

OCTOBER 1972

FAA WORLD

Service to Man in Flight

A large, artistic background illustration covers the entire page. It features a network of dark, branching lines that resemble a tree or a complex flight path. A silhouette of a jet airplane is shown flying through these lines, positioned in the upper right area of the cover.

QUIETING
THE SKIES

DIRECT LINE



Q. How can the agency justify radar for a facility that falls way below the established national criteria?

A. The criteria for establishment of the various terminal air-navigation facilities and air-traffic-control services, including radar, are based on air-traffic demand, since volume of traffic is a tangible and measurable indication of the need for such facilities and services. They do not, however, cover all situations that may arise and are not to be used as sole determinants in denying a location the presence of a terminal facility or service (like radar) for which there is a bona fide operational or air-traffic-control requirement. These situations must be evaluated individually to determine if the tangible and intangible benefits are commensurate with the cost of the facility and/or service.

Q. Order 1100.127, Airway Facilities Sector Configuration, Appendix 2, Chapter 3, Description of AF Sector Positions, lists 39 of the 40 positions in a sector by series and GS grade. The one exception is the Field Logistics Specialist positions. It could be noted that all positions are filled at the highest grade level authorized. What is the reason for not assigning series and GS grades to these positions? Since region/management will not take action to upgrade, will the Washington office make a determination of the proper grade and series in view of the increased duties and responsibilities as a result of sector reconfiguration?

A. This order is not a classification guide, and it specifically states that the final classification as to grade and series is the responsibility of the appropriate personnel office. The order established standard agency policy for the configuration of Airway Facility sectors. The grade and series designations shown are believed to be supportable if the duties and responsibilities are properly assigned and carried out in each position.

The omission of grade and series for Field Logistics Specialist positions was not due to an oversight, since this order was not intended to cover the duties and responsibilities of support-type positions. The regional personnel office, rather than the Washington office, has full responsibility for determining the proper grade and series for these positions in accordance with published standards of the Civil Service Commission.

Q. Speaking only of SATCS positions and of what I have observed in my region, I would like to ask if the FAA is really serious about career progression through promotion? Why are an estimated 95 percent of the supervisory and facility-chief positions filled through internal placement procedures, which is nothing more than in-grade reassignments?

A. FAA is serious about career progression through the promotion program. This is certainly true in the air-traffic-control system. A survey among several Manpower divisions indicates that your 95 percent estimate is erroneous when it comes to filling first-level supervisory ATC positions. First-level supervisory positions (team supervisors) throughout FAA have usually been filled from non-supervisor applicants. Your comments are more valid on filling the various facility-officer positions. In some facilities, such positions as area officer, EPDO, military-liaison officer, data-systems officer, assistant chief, etc., are at the same grade level. These jobs are eagerly sought by in-grade bidders because of the broadening experience and career enhancement such assignments bring. On the other side of the coin, management would be derelict if it did not select an in-grade bidder who is better qualified than other candidates. Therefore, many facility-officer positions are among the most sensitive and important in the system. A special evaluation plan for examining and ranking candidates for GS-15 center chief and terminal chief has been devised to assure selection of the very best-qualified employee available (Appendix 13 to Handbook 3330.1A, Merit Promotion Program). It is not surprising that a large number of the best-qualified candidates are persons already in the grade level of the job to be filled.

Q. I would like to know what the FAA considers proper on-the-job attire for female personnel. Our regional office recently issued a supplement to a directive concerning this matter, which I do not fully understand.

A. The general agency policy regarding the personal appearance of all FAA employees is that personal grooming and clothing must be appropriate to the conduct of government business. Region and center directors have the responsibility to specify, when necessary, certain procedures to achieve the objectives outlined in agency policy. Your supervisor, in turn, should resolve any differences in the interpretation of these procedures through the chain of command.

Is there something bugging you? Something you don't understand? Tell it to "Direct Line." We don't want your name unless you want to give it, but we do need to know your region. We want your query, your comment, your idea. All will be answered in this column, in the bulletin-board supplement and/or by mail if you provide a mailing address.

Better two-way communication in FAA WORLD's "Direct Line" is what it's all about.

FAA WORLD

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The cover: Northwest of Washington National Airport, a jet rises over the Potomac River. In the field, in research labs and through cooperation, FAA and the aviation industry are striving to make airplanes and airports good neighbors and compatible with the environment.

—Photo by Don Braun



Silent Victories

FAA was given the authority by the 90th Congress to control and abate aircraft noise. Responding to this Congressional mandate, the agency issued Part 36 of the Federal Aviation Regulations to arrest the escalation of noise in newer, bigger, more powerful aircraft and initiate a steady, programmed reduction in airplane and airport-community noise levels.

The downward trend in aircraft noise since the implementation of this regulation is amply illustrated by relating the noise impact of airplanes of earlier design and those built since the regulation. Using as a reference point the geographical area impacted by 100 EPNdB during takeoff and landing, the early 707s affected 55 acres per passenger seat, while the larger post-Part 36 DC-10s and L-1011s affect only five acres per available seat. This is truly progress in aircraft noise reduction.

But our noise-reduction program includes much more than just technical research and regulatory action. We have worked feverishly with the airlines to develop safe, compatible air-traffic operational procedures and practices that could reduce noise exposure for residences and businesses adjacent to airport boundaries. Coordinated flight programs and data review with air carriers has produced concrete results—the Air Transport Association announced the implementation of standard take-off procedures during August that get the aircraft higher sooner, thus minimizing off-airport noise impact. Work is continuing on developing modifications to landing-approach procedures. So, in addition to hardware design, operational techniques are contributing impressively to progressive off-airport noise reduction.

And, work is continuing in the areas of standards of noise control and abatement for STOL, VTOL, SST and light aircraft. Noise limits are also being considered for aircraft fleets as an entity. And with all this, methods are being developed to better identify airport-community noise impact. Ours is a comprehensive and balanced noise-reduction program.

FAA is committed to making the aircraft, environmentally speaking, a good citizen and the airport a good neighbor. We are rapidly approaching this goal.

John H. Shaffer
JOHN H. SHAFFER
Administrator

CHANGE OF ADDRESS: FAA employees should send their changes of mailing address for FAA WORLD to the control point in the region or center where they are employed: AAC-44.3; AAL-52.1; ACE-20; AEA-20; AGL-13; ANA-11; ANE-14; ANW-14.7; APC-42; ARM-5; ASO-67.1; ASW-67.23; AWE-15; and Headquarters employees, AHQ-431. You should not send change-of-address information to Washington. If you move from one region or center to another, you should submit your change of address to the region or center to which you move.

