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Air Traffic Delays—Causes, Consequences, Cures

By Charles Spence

It was not shaping up as a good day for those trying to fly home for Thanksgiving—or, for that matter, for the FAAers who operate the air traffic control system.

Traditionally, the day before Thanksgiving is one of the busiest travel days of the year, and that, in itself, can create problems even in the best of weather conditions.

Accordingly, controllers at FAA's Central Flow Control Facility in Washington headquarters were hoping for some good weather news when they gathered for their 5 a.m. briefing last November 26. Unfortunately, staff meteorologist Ron Wooten could not accommodate them.

His forecast indicated a large area of rain and thunderstorms from the Gulf of Mexico to north of New York City, with IFR (Instrument Flight Rules) conditions early in the day from Atlanta and Charlotte, N.C., to Washington, D.C., and as far west as Pittsburgh and Detroit. Later in the day, this mass of low ceilings and threatening thunderstorms would move north into the New York area and by evening into the Boston area.

In the Midwest, IFR conditions also prevailed, with visibility occasionally improving to marginal VFR (Visual Flight Rules) conditions. More thunderstorms would develop in the Arkansas area.

But that wasn't the end of it. There were other problems in the system as well, such as the Instrument Landing System going down for runway nine-right at Philadelphia, a lightning strike to the Central Flow computer at the FAA Technical Center and missed approaches that backed up traffic during two different hourly periods at Newark Airport.

All of these factors would affect air-

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

New Center Automation Revs Up

By Oscar Roos

The Seattle Center became the first of FAA's air route traffic control centers to receive and accept the new Host Computer System on Jan. 6, 1987.

Part of the agency's answer to a projected 43 percent-plus increase in air traffic control operations by the turn of the century, the Host Computer is expected to offer increased storage capacity, greater reliability and reduced downtime for scheduled maintenance, as well as to support the integration of new systems into the National Airspace System.

FAA's acceptance followed delivery of the equipment to a new addition to the center building two months earlier and the completion of IBM's testing of it.

The very next day, Computer Sciences Corp. began training the center's computer operators.

In addition to continuing the center's normal operations on the IBM 9020 computer, center personnel are themselves testing the equipment in depth to ready it for the live environment and

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A proficiency development specialist at the Seattle ARTCC, Mr. Roos is actively involved in the center's switchover to the Host.

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Elizabeth H. Dole
FAA Administrator
Donald D. Engen
Assistant Administrator—Public Affairs
Stephen D. Hayes
Manager—Public & Employee Communications Div.
John G. Leyden
Editor
Leonard Samuels
Art Director
Eleanor M. Maginnis

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John Clabes—Aeronautical Center
Paul Steucke, Sr.—Alaskan Region
Robert Raynesford—Central Region
Peter A. Nelson—Eastern Region
Morton Edelstein—Great Lakes Region
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Jack Barker—Southern Region
Geraldine Cook—Southwest Region
Anthony Willett—Technical Center
Barbara Abels—Western-Pacific Region

CORRECTION (March FAA World)

You're right! The Page One picture illustrating the collision avoidance story in the Feb. FAA WORLD was upside down, although you had to look closely to tell. Now that we know you all are paying attention, we'll try to do better.

Time Article Out of Focus—

Air Travel Is Safer Than Ever

By Stephen D. Hayes

The January 12 cover of *Time* magazine shown here asked a question. The answer should have been "very," but somehow the editors came up with the wrong answer.

In fact, it's puzzling, to say the least, that *Time* would run its cover story on air safety just before the National Transportation Safety Board (NTSB) released its statistics showing that 1986 was one of the safest years in U.S. aviation history.

The major air carriers had no fatalities last year; charter operators had no fatal accidents; commuter airlines had their best year since the NTSB began keeping separate records for this segment of the industry; air taxis reported fewer fatal accidents and fatalities than the previous year; and general aviation improved its fatal accident rate for the fourth consecutive year.

Despite *Time's* repeated representations to the contrary, aviation safety record since the 1978 Deregulation Act and the 1981 controllers' strike has been outstanding and significantly better than the comparable periods before these events. Between November 1979 and January 1985, U.S. airlines had one period of 26 months and another period of 30 months without a single fatal jet accident.

So, the 1986 safety record is not an exception to the rule; it is the rule.

Time cites figures showing that near midair collisions are increasing at an "alarming rate," but never explains that this is due in large part to a greatly improved pilot reporting system established in 1985. Indeed, because of this overhaul of the reporting system, comparisons of 1985 and 1986 near-collision numbers with those of previous years have little or no validity.

There also is no recognition in the article—and probably no comprehension by the writer—that near midair collisions are a very poor indicator of air traffic control system performance. In most of these incidents, one or both of the aircraft involved are operating under visual flight rules (VFR) and, thus, the pilots are responsible for their own separation from other traffic.

The number of reported near midair collisions in which both aircraft are under air traffic control—that is, both flying under instrument flight rules (IFR)—is only about six to eight percent, and many of these are due to pilot deviations rather than ATC errors.

Mr. Hayes is FAA's Assistant Administrator for Public Affairs

Then, too, *Time* refers to near midair collisions when it should be using the term near midair-collision *reports*. About 20–25 percent of all reports are ruled "no hazard" upon investigation. They are not in any sense near collisions.

There also is no effort by *Time* to put the near midair-collision figures in perspective. We received an average of just over 2.2 pilot reports of near collisions a day in 1986. When measured against approximately 143,000 daily flights in the national airspace, that averages out to one report for about every 63,000 operations. That still is not an acceptable figure, but it does provide important balance to the subject, which was sorely lacking in the article.

The magazine also cites the "snitch" alarm system as one of the reasons for the increase in near midairs, which only serves to demonstrate that the writer really doesn't understand the system. The so-called snitch alarm is a computer software program at the 20 domestic air route traffic control centers that detects violations of minimum-separation standards in the enroute environment. These violations are what we call operational errors, and only a very small percentage of these incidents result in near midair collisions. Analysis has shown that about five percent involve ATC errors.

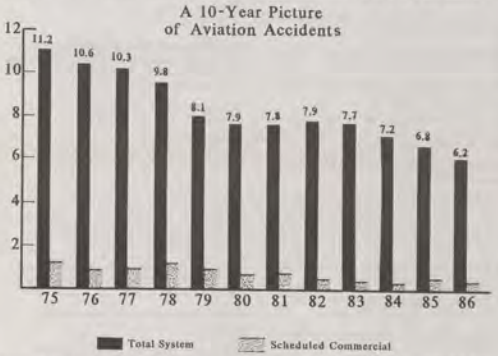
I might mention here—since *Time* did not—that FAA has made excellent progress over the last several years in reducing the number of operational errors at its air traffic control facilities. That number was down 25 percent in 1985 from 1984, and preliminary figures indicate that they dropped another 13 percent in 1986.

The writer also erroneously implies that FAA has changed aircraft separation standards by the following statement: "The FAA has loosened another requirement: Until 1985, planes that passed within 1,000 feet of each other vertically were considered too close, and the incident had to be reported; now the vertical separation standard is 500 feet."

This is a complete misunderstanding of a new FAA policy designed to provide more-complete near midair-collision reporting. The vertical separation standard between controlled aircraft remains 1,000 feet, and any violation of that standard resulting from a controller mistake is recorded as an operational error. In addition, the agency has directed that any violation of less than 500 feet also will be reported as a near midair collision.

Time also erred in reporting that the Washington ARTCC "lost all its radar and computers on November 29," forcing pilots "to fall back on 'see and avoid' flying practices."

The Washington Center did have a 20-minute outage of the main computer system that day, requiring a switch over to the back-up system. It did not lose its radar. But even if it had lost all radar—and that is an extremely rare occurrence—the pilots would not revert to "see and avoid," or VFR operations. What would actually happen is that controllers would use nonradar separation procedures to increase the distance between controlled aircraft and ensure an adequate safety cushion. This is essentially the technique used for controlling transoceanic flights, where there is no radar coverage for most of the routes.



It's important to remember that all pilots, whether they are operating under IFR or VFR rules, have a responsibility to scan the skies continuously for other traffic. I mention this because the writer apparently doesn't understand that the pilots themselves have important safety responsibilities in the cooperative airspace system.

