

MAY 1975

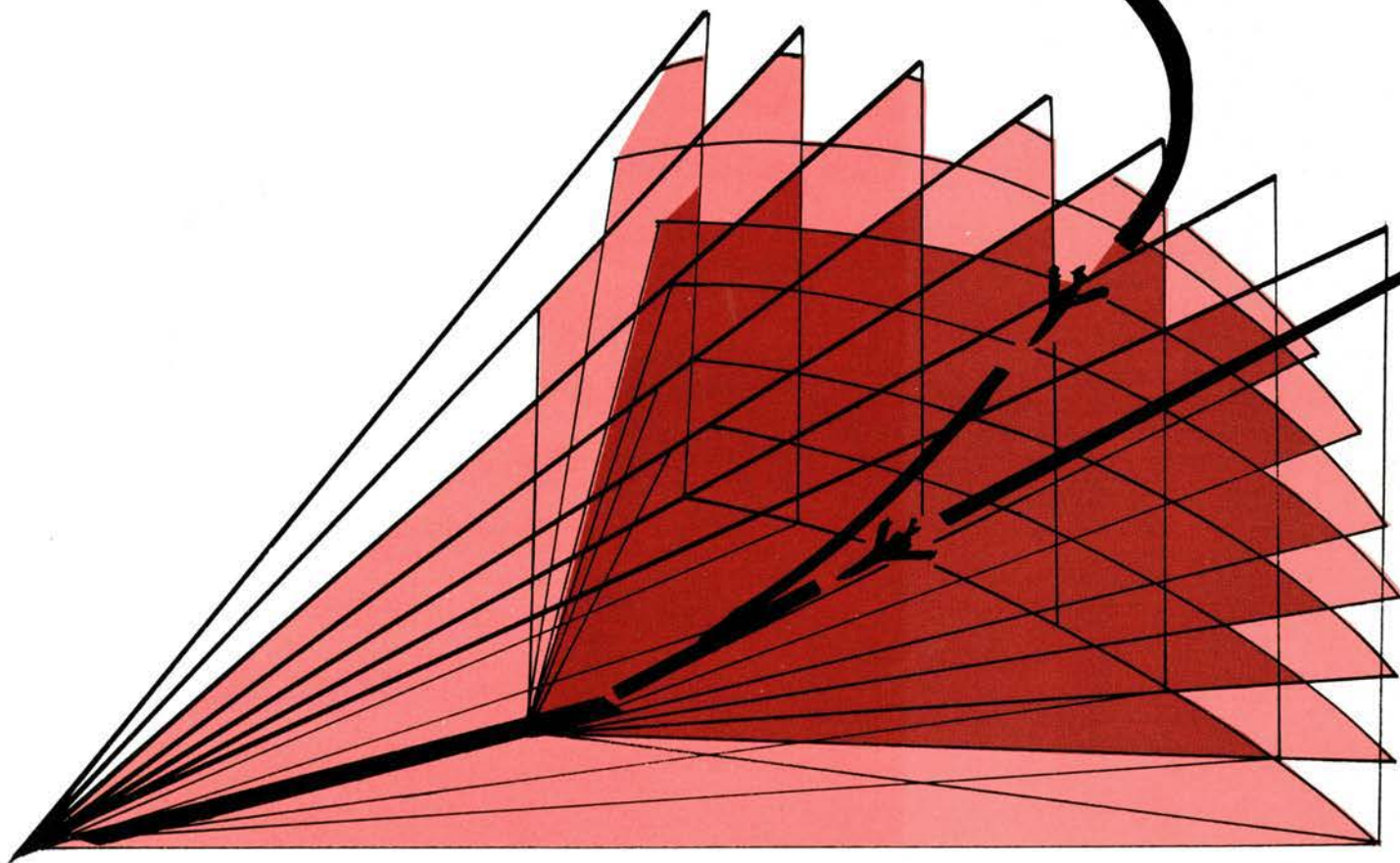
# FAA WORLD

*Service to Man in Flight*



## MLS--

## Wave of the Future





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The cover: The wave of the future is an all-weather, all-terrain, 200-channel landing system that will increase airport capacity.



## A Need for Timely Decisions

The problems we face as a nation do not afford us the luxury of long periods to arrive at solutions. The same holds true for the FAA in keeping pace with the needs of the aviation subsystem of our national transportation system.

Now is the time when a number of decisions and implementing actions can contribute significantly to safety and efficiency for the American public and the aviation community. In many cases, we have the technical information, or access to it, and the wherewithal to act. What will make the difference is our "top to bottom" commitment to act with dispatch, although some of us may have to change our thinking and way of doing business.

We must, for example, order the priorities of our work in terms of timeliness; those of us in the same building must cross the hall for "face to face" talks, instead of corresponding with each other; we must get pertinent information but limit studies and meetings to the minimum.

After assimilating all the necessary facts in a short period, we must have the intellectual courage not to procrastinate by stretching that time to obtain additional information that really may not contribute more to the solution.

Our approach to the problems should be with a view to optimizing the solutions, so they may solve not only the problems at hand but also similar ones in the future.

Some of this may seem elementary and repetitive, but it's the little things that count and bear repeating. Doing our job with commitment will make not only good solutions but also timely ones, and this will enhance our service to all.

My personal commitment—as well as yours—to this need for timely decision-making will produce, I believe, a deep sense of satisfaction in a job well done.

*James E. Dow*

JAMES E. DOW  
Acting Administrator



## MLS-- Wave of the Future

NAFEC is testing MLS scanning-beam equipment, which requires three sites along the runway. This is the glide-slope equipment, consisting of (from the left) an antenna, an equipment shelter and a power transformer.

Landing has always been the trickiest part of flying. For many years, the Instrument Landing System (ILS) has been the most widely used method—other than eyeballing—to help pilots find their way back to the ground. It has performed well, but a better system is coming: The Microwave Landing System (MLS).

In late February, an inter-agency group put the seal of approval on FAA's four-month marathon evaluation of what kind of MLS to develop by endorsing a recommendation to go with a "time reference scanning beam" system. A thick document containing test results and a technical description of the system will be submitted by this July to the International Civil Aviation Organization, which is conducting a competition among the U.S., Britain, France and Australia for selection of an international standard microwave landing system. ICAO is expected to pick the winner by mid-1976. The first systems could go into operation in 1978. FAA officials foresee a need for perhaps 1,600 installations by the year 2000.

MLS is expected to solve the three major problems of ILS—signal interference from airport buildings and surrounding terrain, the single landing approach that limits the flow of traffic and radio-frequency congestion.

The 475 ILSs now in use or under construction are based on designs developed before World War II and adopted by ICAO in 1949. Despite longtime yeoman service, ILS's inherent weaknesses will become even more of a problem as air traffic con-

tinues to grow in the last quarter of this century.

Ten percent of the ILS systems now in service are considered substandard solely because of terrain interference. Lower radio frequencies make ILS more susceptible to reflections off hangars, aircraft and surrounding hills, often resulting in runway closings from this electromagnetic interference when visibility is poor.