QUIETING THE SKIES AND CLEARING THE AIR

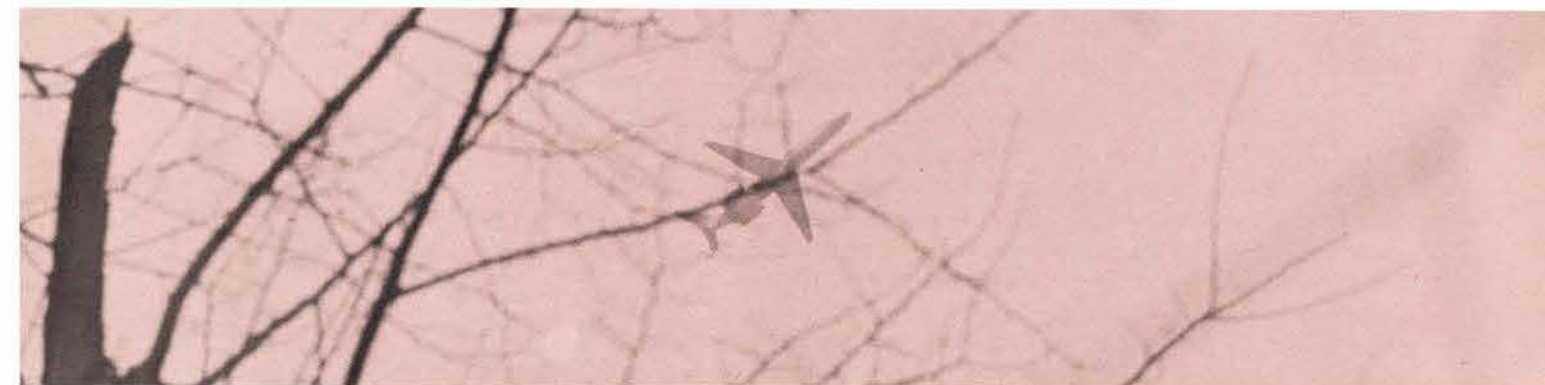
Besides getting bigger, airline jets are growing quieter and cleaner.

That's good, because noise and air pollution from jet airplanes are the two major environmental problems that the aviation industry, FAA and other agencies are joined in a struggle to overcome.

"I think technology will do a lot to keep aviation out of environmental trouble in the coming years," said Richard Skully, director of the Office of Environmental Quality. "It's already made a big difference. The newest jumbo jet, the L-1011, is 15 to 20 decibels quieter on takeoff and 10 to 15 decibels quieter on landing than the first-generation jet transports, the 707s and DC-8s. And the L-1011 is much more powerful than the earlier jets. A 747 jet engine is 1400 percent more powerful than a DC-6 propeller engine, but has two-thirds less emissions. In fact, all jet engines burn cleaner than propeller engines. These are examples of real progress, and the next generation of jet engines should show even more improvement."

Complaints from the public against airplane noise go back for decades. Over the years, the population grew. Aviation and airports grew. The result today is that at many of the country's largest cities, busy airports are hemmed in by densely populated areas.

In 1963, the agency set up the Office of Noise Abatement and last year transformed it into the Office of Environmental Quality, reflecting a broader concern for the effect of aviation on the community. The agency received clear Congressional authority to regulate aircraft noise when the Federal Aviation Act was amended by Congress in 1968. The following year, FAA issued its landmark rule on aircraft noise, Part 36 of the Federal Aviation Regulations. This rule requires aircraft manufacturers to show that their newly designed planes don't exceed noise levels ranging from 93 to 108 "effective perceived



noise in decibels" on takeoff and 102 to 108 on landing.

"Part 36 halted the progression of noisy airplanes," observed Environmental Quality's Bob Swanson. "It's preventing any more increase in aircraft noise. Besides affecting the big transports, the rule also muzzles business jets, which were pretty loud relative to their small size."

Under Part 36, FAA sets noise limits on airplanes but does not substitute its judgment for that of local authorities in deciding if a certain amount of noise is acceptable or unacceptable at an airport. In any case, the agency is committed to further deescalation of aircraft noise. EQ officials say the agency will consider lowering Part 36 noise limits or taking other regulatory action as fast as new technology permits such changes at a reasonable cost to the industry.

Aircraft manufacturers are now making a big contribution to the quest for quiet by building planes that put out fewer decibels than earlier jet aircraft. The new model of the 747—the world's largest passenger plane—and the jumbo DC-10 and L-1011 all meet Part 36 standards, and all are quieter than first generation of less powerful 707s and DC-8s.

It's encouraging that the new generation of jets is quieter than the old, but what about the older

generation? Hundreds of jet transports of older design are flying today, and many are still being manufactured. Years of service remain to some of the 707s and DC-8s, and even more time is left to the later 727s, 737s and DC-9s. The agency is therefore looking at several ways of squelching the noise in the old-line jet fleet. FAA-sponsored research and comments solicited from the aviation industry will show which schemes can work at a reasonable cost. Under one plan now being considered, jet engines would be modified on certain planes that have already come off the assembly line and have been flying for some time. Another plan would amend Part 36 to require manufacturers to build quiet features into the engines of the older generation jet aircraft which are still being produced—before they leave the factory.

Still another plan under careful study by the Office of Environmental Quality would set noise limits on the operation of entire fleets of aircraft flown by the airlines. If adopted, this plan would leave the airlines responsible for deciding how to bring their fleets down to the required noise limits.

FAA has also proposed a rule which would prohibit any civil flight over the U.S. that would cause a sonic boom to reach the ground.

Agency people in Environmental Quality, Air

In a test of noise-abatement flight paths near Washington National Airport recently, William Hawkins (left) and management intern Dick Cullerton, both with the Office of Environmental Quality, measure noise in decibels and relate it to altitude, aircraft type and airline.



"In research and test programs, turbojet nacelles are being lined with acoustic materials to deaden noise," explained Dr. John Powers, EQ, holding a sample of liner material.

Traffic and Flight Standards have worked closely with the airlines in the last few years to develop safe noise abatement flight procedures. This means flying where the people aren't—or are fewer—as much as possible. Where the geography is helpful, these methods include approach and departure to and from airports over rivers, lakes, oceans or sparsely populated land. Runways are alternated for takeoff and landing (weather permitting) to avoid saturating the same areas with continual noise. A "Get-'Em-High-Earlier" program was launched by the agency in October 1970, allowing air traffic controllers to delay the descent of jets until they're fairly close to the airport area and to climb the planes quickly after takeoff. The pilots of 23 major airlines began the new "Get-'Em-High-Earlier" procedure last August at nearly all major airports in the country, under an agreement between the Air Transport Association of America and the FAA. Jet transports can make quick and quieter ascents over areas close to the airports by climbing at full power to 1,500 feet, reducing power slightly, climbing steeply to 3,000 feet, and then resuming normal climb out of the area. Extensive tests at NAFEC proved this method to be safe and effective.

Notwithstanding noise reduction from the engines and in the airplanes' flight paths, planning the use of land near airports is an essential third way of keeping jet noise away from people's ears, and vice-versa.