The article also talks about ATC computers and other equipment "burning out," but gives scant attention to FAA's $12.2 billion user-funded National Airspace System Plan for modernizing the entire air traffic control network. More than 80 percent of the contracts for new 1,300 full-performance-level controllers to the workforce since then—an increase of 16 percent.

At the same time, the article ignored one of GAO's findings that is most relevant to its safety theme: that 82 percent of the controllers who responded to the survey questionnaire rated the safety of the air traffic control system from "adequate" to "excellent."

Yet another error can be found in the statement that "about 500 of the less-militant PATCO members have been quietly rehired . . . with a wink and a nod" to strengthen the ATC system. The truth is that we haven't rehired any of the fired strikers. However, we were directed by the Merit Systems Protection Board and, in some cases, by the courts to *reinstate* about 500 controllers who successfully appealed their firings on procedural or other grounds. Their militancy, or lack thereof, had nothing to do with it.

Finally, *Time* also says that FAA's "air flow," or traffic-metering procedures, were responsible for delaying some 70,000 holiday travelers when fog closed the Atlanta Airport December 28 and 29. Obviously, there's a contradiction here—was it fog or *flow control?*

In reality, the airport never closed, and FAA controllers at Atlanta did an outstanding job of moving aircraft fitted with sophisticated equipment, as well as slipping in other traffic as weather conditions permitted. The point is, however, that it was the fog and not FAA's flow-control procedures that delayed the holiday travelers. Actually, it was the flow control procedures that minimized the inconveniences they suffered.

FAA appreciates *Time*'s suggestions for "restoring safety margins," but the answer to its cover question is that the margins are there—air travel is safe. ■

People

Aeronautical Center

■ **Philip H. Cushing,** manager, Domestic Civil Aviation Security Branch, Transportation Security Division, Transportation Safety Institute.

■ **Ollie C. Foxhall,** manager, Quality Control Branch, FAA Depot, promotion made permanent.

■ **James Victor Seignious,** supervisor, General Operations & Airspace Systems Section, Aviation Standards Branch, FAA Academy, promotion made permanent.

■ **James D. Stephens,** supervisor, General Materiel Section, Supply Management Branch, FAA Depot.

Central Region

■ **Jesse R. Ball,** manager, Project Support Office, Aircraft Certification Division.

■ **Thomas C. Cetlinski,** area supervisor, Kansas City ARTCC.

■ **John E. Elliott,** area supervisor, St. Louis Automated Flight Service Station.

■ **Marion Green,** manager, Accounting and Disbursing Branch, Accounting Division.

■ **Harold G. Hess,** manager, Bellevue, Neb., Airway Facilities Sector Field Office, Grand Island, Neb., AF Sector.

■ **Laurence T. Leonard,** area supervisor, Sioux City, Iowa, Tower, from the Great Falls, Mont., Tower.

■ **Michael J. Lovvorn,** manager, Financial and Cost Accounting Branch.

■ **Roger L. Vogel,** area supervisor, Des Moines, Iowa, Tower.

Eastern Region

■ **Glenn A. Adams III,** assistant manager, Greater Pittsburgh, Pa., Tower, from Buffalo, N.Y.

■ **Randolph W. Baldwin,** unit supervisor, Roanoke, Va., Airway Facilities Sector Field Office, Charleston, W.Va., AF Sector.

■ **Robert A. Brown,** area supervisor, Essex County Airport Tower, Caldwell, N.J.

■ **Pasquale D. Codispoti,** area manager, Millville, N.J., Automated Flight Service Station.

■ **William Deal,** unit supervisor, Trenton, N.J., AF Sector Field Office, Tri-State AF Sector, promotion made permanent.

■ **Joseph F. Heitz,** unit supervisor, Atlantic City, N.J., AFSFO, Tri-State AF Sector, promotion made permanent.

■ **Robert J. Maher,** area manager, Millville AFSS.

■ **John D. McCarthy,** area supervisor, Millville AFSS, from Philadelphia.

■ **Leroy Moses,** area supervisor, Washington National Airport Tower, promotion made permanent.

■ **John A Pallante, Jr.,** assistant manager for training, Philadelphia Tower, from N. Philadelphia Tower.

■ **Bobby G. Thompson,** manager, Harrisburg, Pa., AFSFO, Harrisburg AF Sector, from Montgomery, Ala.

Great Lakes Region

■ **Thomas J. Allison,** area supervisor, Indianapolis, Ind., ARTCC.

■ **Herbert S. Berg,** area supervisor, Minneapolis (Minn.) Wold Chamberlain International Airport Tower.

■ **Ernest C. Bowman,** area supervisor, Cleveland, Ohio, ARTCC, promotion made permanent.

■ **Donald R. Engel,** unit supervisor, Minneapolis ARTCC Airway Facilities Sector.

■ **Earl C. Fenner,** area supervisor, Saginaw, Mich., Flight Service Station, promotion made permanent.

■ **Douglas M. Haney,** area supervisor, Cleveland ARTCC, promotion made permanent.

■ **Daniel J. Hoke,** manager, Alton, Ill., Tower, from Bismarck, N.D.

■ **Wilfred N. La Riviere,** manager, Indianapolis AF sector, from Aurora, Ill.

■ **Jesse T. Lee, Jr.,** unit supervisor, Michigan AF Sector, from Bangor, Me.

■ **Lloyd T. McGinnis,** area supervisor, Cleveland ARTCC, promotion made permanent.

■ **Ronald E. Miley,** manager, Aurora, Ill., AF Sector, from Indianapolis.

■ **David M. Phillips,** assistant manager, plans and procedures, Kankakee, Ill., Automated FSS, from the West Chicago, Ill., FSS.

■ **Robert D. Plummer,** area supervisor, Indianapolis ARTCC.

■ **Robert M. Purcell,** area supervisor, Muskegon, Mich., Tower, from the Lansing, Mich., Tower.

■ **Robert H. Purdy,** area supervisor, Cleveland ARTCC, promotion made permanent.

■ **Wendell Rindlisbach,** unit supervisor, Michigan AF Sector, Belleville, Mich.

■ **Theodore B. Shaw,** unit supervisor, Duluth, Minn., AFSFO, Minnesota AF Sector.

■ **Charles M. Spayd,** area supervisor, Indianapolis ARTCC.

■ **Ronald J. Tishma,** environmental support technician, Cleveland ARTCC AF Sector, from the Aurora AF Sector.

■ **Wayne R. Traaseth,** assistant manager for training, Princeton, Minn., AFSS, from the Minneapolis FSS.

■ **Norman Willis,** manager, Jackson, Mich., FSS, from Cleveland AFSS.

Metro Washington Airports

■ **Mark C. Bean,** sergeant, Washington National Airport Police Branch, Public Safety Division.

■ **John H. Booth, Sr.,** pipefitter foreman, Utilities Services Branch, Engineering and Maintenance Division, promotion made permanent.

■ **Cordell H. Burch,** sergeant, Dulles International Airport, Washington National Police Branch.

■ **John H. Burke III,** sergeant, Washington National Police Branch.

■ **Christopher J. Currie,** sergeant, Washington National Police Branch.

■ **Andrea F. Dies,** sergeant, Washington National Police Branch.

■ **Randall C. Gillespie,** sergeant, Washington National Police Branch.

■ **Robert E. Glessner,** lieutenant, Washington National Police Branch.

■ **Cleo McNair,** sergeant, Dulles Airport, Washington National Police Branch.

■ **Lloyd W. Miner,** sergeant, Dulles Airport, Washington National Police Branch.

■ **Thomas L. Morgan,** sergeant, Washington National Police Branch.

■ **Robert C. Tyng,** lieutenant, Dulles Airport, Washington National Police Branch.

■ **Roger L. Ward,** fire captain, Aircraft Rescue and Firefighting Branch, Public Safety Division.

■ **Ralph A. Wessell II,** sergeant, Washington National Police Branch.

New England Region

■ **Donald E. Seavey,** manager, Montpelier, Vt., Flight Service Station, from the Lebanon, N.H., FSS.

■ **Mary J. Young,** manager, Beverly, Mass., Tower, from Groton, Conn.

Northwest Mountain Region

■ **Arno C. Bosley, Jr.,** area manager, Salt Lake City, Utah, ARTCC.

■ **Susan D. Cornell,** area manager, Salt Lake City ARTCC, from Denver ARTCC.

■ **Terry D. Falkner,** section supervisor, Resource Management Branch, Air Traffic Division, from the Seattle, Wash., ARTCC.

