World

October 1981
Volume 11 Number 10

U.S. Department
of Transportation

**Federal Aviation
Administration**

All-important support—Electronics technician Lynn Wells of the Tulsa, Okla., Airway Facilities Sector makes adjustments to a teletypewriter printer.

Photo by Herman Carter
Photo Contest Honorable Mention
"FAA Employees on the Job"

Front cover: The FAA Academy is humming as new controller training builds to a round-the-clock operation, as shown in the non-radar practice lab, where instructor Gary O'Neill monitors student Earl Austin (foreground). Photo by Paul Southerland

Back cover: Last year, Nan-42 completed 5,130 hours of flying time for the FAA Technical Center in airborne research in MLS, LORAN-C and Omega navigation before being sold to the Navy. Today, the Convair 880 is a tanker flying in support of the F/A-18 (shown) at the Patuxent Naval Air Test Center, Md. U.S. Navy photo

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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 & Employee Communications Division, Office of Public Affairs, FAA, 800 Independence Ave. SW, Washington, D.C. 20591. Articles and photos for FAA World should be submitted directly to regional FAA public affairs officers:

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George Miyachi—Pacific-Asia Region
David Myers—Rocky Mountain Region
Jack Barker—Southern Region
George Burlage—Southwest Region
Michael Benson—Technical Center
Alexander Garvis—Western Region

By James Johnson
The aviation and military writer for the *Oklahoma City Times*, his article on the Radar Training Facility appeared in the March issue of FAA WORLD.

The 1981 Sooners

The Academy Is ready for the Tide of Controller Trainees.

Jack Baldwin knew he'd be back in school this fall, but it wasn't where he thought.

After dangling for two years on the waiting list for air traffic controller training, he had despaired of ever seeing the inside of the FAA Academy. He had just ended summer training as an Army National Guard helicopter pilot and had enrolled in college courses to complete his master's degree in psychology when his plans were changed by the controller strike.

Baldwin was one of 144 qualified applicants who received instructions to report immediately to the academy, as the goverment began training successors to the more than 11,000 controllers who joined the illegal strike of the Professional Air Traffic Controllers Organization (PATCO).

Because of his plans, Baldwin was better prepared to comply than most. He already had given notice to the Fredonia, Kan., hospital where he was business manager. Bundling his wife and son off to temporary quarters with his parents and selling his new psychology textbooks, he headed south for 20 weeks of training as a tower controller.

* * *

Mark Stempel was having qualms in Council Bluffs, Iowa. He had waited for two years and three months until the call came from FAA. Although he was now the manager of a jewelry store, he had developed a strong desire for controller training during his Air Force service in airfield management and from learning the nature of the work from his brother, who was a controller at the Omaha, Neb., RAPCON at Offutt Air Force Base.

"He was one of the strikers," Stempel acknowledged. "He believed in what he was doing, but if I said 'no' [to FAA], I would have been thrown to the back of the roster. Then, if the strike had been settled, I'd have been 300 people behind. I had been in the top 10 on the roster for more than two years, and someone else would have been more than happy to take my place. In the end, there were no hard feelings," Stempel said.

* * *

Edith Parish didn't even know of the FAA Academy's existence until September 1980, when a fellow worker at the General Services Administration's Payroll Center in Kansas City signed up.

"I had worked in bookkeeping and accounting ever since I graduated from high school, Parish said. "But in my field, you don't normally advance without college."

So, she was looking for a better job when her co-worker signed up; she did, too, and took the air traffic controller qualification test in November after some government tutoring. In April, Parish took the physical and psychological tests. When this summer's call came, she, along with her husband, Richard, and their son, Bradley, 2, moved to Oklahoma.

"My husband is a machinist, and he has a very understanding boss," she noted. "He took a leave of absence to stay with me for the 17 weeks of en route training."

* * *

The controller walkout was national news,

and so was the arrival of the hurriedly assembled class at the FAA Academy. Stempel, Baldwin and Parish had the accurate impression that photographers were everywhere, singly and in packs, recording activities that in normal times would have been disdained as commonplace.

Ultimately, FAA officials barred photographers from the classrooms, because the crisis demanded that the students be undistracted during the fast-paced training.

For FAA Academy Superintendent Edwin Harris and his staff, the first 10 days were a swirl of activity, for the academy had been reduced to 60 air traffic control students in

July, most of them undergoing transitional training from flight services to tower controller. There hadn't been two-shift controller training since 1979, and the early spring general hiring freeze had slowed the training even futher.

From a standing start, then, the academy had jumped to a class of 144 students, with a class twice that size arriving September 1—and that was only to be the beginning. In October, a class of 432 will have begun training. By then, the academy will be turning out the students at the rate of 5,500 to 6,000 a year, says Harris, and it will be a 24-hour operation of three-shifts a day.

The original class of 144, which had been taking the first two phases of instruction in the daytime will then have been moved to a 3 p.m.-to-midnight schedule. For students who had no expericence with shift work, it was a good preview of their future as controllers. "A lot of the guys in the class had 8-to-5 jobs, but I've worked shift work before," said Baldwin. "If you think you can do it, you can."

The influx of so many people into normally stable Oklahoma City, which has low unemployment and few vacant rental units, posed housing problems. The first class was placed in motels until the students could find other lodgings. Even that was a pretty good trick for a town where motel occupancy was running 95 percent before they arrived.

Harris says the pattern is set—once the 432-member October class is housed, arrivals and vacancies will even out. "We don't see housing as critical yet," he said. "We are looking at our November-December needs,

RADAR TRAINING FACILITY

Tapping solid experience, FAA has rehired on contract retired FAA employees as instructors. First, the instructors must be instructed in a training basics class.

and we are getting a good community response."

Housing was the immediate problem to be solved before bedtime the day the class arrived, but the academy was also wrestling with longer-range problems of its expansion of training capacity.

To begin with the resources at hand, Harris shifted instructors from other courses of study to meet the new priorities and began beating the bushes for additional ones to handle a three-shift controller training program.

He also began rethinking about who should teach what. Some courses that don't deal directly with controlling traffic could be taught by such non-controllers as furloughed pilots and meteorologists and instructors from the University of Oklahoma. Then, too, he contacted 100 retired controllers about coming to the academy to work as instructors, receiving a favorable response from 38. Those went immediately into retraining to be ready by the end of October.

