, Jr.,** manager, Maintenance Support Branch, Regulatory Support Div., from Washington Headquarters.

■ **Donald E. Schein,** supervisor, Information Management Section, Operational Systems Branch, Regulatory Support Div.

Alaskan Region

■ **Robert J. Bransky,** manager, Establishment Branch, Airway Facilities Div.

■ **David C. Champion,** asst. manger for automation, Kenai AFSS, Anchorage, from Anchorage ARTCC.

■ **William E. Chord, Jr.,** asst. manager, Anchorage ATCT, from Air Traffic Div.

■ **Charles D. Gray,** asst. manager for training, Anchorage ARTCC, promotion made permanent.

■ **James A. Nelson, Jr.,** maintenance mechanic foreman, North Alaska AFS, Fairbanks, from Little Rock AFS.

Central Region

■ **Burt E. Bailey,** unit supervisor, Salina, KS, AFSFO, Wichita, KS, AFS.

■ **Alan C. Bowling,** area supervisor, Columbia, MO, AFSS, promotion made permanent.

■ **Curtis W. Endsley,** area supervisor, Kansas City, MO, International Airport ATCT, from Houston, TX, Intercontinental Airport ATCT.

■ **Richard L. Holdman,** area supervisor, Olathe, KS, ARTCC, promotion made permanent.

■ **Peter H. Hopkins,** unit supervisor, Olathe, KS, AFS, promotion made permanent.

■ **Ivan F. Hunt,** manager, Olathe, KS, ARTCC, from Kansas City, MO, ATCT.

■ **Joseph G. Korb,** area supervisor, Columbia, MO, AFSS, promotion made permanent.

■ **Felton R. Lancaster,** section supervisor, Planning Branch, Air Traffic Div., from Olathe, KS, ARTCC.

■ **Michael Mollohan,** area supervisor, Wichita, KS, ATCT, promotion made permanent.

■ **David E. Sapp,** unit supervisor, Forbes AFB, KS, AFSFO, Wichita AFS, promotion made permanent.

■ **Lawrence P. Smith,** area supervisor, St. Louis TRACON, Berkeley, MO, promotion made permanent.

Eastern Region

■ **Donald A. Barnes,** unit supervisor, Baltimore AFSFO, Capital AFS, promotion made permanent.

■ **Kathleen Bergen,** staff officer, Public Affairs & Planning Staff.

■ **Vito J. Borrello,** asst. manager, New York TRACON, Garden City, from Long Island MacArthur Airport ATCT, Islip.

■ **John T. Brame,** area supervisor, Washington Center, Leesburg, VA, promotion made permanent.

■ **William R. Carver,** area supervisor, Dulles, VA, ATCT, from Baltimore, MD, ATCT.

■ **James L. Church,** area supervisor, Washington Center, Leesburg, VA.

■ **Francis T. Earhardt,** area supervisor, Washington Center, Lessburg, VA.

■ **Donald R. Gregory,** area supervisor, Washington Center, Leesburg, VA.

■ **Kermit W. Hall,** manager, Elkins, WV, FSS, promotion made permanent.

■ **Arthur G. Haugh,** asst. manager for program support, AFS–New York ARTCC, MacArthur Airport, from Airway Facilities Div.

■ **Patricia Healey,** supervisor, Employee Benefits Section, Employee Benefits & Classification Branch, Human Resource Management Div.

■ **Janice R. Hilmer,** asst. manager/programs, New York AFSS, Islip, NY, promotion made permanent.

■ **Richard C. Jones,** area supervisor, Washington Center, Leesburg, VA, promotion made permanent.

■ **Loretta M. Kusk,** administrative officer, Airway Facilities Div., from Logistics Div.

■ **Michael Joseph McCormick,** area supervisor, Philadelphia International Airport ATCT, promotion made permanent.

■ **William J. McGovern, Jr.,** area manager, Leesburg, VA, AFSS.

■ **Edward J. McKenna,** manager, Ithaca, NY, ATCT, from Buffalo, NY, ATCT.

Great Lakes Region

■ **George F. Ackley,** area supervisor, Mansfield-Lahm Airport, ATCT, OH, from Akron-Canton Airport, ATCT, OH.

■ **Ronald G. Adair,** area supervisor, Chicago, IL, ZAU ARTCC, promotion made permanent.

■ **Howard A. Brady,** unit supervisor, Minneapolis-St. Paul, MN, Air Carrier District Office (ACDO), from Frankfurt, Germany.

■ **Vincent A. Bridgeforth,** asst. manager for technical support, Chicago AFS, from Airway Facilities Division.

■ **David R. Brizendine,** area supervisor, Indianapolis, IN, ZID ARTCC, from FAA Academy.

■ **Brigitte A. Brooks,** area supervisor, Toledo, OH, ATCT, from Detroit, MI, Metro Airport ATCT.

■ **Cathleen R. Bruner,** area supervisor, ZID ARTCC, Indianapolis, IN, promotion made permanent.

■ **James R. Callahan,** manager, Dane County Airport, Madison, WI, from General Mitchell Field ATCT, Milwaukee, WI.

■ **Gary M. Duemling,** area supervisor, ZID ARTCC, Indianapolis, IN.

■ **Michael K. Farrell,** area supervisor, Princeton, MN, AFSS.

■ **Ralph D. Forrest,** AF watch supervisor, Chicago AFS, from Airway Facilities Div.

■ **Larry L. Hall,** area supervisor, Mansfield-Lahm Airport, ATCT, OH, from Cleveland Hopkins Airport, ATCT, OH.

■ **Richard F. Hill,** manager, Bloomington-Normal, ATCT, IL, from Moline, IL, Quad-City Airport ATCT.

■ **Paul R. Infanti,** area supervisor, Chicago ZAU ARTCC, from Albuquerque, NM, ARTCC.

■ **Thomas S. Johnson,** unit supervisor, Wisconsin AFS, Green Bay.

■ **Daniel J. Kuhn,** area supervisor, Chicago O'Hare ATCT, from Aurora Municpal Airport ATCT, Sugar Grove, IL.

■ **Timothy J. McCann,** area supervisor, Chicago ZAU ARTCC, promotion made permanent.

■ **John T. Mullen,** area supervisor, Indianapolis ZID ARTCC.

■ **Ronald W. Peterson,** area supervisor, Greater Rockford Airport (IL) ATCT, from Chicago ZAU ARTCC.

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■ **Michael A. Astorino,** area supervisor, Quonset Point, RI, TRACON, from Bradley ATCT, Windsor Locks, CT.

■ **H. Cully Beasley III,** area supervisor, Otis ATCT, Falmouth, MA, promotion made permanent.

■ **Stephen A. Craig,** area supervisor, Burlington, VT, AFSS, promotion made permanent.

■ **Martin R. McColgan,** manager, Cummington, MA, AFSFO, Windsor Locks, CT, AFS 817, promotion made permanent.

■ **Kathleen F. McDonald,** area supervisor, Lawrence, MA, ATCT, promotion made permanent.

■ **Joseph W. Perrone,** area supervisor, Bradley ATCT, Windsor Locks, CT, promotion made permanent.

■ **Edward E. Pinelle,** unit supervisor, Manchester, NH, AFSFO, Windsor Locks, CT, AFS 817, from Nashua, NH.

■ **Robert B. Snow,** unit supervisor, Falmouth, MA, AFSFO, Boston, MA, AFS 820, promotion made permanent.

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■ **William T. Anker, Jr.,** area supervisor, Peterson Field ATCT, Colorado Springs, from Denver, CO.

■ **Michael H. Borfitz,** manager, Denver Aircraft Certification Office, Aurora, CO, promotion made permanent.

■ **Daniel A. Boyle,** manager, Municipal ATCT, Salt Lake City, UT, from Portland.

■ **Lester R. Briggs,** unit supervisor, Portland, OR, FSDO 64, Hillsboro, OR.