■ **Chester D. Hewes,** assistant manager, military operations, Salt Lake City ARTCC.

■ **Norman B. Martenson,** manager, Standardization Branch, Transport Standards Staff, Aircraft Certification Division.

■ **Louis W. Ott,** assistant manager for program support, Portland, Ore., Airway Facilities Sector, promotion made permanent.

■ **Mary Ellen Ozimkowski,** area supervisor, Denver, Colo., Tower.

■ **George C. Paul,** manager, Civil Aviation Security Division, from the Airports Division.

■ **William A. Shoemaker, Jr.,** area supervisor, Denver Automated FSS, from the Miles City, Mont., FSS.

■ **George L. Thompson,** supervisory regional counsel.

■ **Norman E. Wettlaufer,** area supervisor, Denver AFSS.

Southern Region

■ **Sandra Lee Bathon,** area supervisor, Alexander Hamilton Airport Tower, St. Croix, Virgin Islands, promotion made permanent.

■ **Michael A. Commander,** area manager, Atlanta, Ga., ARTCC.

■ **Edward F. Drury,** area manager, Atlanta ARTCC.

■ **Thomas J. Flythe,** area supervisor, Wilmington, N.C., Tower, promotion made permanent.

■ **Elliot L. Gibson,** unit supervisor, South Florida Flight Standards District Office, Miami.

■ **Danny M. Morgan,** area supervisor, Savannah, Ga., Tower.

■ **Leroy F. Powers,** area supervisor, Huntsville, Ala., Tower, promotion made permanent.

■ **Teddy L. Price,** manager, Daytona Beach, Fla., Airway Facilities Sector Field Office, Jacksonville, Fla., Hub AF Sector, from Miami Hub AF Sector.

■ **Nelson E. Queen,** area supervisor, Nashville, Tenn., Tower, promotion made permanent.

■ **Charles E. Rittenberry, Jr.,** supervisor, Design Unit, Radar/Tower Section, Environmental Establishment Engineering Branch, AF Division, promotion made permanent.

■ **Paul A. Rogers,** supervisor, Engineering Unit, Communications Section, Electronic Establishment Engineering Branch, promotion made permanent.

■ **David W. Thompson,** supervisor, Construction Unit, Navaids Section, Environmental Establishment Engineering Branch.

■ **Bobby F. Wetherington,** area supervisor, Meridian, Miss., Tower, from the Pensacola, Fla., Tower.

■ **John T. White,** area supervisor, Macon, Ga., Automated Flight Service Station, from the Pensacola, Fla., Tower.

■ **Benjamin R. Williams, Jr.,** area supervisor, Daytona Beach Tower, from the Orlando, Fla., Tower.

Southwest Region

■ **Andrew S. Billick,** manager, Logistics Division.

■ **James A. Dawson,** supervisor, ATC Enroute Systems Engineering/Installation Section, Electronics Engineering Branch, Airway Facilities Division.

■ **Ernest S. Dominguez,** assistant manager, traffic management, Albuquerque, N.M., ARTCC.

■ **John E. Fortin,** area manager, Albuquerque ARTCC.

■ **Eugenio T. Garcia,** area manager, Albuquerque ARTCC.

■ **Norvel Green,** maintenance mechanic foreman, El Paso, Texas, AF Sector.

■ **Jack L. Grigsby,** unit supervisor, Dallas/Fort Worth Air Carrier District Office.

■ **Willie S. Harris,** manager, Houston, Texas, ARTCC AF Sector, from the Albuquerque ARTCC AF Sector.

■ **Benny M. Hilburn,** assistant manager, plans and procedures, Houston Intercontinental Airport Tower.

■ **Gerald W. Lobb,** manager, New Orleans, La., AF Sector, from the Houston AF Sector.

■ **James C. Morton,** manager, Beaumont, Texas, Tower, from the Roswell, N.M., Tower.

■ **Ronald F. Petersen,** assistant systems engineer, Fort Worth ARTCC AF Sector.

■ **Leroy Powell,** assistant manager for technical support, Albuquerque ARTCC AF Sector.

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

■ **Walter J. Price,** manager, Houston Flight Standards District Office, from the Baton Rouge, La., FSDO.

■ **Larry V. Roose,** supervisor, Environmental Support Unit, Dallas/Fort Worth Regional Airport AF Sector.

■ **David L. Rye,** unit supervisor, Fort Worth ARTCC AF Sector.

■ **Jesse R. Slater,** assistant systems engineer, Houston ARTCC AF Sector.

■ **Albert D. Taylor,** unit supervisor, Austin, Texas, AF Sector.

■ **Jimmie L. Vaughan,** supervisor, Terminal Section, Operations Branch, Air Traffic Division.

■ **John E. Whitten,** assistant manager for program support, Little Rock, Ark., AF Sector, from Albuquerque.

Technical Center

■ **Ronald J. Esposito,** manager, Contracts Branch, Acquisition & Materiel Services Division.

Washington Headquarters

■ **John J. Callahan,** manager, Investigations & Evaluation Division, Office of Air Traffic Evaluation and Analysis.

■ **John D. Canoles,** deputy director, Office of Air Traffic Evaluation and Analysis.

■ **Charles M. Carrington,** area manager, Civil Aviation Security Staff, Europe, Africa & Middle East Office, in Brussels, Belgium.

■ **Kenneth M. Chin,** manager, Technical Analysis Branch, Safety Analysis Division, Office of Aviation Safety.

■ **Timothy E. Halpin,** manager, Traffic Flow Management Branch, Operations Division, Air Traffic Operations Service, from Central Region.

■ **Richard D. Heironimus, Jr.,** manager, Plans Branch, Policy and Plans Division, Acquisition and Materiel Service.

■ **Peter N. Kovalick,** manager, Human Systems Requirements Branch, System Plans & Programs Div. Air Traffic Plans & Requirements Service.

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Retirees

Abfalt, John K.—AC
Blakely, Leo W.—AC
Bussmeier, Lynda I.—AC
Brown, Alan B.—AC
Chappell, George J.—AC
Clark, Glenn E.—AC
Coleman, Robert L., Jr.—AC
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Knorr, Harry W.—CT
McCaughin, William R.—CT
Mobley, Mary—CT
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Quig, Robert H.—CT
Stazione, Frank T.—CT
Tibbitts, William, Jr.—CT
Tyndall, Marvin W.—CT
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Hensley, Jack R.—EA
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Nuzzi, Nicholas R.—EA
O'Donnell, Meredith C.—EA
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Peay, Barry E.—EA
Phieler, Henry O.—EA
Powell, David—EA
Ratkoviak, Emil—EA
Samsalosky, Edward A.—EA
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Smith, Alfred—EA
Stockdale, Charles—EA
Stangel, Robert C.—EA
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Ukleya, John F.—EA
Ward, Ian A.—EA
Ward, William J., Jr.—EA
Watkins, William A.—EA
Welder, Neal J.—EA
Welden, [illegible]—EA
Whitcomb, Boswell A., Jr.—EA
Wilkinson, Frank Y.—EA
Worthley, Clinton G.—EA
Ziegler, John M.—EA
Zinle, Walter K.—EA

Adomaitis, William B.—GL
Allshouse, Catherine A.—GL
Batson, James D.—GL
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Dowes, Bernard J.—GL
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Evans, Robert G.—GL
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Gath, Alvin J.—GL
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Kertis, Charles J.—GL
Kramer, Richard J.—GL
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Mattick, Oscar F.—GL
Mayer, Walter W.—GL
McPike, Otis D.—GL
Miller, Lyle G.—GL
Monsell, Dominic J.—GL
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Niemeyer, William P., Jr.—GL
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Robbins, Glenn E.—GL
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Thomas, Dale E.—GL
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Whitaker, Archie E.—GL
Williams, George F.—GL
Williams, Richard S.—GL
Zoelzer, Vernon A.—GL
Zurn, Thomas W.—GL

