

# BEACON

JANUARY 1961



FEDERAL AVIATION AGENCY

*Aeronautical Center*

OKLAHOMA CITY

The Beacon will have a face-lifting with this new year of 1961. The first indication of that is this true magazine-fold format.

Future issues of the Aeronautical Center magazine will be off the press on a monthly basis.

The problem of magazine circulation has been a major one. The Beacon staff has just brought our mailing lists up to date.

This magazine of yours will continue -- with greater impetus -- to bring you the news from Washington and other regions as well as the news affecting you in the Aeronautical Center environs. One need still lacking support is within the area of "personality" stories. Most of the FAA Center people have been somewhere; done something; have some unusual accomplishments. Let's tell the Beacon reporters in your area about these possible stories.

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The darkness illimitable  
On quiet feet surrounded those lives  
Within the confines of the airliner.  
In the cockpit a faint luminous glow  
Shadowed the faces;  
Silhouettes guiding the machine  
Talked to voices from depths below.

In the airliner a child turns in sleep,  
A man dabs out the fire of a cigarette  
And then peers into the mirrored deep  
Of the blackness seen past the wings.  
The engines, in a murmuring chorus  
Of power, protest as the plane starts  
Down... swiftly past beckoning lights,  
Marching ahead on the approach  
Between lines of light in darkness.  
Blurred lines of lights become pools  
of brightness.

The plane's wheels protest the touch  
of earth.

Christmas Eve in flight!

The picture inside the back cover is a time exposure night shot of the Oklahoma City Civic Center. The County Building in the foreground, the Municipal Building and the Municipal Auditorium in the background.



#### POINT OF VIEW

I thought you might be interested in knowing, at this the beginning of a new year, how you collectively are regarded by your neighbors. Oftentimes, because of the closeness of our association, we are not aware of our neighbors reaction to our particular way of life. It takes someone in a more remote relationship, to sense the true situation. Being relatively a newcomer to Oklahoma City, I find myself in this remote situation.

In getting located here I of necessity had occasion to contact many different people both in the business world and in the civic world. The fact that I too was an employee of FAA served as an "Open Sesame." I was made to feel wanted and no favor was too much to ask.

This experience without question is a reflection of the high regard in which you are held by your fellow citizens. The fact that this high regard is well deserved was further demonstrated by the excellent showing, 114 percent of quota, which you made in the United Fund drive.

I can only say that I am proud to be identified with you as an employee of the FAA Aeronautical Center and will strive to do my part, as I am sure you will continue to do, in maintaining this reputation.

Lewis N. Bayne  
Manager, Aeronautical Center



### **PYLE SPEAKS TO NATA**

Deputy Administrator James T. Pyle spoke to the 21st annual National Aviation Trades Association convention in Oklahoma City this last month.

The Federal Aviation Agency number two man was one of several speakers. Pyle told the group that both the FAA and aviation industry share responsibilities. "There is no room for differences insofar as methods are concerned. There can be no compromise on goals.

"Many times, it seems to me, that segments the industry, the public and some of us in government get the idea that we must be on either one side or the other. However, there is only one side and all of us are on it."

Among other speakers were Russell J. Abbott, safety investigator for the Civil Aeronautics Board. Abbott told NATA members that if no other way is found to get information to the pilot to eliminate accidents, one obvious solution is to require regulations.

Most of the NATA's members, in six meetings, attempted to eliminate FAA regulations.

Brigadier General Stephen McElroy, Civil Air Patrol commanding general, stressed the need for better educational liaison between aviation and the CAP.

U.S. Senator Mike Monroney told the convention that the need for air cargo and the planes to handle such cargo was a growing need. Someday soon it must be faced by the industry that this is a much more commercial facet of aviation than passenger hauling.

### **CENTER HOSTS CONFERENCE**

Aerial applicators—"crop dusters"—met with the FAA in Oklahoma City this last month to discuss safety standards and operational requirement problems of agricultural flying.

A. L. Coulter, Chief of the Safety Regulations Division of the Bureau of Flight Standards, headed the FAA group which met with members of the industry. This meeting was a further discussion of certain regulatory areas and followed an earlier meeting this last Summer.

At about the same time, a Facilities Training Conference was held at the Aeronautical Center's FAA School. The conference took up training problems associated with all electronic equipment of the Federal Airways System in the United States, including Alaska and Hawaii.

Thirty persons from New York, Fort Worth, Kansas City, Los Angeles, Anchorage, Alaska, Honolulu, Hawaii and Washington, D.C., attended.

From Washington FAA were Joseph H. Tippets, Director of the Bureau of Facilities and Materiel, W. H. Hill, Assistant Chief of the Training Division and Carl Kusrow, Chairman of the conference.

Center officials attending were E. B. Olson, Superintendent of the FAA School and C. W. Mueller, Head of the Department of Air Navigation Facilities Training of the FAA School.

### **QUESADA LAUDS DECISION ON NO INAUGURAL FLY-BY**

E. R. Quesada, Administrator, Federal Aviation Agency, today lauded the decision of President-elect Kennedy's Inaugural Committee to omit a military fly-by from the inaugural proceedings to take place in Washington, D.C. on January 20, 1961.

The desirability of scheduling a fly-by with several different kinds of military aircraft had been under consideration by the Inaugural Committee in planning the Inauguration Day program. However, at a December 1 meeting, presided over by Edward H. Foley, General Chairman of the 1961 Inaugural Committee, the group unanimously opposed the aerial demonstration.

"I am extremely pleased by the Committee's decision," Mr. Quesada said. "I think it is most realistic and reflects obvious concern for the public interest. The Committee officials should be highly commended for placing the public interest ahead of other considerations."

In acknowledging the Committee's decision to forego the fly-by, Mr. Quesada pointed out

that a group of military planes flying at relatively low altitudes over the inaugural route and other parts of the metropolitan area would disrupt normal air operations causing undue burdens and inconveniences to the flying public and to the carriers.

"The interruption to the normal flow of interstate air commerce would create delays to passengers and cargo at air terminals that would be felt not only locally," he said, "but at many distant parts of the country as well."

Mr. Quesada further added that in view of the heavy concentration of persons that is expected to line the inaugural route, a fly-by would carry with it an element of hazard which would greatly detract from its appeal.

Dr. Arnold E. Briddon has been appointed to head our Agency history program. Until his appointment with FAA on November 21, 1960, as FAA Historian in the Office of Management Services, Dr. Briddon was a Senior Historian for the Joint Chiefs of Staff, Department of Defense.

The Agency Historian is responsible for directing the Agency's history program and preparing the Administrator's Annual Report to the President and the Congress.

Dr. Briddon will work with the Bureaus and Offices during the next several weeks in connection with the preparation of the Annual Report. This should also provide an opportunity for an exchange of information regarding the scope and operation of our official history program.

#### NEW APPROACH TO ADULT EDUCATION

The interest in self-improvement and education among FAA employees is very evident and gratifying. We just received a recent news release from the University of Oklahoma which describes a new approach to Adult Education. It appears to hold some very real possibilities to the working man who would really like to know a degree program. We are reproducing the article verbatim.

For those who are interested in learning more about this new degree program we are arranging for Hal McGee from the University Extension Division to outline the program, answer questions and furnish applications. This will be during the month of January and the specific time and place will be announced soon.

Norman.—The University of Oklahoma today announced a new degree and a new college, opening the door for Oklahoma and Southwest

ern adults to an unusual liberal education opportunity.

The new degree, the bachelor of liberal studies, will cover the humanities, social sciences, and natural sciences. Major emphasis will be placed on independent study, intensive residential seminars, comprehensive examinations and continuous advisement, rather than the accumulation of the traditional residence credit hours.

The BLS program, developed by a 10-member faculty committee after two years of intensive investigation and study, will be administered by a new College of Continuing Education composed of university faculty members and headed by the Extension Division dean.

"The degree program represents the concern of the university for adults who wish to participate in a systematic program of continuing education," said Dr. George L. Cross, university president.

"It recognizes abilities of gifted adults to pursue a baccalaureate program, with a minimum amount of supervision and a maximum amount of independent study," Dr. Cross added. "From the university's experience in serving more than 35,000 adults a year, we know that the degree will satisfy both the desires of Oklahoma employers and individual members of the university's adult student body."

The degree committee, headed by Dr. J. Clayton Feaver, David Ross Boyd professor of philosophy, planned the program to provide the adult student with:

1. Knowledge of the natural sciences, social sciences, and humanities in sufficient depth to enable him to understand the relation between the broad areas of knowledge; understand the investigative methods used in each field, and to read, write, interpret and evaluate the works of scholars within each field.
2. Understanding of self.
3. Understanding of the behavior of individuals and groups; knowledge of one's own and contemporary cultures.
4. A historical view of man's development—social, intellectual, scientific, artistic and religious—and the probable direction and effect of political, economic and technological change.
5. Understanding of great literary, scientific and artistic works.

"Believing that education is a lifelong process, involving the many facets of human interests and concerns, the BLS program is calculated to give to the mature person a broad and solid basis on which to think and act in the three great

areas of learning and achievement: natural science, social science, and humanities, including fine arts," Dr. Feaver said.

"Preparation for the degree in liberal studies will include extensive guided reading by non-resident students and independent study," Dr. Feaver noted. "The competence of the student will be evaluated through comprehensive examinations and seminar participation in each of the three areas, a special research paper, and the completion of an inter-area seminar and examination."

Completion of the degree program will require from two to eight years, depending on background, motivation, and time the individual can devote to his studies.

Dr. Thurman White, dean of the university Extension Division, had this to say about the committee's work:

"The program is brilliantly conceived and shows a rare faculty insight into the educational requirements of mature people, particularly those of the Southwestern area.

"The experimental approach used by this faculty committee is in keeping with current efforts by academic communities to meet the demands of modern society.

"It represents a courageous break with traditional patterns and represents a profound appreciation for the quality intellects in our adult population."

Committee members who worked with Feaver in designing the program are Carlton W. Berenda, department of philosophy; Jess E. Burkett, director of research, Extension Division; Kenneth Crook, David Ross Boyd, professor of chemistry; Gail de Stwolinski, chairman, department of music theory and history; Rufus G. Hall, Jr., chairman, department of government; Bernard O. Heston, department of chemistry; Franklin C. Morris, chairman, department of engineering drawing; Ralph E. Olson, chairman, department of geography, and Othel D. Westfall, David Ross Boyd, professor of accounting.

The new degree offers assistance in meeting a need that has troubled American educators for many years, Dr. Pete Kyle McCarter, OU vice president, pointed out.

"In offering this new degree," Dr. McCarter explained, "the university offers a solution to a long-standing problem in American education; how to build a solid and substantial degree in the liberal arts, design it for mature people, and adapt it to the demands that their varying occupations make upon their time.



#### AERODYNAMICS OF THE HUMAN BODY

A research report entitled "Studies of Air Loads on Man" by John J. Swearingen and Ernest B. McFadden of CARI has been published in the Journal of the Human Factors Society. The paper describes the aerodynamic qualities of the human body in various positions or flight attitudes. Studies on human subjects were carried out in a blast tunnel attached as a parasite to an altitude chamber (for short duration exposures) and in the U. S. Navy David Taylor Model Basin wind tunnel at Washington, D.C. (for longer exposures). The project was in part supported by the Office of Naval Research.

Blast tunnel studies were conducted in order to determine the magnitude of blast forces required to cause displacement and disorientation of the body. Wind tunnel experiments were carried out to determine the aerodynamics of the body in the same manner aircraft models are tested by supporting the body in a wind tunnel and measuring drag coefficients, lift, pitch, yaw, side forces, etc. In addition a man-aircraft combination was tested in the wind tunnel as an evaluation of one-man aircraft aerodynamics. Measurements were made with the subject in five body positions (standing, sitting, lying on his back and in two squatting positions). The

subject was rotated through 360 degrees in each of these positions and the measurements required approximately 30 minutes of exposure at each position. A total of 25 subjects were exposed to wind velocities at increments of 24, 40, etc., up to 160 miles per hour.

Thirty minutes exposure to moderate high velocity wind forces imposed considerable stress and discomfort on the subject tested. At certain angles breathing was quite difficult and the skin and flesh rippled in a definite wave form and frequency. Subsequent studies of the frequency of this phenomena has shed light on failure (premature release) of ejection seat belt mechanism. Release mechanisms were test vibrated at this frequency and found to release spontaneously. Design changes were instituted and premature releases were reduced to a minimum.

Very small particles of debris were picked up by the wind tunnel fans and were carried through the test throat with sufficient velocity that they were imbedded in the skin of the test subjects.

Subjects held a "dead man" switch on at all times during the wind tunnel exposures. Release of this switch would result in an emergency stop of the huge wind tunnel fans in order to avoid injury to any subject who unexpectedly became stressed beyond his limits.

Blast tunnel studies showed that light clothing increased the drag of the body by 17-22 percent. Similarly wind tunnel studies showed a 17-20 per cent decrease in the drag of nude subjects as compared to clothed subjects.

Blast studies were designed to determine the force required to disorientate the body beyond recovery (i.e., knock the subject off his feet or seat, etc.). Results of this study find application in the definition of hazardous areas around pressurized aircraft windows, doors, exits, etc., in case of failure of these structures. Wind blast hazards are also encountered near the intakes and exhausts of jet aircraft. These findings are also important in military situations where it is important to know if a standing or seated operator may continue his function following exposure to wind blast. It was found that an average force of 125 lbs. standing face-to-blast was sufficient to knock the subject off his feet. Standing back-to-blast required 170 lbs., sitting face-to-blast 91 lbs., sitting back-to-blast 92 lbs. Various combinations of sitting and standing side-to-blast as well as numerous body positions assumed during the act of walking were tested.