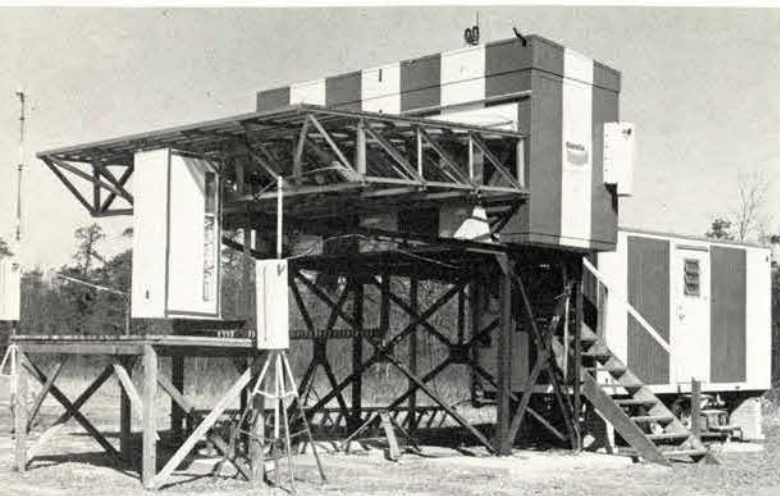
Under ILS, pilots must steer a straight approach and their glide slope is fixed at about three degrees—in effect, stringing out incoming planes.

Finally, ILS uses 20 radio frequencies—with a total of 40 available—but future demands are likely to outstrip this capability.

MLS is less susceptible to terrain interference and will have 200 radio channels available to it. It will offer a choice of glide-slope angles ranging up to 20 degrees, permitting a two-segment approach with greater safety. The two-segment approach, now under consideration by FAA, would keep aircraft farther from the ground for a longer time during landing approaches to further reduce noise impact near airports or avoid obstructions.

Adding to its versatility, MLS will permit the long-sought curved approach to a runway. Thus, the circus elephants of the sky—the long nose-to-tail strings of aircraft on landing approaches—finally can be dispersed. Pilots will no longer need to align aircraft with a runway many miles out. All types of aircraft—whether jetliners, short-take-off-and-landing craft or general aviation planes—will be able to approach the runway at angles up to 40 degrees





The azimuth site at NAFEC includes a counterpoise (left), the antenna system and an equipment shelter.

on either side, allowing less separation without compromising safety. Thus, by providing multiple approach paths, MLS will help increase the capacity of airports to handle incoming flights.

Although preliminary MLS efforts date back to the 1950s, the real watershed was reached in 1970 when the Radio Technical Commission for Aeronautics (RTCA), after long consultation with experts in the field, issued specifications for the kind of MLS now under development.

This led to the formation of a Joint Planning Group from the Departments of Transportation and Defense and the National Aeronautics and Space Administration, which prepared the National Plan for Development of the Microwave Landing System in July 1971. This plan outlined a five-year program to provide a common civil/military MLS to meet the RTCA requirements. The plan named FAA as the agency for managing industry development.

FAA mounted a three-phase program to bring MLS to fruition. Phase I, an investigation of basic engineering design, began in January 1972. This phase confirmed that critical technical problems could be solved and that two candidate MLS techniques, scanning beam and Doppler, had the potential to satisfy all operational requirements.

In Phase II, four companies began working on the two types of MLS under FAA contracts worth \$15.5 million. Texas Instruments, Inc., and the Bendix Corp. separately developed the scanning-beam system. The Gilfillan Division of ITT Corp. and the Hazeltine Corp. developed the Doppler scanning technique.

The scanning-beam system sweeps two narrow radio beams across the sky—one, from side to side; the other, up and down. The aircraft measures the elapsed time between successive passes by both the

horizontal and vertical beams to determine the plane's angular position from the runway and its position on the glideslope. This is what the phrase "time reference" means. In the Doppler system, the aircraft uses the difference between the received frequency and a reference frequency to determine its position.

At the end of Phase II, flight tests were conducted with pre-prototype models of both MLS types at NAFEC and Wallops Island, Va. These tests were completed last July.

At this juncture between Phase II and Phase III came the crucial decision on which scanning technique to employ. Both systems performed well in Phase II tests, making the decision especially difficult. To make the choice, FAA brought together about 120 experts from its own ranks and from other government agencies, the military and other nations engaged in MLS development.

Dubbed the "Central Assessment Group," this core of specialists met in Washington from last



Another glide-slope antenna and equipment shelter provides a signal for flare out and touch down on instruments.

August to December and was divided into subgroups to weigh the two techniques and to look at costs, performance, implementation and integrity. The group was headed by Joseph Del Balzo, chief of the Microwave Landing System Division in the Systems Research and Development Service, who also served as chairman of a 17-man steering committee that pondered the judgments of the various assessment subgroups.

Public status reports and a free flow of information among the various subgroups marked this selection process. "Usually, a government evaluation team goes into hiding," Del Balzo said. "Its members weigh the matter, reach a decision and then an-

nounce it. Nobody really knows how and why the decision was made. We wanted to keep this decision-making process as open as possible."

In charge of the scanning-beam group was George Haroules of the Transportation Systems Center; Lt. Col. Douglas Vickers of the MLS Division led the Doppler group. Other subgroups dealing with the evaluation factors were headed by Jack Edwards and Seymour Everett of the MLS Division and John Reed and George Pickard of the Airway Facilities Service's NavAids/Communications Division and Maintenance Program Division, respectively.

In late December, the steering committee voted nine to six to recommend use of the scanning-beam system. The scanning-beam and Doppler systems were so close in the quality of their performance that two committee members abstained, offering to accept the decision of the majority. The choice fell to the scanning beam on the basis of its 12 percent lower cost, lower power consumption and less crowding of available radio frequencies.

One more step still had to be taken for a final decision on which technique to use. This lay with the inter-agency MLS Executive Committee which had the final say in the matter. The committee was chaired by David Israel, FAA's Deputy Associate Administrator for Engineering and Development, and included George Webber from the Office of the Secretary of Transportation and representatives from the Department of Defense and NASA.

Because of the small performance differences between the scanning-beam and Doppler systems, nearly two months of industry-government discussion ensued over the steering committee's recommendation, while the MLS Executive Committee pondered the final decision.

After carefully reviewing the data, the executive committee decided in late February to uphold the steering committee's recommendation, thus officially putting the U.S. eggs into the scanning-beam basket.



NAFEC test pilot John Ryan adjusts his ILS-VOR cross-pointer display that can be switched for MLS or ILS.

FAA then prepared to launch Phase III, which involves the building of prototypes by Texas Instruments and Bendix, the companies which developed the scanning-beam design. Work on some of the prototype versions of MLS, such as Category III (all-weather) and military systems, will be divided between the contractors, while both companies will design basic and small-airport versions. FAA plans to have one of the basic prototypes in operation early in 1976, before ICAO makes its decision on a world-wide standard MLS.

The U.S., of course, hopes ICAO will pick the American design. If that happens, American companies will go into production and license other domestic and foreign companies to build the systems, as well.

Then at last, the long journey to an international standard MLS will be over, and the promise of a better way to get back on the runway will be fulfilled.



The MLS team that worked on the scanning-beam and doppler systems at NAFEC are (from left) Ray Harter, Robert McFadden, program area leader Bernhart Dinerman, John Collins, Paul Riley, Harold Liepe, Cliff Mackin, Morris Ritter and Harry Sorensen. In the rear is an MLS siting van.



## DIRECT LINE



**Q.** I recently attended a four-week course at the Academy, and POV (advantageous to the government) was not authorized, since the course was less than 30 days. There were two of us from one region and one from another who were not authorized to travel POV, but everyone else in the class was. I thought that I was working for the Federal government and that everyone would be treated equally, no matter where we lived. Can you explain the reason for this discrimination?

