FAA HORIZONS

Read About Facility Maintenance—How Much? Pages 4-5

Vol. 1, No. 12 | Published biweekly for the people of the Department of Transportation/Federal Aviation Administration | November 13, 1967

Administrator Honored

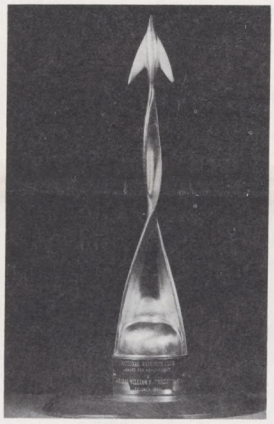
General William F. McKee, holds the National Aviation Club's Award of Achievement at presentation ceremonies in Washington on October 24. With General McKee are (from the left) Air Force Chief of Staff General J. P. McConnell; General Carl Spaatz (USAF Ret.); Lt. General James H. Doolittle (USAF Ret.); and Clinton M. Hester, first Administrator of the C.A.A. (August 1938 - June 1940).

National Aviation Club Honors Administrator

WASHINGTON—The National Aviation Club presented Administrator McKee with its coveted Award of Achievement on October 24, in recognition of his "effort and leadership in administering the supersonic transport program and the national airspace system."

In presenting the award, Jerry Hannifin, aviation editor of *Time* magazine and club officer, told the capacity audience of aviation leaders that "our honoree this evening is a Virginian who has served our country notably and significantly. As a strong advocate of the national and public interest and as a true counsellor of the aviation community, Gen. McKee fully meets all the tests for receipt of the National Aviation Club's highest honor."

Among those who attended the ceremony were Gen. Carl Spaatz, Lt. Gen. James Doolittle, Secretary Alan S. Boyd; Lt. Gen. Elwood Quesada and Najeeb Halaby, former FAA administrators; and Gen. J. P. McConnell, Chief of Staff of the Air Force.



Award of Achievement

Noise Rules Now Apply To Every Turbo Jet Pilot

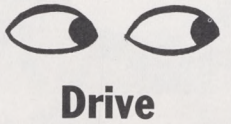
WASHINGTON—Pilots of small turbine-powered airplanes will be required to follow the same noise abatement procedures as pilots of large transports under revised airport operating rules announced by the agency.

Effective December 4, the noise abatement procedures prescribed in Part 91 of the Federal Aviation Regulations ("General Operating and Flight Rules") will apply equally to large and small turbine-powered airplanes as well as to all large piston-engine airplanes. These procedures cover minimum altitudes, climb and descent, and use of noise abatement runways. At present, the procedures apply primarily to turbine-powered and piston-engine airplanes having a maximum gross weight of 12,500 pounds or more.

Under the revised FAR Part 91, pilots of all turbine-powered airplanes and large piston-engine airplanes will be required to adhere to the following noise abatement procedures when using an airport with an operating control tower:

- Enter the airport traffic area at an altitude of 1,500 feet above the surface of the airport and maintain that altitude until further descent is necessary to make a safe landing (now applies to turbine-powered airplanes only).
- Climb to an altitude of 1,500 feet above the surface as rapidly as practicable after takeoff (now required of large airplanes only).
- Use the noise abatement runway assigned by Air Traffic Control at airports where FAA has established a formal runway use program (presently applicable only to large airplanes).

In addition, pilots of all turbine-powered airplanes and large piston-engine airplanes equipped with an instrument landing system (ILS) will be required to remain at or above the glide slope on final approach for landing on an ILS runway. Only ILS-equipped large airplanes are affected by this rule at the present time.



Drive Defensively!

Best FSS

During a busy session, three specialists work the briefing counter in the Oklahoma City FSS, judged "Facility of the Year" in competition between 332 flight service stations nationwide. They are (left to right): Richard Stuck, Leon Spychalski and Darrel Fink.

JAX, Opa Locka, and OK City

Agency Names Its Top ATC Facilities

WASHINGTON—In a new program to recognize the most outstanding air traffic control facilities in the nation, the agency has announced that the winners in the first annual competition are Jacksonville ARTC Center, Opa Locka Tower, and Oklahoma City FSS.

Before choosing the winner, a hard-pressed panel of air traffic experts deliberated long and carefully recently to compare the merits of 19 leading facilities nominated by their regions as "Facility of the Year."

They weighed each thoroughly documented nominee for personal and facility appearance, training, employee morale, community relations, security, suggestions for improvement, operational efficiency, and error-free operation among other criteria.

All three winners, were rated "outstanding" in these categories.

To make the announcements, Archie W. League, director, Air Traffic Service, began a busy week of personal presentations honoring the achievement of the winners.

Dual Presentations in Florida

Traveling to Florida, he presented two of the three handsome top facility plaques which cite the recipients for having the "highest degree of operational efficiency in rendering professional air traffic services." The awards reproduce the FAA seal, and are signed by Administrator William F. McKee.

"The Jacksonville ARTC Center is tops among the nation's 28 centers," League told its chief, James Pound, "for a number of reasons, among which are: providing above-average service to an exceptionally high volume of military traffic; for originality in developing and improving new ideas and concepts; and for maintaining a business-like appearance during a continuing major facility reconstruction program."

League asked the winning center's chief what Pound believed contributed most to winning.

"Almost continuously the control room was undergoing major modifications for the NAS Stage 'A' installation," Pound said. "Yet everyone cooperated to the fullest, so that the work would give minimum interference to normal operations."

Pound said that a remarkable three-way cooperative attitude between center specialists, civilian contractors and headquarters personnel played a large part in garnering the award.

Sudden "freezes" in recruitment and grade ceilings, as well as special project requirements and training above the normal, proved no deterrent to the "can do" attitude of the center.

(Continued on pg. 8)

U.S. Coast Guard Academy Nominees Will Be Selected

WASHINGTON—The U.S. Coast Guard has announced that annual nationwide competition for entrance to its Academy will commence with the administration December 2 of College Entrance Examinations, to be given in over three thousand test centers in the United States and overseas.

Applications are now being accepted, and all applicants must make arrangements to participate in the examinations by October 28.

Appointment to the Academy is obtained solely through competitive examination; there are no congressional appointments or geographical quotas. The four year curriculum at the Academy leads to a Bachelor of Science degree and a commission as Ensign in the U.S. Coast Guard.

The competition is open to any qualified young man, military or civilian, who is unmarried, a U.S. citizen and will have reached his 17th but not his 22nd birthday by July 1, 1968. Applicants must be high school graduates or high school seniors assured of graduation by June 30, 1968, who are sincerely interested in a career as an officer in America's oldest continuous seagoing service.

Requests for information and application forms should be addressed to: Director of Admissions, U.S. Coast Guard Academy, New London, Connecticut, 06320.