### SWEDISH RESEARCHER VISITS CARI

Dr. Hohwii Christensen, Director of the Royal Gymnastic Institute at Stockholm visited CARI November 21 and 22, 1960. Dr. Christensen is a consultant to the Swedish Air Force and Civilian Airlines. His work is closely related to the many facets of research to be conducted at CARI. In 1934 he participated in one of the earliest international scientific expeditions into the high Andean Mountains of South America and collected a wealth of original data on circulatory and respiratory responses at high altitude. He has remained a leading international authority in the field of performance physiology and has strongly influenced many research workers throughout the world.

Dr. Christensen has also conducted research within this country having been attached to the Harvard Fatigue Laboratory where he was engaged in research work on problems of fatigue, physical exercise, altitude, nutrition and climatic extremes.

At a joint seminar of staff members of the O. U. Medical School and CARI, Dr. Christensen presented experimental data on the optimum efficiency of working-resting periods. As daily practices in some industries show, enormous physical loads can be tolerated by the working man if the working periods are relatively short and followed by resting periods of certain length.

Dr. Christensen and his research associates in Stockholm experimented with a variety of work intensities and work-rest periods.

Their results show that the total tolerable workload depends more upon the proper length of the working period than on the length of recovery. For instance, a certain heavy workload might be tolerable in cycles of 30 seconds on and 30 seconds off, for a very long period of time. However in the event of the same work intensity lasting a full minute, even a recovery period of 2 or 3 minutes may become insufficient, reducing the total work load considerably because of premature exhaustion.

The physiological reasons for such behavior were discussed and it was generally felt that these findings stimulate thinking and new studies on cellular metabolism.

### SEMINAR ON ACCELERATION RESEARCH CONDUCTED AT CARI

Dr. Randall Chambers, Chief of the Human Engineering Branch of the Naval Air Development Center at Johnsville, Pennsylvania visited CARI on November 9 and 10, 1960. Dr. Chambers (a physiological-psychologist) presented a

summary of research conduct, utilizing the human centrifuge at Johnsville. This facility capable of attaining 40 "g" within 7 seconds (to my knowledge the largest and most versatile facility of its kind within the free world) was designed and built specifically for the testing of human tolerance and the development of protective equipment to high "g" forces.

Dr. Chambers described human performance studies on vehicle simulation and acceleration profiles of the X-15 Research Aircraft, the Mercury capsule, the Dynasoar, plus a number of proposed space vehicles.

The centrifuge has recently been equipped with a closed-loop flight simulator, consisting of flight controls, programmer and analog computer. This makes it possible for the pilot in the centrifuge gondola to fly a mission with acceleration response of the gondola determined by the pilots flight maneuvers and aerodynamic equations fed into the analog computer.

Dr. Chambers also described some of the experiments with the 7 Mercury Astronauts and utilization of individually cast contour couches and water immersion to increase human tolerance to high "g" exposure.

Psychological research has been concentrated on problems relating to high "g" exposure and impairment of simple motor performance, complex task performance, higher mental function and time preception.

#### **CARI Pharmacologist Offers Advice to Parents**

That innocent bottle of aspirin sitting on your bathroom shelf is a potential killer if negligence is permitted to enter the picture. Dr. W. B. Stavinocha, new Chief of CARI's Pharmacology-Toxicology Section, says that most people are unaware of the dangers that aspirin and many other common household items may hold, especially for children, when used improperly.

Dr. Stavinocha, whose work with CARI will involve toxicological problems of modern aviation, has in the past witnessed grim examples of poisoning in children. After receiving his B.S. in 1951 and his M.S. in 1954, both from the School of Pharmacy at the University of Texas, he studied at the Medical Center in Galveston, Texas, for a Ph. D. in Pharmacology, which he received in 1958. While in Galveston he became interested in a large number of children who had been referred to the John Sealy Hospitals there with strange symptoms such as difficulty in walking, tremor, sleepiness, and loss of hair.

It was discovered that they were the victims of thallium poisoning, having eaten vanilla wafer

crumbs combined with thallium sulfate, a highly potent poison. This mixture, extremely palatable to cockroaches, is also attractive to children. Since the poison was deadly and its concentration in the mixture was about three per cent, less than a teaspoonful could have been fatal to a small child.

One of the first thallium victims treated at Galveston did die, and another was permanently injured. In later cases, however, a treatment was evolved which seemed to relieve symptoms, and several new drugs were developed as antidotes.

A particularly bad aspect of the Galveston situation, says Dr. Stavinocha, was that it was not legally possible to prevent more cases of the poisoning by removing the product from the market. Stronger laws had to be passed to force manufacturers to reduce the thallium content to one per cent in preparations for use by the general public.



The need for stronger laws controlling poisonous substances still exists, Dr. Stavinocha says. With new and possibly harmful household chemicals appearing every day, he has four pieces of advice for parents of small children:

1. All parents should realize that even substances not marked "poison", such as aspirin, may be poisonous if taken in large amounts.
2. All suspected poisons should be kept under lock or out of reach of children and should be clearly labeled.
3. Parents should become familiar with accepted first aid procedures and have the family physician's telephone number handy.

4. In the event of poisoning, the container should be preserved and given to the physician, so that he may know exactly what the child has taken. The flood of new products on the market, many with contents and antidotes not specified on the label, has led to the establishment in many cities of Poison Control and Information Centers. Here, at all times, extensive files and the advice of competent toxicologists are available to physicians.

#### **NINE LONG-RANGE RADARS TO BE ADDED TO FAA SYSTEM**

Nine additional long range radars have been ordered by the Federal Aviation Agency to increase the capability of its air traffic control system for handling heavy en route air traffic. The \$5.2 million contract was awarded to the Raytheon Company, Waltham, Massachusetts.

Joseph H. Tippets, Director of the Bureau of Facilities and Material said that when installed, the new radars will bring the total of FAA long range radars to 52. In addition, FAA uses radar information from 12 military long range radar installations for air traffic control. Locations of the radars and the Air Route Traffic Control Centers to be served are still under study.

Improvements in electronic components, particularly the use of power tubes called amplitrons, have increased the range and performance of the equipment. With the amplitrons the range of the new radars will be 200 miles on transport type aircraft. At a shorter range, the radar will be able to track aircraft up to 60,000 feet in altitude.

The new radars will be equipped with circular polarization which will increase the ability of the Air Route Surveillance Radars (ARSR-2) to detect and track aircraft in rain and snow.

An improvement moving target indicator system is incorporated in the radars. The moving target indicator (MTI) makes moving targets easier to detect on the scope by drastically reducing the shielding effect of fixed objects such as buildings.

The radars will be equipped with a video mapper which will super impose an electronic map of ground areas under specific air routes to assist controllers to pinpoint targets.

The Air Route Surveillance Radars generally will be located at some distance from the air route traffic control centers they are to serve. The radar information will be transmitted to the FAA traffic control center by microwave link.

The antenna for the new equipment will measure 25 by 50 feet providing improved, high-altitude, close-in coverage of air traffic. Current

long range radars have an antenna 11 by 40 feet in size.

Delivery of the first radars under the new contract is scheduled for January, 1962.

#### **HIGH SPEED TELETYPES TO SPEED WEATHER TO PILOTS**

The Department of Air Traffic Management Training has just completed training 58 Flight Service Specialists in the operational techniques of the ADIS equipment. ADIS, meaning Automatic Data Interchange System, is being installed at key locations throughout the conterminous United States to permit a rapid exchange of aviation weather data, keeping pace with the accelerating jet age.

Representing the Washington Office and Regional Offices of the Bureau of Air Traffic Management, Flight Service Station field facilities, and personnel of ATKT and Lincoln Laboratories, these 58 were introduced to the newest methods of handling vital meteorological data, the equipment, and the new Service "A" circuit configurations.

ADIS will incorporate 5 Interchange Centers, receiving weather data from numerous Low Speed circuits (100 wmp) and disseminating this weather data, via High Speed circuits which will carry this data to distant points at speeds of more than 800 words per minute.

This unique equipment is installed in the ANF-1 Building here at the Aeronautical Center, and is being shared by the DANFT and DATMT personnel for training of their personnel. Designed and manufactured for the FAA, the ADIS equipment utilizes a Message Director

to "pick" off the required weather data, being transmitted over the High Speed circuit, and relays it to the proper Low Speed circuit. Pre-programmed schedules are put into the Memory Circuit of the Message Director enabling stations along any circuit to receive only the meteorological data pertinent to their needs.

The ADIS program is well under way and should be fully operational on the weather circuits shortly after the first of the year. This will result in a phenomenal increase in the speed of disseminating this weather data to Flight Service Stations throughout the country. To illustrate this rapid acceleration, it now requires nearly one hour to transmit and relay meteorological data over the circuits within the U.S., when ADIS is fully operational, this same data will be disseminated in approximately 17 minutes.

## **Revision of Very High Frequency Deployment Plan Announced by Federal Aviation Agency**

E. R. Quesada, Administrator, Federal Aviation Agency, has announced a revision of the Agency's Very High Frequency Development Plan which will extend to January 1, 1966, the date when the FAA will implement unrestricted channel assignments using 50 kc. separation.

The revised plan followed numerous meetings with the General Aviation Council and a general meeting with industry representatives and the FAA earlier this year. Industry suggestions have been considered in the revised plan, and it now more fully meets the objectives of both the Air Traffic Control System and the users.

A Technical Standard Order will not be adopted as a requirement for communication transmitters and receivers for general aviation aircraft. Instead, a guide for general aviation communications equipment manufacturers is being developed by Special Committee 93 of the Radio Technical Commission for Aeronautics. The Federal Communications Commission requirements for transmission stability and quality govern aviation communication equipment.

The plan provides for continuing both VFR and IFR (below 24,000), communications service on the 100 kc. channels between 118-127 mcs. until January 1, 1966. VFR communications service will continue thereafter on the 100 kcs. to the extent feasible. The plan continues to provide service on 50 kc channeling in the 127-135 mcs. band for users with this tuning capability.

Beginning January 1, 1961, frequency assignments of 50 kc. separation will be progressively implemented below 127 mcs. on a case-by-case basis, as may be required for both terminal and en route services. However, until January 1, 1966, 50 kcs. channel assignments will in most cases be installed in high density traffic areas.

Commencing in 1966, unrestricted channel assignments using 50 kc. separations will be implemented for all communication functions as air traffic control requirements may dictate. Airport control towers and flight service stations will continue to provide communications service for VFR traffic on 100 kcs. 100 kcs. channels to the extent feasible.

As the traffic control services expand and additional 50 kc. assignments are progressively made, it will be highly desirable for aircraft to be equipped with 50 kc. equipment throughout the 118-135 mcs., if they are to benefit from all the communications and traffic control services

available to them. The FAA points out that it is not intended to infer that present airborne radio gear will be unusable. However, the communications service available on 100 kc. channels will of necessity be less than a complete service, and will be subjected to interference from adjacent frequencies in some parts of the of the country.

## **FAA LIBERALIZES ITS APPLICATION OF COLOR VISION REQUIREMENTS**

The FAA has liberalized its application of color vision requirements for airman applicants for commercial pilot (Class 2) and student and private pilot (Class 3) medical certificates. The action, which eliminates the "practical signal light test", will result in unlimited certifications of some applicants who previously had not met the requirements.

Under the reinterpretation of the color vision standards, a lower passing score has been adopted for each of the six established color vision tests which are used by FAA to determine if applicants can distinguish the aviation signal colors—red, green and white. Applicants take only one of the six tests.

An applicant who fails to make a passing score on the test may be issued a limited medical certificate if he meets the other physical standards. As an alternative, he may request a medical flight test by the Regional Flight Surgeon to determine his ability to safely exercise the privileges of his medical certificate. If he establishes this ability, he may be issued an unlimited medical certificate.

Previously, an individual who failed to pass the test given by the medical examiner was required to go through a time-consuming procedure to see if he could pass a practical field test. This involved getting authority to take the practical signal light test from the Regional Flight Surgeon, arranging with an FAA inspector to meet at an airport where there was a control tower with signal lights, and then being tested with color signals from the tower at random distances, to determine color vision discrimination. The flight test, under the new procedures, replaces the practical signal light test.

The more liberal application of the color vision standards was made possible as a result of studies by FAA's Bureau of Aviation Medicine, utilizing various research papers of the Armed Forces and a study made by Indiana University.

The Agency's Aviation Medical Examiners have been advised of the liberalized interpretation of the standards which are now effective.

## **FAA ASKS AIRPORT OPERATIONS TO SEEK LOWER AIR TRIP INSURANCE RATES**

Federal Aviation Agency Administrator E. R. Quesada has hailed the inauguration of the lowest air trip insurance rates in the country at Washington National Airport as an invitation to the rest of the Nation's airport operators to see whether similar reductions can be obtained for their air travellers.

"The new low rates," Mr. Quesada said, "prove that airport operators can make air travel more economical insofar as the cost of air travel insurance is concerned.

"The Federal Aviation Agency long ago realized that air travel insurance rates could be considerably lower in terms of the true risk involved. Actually, the record of safety in air travel is extremely good and readily predictable on actuarial basis.

"As Administrator, I am charged by law with responsibility for the development and encouragement of civil aeronautics and air commerce, as well as safety. Any decrease in the cost of travel without any accompanying decrease in the service provided, is clearly a forward step.

"We have also felt that last-minute sales of insurance at airports in very high amounts as an accommodation to air travellers is unhealthy. As is well known, the easy availability of insurance in amounts unrelated to the risk involved has proved a temptation to unbalanced persons and has probably been responsible in large measure for several air tragedies. It is hoped that a dollar limitation on the amount that can be so purchased will eliminate such motivation. Passengers previously could buy almost a half million dollars of insurance; now the limit is \$150,000.