Once the academy's capacity is reached, Harris may transfer some phases of training elsewhere. Harris and his staff have looked into the training facilities of United, American, Eastern and Pan American Airlines and the military training facilities at Fort Rucker, Alabama, and Keesler Air Force Base, Mississippi. If the academy decides to use them, instructors will have to

Early in their training, the students are lectured by Harry Pelphrey on the basics of terminal non-radar control.

be provided by FAA. "We still must have control of the training to maintain high quality," Harris says.

Quality training is Harris's overriding concern. Twenty-five percent of the applicants don't make it through the school. Rather than yielding to the temptation to lower the barriers during this critical time, FAA is beginning to use a new aptitude exam that will be tougher so as to improve the predictability of a applicant's success in air traffic control and help reduce the wash-out rate.

The standards within the academy are still high. Says Harris: "We have seen only a six percent wash-out rate in the field after students pass the academy. Our standards have been developed over a period of time, and we don't intend to change our standards or the quality of the product we turn out."

While non-controllers are being used to stretch the instructional staff in the early training phases, only controllers teach the students in the laboratories. The radar training laboratories are so realistic that students virtually learn their craft by playing in traffic. Many students suffer anixiety attacks, forgetting that it's a simulation. Students have been known to faint or otherwise lose control ot themselves when a "collision" occurred. Better then than later.

With instructors grading over their shoulders in a one-on-one situation, students solve varying computerized air traffic problems on radar screens where the blips react realistically according to the flight characteristics of scores of aircraft types. The students must pass the laboratory work to demonstrate they have what it takes to be controllers. Most training failures occur in the labs. (For details on the Radar Training Facility, see "Play It Again, Sam" in the March 1981 FAA WORLD.)

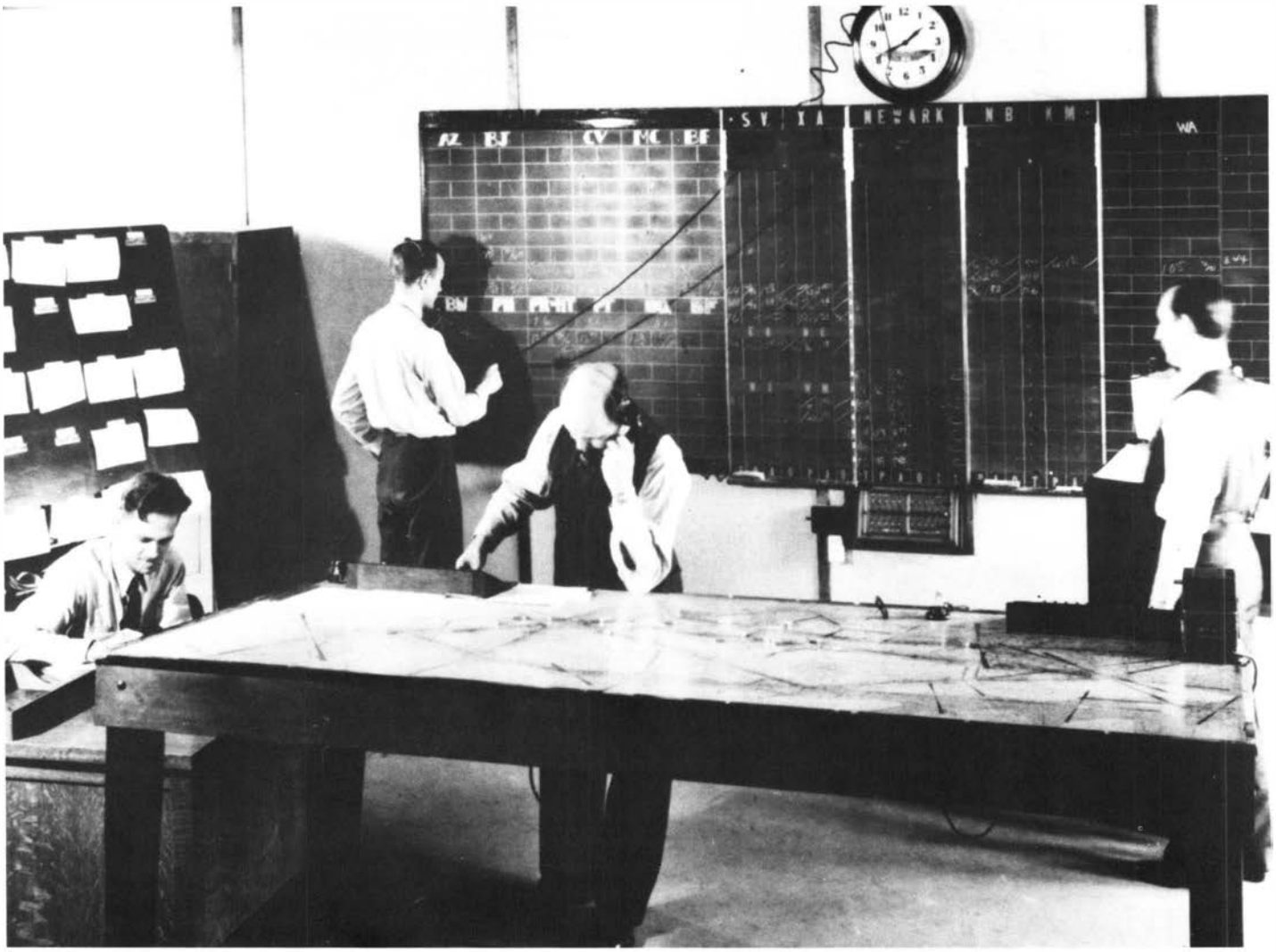
Despite the controller emphasis, the academy has also enlarged training classes for flight service station specialists and is now begining a long-planned second shift for Airway Facilities classes.

"We're off to a good start," Harris declares. "We have one of the finest technical training institutions in the world. How fast we went to a class of 144 on August 11 is a good example of our felexibility." ■

Academy instructor Rick Larson observes trainee Melissa McPherson in the Phase 4 non-radar practice lab.

When 'Shrimp Boats' Were Brass

The First Controllers Could Only Estimate Their Traffic



The first airway control station (en route center) was established by several airlines in Newark, N.J., in December 1935.

The young men and women now being trained as air traffic controllers at the FAA Academy in Oklahoma City will learn to work with a variety of tools: ground-to-air radio, radar, computers, video digitizers and three-dimensional alphanumeric video displays. It's difficult to imagine controlling air traffic without these tools, yet the first Federal controllers had none of them, and they managed very well—though, admit-

Controllers—believed to be J. V. Tighe (left) and Glen Gilbert—use the tools of their trade at the Newark Center: a cumbersome telephone headset, dividers for measuring distances on the map and a calculator for estimating aircraft arrivals over radio fixes.

tedly, they were dealing with a far less complex air traffic environment.