First Airport Field Trip Fascinates Children

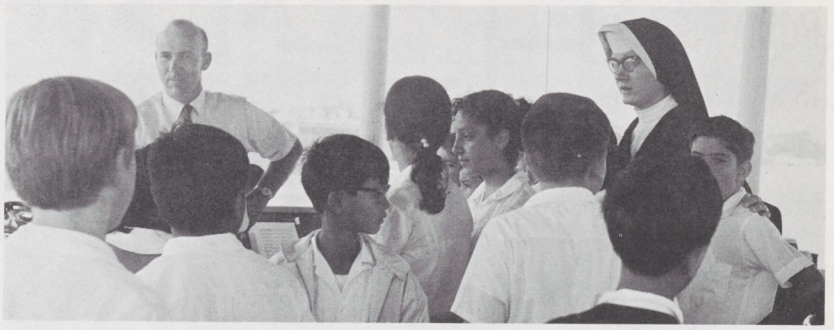
LOS ANGELES—Sixth-graders of the Our Lady of Loretto Grammar School were treated to their first field trip of the school year recently. The excursion featured a guided tour of the Hawthorne Municipal Airport and the FAA tower.

Fred Archer, Hawthorne airport maintenance man, provided a descriptive bus tour of the installation. Air Traffic Specialists David H. Perry and Major Warren explained the operation and responsibilities of tower facilities.

The group of 47 students was accompanied by several mothers, bus driver George Vogel, and a teacher, Sister Mary Anselm.

Our Lady of Loretto School is run by the Sisters of the Presentation. Sister Mary Anselm said, "The children were very pleased and impressed with the field trip. It has been the high point of the year for them."

Many of the children in the group come from low-income, disadvantaged families. Several of the youngsters are members of Cuban refugee families.



Air Traffic Lesson

Major Warren, Hawthorne, Calif. tower controller (left), explains air traffic procedures to tower-touring children of Our Lady of Loretto Grammar School. Sister Mary Anselm, sixth grade teacher, is at right.

Road to Singapore

Carrying the two-piece, 64-pound flight inspection package, John Baird (left), Aero Center, and Robert Luebbe, Honolulu FIG, wait for hotel elevator. They recently completed, along with third team man Joe Price, Tokyo Flight Inspection Group (FIG), a highly successful field test of the prototype model at Singapore and at Kuala Lumpur, Malaysia.

'In the Bag' Package Inspects Asian Aids

HONOLULU — "Have PFIP, will travel." The unpronounceable abbreviation stands for "Portable Flight Inspection Package."

Three FAAers recently took a prototype model PFIP to Singapore and Malaysia to check out navigation aids under agreements between FAA and these countries. Assigned to introduce this latest development in the international flight check field were Robert Luebbe, Honolulu Flight Inspection Group (FIG); Joe Price, Tokyo FIG and John Baird, Aeronautical Center.

About the size of a two-suiter and a cosmetic case, the two piece unit weighs 64 pounds and can be carried by one person. The smaller case contains transistorized ILS/VOR and glide slope receivers; the larger has the recorder panel, associated cables and antenna connectors.

Development of a low-cost, lightweight portable flight inspection system was initiated in the Agency in 1964. A later prototype unit, incorporating several modifications, was tested operationally by FAA's National Flight Inspection Division at Oklahoma City in 1966. Its performance met FAA's stiff requirements for inspection of VOR and ILS facilities. (FAA subsequently awarded a contract to a commercial firm for additional units, and several foreign countries have already placed orders for this equipment, which sells for about $10,000 per unit.)

The PFIP is a boon in the international flight check field. One of its most significant advantages is the cost reduction potential, particularly in countries which do not have enough air navigation facilities to justify purchase of high cost flight inspection systems involving special purpose aircraft.

Team Leader Luebbe considers the recent field tests at Singapore and Kuala Lumpur, Malaysia a success. The FAA team conducted the VOR and ILS flight inspections with the PFIP, using locally available aircraft. They found the unit very adaptable and particularly stable.

Model Service Counter Helps Alaskan Pilots

FAIRBANKS, Alaska — Dean Brennan, chief of graphics, and Virgil Lamb, chief of plans & procedures, have made a model of a service counter proposed for the new Fairbanks FSS.

"We wanted to get away from the country store look in planning this new facility," stated Lamb, who is in charge of a program to upgrade the appearance of stations in Alaska.

"We felt that the counter that separated the specialist and the pilot was a barrier between the two."

Brennan's design talents were enlisted for the project. The result is a very open arrangement of counters and tables which permits free movement. Guides, charts and other materials a pilot needs for flight planning are placed on his side of a simple room divider.

"Standard counters cost more than $2,000," states Lamb. "The cost of this arrangement is about $800," he adds. Removing the counter barrier will improve communications between the pilot and the specialist, believes Lamb. "By providing an attractive, roomy, and cheerful atmosphere for the pilot in which to work, we are improving our services to him."

Model Counter

An open arrangement of counters and tables, which should improve communication between visiting pilots and flight service specialists, has been designed into the model of a modern FSS in Fairbanks, Alaska. Dean Brennan (left), chief of graphics, talks over the model's features with Virgil Lamb, chief of plans and procedures.

Fox's Bright Ideas Make Him Money and Improve Agency

CHATTANOOGA, Tenn.—William Fox's perceptive mind and tireless quest for more efficient work methods again have paid dividends both to him and the agency, through the employee suggestion program.

Fox, senior technician in charge at the airway facilities sector here, has set quite a record for himself in developing ideas which have proven to be real money, time and work savers. His most recent suggestion provides improved methods for conducting monitor tests on instrument landing systems, and has won for him another Beneficial Suggestion Certificate, a letter of commendation, and a check for $75.

During presentation ceremonies, Local Coordinator Marvin Catron commented that Fox is one of the agency's most active participants in the employee suggestion system—in fact he has submitted so many suggestions adopted over the years that they have lost count of them. During a period of one year, he received three separate cash awards for suggestions that were adopted by the agency!

Alana McCollum

Diane Isonaka

LBJ Gets Thanks From California

BURBANK, Calif.—When two lovely girls employed by the agency under the Youth Opportunity Campaign this summer wanted to say "thank you," they did it in a big way.

Diane Isonaka and Alana McCollum wrote to the President of the United States.

Diane, 17, worked in the Burbank GADO office for the summer and is now a freshman at the University of California at Los Angeles. She will be a political science major.

Alana, also 17, entered Long Beach State College, where she will study business. She was employed in the Burbank Aircraft Engineering District Office.

In their letter, the two said, "We wrote this letter because the campaign, and all connected with it, deserve to be commended. It, above all else, makes us feel useful; and, as someone once observed, 'There is nothing better in this old world than that.'

"Thank you very much for caring about today's youth. Your concern makes it possible for qualified Americans to help their country as well as themselves."

Both Alana and Diane hope to work for the agency again next summer under the YOC program.

Public Service Is Very Real Deep in Texas

LUFKIN, Tex. — When the weather is ideal for flying, chances are all general aviation planes available for hire have been signed for in advance. In an emergency, when all are booked, you can't get a plane for love or money.

But sometimes "love" will help you get air transportation where "money" doesn't mean a thing. It happened here recently, when a flight rushing two severely burned children to a hospital had to land because of engine trouble with still an hour to go. Mechanics found they couldn't repair it quickly enough so that the journey could continue.

Aware of the frantic search by the doctor-pilots for a plane they might charter or rent was Eugene Valentine, flight service specialist on duty here. Both he and Carl E. Carroll, station chief, were concerned that the flight plan from Kansas City to Galveston had suddenly been altered. The disabled plane was now idle on the ramp, while mechanics went on to other work after putting in their order for parts from far off suppliers.