■ **Kathleen Child,** area supervisor, McMinville, OR, AFSS, from Sheridan, WY, FSS.

■ **Michael A. Dasovich,** supervisor, NAV/COM Construction Engineering Section, Establishment Branch, Airway Facilities Div., promotion made permanent.

■ **Carl P. Dean,** manager, Stapleton ATCT, Denver, CO.

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■ **Richard J. Mathews,** area supervisor, Seattle-Tacoma, WA, ATCT, from Los Angeles ATCT.

■ **Collet E. McElroy,** manager, Flight Test Branch, Seattle Aircraft Certification Office (ACO).

■ **Vernon F. Morgan,** asst. manager for program support, Portland, OR, AFS.

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■ **Edwin Berrios-Pacheco,** asst. manager for automation, San Juan CERAP, promotion made permanent.

■ **Dan G. Burns,** area supervisor, Hampton, GA, ARTCC.

■ **Edward J. Clore,** traffic management unit supervisor, Miami, FL, ARTCC.

■ **Arthur T. Crook,** area superviser, Hampton, GA, ARTCC, promotion made permanent.

■ **Stephen T. Elkins,** unit supervisor, Atlanta, GA, Civil Aviation Security Field Office, promotion made permanent.

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■ **Patricia A. Graham,** area supervisor, Standiford Field ATCT, Louisville, KY, from Miami International ATCT.

■ **Deloris A. Henry,** manager, Mc Comb, MS, FSS, from Lansing, MI, AFSS.

■ **Rodney Hoyt,** area supervisor, Atlanta International Airport ATCT, promotion made permanent.

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 to branch manager in offices are published. Other changes usually cannot be accommodated because there are thousands each month.

■ **Kip B. Johns,** area supervisor, West Palm Beach ATCT, from Memphis, TN, ATCT.

■ **William L. Johnson, Jr.,** area supervisor, Greater Cincinnati Airport ATCT, Hebron, KY.

■ **Michael A. Mac Iver,** manager, Gulfport, MS, AFSFO, Jackson AFS, promotion made permanent.

■ **James A. Miceli,** area manager, Greater Cincinnati Airport ATCT, Hebron, KY.

■ **Johnny L. Morrow,** area supervisor, Montgomery, AL, ATCT, from Atlanta.

■ **James O. Ortiz,** unit supervisor, N. Florida FSDO, Jacksonville, from O'Hare ACDO, IL.

■ **Gary K. Perkins,** section supervisor, Miami, FL, FSDO.

■ **William K. Richardson,** unit supervisor, North Carolina FSDO, Winston Salem.

Southwest Region

■ **Roy L. Allen,** unit supervisor, Houston, TX, FSDO, promotion made permanent.

■ **Eric D. Bries,** supervisor, Policy & Procedures Group, Rotocraft Standards Staff, Aircraft Certification Div., promotion made permanent.

■ **Norberto R. Da Silva,** team supervisor, Houston FSDO.

■ **Fred J. Fox,** maintenance mechanic foreman, Austin, TX, AFSFO II, Austin AFS, promotion made permanent.

■ **Thomas P. Germino, Jr.,** principal maintenance inspector, Dallas/Ft. Worth FSDO.

■ **John G. Gillespie, Jr.,** area supervisor, Corpus Christi, TX, RAPCON, promotion made permanent.

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■ **Lane E. Jensen,** asst. manager, Little Rock, AR, RAPCON, from San Juan CERAP.

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■ **William H. Meyer,** systems engineer, Albuquerque ARTCC AFS.

■ **Carl A. Minnich,** traffic management unit supervisor, Albuquerque, NM, ARTCC.

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■ **James Thomas,** technical program manager, ATC Technology Branch, Concepts Analysis Div.

■ **John L. Wiley,** manager, Advanced Systems Technology Branch, Concepts Analysis Div.

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■ **Barbara W. Butts,** chief, Services Staff, Contracts Div., Logistics Service.

■ **Kenneth V. Byram,** deputy manager, Ground to Air Systems Div., Advanced System Acquisition Service.

■ **Murry E. Camp,** manager, Real Estate Branch, Materiel Management Div., Logistics Service.

■ **Lauraline Clark,** team supervisor, Advance Automation Branch, Contracts Div., Logistics Service.

■ **Micheline A. Conn,** team supervisor, Systems Operation Branch, Contracts Div., Logistics Service.

■ **Donald E. Deering,** section supervisor, Aircraft Interfacility & Safety Branch, Contracts Div., Logistics Service.

■ **Marion B. Dittman,** manager, Certificate Management Branch, Field Programs Div., Flight Standards Service, from Great Lakes Region.

■ **Victor E. Fouse,** manager, Frequency Engineering Branch, Spectrum Engineering Div., Systems Maintenance Service, promotion made permanent.

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■ **James R. Carey,** manager, Grand Canyon, AZ, ATCT, from Twin Falls, ID, ATCT.

■ **David W. Ceballos,** area supervisor, Executive Airport ATCT, Sacramento, CA, from TRACON, McClellan AFB, Sacramento.

■ **Ruskin I. Cerretti,** area supervisor, Hayward, CA, ATCT, from Oakland, CA, ATCT.

■ **Norman E. Cyphers, Jr.,** area supervisor, TRACON, McClellan AFB, Sacramento, from TRACON, Phoenix, AZ.

■ **Bruce J. Greer,** manager, Palmdale, CA, ATCT, from Air Traffic Div.

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■ **Lawrence J. Jacobson,** area supervisor, ATCT/TRACON, Burbank, CA, from New York TRACON, Garden City.

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■ **John A. Svoboda,** operations chief, San Diego, CA, AFS.

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JULY 89

FAA Pilot and Engineer Lauded for B747 Flight Test

By Mac McElroy

A Boeing 747-400 touches down at Moses Lake, WA, after a flight test conducted by FAAers Don Wilson (left in the insert) and Berk Greene.

FAA Pilot Berk Greene and Flight Test Engineer Don Wilson of the Seattle Aircraft Certification Office Flight Test Branch have been formally recognized for participation in a U.S. national record flight on a Boeing 747-400.

Flying out of Moses Lake, WA, on June 27, 1988, the team conducted a takeoff at 892,450 lbs. gross weight. A certificate from the National Aeronautic Association (NAA), which represents the Federation Aeronautique Internationale in the United States, cites the takeoff as "the greatest mass lifted to 2,000 meters for a C-1 class landplane."

An NAA official formally witnessed the takeoff. It was part of the 747-400 certification program, for which Greene and Wilson were FAA flight test project leaders.

The author is Flight Test Manager at the Seattle Aircraft Certification Office.

U.S. Department of Transportation

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Federal Aviation Administration

FAA World

July 1989
Volume 19 Number 7

Jet Flight Hits the Big 50

By Richard K. Smith

Fifty years ago—on Sunday, Aug. 27, 1939—a small airplane went screaming off the Heinkel Flugzeugbau's airfield on the Baltic coastal plain at Marienehe, Germany, circled the field and landed. The short flight had to be terminated prematurely because a sea gull had been ingested into the engine intake. Still, the test pilot, Erich Warsitz, and all the observers were pleased by this first flight of the world's first jet airplane.

The airplane was the Heinkel He.178, a diminutive, shoulder-wing flying machine of 4,400 pounds with an all-metal monocoque fuselage and a wing of stressed plywood. A wooden wing in the first jet plane was a bit of a paradox, but the He.178's only function was to serve as a flight vehicle to validate its HeS–3b turbojet engine.

The first jet flight was the brainchild of 28–year-old Hans von Ohain. In 1932, as a student at the University of Gottingen, he flew as a passenger on a Lufthansa airliner and was appalled by the noise and vibration that filled the

(Continued on page 4)

Dr. Smith is a noted aviation historian and a previous contributor to FAA World.

In This Issue

Fast Radar Boosts Airport Capacity

Somebody is doing something about flight delays.