Controlling en route traffic became the responsibility of the Federal Government on July 6, 1936, when the Bureau of Air Commerce, the first air safety regulator of that day, took over three airway traffic control centers at Newark, Chicago and Cleveland that had recently been established and operated by an airline consortium.

The need to separate en route traffic and regulate its flow became apparent to the airlines and the Federal Government in the mid-930s, when Newark and Chicago airports :gan handling between 50 and 60 aircraft operations per hour during peak traffic periods. Aircraft came into these airports randomly, often arriving at the same time to compete for a portion of the congested terminal airspace and, eventually, for a piece of concrete on the ground. Conditions became particularly perilous during instrument weather.

Gill Robb Wilson, a New Jersey aviation official, reported that Newark Airport often had "as many as 15 planes circling [it], all of them blind flying and trying to keep at a different altitude, and some of them low on gas."

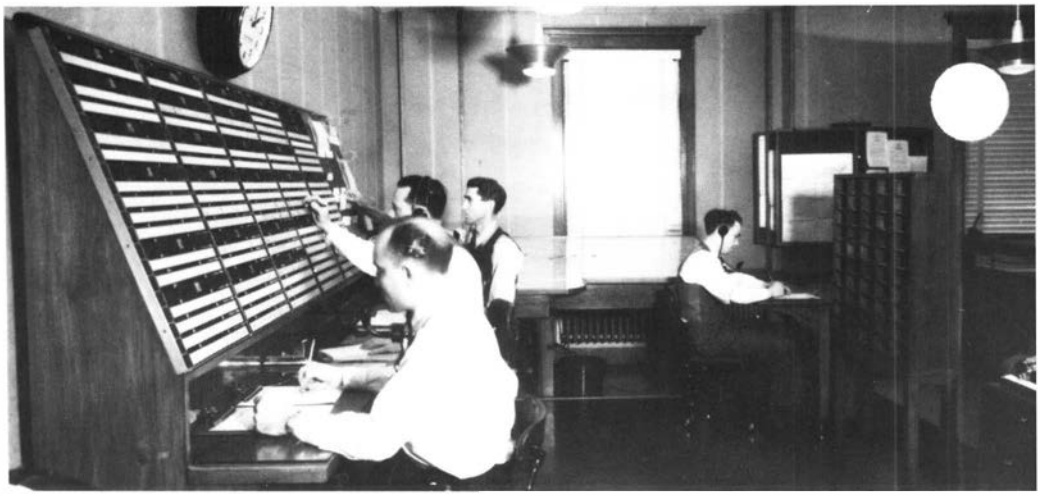
In April 1935, the carriers flying into Newark, Chicago and Cleveland petitioned the Bureau of Air Commerce to establish en route air traffic control. The agency was short of cash and could not think of undertaking such a costly responsibility. However, in November 1935, it struck a deal with the carriers: The carriers would proceed on their own to establish an en route ATC system, which the government would take over as soon as Federal funds became available.

Backup emergency lighting was not very sophisticated in the early centers.

The consortium set up the Newark Center in December 1935, the Chicago Center in April 1936 and the Cleveland Center in June 1936. The following month, with the beginning of a new fiscal year and its treasury replenished, the Bureau took over the entire operation, including controller personnel. Terminal control, however, remained the responsibility of airport operators until November 1941, when military necessity forced the takeover of terminal control facilities by the Civil Aeronautics Administration.

Unlike today's centers, which are staffed by hundreds of people, the typical center in 1936—or, airway traffic control station, as it was called at the time—was manned by a crew of five—a manager, assistant manager and three controllers. The stations originally operated 16 hours a day, from 8 a.m. to midnight; but the availability of air traffic control services itself created more traffic, and the stations soon went on a 24-hour schedule. The crews worked overlapping shifts. The largest on-duty contingent, present during periods of heaviest traffic, numbered three; the smallest, one.

Each station was equipped with a blackboard, a large table map, a teletypewriter and a telephone. Flights were posted on the blackboard, which detailed their progress and their estimated time of arrival and altitude over designated geographical fixes. The information on the board was transferred to the map, on which



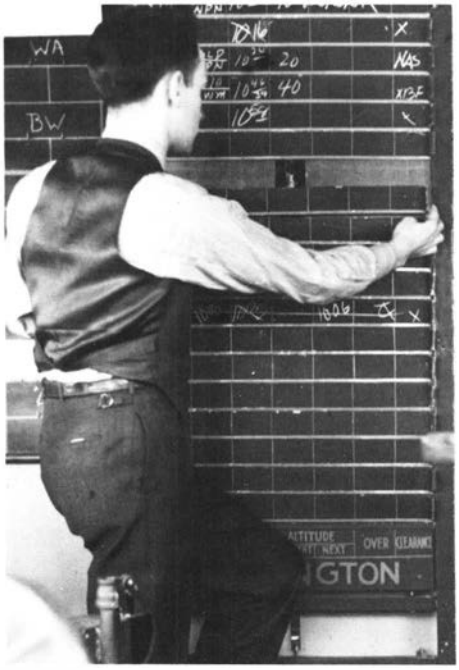
Progress beyond the beginnings: Flight strips are in evidence at the St. Louis airway control station in 1938, here manned by (left to right) John Knoell, Cleon Freeman, Charlie Clift and Charlie Carmody.

all airways were plainly marked.

Small brass markers shaped like shrimp boats, one for each flight in the control area, dotted the map. Each was equipped with a clip to which could be attached a slip of paper. The controller noted on the paper the name of the airline, the flight number the flight's time of departure and cruising altitude. Placed in positions on the map table corresponding to the actual flight progress of aircraft, these markers showed by their pointed ends the direction of flight and gave a clear, concise picture of what would probably take place as incoming aircraft converged around the terminal area. Each marker was moved every 15 minutes to conform to the estimated or actual progress made by aircraft.

When ATC was under airline jurisdiction, its function was to keep en route airline traffic separated and flowing to terminal areas in an orderly sequence. The Bureau recognized that under its jurisdiction, airway control had to be expanded to include all aircraft flying the civil airways on instruments. "We have been prone, perhaps subconsciously, to think of airline transports when air traffic control is mentioned," cautioned Earl Ward, the first ATC chief. "However, the safety of passengers in and operations of other than scheduled air transports must be given consideration; . . . an air transport . . . can be jeoparized by lack of supervised control of an operator of any other aircraft . . . ."