As the doctor-pilots kept striking out in their attempt to get a plane, Valentine asked Carroll for relief from watch, in order to help the stranded burn victims.

"If I can take annual leave, I think I can get a plane," he told his boss. Carroll agreed, and arranged for a substitute.

Valentine called a local businessman, got permission to use his aircraft, and checked it out. Soon the children, their mother and one of the two doctors were winging their way to Galveston and its hospital which specializes in burn treatment.

A waiting ambulance met them on arrival, and the children were treated immediately.

Valentine has been a private pilot since 1945, and an FAA employee since 1951. It was the first time he had rendered such an unusual flight assist.

Real Flight Assist

Eugene Valentine, specialist with Lufkin, Tex. FSS, stands by a parked aircraft with the station in the background. When an emergency flight was interrupted and two burned children were stranded at Municipal Airport while heading for treatment at a Galveston Hospital, he took annual leave to solve their dilemma.

The Bearded and the Bald

Members of the Denver ARTCC joined the community spirit generated by the recent Boulder County Fair by entering the beard-growing championship. Showing their hirsute adornment on the job are (standing from left): Controllers Robert Byrd and Tracy Perry; (seated from left) Harry Wayment, Frank Shelton and William Clawson. Demanding equal space with the bewhiskered set were the center's "old smoothies" (standing from left): Chester Zents, Charles Thurston, Bruce Larson and George Durand; (seated from left): Robert Reid, Duane Coffield and Thomas Ross.

Birmingham Tower Controller Writes Colorful Air Safety and History Stories

By Gerrie Cook

BIRMINGHAM—Roger Myers, air traffic specialist here, is versatile in the field of communications. As a journeyman controller at busy Municipal Airport, Myers' at busy Municipal Airport, Myers' job requires lean, terse verbal skill to safely direct flight operations of the hundreds of pilots, from students to ATR veterans, who fly in and out of Birmingham daily.

Myers also excels in another form of communication—the written word. He is rapidly establishing himself as an aviation writer and criitc whose proficiency is well-documented.

During the past two years, in his free hours, Myers has pursued his avocation with enthusiasm. His skill as an author has served him and the agency well. His numerous feature stories have run the gamut of aviation topics. Recently a series of seven articles were featured in the *Birmingham News Magazine*.

Myers stories were so original, factual, and timely, that he received a special award from the Air Traffic Controllers Association for "original and significant contributions to the dissemination of knowledge pertaining to the aviation industry."

Takes Color Photographs

To tell the general public about FAA's important air safety activities, he has spent many hours in travel and research. And, using his own funds, has taken many outstanding color photographs to illustrate his stories.

Some of his articles have covered the colorful lives of such aviation immortals as Charles Lindbergh and Amelia Earhart. Others have documented manned balloon flights, and famous planes, such as the Lockheed *Sirius* and Glenn Messer's *Air Boss*. His feature about the continuing war against the destructive fire ant has won for him the gratitude of the Department of Agriculture. Another recent story, about FAA's flying laboratory DC-3 flight inspection planes, has received considerable recognition.

Myers at this time has two more ambitious writing projects underway. One is a "History of Aviation in the South." The other, "Lest We Forget," is designed to provide a closeup of historical aviation events. Myers feels, because of the fast pace of advancing aviation technology, that we are in danger of "overlooking the historical significance and impact that powered flight has had on our American way of life.

"With the advent of the aerospace age," Myers comments, "our attention has been distracted by today's spectacular achievements, and our great American air heritage has not yet been sufficiently documented for posterity." He hopes the youthful readers of his books will be spurred on to even greater aviation achievements in the future.

Myers began his FAA career at the Atlanta Center in 1959, later transferring to the Birmingham Tower. He has also proven to be an invaluable (though unofficial) public relations representative for the agency on the local scene.

To quote Southern Region Public Affairs Officer Jack Barker, "I wish I had a dozen more just like Myers on our team!"

ABC of ATC

Frank O'Connor (right), New York City council president, observes two New York Center controllers at work during a visit to that facility as part of a recent agency sponsored Aviation Education Day. Some 75 federal, state and local officials participated in the day-long program designed to highlight the importance of aviation to the community. A STOL aircraft demonstration and fly-overs of several of the proposed sites for a fourth area jetport were also included in the day's activities.

Author and Critic

Roger S. Myers, air traffic specialist at the Birmingham Tower, spends his spare time researching and documenting the past and present of the world of aviation. As a knowledgeable aviation writer, he prepares book reviews on aviation subjects for newspaper and magazine editors.

General 'Leafs' Regional Counsel

ANCHORAGE, Alaska — There aren't many places in the agency where a "pinning" ceremony can be held with the proper military trappings for an employee who gets promoted in the U.S. Army Reserve.

Fortunately for Joseph A. Kovarik, regional counsel, Alaska is one of them. Kovarik was promoted to Lieutenant Colonel in August. Hearing of the event, Deputy Director John R. Kullman, Brigadier General, USAF, insisted that the leaf pinning be done with proper ceremony. So both wore their military uniforms for the occasion.

FAA HORIZONS

FAA HORIZONS, the official employee publication of the U.S. Department of Transportation, Federal Aviation Administration, is published biweekly by the Employee Information Division, Office of Information Services, FAA, 800 Independence Ave., Washington, D.C. 20590. Telephone: WO 2-5575. Articles of general interest to employees should be submitted directly to Regional FAA Public Affairs Officers: George Fay, Alaskan Region; Robert Fulton, Eastern Region; Jack Barker, Southern Region; Joseph Frets, Central Region; K. K. Jones, Southwest Region; Eugene Kropf, Western Region; George Miyachi, Pacific Region; Edwin Shoop Jr., NAFEC, and Mark Weaver, Aeronautical Center.

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"How Much Maintenance, Mr. Martin?"

Mervyn Martin

From the red clay of the Southwest to the green banks of the Potomac, Mervyn Martin has been a systems maintenance man almost from the word "go." He began his Federal career in 1946 in Fort Worth—became a sector chief in Tulsa—went to Oklahoma City to run a communications equipment training program—received a BA degree from Oklahoma City Universtiy—and then went to Washington in 1959 as chief of the communications section in Systems Maintenance. After holding increasingly responsible positions at headquarters, he became an assistant to the director of the Service in 1962. Then, in 1963 he returned to Texas to head the Systems Maintenance Division of the Southwest Region. In '65, it was back to Washington. Later that year he became Deputy Director of Systems Maintenance Service. And, this past January, he was named Director of the Service.

A number of questions have been coming into headquarters from systems maintenance personnel throughout the agency concerning our present policies on the maintaining of air navigation and communication aids. In an attempt to set the record straight, Horizons interviewed Mervyn Martin, director of Systems Maintenance.

Q. Mr. Martin, let me start by asking you to define what is meant in FAA by the term "maintenance" as used in the National Airspace System?

A. It means, simply stated, the upkeep and repair of facilities and equipment so that they perform the functions for which they were intended. These functions are generally services to the flying public, either directly, in the case of most navigational aids, or indirectly through air traffic personnel using radar and aeronautical communication facilities.

Q. Do you have fixed goals or objectives that you are trying to attain? By that I mean do you expect every facility to be on the air 100 per cent of the time?