Barth, Carl L.—MA
Mandy, John E.—MA

Anderson, Harry D.—NE
Anderson, Roger A.—NE
Chapman, Benjamin G.—NE
Cherry, Donald A.—NE
Cosgrove, Arthur—NE
Courtney, James F.—NE
Gill, Thomas W.—NE
Haddow, Helen B.—NE
Higgins, Lawrence O.—NE
Hoskins, Reginald C., Jr.—NE
Houle, Gabriel H.—NE
Larocque, Ervin E.—NE
Mankata, Irving J.—NE
McKeen, John E.—NE
Medeiros, Edmund—NE
Page, Charles M.—NE
Perry, James A.—NE
Persson, Kenneth R.—NE
Pinkerton, Robert H.—NE
Poore, Edward—NE
Shaker, Sali J.—NE
Small, Sumner L., Jr.—NE
Spencer, Leo A.—NE
Stober, Mason F., Jr.—NE

Acampora, Jack—NM
Bachofer, Raymond J.—NM
Bians, Billy D.—NM
Bearden, Larry C.—NM
Bonanno, Anthony M.—NM
Butler, Theresa—NM
Davis, Robert H.—NM
Davis, William R., Jr.—NM
Dawson, Harry M.—NM
Dietz, Albert C.—NM
Erickson, Maurice W.—NM
Farn, William G.—NM
Garcia, Eugene—NM
Get, Arthur H.—NM
Hart, Mortimer L.—NM
Hogan, Robert W.—NM
Howard, Roy F., Jr.—NM
Hughes, Robert G.—NM
Inman, John J.—NM
Jensen, Marvin L.—NM
Johnson, Dale V.—NM
Joyce, James R.—NM
Jublin, Ronald E.—NM
Kelly, Michael L.—NM
Koles, Roberta L.—NM
Landon, Harvey D., Jr.—NM
Layton, Roy O., Jr.—NM
Lee, Gerald D.—NM
Lee, William B.—NM
Lysengen, Lloyd D.—NM
McDaniel, James D.—NM
McLaughlin, John J.—NM
Melnsky, Joseph J.—NM
Meyer, John F.—NM
Neerings, Gerald A.—NM
Passey, Raeo L.—NM
Paulson, Clarence—NM
Phillips, James M.—NM
Poland, Jackie A.—NM
Porter, Warren B.—NM
Riter, Donald A.—NM
Schmeike, Kenneth E.—NM
Seabrook, Harvey E.—NM
Slowaiko, John—NM
Sickinger, Albert H.—NM
Smith, William R.—NM
Tobey, Wayne K.—NM
Wheeler, Jack F.—NM
Williams, Berton E.—NM

Acton, Billy R.—SO
Babyak, Francis—SO
Baker, Robert R.—SO
Barlow, Henry F., III—SO
Beck, Lafayett H.—SO
Becker, Charles L.—SO
Bender, Charles O.—SO
Bevans, Robert J.—SO
Bourgeois, Eugene T.—SO
Brown, Joseph D.—SO
Byrd, James C.—SO
Calhoun, Jerald W.—SO
Candelario, Pedro L.—SO
Carpenter, Delmer R.—SO
Caton, Billy R.—SO
Cail, Elden A.—SO
Chapman, T. J. C.—SO
Coates, Willard N.—SO
Cook, Donald S.—SO
Crawley, Fred A.—SO
Crouch, Leonard A.—SO
Crumbley, Richard T.—SO
Cumbia, Oscar F.—SO
Currence, Ernest N.—SO
De Cock, William F.—SO
Deal, William J.—SO
Dilworth, John H.—SO
Downs, Paul V.—SO
Duncan, Paul E.—SO
Duncan, Paul H.—SO
Espinosa, Prudencio—SO
Ferguson, Walter M.—SO
Fiala, David D.—SO
Galyen, Cullen F.—SO
Griffin, Marvin R.—SO
Hale, James C.—SO
Hathcock, Francis M.—SO
Head, Billy M.—SO
Hendrick, William D.—SO
Holt, Melvin L.—SO
Humphrey, George—SO
Huntley, George W.—SO
Joe, Robert—SO
Johnson, Harold E.—SO
Jordan, Roy L., Jr.—SO
Jordan, Thelma J.—SO
Kirby, William A.—SO
Kitchens, John R.—SO
Klimek, Raymond L.—SO
Kulikowski, Alexander J.—SO
Louthan, John L.—SO
Luke, Haskell B.—SO
Lutz, Joseph S.—SO
Mason, June Sandra—SO
Mc Guire, Thomas W.—SO
McCrory, James M.—SO
McManus, James D.—SO
Middleton, Billy E.—SO
Miller, David H.—SO
Millones, Frank—SO
Mills, James B.—SO
Nalley, John P., Jr.—SO
Nash, James Y.—SO
Nesmith, Ernest R.—SO
Pader, James B.—SO
Page, Eugene R., Jr.—SO
Patton, William L.—SO
Ratliff, Thomas G.—SO
Ray, Donald K.—SO
Read, Frederick N.—SO
Reed, Morris C.—SO
Reynolds, George A.—SO
Richardson, Philip W., III—SO
Rood, Loren K.—SO
Rose, Howard L.—SO
Scott, Norman E., Jr.—SO
Shaw, Ronald L.—SO
Sly, William B.—SO
Smith, Donald E.—SO
Smith, George T.—SO
Smith, Russell L.—SO
Snowden, Dave O.—SO
Spataro, John B., Jr.—SO
Thompson, Edward—SO
Thrasher, Robert D.—SO
Todd, Lonnie L.—SO
Townsend, Bud E.—SO
Van Koren, Ronald J.—SO
Washburn, James L.—SO
Wheeler, James J.—SO
Whigam, Otto—SO
Whitfield, Charles R.—SO
Wilcox, Betty H.—SO
Williams, Chester L.—SO

Adams, Gary L.—SW
Alvarez, Joseph, Jr.—SW
Cobb, Charlie V.—SW
Cerver, Epigen—SW
Donaldson, Donald C.—SW
Evans, Lyle V.—SW
Floyd, James E.—SW
Garrett, Basil G.—SW
Golden, Lon T.—SW
Hardy, Jack L.—SW
Harty, George F.—SW
Holub, William E.—SW
Jennings, Norris W.—SW
Johnston, Bobby G.—SW
Jones, James D.—SW
Larsen, Herbert H.—SW
Lenard, Dean F.—SW
Lozano, Juan G.—SW
Marley, Harold S.—SW
Martin, Noel D.—SW
Martinez, Heriberto—SW
Masterson, George N.—SW
McAlpin, Darrell B.—SW
Michaud, Melvin C.—SW
Moore, Reuben T., Jr.—SW
Morgan, Charles A.—SW
New, Ronald E.—SW
O'Berry, Donald L.—SW
Osborn, James T.—SW
Parker, Lloyd L.—SW
Perry, Bobby J.—SW
Raney, Virginia L.—SW
Saenz, Julian A.—SW
Salinas, Robert—SW
Satterwhite, Ray G.—SW
Schoppe, Clarence A.—SW
Sears, Robert L.—SW
Seaver, James D.—SW
Sholl, Robert D.—SW
Spiller, Marvin D.—SW
Stanfield, Bill L.—SW
Stoner, Calvin L.—SW
Stoner, Calvin O.—SW
Stevaco, Raymond, Jr.—SW
Swendsen, Vernon L.—SW
Tennison, James D.—SW
Thomas, Loran H.—SW
Watson, Betty J.—SW
Williams, Arnel V.—SW
Wooldridge, George H.—SW

Bohler, Millard F., Jr.—WA
Briant, Theodore C.—WA
Brown, Henry O.—WA
Craig, Maxine W.—WA
Dickson, Henry L.—WA
Horton, Charles A.—WA
Huber, Eileen M.—WA
Hunt, Thomas F.—WA
Lyons, Harry A.—WA
MacNamara, John W.—WA
McCarthy, Ronald M.—WA
Montague, Kathryn E.—WA
Parrish, Kenneth A.—WA
Pierre, Roger Y.—WA
Powers, John D.—WA
Rapp, Fred V.—WA
Seibert, Raymond T.—WA
Springer, Fred S.—WA
Switzer, David—WA
Thompson, Hilda B.—WA
Thompson, Robert N.—WA
Turner, Nancye P.—WA
Watterson, John P.—WA
Wimsatt, Donald B.—WA
Wismer, Leroy W.—WA