By Anees Adil

The Federal Aviation Administration, with the strong support of the aviation community and the U.S. Congress, is pursuing a broad range of hi-tech approaches to increasing existing airport capacity at the same time that it is working to promote new airport development.

Of the various technical programs, none is more promising than the demonstration of a new precision-approach-radar monitoring system at the Raleigh-Durham, NC, Airport. It would allow aircraft to make more efficient use of closely spaced parallel runways and converging runways during bad weather, when two-thirds of all flight delays occur.

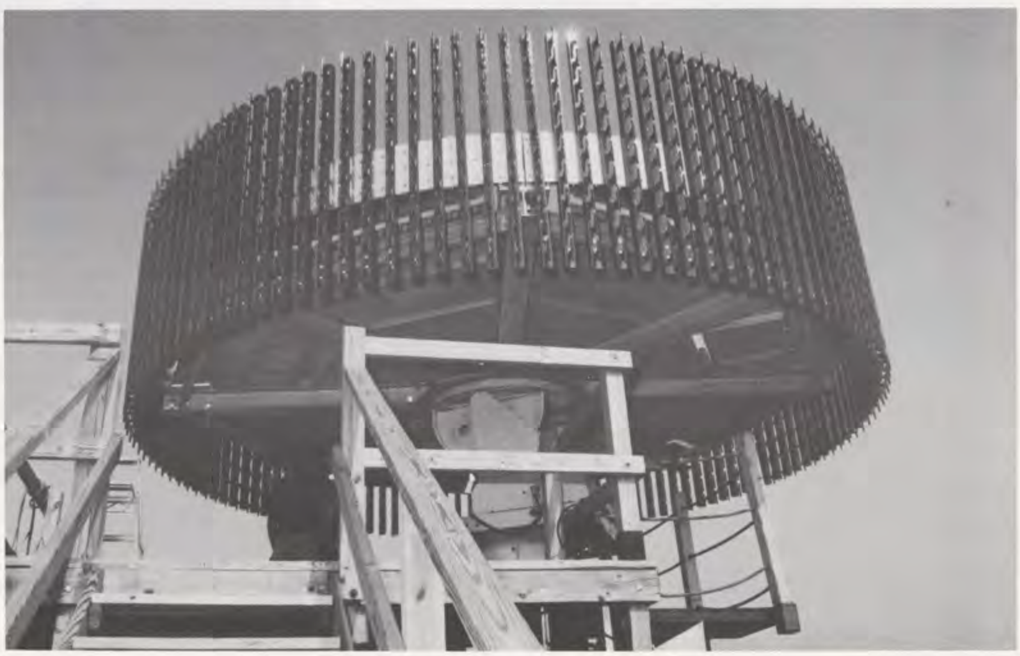
The agency also has a related program in progress at the Memphis, TN, Airport, using a different system for monitoring traffic (see box). Both are part of the Precision Runway Monitor (PRM) Program.

The Raleigh-Durham demonstration program got underway this summer and is expected to run for about one year. If successful, the system will be upgraded and become a permanent fixture at the airport. Implementation at other airports could be expected to follow. In all, FAA has identified 12 locations that could immediately benefit from the use of the Raleigh-Durham, Memphis or a similar system. There is the potential for 50–100 airports to benefit ultimately from the program.

One of the major problems currently facing many fast-growing airports, like Raleigh-Durham and Memphis, is the

(Continued on page 2)

Mr. Adil is a staff member in the Advanced System Acquisition Service and program manager for the Raleigh and Memphis program for closely spaced parallel runways.



FAA World

July 1989

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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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Faster Radar

continued from page 1

sharp reduction in runway acceptance rates during periods of bad weather when visual approaches are restricted or prohibited. Capacity can be cut by as much as 50 percent under instrument flight rule (IFR) conditions, depending on the airport layout.

For example, at Raleigh-Durham, the 3,500-foot spacing between the airport's parallel runways permits simultaneous approaches as long as pilots can ensure safe separation through visual contact. However, in IFR weather, FAA requires a minimum distance of 4,300 feet between runways for parallel approaches. The IFR standard provides an additional margin of safety and ensures that one aircraft will not blunder unseen into the approach path of another.

The idea behind this demonstration is that IFR parallel operations can be conducted safely on runways separated by less than 4,300 feet if controllers are provided with precise, rapid updates on aircraft position. Thus, any course deviation can be detected quickly and corrective action taken to put the errant pilot back on track before he or she can pose a hazard to other air traffic.

The Raleigh-Durham system achieves this objective through the use of an electronically scanning radar capable of updating aircraft targets as often as two times a second, compared with once every five seconds for conventional airport surveillance radars.

The highly accurate equipment also can monitor lateral (left-right) aircraft movements to within a few feet at distances many miles from the runway. Controllers are alerted to course deviations by automated visual and aural alarms on their displays.

Perhaps the most distinctive physical feature of this system is a 17-foot-diameter circular antenna positioned 90 feet above the airport surface. This is a phased-array antenna, which means it

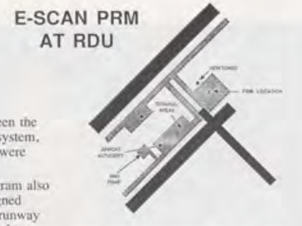
Anees Adil, Quick Scan's program manager, checks out the equipment at the North Carolina airport.

remains stationary while the radar beam is steered electronically in a 360-degree sweep.

The Raleigh-Durham system also features high-resolution color displays and a "desk-top" simulator that serves as a link with remote aircraft simulators at the FAA Aeronautical Center in Oklahoma City and at the American Airlines training center in Dallas-Ft. Worth. American has been deeply involved in the demonstration from the start because of its plans to develop Raleigh-Durham as a major hub airport.

Former FAA Administrator Donald Engen can take credit for initiating the program, having approved the concept in August 1986. It was enthusiastically applauded by the aviation industry. Due in large measure to industry efforts, the Congress subsequently agreed to provide $5 million for fast-track airport capacity programs. It named the new airport surveillance system as a prospective candidate program, and a contract with a project management firm was signed in April 1987.

A major milestone in the Raleigh-Durham project was achieved in April 1988 when the 77-foot-high radar tower



was erected at the airport between the parallel runways. The antenna system, displays and other components were delivered in March 1989.

In this same period, the program also began to evolve from one designed solely to improve IFR parallel runway operations to one which can apply to IFR converging operations and other multiple approaches. The name of the system changed accordingly to reflect its expanded scope—i.e., from "parallel runway monitor" to "parallel and converging runway monitor" to "precision runway monitor" to "Quick Scan airport surveillance system."

The Raleigh-Durham demonstration now is in the initial proof-of-performance phase. The agency expects to begin the actual data-collection effort this fall, with eventual participation by all elements of the aviation industry. Through the use of simulation techniques, the demonstration team will look not only at the Raleigh-Durham runway configuration but also at very closely spaced parallels down to 2,500-foot separation. In the final phase, team members also will evaluate the requirements for conducting IFR approaches to converging runways.

Seventy-seven feet of steel reach skyward at the Raleigh-Durham Airport to cradle the high tech Quick Scan radar.

FAA controllers who have had experience with parallel approaches at various airports around the country will be brought in to work with the demonstration team. The agency also is recruiting volunteer airline crews to fly the simulators at the FAA and American Airlines training facilities that will be linked to Raleigh-Durham by telephone or satellite. Simulator crews will receive and respond to controller instructions as if flying an actual aircraft.

The success of the Raleigh-Durham and Memphis demonstration programs will pave the way for more than a score of airports with closely spaced parallel runways to implement these systems. Moreover, once a standard is established, many of the major airports can begin to plan new parallel runways on existing airport land and provide near-term options for increasing airfield capacity up to 100 percent, compared to the best configuration today.

One measure of the results will be substantial cost savings for airline operators due to fewer delays. For example, FAA estimates that operational use of precision-approach-radar monitoring systems would reduce delays at 10 target airports by 250,000 aircraft hours in the year 2000. That translates into a total of more than $400 million annually in fuel and other savings.