A. Our first goal or objective is to maintain facilities and equipment in such a manner that they provide maximum safety to the user. A facility is operating safely when the information or guidance it provides to the user is accurate and useable. Our second goal is to keep facilities and equipment on the air to meet the operational requirements placed on them by the users. This is usually expressed in terms of "availability" and "reliability." Ideally, we would like to have all facilities operating 100 per cent of the time, but practically we can't achieve such an objective.

Q. I gather then that the first goal is safety. Would it be correct to say that if a facility is unsafe it is turned off and not used?

A. At unattended facilities we have equipment that continuously monitors the operation of the facility and when the equipment is out of useable tolerance the facility is either shut down automatically or a signal is flashed to operators at one of our air traffic facilities. They, in turn, either shut the facility down or place in operation at the facility satisfactorily operating standby equipment. At attended facilities, either maintenance technicians or air traffic specialists take the same actions when the facility, or equipment at the facility, is not operating properly. So, a facility that is unsafe is removed from service and, therefore, can't provide faulty information or guidance to the users. In such cases, alternate procedures or facilities are employed to provide the service which has been discontinued.

Q. So we can assume that all facilities in use are safe—at least to the best of our knowledge, are safe. If not, they are turned off. Is that right?

A. Yes, that is correct.

Q. The other goals you mentioned were "availability" and "reliability." Just what do you mean by these terms?

A. Availability is a term used to indicate how much of the time a facility is on the air providing the service for which it was intended. It is expressed as a percentage. For example, a facility with an availability of 98 per cent for one year was in operation 98 per cent of the time during that year. Reliability indicates the probability that a facility will operate satisfactorily for a stated period of time. We use 24 hours as a reference standard. It is also stated as a percentage. If a facility has a reliability of 95 per cent, it means that there is a 95 per cent chance (odds of 19-to-1) that the facility will operate for any 24-hour period without interruption.

Q. Then 100 per cent availability would mean that the facility is in safe useable condition all of the time, and 100 per cent reliability would mean no failures in any 24-hour period. Right?

A. Yes.

Q. In the absence of 100 per cent availability, what is the standard we are trying to achieve?

A. The standards vary with the type of facility. They are based on the national averages of availability achieved for all facilities of a given type. To illustrate this, the standard or "norm" for VOR facilities is 99.2 per cent and the standard for ASR facilities is 99.3 per cent.

Q. How do we get these?

A. These standards are obtained by averaging the availability of all facilities during the previous two fiscal years. In this case, the average availability during FY-1965 and FY-1966. I might add that these standards are used in lieu of specific standards based on operational requirements. They represent norms of performance which have substantially met past operating requirements. The Air Traffic Service is presently engaged in a study to develop specific operational requirements for air-ground communications service. When established, these operating requirements would become the standard for communications.

Q. How do you know we are meeting the standards?

A. We have a reporting system which identifies all failures and outages which occur at major facilities. These reports are processed by agency computers and the results are made available to the various levels of management.

Q. If an individual facility falls below these standards, is it a "bad" facility? Does this rating indicate that the maintenance is not satisfactory?

A. Since our present standards are actually averages, statistically about half of our facilities will be above the average and half below average. So, just because a facility is below average does not mean that it is a bad facility nor does it necessarily indicate that maintenance of the facility is less than satisfactory. Our facilities are dispersed geographically among the 50 states, the Carribean area, Panama and the Pacific. They are operating in many different environments—heat, cold, salt air, dust, etc., and, therefore, we can't expect exactly the same performance from all facilities. The maintenance requirements are also different—some require more preventive and corrective maintenance than others. We do have performance limits set however, and if a facility exceeds these limits, corrective action is initiated.

Q. I note you used two more terms which are not generally familiar: "preventive" maintenance and "corrective" maintenance. What do they mean?

A. Preventive maintenance describes maintenance actions taken to prevent or reduce equipment and facility failures. Corrective maintenance describes maintenance actions taken to repair equipment after a failure has occurred. Preventive maintenance activities include periodic adjustments, cleaning, checking, lubrication, painting, inspection and the like. Corrective maintenance activities include such things as replacement or repair of defective parts or equipment. There is a wide range of these activities. To illustrate the extremes, let's consider the actions taken because of Typhoon Sarah and Hurricane Beulah. Before these storms arrived, equipment was covered with plastic sheets, antennas and towers were guyed or otherwise secured, windows were boarded up, mobile power plants were readied for use, mobile communications equipment was set up, etc. These were preventive actions taken to prevent or reduce the effect of failures and outages due to the severe weather. After the storms passed, power lines were repaired, buildings repaired or reconstructed, water damages repaired, roads rebuilt, broken antennas and towers replaced, etc. These are corrective actions. For the record, the preventive maintenance actions taken in these cases drastically reduced facility damages and the time taken to restore normal operations where facilities were put out of service. Certain preventive maintenance tasks can only be performed when a facility is shut down—tasks involving antennas and transmission lines for example. So a facility can be off the air even though it has not failed.

Q. Based on what you say then, it appears that too much preventive maintenance could reduce availability. Is this possible?

A. The performance of any preventive maintenance which requires the facility to be shut down will reduce the availability unless the work done will pervent other outages of greater duration.

Q. I've heard that the agency has advocated a "no preventive maintenance" policy. Can you explain?

A. That is certainly not the case! We have run some tests which involved performing different amounts of preventive maintenance at different facility locations. But even in the case where preventive maintenance was reduced the most, certain preventive maintenance inspections were performed so that we would know the exact operating condition of the facility. As I said, these were tests and only a limited number of facilities were involved. Preventive maintenance has become a way of life in the agency and I can't foresee the time when it can be abandoned. Our concern is that we do only the amount of preventive maintenance that is appropriate. We should not perform any maintenance that is not required nor would we perform required maintenance more frequently than is needed. On the other hand, we should perform all preventive maintenance tasks which are needed to see that facility performance is safe and meets the oprational requirements of the users. For a given operational requirement there is an optimum ration between preventive and corrective maintenance. We want to bring our maintenance operations as near to this optimum condition as we can. The various tests that we have conducted over the past few years were for that purpose, and it is true that mandatory preventive maintenance has been reduced considerably during that time. At the same time, however, our overall facility performance record has improved. So I can only conclude that our maintenance efficiency has increased.

Q. What you are saying is that through the maintenance routines you have set up, and through the information you get on failures and outages, technicians are now performing at a higher level of efficiency. If that is correct, what do you really expect of the individual field technician?

A. We expect the individual technician to schedule his work time so that there is a minimum of wasted effort. Also, since he is the person with the greatest knowledge of the day-to-day operation of the facilities which he maintains, we depend upon him to feed back technical information to higher levels of management so that changes to improve equipment or maintenance operations can be implemented when warranted. To oversimplify, we want him to work smarter, not harder. The agency has limited resources and we do not want to use more of these resources than is necessary. The Administrator has made it clear that he wants us to have those resources required to get the job done. The field technicians have a primary role in the achievement of effective maintenance operations and, I think, their results have been outstanding.