The Administrator further pointed out that the Federal Aviation Agency believes that the amount of insurance that can be purchased by an air traveller should be limited to an amount more in keeping with what an insured ordinarily might purchase on his life, since statistics prove that air travel does not impose risks greater than exist in other normal areas of human activity.

In line with these principles, the Federal Aviation Agency, as the operator of Washington National Airport, voluntarily undertook to reduce its fee for the insurance concession there. In the past the fee paid for the right to sell insurance at the airport ran in excess of \$300,000 a year, and was determined, in effect by auctioning off the concession to the highest bidder. The insurance concessionaire then attempted to recoup the fee and turn a profit through correspondingly higher insurance charges to the public.

Under the contract inauguration December 1, the concession fee was reduced to produce an estimated \$130,000 a year. The reduction lowers the cost of selling insurance and was put into effect with the idea that the insurer would pass the savings on to the air traveller. The Agency's success in negotiating a contract that provides such savings to air travellers is regarded by it as a distinct achievement, and was made possible only as the result of extended negotiations with a number of companies.

Initial efforts to secure savings for air travellers, by inviting insurance companies to bid on the basis of lowest rates charged to the public, were unsuccessful. All bids received were identical in the price of insurance to the purchaser, although they did vary somewhat in the extent of coverage offered. FAA then resorted to negotiations and succeeded in obtaining a reduction in cost to the traveller from 3½ % per \$1,000 to 2½ % per \$1,000. This means that a policy with a face value of \$30,000, which formerly cost \$1.00, now costs 75c.

The reduced rates now in effect at Washington National will also be in effect at Dulles International Airport when that airport opens next year.

## **FAA LOANS INSTRUMENT LANDING SYSTEM TO THE GOVERNMENT OF PERU**

The Federal Aviation Agency has loaned an instrument landing system (ILS) to the Peruvian Government for use at the Lima International Airport at Callao, Peru.

The new airport was dedicated in October, 1960. Early installation of this U. S. developed, world-standard approach aid will greatly facilitate the operation of the large transport aircraft which will be operating into the airport.

Procurement of the equipment by the Peruvian Government through normal channels would have entailed extensive delays. To save additional time, the equipment, weighing some 17,000 pounds, was flown from the FAA Aeronautical Center at Oklahoma City to Peru on November 18 through the cooperation of the U. S. Air Force.

As a part of the technical assistance program which the FAA carries out for the International Cooperation Administration, an FAA engineer has been temporarily assigned to the Civil Aviation Assistance Group No. USOM in Lima to work with Peruvian engineers and technicians in installing the equipment.

## **ECONOMIC FUTURE OF HELICOPTER PRESENTED IN FAA PROJECT REPORT**

Traffic on the three established helicopter airlines will increase from 366,000 passengers in 1959 to two million by 1970, according to a new report issued by the Federal Aviation Agency.

The report, entitled "The Helicopter and Other V-STOL (Vertical and Short Take-off and Landing Aircraft in Commercial Transport Service", is the first to be issued under the FAA's "Project Hummingbird" which was established to provide FAA and the aviation community with planning guidance regarding the future role and utilization of steep-gradient aircraft in civil aviation.

This report covers the potential uses of the helicopter and other V-STOL aircraft in short-haul commercial air transportation during the next ten years. In addition to providing overall traffic forecasts for New York, Chicago, and Los Angeles, the three metropolitan areas which now have scheduled helicopter service, the report evaluates the requirements for helicopter services in other metropolitan areas and the outlook for intercity and commuter services in the 1960-1970 period.

The report lists Washington, D. C. and San Francisco-Oakland as likely possibilities for new certificated helicopter services in the future.

A limited number of the reports are available from the Federal Aviation Agency's Office of Plans, Washington, D. C.

It is anticipated that another "Project Hummingbird" report covering the technical phases of V-STOL aircraft will be issued in the near future.

## **HOEKSTRA NOW FELLOW OF ROYAL AERONAUTICAL SOCIETY**

Harold D. Hoekstra, Projects Control Officer of the Engineering and Manufacturing Division of the Federal Aviation Agency, Bureau of Flight Standards, has been named a Fellow of the Royal Aeronautical Society of Great Britain.

Hoekstra is a veteran of 23 years of work with the FAA and the former Civil Aeronautics Administration, and has long been prominent in professional engineering societies, such as the Institute of Aeronautical Sciences and the Society of Automotive Engineers.

He was born in Chicago, educated in Battle Creek, Michigan and attended Michigan State and the University of Michigan, where he gained his engineering degree in 1920.

# WILLY





ATM (TF-31) Students Abdulkadier Olmez of Turkey and Takumi Nishihata of Japan, jointly record their messages for each other's families. They are assisted by Mrs. Jupe, ARC Volunteer.

ATM (AF-31) Student Soontorn Subthaha, Thailand, assisted by ARC Volunteer Mrs. (Mayor) Norick, also First Lady of Oklahoma City.



Mr. and Mrs. Juan Vassallo of Argentina, assisted by June Grayson, International Liaison Assistant at the Aeronautical Center, who wore the "second hat" of ARC Volunteer for the downtown recording session. Mr. Vassallo is in the ILS Section of training in the ANF Department.



While the tape recorder was in use at the special session in the Youth Center of a downtown church, the Rudolfo Villarinos, of Argentina, and son Rudolfo, Jr., enjoy a session of Christmas singing around the piano. Mr. Villarino is studying Radar in the ANF Department.

#### OPERATION "TALKING TAPE"

Did you ever see a tape recorder come to life and take on a real personality? The International Liaison Office and several instructors of the Aeronautical Center FAA School who assisted the American Red Cross in their Operation "Talking Tape" the first of December, were witnesses to this bit of magic—not just once, but many times.

Red Cross volunteer workers set up their first operation in classrooms of the ATM Building and assisted approximately forty students from about seventeen different countries in recording holiday messages to their families and friends at home. These students are enrolled in Air Traffic Management, Air Navigation Facilities and Flight Inspection Classes through the International Cooperation Administration and the FAA Office of International Coordination. Some of them have been in Oklahoma City but a few days, while others have been here for a number of months, but the opportunity to send their voices home was passed up by very few of them.

One admonition given the students was needless—that they might not think of enough to say to cover the seven and one-half minutes in each spool of tape. As the green light blinked "on" and the recorder picked up the microphone, the machine came alive and he was really talking to a loved one or a friend, not many miles away for the moment, but there with him.

The messages of the Juan Vassallos and the Rudolfo Villarinos, all of Argentina, were recorded at a special session in the youth center of a downtown church to allow the families to participate.

The time was especially short for the Vassallos' recording. They have been away from home for nearly a year and they had much to tell their 21-year-old son to whom the message was addressed.

Through the American Red Cross, "Merry Christmas!"—"Happy New Year!"—or just the Persian equivalent of "Hi, Mom!"—went from Oklahoma City in many languages to many lands this month—in the form of little packages of tape, to be eagerly received and played time and again.



#### FAA STUDENT HOLDS ART SHOW

Sami Ali Hassan, Cairo, Egypt, is holding a "one-man" art show at the Oklahoma Art Center, State Fairgrounds, Oklahoma City.

The paintings of this Air Navigational Facilities Students at the FAA Aeronautical Center went on exhibit December 27 and will be shown through January 16th.

Sami Hassan's interest in painting started when he was in school and is now a hobby.

At the Oklahoma City Art Center his paintings may be seen between 10 o'clock in the morning and 4 in the afternoon, Tuesdays through Saturdays; from 2 until 5 in the afternoon on Sundays.

In his business occupation, Sami Ali Hassan is Chief of Navigation Aids in Cairo.

## JET GEMS



Figure 1

Rear view of current jet transport with spoilers (top of wing) and flaps (below wing) extended. Due to gaps because of underwing engine pods, the larger components create service problems. The close proximity of the pods (worse with larger diameter fan type engines) to the ground results in occasional pod damage in cases of inadvertent wing low landings. The "red hot" turbines are relatively close to the fuel tanks and lines in the wings which may create a fire hazard in case of a "crash" landing. Kerosene fuels of higher flash characteristics (than AVGAS) have enabled fire crews to keep fire under control until passengers escaped in 6 crash landings of turbine powered Foreign aircraft.



"Pete" Young, "Woody" Monday and Frank Hand beside a Caravelle demonstrator - shot by Ye Ole Scribe at Kansas City, Mo., on May 27, 1957. Although the engines, (one mounted each side of the fuselage above group heads) were not equipped with silencers the cabin was unbelievably quiet due to rear mounting of engines. Mozart at low volume on the cabin intercom soothed the 48 passengers throughout all flights! Note the integral rear cabin passenger stair and the short distance of the fuselage from the ground, which eliminates some expensive ground loading equipment. The mounting of the hot turbines considerably aft of the fuel tanks in the wings and behind the passengers reduces fire hazards.

The next crop of jet transports will be short/medium range (up to 2000 miles), designed to carry about 70 first class passengers, cruise around 550 MPH and operate from 5000 - 7000 ft. runways. Since about half of the airports where considerable numbers of passengers are available have runways around 5000 - 8500 ft., this will make turbojet transportation available to people living in smaller cities throughout the land. For the many reasons outlined herein including the more critical noise problems these new aircraft will be equipped with rear mounted engines.

Earlier this year United Airlines ordered 20 Caravelle aircraft (Figure 3, November issue) which are jointly produced and serviced by Sud Est in France and Douglas Aircraft in the U.S. As previously explained, this aircraft is to be equipped with two General Electric Aftfan engines (16000 lbs. thrust) mounted each side of the rear of the fuselage, under the high tail surfaces (see Figure 2). Deliveries of these aircraft are scheduled to start next summer. The first aircraft to be used in training UAL flight crews may be equipped with conventional Rolls Royce 12,000 lb. thrust turbojet engines.

Recently Eastern and United Airlines ordered 40 each Boeing 727 - 70 passenger, medium range, 5000 - 7000 ft. runway transports, equipped with three P & W turbofan (see Figure 3, September issue) tail mounted engines. The mounting of three engines may be similar to the DH 121 (Figure 7, November issue), one each side of the tail and one in the fin area - or the center engine cradled in the rear end of the fuselage with extended air intake "scoops."

The pitch of the rear engine advocates includes the following features: performance is improved because the clean wing gives maximum lift and minimum drag resulting in better takeoff, approach and landing speeds and higher takeoff weights and payloads, low asymmetric thrust makes the effect on handling slight in the normal critical case of engine failure at takeoff.

There is no danger of the engines touching the ground even on large angles of roll. "Pavement blast" on the airport is eliminated. Structurally, heavy local transient loads as at pod attachments are avoided. There is no additional flutter problem, and the stiffer wing is better able to prevent onset of control reversal. The jet efflux is clear of the main structure and maintenance costs are thereby reduced.

Maximum protection is given to engine intakes from stones, slush and water. There is less slush-thickness restriction on takeoff. The turbine planes are such that fragments of a failed turbine cannot strike passengers, fuel lines, or fuel tanks. Engine in-flight fires can be confined to individual engine installations and cannot spread to main fuel tanks or lines.

Hot engines cannot be torn off in a wheels-up landing or put into spilled fuel from tanks. Wing tip dig-in is unlikely. There is no risk to ground staff from

air intakes. And--a very important point-- there is much less cabin noise and vibration.

We are hoping this new approach in powerplant installation will reduce the over-time consumption of cigarettes, fingernails and coffee for the "Mexican Snapon Artists" who maintain these new "concepts."

..Selah P A Load

## WILLY



"Whattya mean HE'S in trouble!"

## THE FLIGHT INSPECTION STORY

by Carl C. Drummeller

Electronic aids to air navigation are useful only as their accuracy is known and certified. They must be tested in the environment of their use. This involves the use of aircraft, airmen, and electronic equipment. Together, these three elements make the story of Flight Inspection.

For Flight Inspection work, a specialized aircraft is required. It is not a cargo or a passenger or a military aircraft, but one built to contain personnel and equipment for the express purpose of Flight Inspection.

Flying such specialized aircraft is in itself an art requiring a technique all its own. Each type of electronic aid to air navigation to be checked has a unique radiation pattern, and the flight inspector pilot must position his aircraft in a critical relationship with this pattern in order to investigate the performance of each type of facility. The investigation may be a subjective one performed by the pilot, as in the inspection of a low frequency range course. More often, though, it involves making recordings for subsequent objective evaluation.

The signals to be recorded are intercepted by receiving equipment meticulously calibrated to the highest obtainable accuracy. Meaningful information is extracted in the form of electrical potentials which actuate recorders. The data thus accumulated are studied and evaluated by flight inspectors and navigational aids analysts to determine the range, reliability, and accuracy of course alignment for each facility.

The Aeronautical Center of the Federal Aviation Agency furnishes support to the flight inspection program in each of its vital phases. It prepares aircraft for Flight Inspection work. It trains pilots and airborne electronic technicians who man the Flight Inspection aircraft. It trains technicians who man the Flight Inspection aircraft. It trains technicians to maintain the airborne electronic equipment. It processes data accumulated by the Flight Inspectors. In addition, it has come, through an evolutionary process, to serve as a standardization center.

The evolution of Aeronautical Center participation in Flight Inspection work started in 1947 with R. E. Van Wald in charge of a 3-man group. The primary duty of this group was to teach United States Air Force personnel the principles used by the Civil Aeronautics Administration in Flight Inspection work. In order to accomplish this training, an Air Force aircraft, No. 9930, was modified for Flight Inspection service. With only three men and limited shop facilities, the

modification was completed and the first training flight made in July, 1948. The performance of No. 9930 was impressive. As a result of its success, a conference was held at the Aeronautical Center in September, 1948, under the direction of Randy Mulhorn, who at that time headed the Washington Office Flight Inspection program. In this conference a decision was made to build a Flight Inspection aircraft for the Civil Aeronautics Administration. Starting from a bare hulk, a complete Flight Inspection aircraft was fabricated at the Aeronautical Center. This Douglas DC-3, N-70, was the first of a series of Center-designed, Center-constructed Flight Inspection aircraft. Placed in service in the early part of 1949, it became the prototype of the Type I Douglas, a design that continued as a standard until 1957.