To help land-use planners identify what areas around airports and runways are exposed to certain levels of noise, the Office of Environmental Quality has developed diagrams of noise "footprints" made by different kinds of jets.

"Where the noise is severe, the land should be



The evolution of environmental planes: The 727 (above) smokes from all three engines on this takeoff before being retrofitted with a burner can to cut emissions; the DC-9 (right) is a "half-smoke"—one of its engines has been modified during its regular maintenance schedule; the 747 (far right) takes off virtually smoke-free because it was designed that way. In fact, all piston transports are far dirtier than this giant, which is also much quieter than the 727 and DC-9.

zoned only for certain kinds of industrial, commercial or recreational uses, and not for houses, apartments or motels," explained EQ's land specialist, Manny Balenzweig. "But the territory around most of the largest and busiest airports is a patchwork of different zoning authorities—towns, cities and so forth. This makes it difficult to work out a master plan for the land. The Federal Govern-



ment's main avenue in this area is the power of persuasion over local zoning. Houses, apartments and motels are still being built within earshot of airports where local laws allow it and there's land left. But now, many local governments have started to zone such land for more appropriate uses."

Some airports have taken the extreme and expensive step of buying out nearby landowners to create either uninhabited or non-residential buffer zones around the airports.

Some big, new airports are being built from scratch, offering the chance of planned development in the airport neighborhood. The Dallas-Fort Worth Regional Airport, opening next year, is the biggest—old or new. It will cover 18,000 acres, much of it prudently set aside as buffer areas where the noise will be greatest.

The agency's Southwest Region Airports Division helped several local governments in concert to work out suitable zoning and building codes around the huge, new airport.

Where airports are already in business, citizens' groups have brought an increasing number of legal challenges to restrict or stop jet operations. The FAA successfully defended itself recently against a lawsuit to keep jets out of Washington National Airport, which is run by the agency. In the trial, the court took note of the agency's noise abatement efforts at the airport and weighed public interest

in the airport against the annoyance it caused.

Second to noise is the problem of aircraft-engine emissions: smoke, carbon monoxide, hydrocarbons, oxides of nitrogen. The Environmental Protection Agency is charged with setting standards for aircraft emissions, the FAA with carrying them out. Both agencies are currently working very closely on this project. In early 1970, 31 major airlines, the FAA and the Department of Health, Education and Welfare hammered out an agreement whereby the airlines would voluntarily install smoke reduction devices on JT8-D engines, which power the bulk of the present jet fleet—727s, 737s and DC-9s. The program is on schedule and headed for virtual completion by the end of this year. Everything but engine power and oxides of nitrogen is reduced by the new "burner cans" after they're installed. With them, each engine spews out about six pounds less than its original 25 pounds of smoke and gases per takeoff, landing and taxi maneuvers.

"Environment is kind of a wild field," EQ Director Skully reflected. "It can get pretty emotional. But I think in aviation we've made excellent progress in the last few years, particularly in noise-abatement methods, in our rule-making and in the industry's new jumbo jets. We won't solve all the problems overnight. But things are getting better. And they're getting better faster."

—Text and photos by Don Braun



Fingering sites on a map of Washington for field measurement of aircraft sound are (left to right) Richard Skully, Director, Office of Environmental Quality; Seymour Horowitz, Office of Aviation Economics; and William Hawkins, EQ.

... Like it is!

HEALTH WILL COST LESS

Blue Cross-Blue Shield has agreed to pay Supplemental Benefits for diagnostic admissions to hospitals, reversing its former stand. Now, your hospital room, board and related medical care for diagnostic tests as a voluntary inpatient are covered subject to the deductible. For such care in 1971 and 1972, you can refile a claim to your local plan until Dec. 31, 1973. ■ The Administration is backing the Senate version on increased government contributions to Federal employee health insurance rather than the more liberal House bill. The Senate bill would have Uncle Sam paying 50% of the premiums by 1974. ■ The House Civil Service Insurance Subcommittee says there will be no increase in 1973 premiums for employees covered by Blue Cross-Blue Shield and Aetna.

SO MAY PENSIONS

Since the cost of the Civil Service Retirement Fund has dropped, Congress is expected to cut your contributions from 7% to 6.5%. ■ An IRS employee has filed a suit asking that salary deductions for pensions not be taxed until the employee has retired and is drawing the annuity. If he wins the case, you could file amended tax returns for the last three years to recoup the tax on the 7% of income withheld. ■ A bill has cleared the House Post Office-Civil Service Committee on the 80 retirement plan, whereby you could retire on an immediate pension when your age and years of service totaled 80. No additional deductions are entailed. A rider to it would permit employees in agencies with RIFs to retire with 25 years of service or if age 50 with 20 years of service. It still has the

Rules Committee to take a cut on it before a House vote, but backers are angling to see it on the President's desk before the election. The CSC chairman expects a veto if Congress approves the bill.

■ Rep. Jerome Waldie (D-Calif) has introduced a bill to pin the minimum Federal annuity to the minimum benefits under Social Security. A second bill by Waldie would provide increases to annuities to bring them up to a \$200 a month level.

RIGHTING WRONGS

A bill to waive repayment of back life-insurance premiums for Federal employees fired in error has cleared the House Post Office-Civil Service Committee. ■ The Comptroller General has ruled that agencies can restore sick leave lost due to agency error.

HATCHING RIGHTS

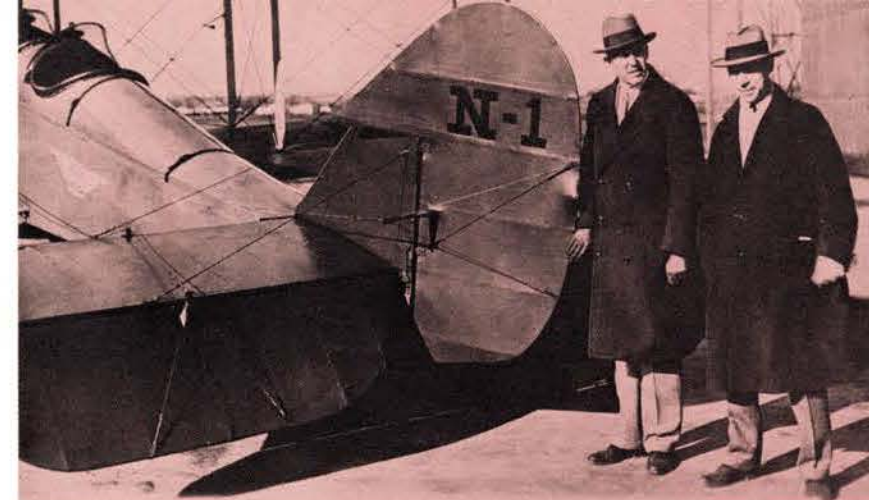
A 3-judge panel agreed with the National Assn. of Letter Carriers that the Hatch Act banning partisan political activity for most Federal employees was too broad and infringed on freedom of speech. The government is expected to appeal to the Supreme Court.