"On Course...on Glide Path"

Last year, pilots of airliners and general aviation aircraft made more than a million instrument landings safely at the 266 airports equipped with FAA instrument landing systems. These ILS, with their localizers, glide slopes and marker beacons were working reliably and were available to pilots 95.1 per cent of the time. "They are well-designed . . . accurately made . . . efficiently installed . . . and intelligently maintained," says Mervyn Martin.

Q. There have been some contentions that the agency has put too much emphasis on economy and, as a consequence, facilities are not being maintained properly. What do you think about this?

A. I agree that certain maintenance is not being performed as well as it could be. This is particularly true in the Plant and Structures area, and we are taking steps to correct this deficiency. In addition, we are currently short of maintenance technicians. For the last few years we have had a very stable work force and were hiring no new technicians. However, last year our attrition rate increased, partly through new retirement regulations, and our recruiting efforts did not fill vacancies fast enough. Consequently, at the beginning of FY-1968, we had 350 vacancies. We hope to fill these shortly by increasing our recruiting efforts. I expect that our attrition will continue to be higher than in the past, due primarily to increased retirements. However, once caught up, we should remain at nearly full strength.

Q. You mean that we will have more new hires for the next few years than we have had in the past?

A. Correct.

Q. What impact will this have on the maintenance workload?

A. Adding new personnel means that we must increase training activities. This is planned. It also means that our average productivity will be lower. This is a problem of the near future and the agency has been unable to obtain the additional resources which are needed to overcome this reduction in efficiency.

Q. Again, getting back to the emphasis on economy, how do you feel about cost-consciousness?

A. I think that we have all become more cost conscious and I certainly hope this continues. We have made tremendous savings during the past few years, but we must never permit the safety of flight operations to be jeopardized. Safety is our first consideration—then prudent economy.

Q. We are moving into automation and the use of solid state devices. How does this change the job of the technician?

A. The automation of certain air traffic control activities will have two important effects on the job of the technician. First, automation will result in more equipment at terminal and enroute control facilities; so more technicians will be required at these facilities. Second, the various units of equipment will be integrated into more of a "system operation" than before, so we will need people who can analyze and troubleshoot systems as well as the individual units of equipment. The use of solid state devices will not only affect the job of the technicians, but will also bring about major changes in our present maintenance concepts. There will be more centralized repair work and, on the other hand, repairs done at the facility will require new skills and test equipment. Our equipment will be much more reliable and, therefore, require less maintenance. It will also be much smaller in size and certain facilities will be housed in watertight cabinets rather than in buildings. The equipment will be modular in form—that is, divided up into a number of individual plug-in units which can easily be removed and replaced.

Q. How do you plan to make these changes?

A. The changes will be evolutionary. They will be incorporated into our maintenance program as the equipment is procured and installed. The process is already underway, but it will be accelerated continuously for the next few years.

Q. Do you see a need for fewer technicians or for more technicians in the future?

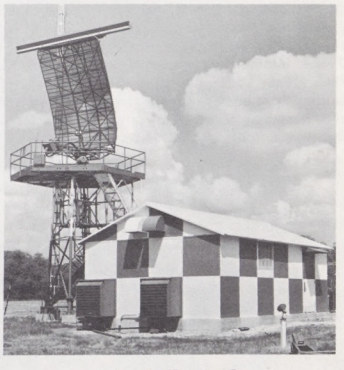
A. I see a rapid increase in the number of technicians needed during the next three years. After that it will probably begin to level off with the number dependent upon agency plans and policies which are now being firmed up and on the level of expenditures authorized to carry out planned programs. I believe that there will be more technicians and many more facilities.

Q. In summary then, you don't expect that the technician's job will be the same in the future, but on the other hand there is no reason to believe that our existing field people cannot meet the new opportunities?

A. Right. I have no doubt that our technicians and other maintenance personnel will meet the challenges ahead. We have the best-trained and most effective maintenance workforce ever assembled. They have always met the challenges presented by past changes in technology and operations, and should take future changes in their stride.

VORTACs are Available!

Of the 1,420 VORs and TACANs throughout the nation, the average "on the air" time figures are a source of great pride to the systems maintenance people who are primarily responsible for their record. Last year, for example, the average VOR was performing its safety duty 99.3 per cent of the time . . . 24 hours a day.



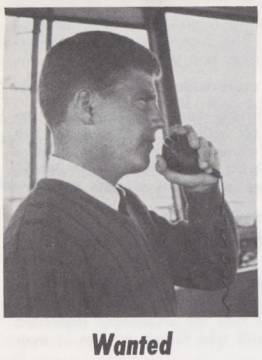
Let's Talk Radar

"Around and around she goes. When she stops . . . systems maintenance knows." The combination of airport surveillance and long range enroute radar brings virtual blanket coverage of the airways coast to coast. Reliable? Available? You bet! Last year the 213 radars operated by the agency worked reliably 98.6 per cent of the time.

Eight Men in a Cab

All aircraft within a six-mile radius of busy O'Hare International Airport are sequenced by this air traffic specialist crew (l. to r.): (1) R. C. Schwank, assistant tower chief, who is observing the operation; (2) Controller who tape records data briefing the pilot on weather, code information, etc. for automatic broadcasting. (3) At flight data post, standing controller briefs seated trainee on job of receiving, posting and relaying flight data. (4) Man delivers clearances to departing and en route aircraft. (5) Ground controller handles taxiing aircraft and landed aircraft. (6) Local control issues landing and takeoff clearances to air traffic within O'Hare's zone, usually has two men. (7) Runway utilization control logs each operation for noise abatement, research, etc. (8) Watch supervisor. (Chicago Sun-Times Photo.)

O'Hare's Busy Young Men



Wanted

Peter H. Salmon, age 23 and married, typifies the right combination of youth and talent being sought for air traffic specialists to work at O'Hare International Airport Tower. The agency has streamlined recruiting procedures to fill needs at O'Hare and 45 other tower cabs in Illinois, Indiana, and Michigan.

20-20

You don't have to be 23 years old and named Peter to excel at O'Hare Tower, but it helps. Peter B. Fogg, assistant controller, recently saved a Cessna 210 from landing with its wheels up, thus averting a runway tie-up and saving thousands of dollars for airliners waiting to land.

Bypass Taxiway

Easing the burden on O'Hare's controllers somewhat is a new bypass taxiway, which crosses the air terminal road to connect a parallel runway with the passenger loading-unloading area. The bypass saves two miles of taxiing distance, and consequently reduces ground control time needed.

By Thom Hook

CHICAGO—The high-wing, retractable gear Cessna 210 made its descent with flaps down on final approach to O'Hare International Airport's main Runway 32L.

With a plane landing every 44 seconds, eight busy men in the tower were aware of the Cessna, as well as other traffic in the area.

Suddenly, assistant controller Peter B. Fogg, a 23-year-old bachelor new on the job, instructed the Cessna to make an immediate go-around. The pilot smoothly shoved carburetor heat "off" and pushed the throttle to the wall, just short of touch-down, to abort the landing.

By noticing that the Cessna's gear wasn't down, young Fogg not only saved thousands of dollars in damage to the aircraft, but also many thousands more by averting a runway tie-up that could seriously cripple traffic movements at O'Hare. A score of airliners also saved countless gallons of fuel by not having to hold in a race track pattern 30 miles away if the runway had to be closed off.