**A.** Federal Travel Regulations implemented by FAA Order 1500.14 require that an individual determination be made by each authorizing official in each travel situation. It should be understood that the mode of travel authorized should be justified on the basis of the need to accomplish the mission. Each authorizing official should be concerned with applying the travel criteria in accordance with the requirements and not justify his actions based on what another official authorized, as there could be a completely different set of facts involved. If each authorizing official conscientiously uses his best judgment, all employees should be treated fairly within the intent of the Federal Travel Regulations.

**Q.** In my region, a bid was announced for a GS-12 assistant chief vacancy at a VFR tower. There were quite a few applicants, myself not included. Many were from a Level IV TRACON and had over 12 years' experience in more than one option. As you have probably guessed, none of these over-qualified people were selected. The job was awarded to a GS-11 tower controller with five years at the same facility. How can you justify this selection? It is morally wrong, legally wrong and poor management.

**A.** Many of the applicants for this position were down-grade applicants with backgrounds as stated. However, length of experience does not always dictate the most-qualified candidate for a supervisory position. The selecting official

must take many qualities into consideration prior to making a decision. Ingrade/downgrade candidates are normally not ranked, but referred to the selecting official for consideration and possible selection under the Inservice Placement Program. In this particular action, the selecting official made his choice from promotion candidates ranked among the best qualified. The factors considered included performance evaluation record, experience, education, training and awards. The selection made and the procedures used indicate that the spirit and intent of the MPP were fully followed. If an ingrade/downgrade candidate had been selected, there might have been complaints that the region was subverting the MPP, too. No matter which selection method is used, many times those not selected who filed under a different method mistakenly feel that procedures were improperly used. Unsuccessful applicants are invited to discuss MPP requirements and their relative standing in a particular action with their supervisors and a representative of the regional Manpower Division.

**Q.** What effect does it have on my per diem rate if I receive a free meal while in a travel status?

**A.** Because of the general nature of your question, we will have to consider specific situations in which per diem is affected. When an FAA employee during official travel by commercial carrier is delayed en route because of bad weather, and the employee is furnished meals and/or lodging at the expense of the carrier, the period of delay is not considered to be for the personal benefit of the employee. Therefore, the employee is entitled to claim full per diem for the period of the delay, unless he is on an actual-expense basis. No deduction need be made for meals served without charge by commercial carriers as a courtesy or as incident to transportation. When meals and/or lodging are furnished by a government agency or by a business or firm, a deduction is required for each meal and lodging furnished. The rate to be deducted for each meal depends on the meal furnished. These rates are stated in FAA Order 1500.14, Travel Manual, Para. 721. The traveler should be cautioned that a conflict of interest, or the appearance of a conflict of interest, might result through obtaining such gratuities from a business or firm having business with the FAA or regulated by the FAA.

**Q.** Why was the Pacific Region's Manpower Division allowed to sit on personnel actions for promotions for an inordinately long time?

**A.** You are right; classification actions in the Pacific-Asia Region were delayed for significant periods of time. A Civil Service Commission inspection, the retirement of one of the key people in the Manpower Division, the unsuccessful attempt to hire a qualified temporary employee to help fill the void and a heavy workload did combine to cause long delays. After considerable effort, we were able to obtain the temporary assistance of a classifier from another region. No distinction based on

grade level was made in establishing priorities for accomplishing promotions; however, actions required to fill vacant positions were taken prior to those involving reclassification of filled positions. You may be sure that management in the region was fully aware of the problems and made every effort to find a solution. Now, a new position classifier has been hired and the backlog largely eliminated.

**Q.** I would like to know if all secretaries/stenos in field offices in other regions are only classified as GS-4/5 as they are in my region. Why are those located in the regional offices given such high grades? I have worked in both and find that the workload and responsibilities are much greater in a field office than the regional office. It doesn't seem fair to me that girls working in regional offices are given GS-6/7s for less work. Wouldn't you say that is discrimination?

**A.** There are secretarial and clerical positions in field offices that are classified above the GS-5 level. There are GS-6 secretarial positions at the very large and complex facilities. In other instances, there are highly specialized clerical positions that are classified at the GS-6 level. Neither the number of people in an office nor the amount of work required is necessarily significant in the actual classification of a job. The significant elements in classifying a secretary's job are "the scope of the supervisor's administrative responsibility" and "the extent of the secretary's participation in the work of the supervisor." While the degree of participation can be much the same in the field office positions as in most of the offices in the regional office, the scope of the supervisor's administrative responsibility does differ. There are more offices in the regional headquarters at a higher level of responsibility than there are in the field. This fact does have a significant influence on the grade levels of these positions. This should not be

taken to mean that secretarial and clerical employees in the regional office work any harder or perform more efficiently than their counterparts in the field.

**Q.** Since the Fair Labor Act has been enacted, why has no decision been reached at NAFEC to determine whether electronics technicians are to be paid true time and a half? In some of the travel I've had, it appears that almost all other branches of FAA are receiving it.

**A.** We believe you are mixing two different regulations. The true time and a half overtime law (PL 90-556) has been in effect since November 1968. Its purpose is to pay overtime to employees whose duties are critical to the immediate daily operation of the air traffic control system and directly affect aviation safety. Appendix 4 of Order 3550.10 identifies those positions in FAA that are covered and those that are not. All positions at NAFEC are specifically excluded from coverage. In May 1974, the Fair Labor Standards Act (FLSA), covering the entire Federal workforce, became effective. The FLSA also distinguished employees as covered or not covered. In certain situations, a covered employee will be entitled to true time and a half compensation for all hours worked in excess of 40 hours a week. Supervisors, T&A clerks and payroll are keeping records concerning the hours worked by all employees until the Civil Service Commission issues definite instructions for payment. Apparently, you see technicians in the regions getting paid under the regulations of 1968 and are confusing it with FLSA. No FAA regional employees have received payment under FLSA, since guidelines and authorizations have not been issued by CSC. Once these are received by the regions and NAFEC, payment under FLSA will be retroactive to May 1, 1974. If your position is identified as covered, you will be entitled to true time and a half for hours over 40 worked in a week.

## HEADS UP

### ALASKAN

James Jensen has moved up from assistant chief to chief of the Fairbanks FSS . . . David Gray vacated the Fairbanks FSS chief's job to become chief of the Anchorage IFSS . . . Ken Peavyhouse has reported in as chief of the new Valdez CS/T . . . Martin Ondra is in charge of the Deadhorse CS/T.

### CENTRAL

Selected as assistant chief of the Grand Island, Neb., FSS is Orin Cooter . . .

Robert McFadden has gotten the nod as chief of the Eppley Tower in Omaha, Neb. . . . Jerry Fisk was promoted to assistant chief of the Kansas City FSS . . . Taking over as chief of the Ottumwa, Iowa, FSS is Victor Eickelberg . . . The new chief of the Dodge City, Kan., FSS is Warren Randolph.

### GREAT LAKES

Jim Norcutt was selected as chief of the Oshkosh, Wis., Tower.

### NAFEC

Albert Lupinetti has been named chief of the Systems and Equipment Branch of the Air Traffic Systems Division.

### PACIFIC-ASIA

Former chief of the Lihue, Kauai, CS/T William Lawless has moved over as chief

of the Maui CS/T . . . The new chief of the Lihue CS/T is John Carrere, Honolulu Tower EPDS.