Arakaki, Norman T.—WP
Athans, Louis R.—WP
Baird, Harold W.—WP
Baraiaci, Salvo C.—WP
Barrows, Robert E.—WP
Beal, Robert M.—WP
Becker, James R.—WP
Bowen, Larry B.—WP
Cano, Leonardo V.—WP
Champagne, Kenneth J.—WP
Cox, Robert T.—WP
Cronin, Donal P.—WP
Curl, Marvin A.—WP
De Voll, J. L.—WP
Dennis, Charles D.—WP
Dethart, Dean O.—WP
Doody, Robert J.—WP
Elder, Howard L.—WP
Ellis, Richard N.—WP
Erickson, Bernard L.—WP
Eshum, Kenneth R.—WP
Fails, Lloyd D.—WP
Foehl, George T.—WP
Fordham, Robert J.—WP
Fry, William J. A.—WP
Fujiwara, Tamotsu—WP
Gross, Donald F.—WP
Hadley, William R., Jr.—WP
Heath, Frank W.—WP
Hunter, Charles R., Sr.—WP
Kenna, Edward R.—WP
Knight, William E.—WP
Knolton, James M.—WP
Kunimoto, Kenji W.—WP
Lamrip, Norman A.—WP
Lawless, William A.—WP
Lok, Gordon R.—WP
Mack, Daniel L.—WP
Magnan, Rose M.—WP
Magney, Edgar J.—WP
Maslawy, Jose—WP
McSpadden, William T.—WP
Meier, Donald L.—WP
Mendribil, Richard G.—WP
Micco, Frank R.—WP
Miller, Johnny, Jr.—WP
Miller, Norman L.—WP
Moore, Robert H.—WP
Morgan, John D.—WP
Morley, Bill T.—WP
Nuevo, Nicanor—WP
Olson, Sheldon S.—WP
Owens, Edward—WP
Oya, Ernest M.—WP
Park, Carroll W.—WP
Patterson, Robert E.—WP
Pendergast, James L.—WP
Petersen, Clarence J.—WP
Pry, Wayne L.—WP
Reuter, Jean P.—WP
Rhodes, Gordon E.—WP
Rotelli, Joseph J.—WP
Sharp, Philip E.—WP
Smith, Jack S.—WP
Spooner, William G.—WP
Stallings, Drew N.—WP
Stevenson, Ward E.—WP
Taylor, Charles B.—WP
Techau, James A.—WP
Timmons, Jimmie C.—WP
Todd, Raymond, J.—WP
Treece, William G.—WP
Trevino, Antonio—WP
Walter, Finley E.—WP
Washington, Ronald J.—WP
Welton, James H.—WP
Widmayer, Gerald J.—WP
Young, Darrell L.—WP
Zakrzew, Sam G.—WP

Delays

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"Even in the best weather conditions, there are limits on the number of aircraft that can be funnelled into and out of our major airports."

port and airspace capacity adversely, requiring Central Flow to develop an overall national traffic management strategy for metering aircraft into the system in the safest and most efficient manner. Staff specialist Terry Bolerjack says, "We're like a Band Aid. Something goes wrong and we put in as quick a fix as we can. If we continue to do the same fix day after day, we've identified a problem and recommend a procedural change."

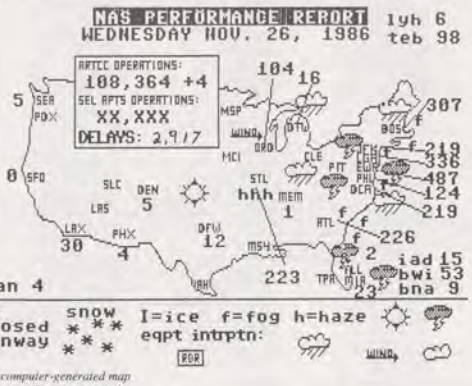
By 8:30 a.m., this day and everyday, the staff is ready for a TELECON with FAAers at Boston Logan, the New York TRACON and the Boston, New York and Washington centers. Various airspace users also are plugged in, including the airlines, military services and some commercial general aviation flight-planning companies. The TELECON is repeated at 11:30 a.m. with FAA personnel and users in the West.

Information about traffic flows also is disseminated on the Aeronautical Fixed Telecommunications Network. This includes Flight Service Stations, which brief general aviation pilots, and ARINC (Aeronautical Radio, Inc.), which provides similar briefings for the airlines. In addition, a continuously operating recorded telephone message (800/322-2432) is available for any pilot to obtain a current status report.

But even the best traffic-management techniques and procedures can't negate completely the impact of adverse weather. On the day before Thanksgiving, there still were 2,917 flight delays of 15 minutes or more in the ATC system. Although not a record, that number was two and one-half times the daily average of 1,144 for all of 1986.

John Richardson, assistant manager of the Traffic Flow Management Branch, emphasizes that weather historically is the major cause of flight delays, accounting for about two-thirds of the total, year-in and year-out. But, he says, it's not as simple as that.

"Safety is always the first consideration. Even in the best weather conditions, there are limits on the numbers of aircraft that can be funnelled into and out of our major airports," he says. For example, in ideal weather conditions, Chicago's O'Hare Airport with its six runways can handle 155 operations per hour and Boston Logan can accommodate 99. When the weather deteriorates, these numbers decline sharply. Operations at O'Hare may be restricted to four runways, dropping hourly capacity from 155 to 130. Boston can lose one-fourth of its capacity, with operations declining from 99 to 75.



This computer-generated map shows weather patterns and traffic delays for selected airports—the day before Thanksgiving 1986.

Meanwhile, commercial air traffic continues to grow, placing increasing demands on the airports and airways system. And since virtually all commercial traffic operates IFR—that is, within the ATC system—the enroute centers have experienced significant traffic gains in recent years. Prior to the 1981 controllers' strike, there was only one day when the traffic count in the enroute system topped the 100,000 mark. In 1984, with virtually all the post-strike traffic restrictions removed, that number was up to 54. It came close to tripling in 1985 and was up to 163 last year.

Paralleling this increase in activity—and putting an additional load on the system—has been the expansion of the airline hub-and-spoke operation that has characterized the post-deregulation period. Newark Airport is perhaps the outstanding example of what hubbing can do for an airport . . . and to an airport. Once almost a ghost facility, it grew into the busiest airport in the New York metropolitan area after People Express located its major hub there. Not surprisingly, it also has the nation's worst delay problem, averaging 138 delays of 15 minutes or more per 1,000 operations last year.

From an ATC standpoint, the problem with the hub-and-spoke system is that arrivals and departures frequently are compressed into relatively brief periods, creating schedules with built-in delays. As John Richardson points out, "If there are 20 departures scheduled in a five-minute time period, obviously someone's going to get delayed."

These kinds of scheduling practices helped to create record flight delays in the summer of 1984 and led to an FAA-supported conference of airline operators in September of that year. The result was a realignment of peak-hour schedules at the three New York airports, Chicago O'Hare, Denver Stapleton and Atlanta Hartsfield. The new schedules implemented that November 1 helped to produce a sharp drop off in delays—from an all-time high of 1,600 per day in October to 741 daily in November.

The Washington Headquarters Central Flow Control Facility is manned on this shift by traffic management officer Don Gaddy (left) and traffic management specialists Elliot Reid (foreground), Bill Granger and Tom Nielson (right). Photo by Lance Stevens

But given the highly competitive nature of the airline industry, it is not surprising that the spirit of the 1984 agreement has been eroded by the passage of time.

In a recent lecture at the Massachusetts Institute of Technology, FAA Administrator Donald D. Engen cited nearby Boston Logan Airport as an example of the problem, noting that it had 23 departures scheduled between 9:00 and 9:06 a.m. He said the actual time required to get those 23 departures off the ground ranged from 20 minutes in VFR conditions to 45 minutes in IFR weather.

Accordingly, Transportation Secretary Elizabeth Dole recently announced that DOT would investigate airlines' schedules at 13 major U.S. airports "to determine if the airlines are scheduling more operations at peak hours than the airports can handle even in good weather." She also announced the Department's intention to grant the carriers anti-trust immunity to permit them "to conduct joint discussions aimed at adjusting schedules to reduce delays." This meeting during the week of March 15 focused on the flight schedules for the peak summer season.

Administrator Engen is one of those who believe that more realistic airline scheduling practices could provide some immediate relief for current delay problems in the system. "Unless the nation's aviation operators think that Murphy's Law needs further proof, they simply cannot plan on the assumption that visual flight conditions will always prevail," he told his MIT audience. "We find that operators expect unlimited departure and arrival flexibility at clearly finite facilities."