Not only the Civil Aeronautics Administration, but also the United States Air Force admired N-70. In April, 1949, it was flown to Dayton, Ohio, where its engineering design features were copied for use in Air Force Project 440. Under this project, a total of 26 DC-3's and 5 AC-54's were modified at Tinker Air Force Base for Flight Inspection use by the Airways and Communications Service.

In connection with its interest in N-70, the Civil Aeronautics Administration, in a conference held at the Aeronautical Center in 1949, made a decision to standardize its DC-3 Flight Inspection fleet. The configuration of N-70 was used as a guide, with modifications and improvements. Standardization had become a necessity. Variation of Flight Inspection equipment from Region to Region no longer could be tolerated, for pilots were complaining about regional differences in the performances of navigational aids.

The standardization program started in 1950 and continued under the direction of Mr. J. Chester Shimp, who became Chief of Flight Inspection in 1951. At that time, some 15 employees were employed on the program, a number that grew to approximately 35 within the next two years, when Mr. Shimp was succeeded by Mr. J. C. Smith. Under this program 19 Douglas DC-3's, starting with N-10 and ending with N-30, were rebuilt at the Center to conform to the established standard.

The principles of standardization, originally applied to Douglas aircraft, also were applied to Beechcraft. The systems' engineering for the electronic equipment and the design work on consoles and equipment racks were performed at the Aeronautical Center with its Director, Mr. F. M. Lanter, taking an active hand. A total of 24 Beechcrafts were processed through the Aero-

nautical Center shops during the period of 1951 to 1958.

The concept of what constitutes an acceptable Flight Inspection aircraft is far from static. As soon as the Type I DC-3 was placed in service, the using personnel started thinking of ways by which its operation could be improved. Over the course of years, a considerable number of such ideas accumulated. This, coupled with the fact that the variety and complexity of ground facilities to be checked were multiplied, forced the conclusion that the Type I DC-3 no longer was an adequate Flight Inspection aircraft. Under the direction of Mr. Norman R. Hodgkinson, who in 1954 succeeded Mr. J. C. Smith as Chief of the Flight Inspection Branch, work was started on the design of a new concept Douglas Flight Inspection aircraft, the Douglas Type II DC-3. This aircraft was engineered for the convenience of the pilot and the electronic technician, for this is an important factor in determining workload. Maintenance requirements were considered too, so that the aircraft would require a minimum hangar time.

Constructed as a prototype by Aeronautical Center personnel, the first Type II DC-3 marked a sharp advance in the art of Flight Inspection aircraft design. In both the electronic equipment and in the aircraft itself, the Type II Douglas is better adapted for its specialized duty than was the Type I.

Electronics-wise, the Type II Douglas can inspect VHF Communications, UHF Communications, Marker Beacons, Localizers, Glide Slopes, Low Frequency Ranges, Low and Medium Frequency Homers, VHF Omni-Directional Ranges, Civil Distance Measurement Equipment, TACAN, Airport Surveillance Radar, and Precision Approach Radar facilities.

Externally, the Type II Douglas has several distinguishing characteristics. Its radar nose, one piece windshield, and picture windows are immediately evident. Not so obvious, but still important, are such items as dual rotating beacons, one on top of the vertical fin and one on the bottom center of the fuselage, the placement of antennas for optimum radiation pattern, nacelle, and icing lights.

The interior furnishes more striking contrasts. Careful psychological research into the field of color related to fatigue factors resulted in the selection of interior finish that is distinctive, light, and easy on the eyes. Removal of bulkheads has left an unobstructed vista from entrance to cockpit; more space and better lighting result. In the interest of both noise reduction and heat insulation, a reflecting foil is used next

to the interior surface of the skin. This is supplemented by a batting of glass-wool insulation.

Operational convenience, ease of maintenance, and flexibility of use set the console apart from all previous design, as does its array of monitoring meters and instantly-switchable calibration circuits. With 24 channels available, the recorder can trace the responses of a whole battery of receivers simultaneously. All inter-unit cabling is contained in overhead channels instantly accessible through removable panels and quick-detachable hangars. The removable equipment racks make for ease of maintenance as well as possible future modifications.

Up front, a rearranged instrument panel, sectionalized for convenience, accommodates the larger load of instruments, which include dual flight instrumentation. A modern auto-pilot aids both in flight and in the checking of navigational aids. Communication between crew members and air-to-ground is facilitated by an improved interphone system. Within the cockpit, eyestrain and reflections are kept at a minimum by the use of mixed red and white light. Crew comfort is served by a semi-automatic heating system, and an adequate ventilation system keeps the auxiliary power unit cool and odorless. Just back of the pilot and at the point opposite the console are folding seats that may be used by observers or by instructors for On-the-Job Training.

The Type II Douglas presently is used for flight checking at basic, enroute altitudes. Although it is performing this assignment satisfactorily, plans call for its being replaced within the next five years by a more modern aircraft.

Paralleling the development of the Type II Douglas for basic altitudes, other aircraft were modified at the Aeronautical Center for Flight Inspection service at medium altitudes and at high altitudes.

In 1957 the United States Air Force contracted with the Civil Aeronautics Administration to produce three Convair T-29 Flight Inspection aircraft. It was felt that there was a need for an aircraft that could carry more electronic equipment and fly faster and farther than the Douglas DC-3. The electronic package was designed, fabricated, and installed at the Aeronautical Center. The design proved so satisfactory that in July, 1959, the Air Force contracted for an additional seven aircraft of the same configuration.

The Civil Aeronautics Administration also recognized the need for an aircraft better suited for Flight Inspection work at altitudes between 10,000 and 20,000 feet. To meet this need, N-105, a Convair model 440, went into work status for

the Aeronautical Center in July, 1957, and was completed in September of that year. Early in 1958, N-101, N-102, N-103, and N-104 were similarly equipped for intermediate altitude Flight Inspection service.

In the intermediate Flight Inspection service only VOR and TACAN facilities are inspected. Therefore, the Convair aircraft does not carry as wide a variety of electronic equipment as does the Type II DC-3. It does, however, carry a greater number of VOR receivers and transponders for DME and TACAN. Exclusive of navigational equipment, it has 4 VOR receivers, 2 DME receivers, 2 DME transponders, and 2 TACAN transponders. Any one or all of these can be operated fully independent of the others. In normal service, 2 TACAN or 2 DME transponders are used to determine the geographical location of the aircraft to an accuracy of plus 500 feet. To accomplish this, the output of either a pair of DME receivers or a pair of TACAN receivers is fed into a pair of Systron counters. The output of these Systron counters, in turn, actuates a printer which prints out either in terms of nautical miles or microseconds lapsed time the precise distance between the aircraft and each of the two ground stations being interrogated. The remaining equipment can be used to check the performance of the VOR, DME, or TACAN facilities. A 36-channel Consolidated Electronic Corporation recorder permits the simultaneous recording of a number of discrete bits of information from each facility being investigated.

Although the Air Force had investigated the performance of electronic ground-based navigational aids from a B-47 at an earlier date, it was not until 1956 that the Civil Aeronautics Administration entered into its high altitude Flight Inspection program by arranging for the loan from the Air Force of two Martin Camberra Jet reconnaissance aircraft. These were adapted for Flight Inspection work at Orlando, Florida, by a civilian contractor. Engineers from the Civil Aeronautics Administration monitored the modification to ensure conformance to Flight Inspection requirements. Delivery of the two aircraft was accepted in mid 1957. Based at the Aeronautical Center, these two jet aircraft, designated N-96 and N-97, are used for Flight Inspection work at altitudes above 20,000 feet. At such altitudes, ground reference points are difficult to establish with precision. It is necessary, therefore, to determine the aircraft's position by electronic means. The same system of triangulation used with the intermediate altitude Con-

vair is employed with the high altitude Camberra.

ED. NOTE: The importance of flight inspection is one that can't be told in just one article. Therefore, the Editor of the Beacon decided to put this story by Carl Drumeller into two parts. The next issue of the Beacon will carry the story on into the realm of automated inspection of air nav aids.



A new Chief in the Facilities and Material Depot at the Aeronautical Center is Charles W. VonRosenberg (of Prussian ancestry). This Stalwart chief stands tall and straight--he's 6 Ft. 1 1-2 In. tall and weighs 195 pounds. He has piercing black eyes and dark hair. Mr. "Von" is spontaneously friendly and has a remarkable sense of humor. On this tract of public land reserved for use by the FAA his lodge is in the chief's office of the Aircraft Division, FM-915, room 313, in hangar No. 8 west.

As in the case of all good chiefs, Mr. "Von" has passed all the tests required. He has intelligence, stamina, and courage. We won't disclose his age, but he was born just the proper number of years ago in Temple, Texas. During World War 1, young "Ted" was very attracted to the military planes that flew over his home. (Ted is an affectionate nickname given him by his father, which is short for "Teddy Bear", and many of his friends still know him by this name. He is still Ted to Mrs. Von Rosenberg.)

In his early twenties "Ton" and his friend built their first airplane in a warehouse in Temple. It was a monoplane, powered by a 10 cylinder Anzia engine. (French manufactured, W.W.I. surplus). He used this plane for barnstorming tours.

Later, he went to Fort Worth to work for

Bowen Airlines as Assistant-Superintendent of maintenance.

After leaving Fort Worth, he was with the Texas Company in Southern Louisiana, where the first amphibious operations were set up in the Gulf area for the oil industry. This was in 1935. He flew a Keystone-Leonard amphibian plane.

During this time, he became acquainted with Mr. Ray Lucas of Thibodaux, Louisiana, who was pilot and who was quite active in civic affairs. Mr. Lucas was directing a production for the local Dramatic Club, and Mr. "Von" was invited to witness a rehearsal. It was here that he met Miss Billie Brown, the lady who was later to become his wife. She appeared as a member of the cast.

In 1936 he ran a fixed base operation at the Wendell-Williams Airport in New Orleans. On one of his flights back to New Orleans, after visiting his prospective bride, and while tipping his wing to bid farewell, one blade of the propeller of the Waco-F airplane came off. This caused the engine to be torn from its mounting. The engine remained hanging by cables and lines, etc. He landed the plane successfully in the furrows of a cane field on the Rienzi Plantation across a bayou from the town. Needless to say "Von" walked away.

On July 21, 1936 after having flown to Houston, a leaking valve forced him to leave the air. He was flying over marsh land, but "Von" brought his plane safely down between the high tension wires that flanked the highway to the middle of the Old Spanish Trail (U. S. highway No. 90) just east of Orange, Texas. Of course, this made in the Texas papers.

Being very versatile, "Von" then did crop dusting in the Mississippi Delta country of Louisiana and Mississippi and the Rio Grande Valley of Texas. Then came aerial mapping for a company in San Antonio.

In 1940, Mr. Von Rosenberg entered service with CAA in old Region VI, Los Angeles, in engineering Flight Test, which involved flight of aircraft for original type certification. In this capacity he worked with all of the manufacturers on the West Coast.

On May 18, Mr. Von Rosenberg was one of a crew on a short ferry flight from Boulder City Airport to Lake Mead. The flight was being made in a twin engine amphibian Sikorsky, an experimental aircraft which had been modified and was owned by an aircraft designer, Howard Hughes. Other members of the crew

were: Howard Hughes, pilot; Richard Felt, of Burbank, California, flight mechanic; C. E. Blanford, Santa Monica, aeronautical engineer; and William M. Cline, Santa Monica, a CAA Inspector. Mr. Felt and Mr. Blanford were from the Howard Hughes Aircraft Co. The flight was preparatory to Mr. Von Rosenberg conducting water controllability tests on the aircraft to the U. S. Army Engineering Corps.

Since the aircraft was still in the experimental stage, an unpredictable controllability problem developed during procedures for landing on Lake Mead, which resulted in a very serious crash, in which Mr. Cline of CAA and Mr. Felt of Howard Hughes Aircraft Co. lost their lives. Although Mr. "Von" received two broken vertebrae in the crash, he was credited with having played an important part in saving Mr. Hughes and Mr. Felt from being carried down into the waters of Lake Mead with the aircraft which sank rapidly. Mr. Felt later succumbed to injuries received in the accident. Mr. "Von" wore a cast for many long months, and was one year in convalescing.

In his tenure of service with CAA-FAA he has been assigned as Chief, Engineering Flight Test and Manufacturing Inspection Branch, in Chicago, Region III. Toward the end of World War II he also served in this capacity in Kansas City. In 1946 he went to Fort Worth, Region IV, as Superintendent of Aircraft and Components Division, which was Airworthiness Division including all of maintenance, as well as engineering. He also served as Chief, Aircraft Engineering Division, at Fort Worth.

In 1949, at a Division Chiefs' Conference in Washington, Mr. Von Rosenberg proposed regulations which would foster the development of an Agricultural aircraft (for crop dusting). At this meeting Mr. Dell Rentzel, Administrator, suggested that possible CAA could sponsor the development of such an airplane. Upon returning to Fort Worth, Mr. "Von" followed up on this project through his Regional Administrator. As a result of conferences and discussions with the Flying Farmers Association, which endorsed the project, this assignment was given to Region IV. The region developed a working arrangement with Texas A and M Experimental Station whereby the aircraft was built as a cooperative venture, with CAA furnishing the funds and several design engineers and the college furnishing the housing for the project plus some design engineers and a number of aircraft manufacturers furnish-

parts and equipment through the Flying Farmers Association. Mr. "Von" stayed very close to the project, representing the CAA in the resolving of design problems and conducting the first twelve-hours of flight testing on the airplane. The aircraft was called the AG-1 Mr. "Von" received a letter of commendation from the administrator for his contribution to this achievement.