Still, the ultimate winner will be air-line travelers, who may come to feel the tide has finally turned in their favor. ■

Another Way To Skin a Cat

The Memphis demonstration program got underway in August 1988 and is scheduled to continue until late spring 1990. One of the major differences between it and the demonstration at the Raleigh-Durham Airport is the design of the antenna system. Unlike Raleigh-Durham, which uses a fixed phased-array antenna, Memphis employs a rotating pair of five-foot open-array beacon antennas mounted back to back. This provides traffic updates every 2.4 seconds, or double the rate of conventional radar antennas.

Both programs have the same objective, however—that is, to define the technical characteristics of a radar runway-monitoring system that will permit more efficient utilization of closely spaced and converging runways during instrument conditions.

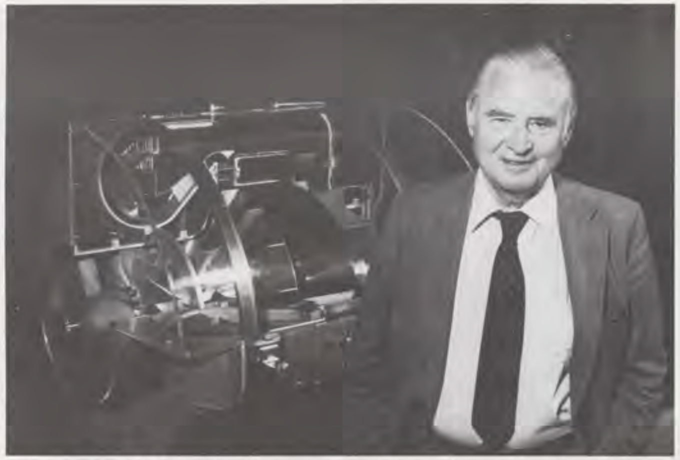
Like Raleigh-Durham, the Memphis demonstration will be evaluated through flight-simulation techniques using actual airline crews and a cross-section of veteran FAA controllers. There also will be flight demonstrations involving aircraft from FAA, Federal Express, Northwest Airlines and other carriers, as well as from the general aviation community.

The Quick Scan radar tower is a close neighbor to the airport control tower. The bright red circular radar measures 17 feet in diameter.

Photos by Roger Myers

Jet Flight

continued from page 1



Hans von Ohain poses with a model of the turbojet engine that ushered in the jet age 50 years ago. Now in his late 70s, he resides in Dayton, OH.

cabin and shattered what should have been the serene elegance of flight. Instead of a series of explosions providing the energy for flight, it occurred to Ohain that the engine power should be a steady thermodynamic flow.

Clearly, such a flow would be found in a turbine engine. But in the 1930s, gas turbines were very few and limited to large industrial installations. The term "gas turbine" provoked images of a huge machine anchored in tons of concrete. Nevertheless, Ohain went ahead with calculations based on the lightweight requirements of an airplane.

Besides simplicity, the gas turbine was superior to the piston engine on the point of thrust to weight. Whereas the piston engine required a propeller to translate power to thrust, the turbojet is a self-contained unit of pure thrust. Although the turbojet's fuel consumption seemed shockingly high, the weight of additional fuel was neatly traded off against the lightness of the engine and the final result was a 40% increase in speed.

Aware that abstract figures were not enough, Ohain designed and built a working model engine to demonstrate its principles, dividing his time between that project and finishing a Ph.D. in physics at the university. Meanwhile, one of his professors, R.W. Pohl, took an interest in the primitive turbojet, saw that the project required industrial support, and offered Ohain a connection to a manufacturer of his choice.

Ohain was skeptical about established aero engine manufacturers, who probably could come up with ten thousand reasons why a turbojet was premature or simply could not be adapted to an airplane. Instead, he looked to a sponsor who wanted to fly faster, a builder of airplanes, and he chose the Heinkel Flugzeugbau.

Ernst Heinkel was a "natural" for the jet engine. He had a reputation for being unorthodox, somewhat difficult and for doing the unusual. By the mid-1930's, his airplanes were synonymous with speed in the air. But Heinkel also wanted to expand into manufacturing engines like his arch rival, the Junkers company. Ohain's turbojet promised him an early engineering foundation for what was clearly the aero engine of the future.

In April 1936, Ohain signed on with Heinkel, and a year later had a prototype engine running on a test bench. Early problems with the design of a combustion chamber were eventually resolved and, during 1938, the HeS–3 turbojet made numerous flights as a successful auxiliary power plant aboard a He.118 dive bomber.

Although Heinkel kept the company's turbojet work a secret, word of it inevitably leaked out after Ohain applied for a patent in 1937. The patent search also revealed the prior ideas of other jet engine pioneers, including the Britisher George Whittle who patented a turbojet similar to Ohain's in 1930. But in an era dominated by fabric-covered biplanes, these inventions were premature, demanding entirely new types of airplanes. It was not until the early

The first jet to see combat in World War II—the twin-engine Messerchmitt Me.262—arrived too late to affect the outcome of the war.

1930s that streamlined, all-metal monoplane aerostructures started to come into existence that could make effective use of jet propulsion.

The Whittle engine eventually was developed, but the British inventor had no Ernst Heinkel to support his efforts. As a result, a Whittle engine did not power an airplane until 1941.

Even in Germany, the higher echelons of the Air Ministry showed little or no interest in jet propulsion or the gas turbine. It was the middle level engineering staff in the Luftminsterium

bureaucracy that recognized it as an idea whose time had come. A small office devoted to jet propulsion was created under Helmut Schelp. He was the person who subsequently orchestrated the development of the jet engine in Germany. It was not an easy task.

With Germany preparing for war, the manufacturers of aero engines already felt overloaded by work on conventional piston engines and did not want the burden of gas turbine development. Nevertheless, in 1938, Schelp convinced Junkers Motoren (Jumo), BMW's Flugmotorenbau, and the Brandenburgerische Motorenwerke (Bramo) to accept development contracts. The Junkers contract ultimately resulted in the Jumo 004; it was not only the world's first production axial flow jet engine, it introduced many design innovations that remain basic to the gas turbine.

Because of the rising war fever in Berlin—the first flight of the Heinkel He.178 occurred just one week before the German legions stormed into Poland—Heinkel had great difficulty luring any of the Air Ministry's officialdom to Marienehe to witness the inaugural flight. Even after watching the event, top officials still did not grasp the significance of what they had seen. Only the engineering people saw the jet's true potential.

Still, Heinkel was given a contract for a jet fighter—the twin-jet He.280, with a weight of 9,500 pounds and a top speed of 550 mph. The He.280 first flew in April 1941 and, despite some early teething problems, could have been put into production in 1941 and been available in squadron strength by the summer of 1943. Since it was dramatically superior to anything in the Allied inventory, it probably would have defeated the American daylight bombing offensive against Germany

But the German Air Ministry was holding out for something better. The He.280 was cancelled in favor of the Messerchmitt Me.262 jet fighter which did not fly until July 1942 and was not available in numbers until October 1944. Although far superior to the He.280, the Me.262 was much too late to have any influence on the war's outcome.

The British did not fly a jet airplane until May 15, 1941—the Gloster-Whittle E.28/39. It was a simple flight test vehicle similar to the Heinkel He.178 of 1939. No American saw a jet airplane until a party of Army Air Force officers examined the E.28/39 in the summer of 1941. The origins of the turbojet in the United States were subsequently built on British experience.

Although it is often said that development of the jet engine was the result of World War II, this is only a fractional truth. Hans von Ohain's work, the HeS–3b engine, and the little Heinkel He 178 were not inspired by war but by the forces that have always driven aviation progress—the desire to fly faster and more efficiently. ■

The diminutive Heinkel He.178 made the first jet flight on August 27, 1939, on Germany's Baltic coast.

FAA World Editor Retires

You may have noticed already the familiar name of Len Samuels missing from the magazine's masthead.