Thanks to an accelerated program, controller-trainees like Peter Fogg can move ahead several grades in six months, if they meet the requirements. This includes attaining a junior rating, passing various tests and examinations, and solving intensive simulation problems.

But not every applicant can "eat 2,000 planes a day"—the normal traffic load at O'Hare. The 8 a.m. to 4 p.m. shift, for example, often handles as much traffic as other airports do in 24 hours.

Of 26 trainees, about two-thirds will measure up to the demands of O'Hare. The rest will go where the daily diet of planes is more palatable to their individual tastes.

Training Is on the Job

Another O'Hare hopeful besides Fogg also is checking out fast. He is 23-year-old Peter H. Salmon, who is married and a father. He was born and grew up in Chicago, but spent two-and-a-half years in Italy learning military operating control at Aviano AFB, near Venice.

Salmon's training now requires that he absorb a vast amount of technical knowledge in order to safely guide aircraft in and out of the Chicago "metroplex," with its seven satellite airports. Whereas the average busy airport has one ILS instrument landing system (ILS), O'Hare alone has six full systems, plus the satellite approaches. A new east-west runway commissioned this month will add two more ILS to O'Hare.

Salmon works alternate weekly shifts in the tower and in the IFR room below it. As he completes his written and oral tests and examinations, he must be checked out in each specific position in order to reach a GS-12 after 3½ years of intensive training.

"Not all of the crew are in their early twenties," says Edward A. Hayes, head of training, and in charge of proficiency development. "Some of us old timers have to provide the guidance and monitoring the young fellows need."

Hayes cites one controller who is a grandfather, as an example of the seasoned experience in back of the young brigade.

Recruiting Effort Is Streamlined

Getting new controllers for O'Hare at one time required a lot of paper work and two months in which to process it, by which time the applicant might have landed a job elsewhere. Now recruit testing can be completed in one day, and then medical and security checks are completed so a man can be on board within two weeks.

Hiring is now going on full throttle for some 24 towers, five combined station/towers, and 18 FSS and two centers in Illinois, Indiana, and Michigan, as well as for O'Hare. The Chicago Area Office first simplified solving the severe shortage of qualified trainees by having the city's metropolitan area become one zone for recruitment and certification. The goal was to staff O'Hare from its own area, rather than to transfer employees in from other locations.

Publicity on the need for air traffic specialists was issued, using almost all available paid and free media in the area—including handbills, newspaper ads, radio spot announcements, and film clips for television. Special news releases were issued two weeks before examinations were to be given. Applicants were encouraged to apply directly to the Area Office, the tower or the center.

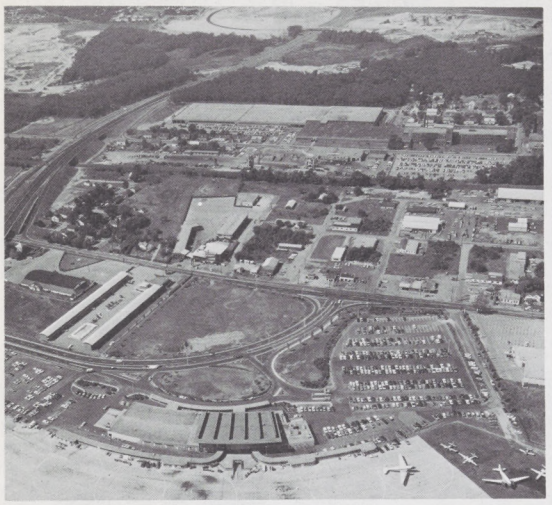
Exams are given in downtown Chicago, screening and aptitude tests are given and graded immediately. All applicants getting by the written exams are interviewed and given a psychological test—all in the same day.

Tentative selection is made and the applicant is given a job offer, subject to medical examination approval. Trainees start at the GS-6 level and embark on the accelerated training program.

Last year O'Hare handled 560,000 airplanes and 22½ million passengers. This year the total will go to 600,000 airplanes and 28 million passengers, according to training head Ed Hayes. Last August 60,462 takeoffs and landings were processed — one every 44 seconds. Handling the volume of traffic is further complicated when runways become unavailable due to expansion—such as the recent creation of a new 10,000 foot runway intersecting one of the existing prime parallel runways. Greater use then must be made of fewer runways, until construction is completed.

Instrument operations at seven other area airports—including Midway, Meigs, Glenview, Palwaukee, Sky Harbor, Chicagoland, and Ft. Sheridan—also are handled by O'Hare radar controllers. The new TRACON and tower will be completed in 1969, to facilitate traffic handling capability.

At present, Daniel M. Vucurevich, O'Hare tower chief, heads 87 tower employees, five of whom are administrative. Their hard work and devotion to duty is known and appreciated agency-wide.



Easy Access

If little Rhode Island can do it, says Boston Area Manager William Cullinan, anyone else can. Working closely with Rhode Island's state aviation director, his office succeeded in getting a connector highway constructed leading to the airport from an interstate highway to the north. The new access road circles into Providence's T. F. Green Airport (above left). The new highway cuts the auto trip to Providence from 40 minutes to only nine minutes.

Hawaiian FSS 'Walks' To Lost Pacific Aircraft

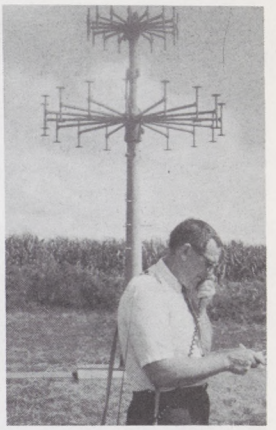
LIHUE, Hawaii—"Necessity *is* the mother of invention," observes Gordon Pearson, Honolulu air traffic chief, to describe the ingenuity used by one of his men in the Honolulu Area Office to meet a vital training need.

Pearson was relating how John Enlow, facility training officer at the Lihue FSS, engineered an unusual training solution to provide more realistic training for station specialists in the use of recently-installed Doppler Direction-Finding (DF) equipment.

Using a Boy Scout compass and a portable VHF transceiver, Enlow found he could set up lost-aircraft problems by "flying" (walking) around the DF antenna. He paced a 25-foot-radius circle around the antenna, determined the number of degree-bearing changes per step within the circle, and worked out reference tables for aircraft speed and angular change at different distances from the station. This enabled him to simulate time and distance problems.

Enlow exercises his specialists in lost aircraft orientation, emergency orientation, emergency approach, no-gyro approach, time and distance and DF vectoring. To add a touch of realism, he often acts the part of a confused and panic-stricken pilot.

Enlow suggests that FSS training officers having difficulty in geting local pilots to partcipate in DF exercises might find a solution to the problem in his idea.



Mayday!

Lihue, Hawaii FSS Training Instructor John Enlow "flies" a lost aircraft exercise, using a battery powered VHF receiver. Pacing the circle around the DF antenna behind him, he determines the number of degree-bearing changes per step.

Agency Team To Test Navaid Testers

ATLANTIC CITY—Three agency electronics technicians from NAFEC and the Southern Region are visiting more than 100 avionics shops throughout the nation to survey the accuracy of electronics test equipment.

The effort, according to NAFEC Project Manager Jack A. Muller, will determine the accuracy of equipment used to calibrate airborne VOR equipment and the glide slope and localizer receivers for ILS.