Accordingly, the Bureau issued a set of regulations, effective Aug. 15, 1936, governing instrument flight. Under them, all civil pilots (and subsequently military pilots) desiring to fly intentionally by instruments over a civil airway were required to have a federally licensed aircraft equipped with a two-way radio and federally prescribed instrument-flying equipment. The pilot himself had to possess an instrument rating.



Controller Lee Warren operates his own design for the first ATC automation: A blackboard arrangement of slats that could be changed to keep flights in sequence. The pins at right anchored the slats. A foot treadle linked to pulleys raised the column of slats below the one removed.

Pilots were also required to file a flight plan if they intended to fly by instruments or along a civil airway when visibility was less than one mile. Flight plans were subject to the approval of airway traffic control. These rules had the effect of keeping general aviation aircraft, few of which were equipped for instrument flying, and general aviation pilots, few of whom had instrument ratings, off the airways frequented by air carriers during instrument weather conditions. Aircraft not equipped with instrument-flying equipment, however, could fly between the bottom layer of the overcast and the ground.

All aircraft on civil airways were at all times separated horizontally. Eastbound aircraft were required to fly at odd-thousand foot altitudes; westbound aircraft, at even-thousand-foot altitudes. Pilots could deviate from these only in an emergency, at the express request or authorization of ATC or when crossing an intersecting airway. In the last case, they were required to cross at 500 feet above their normal altitude.

Controllers did not have direct radio contact with aircraft under their control. Pilots and airway controllers communicated with airline dispatchers, Department of Commerce radio operators and airport traffic controllers, who acted as middlemen, relaying messages between pilots and airway control. The chief means of communication between ground personnel was a private telephone circuit.

The practice was soon adopted of recording every word spoken to or by controllers over the system. The wax cylinders were filed, for future reference in the event of controversy, or shaved and reused.

The interphone system could not begin to handle all the information required by ATC. Weather reports came over the Bureau's teletypewriter network. This system was also used by airways communications stations (the forerunners of flight service stations) to transmit position reports and other information on itinerant pilots. In no time, this system, which possessed only a single circuit, was

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People

Aeronautical Center

Dean R. Haney, unit chief in the National Program Support Section, Air Traffic Branch, FAA Academy . . . **Frank D. Milazzo,** unit chief in the Special Services Section, Air Traffic Branch, FAA Academy . . . **George H. Sullivan, Jr.,** unit chief in the National Program Support Section.

Alaskan Region

Robert A. Salzman, chief of the Sitka Airway Facilities Sector Field Office, Juneau Sector, from the Fairbanks Sector . . . **Robert D. Turner,** team supervisor at the Anchorage Flight Service Station/International Flight Service Station.

Central Region

Elbert G. Parks, chief of the Ottumwa, Iowa, FSS, from the Omaha, Neb., FSS . . . **James E. Tyma,** team supervisor at the St. Louis, Mo., Tower, from the FAA Academy.

Eastern Region

William F. Cannon, Jr., programs officer at the Greater Pittsburgh, Pa., Tower . . . **Henry G. Grote,** team supervisor at the Newark, N.J., Tower, from the Morristown, N.J., Tower.

Great Lakes Region

Timothy J. Curtis, team supervisor at the West Chicago, Ill., FSS, from the regional communications control center . . . **Wesley Gahagan,** team supervisor at the Columbus, Ohio, FSS, from the Youngstown, Ohio, FSS . . . **Mark L. Grefrath,** team supervisor at the Pontiac, Mich., Tower, from the Flint, Mich., Tower . . . **Samuel N. Hedrick,** chief of the Bethalto, Ill., AF Sector Field Office, Springfield, Ill., Sector . . . **Robert F. Klein,** team supervisor at the Chicago ARTCC . . . **Charles R. Murray,** watch supervisor at the Cleveland, Ohio, AF Sector . . . **Curtis Williams,** chief of the Youngstown FSS, from the West Chicago FSS.

New England Region

Galen M. Birch, chief of the Burlington, Vt., Tower, from the Boston Tower . . . **Robert C. Briggs,** chief of the Engineering & Safety Branch, Airports Division . . . **George Dileo,** deputy chief of the Burlington Tower . . . **Howard R. McGlauflin,** chief of the Bradley Tower in Windsor Locks, Conn., from the Boston Tower . . . **Frederick E. Merrick,** deputy chief of the Bradley Tower.

Northwest Region

Lyle L. Grant, Jr., evaluation & proficiency development officer at the Seattle ARTCC.

Pacific-Asia Region

Reynaldo P. Juarez, maintenance mechanic foreman in the Guam Airway Facilities Sector.

Rocky Mountain Region

Paul C. Andes, team supervisor at the Arapahoe County, Colo., Tower . . . **David D. Borgmann,** computer display channel crew supervisor at the Denver ARTCC AF Sector . . . **Harold H. Eggers,** manager of the Denver ARTCC Sector, from the Great Falls, Mont., Sector . . . **Willie F. Griffin,** computer display channel crew supervisor at the Denver ARTCC Sector . . . **Noel F. Keane,** chief of the Arapahoe Tower, from the Denver Tower . . . **Phillip W. Skeith,** chief of the Pueblo, Colo., Tower . . . **Clarence C. Wuthrich,** team supervisor at the Salt Lake City, Utah, Tower.

Southern Region

James E. Ansley, unit supervisor in the Jacksonville, Fla., ARTCC AF Sector, from the Program and Planning Branch, AF Division . . . **Philip H. Crawford III,** deputy chief of the Fayetteville, N.C., Tower, from the Kinston, N.C., Tower . . . **Herman L. Drake, Jr.,** deputy chief of the West Columbia, S.C., Tower . . . **Bobby G. Durham,** manager of the Jacksonville ARTCC AF Sector, from the Atlanta Hub Sector . . . **Stanley D. Ensley,** assistant chief at the Jacksonville ARTCC . . . **Ronnie O. Farmer,** chief of the Charlotte, N.C., AF Sector Field Office, Raleigh Sector, from the San Juan, Puerto Rico, Sector . . . **Donald B. Houlihan,** team supervisor at the West Palm Beach, Fla., Tower, from the Atlanta, Ga., International Tower . . . **Jack L. Howarter,** team supervisor at the Jacksonville ARTCC . . . **Raymond E. Johnson,** team supervisor at the Knoxville, Tenn., Tower, promotion made permanent . . .