On June 16, he took up his red pen for the last time and edited his final article for *FAA World*. After almost 18 years as editor of the magazine, he was ready to focus on overcoming some persistent back problems that have severely limited his mobility in recent years.

Coming to the *World* in July 1971, when the magazine was only seven months old, Samuels directed the production of more than 200 issues before his retirement. Under his editorship, *World* received a first place award for both content and design from the National Association of Government Communicators. The NAGC's "Blue Pencil Award" is given annually to recognize outstanding examples of government publications.

Known by his colleagues for his careful attention to detail as well as for the scenes of ski slopes on his office walls, Samuels leaves much of himself at the agency in the publications he produced over the years.

"Editing *FAA World* is different from editing other magazines," he said. "We address a multiplicity of audiences in each issue, not unlike a *Saturday Evening Post* or a *Readers Digest*. We're dealing with some 50,000 readers with different personal tastes, split along regional and social lines, in different professional disciplines, working in a large community like an ARTCC or alone at a remote site. And each audience thinks we give too much attention to another.

"While we try to balance our content and keep all these audiences, we must remember that they often are not seeking *FAA World* as they would a news stand publication of their own choosing," he continued. "We have a harder job of capturing and sustaining the interest of this readership, but it is necessary to work at keeping open this line of communication between agency management and its employees."

Prior to joining FAA, Samuels worked for the U.S. Information Agency as a Foreign Service staff specialist. He also had worked in Southeast Asia as a "conduit between public affairs officers and printers for all kinds of publications." He worked for various general and trade magazines, including *Popular Mechanics*, before entering government service.

Paragons of Performance

Increased services and increased productivity marked the air traffic facilities that landed the national Air Traffic Facility of the Year awards for 1988.

As usual the awards were made in four categories: Dallas-Fort Worth, Texas, Tower as the terminal radar facility; Yakima, Wash., Tower as the nonradar control facility; the Minneapolis, Minn., ARTCC in the center category; and the Lansing, Mich., Automated Flight Service Station (AFSS) as the flight service station of the year.

The Yakima Tower, which provides nonradar approach control services to IFR flights and traffic advisories to VFR aircraft within a 25-mile radius, encompassing two airport traffic areas and 10 uncontrolled airports, added 33 percent more airspace to its territory in 1988. This helped to minimize delays between departures and arrivals at the same time that the tower had no involvement in any operational incidents.

Despite its small staff, Yakima mounted an aggressive aviation-education program, which included more than 100 hours of volunteered time that led to 1,100 people being introduced to FAA and the air traffic system.

The Dallas-Fort Worth Tower was found cooking on all burners, crossing the one-million mark in instrument operations while it installed a new radar system, implemented a new ARTS IIIA program, suffered only the briefest disruption during a facility fire and was heavily involved in planning and designing the new DFW Metroplex Plan for enhancing future capacity and flexibility.

While the Minneapolis Center was increasing its level of service, it reduced its operational errors by 46 percent over the previous year. The institution of an automated operations-tracking program helped reduce overtime by 53 percent. The ARTCC also launched an ambitious aviation-education program, which included many speeches, creating television segments for local TV and public broadcasting and briefing 3,100 pilots in Operation Raincheck programs.

The Lansing AFSS was no slouch in this department, as well, providing speakers to activities that briefed more than 1,500 pilots, facility tours to 128 aviation groups and continuing support to the Lansing Community College's Aviation Department.

The AFSS provided a total of more than 300,000 personalized and recorded pilot weather briefings but kept user delays to an average of 24 seconds—one of the lowest in the nation. It also provided over 1,400 hours of classroom instruction and over 4,000 hours of OJT training to specialists as a result of the consolidation of three stations with itself.

Dallas-Fort Worth ATCT

Controllers in the DFW TRACON are (from the left) John Sullivan, feeder west; Steve Kaine, arrival radar; Don Lloyd, arrival radar; Rudy Reyes, feeder east; and Dale Slaton, departure radar.

Working the DFW tower cab are (left to right) Jeff Peace, local control east; Jodi Grant, flight data air traffic assistant; Bob Lezon, ground control east; Richard Woodard, clearance delivery air traffic assistant; and area supervisor Bill Eudaley.

Air traffic assistants at the TRACON's flight-strip printers are Tom Worley (left) and Gary Brazeal.

Providing support at DFW are (from the left) secretary Betty Sewell, administrative officer Carolyn Davis and administrative support clerk Vi Perez.

Working the Dallas North satellite radar in the DFW TRACON is ATCS Roy "Corky" Spillner, about to turn 63, reported to be the oldest level 5 controller in the FAA.

Photos by S. Michael McKean

Minneapolis ARTCC

Controllers Mel Luvigson (left), Rich Green and Barry White (observing) pause for the photo flash.

Manning the Center Weather Service Unit (CWSU) are Bob Christensen (left) and Rich Kessler.

The center's executive support consists of T&A clerk Sharon Wilson (left) and administrative assistant Marilyn Briesacher.

Orville Putzier, Jim Maness and Preston "Butch" Banning (from left) comprise the Military Staff, one of five staffs at the center.

Minneapolis ARTCC's personnel office consists of (from left) Pat Hennen, Darlene Pfahning, Penne Schuldt and Marlys Hillmer.

Lansing, MI, AFSS

Training specialist David Jackson helps the station maintain a high level of proficiency.

Model 1 automated equipment was commissioned at Lansing AFSS in December 1986.

ATCS Jeff Bittner works an inflight position during a busy period.

Paragons of Performance

All-hands meetings are frequent at Lansing. Manging one here are (from the left) area manager Tim Bailey, facility manager David Shattler, administrative assistant Karen Sell and assistant facility manager William Perkette.

Pictured are facility support troops at Lansing. They include clerk-typist Judy Burch (left), secretary Tammy Graham and administrative assistant Karen Sell.

Yakima, WA, ATCT

Yakima tower manager John Keller presides over a small but productive facility.

Controllers Gerald Strang, Thad Faussett, Daniel Potts and Roy Rutherford (from left) pause for camera.

These photos represent the entire full-performance-level complement at Yakima. Here (from the left) are ATCSs Richard Thomas, Gene Brown and Mark Smith.

The final trio here are (left to right) ATCS Jeffrey Bennett, area supervisor Michael Schuett and ATCS Douglas Bubb.

A Little Hot Air Was All It Took

By Dennis Schwartz

Early one morning last May, the control tower at Detroit's Metropolitan Airport broadcast a surprising announcement to pilots: A hot air balloon was operating in the middle of the airport.

This unusual development was the first, and certainly most unique, in a series of events leading to the projected commissioning of a new multimillion dollar control tower at Detroit Metro in the spring of 1991.

Normally, a hot air balloon flight has nothing to do with planning a control tower. But at Detroit, it played a key role, saving thousand of dollars and giving engineers an important perspective on the future facility.

The responsibility for the design and construction of new control towers in the Great Lakes Region resides with the Establishment Engineering Branch (AGL-450) of the Airway Facilities Division. Once Congress approves funds for a new tower and a project assignment is received, our engineering staff begins the process of finding a suitable location for the new tower at the designated airport. The process involves representatives of the Airports, Air Traffic, Flight Standards, Logistics, and Airway Facilities divisions.

Many factors are taken into account in selecting a tower site, the most important being complete visibility from the tower cab of all controlled aircraft movement areas, as well as airborne traffic patterns and runway approaches. Visibility can be affected by large hangars, terminal buildings, trees, navigational aid structures, and even tails of parked aircraft.

The initial step is a paper study to determine a tower location and control cab height that will provide the required visibility and meet other siting requirements. Then, an Air Traffic and Airway Facilities team visits the airport to make an on-site evaluation. Observations are made at the proposed tower cab floor level, normally with a crane. Panoramic photographs also are taken to insure that visibility from the tower will be acceptable.

Ground crewmembers inflate the balloon used in "Operation Ascent" to assess the height requirements for a new tower at Detroit Metro Airport.