Matthew Naimo and Harold Postel, both from NAFEC, and Homer Henrioud, of the Southern Region headquarters, are now finishing up in the Central Region.

New Elmendorf Tower/RAPCON Really Stands Tall and Handsome

By George Fay

ANCHORAGE, Alaska—Like a giant exclamation mark, the new control tower at Elmendorf AFB rises prominently on the Anchorage skyline. Atop its tall, graceful concrete shaft is perched the control cab operated by controllers at Elmendorf's 1931st Air Force Communications Squadron. Its base, 125 feet below, houses the FAA Radar Approach Control facility (RAPCON), which serves all traffic entering or leaving Anchorage's five major airports within a range of 50 miles.

"This control extends from the ground to 20,000 feet," says Ray VanVuren, facility chief, who heads a team of 49 controllers and maintenance technicians assigned to the Elmendorf Tower/RAPCON, as it is commonly known.

Normally RAPCON services are provided from the ground to 6,000 feet within an area of 20 or 30 miles. "Ours extends considerably beyond that," says VanVuren.

Commissioned last summer, this combined facility is one of the most advanced of its type to be found anywhere. "The Air Force needed a tower to replace the one destroyed in the 1964 earthquake," recalls VanVuren. "We needed to move the RAPCON from the crowded Anchorage Center at Elmendorf because of increasing traffic flying the North Pacific. This $1.5 million combined facility serves both our needs," he adds.

The Air Force put up 49 per cent of the cost, the agency the rest. FAA takes care of all electronic and radar maintenance for the tower and RAPCON. The Air Force takes care of all building and ground maintenance.

Vietnam Flights Increase Traffic

"Sometimes we have as many blips on the scope as we had at O'Hare Airport," reflects Richard Delaney, air traffic control specialist. The Anchorage terminal area is experiencing some of the traffic indigestion that other areas are faced with outside. The huge airlift of C-141s flying men and material to Vietnam uses Elmendorf as a refueling base on east-west flights.

Aircraft of every description operate out of Anchorage's five airports. Air Defense Command jets scramble at Elmendorf on training missions; air carriers flying between Europe, the United States, and the Orient refuel at the International Airport; air taxi, bush and private aircraft swarm in the traffic pattern at Merrill Field; float planes splash in and out of nearby Lake Hood; and U. S. Army helicopers and *Caribou* fixed wing aircraft operate at Fort Richardson.

This mix of aircraft with the C-141s on the Vietnam airlift combine to crowd Anchorage's airspace, which is already dotted by mountain ranges which surround Alaska's largest city. Air Traffic Control Specialists Kenneth Spencer, who transferred from Portland, and Donald Kent, who formerly worked at the New York Center, agree with Delaney that their RAPCON is strictly a big league operation.

Initiate Direct Clearance

To speed up departures, VanVuren's controllers started a clearance delivery service last summer. Pilots speak to the controller in the RAPCON directly for clearances, bypassing the control tower operator. "Since flight plans are 'stored' in advance, it only takes a radio call to activate them," explains VanVuren. This cuts down on radio use and saves time.

Ground Control Approaches to Elmendorf are also handled uniquely, with the Air Force paying the tab. Five FAA controllers handle GCAs from approach to touchdown. But, the final controllers usually wear Air Force blue. The agency is reimbursed for this service. It's safer, too, since the pilot doesn't have to change communications channels as he transitions from approach to final controller. He uses only one frequency all the way to touchdown.

The Elmendorf Tower/RAPCON stands as a symbol to that special rapport that has always existed between the Air Force and the agency in the "49th State." Lieutenant General Robert A. Breitweiser, USAF, the commander of all Alaskan military forces, said it best at the dedication ceremony held last summer:

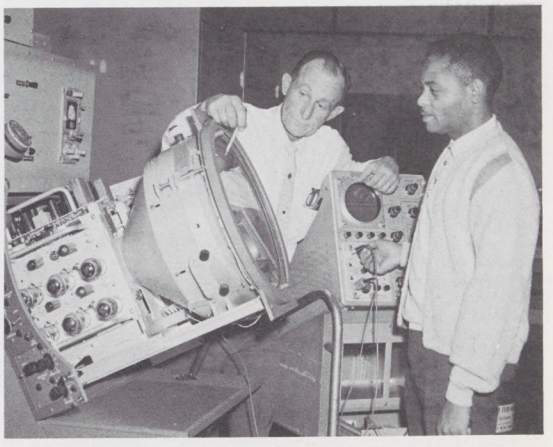
"While the new facility will greatly aid all the combined military forces, it will also greatly benefit our Alaskan friends. The new radar approach control facility, operated by the FAA, is a symbol of the continuing efforts of the Federal Government to make flying safer and the movement of air traffic more efficient."

New Tower Rapcon

Henry Spiller (left), and Dick Delaney, air traffic specialists, work arrival scope and precision scope for GCA landings at Elmendorf AFB in Alaska.

Big League Tower

The new Elmendorf AFB Control Tower sits 125 feet above the RAPCON facility located in base of structure. It serves Anchorage's five major airports within 50 miles.



Giant Eye

Henry N. Payton (left), supervisory electronics maintenance technician at the Elmendorf Tower/RAPCON, trouble shoots radar indicator with Willie R. Cadwell, EMT. Signal is transmitted by radar microwave link (RML) from ASR-5 radar 12 miles distant to a reflector at Elmendorf and thence to the antenna at the RAPCON site. This is a little different—usually coaxial cables are used to transmit radar signals.

Direct Line!

This is your direct line to the top! Your questions will get answers! Of course, employees are encouraged to discuss questions or problems with their supervisors or their local personnel office, but for those FAAers who do not have ready access to a personnel office, this column will give them an opportunity to have their questions answered. Write today to Joseph H. Tippets, PT-1, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20590. General Ground Rules: • All questions must be signed by the employees. • This column should not be used in place of the formal grievance and appeals procedures. • The questions should concern personnel or training policies, programs, and procedures and not be operational or technical in nature.

QUESTION: Sometimes it takes months to find out who is selected for a bid. Why not have a short memo sent to the bidders as soon as a selection is made?

ANSWER: You've put your finger on a problem that has been of concern to both management and employees. The Merit Promotion Program requires each personnel office to periodically publish a list of employees selected for promotion. As a result of your suggestion, however, additional instructions have been sent to all regions and centers emphasizing the importance of issuing selection lists on a more timely basis. Your suggestion would be the ideal solution, but it would add a great deal of paper work to an already heavy workload.

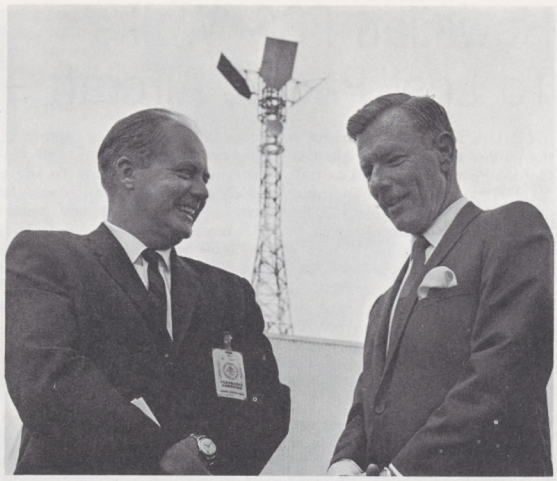
QUESTION: What is the agency policy with respect to the value accorded experience gained in outside activities in filling agency executive positions? How can information on details of less than six months be incorporated into the ESIS system?