It was Mr. "Von" who came to Oklahoma City on February 1, 1952 to Aero Design and Engineering Company to issue the first type Certificate for the Aero Commander.

In 1956 he went to Washington as Chief, Flight Test Branch, where he is responsible for flight testing all of our new jet transports and other aircraft.

On November 13, 1960 he was chosen to replace Mr. Norman Hodkinson, who had been selected as Asst. Manager of Facilities and Material Depot, as Chief, Aircraft Inspection Division at the Aeronautical Division at the Aeronautical.

Mr. "Von" believes the highlight of his travels was a trip he made to La Paz, Bolivia, where he was working on flight engineering tests on four-engine transports at the highest airport in the world from which a United States carrier operates. This was located at 13,500 feet in the Andes Mountains of South America.

The Von Rosenbergs have two sons and two daughters. Gretchen is married and has one child. She resides in North Carolina. Charles W. Jr. is a sophomore at the University of Maryland. He is majoring in Aeronautical Engineering. ("Von" soloed Chas. W. Jr. last spring). Amanda (Mandy) is eight years old and the "Capitan of the Crew" is Jon Karl, who is three.

Faye Carter, FS-871, of the FAA Northside Bowling League, was the woman bowler of the week and appeared on Oklahoma Live Bowling, WKY-TV, for two weeks in succession.

Robert A. Brown, FM-948, of the FAA Northside League bowled an all spare game.

The Avionics Branch of the Aircraft Division has decided this year to take a part in the Division's annual sponsoring of a needy family. The Branch will do this as a Christmas project rather than send Christmas cards.

We wish to take this opportunity to wish all our friends at the Aeronautical Center a very merry Christmas and may the New Year bring much happiness.



In picture above, left to right: Milton Lewinsohn, Oklahoma City, Garrison Coster, F & M Depot, Kim Mich, Cambodia, and Darwin Maurer, International Liaison Officer, A. C.

A Cambodian U-S Information Service employee visited Oklahoma City and the Aeronautical Center this last month.

Kim Mich, who lives in the Cambodian capital of Phnom Penh, is visiting government installations and newspapers in this country.

He's shown in the above picture with, left to right, Milton Lewinsohn, his Oklahoma City host, Garrison Coster, Aeronautical Center, Kim Mich, and Darwin Maurer, Center International Liaison Officer.

Kim Mich says there are five papers published in Cambodia, one by the political party in power, one by an individual and three by the Communist Party. His desire is to put out his own paper, one giving the "freedom's side of things." Kim says the Information Service used to publish a magazine with 20-thousand circulation in Cambodia. However, they now are concentrating on pamphlets distributed throughout the country.

It is a thousand times better to have common sense without education than to have education without common sense.

-Robert G. Ingersoll-



FAA Airways Engineer, James T. Murphey, FM-972 has extensive variety of activities aside from his duties here at the Aeronautical Center. At the ripe old age of "twenty-six years" a well planned schedule of time is required to stretch an ordinary week, with only seven 24-hour days, far enough.

The five hats he dons each week are:

1. **ENGINEER** - five days are devoted to wearing a hat with responsibility of designing, developing and executing plans and specifications for new and modification of existing structural and plant facilities from work orders. These assignments include such navigational aids, as towers, building components, transformer substation enclosures, cabinets and racks for electronic devices, automatic controls forengine generators or lighting systems.

2. **STUDENT** - two nights each week he wears a scholar's hat as a post-graduate of Okla. State University. Working toward a M. S. degree in Engineering, he attends classes at Stillwater each Thursday evening by commuting with four other students. Classes are attended each Wednesday night at O.S.U. Engineer's Extension School here in Oklahoma City.

3. **LIEUTENANT** - one night each week he wears the military hat, while reporting as a First Lieutenant in the Army Reserve Training Unit. Two weeks of each summer are spent at the annual Unit Training Communication Off-

ice, providing experience at the message center in telephone communication and photo laboratory work.

4. **RANCHER** - on week-ends he rolls the brim of a ten gallon hat for a trip to Hinton, Oklahoma where he raises cattle and engages in wheat farming.

5. **FAMILY MAN** - on Friday nights he wears any comfortable hat at hand and stays home with the wife and two children. This night is reserved for fun with the family - a well-deserved recreational time.

Following graduation from Oklahoma A. and M. in 1956, Jim began his career as a mechanical engineer by working at Tinker Air Force Base. This work consisted of field inspection and change of plans as necessary for the steam systems, plumbing systems, air conditioning, and ventilating systems of various buildings. His next work with an engineering firm included buildings such as the Muskogee Municipal Hospital, Muskogee High School Auditorium, Muskogee Health Center, School Additions in Muskogee, Vanita Telephone Office, Building 900 at Ft. Sill, Crooked Oak School Addition, Stillwater Dial Building, Shawnee Post Office, First Methodist Church at Erick, Nike Missile Bases, Cushing Hospital, Motor Vehicle Test Building at Ft. Sill, Health Research Center at Stillwater, Department of Motors Building at Ft. Sill, Communications Building at Ft. Sill, and American Airlines in Tulsa.

### Thermonuclear Warfare vs. Radiological Warfare

Few people today are unaware of the meaning of thermonuclear (atomic) warfare. The atomic era of 1941 brought to the world new weapons of tremendous destructive power. When compared to conventional explosives such as powder and TNT, the atomic bomb represented an unprecedented increase of energy potential. This increased potential was of such high order that it was necessary that its energy level be expressed in terms of *tons* of TNT equivalent. The first atomic bomb was the equivalent of 20,000 tons of TNT (20 Kilotons).

The thermonuclear era began in 1945 with the detonation of an atomic bomb of such design that the thermal (heat) product of the atomic fission reaction was utilized to fuse light atoms together resulting in a tremendous increase of energy. This new weapon made energy levels of *millions* of tons of TNT possible (MEGATONS).

Both the atomic bomb and the thermonuclear bomb were characterized by hazardous radiation of such nature that its intensity would decrease by 98 percent within 48 hours of detonation. Thus personnel would be able to emerge from shelters and reoccupy the general area of detonation within a matter of hours.

The particular characteristic of the radiation decay indicated above was not designed into the original bomb but rather was a secondary result somewhat subordinate to the primary objective of obtaining nuclear fission. Some 200 radioactive isotopes of various elements were created during the detonation. Some of these elements would emit radiation for many thousands of years. Others had radiation lives of only seconds. There was a preponderance of the short lived isotopes hence, the decay rate of all together was somewhat rapid and resulted in the generalization that there would be a 98% decay within 48 hours.

Following perfection of the process for obtaining the basic fission reaction the matter of controlled modification of the various results of the detonation was feasible. Little could be done with the blast and thermal effects except to increase them quantitatively. These effects, of whatever size, were over in seconds. Radiation, however, offered an area for consideration. If a preponderance of long living isotopes could be produced during the explosion there would be no rapid decay of radiation. Rather there would be a sustained level of radiation for a long period of time. Areas covered by this radiation could not be entered for extremely long periods of time.

It is this use of long lived radioactive isotopes capable of long term radiation that produces what is termed a "dirty bomb". This is radiological warfare.

Whether an enemy will choose to use radiological warfare or not, is questionable. The long term radiation produced not only will have local effect but may in time, cover large areas of the world including his homeland. It is entirely possible that this feature of radiological warfare will serve to restrict, if not prevent its use. Such type of warfare is, however, possible.

Current national planning for protection against radiation is predicated on the relatively "clean" thermonuclear bomb. The same protective measures that are effective against thermonuclear warfare are, however, effective against radiological warfare. The elements of time required to remain in shelters and if possible world contamination are the primary differentiations.

Radiological warfare is feasible. Conditions such as depicted by the movie "On the Beach" can occur, however. No nation would be free from the radiation hazard involved. Therefore, the likelihood of radiological warfare is remote.

The purpose of this article is to clarify and make a distinction between the concepts of these two types of warfare. Nations with an adequate capability for protection against thermonuclear warfare can survive radiological warfare.

### TIME FOR A CHANGE

New license tags are presently on sale. Now is the time to register those new tags with Plant Protection Branch, AC-165. Those who have not previously registered their cars should do so immediately. Motor Vehicle Registration form to be used is Form AC-678.

Carl Bailey, Plant Protection Branch Chief, finds that courtesy is contagious at the newly established traffic pattern at Southwest 59th and MacArthur and submits the following humorous quotation of Abraham Lincoln for all Center motorists:

Joke with him who jostles you,  
Laugh at him who pushes you,  
It doesn't cost a cent!  
Don't be carrying around that chip,  
Wink your eye and curve your lip,  
And from life's sunshine take a sip.  
It doesn't cost a cent.  
Don't be always first to rile  
Your neighbor—give him just a smile,  
It will cheer the dullest, while  
It doesn't cost cent.



### DATMT CONDUCTS NAFEC COURSE

At the request of the Chief, Systems Engineering Section at NAFEC, three Department of Air Traffic Management Training instructors conducted a two week Air Traffic Control indoctrination course for some 41 NAFEC engineering and technical personnel.

The indoctrination course, patterned after the course conducted at the Aeronautical Center in Oklahoma City, was developed to present the engineering and technical personnel involved in the Data Processing Central Project, with a familiarization of some of the mechanical, clerical, and technical problems encountered in Air Traffic Control.

DATMT instructors Ron Bereman, Joe Basham, and Ron De Garmo presented this course which included an Introduction to the Common System of Air Traffic Control, a basic understanding of the Civil Air Regulations, and a discussion of some of the many problems encountered in the control of en route and terminal air traffic.



Reports indicate that the course was a success and aided materially in providing these professional technicians with a more practical look at the current air traffic control procedures. It served to emphasize the importance of teamwork between the many segments of the aviation industry, and to stress the importance of a close intra-agency working relationship for the overall efficiency of the FAA.

Of the 41 participants, only two had previous pilot experience and many had only recently joined the engineering teams at NAFEC. A team responsible for engineering and installing the numerous electronic devices necessary to operate the forthcoming Data Processing Central Air Traffic Control Center in Atlantic City. The new DPC Center, though simulated, will "control" live traffic in the New York Air Route Traffic Control Center Area in a live traffic environment. A nucleus of ATM specialists have been transferred to Atlantic City to prepare for this project and will be working with the FAA engineering teams and the engineers from the General Precision Laboratory, the prime contractor.

### CUPID STRIKES DATMT

The penetrating effects of Dan Cupid's arrow was felt by two proud employees of the Department of Air Traffic Management Training. The wedding of DATMT instructor Earl Shaum and Kay McNeal, who just recently transferred to the Accounting Division, took place Saturday December 10, 1960 at the Country Club Baptist Church in Midwest City.

Earl and Kay exchanged vows in a double ring ceremony performed by the Rev. Harold McGlamery, pastor. Kay's attendant was Mrs. Marcelyn McGuar and Earl's best man was Kenneth Lux, also an instructor in the DATMT.

Kay wore a white satin ballerina length dress, covered with sequins on the bodice and skirt. She carried a hand bouquet of White Stephanotis and Lily-of-the-Valley surrounding a white orchid corsage.

The newly weds will reside at 5613 S. Youngs upon their return from a two-week honeymoon in Tampa.

Kay transferred to the Aeronautical Center in February from the Vance Air Force Base in Enid. Kay was a member of the staff of the DATMT until she recently transferred to the Accounting Division.

Earl, a native of Kansas, joined the instructor staff in June 1960, coming to us from the Chicago Air Route Traffic Control Center.

## THE MAIRT SYSTEM—AS ITERS SEE IT

*In the field of Federal personnel management, John Fox furnishes a good deal of fun and occasionally points a moral through the mouths of his colorful Irish characters "Mulligan" and "Grogan." First featured in Shot and Shell, the employee house organ of the U.S. Naval Ammunition Depot, Hingham, Mass., Mulligan pieces have been printed in a number of other publications. Here, by permission, we present brief extracts of Mulligan on a number of personnel subjects.*

"Mulligan," Mr. Fox states, "is one of the few surviving members of a delightful generation of South Boston Irishmen whom I knew so well and loved quite dearly when I was stationed for 15 years on the South Boston waterfront."

*The setting of the Mulligan-Grogan colloquies is an ammunition "burning area" at a remote location where unserviceable or highly unstable explosives (as well as an occasional FPM) are dumped for destruction or detonation. Mulligan, of course, is the supervisor and Grogan his subordinate.*

### ON THE FPM

"I run a tight ship here, Grogan. Strictly according to Hoyle, the distinguished author of the Federal Personnel Manual, and a man after me own heart."

"Hoyle, hmm. Do ye suppose he is wan of the Limerick Hoyles, the well-known horse and whiskey family that always had a winner in the Belfast Derby?"

"No. None of them could spell, as they were too rich to bother learning. The fellow who wrote this book must have been a college graduate, at least, probably a P-Haith-D, be the way he throw the lingo. He's a right-wing personnel man who never committed a sin on any subject, according to the way he tells it. It's a lovely book, Tim, that should be kept in every library, up there on the shelf. Iv course, it is perfectly safe to have a copy in most Government offices, as it have not yet been banned in Boston. Few people have ever got beyant the first three pages without remembering that the boss wanted them to sweep the floor this afternoon."

### ON THE CIVIL SERVICE COMMISSION

"Under the law, Tim, the Commission is the world's authorita on mairt, timperance, and the other Sunda School aspicts of government. You might say they are the official sidewalk superintindints of the creer service. They mane no harm. A while back someone tipped them off

on the subject of promotions, but the subject is only wan part of the mairt system. Now they say that ne outfit have any mairt unless they write it up and say so.