PAY-RAISE CHEER

A new law creates 5 within-grade pay steps in place of 3 for Federal blue-collar employees. Each additional step means a 4% raise. The law will be effective when the President lifts economic controls or when the controls expire automatically by April 30. The law also established a 7 1/2% night differential for the first shift and 10% for the second shift. ■ BLS figures suggest that Federal white-collar employees will get a 5.14% pay raise in January.

The Job Aloft

FAA's air arm has a diversified mission



In 1927, the agency acquired its first plane, this two-place De-Havilland DH4B, a former mail plane. Standing by the tail are (from left) William P. MacCracken, Jr., the first Assistant Secretary of Commerce for Aeronautics and his deputy, Clarence Young, who later became Director of Aeronautics.

Safety of the airways is our mission. Service to men in flight is our business. FAAers can't do these jobs by staying on the ground exclusively. Agency pilots "go flying" for a number of reasons—among them, to check navigation aids, to improve their own proficiency or to learn the ins and outs of new aircraft.

FAAers also use planes to carry needed equipment to out of the way places and to carry personnel to places where they are needed.

On the following pages you can see some of the aircraft used to do the airborne job for the FAA. These do not represent all the planes owned by the agency, but they are typical of the bright red, black and silver fleet.

In all, the agency owns 81 aircraft, ranging from the 5,000-pound Beechcraft Baron light twin to the four jet KC-135, which is modified from the military tanker aircraft similar to the Boeing 707.

They are based from Brussels to Tokyo. Generally, the planes used for training are based at the Aeronautical Center, while research and development planes are found at NAFEC. Flight inspection planes—comprising more than half the FAA fleet—are based in all regions and overseas, virtually anywhere there are nav aids to check.

The jets used regularly by commercial carriers

The agency's latest addition is the McDonnell-Douglas DC-9 used for training missions at the Aeronautical Center.



are well represented in the agency fleet. For instance, FAA N-127 is a Boeing 727 while N-96 is a Boeing 720. And the agency's latest acquisition is the McDonnell/Douglas DC-9. All three of these planes are airline workhorses.

Another new plane acquired on a lease basis to do a specific job is the agency's first Short Take Off and Landing aircraft, FAA STOL-1. This plane is being used to help test all aspects of STOL operations including requirements for airports and accompanying nav aids and landing systems as well as noise suppression and crew training.

A careful look at the list of active FAA aircraft shows that more than half the planes are the reliable DC-3s, the first of which appeared on the agency's aircraft inventory list over 30 years ago. Of the 47 "Dizzy Threes," or "Gooney Birds," as the venerable planes are variously called, 42 are used for flight inspection. Day after day, week after week and year after year, FAA pilots fly these planes along the nation's airways checking en route and terminal nav aids to make sure they are functioning properly.

Although the threes have served the agency well—as they have served all aviation well—there are plans afoot to replace these planes with light twin jets that can do the job faster, easier and more economically.

These then are some of the planes and some of the tasks that FAA pilots are doing and have been doing since the agency's first "N-1" was assigned to the Department of Commerce Aeronautical Branch. This was a two-place, open-cockpit DeHavilland DH4B biplane. It was a former mail plane converted for the use of the first "administrator," William P. MacCracken, Jr., who accepted the plane in January 1927 at Bolling Field near Washington.

Since that time the agency has had a series of N-1 aircraft that have reflected the evolution of aircraft

design, until today N-1 is a sleek, medium-sized 500-mile-an-hour Lockheed Jetstar.

Although the missions of the balanced fleet of FAA planes is pretty well set: flight inspection, training, proficiency checks, logistics and personnel transportation, over the years agency planes have been called upon to show their stuff when the chips were down.

FAA planes have diverted from their various missions to search for downed aircraft, help curtail

narcotic smuggling and carry supplies to disaster-stricken areas. For instance, during the aftermath of the recent hurricane Agnes, an agency DC-3 was on the job carrying medicine and food to the disaster area.

As a matter of fact, whenever FAA's flight-inspection aircraft are doing their job aloft, their radios are tuned in to emergency frequencies just in case they are called upon to help someone in trouble.

—By Theodore Maher

1. The two-place Lockheed TV-2 jet is used primarily for air-traffic evaluation. It is based at the Aeronautical Center.

2. Participating in both flight-inspection and logistic missions is this L-188 Lockheed Electra, based in the Pacific Region.

3. Leased to test STOL operations around the country is this DeHavilland Twin Otter.

4. Like this aircraft from one of the regions, most of the agency's Douglas DC-3s are used for flight inspection.

5. Based at the Aeronautical Center and used for training is the big four-jet Boeing-720.

6. The Grumman Gulfstream, hangared in Washington, is used as a personnel transport.

7. The Washington-based Beechcraft Queen-air is used primarily as a personnel transport.

8. The three-jet-engine Boeing-727 is used for training purposes at the Aero Center.

9. This Aero Commander twin-prop plane is used for research and development at NAFEC.

10. The Fairchild-123 is used to transport supplies in the far-flung Alaskan Region.

11. Research and development is the mission of the Convair-880, which is at NAFEC.

12. The agency has under lease five North American Sabreliner light-twin jets used for flight inspection. The one pictured is based in Tokyo, Japan.

13. The twin-engine Convair T-29 is used as a flight-inspection aircraft in Europe.

14. Today's N-1 is a sleek Lockheed Jetstar.

FAA PLANES



3



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11



14

A BIG STEP UPWARD

Twenty-six young men and women from FAA and other Federal agencies studied air traffic together, though none of them had had any ATC experience. What they had in common was a desire to better themselves, and FAA was providing the vehicle for them.

Their class this summer was the result of FAA's outreach and inreaching through the 150 Program to bring more minority people and women into more meaningful jobs, especially the technical occupations. As student Alma Poole related, her "opportunities were limited, and I found myself in a job that was monotonous. I grabbed at this chance for a challenging job." She had been an IRS tax examiner telephone specialist.

The need to bring more women into meaningful jobs and satisfy the agency's commitment to upward mobility concerned personnel management specialist Gwen Riley and Kathryn Vitek, the Federal

Trying out a radar controller's position is Bernice Campbell, while other members of the 150 class look on: Horace Wesley, Chris Osborne, Alma Poole and Mike Millen.



Women's Program coordinator. It seemed to them that the logical means to promote both efforts was the 150 Program that would train controllers and electronic technicians at the GS-4 level.

Through the cooperation of the Office of Civil Rights and the Office of Personnel, persons in dead-end jobs were sought through the regional manpower offices to take advantage of the new opportunity. Non-competitive air-traffic tests were set up this spring and informational sessions held for interested people, among whom were non-FAAers.