Engen notes that FAA also is implementing improvements in ATC procedures, such as the Expanded East Coast Plan (EECP), in an effort to make the system function more efficiently and, thus, reduce delays. Phase I of the EECP went into effect on Feb. 12, providing additional departure and arrival routes to the three major New York airports, among other changes. The plan should reduce delays at these facilities, which presently account for about 25 percent of the total system delays.

At Engen's direction, FAA also has established an Airport Capacity Office to coordinate capacity enhancement and delay-reduction activities. The agency also is pursuing a broad range of projects designed to achieve these objectives, including IFR approaches to converging runways, independent closely spaced parallel approaches, construction of separate short runways, triple IFR approaches and new terminal rotorcraft procedures.

Key elements of the National Airspace System (NAS) Plan also are beginning to come on line, promising further increases in flight efficiency and controller productivity. For example, the first of the new faster and more powerful IBM "Host" computers was delivered to the Seattle ARTCC in November, with the second going to the Houston Center in January. The agency expects to have the equipment on site at all 20 centers by the end of the year.

However, Engen notes that none of these measures can be considered a substitute for increasing airport capacity. "There are no easy or cheap solutions to our present delay concerns," he says. "Improvements in the nation's airports—using all available capacity, lengthening and strengthening existing runways, and building new runways where people want to travel—offer the only long-term ways to meet the nation's air transportation needs."

But translating this rhetoric into reality is complicated by the fact that FAA has no power to initiate airport construction projects. Although the agency currently is allocating over $1 billion annually under the Airport Improvement Program, it must rely on local communities to provide the necessary leadership in airport development.

Unfortuantely, at this level, the political and environmental arguments against airport development more often than not overwhelm the hard-edged economic, business and social considerations advanced by its supporters, with the result that little or nothing gets done.

Meanwhile, the clock is ticking, and time is running out. In the interim, there is tomorrow to deal with at the 5:00 a.m. briefing in FAA's Central Flow Control Facility. ■

Jim Bassett, an air traffic control specialist in the Airspace—Rules and Aeronautical Information Division of the Air Traffic Operations Service, was one of five federal employees selected for the 1986 GEICO Public Service Award. Presented by Acting Deputy Administrator Robert Whittington, the award was for Bassett's work in physical rehabilitation. He has worked extensively in anti-smoking clinics and cancer support groups throughout the Washington area, following his own bout with "terminal" cancer 10 years ago.

People

continued from page 5

■ **James M. Pearson,** manager, Air Traffic Training Requirements & Certification Branch, System Plans & Programs Division, Air Traffic Plans & Requirements Service.

■ **Stephen M. Soffe,** programs officer, office of the director of the Office of Airworthiness.

Western-Pacific Region

■ **Thomas R. Anthony,** manager, Arcata, Calif., Flight Service Station, from the Fresno, Calif., FSS.

■ **Russell S. Crooks,** manager, Tutuila Island Airway Facilities Sector Field Office, Pago Pago, American Samoa.

■ **Phyllis J. Edmison,** unit supervisor, Oakland, Calif., ARTCC AF Sector.

■ **Sandra D. Gould,** assistant manager for training, Oakland FSS.

■ **William F. Guest,** unit supervisor, Environmental Engineering Section, Maintenance Operations Branch, AF Division, promotion made permanent.

■ **Robyn L. McDonough,** unit supervisor, Fresno Flight Standards District Office.

■ **Robert M. Olsen,** area supervisor, El Toro Marine Corps Air Station TRACON, Santa Ana, Calif.

■ **Lewis Perry, Jr.,** assistant manager, programs, Los Angeles TRACON.

■ **George H. Sullivan, Jr.,** assistant manager, Los Angeles TRACON, from the Tucson, Ariz., TRACON.

■ **Thomas L. Vandervelde,** unit supervisor, Los Angeles FSDO, from the San Francisco FSDO.

■ **James D. Varney,** manager, Chino, Calif., Tower, from the Ontario, Calif., TRACON.

■ **Howard S. Yoshioka,** supervisor, Planning Section, Planning and Programming Branch, Airports Div.

The Buhl J-4 Airster was a modest airplane by any reckoning. It accommodated one pilot and two passengers in two open cockpits and delivered a payload of 440 pounds as it lumbered along at a cruising speed of 110 mph. Yet the Airster has a secure place in aviation history.

Sixty-years ago—on March 29, 1927—it became the first airplane to be type certificated in the United States.

The certificating authority was the Aeronautics Branch, a small unit of bureau rank within the Department of Commerce. It came into existence on August 11, 1926, to discharge the air safety and air navigation responsibilities imposed by the Air Commerce Act.

The old saying that necessity is the mother of invention fits the institution of type certification precisely. Aeronautics Branch personnel recognized at the outset that certification must begin at the manufacturing plant. If it did not, branch personnel would be forced "to take apart every aircraft that came out of the factory." That was clearly out of the question. For one thing, it was beyond the meager resources of the branch's Engineering Section, which could count only eight airplane factory inspectors among its ranks. So the branch hit on a now fundamental solution: It instituted a single certificate that covered all aircraft of identical design and construction.

No innovation adopted by this pioneer regulator has proved more durable or felicitous. Today, the approved type certificate is at the core of Federal procedures for certificating aeronautical products.

In October 1927, the Aeronautics Branch issued a handbook setting forth minimum engineering standards that aircraft manufacturers had to meet to secure type certificates.

Branch procedures required manufacturers to submit drawings and stress analyses of preproduction aircraft to the Engineering Section for approval. If the data conformed with the government's standards, a Federal inspector visited the factory to determine whether the manufacturer was following the approved design and specifications and acceptable levels of workmanship. This was followed by flight testing one aircraft of the type being manufactured, first by a company test pilot, then by a Federal inspector.

The Buhl-Verville C.A. 3, a 1926 predecessor of the Buhl J-4 Airster is shown on the Ford Reliability Tour.

Photo by Elmer Richardson, *Wisconsin News*

Midwife to a New Industry

Government Type Certification Brought Order

By Nick Komons

When the tests were passed, the aircraft was issued an approved type certificate, which authorized the manufacturer to produce aircraft of "an exact similarity of type, structure, materials, assembly and workmanship" to the test model.

Individual airplanes of the approved type received an airworthiness certificate (or license, as it was then called) after the manufacturer certified in an affidavit that he had followed the specifications of the type certificate and that the individual aircraft was flight tested by an Aeronautics Branch inspector.

Engines were also type certificated; here, however, the Aeronautics Branch adopted the cumbersome procedure of requiring the manufacturer to deliver an engine to Washington for evaluation. Among other things, the engine was given a 50-hour endurance-block test by engineers in the Bureau of Standards. Immediately following, the engine was torn down, and a detailed inspection was made of its parts. Failure of a major component during the block test resulted in the denial of a type certificate.

Type certification proved such an efficient procedure that it soon expanded to propellers and then to other aircraft components.

This is not to say that everything ran smoothly from the start. Indeed, the seriously understaffed Engineering Section was literally overwhelmed by the number of type-certification applications that poured in from manufacturing concerns.

One reason for the serious understaffing was the general paucity of funds for regulatory activities. More critical, however, was the Federal salary scale. Aeronautical engineers—in short supply and capable of earning more in private industry—were very difficult to come by. Moreover, many that did take Federal employment were eventually lured away by higher private-sector salaries.

Turnover among engineers continued very high, even into the Great Depression. That led to what industry believed was an inordinately long type-certification cycle.

Some manufacturers had to wait months to secure approval of a minor change in an aircraft that already possessed an approved type certificate. Shuttling engines between Washington and California, which was rapidly becoming a center of aeronautical manufacturing, proved both time consuming and irritating.

Only slightly less irritating was the long distance that many industry engineers were forced to travel in order to come in personal contact with their Aeronautics Branch counterparts.

The government, however, was not solely responsible for the disappointing rate of processing. More than one manufacturer submitted inadequate or hastily drawn data that had to be shipped back for further work.

Shoddy design and workmanship was particularly prevalent among engine manufacturers. Engines repeatedly broke down during the first few hours on the endurance block. By the end of 1928, the Engineering Section had rejected more than 50 percent of the engines tested. Half of the rejects, according to an Aeronautics Branch official, "would not have stayed in the air four hours."

All this slowed the certification process and proved costly not only to engine manufacturers but also to airframe makers who were awaiting engines for their new airplanes.