### SOUTHWEST

Selected as chief of the Downtown Tower in Shreveport, La., is Calvin Losey . . . Richard Grube garnered the assistant chief's job at the Dallas FSS . . . Frank Mobley was named assistant chief of the Hobby Tower in Houston . . . Joe Hokit got the nod as chief of the Midland, Tex., TRACAB Tower . . . The Albuquerque ARTCC has new assistant chiefs in Billy Lucy, Charles Ricketts and Glen Witt.

### WESTERN

Darrell Harless reported aboard as chief of the Yuma, Ariz., AF Sector Field Office . . . Fresno, Calif., Tower has a new assistant chief in Larry Fiscus.



The entrance to FAA's 1971 Paris Air Show exhibit.

# FAA GOES TO THE MARKETPLACE

When the FAA goes to an air show, it is selling an idea—air safety, and the fallout from that message means business for the American aviation industry.

The message that the agency spreads is that a safe, efficient international aviation system demands uniformity and compatibility in equipment and systems. With the U.S.'s lead in experience in all aspects of aviation, our know-how, FAA systems and American aeronautical products enjoy an enviable respect in the world marketplace.

Nevertheless, the traditional U.S. dominance has been challenged in recent years by stiff European competition. FAA's participation in international aeronautical expositions gives added impetus to U.S. industry sales and to spreading the word on the concept of an integrated and compatible air system throughout the world.

"FAA's impetus is needed," says J.H. Carmichael, special assistant to the Deputy Assistant Administrator for International Aviation Affairs, "because the United States operates on the free-enterprise principle, which involves open-competition among manufacturers. It's difficult for other nations to

understand our system and FAA's relationship to industry."

Most foreign competitors either organize government-industry marketing teams or have nationalized their civil aviation systems. As a consequence, FAA believes that closer cooperation with industry is necessary if American products are to compete and gain new markets and improve the U.S. balance of payments. On the other side of the coin, foreign visitors interested in U.S. equipment generally are high-level government representatives who especially seek out FAA exhibits and agency personnel because they are more comfortable dealing on a government-to-government basis.

Agency personnel who man the exhibits are experts both in the subject areas of FAA activities and the needs of the primary target nations that the agency expects to deal with. To provide this competence and language capability, the staff is drawn from the Services and FAA overseas offices.

The FAA's "booth" also provides agency executives a home base from which to operate in meeting with their global counterparts, not far from the U.S. industrial firms. While FAA's presence equalizes industry's position with that of other nations, the agency treads lightly on the matter of identifying with any particular firm, tending to point to all the firms represented in the field of interest.

"The problem of impartiality presents itself most often when foreign representatives question us on government contractors," explains Sue Silverman,

H.R.H. Prince Philip (right) is escorted through the FAA display at the 1974 Farnborough Air Show by Charles Dowling (left), chief of the European Region's Air Traffic Staff, and Chet Norris, head of the U.S. Trade Center in London.

chief of the Plans & Programs Division in the Office of Information Services, who has the primary responsibility for FAA's air show presence. "They frequently assume that because a firm has a contract with the government, its products must be the best. We point out that FAA selects a contractor for criteria that meet our needs, which are not necessarily those of another country. The contractor's equipment, for example, might be the same spec for spec with another firm's, but be different in price or delivery."

FAA has participated in the 1967, 1969, 1971 and 1973 Paris Air Shows, the 1973 U.S./U.S.S.R. Technical Symposium, which was combined with an exhibition, the 1973 First International Brazil Air Show and the 1974 Farnborough International, which was international for the first time last year. At the end of this month, the agency will be holding forth at the 1975 Paris Air Show.



FAA took a puppet show to Moscow. The puppets smile for the camera behind (from left) Charles Dowling, Sue Silverman, chief of the Plans & Programs Division in the Office of Information Services, and William Flener, Associate Administrator for Air Traffic and Airway Facilities.

This year, the overall theme of a joint FAA-Department of Commerce display at the entrance to the United States' pavilion will be "Aerospace Technology in Service to Mankind," illustrating, in the FAA part, how aviation touches the lives of virtually everyone on earth. It highlights the agency's stewardship of the National Aviation System and recent developments in air traffic control, navigation and communication.

Augmenting this public display area for the first time will be a trade-only exhibition. Here, FAA will concentrate on foreign business and government visi-



At the Farnborough show, "Sam," FAA's cartoon host, tells Fred Meister, Associate Administrator for Policy Development and Review, and the pilots of the record-breaking SR-71 that their 1½-hour trans-Atlantic flight could have been even faster if they hadn't circled for 20 minutes over Scotland waiting for the in-flight movie to end.

tors, primarily from the developing countries, with an exhibit on "Fifty Years of Airport Progress."

"With displays on airport planning, design, construction, security techniques, services and equipment," explains Miss Silverman, "we will be emphasizing the evolution of airports and airport systems. We want to portray the idea that in emerging regions of the world, the airport is playing the same role the river junction, the harbor and, later, the railroad junction played in the early development of this country. The community without adequate airport facilities today or without plans for long-range development will lose its growth potential." She pointed out that the display will feature primarily the small-to-medium-size airports, since these are the ones visitors from the target countries will identify with most, and will depict U.S. airports operating in every type of geography, climate and terrain.

FAA does thorough market research into the specific objectives of the particular show, the typical visitors to be expected and how many, the time of day for the show (in Sao Paulo, Brazil, it was 4:00 p.m. to midnight), the location of the exhibit in the pavilion and how it relates to other exhibitors, the aeronautical strengths of the host countries (at Farnborough, radar; in Paris, aircraft) and even the auditory competition from jets when there's an active air show.

According to Frank Sharpnack, FAA's exhibit manager, the exhibit is designed to smooth traffic flow through the displays while maintaining an openness and sense of organization.





Gordon Bennett, Special Assistant to the Assistant Administrator of the European Region, goes over the Farnborough schedule with former Administrator Alexander Butterfield, while an unidentified eavesdropper looks on. It's actually a display of the suit worn by the SR-71 pilots.

"The type of audience really dictates the type of design," he says. "If the display is geared to the general public, where we might have 1,000 visitors an hour, then the exhibit elements are structured to keep the audience interested, but moving. On the other hand, if our aim is to create an environment for thoughtful conversations with business and trade visitors, we generally fashion a semi-private conference lounge as part of our display."

A consideration of traffic flow sometimes presents unusual problems. Sharpnack recalls that at the 1969 Paris Air Show, the public tended to bunch up in the aisles looking at an FAA film, despite attempts by FAA personnel to usher them inside the exhibit to available seats. In Sao Paulo in 1973, however, posting a schedule of times for the eight one-hour films reduced the congestion. At the Moscow show, the Russians had provided a red carpet for FAA's display that didn't cover the entire area, Sue Silverman relates. When FAA added strips of blue carpeting to fill it out, they found that the Russian visitors

Outside the American pavilion at a Paris Air Show is Henriette Soltysiak, a multi-lingual staffer in FAA's Brussels office who offers indispensable assistance during the shows.



Roger Pierre (left) and Don Burlingame, FAA representatives to Paris and Beirut, respectively, provide technical expertise during western European air shows.



considered it a line of demarcation beyond which they weren't supposed to go.

Although always underscoring a serious purpose, FAA displays nevertheless employ innovative exhibit techniques that are appealing and often fun for the visitor. We use low-key, comfortable visuals to deal with abstract and complex technological ideas," Miss Silverman says. "Our animated shows go over well without being condescending. I guess there's a little bit of the child in everyone." At Farnborough, Paris in 1973 and at Moscow, FAA used Aniforms, a cartoon on a video tube that conversed with the visitors.