"The mairt system, Tim, have nothing to do with such worldly considerations as work, but concern itself with the theological virtues of the public service, such as getting the promotion because you deserve it, which is rarely the case."

"I see," mused Grogan. "I wonder phwat the Commission do for amusement in place of committing sins?"

"They write Departhmental Circulars to each other," said Mulligan, "and let the rest of the government in on the fun."

### ON CIVIL SERVICE INSPECTIONS

"Now, Grogan, a civil service report is something to see, they tell me. They make references to this law and feetnots to other laws and comments about this onee and that one, and who is misassigned and who isn't, and why you shouldn't have done what you did and should have donee what you didn't, and a list of sins that would make you blush for shame as you like to forget such things instead of being reminded of them. They go on and on suggesting this thing, deploring something else, pointing out this error and overlookin that virtue, grinding you up into hamburg and reequiring you to put yourself back together if you can."

"They do be hard people to please," commented Grogan.

"And that's a fact," concluded Mulligan. "But they're very polite about it all. At the end of the report after they have torn you to pieces for your sins they always thank you for our coopration in helping them do it."

### ON EMPLOYEE DEVELOPMENT

"Nothing is more deplorable, Tim, than a worker who goofs off when there is nothing else that he can do."

"Yirrah," sighed Tim. "Phwat can a man do whin they's nothing to do, I don't know?"

"He can read regulations," retorted Mulligan, "and give a little depth as well as width to his misunderstanding."

### ON MOTIVATION

"Never let yourself get lulled into a sense of insecurity, Grogan, be the war of nerves that go on in government. Walk on the sunny sides of the alley, and holt your head high in your hands so no sstranger can cut it off whin you aren't looking. I owe me own survival to an unflinching faith that some supervisor is just waiting to give me the works. Let him do the worrying,

say I. That's phwat he's paid for. They may nail me with a letter of warning for chronic absinthism, but each time they do it somebody in Personnel chalk up wan more mark against the leadingman for his failure to motivate me in the roight way. In the long run they will call him on the carpet, and make him take a training course in executive development, which will confuse him so bad that he'll ask for a transfer and a nw start in loife at some distant outpost where nobody knows him. For these wise guys of bosses come and go with the wind. Under my system, Tim, I may never get proomted but at least I can count on new blood in supervision every year or two. Motivation is the best thing ever invented by Civil Service. It is the poor man's secret weapon aaginst management."

"Bedad, Grogan," observed Mulligan. "They now have it down to a scoince. This is phwat they call the promotion policy. It's all here in black and blue—how you go about getting promoted, phwat you do to qualify, and the lines of work that make you into a successful creer employee. It tells you just where you stand as if you didn't already know. Right now, in me own case, only 16 people must die or meet with a fatal accident in order for me to get the offer . . .

"Iv course, Grogan, getting promoted is not just a matter of Larry-turn-the-crank. There are usually three or four other people who have their eye on the job, and most of them complete strangers. That's phwat's heert-breaking about the deal—when you suddintly learn that the other fellow got the job because he was a stranger and nobody had anything against him . . .

"You can't win, Grogan, promotion policy or no promotion policy."

#### ON REPORTS

"I expect yu to make mistakes, Grogan. That's why lead pencils were invented. But the biggest mistake you can make is to turn in no report atall. How many times have I tolt you that if you don't know the facts, improvise? A report is a report irregardless of what it contain. The leadingman won't understand it and the Ould Man is too busy to read it. In any case you can always amend it if someone questions it. But wanst you let the deadline escape you there is sure to be a lot of interest in why you didn't make the report. It's the deadline that count, Tim, not the report. So in the future, zero in your reports on time and everybody will be happy."

#### ABOUT THE AUTHOR

John Fox, a long-time practitioner and

observer on the Federal personnel scene, is currently the Chief of Management Staff, Internal Revenue Regional Office, Boston, Mass. After graduation from Harvard in 1930, he took a civilian job with the U.S. Army and literally grew up with Federal personnel administration. From 1950-53, he was Deputy Regional Director, Office of Price Stabilization, in the New England area, and from 1953-59 he was the Industrial Relations Officer, U.S. Naval Ammunition Depot, Hingham, Mass. Mr. Fox has served as Chairman, Federal Personnel Counsel of Boston, 1945-47, and as a consultant to various State and Federal committees and commissions on personnel and government. A former editor of *Education*, a national professional journal, Mr. Fox has many published articles in the fields of public administration and finance, economics and personnel. Since 1939 he has been listed in "Who's Who in the East."

—From the *Civil Service Journal*



The average parent takes considerable pride in his child. Here is a boy in whom all of the employees of the Aeronautical Center can take considerable pride. He is Terry Anders, son of Mrs. Susan Anders of the Records & Reports Section, FM-938. Terry, who will celebrate his thirteenth birthday in February, doesn't just sit around and wait for things to happen—he sets them in motion and keeps them going his way. In looking over Terry's activities, one might say his talents rest with athletics; but a closer

look convinces one that his primary activity is that of excelling.

Playing halfback on the Northwest Optimists Pee Wee football team under the name of Capitol Hill Bears, Terry scored fifteen touchdowns and more than one-hundred points for the season just ending. His stellar play was instrumental in leading the Bears to a city championship. They are awaiting an invitation to play in a post season bowl game. Under the coaching leadership of Art Fent and Bob Austin their record for the year was ten wins and one loss. Their first year (1958) of participation won for them the Sportsmanship Award.

Terry's accomplishments neither start nor end with this year's football season—it is just the latest in a long list. Football is his favorite when it is in season, and this is his third season to participate in organized play. During the baseball season it doesn't take much imagination to guess where he is. His participation this year (his 4th) consisted of that of assistant coach with the Stand Watie Midget "A" Team. In his third year of YMCA Little League baseball at Fillmore School he received the Sportsmanship Award.

Last spring at Fillmore School Terry was a sixth grade nominee for the school's citizenship award. At the same time he was winning first places in the school's fifty-yard dash, chinning, baseball throw and dodgeball throw. Not content with this, Terry took second place in the city-wide track meet. This was a repetition of second place in 1959 and a let down from his winning of first place in the 1958 meet.

Terry is an ardent member of the YMCA, and his activity is not limited only to baseball. He has won two first-place trophies and one second-place trophy in YMCA bowling. In his "Y" swimming program he has successfully progressed to the junior life saving course.

Up to this point one would think that Terry's interests and accomplishments are strictly within the scope of athletics. This is far from factual. During the football season just finished, he maintained a B-minus average in the seventh grade at Grant School along with daily football practice. He is a member of Asbury Church where he is the president of his Church School class, an officer in the Methodist Youth Fellowship and a member of the youth choir. He has been active in Scouting since beginning early with the cubs. He is now sought after as a den chief in Cubbing.

## **MARDIGRAS COSTUME BALL**

On February 24, 1961, the employees Association will hold its first annual Mardigras Costume Ball in the Zebra Room, of the Municipal Auditorium.

The association will also sponsor a King and Queen Contest. The women will nominate and elect the King, and the men will nominate and elect the Queen. The results of this election will be announced at the night of the Ball at intermission time. Prizes will be presented to the King and Queen at that time. The man and woman wearing the most original costume will also be presented with a prize.

To be able to nominate and vote in this election you must be a member of the Employees Association. So if you want to join in the fun—join the association immediately.

## **FAA SEEKS BETTER COMMUNICATION METHOD OVER NORTH ATLANTIC**

Radio signals bounced off the troposphere will give better communication on the air routes over the North Atlantic if the Federal Aviation Agency is successful in a development project now under way.

Equipment including a special antenna system and a high powered amplified has been ordered by the Research and Development Bureau of the FAA for tests to learn whether such a "forward scatter" method of transmitting can be made effective in the very high frequencies now used for airways communications.

The "forward scatter" principle, in use in our northern defense lines for several years, now gives crystal clear voice communication between places as distant as Kotzebue, Alaska, and any continental U. S. city. It involves directional broadcast of radio waves, some of which are bounced back from the troposphere earthward where they are received in exceptional clarity. Only recently, it became evident that this technique could be applied to aeronautical communications where one station is mobile or moving.

If these frequencies can be used, the result would be a very flexible system in an area where good communications are now often interrupted. A minimum of additional equipment would be required in the aircraft now flying the routes.

Two terminals will be established at first on the western side of the Atlantic. Later, depending on the success of the development, transmitters will be located also on the European side.



"THERE'S A SONG IN THE AIR" during the holiday season as the FAA Choralairs present programs before civic and charity organizations in the Oklahoma City area. The Choralairs, the singing group composed of FAA employees and their spouses, are in the midst of the most successful season since the group was organized in 1958. Edwin T. Karhu, Minister of Music at the First Methodist Church, has directed performances recently before the United Appeal workers at a luncheon in the Skirvin Tower Hotel; the Men's Club at the First Methodist Church; St. Anne's Home; a television audience; and the Christmas program at the Aeronautical Center in the Headquarters Auditorium.

Director Karhu and his wife entertained the members at a Christmas party in their home. Another party was given for the accompanist who left her post at the piano long enough to say "I do," and the group presented her with a silver compote in appreciation for her contribution to the chorus. One member commented that while seeking another accompanist to replace those lost in matrimony they entice the prospective member with the reminder "patience displayed in accompanying our efforts is excellent experience for those actively engaged in or anticipating the status of accompanying the other half through life."

A special invitation is extended to anyone who likes to sing - "COME JOIN THE FAA CHORALAIRS!"

The Fred Lanter Memorial Committee (See BEACON, September 1960) has completed their study of the memorial suggestions submitted and have made their report to Harry Donceel, President of the Aeronautical Center Employees Association.

Mr. Donceel reports the committee has recommended that a Bas-relief Plaque, with suitable inscription be obtained and permanently affixed to the wall of the lobby of the Headquarters Building.

The Committee has further recommended that Mr. Leonard D. McMurry, prominent Oklahoma City sculptor, be commissioned to do the work.

Mr. McMurry is presently working through the many photographs we have of Mr. Lanter and we hope to have the finished plaque ready for unveiling soon.

The Federal Aviation Agency and the Aeronautical Center were in the national news limelight as 1960 drew to a close. In the mid-December period, Mark Sullivan, a writer for Time Magazine, gathered material at the Aeronautical Center. His article on the Center activities will appear in Time Magazine January 2, 1961, issue.

An article by FAA administrator, E. R. Quesada, is in the January issue of Harper's Magazine, on the newsstands December 26th. The story is entitled -- "The Pressures against Air Safety."

The outgoing FAA head will make an appearance on the NBC "Meet the Press" television show on New Year's Day. That show is aired over WKY-TV in Oklahoma City and KVOO-TV in Tulsa. The Administrator will be questioned by a select group of aviation and news writers.



#### AERO CENTER "MANAGERS" RECEIVE FAA RING

The Aeronautical Center Employees Association voted to present each of the Center "Managers" one of the new FAA Rings. Presenting the ring to Mr. Ron Pulling, Depot Manager; Lewis Bayne, Aero Center Manager, and Bud Olsen, FAA School Superintendent, is Harry Donceel, President of the Aeronautical Center Employees Association.

#### FAA RING ORDERED FROM DISTANT PLACES

Evidence of how extensive FAA's role is in the free world can be gathered by reviewing the orders being received by the Aeronautical Center Employees Association for the new FAA Ring. To date, orders have been received from the four Continental Regions and from such distant locations as Japan, Hawaii, Alaska, Canal Zone, and Puerto Rico.

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Wherever men in your profession gather, at the conference table, in the field or at any gathering whether large or small, each man's ring gains for him the same, quiet recognition that your ring will win for you.

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- Synthetic Ruby ☐
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Smooth top stones will be used unless facet top is specified.