Detroit Metro presented several problems with respect to making these vital observations. The planned tower is a new design with cab floor heights ranging from 204 feet to 300 feet above ground level (compared to 167 feet at Chicago O'Hare). Cranes capable of reaching these heights are not readily available. They also are time-consuming to erect and very expensive to rent.

In considering various alternatives to a crane, the idea of using a hot air balloon evolved and discussions with balloonists proved the idea practical, efficient, and inexpensive. Thus "Operation Ascent," as it was later designated, became a reality.

Civil engineer Bill Maki coordinated the entire effort. The balloon and ground crew were provided by Ted Gauthier, owner of the Balloon Depot in Pontiac, MI. He also acted as pilot.

Al Russel and John Converse from the Detroit Metro tower get a preview of what controllers will see at the airport when the new tower opens in the spring of 1991.

Preliminary preparations involved a myriad of details, including locating three tether points at the proposed tower site equally spaced around the tower centerline and out to a distance of approximately 200 feet. The tethers were to keep the balloon positioned over the centerline.

The morning of May 26 dawned bright and clear, just as forecasted, with winds less than 5 knots. Representatives of local newspapers and television stations were already on hand. Detroit Airway Facilities Sector vehicles were positioned at the tether points for anchoring the tether lines. The balloon was inflated and by 6 a.m., Al Russell and John Converse from the Detroit tower were making the first observations. Several more ascents were made and photographs taken before the operation ended at 7 o'clock. Operation Ascent had proved to be a total success.

Although the hot air balloon was not as stable as a crane, it was more than adequate. Moreover, using a balloon resulted in an estimated savings of $6,000 to $8,000 when compared to the cost of renting a crane.

Our observations confirmed the acceptability of the proposed tower site with a cab floor height 204 feet above the ground. This will make the new Detroit tower the tallest in the country. Construction is scheduled to begin next August with commissioning set for April 1991. ■

The writer is the Supervisor, Terminal Environmental Engineering Unit in the Great Lakes Airway Facilities Division.

People

Aeronautical Center

■ **Sharon E. Feland,** manager, Labor Relations & Occupational Safety Branch, Human Resource Management Div., promotion made permanent.

■ **Robert M. Guinn, Jr.,** supervisor, Automation Section, Airway Facilities Branch, FAA Academy.

■ **Owen H. Magruder, Jr.,** manager, Maintenance Support Branch, Regulatory Support Div., from Washington Headquarters.

■ **Donald E. Schein,** supervisor, Information Management Section, Operational Systems Branch, Regulatory Support Div.

Alaskan Region

■ **Robert J. Bransky,** manager, Establishment Branch, Airway Facilities Div.

■ **David C. Champion,** asst. manger for automation, Kenai AFSS, Anchorage, from Anchorage ARTCC.

■ **William E. Chord, Jr.,** asst. manager, Anchorage ATCT, from Air Traffic Div.

■ **Charles D. Gray,** asst. manager for training, Anchorage ARTCC, promotion made permanent.

■ **James A. Nelson, Jr.,** maintenance mechanic foreman, North Alaska AFS, Fairbanks, from Little Rock AFS.

Central Region

■ **Burt E. Bailey,** unit supervisor, Salina, KS, AFSFO, Wichita, KS, AFS.

■ **Alan C. Bowling,** area supervisor, Columbia, MO, AFSS, promotion made permanent.

■ **Curtis W. Endsley,** area supervisor, Kansas City, MO, International Airport ATCT, from Houston, TX, Intercontinental Airport ATCT.

■ **Richard L. Holdman,** area supervisor, Olathe, KS, ARTCC, promotion made permanent.

■ **Peter H. Hopkins,** unit supervisor, Olathe, KS, AFS, promotion made permanent.

■ **Ivan F. Hunt,** manager, Olathe, KS, ARTCC, from Kansas City, MO, ATCT.

■ **Joseph G. Korb,** area supervisor, Columbia, MO, AFSS, promotion made permanent.

■ **Felton R. Lancaster,** section supervisor, Planning Branch, Air Traffic Div., from Olathe, KS, ARTCC.

■ **Michael Mollohan,** area supervisor, Wichita, KS, ATCT, promotion made permanent.

■ **David E. Sapp,** unit supervisor, Forbes AFB, KS, AFSFO, Wichita AFS, promotion made permanent.

■ **Lawrence P. Smith,** area supervisor, St. Louis TRACON, Berkeley, MO, promotion made permanent.

Eastern Region

■ **Donald A. Barnes,** unit supervisor, Baltimore AFSFO, Capital AFS, promotion made permanent.

■ **Kathleen Bergen,** staff officer, Public Affairs & Planning Staff.

■ **Vito J. Borrello,** asst. manager, New York TRACON, Garden City, from Long Island MacArthur Airport ATCT, Islip.

■ **John T. Brame,** area supervisor, Washington Center, Leesburg, VA, promotion made permanent.

■ **William R. Carver,** area supervisor, Dulles, VA, ATCT, from Baltimore, MD, ATCT.

■ **James L. Church,** area supervisor, Washington Center, Leesburg, VA.

■ **Francis T. Earhardt,** area supervisor, Washington Center, Lessburg, VA.

■ **Donald R. Gregory,** area supervisor, Washington Center, Leesburg, VA.

■ **Kermit W. Hall,** manager, Elkins, WV, FSS, promotion made permanent.

■ **Arthur G. Haugh,** asst. manager for program support, AFS–New York ARTCC, MacArthur Airport, from Airway Facilities Div.

■ **Patricia Healey,** supervisor, Employee Benefits Section, Employee Benefits & Classification Branch, Human Resource Management Div.

■ **Janice R. Hilmer,** asst. manager/programs, New York AFSS, Islip, NY, promotion made permanent.

■ **Richard C. Jones,** area supervisor, Washington Center, Leesburg, VA, promotion made permanent.

■ **Loretta M. Kusk,** administrative officer, Airway Facilities Div., from Logistics Div.

■ **Michael Joseph McCormick,** area supervisor, Philadelphia International Airport ATCT, promotion made permanent.

■ **William J. McGovern, Jr.,** area manager, Leesburg, VA, AFSS.

■ **Edward J. McKenna,** manager, Ithaca, NY, ATCT, from Buffalo, NY, ATCT.

Great Lakes Region

■ **George F. Ackley,** area supervisor, Mansfield-Lahm Airport, ATCT, OH, from Akron-Canton Airport, ATCT, OH.

■ **Ronald G. Adair,** area supervisor, Chicago, IL, ZAU ARTCC, promotion made permanent.

■ **Howard A. Brady,** unit supervisor, Minneapolis-St. Paul, MN, Air Carrier District Office (ACDO), from Frankfurt, Germany.

■ **Vincent A. Bridgeforth,** asst. manager for technical support, Chicago AFS, from Airway Facilities Division.

■ **David R. Brizendine,** area supervisor, Indianapolis, IN, ZID ARTCC, from FAA Academy.

■ **Brigitte A. Brooks,** area supervisor, Toledo, OH, ATCT, from Detroit, MI, Metro Airport ATCT.

■ **Cathleen R. Bruner,** area supervisor, ZID ARTCC, Indianapolis, IN, promotion made permanent.

■ **James R. Callahan,** manager, Dane County Airport, Madison, WI, from General Mitchell Field ATCT, Milwaukee, WI.

■ **Gary M. Duemling,** area supervisor, ZID ARTCC, Indianapolis, IN.

■ **Michael K. Farrell,** area supervisor, Princeton, MN, AFSS.

■ **Ralph D. Forrest,** AF watch supervisor, Chicago AFS, from Airway Facilities Div.

■ **Larry L. Hall,** area supervisor, Mansfield-Lahm Airport, ATCT, OH, from Cleveland Hopkins Airport, ATCT, OH.

■ **Richard F. Hill,** manager, Bloomington-Normal, ATCT, IL, from Moline, IL, Quad-City Airport ATCT.