As a result of these efforts, 11 members of the summer 150 class at the Aeronautical Center were women, nearly double the number of any previous class. Five—both men and women—had been simulator operators at NAFEC, which had given them good backgrounds for an air-traffic option. Now, a study is being made on providing the upward-mobility option for all air-traffic simulator operators.

"The 150 Program fills the gap for those who don't have the knowledge to enter the air-traffic field," explained Art Washburn, Jr., chief of the Initial Qualification Training Section at the Aeronautical Center. "It's a preparatory course for regular training. It carries the students at a pace at which they can orient and learn the basics, instead of plunging right in as the competitive entrants do."

The success of the design is apparent in talking to the students. Chris Osborne, who had worked in the Western Region personnel office, said, "I find the course very interesting, and I'm very pleased with the way the students are encouraged." Her sentiments were echoed by Mike Millen, who had come into the program upon his discharge from the Air Force, where he had applied for "Project Transition" in which he studied ATC and FSS work for six weeks. "The course seems like good preparation," he said. "It provides insights into what's to come."

For the most part, the Federal employees entering the program are GS-2s through 5s. Upon acceptance, they receive GS-4 grades; when they complete

the 17-week intensive training course at the FAA Academy, they go to their assigned facilities as ATC specialists for regular career progression.

Career or career-conditional employees or those who qualify for an appointment under the Veterans Readjustment Authority (VRA) can be tested non-competitively on the Air Traffic Aptitude Examination. All candidates must be under the age of 31, pass rigid physicals and have two years of general experience or substitutable education. The 150 students are selected from the ATCS register or enter via the VRA, inter- or intra-agency transfer or reinstatement routes.

The course of study indoctrinates the students with a broad knowledge of aviation activities, educational experiences and technical knowledge, along with the attitudinal qualities needed in individual and team-oriented air-traffic work. At the outset, they study Communications to improve their competency in verbal presentation and written commu-



Introducing some members of the class to the Aero Center's mockup of a flight service station is Art Washburn (right), chief of the Initial Qualification Training Section. The students are (left to right) Mike Millen, late of the Air Force; Alma Poole from IRS, Bernice Campbell (partly hidden) from the post office; Chris Osborne from Western Region personnel; Horace Wesley from NAFEC; and Sharon Smallwood (seated) from the Aeronautical Center.

nications; Social Studies in Aviation, which involves the history of aviation, the role of the FAA and aviation's impact on modern society; Human Relations and Facility Management, for developing attitudes toward the agency and co-workers and an increasing awareness of self; Mathematics; Computer Theory; and the basic air-traffic studies.

Mike Millen's reaction to all this was, "If instruction at the facilities is as good as it is at the Aero Center, we've got it made."



Is there a move in your future? Are you planning a vacation away from home? Do you have a house you wish to sell-rent-buy? This column is your stepping stone to planning ahead. If your home will be up for sale, another FAAer coming your way might be a likely customer. A home advertised from your future post is the place to look into first on your free house-hunting trip. A mountain retreat may be just the ticket for vacationing flatlanders, or a beach house for the land-locked . . . and you can arrange for it before you slam the car door. Do you have an airplane to sell? An FAAer within flying distance may be looking for you.

This free service is open to principals only. Send your ad with address and phone number, including the area code, to "Mobility Gulch," FAA WORLD, 800 Independence Ave. SW, Washington, D.C. 20591.

River Park co-op apartment for sale in Southwest Washington, 10-15 minutes walk from FAA; 2 bedrooms, 2 baths, all modern with swimming pool, day-care center, wood and metal shop; \$5,700 down with 8% return. \$244 per month including principal, interest, utilities and maintenance—43% tax deductible. Call 202-484-3180 for Apt. 349 South.

Chesapeake Ranch Club lot at Drum Point, Va., for sale, 1 hour from Washington; 100x150 feet, wooded and level; club has adult and teenage clubhouses, golf course, swimming pool, tennis courts, 2 beaches on Chesapeake Bay and one on a fresh-water lake, 2 marinas, 2400-foot landing strip, own water system, police and security system; asking \$6,500. Call 301-577-1486.

Rambler for rent on 2-year lease; 3 bedrooms, 2 baths, ¾ acre, fenced, private swimming pool, attractively landscaped frontage on Occoquan River in Virginia, 45 minutes from FAA. Call 703-494-6650. Reasonable rental.



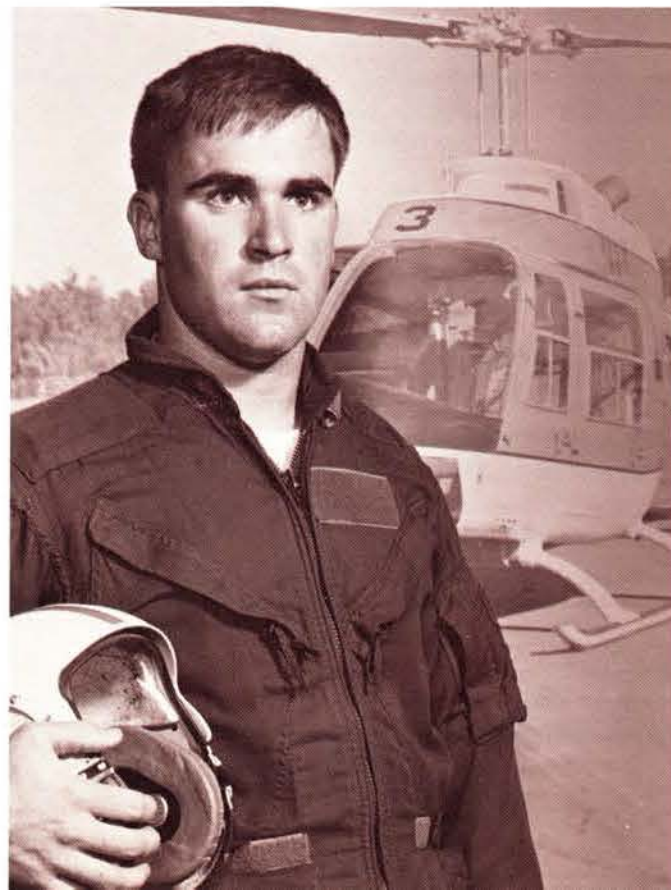
YOUNG EDITORS—Planning the first issue of the Southern Region's Student Aid newsletter, Southern Runway, are (left to right) Phyllis Bubel, Bill Bramlett, Barbara McDevitt, Ronald Seay, Linda Lewis and David Ellis.

FACES AND PLACES

A GO-GETTER—Volunteering to install cables for computers for the AF Sector at the Salt Lake Center was computer operator Lila Fielden, here working with CCC technician Merlin Fryer. Ms. Fielden holds a multi-engine pilot's license, was a Powder Puff Derby entrant and is taking a Directed Study course on airframes.