The branch struggled mightily to accommodate the industry. Indeed, it was so accommodating that it even bent the rules, awarding the first 12 approved type certificates before type-certification standards had been established.

It was difficult on occasion, particularly in the beginning, to tell a manufacturer that he might as well stop production because his aircraft was not airworthy. In some cases, stopping production would have put him out of business. The pressure on Federal officials in such cases was enormous. In more than one instance, the Aeronautics Branch granted manufacturers temporary certificates so they could continue building while correcting their deficiencies as they went along.

The agency historian, Dr. Komons is author of the first volume on federal air regulation, Bonfires to Beacons, *and other published works and is a past contributor to* FAA World.

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE

Official No.
2-1

Approved Type Certificate

This certifies that Buhl Aircraft Company, Marysville, Mich.

is entitled to the benefits granted by law in the production of airplanes manufactured in quantities of an exact similarity of type, structure, materials, assembly and workmanship with the authenticated specifications, description and drawings on file in the office of the Secretary of Commerce, duplicates of which are attached hereto and made a part hereof.

The type of airplane for which this certificate is issued is known as J-4 Airster

Dated March 29, 1927

All attached papers bear the seal of the Department of Commerce.

Assistant Secretary of Commerce

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON

HELICOPTER

TYPE CERTIFICATE No. 1

This certificate, issued to BELL AIRCRAFT CORPORATION,

certifies that the following is of proper design, material, specifications, construction, and performance for safe operation, and meets the pertinent minimum standards, rules and regulations prescribed by the Civil Aeronautics Board:

HELICOPTER MODEL 47.

This certificate is of indefinite duration unless revoked, suspended, or rescinded.

Date: Mar 8, 1946

By direction of the Administrator

(Signature)

Charles H. Tower
(Title) Director, Aircraft & Components Service

This certificate may be transferred if endorsed as provided on the back hereof.

Bell Helicopter's chief pilot Floyd Carlson performs a hands-off stability test during the flight certification of the Bell Model 47—the first rotorcraft to receive Civil Aeronautics Administration type certification, 40 years ago on March 8. Its registration became NC-1H.

Bell Textron photo

The result was a number of "curious accidents" during 1927 in the light commercial airplane class: Wings flew off, fuselages failed and aircraft suddenly lost stability. Fortunately for the industry—and for the branch's reputation—this kind of seat-of-the-pants certification was short lived.

In addition to certificating new designs, the branch faced the problem of what to do with World War I surplus aircraft, particularly those in commercial service. In 1927, just prior to his historic Atlantic crossing, Charles Lindbergh made two emergency parachute jumps that were due in part to the war-surplus equipment he was flying.

Many operators picked up war-surplus equipment for a nominal price, patched it up and pressed it into service either on airmail routes or on their fixed-base operations. They did a brisk business in these dilapidated aircraft, as did spare-parts suppliers.

Assistant Secretary of Commerce for Aeronautics William P. MacCracken, Jr., had reservations about the safety of this equipment. "The 10 years which have elapsed since those ships were constructed has meant that there has been a good deal of deterioration in the material itself," he pointed out to a group of industry representatives. "The rebuilding that has been done has been done without any supervision, and without much means of checking on it."

Accident statistics bore out MacCracken's suspicions. Over a 10-month period, war-surplus equipment experienced structural failures at twice the rate of postwar equipment.

Industry opinion about this equipment was mixed. Ford executive William B. Stout believed the question would be settled in time by "the natural gravitation of the industry." The aviation industry had to acquire "a whole new suit of clothes," and the question of war surplus equipment would resolve itself.

A fixed-base operator out of Chicago, Leon Morgan, lent credence to Stout's prediction. "We were forced into new-production [aircraft] much against our wishes and with a good deal of gnashing of teeth . . .," he explained. But now that his company had the new airplanes, it would never consider going back to

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Automation

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conducting refresher and operational training.

This leads to the next milestone for the Seattle ARTCC, which is the Initial Operating Capability (IOC) expected to take place on May 1. This marks the beginning of the shakedown period, during which the software and any patches to it will be tested, training requirements will be completed and the performance of the Host Computer will be closely examined and evaluated in a low-traffic live environment.

This shakedown period will last anywhere from four weeks to four months, depending upon the test results.

At the end of the shakedown begins a live evaluation period called the Operational Readiness Demonstration (ORD). Center manager Bud Snelson says, "We are confident that the IOC will occur on May 1 and the ORD will occur on or before May 29. We are determined to reach the ORD on the early side."

The author analyzes the Host Computer system's status on the Systems Maintenance Console display (KVDT) and via a hard copy from the associated IBM 3268 printer.

This bank of cartridge tape drives services the Host Computer. Easier and faster to load, it has more capacity and is 30 times faster in data transfer than the open-reel drives of the IBM 9020 computers.

Barring any serious problems during the ORD, the Seattle ARTCC expects to retain the parallel Host and 9020 computers as short a time as possible, possibly removing the 9020 as early as July.

While the Seattle Center goes through its IOC and ORD phases, other ARTCCs are going through their own equipment acceptance and IOC. Once underway, deliveries of Host Computers were to be at the rate of two a month.

"The lessons we're learning in being the first site," Snelson says, "will be of great value to other sites as they come on line, and we plan on using our resources to help them not re-invent the wheel."

The Host Computers represent only the first step in the modernization of the air traffic control system. There also will be the Voice Switching Communications System (VSCS), the Initial Sector Suite System (ISSS) and the Advanced Automation System (AAS).

The control room of today's ARTCC will be replaced by the ISSS, which with the Host and VSCS will offer intelligent controller work stations. They will have individual processing capabilities for surveillance, flight and real-time weather data. This control room, however, will be in the new building addition with the Host Computers.

The NAS Plan calls for the consolidation of more than 200 separate radar control facilities into 23 Area Control Facilities (ACF) by the mid-1990s, and those combined TRACONs will be resident in what are today's center control rooms.

All of this is beginning to happen in Seattle and other centers thanks to the team efforts of Airway Facilities, Air Traffic, System Engineering and other support personnel and system integration contractors. We may be talking about high-technology equipment, but it's still a system based on people.

"I think it has worked as well as it has here," comments Snelson, "simply because of the ability of the people in the trenches to work together, to resolve conflicts without much problem and press on to accomplish the task. It's really been a challenging and fun project to work on." ■

Because the presence of the Host Computer is considered transparent to the air traffic controller, the only equipment to see is in the new computer room. Here, Larry L. Thurman checks paper alignment in the new IBM 4248 high-speed printer.

Bob Gates, a trainer from the Computer Sciences Corp., observes Seattle Center computer operator-trainee Larry L. Thurman work at an operator console of the Host IBM 3180 Keyboard Video Display Terminal (KVDT).

At this point, the Host will be considered the primary NAS system, and the IBM 9020 computer will become the back-up. Actually, the second back-up.

The Host consists of two IBM 3083 (Model BX1) processors, one of which functions as the primary unit and the other as a back-up and a support computer. Should the primary processor fail, the second 3083 drops its support functions and in 10 seconds switches over to air traffic functions. The 9020 will be a back-up to this.

EECP Puts a New Map in the Sky

By Duncan B. Pardue

To help expand the National Airspace System's capacity, the most extensive revision in domestic air traffic procedures in 20 years went into effect on February 12 with Phase I of the Expanded East Coast Plan (EECP).

The EECP can be likened, in part, to adding lanes to a freeway, including separate truck lanes.

Under the jurisdiction of the Eastern Region, the EECP also involves the New England, Southern and Great Lakes regions. New England's portion will not go into effect until Phase II is implemented this fall. Then, traffic to and from Boston and Europe will be integrated into the system.

Originally intended to relieve traffic congestion in the New York and Washington, D.C., areas through the more-effective use of airspace and to provide better service to users, the plan was expanded to cover the airspace from Maine to Florida and west to Chicago. Due to the volume of traffic in and out of these cities, the plan will affect in some degree every major airport in the country.

What the plan has done is to

- create new departure and arrival routes,
- set up separate paths and altitudes for jets and slower propeller aircraft,
- establish numerous new city-pair routes and
- increase airport departure flows and reduce holding procedures by using new traffic management techniques.

The effect is to reduce delays for air travelers and to save enroute time and fuel for the airlines.