In the Soviet Union, the agency staged a puppet show to explain advances in the application of computer technology to air traffic control. Marshal Bugaev, who heads up the Soviet counterpart of the Department of Transportation, brought back

Listening to a response is Beverly Warran (right), Information Services, Plans & Programs Division, who organized a press conference for Southern Regional Director Philip M. Swatek during the First Brazil International Aerospace Exposition in Sao Paulo in 1973.



Assistant Administrator for Europe, Africa and Middle East Region Clyde W. Pace, Jr. (left) and J. H. Carmichael of International Aviation discuss potential marketing leads for U.S. sales of systems and equipment abroad.

many groups of Soviet officials to see the show.

Although English is the international language of aviation, it may not be a comfortable vehicle for visitors. Since the idea is to communicate on the visitors' point-of-view and encourage business followups, FAA exhibits are staffed with agency officials who are proficient in the language of the host country as well as some others, and exhibit materials are always prepared in at least two languages. We use simultaneous translation or successive translations for the shows.

FAA's Paris exhibit this year is designed to meet the needs of developing nations in planning and modular development of airports. The exhibit begins with a display of the development of Los Angeles International Airport and the lesson to be learned from its unplanned growth and the problems it faces in further expansion. Successive display panels take the visitor through the planning process, the desirability of round-the-clock operation through airport lighting and the building block approach to equipping the airport.

Illustrative of the lighting is an illuminated screen on which the visitor can display the variety of



Sen. John Tower (Tex) was a visitor to the Farnborough FAA exhibit, here at a mock-up of a Plan View Display console, which showed moving targets simulated via videotape.



FAA exhibit manager Frank Sharpnack worked on designing the 1975 Paris exhibit layout last winter.

systems that can be added on for runway and taxiway lights and approach and glide slope indicators. Adjacent are displays of actual lighting hardware.

Displays are also provided on airport security, a model of the construction of a low-activity prefabricated tower and an animated plexiglass model of a microwave landing system.

Rounding out the exhibit is a film on building-block lighting systems and a displayed list of FAA publications on airport planning, design, operations and microwave landing systems.

FAA displays usually are winners. Part of the reason is that FAA and American products are highly regarded, and FAA symbolizes standing behind U.S. aeronautical products. A sidelight on this reputation is provided by Beverly Warran of the Plans & Programs Division, who served as press liaison at the Sao Paulo show. Many pilots attend these shows, and, like the public at any exhibition, are big on picking up things such as pamphlets. But what pleased Mrs. Warran was the repeated requests by these Brazilian pilots for information on U.S. pilot certification. She surmises that U.S. certification carries prestige value for them.

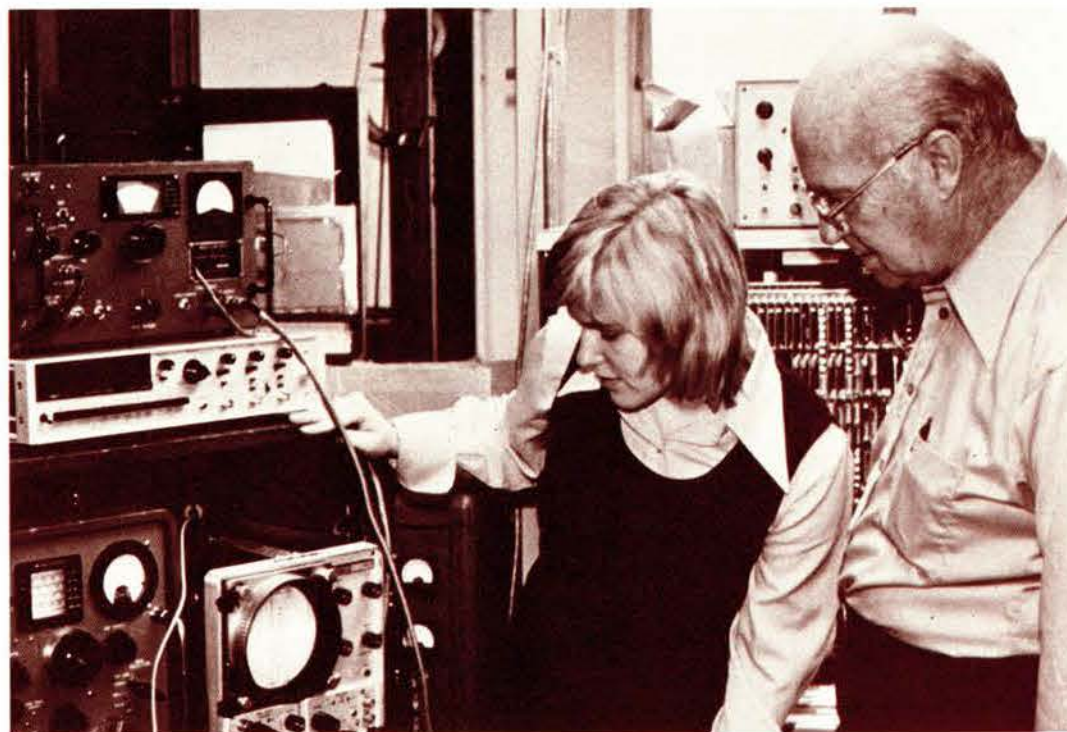
All this does add up to concrete benefits. At Farnborough, FAA's presence is credited with producing \$36 million in sales to American exhibitors. The Soviet Union has indicated they are in the market for ATC systems, which could mean billions of dollars in business to U.S. firms. Although they have an enormous technical capability in this area, the Soviet Union's interest is in short-circuiting development time by buying a "turnkey" operation. FAA's journey to Moscow was a step toward turning that interest in our direction.

As International Aviation's Carmichael says, "No question that out of these shows comes a lot of business. We backstop our industry 100 percent."



# FACES and PLACES

**CHIP OFF THE BLOCK**—*Evansville, Ind., AF Sector technician Paul Tuley used to give his daughter electronic kits instead of dolls. The payoff is that daughter Patty is the only female industrial arts major in Purdue's engineering school and might consider following her father into FAA.*



**DIELECTRIFYING HOBBY**—*Winston Sims, Baton Rouge, La., tower controller, sports a collection of more than 1,100 glass and ceramic telephone and telegraph insulators. Because of their scarcity and age, his collection is considered a hot commodity in the antique market.*

**OFFICERS AND GENTLEMEN**—*For their assistance to three Alabama National Guard helicopters forced down in a sandstorm, Jim Greenwood, Bob Woods and chief George Ochs (left to right) of the Daggett, Calif., FSS were appointed by Alabama Gov. George Wallace as lieutenant colonels, aide-de-camp, on his personal staff.*

*Photo courtesy of Desert Dispatch*



**PINNED** — *Richard Skully (right), Director of the Flight Standards Service, replaces a gold safety pin tie tack on Paul Poberezny, president of the Experimental Aircraft Assn., for EAA's "self-policing" accident prevention activities.*



**THAT'S USING HIS HEAD**—*When the ceremonial scissors wielded by New England Region Deputy Director William Crosby and Albert Tavani, Rhode Island Assistant Director of Transportation for Airports, failed to cut the ribbon at the commissioning of the T. F. Green Airport tower in Warwick, R.I., quick-thinking Tavani obliged the television cameras by biting through the ribbon.* *Photo by Vet Payne*