DOUBLE JOY—Tim Beeton, son of Art Beeton, senior FAA rep in Frankfurt, Germany, graduated from the Naval Air School, Pensacola, Fla., the fourth in his family to do so. In the morning, his wife pinned on his wings; in the evening, she presented him with their second son.



BOTTLED HISTORY—Old bottles tell tales of history and drinking habits of our forbears and make a fascinating hobby for Mary Gentile and her husband, Dom. Mrs. Gentile is an administrative assistant in the Airway Facilities Program Planning Branch in the New England Region headquarters.



HEADSIDE MANNER—ATCS Rhevis (Rev) Cothran of the Talkeetna, Alaska, FSS is the town's unofficial and only barber. Starting off with it only as an avocation, Cothran now owns three-quarters of the heads in the 150-resident town.



FRUITS OF VICTORY—The AT and AF chiefs of the Jacksonville and Oakland Centers bet a crate of Florida oranges against a crate of California oranges on Savings Bond campaign participation. Jerry Lamper, technician-in-depth (left) and controller Kermit Nourse display their Florida oranges prize in Oakland.



THE LONG HAUL—Retiring with 40 years of Federal service was Linne Ahlberg, chief of Southwest's Budget Div., here receiving the FAA Meritorious Service Award from James E. Dow, then Director of Budget, now Associate Administrator for Administration.

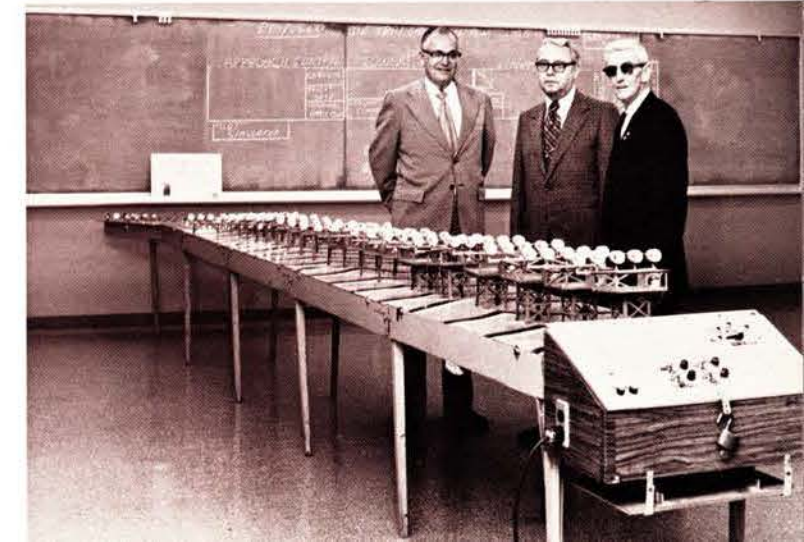


EXPERIENCED BEGINNER—Carolyn Ellis is the Southern Region's first DOT intern, a position classification specialist in the Compensation Branch, Manpower Div. She has worked in several DOT modal agencies, most recently as a staffing specialist in Headquarters Personnel. She consults with Billy Little of the Compensation Branch.

NEW CHIEF—John B. Roach (right) gets the glad hand from New England's Flight Standards chief Paul Baker on Roach's appointment as chief of Logan Airport's Air Carrier District Office, the first Black to head up a Flight Standards field facility office worldwide. He came from Pittsburgh's Air Carrier District Office.



BRIGHT GIFT—Dave Kimball (right), Bakersfield, Calif., AFFO, and his supervisor Grover Palmer (left) presented a working model of the Meadows Field light lane to Dr. Thomas O'Connor of Mt. San Antonio College. Kimball spent three years building it from pinball machine parts, a record player motor, aerosol caps and hundreds of feet of wire.



A center within a center. These are the simulators' problem-giver positions. The black gloves and ceiling panels obscure the blip-manipulators' presence.

SCRATCH-BUILDING A SIMULATOR

It was said that American ingenuity won the Second World War. It's also ingenuity that can win the battle of the budget, specialists in the training department at the Indianapolis Center realized. To help trainees get rid of the butterflies before they handle the real flies, evaluation proficiency development officer Walter Kaestner and specialist Robert Schaaf devised a simulator that cost under \$1,000 and some sweat.

While NAFEC and the Aeronautical Center have more sophisticated simulators, field facilities have neither the funds nor manpower for such training equipment—nor is it the center's intention to make a radar controller on this homebuilt; but it can help with familiarization, conquer mike fright and refine the trainee's knowledge of phraseology and separation standards.

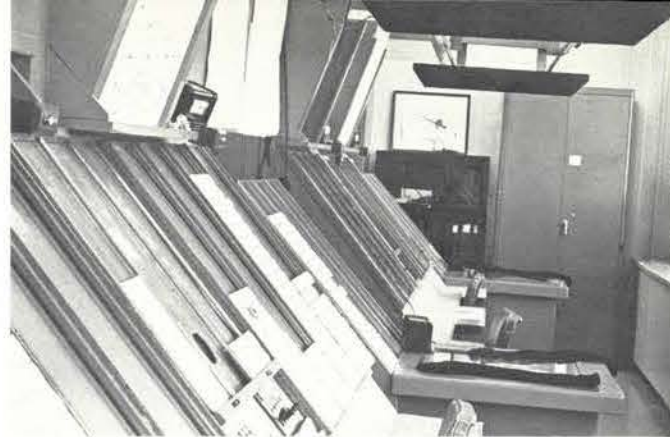
The ingredients of the simulator are plywood, a mirror, black cloth, a 10-second timing light, plexiglass, elbow-length black gloves, bathroom tissue, a video camera and a television receiver.

The simulator operators sit at a glass "scope" wearing black gloves under a black cloth ceiling. The aircraft they push are pieces of transparent plastic with marks on them to simulate aircraft blips. An irregularly torn piece of bathroom tissue appears to the trainee like an impassible line of thunderstorms. These images are reflected onto a 45-degree-angled mirror in front of the video camera, which records the problem on the trainee's television-receiver radar scope. Covered with green plexiglass, the TV monitor is illuminated for 10 seconds at a time, all designed to create a semblance of realism.

Three operators are used with each simulator—one acts as a pilot; the others push the blips. The maximum number of aircraft that can be handled is four or five per problem-giver, providing eight to 10 planes per student. The student uses shrimp boats to keep track of his targets.

The Great Lakes Region is highly enthusiastic about this simple, low-cost tool and hopes to expand the idea to other centers in the region. But if it's working in Indianapolis, why not put it to work around the country? A lot of people in air traffic may be thinking this one over.

—By Jerome Solkiewicz



It looks like the real thing, so controller trainees can work up a mighty sweat while involved in air-traffic problems at this TV-monitor control position.

faables



"WELL I'LL BE DAMN'D!!"