ANSWER: You may be assured that experience gained through outside activities is taken into consideration by selection officials when reviewing the complete qualifications of candidates for an executive position. However, you must remember that while outside activities will be considered, your record of job performance will play the major role in selection.

If you feel that the details to which you were assigned added significantly to your qualifications, you may describe them in the narrative portion of the assignment section of your career profile. To update your profile, just contact your local personnel office. You should make sure that your personnel office documents any details in excess of 30 days (in accordance with PT P 3330.9) so that they become a matter of record in your official personnel folder and available for review by the selecting official. By the way, ESIS stands for Executive Selection and Inventory System and contains background data on FAA employees in grade GS-14 and above.

QUESTION: Our area office has issued a ruling that no employee shall be scheduled to work more than six consecutive days. Is this consistent with agency policy?

ANSWER: Yes. The present agency rule is that employees should not be scheduled to work for more than six consecutive days. (See PT P 3600.3) However, this policy is presently being reviewed to make sure that it is in the best interest of the agency and FAA employees. If appropriate, it will be modified.



Champ Center

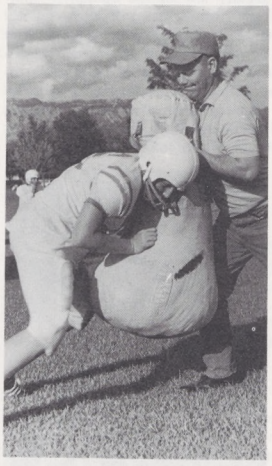
James Pound (right), Jacksonville ARTC chief, tells James Rogers, Southern Region director, why he believes his was the "Facility of the Year" in keen competition among the nation's 28 centers.

First FSS

Archie W. League, Director of Air Traffic Service, makes presentation of plaque for being number one among 332 flight service stations as Chief William P. Carlton, Oklahoma City FSS, prepares to accept it for his facility.

Christmas Seals Booster

Holding a copy of FAA HORIZONS to add a personal note, Michele Patrick, Miss American Teen-ager, asks our readers to use Christmas Seals generously. Contributions finance work against tuberculosis, other respiratory diseases and air pollution.



Hubba-Hubba

Barney Orgill (wearing coach's cap) is one of six Albuquerque Center controllers teaching some 600 boys good sportsmanship and football fundamentals in the local Young America Football League. Other controllers who enjoy working with the young boys and limping home weary but inspired are: Robert Bibbey, Larry Paschick, Dempy Archer, Frank Feldman and Warren Sylvester.

Agency Names Top ATC Facilities

(Continued from pg. 1)

The semi-automated ATC system being installed at Jacksonville is expected to be operational in April, 1969.

Opa Locka Traffic Has Doubled

At Opa Locka, "best" of 337 ATC towers, and CS/Ts, Archie League congratulated Chief Paul McConnell for having the outstanding facility in the face of operations that burgeoned from 265,000 in 1964 to 558,000 last year.

"The challenge met by Opa Locka was even more readily appreciated," said League, "when we realize this traffic is handled in a 16-hour-a-day operation—not in a 24-hour day."

Explaining what ingredients make a winner, McConnell said: "We feel the controller and the pilot are on the same team. Our operations not only doubled recently, but in five years have almost quadrupled," he added. "All personnel help solve operational problems and develop procedures to handle this ever-increasing volume."

A very specialized checkout and training program is needed, according to McConnell.

"Personnel here have developed a teamwork concept to smoothly operate despite peak hourly movements up to 347, and up to 3,256 a day, with virtually no delays to the aviation public," McConnell said.

Pioneering of many successful procedures also added to the many reasons for Opa Locka's selection. Among these were the use of dual local control frequencies in a VFR environment, and the use of three parallel runways.

"Each supervisor and controller has helped build and maintain the highest possible standards, in the face of mushrooming growth to the greatest volume level in civil aviation history," McConnell concluded.

League Flies to Oklahoma City

Having duly honored the two Florida winners, Director League took a giant step of more than a thousand miles to proclaim the Oklahoma City FSS "tops" among the nation's 332 flight service stations.

Presenting the plaque, League told William P. Carlton, OK City FCC chief, that his facility's selection was strongly influenced by the unit's high productivity. The FSS provided an average of 13,958 flight services per specialist during 1966. This figure nearly doubled the regional average of 7,500.

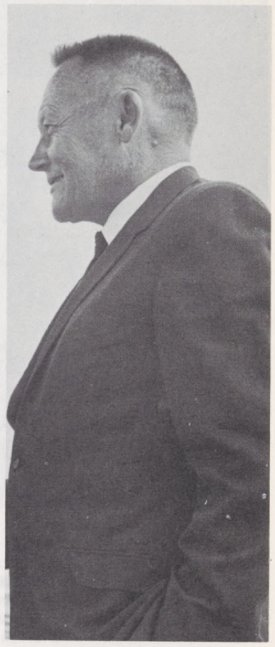
"Oklahoma City FSS personnel were also very active in community relations, training, work with civil organizations and making local improvements," League pointed out.

Accepting the award on behalf of all employees, William P. Carlton said:

"It takes harmony, dedication, and a crew of men among whom there are no slackers."

Carlton went on to say that his controllers give their pilot-customers the impression they are sincerely delighted to wait on them.

One of Carlton's first tasks as chief was to clean up the "language" of the men — improving their phraseology in radio communication.



Top Tower's Chief

Paul McConnell, Opa Locka, Fla. tower chief, has a right to be smiling. His crew has just been selected the best of the nation's 337 air traffic control towers and combined station towers.

"There was a period of friendly nit-picking and gigging among the controllers," he recalls.

"Innovations are constantly being tried and accepted," Carlton said, "which, together with friendly competition, makes service better."

The Oklahoma City specialists also were recognized for the excellent way they handle the varied mix of flight activities involving the Aeronautical Center, a major aircraft manufacturer, Tinker AFB, VIP traffic, airport-based flying schools, and two leading universities.

FSS Has Varied Customers

The winning station works hand-in-glove with Aero Commander during tests in the area of the manufacturer's jet and piston aircraft.

Their location near a state capital brings governors, senators, and even astronauts into the FSS service picture, and the two universities' courses in aeronautical engineering draw faculty and students into working with the FSS staff.

"We are air traffic oriented all the way," said Carlton. "We even have a secretary who was a journeyman before she transferred into office work."

Recently nine of Carlton's specialists bought a single-engine aircraft to keep up their flying proficiency and for business as well as pleasure flying.

Runners-up nominated by their regions, who gave the winners a stiff run for the coveted awards, were:

ARTCC	TOWER	FSS
Los Angeles	St. Louis	Crossville Tenn.
Chicago	J. F. Kennedy	Detroit
Fort Worth	Lubbock	Columbus, Ohio
New York City	San Jose	Phoenix
Guam, M.I.	Honolulu	Kenai, Alaska
.....	.....	Honolulu