**A HELPING HAND** — *Watching NAFEC Director Robert Faith sign an agreement with Atlantic County, N.J., to train disadvantaged persons at the center under the Comprehensive Employment and Training Act are NAFEC civil rights chief Henry Reis-El Bara (standing) and Rep. William Hughes.*



**DAYS OF YORE**—*Harkening back to the days of dog teams, trapping and panning for gold, the FAA-NOAA Civilair Club in Anchorage sponsored a costume competition for the annual "Fur Rendezvous." From the left, Art Chase, Accounting, was judged best-dressed male; Virginia Wilhoit, Accounting, prettiest hat; Mary Smith, Printing Plant, best-dressed female; and Lavern Brooks, Airway Facilities, best beard/mustache.*

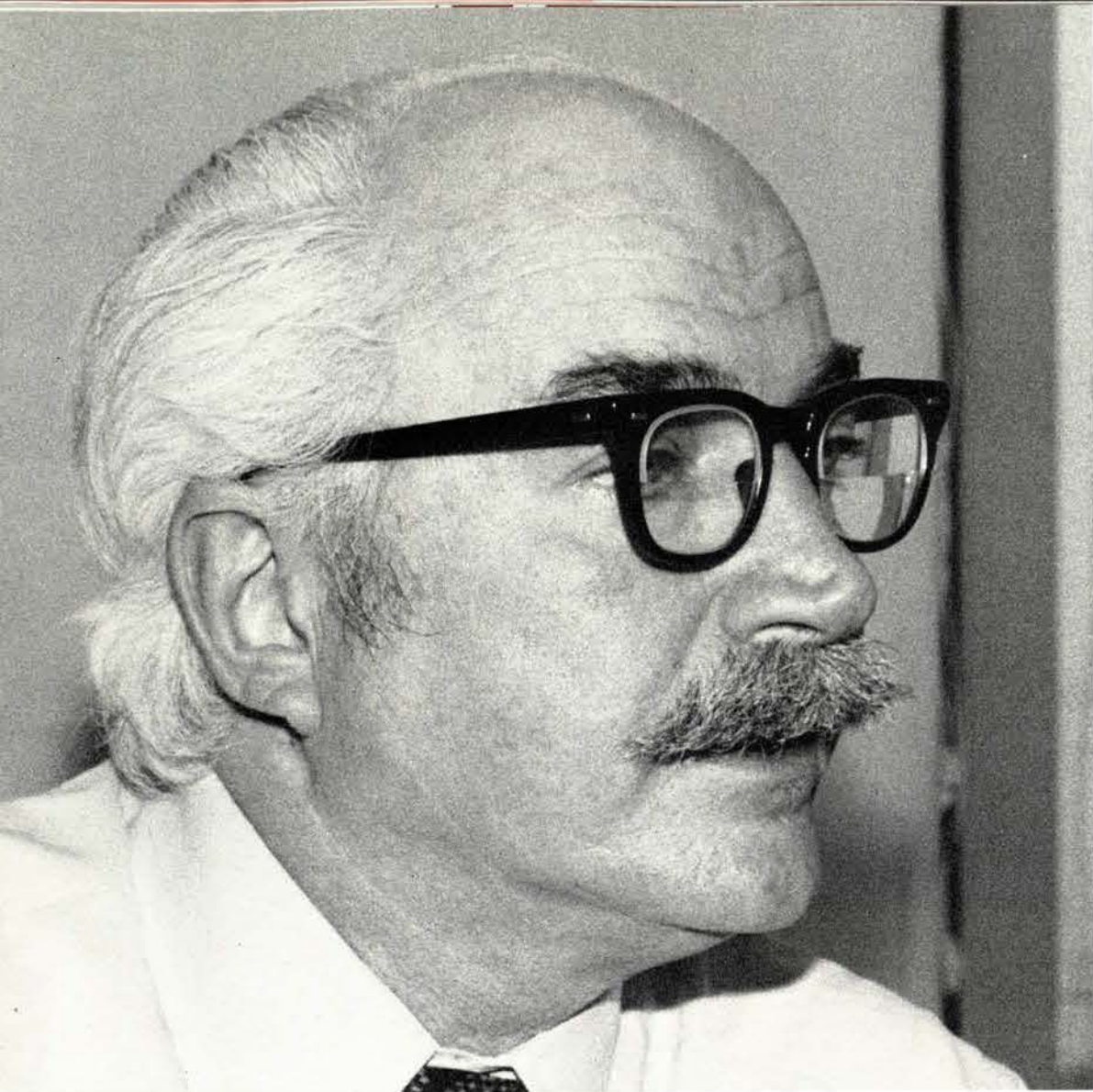
**PACESETTERS**—*Washington National Hangar Six pilots Tom Ward (left) and Dick Coxe earned type ratings in the FAA Jet Star and Gulfstream after about 11 hours each, compared to the usual 40 hours. The check flight was given by Don Juul (second from right), Philadelphia GADO inspector; instruction was given by Joe Solko (right) Hangar Six pilot.*



**DOWN THE UP STAIRCASE**—*Going nowhere fast are some 30 individuals simulating a typical air-carrier passenger mix moving between decks and evacuating the upper deck of a wide-body aircraft. The Aeronautical Center study, involving the Depot, Flight Standards and CAMI, used a narrow passageway and straight and spiral staircases. Oscar Ball of Flight Standards is the project officer.*







## BOOMLESS FAST FLIGHT

**T**homas H. Higgins is a retired Air Force colonel who is now flying a desk as a program manager in the Systems Research and Development Service's Environmental Research Branch. But it's not your run-of-the-mill desk. His is supersonic, but it doesn't batter the ground with sonic booms.

Higgins has a theory that, if correct, will mean that real aircraft could one day be flying over land at supersonic speeds without a sonic boom reaching the ground. Admittedly, the planes wouldn't be going a great deal faster than the speed of sound, but fast enough, Higgins calculates, to cut more than an hour and a half from a coast-to-coast flight that now takes about four hours and 45 minutes.

He is quick to point out that this does not mean that the FAA is attempting to resurrect the SST project. Rather, he explains, it is a matter of recog-

nizing the possibility that national policy could one day favor slow supersonic flight over land and that some means should be available to reduce the noise impact of such flights. His theory would not apply to the booms produced at the higher supersonic speeds that had been envisioned for the SST.

FAA regulations, in fact, already permit supersonic flight under conditions that would prevent a sonic boom from reaching the surface.

Higgins' theory is based on a phenomenon first noted in 1959 by a British scientist named D. G. Randall. He observed that under certain meteorological conditions, sonic booms generated by aircraft flying in the lower end of the supersonic spectrum curve away from the surface of the earth without hitting it. At the same time, the speed that an aircraft can achieve without an earth-bound boom

varies with the intensity of those weather conditions. The most important of these are temperature and wind direction. Altitude is not a factor.

What Higgins did was to take the phenomenon one step further and postulate that with computers and up-to-the-minute weather data, cross-country routes could be plotted for boomless supersonic flights and be updated enroute.

So far, Higgins' theory has been tested only in simulation, both with his desk and with a bank of computers. They do indicate, however, that the theory would work in actual flight. He is now negotiating with the National Aeronautics and Space Administration for the use of an F-111 supersonic fighter-bomber to test the theory in flight.

Higgins made his first supersonic "desk flight"—probably one of the most austere and cost-effective simulations on record—two years ago. Talking about it in his office in the Transpoint Building in Washington, he leaned back in his chair and recalled the event:

"I decided to go from Dulles to San Francisco along the fortieth parallel—the most direct route possible. Then, just like any other pilot, I called the flight service station and asked for the weather along the route."