At home near performers like Walt Pierce's 450-hp Stearman biplane is Aviation Medicine's Dr. Stanley Mohler.

CONQUERING THE G FORCES

There we were—seated side-by-side at 5,000 feet over the lush, green Wisconsin countryside, with blue Lake Winnebago sparkling to the east. The sturdy new "Wichawk" biplane, like a miniature Stearman, was cruising at 127 miles an hour, with the wind whipping by our helmeted faces.

A newcomer to the language of the topsy-turvy set of pilots, I nevertheless knew the stressing of this 180 horsepower sport plane was beyond FAA's aerobatic limits—to 12 positive Gs and 6 negative Gs. The pilot could wrench it around at will and it could withstand a dozen times its own weight. As for the negative Gs, I was aware that one's blood and body organs—the heart, liver and intestines—tend to move toward one's head. Either way, a novice could be made temporarily unconscious. My briefing on this came from Dr. Stanley R. Mohler's recent paper, "G Effects on the Pilot During Aerobatics."

Suddenly, the pilot pushed the biplane's nose down into a 70 degree dive. Roaring groundward, we were briefly at zero gravity, my body registering no weight at all for the next few heart-pounding seconds. Then we started pulling out of the dive, our blood and body organs pooling toward the lower

body. For a second, we registered six positive Gs, followed by several seconds at four positive Gs.

"What's that 'Valsalva Technique' to increase G tolerance—hold the breath and try to expel it, but don't actually exhale?" I asked myself. Before I could figure it out, I "grayed out" losing vision temporarily, followed by a temporary blackout.

Coming to, I saw we were indeed over Wisconsin, straight and level, heading for a landing at Oshkosh's Wittman Field for a RON (remain overnight) at the 20th annual Experimental Aircraft Association Convention and Fly-In, but we weren't in a biplane! In my hands were Dr. Mohler's 26-page paper and a copy of EAA's daydream-producing magazine, *Sport Aviation*, opened to an article about building one's own Wichawk biplane (so named because it was designed in Wichita). I had had a nice snooze, and the realistic dream had ended.

This plane was one of the agency's Beech Kingairs, piloted by Assistant Administrator for General Aviation John L. Baker. Dr. Mohler, chief of the Aeromedical Applications Division, Office of Aviation Medicine, seated opposite me in the first passenger seat, was bringing his technical paper for presentation to the sport aviators at their week-long con-

clave of lectures, fly-bys, workshops and static displays. Another passenger was former accident prevention counselor Willard L. (Pete) Pederson, now with General Aviation at headquarters and on EAA's agenda to address the homebuilders on safety aspects. Our co-pilot was David West, Special Assistant to the Deputy Assistant Administrator for General Aviation.

During the three-hour flight from Washington to Oshkosh, Dr. Mohler had filled me in on the way sport, precision and competitive aerobatics are enjoying a "rebirth of interest exceeding that of the 1930s."

He also showed me a curtly reported item covering a fatality to the pilot of a Citabria (that's air-batic spelled backwards, and a production-line plane anyone can purchase). The item was from the telegraphic accident notification, which keeps the agency's offices informed of the daily "bad news" that threatens safety records.

"That pilot was probably practicing an aerobatic maneuver and blacked out under G forces," Dr. Mohler said. "There are plenty of books on how to do precision flying, but since World War II there has been very little published for civilian pilots on the nature of G forces and human physiology in relation to them."

Dr. Mohler's paper should be "must" reading for all instructors as well as students, since—as in sport parachuting—there are precious few seconds in which to correct mistakes before disaster. A blackout at the wrong time could cause the novice aerobatic pilot to fly right into the ground.

"The late maestro of aerobatics, Beverly E. (Bevo) Howard, entertained the public in his Bucker Jungmeister for 35 years," Dr. Mohler said. "Howard said no pilot should perform low to the ground unless he first could fly a hundred slow rolls at altitude without losing an inch during any one of them."

"Bevo kept in condition by swimming; Scotty

Looking over the partially completed panel of a Great Lakes aerobatic biplane, Dr. Mohler and EAA Washington representative David Scott (left) discuss the popularity of learning precision flying in properly stressed planes. The Great Lakes craft, a favorite of the 1930s, has recently been recertified by FAA for assembly-line production.



Pointing to a G meter he bought for \$20 for his personal collection of instruments, Dr. Mohler shows Office of General Aviation Special Assistant David West how aerobatic pilots can use the instrument. The meter's three hands point to the plane's maximum positive and negative G limits and instantaneous G force (9 o'clock position).

McCray, the glider showman, doesn't smoke and does push-ups daily," Dr. Mohler told me. "The necessity for maintaining good physical conditioning and health is obvious."

After our twin-engine plane landed at Oshkosh, Dr. Mohler met famous aerobatic pilot Duane Cole, author of numerous books on precision flying. Cole was intrigued by Dr. Mohler's upcoming presentation. After talking about the paper, Cole set up a supplementary meeting with his fellow performers to discuss G effects with the FAA doctor.

Humorous highlights in Dr. Mohler's paper include historical references to "the batman," a pilot who prepared for negative G aerobatics by hanging upside-down in his garage in an effort to increase his tolerances. (It did help a little). Another item that boggles the mind is that Charles (Speed) Holman in 1928 performed 1,453 consecutive loops at St. Paul, Minn., taking five hours to do them.

Many of the bad effects from aerobatics are overcome through practice, Dr. Mohler points out. For one, getting the inner ear's semicircular canals in the habit seems to take care of initial problems.

Another interesting point is that older pilots have one advantage over younger ones, as far as the aorta (main artery from the heart) and carotid arteries (supplying the head) are concerned. Stretchable arteries in younger people permit the blood to bulge the walls, while the older fellows have, as it were, a built-in G suit that restricts blood flow.

As we flew back to Washington, I realized that if "the field of aerobatics for the experienced pilot is the true elixir of flight," Dr. Mohler's paper will be a bible for instructors and students and performers. Too many pilots have been lost through inadequate knowledge of the stresses in aerobatic flight. Their lives definitely depend on knowing this gospel.

—Text and photos by Thom Hook; drawings by Dick Hansen

Highlights of Aerobatics Study

One positive G represents the strength of gravity's pull, which accelerates a mass toward the earth's center. If an aerobatic maneuver imposes a positive G load, it is referred to as an "inside" maneuver; if it's a negative G load, it is an "outside" maneuver.