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Gary A. Peterson  
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Indianapolis Center  
Indianapolis Center  
Indianapolis Center  
Chicago Center  
Cleveland Center  
Cleveland Center  
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Washington Center  
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Indianapolis Center  
Indianapolis Center  
Washington Center

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Jimmy R. Durant  
Allan Gilbert  
Onesimo Gonzales  
Curtis L. Gruber  
Edward J. Helton  
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Douglas L. Porter  
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El Paso Center  
Ft. Worth Center  
San Antonio Center  
New Orleans Center  
Jacksonville Center  
New Orleans Center  
Jacksonville Center  
Jacksonville Center  
New Orleans Center  
Ft. Worth Center  
San Antonio Center  
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New York Center  
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TG-30

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Denver Center  
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T-303-61-1A

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Harold R. Boyer  
John A. Budewitz  
Robert J. Burley  
Henry F. Cocheme  
Eugene E. Fraim  
Carl P. Fry  
Lonnie O. Harmon  
Ernest M. Hickok  
William A. Hoelker  
David L. Knight  
Donald W. Jones  
Marion E. Lefkoff  
George E. LeGallia  
Claude J. Lantini  
Clement C. McDaniell  
Elwood J. Mosakos  
Robert L. Monroe  
Elmer C. Vires

Fine Bluff Station  
Watertown, S.D. Station  
Malden, Mo. Station  
Sidney, Neb. Station  
Madison, Wisc. Station  
Hill City, Kan. Station  
Ft. Smith Station  
Raleigh N.C. Station  
Vero Beach Station  
Indianapolis Station  
Montgomery Station  
Peoria Station  
San Antonio Station  
Wake Island Station  
New Orleans Station  
Austin Station  
Grand Forks, N.Dak. Station  
Brunswick, Ga. Station  
Tri-City, Tenn. Station

T-304-61-39

Louis W. Fischer  
Matthew J. Gelard  
Walter Harvey, Jr.  
Cecil O. Humes  
Shelrod E. Kendall  
Daniel W. Larson  
Gordon D. McFay  
George F. Meyer  
Donald F. Norman  
Walter W. Oakley  
Marvin L. Pollock  
Monte L. Porter  
Milo M. Rousculp  
Barry R. Shaw  
William H. Simpson  
Horton O. Smith  
Henry E. Szeleinaki  
Charles E. Waidmesser  
Gerald R. Williams  
Leonard E. Zaher

Akron Station  
Akron, Colo. Station  
Harrisburg, Pa. Station  
Livingston, Mont. Station  
Anchorage Station  
Cape Yakutat, Alaska Station  
Eugene, Ore. Station  
Binghamton Station  
Albuquerque Station  
Toledo Station  
Winslow, Ariz. Station  
Santa Barbara Station  
Woody Island Station  
Newport News, Va. Station  
Nobbs Station  
Grand Junction Station  
Worcester, Mass.  
Maryville, Calif. Station  
Oro, N.Mex. Station  
McGrath, Alaska Station

T-304-61-30

Raymond E. Abbott  
Donald W. Bodeman  
Ernest L. Bracy  
George M. Chandler  
Thomas G. Cianfrani  
James J. Cullen  
Clarence E. Cornelius  
Charles W. Derry  
Chester J. Evans  
Jay K. Pope  
Clarence S. Rasmussen  
Truman L. Stanley  
Willie G. Stephenson  
James F. Sullivan, Jr.  
Edwin W. VanOrden  
Barry C. Woodcock  
Robert P. Young  
Donald D. Yow  
Edward J. Zoellie  
Elizabeth A. Topp

Delta, Utah Station  
La Junta Station  
Augusta Station  
Sagle, Colo. Station  
Homer, Alaska Station  
Thermal, Calif. Station  
Montage, Calif. Station  
Morganston, W.V. Station  
Martinsburg, W.Va. Station  
Bismarck, N.Dak. Station  
Traverse City, Mich. Station  
Alexandria, La. Station  
Goshen, Ind. Station  
Spartanburg, S.C. Station  
Tyler Station  
Anderson, S.C. Station  
Imperial, Neb. Station  
Ashville, N.C. Station  
Minneapolis Station  
Columbus, Ohio Station

T-304-61-34

Andrew Hill  
Howard A. Blish  
Jean E. Britton  
William F. Carlton  
Richard A. Carmen  
Otis L. Deason  
Curry E. Ellison  
Melvin F. Fisher  
Carl A. Fowler  
Joan V. Fowler  
Casmir J. Greas  
Wayne E. Grindeland  
Philip V. Group  
Thomas L. Karkness  
Harold L. Kasser  
Raymond E. Hainold  
Edgar B. Johnson  
Edward F. Johnson  
Larry G. Jones  
Dorothy J. Lee

Terre Haute Station  
Columbia Station  
Pensacola Station  
Midland Station  
Springfield Station  
Aniston Station  
Lubbock Station  
Houghton, Mich. Station  
LeGrange Station  
Knoxville Station  
Sault Ste. Marie Station  
Fargo Station  
Flint Station  
Jorkin Station  
Fort Meyers Station  
Pierre Station  
3rd Regional Office  
Evansville Station  
Greenville Station  
Rapid City Station

James E. Looker  
Archib V. Lott  
Charles E. McGowan  
Walter A. O'Grady  
David Panik  
William J. Pette  
Ormond O. Robbins  
Charles A. Salato  
Frank C. Saunders  
Leonard L. Schormak  
Charles E. Scott  
Lawrence S. Shiflett  
Raymond E. Shire  
Jack E. Shropshire  
Frank R. Sowiński  
Wallace A. Sundberg  
Lloyd O. Travis  
Richard A. Urechurtu  
Cornelius E. Weidner  
Clifford W. Wheeler  
Ronald E. Wiley

T-304-61-48

Wendford Station  
Tucson, Station  
Douglas Station  
Raccochet Island Station  
Hile Station  
Carlsbad Station  
Battlem Station  
Rockwater Station  
Merve Look Station  
Farwell Station  
Lexington Station  
Gordonsville Station  
Prescott Station  
Fort Yukon Station  
Zanesville Station  
Bakersfield Station  
Miles City Station  
Imperial Station  
Tuma Station  
Malad City Station  
LA Regional Office

T-304-61-46

Mark D. Argo  
Ivan E. Briggs  
James L. Brown  
Frank L. Chaplin  
Edward J. Chlapowski  
George N. Hager  
Ralph L. Haselton  
Myron L. Keller  
Joseph L. Kinney  
Marion E. Lambert  
Leland T. Muttarfield  
Robert J. Pivonka  
Ralph L. Reeves  
William Riley  
Joseph M. Sparks, Jr.  
Herbert E. Spell  
Jimmy N. Stanley  
Hilton E. Walton  
Forrest E. Waters  
Willis E. Webb

Trinidad, Colo. Station  
Massena, N.Y. Station  
Hawi, Hawaii Station  
Phillipsburg, Pa. Station  
Billings Station  
Charleston, W.Va. Station  
Nenana, Alaska Station  
Great Falls Station  
Selena, Alaska Station  
Windsor Locks, Conn. Station  
Emporia, Kan. Station  
LeCrosse, Wisc. Station  
Mineral Wells, Tex. Station  
Crestview, Fla. Station  
Walnut Ridge, Ark. Station  
Orlando Station  
Junction, Tex. Station  
Lincoln, Neb. Station  
Quincy, Ill. Station  
Ponca City Station

T-304-61-54

Joseph Abrams  
Richard P. Achatz  
Robert A. Bennett  
Kenneth E. Brown  
Milton J. Brady  
James H. Brascher  
William M. Buchanan  
James L. Caffacus  
Wilbur O. Cameron  
James F. Carroll  
Earle F. Catlow  
Robert L. Clyburn  
Parman R. Cody  
Glen D. Colburn  
Leodore M. Coleman  
Sam C. Colley  
Richard M. Collins  
Donald V. Conry  
Earl C. Cooney  
Joseph E. Crouse  
Charles E. Elster

Battle Mountain, Nev. Station  
Milwaukee, Wisc. Station  
San Juan, Puerto Rico Station  
Key West, Fla. Station  
Honolulu, Hawaii Station  
Eunasa City, Mo. Station  
Waterloo, Iowa Station  
Pittsburgh, Pa. Station  
Denver, Colo. Station  
Fortland, Me. Station  
Ronaoka, Va. Station  
Fayetteville, N.C. Station  
Las Vegas, N.M. Station  
Casper, Wyo. Station  
Kenai, Alaska Station  
Tombokas, Ark. Station  
Hishumina, Alaska Station  
South Bend, Ind. Station  
Lafayette, La. Station  
Hickory, N.C. Station  
Sillsbury, Mo. Station

T-304-61-58

Bobbie W. McIntosh  
Neil V. McMillen  
Conrad W. Melton  
Roy A. Nelson  
Carroll M. Morgaard  
John P. Ortega  
William P. O'ay, Jr.  
Raymond O. Predmore  
Vernon S. Quick  
Royce W. Robbins  
Albert P. Samball  
Clarence M. Schmauch  
Bennie D. Silko  
Barlene M. Small  
John E. Turner  
Harold B. Wick  
Homer L. Willase  
Elmer I. Williams  
Harmon A. Williams  
Walter E. Young

Mech, Ga. Station  
Dodge City, Kan. Station  
Dalhart, Texas Station  
Scottsbluff, Neb. Station  
Eau Claire, Wisc. Station  
Wadepeller, W. Station  
Mobile, Ala. Station  
Hansfield, Ohio Station  
Rawlins, Wyo. Station  
Columbus, N.M. Station  
Gainesville, Fla. Station  
Dillon, Mont. Station  
Long Rock, Wisc. Station  
Columbia, Mo. Station  
North Platte, Neb. Station  
Wenatchee, Wash. Station  
Guam, Marine Islands Station  
Unalakleet, Alaska Station  
Kasigau, Alaska Station  
Berkford, Ill. Station

## T-304-61-5C

Jones I. Ellefson  
Herbert E. Evans  
Marion J. Figley  
Clarence J. Fox  
Tom E. Foy  
John C. Funk  
Cedric L. Gerry  
Everett Haley  
Robert L. Hall  
Helle M. Hill  
Charles P. Ingram  
Vernal E. Jones  
R. H. Josseland, Jr.  
Herbert F. Lamm  
James W. Lawrence  
Lloyd A. Lovasens  
Ernest B. Mann  
Stanley Matejek  
William F. McGart  
Arthur W. Ramsey

North Bend, Ore. Station  
Farmington, N.M. Station  
Summit, Alaska Station  
West Palm Beach Station  
Florence, S.C. Station  
Jacksonville, Fla. Station  
Las Vegas, Nev. Station  
Houston, Mo. Station  
Dickinson, N.D. Station  
Amarillo, Tex. Station  
Bowling Green, Ky. Station  
Sheridan, Wyo. Station  
Evergreen, Ala. Station  
Blackstone, Va. Station  
McAlester, Okla. Station  
Pellston, Mich. Station  
Moline, Ill. Station  
Syracuse, N.Y. Station  
Hanksville, Utah Station  
Portland, Ore. Station

## T-304-61-6A

A. Imman Allison  
William B. Atkins, Jr.  
Julian V. Brandt, Jr.  
Raymond J. Christiansen  
Marion C. Cole  
Herbert J. Dalton  
Kenneth E. Dennis  
Earl B. Drew  
Vincent E. Filimon  
Virgil I. Frazier  
Lon T. Golden  
Harold E. Grow  
Sharkey W. Harrison  
Earl L. Hartley  
Ira L. Hicks  
Walter M. Jolly  
Joseph E. Kingdon  
Fred W. McIntyre  
Billy McKinney  
John R. Mondt  
Wilbur T. Morris

Salinas, Calif. Station  
Daggett, Calif. Station  
Charleston, S.C. Station  
Cedar City, Utah Station  
Crescentville, Tenn. Station  
Worland, Wyo. Station  
Bogalusa, Wash. Station  
Valdosta, Ga. Station  
Drummond, Mont. Station  
Elizabeth City, N.C. Station  
Tulsa, Okla. Station  
Oakland, Calif. Station  
Mullan, Idaho Station  
Gage, Okla. Station  
Melbourne, Fla. Station  
Fayetteville, Ark. Station  
Daytona Beach Station  
Rocky Mount, N.C. Station  
Dyersburg, Tenn. Station  
Bellingham, Wash. Station  
Tampa, Fla. Station

## T-304-61-6B

James T. Hockenbuhl  
Vasily L. Howard  
Ralph D. Huffer  
John H. Hummel  
Glenn R. Husec  
Albert A. Kelm  
Roy L. Mosemore  
Mark P. Mitchell  
James D. Mulligan  
James E. Payne  
Wallace T. Reid  
Kang Mok Rhee  
Alfred W. Schilling  
Eugene E. Smith  
Billie B. Sutton  
Roy W. Swan  
Arthur J. Venne  
William L. Wagner  
Earl E. Waterman  
Charles R. Whitfield  
Harrison W. Yount

Aberdeen, S.D. Station  
Champaign, Ill. Station  
King Salmon, Alaska Station  
Big Delta, Alaska Station  
Philip, S.D. Station  
Garden City, Kan. Station  
Salina, Kan. Station  
St. Louis, Mo. Station  
Marquette, Mich. Station  
London, Ky. Station  
Philadelphia, Pa. Station  
Korea  
Canton Island Station  
Grand Rapids, Mich. Station  
Anchorage Station  
Gladwin, Mich. Station  
Providence, R.I. Station  
Findlay, Ohio Station  
Glen Falls, N.Y. Station  
Anchorage Station  
Manhattan, Kansas Station

## T-304-61-6C

Dominick J. Bellotte  
Walter D. Buss  
Kenneth L. Cooper  
George W. Dolin  
Alexander Dufresne  
John C. Eulow  
Paul Hershbin  
Raymond F. Haurbrick  
Jack C. Hingrave  
Carl N. Ober  
Verdi B. Rognlie  
Lynnwood M. Sage  
Gerald K. Seymour  
Johnnie Stephens  
Claude Stewart  
Wilson C. Sturtz  
Albert A. Villar  
Herbert O. Wanda  
Lloyd U. Miller  
Everett W. Mulligan

Hikins, W.Va. Station  
Cape Gerardeau, Mo. Station  
Topeka, Kan. Station  
Martinsburg, Pa. Station  
Talkeetna, Alaska Station  
Grantsburg, Wisc. Station  
Elmira, N.Y. Station  
Saginaw, Mich. Station  
Flippin, Ark. Station  
Stockton, Calif. Station  
Missoula, Mont. Station  
Redmond, Ore. Station  
San Diego Station  
Tallahassee, Fla. Station  
Nothan, Ala. Station  
Grants, N.Mex. Station  
Miami, Fla. Station  
El Dorado, Ark. Station  
Parkersburg, W.Va. Station  
Foughkeepsie, N.Y. Station

## T-304-61-7A

Lyle K. Becker  
Norman C. Birkholz  
Guy J. Blakely  
L. T. Boyd  
Jack L. Broome  
Dan Brown, Jr.  
Bennie J. Carden  
Clair B. Colburn  
Elliot A. Eckert  
Elton H. Freeman  
Earl Glens  
Carl L. Gontcher  
Joseph E. Gornley  
Ellsworth M. Haines  
Marvin Hill  
Willis E. Hoffman  
G. Earl Jones  
James C. Lambert  
Carl H. McCrary  
Harold Michael