Leaning forward with a mechanical flight computer in his palm, Higgins explained how he called FSSs along the route of flight at the appropriate time to get weather updates and then changed course where necessary to take advantage of optimum weather conditions.

"Where I couldn't find the optimum weather conditions," he continued, "I just had to slow down to avoid a boom."

"But I still did pretty well. From Dulles to St. Louis, I was able to go about Mach 1.3, or about 890 mph true airspeed. From St. Louis to Colorado Springs, I had to cut back to Mach 1.2, and from there on, to Mach 1.1. Nevertheless, I was still able to cut an hour and a half from the time it would take a regular jet."

Moving from his "flying desk," the next step was to use electronic computers with the latest weather information to simulate that flight. Leaning back in his chair again and occasionally letting his hands help him talk, Higgins continued:

"We awarded a contract to the Kaman Aerospace Corp. to perform the simulation, and they arranged for the use of the United Air Lines computer complex in Chicago. The United computers were chosen because data from the airline's weather reporting service could be fed directly into them. This was



vital," he said, "because the whole idea is based on the immediate availability of the latest weather data."

The simulation was run last November, with the computer constantly checking the weather enroute and computing course changes when necessary for make-believe F-111s that were making simultaneous coast-to-coast supersonic crossings of the U.S.

Higgins brushed back his white hair, which is longer now than he could have gotten away with in the Air Force, where he served as a navigator in World War II and as a pilot in the Berlin Air Lift and the Korean War. He quickly added, "It was make-believe only in the sense that the aircraft weren't actually in the air. Everything else was as real as we could make it—the altitudes, speeds and all the weather info fed into the computers."

"And the computers took them across the country supersonically without sonic booms reaching the ground, telling them when to change course to catch the right weather conditions and when to slow down if there wasn't optimum weather."

"This simulation convinced us that it can be done in actual flight, and we hope to do that soon," he said.

What happens after that? Higgins admits it probably will be a long time, if ever, before there are routine, scheduled supersonic flights over land.

In the meantime, he envisions a larger network of special weather stations reporting to a central computer, which will also gather reports from pilots and sensors aboard aircraft. This will provide not only the capability for charting noiseless supersonic courses, Higgins speculates, but for automatically controlling the throttle, as well.

—By Fred Farrar



# Federal Notebook

## MORE LIFE

Rep. Richard White (Tex), chairman of the House Employee Benefits Subcommittee, is expected to introduce a bill to raise the present \$10,000 minimum regular life insurance to at least \$15,000, and coverage at other salary levels would be increased by \$5,000.

■ The Civil Service Commission is also reported to be planning to ask Congress to provide more life insurance coverage, including family coverage. CSC is looking into lower premiums for the additional coverage.

## MORE HEALTH

A bill introduced by Rep. John Burton (Calif) would provide 100 percent coverage for Federal employees' medical and dental bills, including eye, surgical, maternity and institutional care and routine physicals. Under this legislation, the government would be required to set fees for medical services and directly reimburse hospitals, doctors and dentists for services rendered to Federal employees and would assume 75 percent of the premium, while the employee would pay the same or lower rates than now. The Administration is expected to oppose the bill. ■ CSC has issued new rules on disputes between employees and health insurance carriers. Under them, an employee must appeal rejection of a claim within one year. Within 30 days of receipt of the appeal with supporting evidence, the insurer must pay or reaffirm its rejection. If the latter, the carrier must notify the employee of his right to appeal to CSC's Bureau of Retirement, Insurance and Occupational Health. The individual then has 90 days to appeal; CSC then has 30 days in which to reach a deci-

sion, which is binding on both parties.

## TRIMMING THE URBAN COL

Rep. Benjamin Rosenthal (NY) has 19 co-sponsors for a bill to provide cost-of-living differentials to Federal workers living in major metropolitan areas where the COL is above the national average.

Rosenthal says some Federal employees in New York City earn less than they could get on welfare.

## RETIREMENT RESURRECTED

Rep. Richard White (Tex) has sponsored a renewed bill to permit retirement at any age with 30 years of service. It's designed to stimulate retirements and move up younger employees and would be cheaper than the popular combination-80 proposal that permits retirement in any combination of age and service totaling 80. ■ Another bill of his would restore full annuities to a single retiree when the survivor-benefits designee predeceases him or her. Present law allows this for married retirees only. ■ Another bill would lower from 12 to five the number of years of service needed for continuation of health and life insurance benefits after retirement. It would also make retirement mandatory at age 70 with five years of service.

## BEFORE NOT AFTER

A bill to give Federal employees the right to an evidentiary hearing by an impartial person before being fired or suspended without pay has been introduced by Rep. Patricia Schroeder (Colo) with eight co-sponsors. The bill would seem to be an answer to one point in the Kennedy vs. Sanchez decision of the Supreme Court.

# ORCHESTRATING THE FUTURE

Nine men sat at a conference table in a Federal building in Baltimore last March and silently studied some papers. It was not an unusual meeting; they met like this at least once a month. Their job—to insure orderly planning for the nation's transportation needs.

This Intermodal Planning Group (IPG) is one of 10 in the standard Federal regions that coordinate the planning grant programs of the modal administrations in the Department of Transportation. The representatives are from the FAA, the Urban Mass Transit Administration, Federal Highway Administration, the Federal Railway Administration, the office of the regional Secretarial representative and, where water transportation is involved, the Coast Guard. Most of the representatives are from the regional planning staffs, but Great Lakes, Central and Southwest Regions also draw from the Airports Division. Other modal elements or other agencies may be invited to participate.

The nine-man Eastern Region group was studying Unified Work Programs (UWP), which had been received from metropolitan planning organizations. When such organizations, like the Council of Governments, prepare these UWPs, the IPGs often meet more frequently than monthly to help the local planning agencies in producing an acceptable document. The UWP identifies all transportation

and related planning activities in its area for one year. Philadelphia's UWP generated a great deal of discussion, since its one-year plan formed a part of a five-year prospectus.

Pittsburgh's UWP contained a proposal for a rapid transit line called "Skybus," but the UMTA representatives believed the program should include a study of the impacts of other alternatives for improving surface traffic flow.

FAA's representatives, George Briskey, Eastern Region's Emergency Plans Officer, briefed the panel on the agency's proposal for revised legislation for the Airport and Airway Development Program and its implications for future planning.

What the IPGs are attempting to do can best be illustrated by before-and-after contrasts. In the 1950s, informal coordination of planning with agencies known to have urban-assistance programs was recommended by the Federal government, but there was not yet a requirement for determining "consistency with area plans," nor an Intergovernmental Coordination Act (1969), nor a mechanism for eliminating duplication of planning efforts, nor any DOT Intermodal Planning Groups, which started in the Seventies.

On occasion, however, we lucked out. During a site evaluation of a proposed Federal Aid to Airports Program project, an inquisitive FAA airports

*George Briskey of Eastern Region's Planning Office makes a presentation for FAA to members of the Region 3 Intermodal Planning Group. Clockwise are Dean Smeins from FHWA; Cdr. Frank Dearson, Coast Guard; Dave Longmaid, Environmental Protection Agency, Air and Water Programs Division; Sheldon Kinbar (partially hidden) and Al Lebeau of UMTA; and Ken Bellamy of FHWA, chairman of the group. The group meets monthly.*







UMTA's Al Lebeau (left) listens to Glen Laser of FRA. Not pictured is Don Johnson, staff assistant to the regional representative of the Secretary of DOT.

planner discovered that the same general area was under consideration for a housing development with a shopping center core, schools and a hospital under airport approaches and a flood-control/community water-supply reservoir with a super highway on the dam. An abandoned inter-urban railway right-of-way through the site had also been surveyed for a major power transmission line. There was even concern that the reservoir site might prove to be the last local habitat of the pileated woodpecker and a rare red fox.