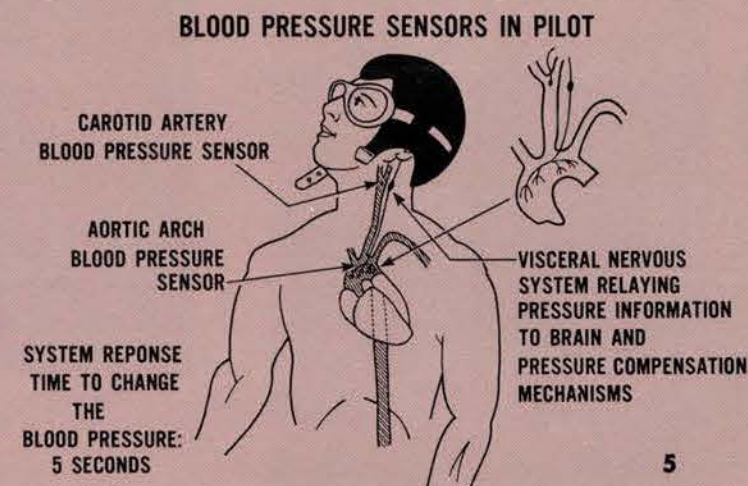
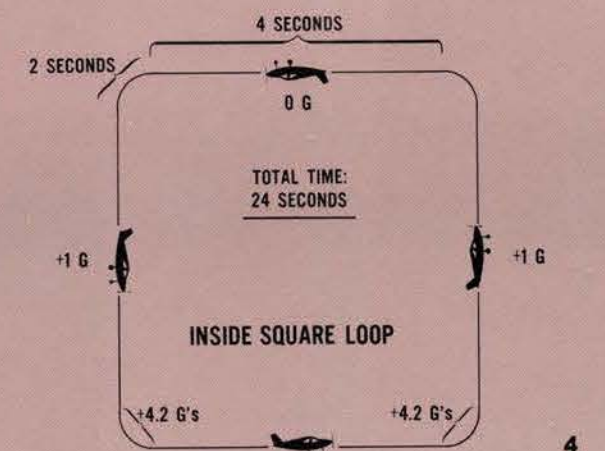
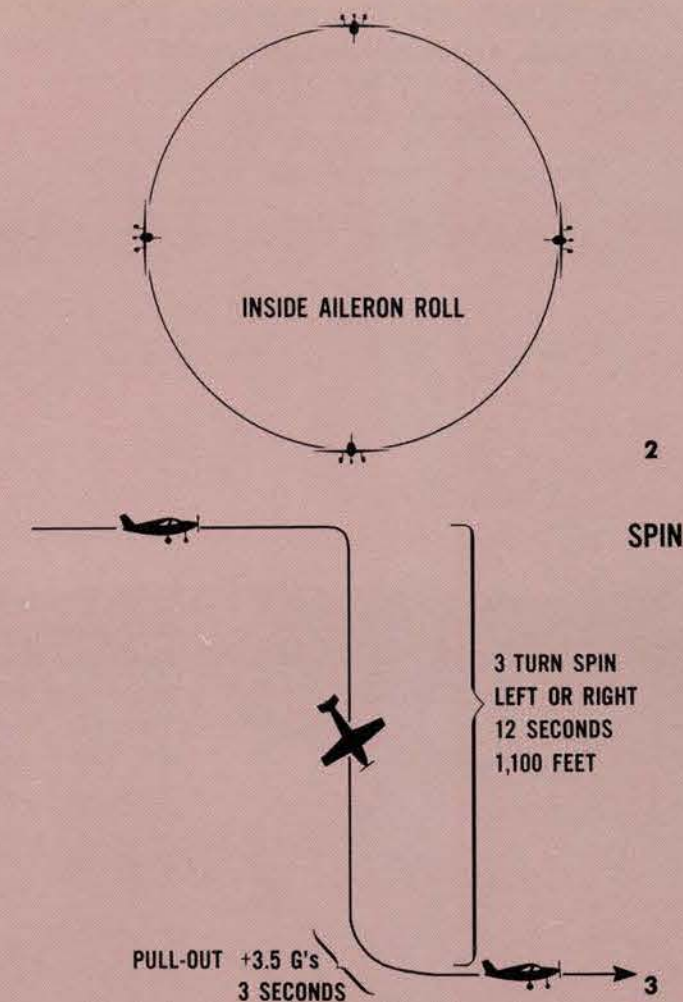
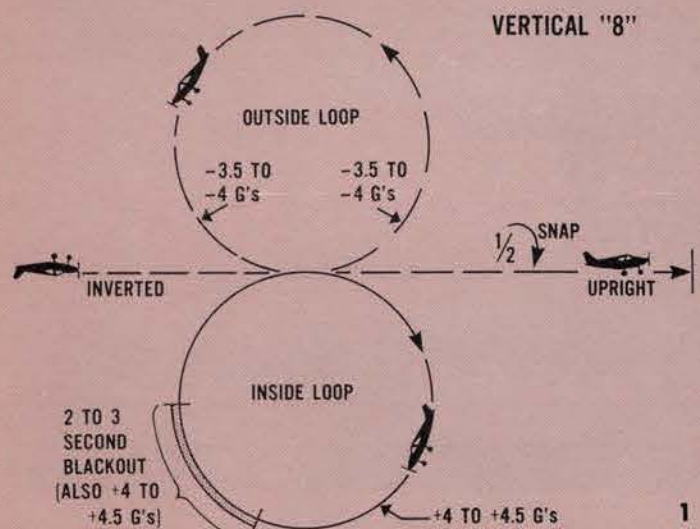
1 This competitive maneuver is very stressful from physiological as well as aerodynamic standpoints—tough on pilot and plane. Dr. Mohler's paper explains that if the experienced pilot begins this "Vertical Eight" rightside-up instead of inverted, he won't black out in the 7-9 o'clock area—but he will win fewer points for doing it the easier way.

2 An inside aileron roll, performed to the left or to the right, requires only six seconds to complete and results in a maximum stress of 2.5 positive Gs. Dr. Mohler suggests that it is perhaps the best maneuver to use when introducing a novice to aerobatics.

3 The average novice aerobatic student will "gray out"—have loss of vision due to decreased blood flow through the brain and retina—at 3.5 positive Gs. A three-turn spin, consuming 1,100 feet in 12 seconds, produces 3.5 positive Gs in the pull-out for three seconds. Starting spins at a safe altitude is imperative under these conditions.

4 A 170-pound pilot will weigh 714 pounds during 4.2 positive Gs and will black out if unprepared at the heavy stress points of an inside square loop. Zero Gs at the top is for a plane without an inverted fuel-flow and oil system for inverted flight, since the upper leg actually approximates a free fall.

5 Aerobatic pilots should be familiar with the physiological mechanisms that compensate for the G force imposed when they perform loops, snap rolls, lomcevak and other maneuvers. At one negative G, the heart, liver and intestines move toward the pilot's head. There is a limit to the time a pilot can withstand this force before losing consciousness.



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What happens to a guy up there when he stresses both man and plane in derring-do? Dr. Stanley Mohler of Aviation Medicine presented the results of his study on this subject to sport aviators at the annual meeting of the Experimental Aircraft Association. Learn about Dr. Mohler's findings in the story on page 17.