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James W. McQuigg, area officer at the Jacksonville ARTCC . . . **Henry P. Merrick,** deputy chief of the Hebron, Ky., Tower, from the Operations Branch, AT Division . . . **Frank Millonas,** assistant chief at the Pensacola, Fla., Tower, from the West Palm Beach Tower . . . **David D. Mudd,** area officer at the Jacksonville ARTCC . . . **Alva A. Owen,** team supervisor at the Jacksonville ARTCC . . . **Kenneth R. Patterson,** team supervisor at the Florence, S.C., Tower, from the Greer, S.C., Tower . . . **John I. Ruth,** team supervisor at the St. Petersburg-Clearwater, Fla., FSS, from the Homer, Alaska, FSS . . . **Charles E. Schumacher,** team supervisor at the Panama City, Fla., Tower, from the Nashville, Tenn., Tower . . . **Robert M. Strong, Jr.,** assistant manager of the Covington, Ky., AF Sector, from the Juneau, Alaska, Sector . . . **James M. Valentine,** team supervisor at the St. Petersburg-Clearwater Tower, from the Meridian, Miss., Tower.

Southwest Region

Charles A. Easton, chief of the Roswell, N.M., FSS, from the Operations Branch, AT Division . . . **James E. Gill,** chief of the Training Branch, Personnel Management Division . . . **Herschel Gillins,** team supervisor at the Shreveport, La., FSS, from the Dallas, Tex., FSS . . . **Ronald C. Hathcock,** team supervisor at the Addison, Tex., Tower . . . **Royce G. Hurley,** chief of the Management Analysis Branch, Management Systems Division, from the Personnel Management Division . . . **Herman G. Reyenga,** chief of the Evaluation Branch, AT Division, from the Moisant Tower, New Orleans.

Technical Center

Martin Holtz, chief of the Technical Analysis Branch, Engineering Management Staff, from the Systems Test and Evaluation Division.

Washington Headquarters

James W. Nimmo, chief of the Accident/Incident Analysis Branch, Evaluation Staff, AT Service, from the Terminal Evaluation Branch.

Western Region

Jesse D. Cookson, team supervisor at the Montgomery Field Tower, San Diego, from the San Francisco Tower . . . **William H. Dickson, Jr.,** deputy chief of the San Francisco Tower, from the Hayward, Calif., Tower . . . **William H. Fisher,** team supervisor at the Edwards AFB, Calif., RAPCON . . . **Richard E. Morrison,** deputy chief of the Burbank, Calif., Tower, from the Airspace and Procedures Branch, AT Division . . . **Leon C. Warner,** area officer at the Los Angeles ARTCC.

Shrimp Boats

(Continued from page 10)

overburdened. In 1937, the Bureau established another teletypewriter circuit—the so-called "white net"—for the exclusive use of air traffic control.

An airway control station's involvement with traffic began as soon as a pilot filed a flight plan. The airline dispatching office immediately relayed the plan to the controller on duty and asked for clearance to take off. Depending on traffic conditions, the controller would either approve the plan as filed or assign the flight a different takeoff time or cruising altitude or both. Once in the air, the pilot was required to report to his dispatcher the time he passed over a designated radio fix and the estimated time he expected to pass over the next fix. This information was also relayed to air traffic control, which entered it on the blackboard and adjusted the position of the brass marker.

A radio fix was a geographical point at which the pilot could obtain a definite check on his position along the airway without visual reference to the ground. Radio markers, which sent out characteristic signals, were most extensively used for this purpose. The point at which two radio range beams intersected also served the purpose, as did a radio range's "cone of silence"—the area directly overhead.

Where the jurisdiction of airway traffic control ended and where that of airport traffic control began varied with conditions. Usually, the airport tower took control within a radius of three miles from the center of the landing area. But as visibility decreased, the jurisdiction of airway control expanded. Earl Ward explained: "The differentiation between the two control functions might be illustrated by saying that, in effect, the tower controls an aircraft only as far as the tower operator can see the aircraft and the pilot of the aircraft can see the airport, all the remainder of the flight being controlled by airways."

Times have changed. ■

By David Hess
The public affairs officer for Metropolitan Washington Airports, he was formerly a newsman for the *Cincinnati Enquirer*.

Military ATCSs Are Heavyweights

New faces in the cab at Washington National Tower are S. Sgt. Mark Mohammed of Dover AFB and Sgt. Deborah Smith, late of the Pentagon Heliport, being observed by team supervisor Robert Goss. Photo by Tom Moore

Nearly half of the controllers working at Washington National Airport since the controller walk-out on August 3 are military, but tower chief Harry Hubbard has no complaints despite initial misgivings.

"When I first learned that I was to get military controllers, I had some reservations because I thought I'd be getting rookies or recruits, and Washington National is no more a place to learn air traffic control than a Boeing 727 is to learn flying," says Hubbard. "But when my contingent of 30 arrived, I was elated—they had sent me some heavyweights—seasoned, experienced, full-performance-level controllers, half from the Air Force, half from the Army."

The tower is functioning with 64 operational people, including military and FAA controllers, team supervisors and other air traffic staff personnel.

The men and women from Dover, Hunter, Scott and McGuire Air Force Bases have long experience with radar approach control, while those from the Army at Ft. Benning, Davison Field (Ft. Belvoir) and the Pentagon Heliport have more tower experience.

Both types of experience are necessary, for, in addition to the up to 1,200 flights in and out of Washington National each day, the tower handles approach control for Andrews Air Force Base across the Potomac in Maryland and Ft. Belvoir's Davison Field in Virginia, as well as Terminal Control Area (TCA) operations.

These military controllers are part of a force of some 830 loaned to FAA by the Air Force, Army and Navy until new controllers can be trained by the FAA Academy. They are certificated in their own facilities under FAA standards.

As with any controller arriving at a facility for the first time, however, the military controllers had to enter an on-the-job training program. Speaking a few weeks after their arrival, Hubbard said: "These highly skilled people are now productive on flight data positions in the tower and radar room, some on assistant local, clearance delivery, assistant ground and some have advanced to near check-out on selected approach control positions."

He added, "We are comfortably and safely handling 80 percent of the normally secheduled air carrier flights and 75 percent of the overall usual daily operations we did before—and we could handle 85 percent if the system could deliver that number to us. We also are experiencing no delays because of situations at this airport." The normal high mix for Washington National is about 620 air carriers, 140 commuters and the rest, general aviation, mostly corporate planes.