■ **Paul R. Infanti,** area supervisor, Chicago ZAU ARTCC, from Albuquerque, NM, ARTCC.

■ **Thomas S. Johnson,** unit supervisor, Wisconsin AFS, Green Bay.

■ **Daniel J. Kuhn,** area supervisor, Chicago O'Hare ATCT, from Aurora Municipal Airport ATCT, Sugar Grove, IL.

■ **Timothy J. McCann,** area supervisor, Chicago ZAU ARTCC, promotion made permanent.

■ **John T. Mullen,** area supervisor, Indianapolis ZID ARTCC.

■ **Ronald W. Peterson,** area supervisor, Greater Rockford Airport (IL) ATCT, from Chicago ZAU ARTCC.

New England Region

■ **Michael A. Astorino,** area supervisor, Quonset Point, RI, TRACON, from Bradley ATCT, Windsor Locks, CT.

■ **H. Cully Beasley III,** area supervisor, Otis ATCT, Falmouth, MA, promotion made permanent.

■ **Stephen A. Craig,** area supervisor, Burlington, VT, AFSS, promotion made permanent.

■ **Martin R. McColgan,** manager, Cummington, MA, AFSFO, Windsor Locks, CT, AFS 817, promotion made permanent.

■ **Kathleen F. McDonald,** area supervisor, Lawrence, MA, ATCT, promotion made permanent.

■ **Joseph W. Perrone,** area supervisor, Bradley ATCT, Windsor Locks, CT, promotion made permanent.

■ **Edward E. Pinelle,** unit supervisor, Manchester, NH, AFSFO, Windsor Locks, CT, AFS 817, from Nashua, NH.

■ **Robert B. Snow,** unit supervisor, Falmouth, MA, AFSFO, Boston, MA, AFS 820, promotion made permanent.

Northwest Mountain Region

■ **William T. Anker, Jr.,** area supervisor, Peterson Field ATCT, Colorado Springs, from Denver, CO.

■ **Michael H. Borfitz,** manager, Denver Aircraft Certification Office, Aurora, CO, promotion made permanent.

■ **Daniel A. Boyle,** manager, Municipal ATCT, Salt Lake City, UT, from Portland.

■ **Lester R. Briggs,** unit supervisor, Portland, OR, FSDO 64, Hillsboro, OR.

■ **Kathleen Child,** area supervisor, McMinville, OR, AFSS, from Sheridan, WY, FSS.

■ **Michael A. Dasovich,** supervisor, NAV/COM Construction Engineering Section, Establishment Branch, Airway Facilities Div., promotion made permanent.

■ **Carl P. Dean,** manager, Stapleton ATCT, Denver, CO.

■ **Donald R. Hughes,** manager, Boise, ID, AFSS, from Seattle.

■ **Richard M. Jensen,** group supervisor, Salt Lake City ARTCC, promotion made permanent.

■ **Richard J. Mathews,** area supervisor, Seattle-Tacoma, WA, ATCT, from Los Angeles ATCT.

■ **Collet E. McElroy,** manager, Flight Test Branch, Seattle Aircraft Certification Office (ACO).

■ **Vernon F. Morgan,** asst. manager for program support, Portland, OR, AFS.

Southern Region

■ **Pamela C. Berger,** area supervisor, Miami, FL, ARTCC, promotion made permanent.

■ **Edwin Berrios-Pacheco,** asst. manager for automation, San Juan CERAP, promotion made permanent.

■ **Dan G. Burns,** area supervisor, Hampton, GA, ARTCC.

■ **Edward J. Clore,** traffic management unit supervisor, Miami, FL, ARTCC.

■ **Arthur T. Crook,** area supervisor, Hampton, GA, ARTCC, promotion made permanent.

■ **Stephen T. Elkins,** unit supervisor, Atlanta, GA, Civil Aviation Security Field Office, promotion made permanent.

■ **James H. Geeslin,** manager, Anniston, AL, AFSFO, Montgomery, AL, AFS, from Brunswick, GA.

■ **Patricia A. Graham,** area supervisor, Standiford Field ATCT, Louisville, KY, from Miami International ATCT.

■ **Deloris A. Henry,** manager, Mc Comb, MS, FSS, from Lansing, MI, AFSS.

■ **Rodney Hoyt,** area supervisor, Atlanta International Airport ATCT, promotion made permanent.

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 to branch manager in offices are published. Other changes usually cannot be accommodated because there are thousands each month.

■ **Kip B. Johns,** area supervisor, West Palm Beach ATCT, from Memphis, TN, ATCT.

■ **William L. Johnson, Jr.,** area supervisor, Greater Cincinnati Airport ATCT, Hebron, KY.

■ **Michael A. Mac Iver,** manager, Gulfport, MS, AFSFO, Jackson AFS, promotion made permanent.

■ **James A. Miceli,** area manager, Greater Cincinnati Airport ATCT, Hebron, KY.

■ **Johnny L. Morrow,** area supervisor, Montgomery, AL, ATCT, from Atlanta.

■ **James O. Ortiz,** unit supervisor, N. Florida FSDO, Jacksonville, from O'Hare ACDO, IL.

■ **Gary K. Perkins,** section supervisor, Miami, FL, FSDO.

■ **William K. Richardson,** unit supervisor, North Carolina FSDO, Winston Salem.

Southwest Region

■ **Roy L. Allen,** unit supervisor, Houston, TX, FSDO, promotion made permanent.

■ **Eric D. Bries,** supervisor, Policy & Procedures Group, Rotocraft Standards Staff, Aircraft Certification Div., promotion made permanent.

■ **Norberto R. Da Silva,** team supervisor, Houston FSDO.

■ **Fred J. Fox,** maintenance mechanic foreman, Austin, TX, AFSFO II, Austin AFS, promotion made permanent.

■ **Thomas P. Germino, Jr.,** principal maintenance inspector, Dallas/Ft. Worth FSDO.

■ **John G. Gillespie, Jr.,** area supervisor, Corpus Christi, TX, RAPCON, promotion made permanent.

■ **Sandra L. Hansen,** unit supervisor, Houston, TX, CASFO.

■ **Robert A. Hughes,** supervisor, Terminal Section, Operations Branch, Air Traffic Div.

■ **Lane E. Jensen,** asst. manager, Little Rock, AR, RAPCON, from San Juan CERAP.

■ **Francis J. Johns,** deputy manager, Air Traffic Div., from Denver, CO, ATCT.

■ **Tommy L. Jones,** asst. systems engineer, Houston, TX, ARTCC (AFS), promotion made permanent.

■ **Howard A. Lewis, Jr.,** area supervisor, Corpus Christi, TX, RAPCON, from San Antonio, TX, RAPCON.

■ **Stephen G. Madick,** area supervisor, Ft. Worth ARTCC.

■ **Richard V. Mashburn,** asst. systems engineer, Albuquerque ARTCC AFS.

■ **William H. Meyer,** systems engineer, Albuquerque ARTCC AFS.

■ **Carl A. Minnich,** traffic management unit supervisor, Albuquerque, NM, ARTCC.

■ **Carl W. Reed,** area supervisor, Houston ARTCC, promotion made permanent.

■ **Eloy P. Santillanes,** unit supervisor, Albuquerque AFS, Farmington, NM.

■ **Glen H. Schroeder,** team supervisor, Dallas/Ft. Worth FSDO.

Technical Center

■ **George C. Apostolakis,** technical program manager, System Design & Transition Branch, Automation Div.

■ **Caesar A. Caiafa,** manager, Airport Technology Branch, Airports Div.

■ **James Thomas,** technical program manager, ATC Technology Branch, Concepts Analysis Div.

■ **John L. Wiley,** manager, Advanced Systems Technology Branch, Concepts Analysis Div.

Washington Headquarters

■ **Matthew E. Asai,** team supervisor, ATC Automation/Flight Information Branch, Contracts Division, Logistics Service.