Picture then the coordination that took place for the construction of the Dallas-Fort Worth Airport. The North Central Texas Council of Governments was formed and took the lead in transportation planning, with the Southwest IPG providing the stimulus for setting up meetings and coordinating the modes of transportation. A program for developing a total transportation plan was formulated by the Regional Transportation Policy Advisory Committee, made up of public officials from the 16 counties involved. FAA funded an Airport System Plan Study; UMTA provided mass transportation study funds, and FHWA provided funds to the Texas Highway Department.

The resulting studies were then evaluated against total area requirements, and a consolidated total transportation program to the year 1990 was adopted. Regional airport surface access and internal circulation received consideration through this planning that would not have been otherwise possible with the conventional one- or two-mode approach.

The IPG concept proves its worth in creating order out of possible chaos and may help to insure that future airports have better access and room to grow.

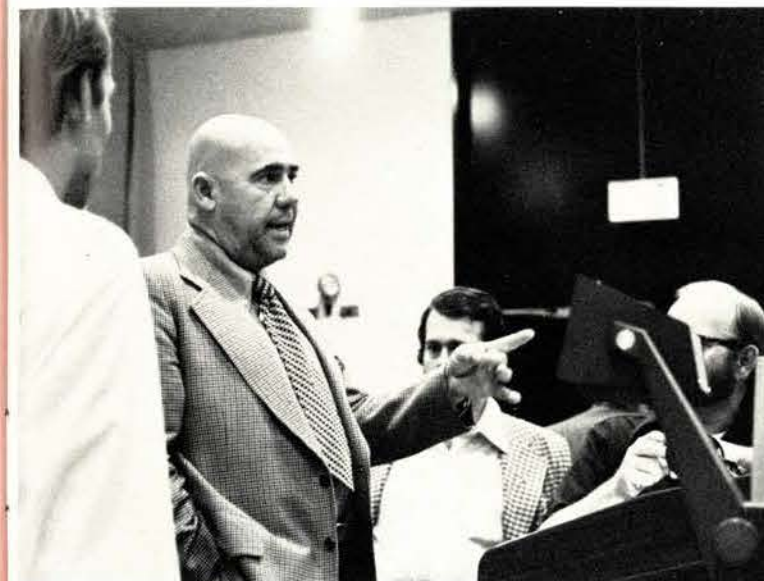


**NICE WORK IF YOU CAN GET IT . . .** There is absolutely no limit to the sacrifices some FAA people are willing to make in the name of air safety. Proof of this can be found in a report out of FAA's Civil Aeromedical Institute, "Anthropometry of Airline Stewardesses," which presents the body measurements of 423 stewardess trainees from American Airlines. The actual survey work was done by two very fortunate male anthropometrists from CAMI who were assisted (and chaperoned?) by three female laboratory technicians. But kidding aside, the survey really did have a very serious purpose—i.e., to gather anthropometric data for improving the design of stewardess jump seats, restraint harnesses and other equipment. The whole idea, of course, is to enhance a stewardess' chances of surviving an accident, not only for her own sake but also for that of her passengers, permitting her to direct their emergency evacuation from the aircraft. Still, if they're looking for volunteers to run another survey. . . .

**FAR FROM THE MADDING CROWD . . .** The Omaha FSS recently played host to the entire student body of Otoe County District School No. 81 and, although operating with minimum staff at the time, handled the crush without any problems or disruption of vital services to pilots. But hold the applause, please. The student body of old No. 81 are seven in number, and the teacher is the mother of four.

**IT'S THE THOUGHT THAT COUNTS . . .** When Dave Robinson left the Daggett, Calif., FSS to take a promotion at the Santa Barbara FSS, his fellow workers all chipped in and bought him a rather unique going-away present. It was a 33-pound can of peanut butter, which means that Dave probably spent the first couple of months on his new job trying to get his jaws unstuck.

**THE WORLD TURNED UPSIDE DOWN . . .** Some people—not us, mind you—suggest that air traffic controllers have a different view of the world than the rest of us. And when they're talking about controllers in the Waco, Tex., tower, they're right. From time to time, they see a mirage of Ft. Worth, which is a good 70 miles away. They know it's a mirage and not the real thing, because Ft. Worth is upside down, which is not the normal state of affairs there. Dallas, yes, but Ft. Worth, no.



Tiner Lapsley of the Aeronautical Center punctuates a point during questioning by inquisitive flight instructors.

## WHERE SAFETY STARTS

**"S**afety starts here at the foundation of instruction." This apt one-liner by Tiner Lapsley from the Aeronautical Center keyed a recent FAA Flight Instructors Clinic held at United Airlines executive offices in Elk Grove Village, Ill.

This three-day joint venture by FAA, the Illinois Division of Aeronautics and United Airlines brought together more than 200 flight instructors for safety presentations and a chance to chat with fellow instructors and pilots.

Lapsley and 10 other FAAers comprise the Systems Support Section of the Center's Flight Standards Division, which is responsible for flight instructor refresher courses throughout the world. "We conduct about 85 courses each year, reaching about 10,000 instructors," noted Jerry Schmeltz of this team. The section has made nearly 700 presentations throughout the U.S. and in Europe.

The presentations at this clinic ranged from medical considerations to aircraft performance levels to pilot techniques necessary for safe flying. Accident prevention specialist Don Muzeroll from the DuPage County Airport GADO made a special presentation, and inspectors Christine Winzer and Gene Lavine were on hand to field questions.

United has made its Oak Grove Village facilities available for the last five years for this refresher program, and is the only commercial airline to do so. In fact, a number of United pilots from the O'Hare Flight Operations Section attend as well. One United pilot, E. E. "Bucky" Hilbert, played an instrumental role in securing the airline's resources necessary for the successful clinic. "As in so many other fields,"

he commented, "expertise in aviation comes from experience. These flight instructors, with hundreds of flight hours, form the nucleus of tomorrow's professional pilots. By participating in these seminars, we hope not only to exhibit United's genuine concern for aviation safety at all levels but also the fact that [we] do, indeed, have a heart for general aviation and its problems." Captain Hilbert, incidentally, is the national president of the Experimental Aircraft Association's Antique and Classic Division.

FAA flight instructor clinics are designed to shape the techniques and values of those most directly responsible for instilling a safety consciousness in new pilots. It is estimated that in the next 10 years, 1½ million new pilots will be trained. Given the opportunity to meet with other instructors and commercial airline pilots, one instructor just might glean a new outlook or conjure up a dormant educational technique advantageous for future instruction.

—By W. E. Holtsberg, Jr.

Christine Winzer, GADO inspector at DuPage County Airport, Chicago, discusses the refresher clinic with Jerry Schmeltz (left), Aeronautical Center, and Burrill Coppernoll, Illinois Aeronautics flight safety coordinator.





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*An exploded bird's-eye view of a preliminary model of FAA's exhibit at the 1975 Paris Air Show, May 30-June 8. For the story on FAA's role in international air shows and the designing of our exhibits, see page 8.*