Morale is tops, says Hubbard, and this is reflected in the comments of chief pilots from American, Eastern and USAir airlines. Says Capt. Lloyd Anderson of Eastern, "Both my pilots and I have found operations going as smooth as silk at DCA and throughout the system. The exchange of conversation between pilots and controllers is more couteous and professional, and that creates a better working atmosphere."

On the other side of the mike, Sgt. Jeffrey Williams of Dover AFB says, "I would accept a permanent job here in a minute. All they would have to do is ask." ■

Q&A

The Boston and Lawrence, Mass., towers have a letter of agreement requiring Boston Tower to control and separate practice approaches. On a VOR Runway 23 approach to Lawrence (a full procedure turn), we are required to get a block of protected airspace from Pease Approach for IFR traffic, because the procedure turn enters Pease's airspace. Are we required to get the same airspace block for a full VOR 23 practice approach by a VFR aircraft? I've had different answers from different people on this one.

Yes, separation of VFR aircraft practicing instrument approaches at Lawrence is required, which must include appropriate coordination for any associated airspace. Handbook 7110.65B, Para. 435b, specifies controller responsibility to VFR aircraft conducting practice instrument approaches. The AIM, Para. 244, provides companion information. In addition, Handbook 7210.3E, Para. 1234, outlines the separation responsibility for VFR aircraft practicing instrument approaches at primary and secondary airports. Further, Para. 1234e directs facilities to issue a letter to airmen advising users of separation services provided to VFR aircraft practicing instrument approaches.

I was slated for return to the states from Puerto Rico under the 3R program with a pick up date in August. Last January, I requested a departure date in July with a delay enroute for annual leave. My chief said that since I was under contract, this leaving with no intention of returning to San Juan was breaking my contract. My leave was approved but with the requirement that I must return to San Juan prior to departing to my permanent change-of-station move. I believe that while on leave, I would still be attached to San Juan and the Southern Region until my pickup date and not in violation of my contract. What is FAA policy on this?

When an employee serving under an overseas contract is within several weeks of completing his contractual agreement, and annual leave is approved up to his pickup date by another region, that employee may take his annual leave enroute to his new change of station without returning to the overseas location. Even though the employee is in a leave status, he is still on the rolls of the Southern Region up to his pickup date. Futher,it would be more advantageous for the government in terms of travel costs for the employee to travel without having to return, only to depart again for his permanent change-of-station move.

I was employed by the Department of Defense as an air traffic controller, tower, for 12 years. I was rated by the FAA and selected from the FAA register, joining FAA in 1970. In 1980, Congress passed H. R. 1781, which provided that civilian air traffic specialists who are employed by the Department of Defense be given the same benefits as those enjoyed by FAA air traffic specialists, such as retirement at age 50 with 20 years of service. Will I be given credit for the 12 years I spent with DOD?

To determine the portion of Department of Defense service that is creditable, you should contact your servicing personnel office. The personnel office will then contact DOD so that appropriate certification of creditable service can be obtained. It sould be noted that only that portion of civilian DOD controller work that required the individual to actively engage in or immediately supervise employees engaged in the active separation and control of live air traffic will receive credit.

Enclosed are seveal messages from the Minneapolis Center's data system specialists on the Service B circuit to other centers and flight data processing facilities. They concern that center's ow· operations. Each message was transmit ted using the XXE code. What is the function of the XXE code on the Service B circuit? I can't find this information in Handbook 7110.80, which covers Service B usage.

Several Discrete Group Codes exist in the Service B system. Those intended for general use are listed in Handbook 7110.80. All others come under the discrete-use category and are known primarily by the facility for which they were developed. This satisfies the "need to know" requirement and helps to prevent misuse by other facilities. Group Code XXE causes the data to be disseminated to all flight service stations in the Minneapolis ARTCC control area. The report in question did not concern the FSSs and should not have been sent on Service B. Your region has taken corrective action.

By Nick Komons
The Agency Historian, he is the author of "Bonfires to Beacons"—a history of early Federal aviation policy—and other published works.

How Many Pilots?

A History of the Airliner's Third Seat: The Closing Chapter

Part II

The crew-complement controversy, as we saw last month, first erupted immediately after World War II with the introduction into passenger service of large, four-engine props. In 1948, the Civil Aeronautics Board resolved the question in favor of the flight crews and their unions by requiring a flight engineer on transports with a gross takeoff weight of more than 80,000 pounds. The promulgation of this rule was followed by a period of labor unrest, which, by the mid-1960s, saw the Air Line Pilots Association (ALPA) succeed in wresting the second officer's seat on most airlines from mechanic-trained flight engineers.

In 1965, FAA dropped the 80,000-pound rule, which, directly or indirectly, had been at least partially responsible for the labor turmoil of the previous 15 years.

The rule was dropped for two reasons. First, it was a bad rule; an aircraft's weight was scarcely a valid criterion for determining crew complement. FAA adopted a new rule establishing workload as the standard; henceforth, FAA would evaluate the amount of work involved in operating an aircraft and then determine the number of crew members required to do that work. A separate determination would be made for each new aircraft type.

Second, and more important, automation and advances in cockpit design permitted aircraft makers to reduce the flight crew's workload. Most of the flight engineer's duties could either be automated or safely turned over to the pilots. In fact, at the time the rule change was being considered, the British Aircraft Corporation and the Douglas Aircraft Company had already asked FAA to certificate the BAC-111 and the DC-9 for operation with a two-pilot crew.

The press, spectators and witnesses crowd the hearing room of the 1981 Presidential Task Force. At the table are (left to right) Lt. Gen. Howard Leaf, former Administrator John McLucas and Fred Drinkwater III.

FAA certificated the DC-9 and the BAC-111 without undue controversy. From that time forward, however, ALPA resisted the trend toward two-pilot aircraft. Indeed, in November 1966, ALPA adopted the now-famous Article XX to its constitution and by-laws, which set forth the following *mandatory* policy: "All future turbine-powered transport aircraft certificated after the adoption of this policy, excluding 'stretched' basic models of turbine-powered, twin-engine aircraft presently certificated, will be manned by a minimum crew of three pilots."

The immediate target of Article XX was the Boeing 737, a twin-engine, short-haul transport, which was certificated for operations with a two-pilot crew in December 1967. ALPA succeeded, through a series of labor arbitration decisions, in putting a third pilot—for a time—on 737s operated by United, Aloha, Wien, Western, Piedmont, and Frontier Airlines.