If the plan works as well as expected—and computer simulations indicate that it will—a similar approach will probably be developed in other traffic-congested regions throughout the country. Such a plan is already being developed for the West Coast. During a December 1986 briefing for more than 200 airline and other aviation-industry representatives, Administrator Engen said that the EECP is an excellent model for the purpose.

At that briefing, EECP coordinator Glenn Bales told industry representatives not to expect the EECP to solve all the problems of delays, but that it "will be one hell of a lot better than what you have now."

The EECP is only one piece in the mosaic of FAA's National Airspace System (NAS) Plan, which is designed to meet aviation's needs through the end of the century. Unlike other phases of the NAS Plan, however—which depend on computers and automation—the EECP is increasing capacity by more-intensive planning and the restructuring of air routes, combined with the refinement of air traffic control procedures.

EECP program manger Glenn Bales briefed airline representatives last December on how the plan works.

In preparation for the EECP cutover, for example, all airspace over Washington, northern Virginia and Baltimore was subdivided among the approach control facilities at Washington National, Dulles, Andrews Air Force Base and Baltimore-Washington International airports. In addition to handling its own traffic, each facility is in charge of all airplanes passing through its airspace, handing off as necessary to other approach control facilities. A 10,000- to 17,000-foot altitude tier has been added to each tower's radar facility's airspace. Controllers in each will work their tier, using common procedures.

Departures from JFK, LaGuardia and Newark airports in the New York area and the three Washington airports will be synchronized and sorted through common airway fixes. This is expected to reduce delays substantially by using computers to keep track of all flights from each airport to metering fixes. Separate programs in New York and Washington will reduce or eliminate entrail restrictions and integrate departing aircraft from all airports in each area.

When new routes and procedures were drawn up, FAA had to make sure that the navigational facilities to support the changes were properly designated and working. National Ocean Survey's Aeronautical Charting Branch had to revise its charts.

In early December, the Atlantic City, N.J., Flight Inspection Field Office, with the assistance of FIFOs in Atlanta, Ga., and Battle Creek, Mich., finished flight checking all the facilities and frequencies in their Jet Commanders.

Following this work, Eastern Region's Airspace Planning Branch issued a request for a Notice of Proposed Rule Making (NPRM), seeking to codify the airspace changes.

On February 12, it was go! ■

A public affairs specialist in the Eastern Region, Mr. Pardue is the editor of the region Intercom.

Type Certification

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Standards and Jennies. The new equipment cost less to operate, was faster and produced larger profits. Competition would drive the old machines off the commercial airways.

Floyd J. Jordan, a fixed-base operator, saw matters differently. "This government sold these war surplus ships and accepted the purchasers' money knowing full well that they were going to be sold and resold for flying purposes," he told Department of Commerce officials. "They received this money without any time limit as to flying. . . . If this government now should break faith with those purchasers, it would be very unfair indeed."

A general ban, which had been contemplated, was not imposed.

Instead, the branch determined whether these aircraft were airworthy on a case-by-case basis, requiring them to pass the same flight test as new aircraft. In the end, only a fraction of existing war-surplus equipment was certificated. Stout and Morgan had been right. Aviation would not be long in getting itself a new suit of clothes.

That had not been entirely expected. Many aircraft manufacturers had feared that the establishment of Federal airworthiness standards might tend to stifle design innovation. That did not turn out to be the case. Federal regulators were not interested in design per se; they were only interested in whether or not an airplane was safe. So they did not intervene in the design process. Indeed, they gave manufacturers the greatest latitude in developing new equipment. Manufacturers were not slow in exploiting this freedom.

By January 1931, nearly four years after the Airster was certificated, the Aeronautics Branch had issued approved type certificates for 390 airplanes and 65 engines. An analysis of these certificates revealed distinct new trends in airplane and engine design. The most easily discernible trend was toward more powerful engines. The result was faster and more maneuverable aircraft.

On the surface, this increase in horsepower did not appear to be leading to more efficient and more productive airplanes. Average payload as a percent of gross weight and average payload in proportion to horsepower both declined during the four-year period.

These averages, however, were not a true reflection of what was taking place. They were skewed by pre-1926 aircraft re-outfitted with more powerful engines. Eliminate this class, and a different picture emerges. Lift-drag and weight-payload ratios improve, and average wing loading increases—all of which meant that the newer airplanes were carrying more load with less structure.

And they were sporting many, if not all, of the hallmarks of the modern air transport: closed cockpits, single wings, streamlined cowls, tail wheels instead of skids, metal props, stressed metal skin and monocoque fuselages. They were already far removed from the Buhl Airster. ■

Federal Notebook

* Civil Service Subcommittee: Patricia Schroeder (D-Colo); and Charles Pashayan, Jr. (R-Calif).
* Compensation and Employee Benefits Subcommittee: Gary Ackerman (D-NY); and John Myers (R-Ind).
* Human Resources: Gerry Sikorski (D-Minn); and Dan Burton (R-Ind).
* Senate Governmental Affairs Committee: John Glenn (D-Ohio), chairman; William Roth (Del), ranking Republican; Lawton Chiles (D-Fla); Sam Nunn (D-Ga); Carl Levin (D-Mich); James Sasser (D-Tenn); David Pryor (D-Ark); George Mitchell (D-Maine); Jeff Bingaman (D-NM); Ted Stevens (R-Alaska); William Cohen (R-Maine); Warren Rudman, (R-NH); and John Heinz (R-Pa).
* Federal Services, Post Office and Civil Service Subcommittee: Pryor, chairman; Sasser; Bingaman; Stevens.

The co-chairmen of the Federal Government Service Task Force, a caucus of members of Congress who support government employee causes, are Steny Hoyer (D-Md) and Vic Fazio (D-Calif).

FEHB HEALTH INSURANCE MORE COSTLY

It should come as no surprise that the General Accounting Office (GAO) has found that federal employees pay more for health insurance in premiums, deductibles and co-insurance than do private-industry employees. In fact, only 39 percent of private-sector employees pay any premium.

EXTENDED PARENTAL LEAVE PROPOSED

HR 925 and S 249 are bills with bipartisan support that would provide up to 18 weeks of unpaid leave for personal illness or to care for newborn, newly adopted or seriously ill children or, in the House bill, to care for a seriously ill parent. Applying to employees in both the public and private sector, the legislation would guarantee their return to their jobs or a comparable position.

RETURN OF RETIREMENT RULE BLEAK

The pundits say that HR 388 and S 69 don't stand a good chance of passage. These bills would retroactively restore the three-year recovery rule, which permitted retirees to recover their own contributions to civil service retirement tax-free at the beginning of their retirement.

WHO'S WHO ON CAPITOL HILL

With the changes wrought in the last election, you need to know who the players are this year:
* House Post Office and Civil Service Committee: William Ford (D-Mich), chairman; Gene Taylor (Mo), ranking Republican; William Clay (D-Mo); Robert Garcia (D-NY); Ron de Lugo (D-VI); Mary Rose Oakar (D-Ohio); Stephen Solarz (D-NY); Gus Yatron (D-Pa); and Benjamin Gilman (R-NY).

TO YOUR HEALTH

The hottest benefit topics this year concern care for senior citizens. Proposals are floating in the House of Representatives and the Administration to provide catastrophic health care--that is, unlimited health care for Medicare-covered services after payment of a maximum out-of-pocket, either $1,700 or $2,000. Federal employees who keep their health plans into retirement would not be concerned with this, since FEHB plans include catastrophic coverage.

More significant is that part of the Administration's plan for long-term care. In brief, the Office of Personnel Management (OPM) proposes to offer up to three years of nursing home care up to $40 per day or home care up to $20 per day in exchange for $25,000 of your basic life insurance. You could purchase additional optional life insurance if you wanted to. Similar long-term care could be purchased for a spouse. Although the plan is a good first step, it should be noted that today's average cost of basic nursing home care is $60 per day and custodial care for the aged is likely to be longer than three years.

The General Services Administration (GSA) has given the nod to equipping federal buildings with physical-fitness facilities and will authorize the expenditure of appropriated funds for alterations and installation.

THE CHOICE IS YOURS

Upon becoming eligible for Medicare, federal retirees had been offered only the opportunity of switching from high to low option in his or her own FEHB health plan. OPM now permits the retiree upon gaining Medicare eligibility to select any option in any federal health plan once. Subsequent changes will be permitted only during open seasons.

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