■ **Barbara W. Butts,** chief, Services Staff, Contracts Div., Logistics Service.

■ **Kenneth V. Byram,** deputy manager, Ground to Air Systems Div., Advanced System Acquisition Service.

■ **Murry E. Camp,** manager, Real Estate Branch, Materiel Management Div., Logistics Service.

■ **Lauraline Clark,** team supervisor, Advance Automation Branch, Contracts Div., Logistics Service.

■ **Micheline A. Conn,** team supervisor, Systems Operation Branch, Contracts Div., Logistics Service.

■ **Donald E. Deering,** section supervisor, Aircraft Interfacility & Safety Branch, Contracts Div., Logistics Service.

■ **Marion B. Dittman,** manager, Certificate Management Branch, Field Programs Div., Flight Standards Service, from Great Lakes Region.

■ **Victor E. Foose,** manager, Frequency Engineering Branch, Spectrum Engineering Div., Systems Maintenance Service, promotion made permanent.

Western-Pacific Region

■ **Rex A. Baker,** area supervisor, Riverside, CA, ATCT, from Palm Springs ATCT.

■ **Michael H. Biggers,** area supervisor, Ontario, CA, ATCT.

■ **Aaron I. Boxer,** area supervisor, Los Angeles ARTCC, Palmdale, promotion made permanent.

■ **James R. Carey,** manager, Grand Canyon, AZ, ATCT, from Twin Falls, ID, ATCT.

■ **David W. Ceballos,** area supervisor, Executive Airport ATCT, Sacramento, CA, from TRACON, McClellan AFB, Sacramento.

■ **Ruskin I. Cerretti,** area supervisor, Hayward, CA, ATCT, from Oakland, CA, ATCT.

■ **Norman E. Cyphers, Jr.,** area supervisor, TRACON, McClellan AFB, Sacramento, from TRACON, Phoenix, AZ.

■ **Bruce J. Greer,** manager, Palmdale, CA, ATCT, from Air Traffic Div.

■ **Gary W. Hobbs,** area supervisor, Los Angeles ARTCC, promotion made permanent.

■ **Harold T. Holifield,** area supervisor, Los Angeles ARTCC, promotion made permanent.

■ **Gregory R. Hollebeke,** area supervisor, Tucson ATCT, from Fullerton, CA, ATCT.

■ **Leslie C. Jackson,** area supervisor, Oakland ARTCC, promotion made permanent.

■ **Lawrence J. Jacobson,** area supervisor, ATCT/TRACON, Burbank, CA, from New York TRACON, Garden City.

■ **Karl E. Kraus,** manager, Edwards AFB, CA, AFSO, Los Angeles AFS, promotion made permanent.

■ **Davidson Luehring,** unit supervisor, Honolulu FSDO, promotion made permanent.

■ **John J. Lyons,** area supervisor, Oakland, CA, ARTCC, Fremont, CA, promotion made permanent.

■ **James G. McOmber,** chief, Air Security Branch, Civil Aviation Security Div.

■ **Patricia A. Meza,** area supervisor, Salinas, CA, FSS, from Oakland, CA, FSS.

■ **Donald B. Mullin,** manager, La Verne, CA, ATCT, from the Ontario, CA, TRACON.

■ **Bruce F. Peterson,** asst. manager, traffic management, Oakland ARTCC, Fremont, CA.

■ **Donald W. Ralph,** asst. manager, programs, Miramar TRACON–NAS, San Diego.

■ **Thomas A. Rea,** asst. manager, El Toro, CA, TRACON, Santa Ana, from John Wayne Airport ATCT.

■ **William N. Rodenhurst,** manager, Bucholz ATCT, Marshall Islands, from Honolulu ATCT.

■ **Wilburn D. Spring,** asst. manager, Prescott, AZ, AFSS, from Lancaster, CA, FSS.

■ **John A. Svoboda,** operations chief, San Diego, CA, AFS.

Retirees

AERONAUTICAL CENTER
Betty H. Daugherty
Victor J. Doering
Lloyd M. Ellis
Frank W. Ely
Francis W. Petersen
Russell T. Randall
Simon Vladovich
Roy T. Womack

ALASKAN REGION
Richard A. Haycraft
William L. Noblett
Richard C. Strassel

CENTRAL REGION
Kenneth D. Baker
Nathan C. Blydenburgh
Maxine E. Duncan
Alta A. Hamilton
Joseph T. Jackson
Ralph O. Jorgenson
John S. Parker, Jr.
Dennis H. Stroot

EASTERN REGION
Thomas R. Ball
Eugene C Breiner
Joseph J. Brogan
Thomas M. Finch
Doris Meidonick
Robert A. Ranke
Catherine A. Rebuth
Harriet L. Weidner
Bobby L. Wells
Frederick C. Wuestner

GREAT LAKES REGION
Mildred R. Brown
Ramon T. Chung
Willard A Cooper
Robert L. Hall
Theodore F. Moran
Frederick P. Schuetz
Georgia R. Smith
Rolland G. Turcotte
Robert I. Wagner
Gerald D. Williams
Norbert F. Zawaski, Jr.

NEW ENGLAND REGION
Arline J. Barrett
Daniel J. Bogumil
Edward F. Curran
Edward J. Koen
Ronald C. Seppala
Raymond M. Willhite

NORTHWEST MOUNTAIN REGION
Lawson Dowell
Ray S. Lansbery
Lawrence L. Portschi
Antonio P. Rego
Robert D. Shepherd
Alton W. Smith
W. Harold Upton
James M. Walker
Homer E. Wilburn

SOUTHERN REGION
Alvah D. Adams
Robert L. Allen
Gary D. Bender
Casper Brown
Sonny B. Brown
Howard E. Burch
Charles E. Clayton
Van D. Evans
Young E. Fitzpatrick
George A. Goodman
David E. Graham
John W. Harrell
Lawton T. Hill
George F. Hobgood, Jr.
Harold T. Janney
Fabian L. Jennings
Kenneth C. King
Joseph F. Lauder, Jr.
Phillip B. Martin
William M. Messick
Joe R. Peters
Hollis D. Phelps III
Paul Raymond
John H. Todd, Jr.
Ellen G. Tucker
Kenneth R. Underwood
Buford G. Williams
Sarah H. Wood

SOUTHWEST REGION
Roy E. Abel
Robert W. Crawford
David L. George
Lawrence Hall
Morris L. Womack

TECHNICAL CENTER
Robert B. Frack
Joseph Rubino

WASHINGTON HEADQUARTERS
Martin Natchipolsky
Jean Otto
Leland F. Page

WESTERN PACIFIC REGION
Edward C. Arri
James T. Bailey
John H. Covey, Jr
Joseph T. Diggle
Larry L. Gardner
Marian A.Gilbreth
Donald Gulberg
James S. Miura
Richard Z. Miyashiro
Edward D. Schleif
John M. Ward
Jack L. Woods

FAA Pilot and Engineer Lauded for B747 Flight Test

By Mac McElroy

A Boeing 747-400 touches down at Moses Lake, WA, after a flight test conducted by FAAers Don Wilson (left in the insert) and Berk Greene.

FAA Pilot Berk Greene and Flight Test Engineer Don Wilson of the Seattle Aircraft Certification Office Flight Test Branch have been formally recognized for participation in a U.S. national record flight on a Boeing 747-400.

Flying out of Moses Lake, WA, on June 27, 1988, the team conducted a takeoff at 892,450 lbs. gross weight. A certificate from the National Aeronautic Association (NAA), which represents the Federation Aeronautique Internationale in the United States, cites the takeoff as "the greatest mass lifted to 2,000 meters for a C-1 class landplane."

An NAA official formally witnessed the takeoff. It was part of the 747-400 certification program, for which Greene and Wilson were FAA flight test project leaders.

The author is Flight Test Manager at the Seattle Aircraft Certification Office.

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U.S. Department of Transportation
Federal Aviation Administration
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