The third man on the 737, like the third pilot on the 707, had no essential duties to perform. He sat in the center jump seat—there was no other place for him. Since that seat was reserved for an FAA inspector and since an en route check by FAA can occur unexpectedly, the third man could lose his seat at any time without notice. In consequence, he could not be given duties essential to coordinated crew procedures. The third man, according to an airline pilot who has flown both DC-9s and 737s, has "the most

nonproductive job in the aircraft.

It wasn't long before the third man on the 737 wore out his welcome on most airlines employing him. Aloha got rid of him first by way of an arbitrator's decision. Piedmont was next to prevail, persuading its pilots to accept a two-man crew in exchange for higher pay and shorter working hours. Frontier took a page out of Piedmont's negotiating tactics and also induced its pilots to fly with two men. Wien had a more difficult time. It absorbed a bitter 21-month strike before its

pilots agreed to fly without a man in the jump seat.

This left only United and Western flying 737s with a three-man crew.

In 1974, Douglas was preparing to introduce the fourth stretched version of the DC-9, the Series 50. This was 29 feet longer and 44,000 pounds heavier than the original Series 10 and was capable of carrying half again as many passengers. In May of that year, ALPA's executive board declared that the Series 50 was not a stretched version within the meaning of Article XX and, therefore, required a three-man crew.

In November, however, ALPA's board of directors, led by DC-9 pilots, overturned the decision of the executive board. The DC-9-50, it held, was a stretched version. But at the same time, the board adopted the following amendment to its crew-complement policy: "All turbine-powered, fixed-wing transport-category aircraft, including stretched and/or all other versions . . . certificated after 1/1/75 shall be operated with a minimum flight deck crew of three pilots . . . ." ALPA had served notice that it would tolerate no additional two-pilot jet transports, stretched or otherwise. This set the stage for the events that eventually led the President to appoint his crew complement task force.

In October 1977, McDonnell Douglas began taking orders for the DC-9 Super 80 for operation with a two-pilot crew.

ALPA immediately challenged the safety of a two-pilot crew, though, it should be said, the union did not claim that two-pilot crews were unsafe; rather, it maintained that three-pilot crews were safer.

The union's case for a third man in the cockpit relied on two traditional arguments—one stressing the value of a third pair of

eyes, the other the value of a third pair of hands. To the claims of the airlines and the manufacturers that the third man was redundant in a cockpit designed for two, ALPA answered that the third man was valuable precisely because he was redundant. "In aviation," said ALPA President J. J. O'Donnell, "the laws of probability clearly support the thesis that redundancy provides a higher margin of safety."

Manufacturers make aircraft fail-safe by employing redundant systems; when the primary system fails, the backup system takes over. Why not employ the same concept to the flight crew? If one of the pilots becomes incapacitated, the third pilot can take over his duties.

For their part, the airlines and the manufacturers claimed that the size of a crew complement depends on how much advanced technology the engineer employs in designing a cockpit. Any aircraft, they said, can be designed for safe operation with a two-man crew. In other words, given today's technology, crew complement is a design specification.

In the course of the debate, ALPA and the manufacturers cited a number of statistical studies showing that two- or three-man crews were safer. None of this proved conclusive. As a matter of fact, the accident statistics didn't support either case, though the raw data gave a slight edge to two-pilot operations. Accidents in scheduled air transportation are so rare and the statistical sample so small that no firm conclusion can be drawn favoring one type of operation over the other.

Still, there was disagreement, and well there might be. If safety were the only issue involved, you might expect reasonable people examining the evidence to reach a common conclusion. But a great deal more than safety was at stake. "[Parties] to this controversy," wrote Robert H. Stanton, FAA's Western Region director, in February 1978, "have self-serving economic interests in the outcome of our certification decision. . . ."

The Super 80 is the first of a new breed of fuel-efficient jetliners, and it will soon be followed into airline service by other fuel-efficient transports, the Boeing 757 and 767 and the European-made Airbus A310. Together, these jetliners are expected to dominate commercial air routes in the non-

communist world during the 1980s.

The airlines, beset by burgeoning fuel costs, increasing competition and declining productivity, have a great deal riding on these aircraft. The Super 80's fuel efficiency, for example, is 40 percent better than that of the 727, the most widely used jetliner in the United States. With the cost of jet fuel having risen 55 percent between 1979 and 1980, adding $3.5 billion to the airlines' direct operating costs, the efficiency offered by the Super 80 can save the airlines a bundle of money.

But how attractive is the Super 80 if it carries an extra pilot? According to one source, a third man on a single jetliner can cost an airline an extra $200,000 a year. This figure, which includes training costs, is that high because airlines require four crews to fully utilize one plane, and because pilots get paid for time spent away from home and for nonflying duty time. Now multiply that figure by the number of aircraft in a typical fleet and you get a tidy sum. So, the third man considerably diminishes the attractiveness of the new jets. For the manufacturer, this translates into fewer orders for new planes.

For the airline pilots, however, three men in a cockpit means more jobs. "I honestly believe that ALPA really thinks that this *is* a safety issue," said Homer Mouden of the Flight Safety Foundation. "I also believe there's no question that the maintenance of jobs is influencing them as well."

Be that as it may, the pilots stuck strictly to their safety arguments, which they eventually expanded into an attack on the type certification process itself. They challenged the methods employed by FAA and cast doubt on the integrity of the process.

ALPA asked FAA to open up the certification process—i.e., to make it public—and allow ALPA's active participation. FAA, J. J. O'Donnell charged, certificated aircraft "behind closed doors," where it made "back room deals" with the manufacturers. In this kind of environment, O'Donnell continued, "the public interest has been given less than full measure of concern when weighed against the manufacturers' and airlines' motivation to reduce cost."

FAA demurred. ALPA's request, said Langhorne Bond, the FAA Administrator at the time, had "the appeal of a Lorelei

and the substance of smoke." An open certification process, he said, would mean releasing the manufacturers' proprietary data to domestic and foreign competitors. This would have a devastating effect on the American aircraft industry. Besides, he said, FAA was perfectly capable of conducting an independent, disinterested investigation.

In August 1980, FAA certificated the Super 80 for operation with a two-pilot crew.

When the Reagan Administration took office, it was promptly confronted with an ALPA threat to conduct a one-day nationwide work stoppage. The stoppage, or strike, scheduled for March 2 this year, was designed to alert the public and the Reagan Administration to the "mismanaged" Federal Aviation Administration and to the necessity of moving quickly to reform "this very troubled government agency."

President Reagan and the new Secretary of Transportation, Drew Lewis, acted swiftly to defuse the situation. On February 20, after meeting with O'Donnell, Secretary Lewis announced that President Reagan would appoint a task force to review FAA's certification of the Super 80 and, additionally, determine whether the operation of such new-generation aircraft as the Boeing 757 and 767 can be operated safely with a two-man crew. O'Donnell, Lewis said, had pledged that ALPA would abide by the task force's findings. On March 5, the President appointed a three-man task force headed by former FAA Administrator John L. McLucas.

In a report released in July, the task force found that the Super 80 had been properly certificated. It also found that the 757,

767 and A310, as now designed, "potentially can be operated safely by a crew of two." The task force also made a number of recommendations intended to strengthen FAA's certification procedures.

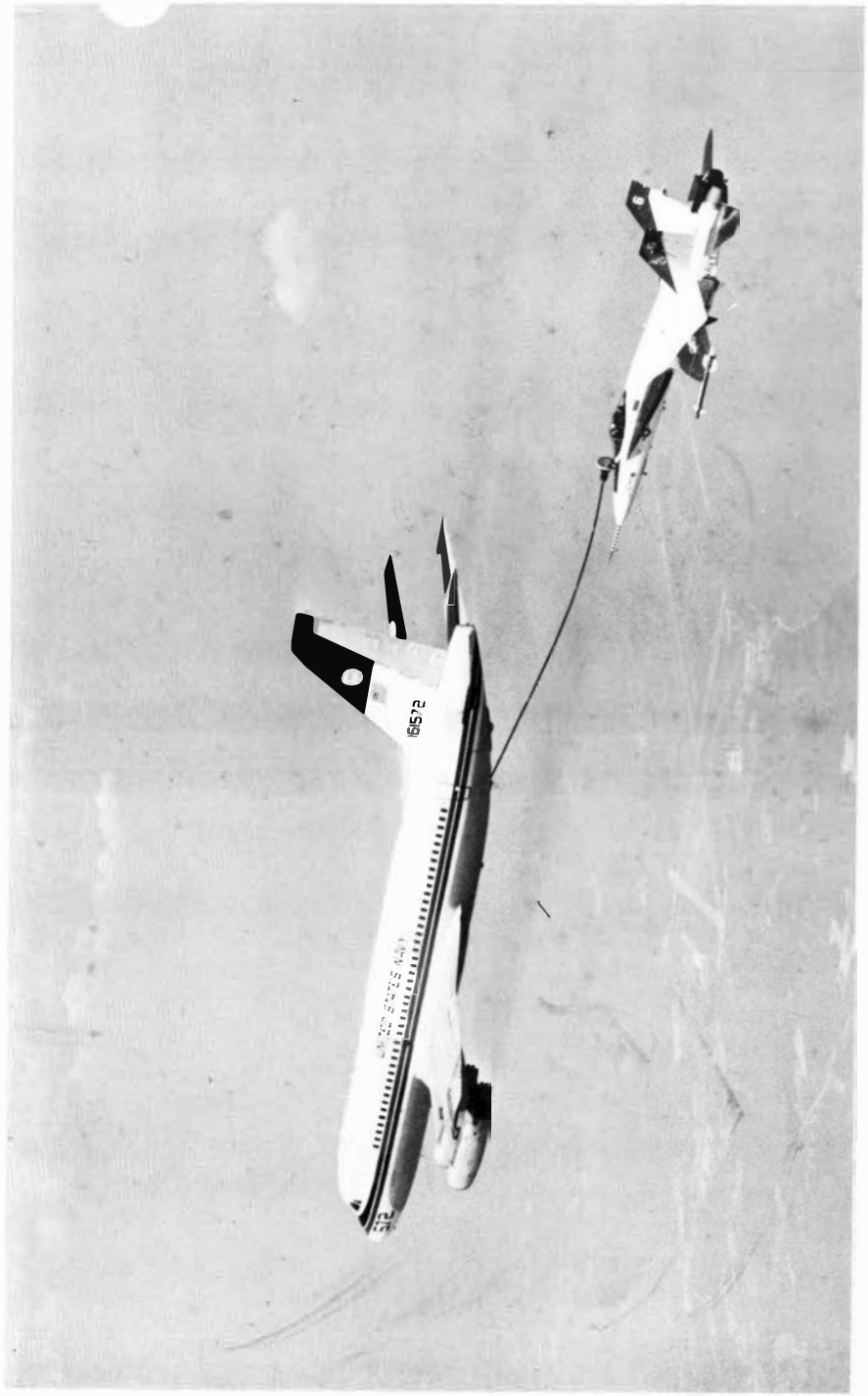
ALPA's national leadership accepted the task force's verdict—not a surprise since ALPA had agreed before the fact to abide by the task force's decision. The surprise—if that is the correct word—is the ease with which ALPA's rank and file, particularly the pilots of United Airlines, have fallen in line.

United's pilots have been in the forefront of the opposition to the two-pilot crew complement. Yet, in the course of negotiating a new 26-month contract, United's pilots asked ALPA's executive board to waive the provisions of Article XX. The board granted the waiver, and, on August 13, United's pilots ratified a contract that permits United to fly the Boeing 737 with a two-pilot crew. Furthermore, United's pilots agreed in the same contract to fly the Boeing 767, scheduled for delivery during the second half of 1982, with whatever crew size the plane is certificated for—two or three.

The example of United's pilots is bound to influence the pilots of other carriers, for the United union is by far the largest ALPA local, numbering some 6,000 members.

Why the sudden reversal in form? The Presidential task force and ALPA's commitment to abide by its findings doubtless are part of the answer, but they do not explain everything. The fact is that United's pilots were out of step with the prevailing trend in the industry. This was affecting their employer's ability to compete effectively in the new environment created by airline economic deregulation. An extra pilot on the 737, said T. P. Austin, an official of United's union, "put us in a very unfavorable competitive position." United's pilots know that whatever hurts United also hurts them. Hence, just as economics eventually forced the third pilot off the 707 in the 1960s, economics was forcing the third man off the 737.

You may speculate, though to no purpose, whether the Presidential task force would have had the same impact on this issue if conditions were different—if, for example, the airlines were enjoying unprecedented profits in a regulated, uncompetitive environment. What appears to be beyond speculation, however, is that the Presidential task force has had the last word on the crew-complement controversy for the foreseeable future. ■



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