Sioux City, Iowa Station  
Green Bay, Wisc. Station  
Ottumwa, Iowa  
McComb, Miss. Station  
Galveston, Tex. Station  
Huntsville, Ala. Station  
Albany, Ga. Station  
Kansas City, Mo. Station  
Honolulu, Hawaii Station  
Des Moines, Iowa Station  
Childress, Texas Station  
St. Joseph, Mo. Station  
Chautauk, Kan. Station  
Joliet, Ill. Station  
Alma, Ga. Station  
St. Croix, Virgin Islands Station  
St. Thomas, V.I. Station  
Salboa, Canal Zone Station  
Springfield, Mo. Station  
Jamestown, N.D. Station

## T-304-61-7B

David C. Burns  
Curtis C. Dyer  
Kenneth E. Harkema  
George E. Hogan  
Clarence C. Holmberg  
Elmer L. Jones  
Cecil F. Lakey  
Sumner S. Loomis  
R. Russell Love  
Edgar C. Medford  
John E. Mosaick  
Robert J. Mitchell  
Earl T. Merton  
William T. Mullaly  
Arthur W. Osoveki  
James O. Porter  
John S. Satterfield  
James H. Selts  
John H. Snyder  
George F. Steele

Elko, Nev. Station  
Huntington, N.Va. Station  
Wallis Wells, Wash. Station  
Allentown, Pa. Station  
Bethel, Alaska Station  
Seattle, Wash. Station  
Truth or Con, N.W. Station  
Youngstown, Ohio Station  
Yakima, Wash. Station  
Illumina Station  
Fresno, Calif. Station  
Reno Station  
Toledo Station  
Anchorage, Alaska Station  
Needles, Calif. Station  
Kaktul, Alaska Station  
Concord, N.H. Station  
Hose, Alaska Station  
Newport, Va. Station  
Burlington, Vt. Station

## T-304-61-7C

George W. Alvanos  
Paul R. Beck  
Peter J. Clark  
Darrel S. Downing  
William B. Duncanson  
LeRoy A. Ellis  
Henry Gabriel  
Vity J. Grabaukas  
Robert E. Grove  
Ferdinand E. Hardebeck  
James H. Miner  
C. E. Minkner  
Alpheus S. Moseley  
I. W. Olson  
Richard L. Plachecki  
Howard R. Rhodes  
Warren T. Rowe  
George L. Seaver  
Leo E. Shull  
Pierce T. Utsey

Erie, Pa. Station  
Dayton, Ohio Station  
Dubois, Idaho Station  
Boise, Idaho Station  
Richmond, Va. Station  
Old Town, Me. Station  
Baker, Ore. Station  
Utica, N.Y. Station  
Ephrata, Wash. Station  
Butte, Mont. Station  
Fr. Worth, Tex. Station  
Mason City, Iowa Station  
Columbia, S.C. Station  
Russell, Kansas Station  
Alexandria, Minn. Station  
New Bern, N.C. Station  
Hill City, Kan. Station  
Hochester, Minn. Station  
Minot, N.Dak. Station  
Wilmington, N.C. Station

## T-304-61-8A

Hobbie R. Basham  
Mylas V. Clements  
George O. Garrett  
Joseph J. Gerten  
Joseph Libutti  
Kenneth W. Morrow  
Osmund F. Olson  
Frank E. Rastad  
George W. Rhodas  
Laurence S. Rich  
Rudolph A. Singley  
Samuel K. Stitman  
Carl G. Suber  
Rupert G. Tiffeny  
Kather L. Wakefield  
Hilton L. Winborne  
Jane M. Wialer  
Irvin W. Lynch

Newport News, Va. Station  
Indianapolis Station  
Third R. O.  
Washington PSS  
M. Y. R. O.  
Boston PSS  
Minneapolis Station  
St. Louis Station  
Memphis Station  
Third R.O.  
Myrtle Beach PSS  
Cleveland Station  
Jacksonville Station  
First R.O.  
Joliet Station  
Second R.O.  
Detroit PSS  
New York PSS

## T-304-61-8B

Devey Donato  
Lynn W. Graham  
Oren L. Hauge  
Robert I. Herron  
Richard L. Imman  
James I. Jensen  
Elbert M. Lindsey, Jr.  
Elmer A. Lively  
Jerome F. Loring  
Ola M. McDonald  
Glenn McFarland  
John J. Marzello  
Adolph Rosenau  
Victor B. Seabarger  
Raymond E. Yeager, Jr.

Pueblo Station  
Cheyenne Station  
Fendleton Station  
Ontario Station  
Anchorage ATM Div., R.O.  
Anchorage PSS  
Washington, D.C. Station  
Denver Station  
Pocatello Station  
Santa Fe Station  
Elmesth Falls Station  
San Diego PSS  
Anchorage ATM R.O.  
Medford Station  
Washington, D.C. Station

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSES IN 200 SERIES**

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSE 1**

NAME	REG	STATION	NAME	REG	STATION
Anderson, L. C.	4	Salt Lake City, Utah	Morrison, R. D.	3	Kansas City, Mo.
Lisens, J. W.	2	New Orleans, La.			

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSE 2**

NAME	REG	STATION	NAME	REG	STATION
Clemens, E. W.	2	Terminal, Tex.	Hong, H. S. B.	FM	Wake Island
Iseri, K.	6	Kaneohe, Hawaii	Macy, K. F.	1	Roanoke, Va.
Holland, W. G.	PT	Oklahoma City, Okla.			

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSE 90**

NAME	REG	STATION	NAME	REG	STATION
Alfred, G. D.	4	Albuquerque, N.M.	Horton, S. H.	2	Ft. Myers, Fla.
Ambrose, D.	FM	Oklahoma City, Okla.	Huffaker, M. D.	6	Kihel, Hawaii
Bailey, E. V.	4	Roosevelt, Utah	Hurst, C. G.	FM	Oklahoma City, Okla.
Baum, G. C.	1	Lyonsburg, Va.	Jensen, E. J.	3	Sgt. Bluff, Iowa
Bell, J. L.	1	Albuquerque, NM	Johnson, C. R.	3	Cedar Falls, Iowa
Bellissimo, A. J.	1	Cincinnati, Ohio	Johnson, W.	2	St. Simons, Fla.
Benson, W. G.	4	Great Falls, Mont.	Jones, E. D.	FM	Oklahoma City, Okla.
Beyer, W. J.	3	Inkster, Mich.	Kelly, E. G.	2	Gage, Okla.
Boehnlein, A. W.	3	Inkster, Mich.	Kiesling, C. H.	3	Shawnee, Okla.
Boguslaw, F. P.	1	Catawissa, Pa.	Kluth, E. H.	3	Hill City, Kan.
Bowman, C. E.	2	Charleston, S.C.	Kochman, C. M.	1	N. Cumberland
Bradham, G.	3	Boonerville, Kan.	Kostler, C. G.	3	Stewartville, Minn.
Breece, H. E.	1	Moffett NAS, Calif.	Kopka, R.	1	Syracuse, N.Y.
Brown, R. L.	1	Brooklyn, N.Y.	Krydas, F. J.	3	Sault Ste Marie
Brown, R. L., Sr.	PT	Clatsop, Kan.	Laperriere, R.	1	E. Boston, Mass.
Brudney, S. P.	2	El Paso, Texas	Lashbrook, J. H.	4	Sacramento, Cal.
Burger, T. W.	2	Hurst, Texas	Lewis, J. E.	1	Paducah, Ky.
Burke, T. M.	3	Independence, Mo.	Livingston, R.	5	Fairbanks, Alaska
Call, R. M. F.	4	Carlsbad, N.M.	McClure, D. L.	3	Wichita, Kan.
Case, J. V., Jr.	1	Roanoke, Va.	Megheeh, C.	FM	Oklahoma City, Okla.
Dang, Quon Ming	6	Honolulu, Hawaii	Miller, D. C.	3	Olpe, Kan.
Davenport, S. T.	EST-2	Ft. Worth, Tex.	Mitchell, L. W.	FM	Oklahoma City, Okla.
Davis, H. E., Jr.	1	Cincinnati, Ohio	Montfort, J. D.	2	Ft. Worth, Tex.
Decker, W.	2	Nunnally, Tenn.	Montgomery, E. A.	3	Kansas City, Mo.
Durbin, C. W.	3	Kansas City, Mo.	Mundt, E. E.	5	Fairbanks, Alaska
Eason, S., Jr.	4	Sunnyvale, Calif.	Newman, H. L.	1	Albinston, N.Y.
Ella, R. L.	4	San Francisco, Calif.	O'Rear, G. W.	3	Plainfield, Ind.
Farrington, C. R.	3	Indianapolis, Ind.	Patino, A. M.	2	San Antonio, Tex.
Fisher, R. W.	1	Oriekany, N.Y.	Pessin, J.	1	N. Y., N.Y.
Fox, R. N.	1	Linthicum, Md.	Ragan, J. H.	3	Duluth, Minn.
Freeman, J. R.	4	Spokane, Wash.	Richards, G. A.	3	Lamoni, Iowa
French, M. L.	2	Alpine, Tex.	Ritterbush, J. L.	3	Olathe, Kan.
Fuzzell, B. J.	PT	Norman, Okla.	Roberts, M. R.	FM	Edmond, Okla.
Gabel, R. W.	FM	Oklahoma City, Okla.	Rodighiero, R. D.	4	Trinidad, Colo.
Garkjen, R. C.	3	Duluth, Minn.	Rood, A. L.	4	Pacifica, Calif.
Gautier, G. M., Jr.	3	Kansas City, Kan.	Rosati, C. A.	2	Christiansted, VI
Gestenslager, K.	3	Kansas City, Mo.	Scott, R. L.	2	Bethany, Okla.
Giannakopoulos, J. K.	4	Sun Valley, Calif.	Shukal, J.	EST-4	Los Angeles, Cal.
Gibbons, R. L.	3	Evanston, Ind.	Smith, A. N.	4	Mesa, Ariz.
Givens, J. J.	1	Jamaica, N.Y.	Stedman, J. A.	5	Fairbanks, Alaska
Grady, M. R.	1	Taunton, Mass.	Stewart, H. W.	3	Seelyville, Ind.
Graham, J. E.	4	Farrington, N.M.	Thompson, B. G.	2	College Park, Ga.
Graves, D. D.	2	Ft. Worth, Tex.	Thompson, G. W.	1	Cheapeake, Ohio
Gray, S. F.	4	Mather, Calif.	Tidwell, G. L.	3	Elephant Butte, NM
Grob, L. W.	5	Anchorage, Alaska	Toth, E. W.	3	Southgate, Mich.
Hansen, S. H.	2	Ft. Myers, Fla.	Verano, T.	1	Cleveland, Ohio
Harris, W. S.	4	Albuquerque, NM	Wagen, P. J.	3	Milwaukee, Wis.
Hill, E. W.	3	Flint, Mich.	Ware, M. P.	1	Louisville, Ky.
Ho, G. C. C.	6	Honolulu, Hawaii	Weber, H. G.	2	Jacksonville, Fla.
Moelting, N. C.	2	Ponca City, Okla.	Wilder, R.	3	Fargo, N. D.

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSE 100**

NAME	REG	STATION	NAME	REG	STATION
Blaslock, H. D.	2	Jacksonville, Fla.	Manthey, G. W.	4	Glendale, Ariz.
Briggs, D. P.	4	Sherman Oaks, Cal.	Mateo, R.	6	Oahu, Hawaii
Brown, J. D.	2	Ft. Worth, Tex.	Millstead, L. L.	4	Moriarty, N.M.
Burke, S. J.	3	Pellston, Mich.	Morrison, J. W.	2	Birmingham, Ala.
Cassidy, T. S.	2	Atlanta, Ga.	Nakamura, D. K.	6	Wahiawa, Hawaii
Cawthon, H. L.	2	Miami, Fla.	Pietro, M. D.	1	St. Albans, NY
Chamberlain, R. M.	4	Phoenix, Ariz.	Polk, N. W.	4	Hayward, Calif.
Conart, B. J.	2	Valdosta, Ga.	Rheuma, A.	4	Marid City, Idaho
Daril, R. E.	4	Oklahoma City, Okla.	Ryback, R. C.	4	San Francisco
Davidson, R.	2	Ft. Worth, Tex.	Saengerlin, E. R.	2	Shreveport, La.
Delong, K. R.	2	Atlanta, Ga.	Sicker, M.	EST-1	Jamaica, N.Y.
Deuse, R. A.	1	Old Town, Maine	Steppe, L. A.	4	Petaloma, Calif.
Duxbury, C. W.	2	Shreveport, La.	Sullivan, B. E.	3	Mooreville, Ind.
Freeman, C. E.	6	Kailua, Hawaii	Thompson, R. E.	FM	Norman, Okla.
Frerksen, W. S.	2	Montgomery, Ala.	Treichel, D. C.	5	Aniak, Alaska
Gordon, J. B.	PT	Moore, Okla.	Tulloch, D. E.	1	St. Albans, W.Va.
Grobos, G.	FS	Bethpage, N.Y.	Tyler, R. S.	PT	Oklahoma City, Okla.
Hargrove, F. D.	4	Aurora, Colo.	Vordman, R.	3	Ft. Wayne, Ind.
Herrington, D.	2	Lubbock, Tex.	Wallace, G. H.	2	Cleburne, Tex.
Judd, F. L.	EST-2	Tulsa, Okla.	Walker, R.	1	Philadelphia, Pa.
Kubo, Y.	6	Wake Island	Wilson, J. W.	2	Augusta, Ga.
Landon, F. E.	3	Kansas City, Mo.	Yerkos, C. F.	4	Melton, Wash.
McNees, T. A.	3	Inkster, Mich.			

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSE 901**

NAME	REG	STATION	NAME	REG	STATION
Charnick, W. E.	FM	Bronx, N.Y.	Ing, J. C. Y.	EST-6	Honolulu, Hawaii
Ditler, B. F.	2	Ft. Worth, Tex.	Mosser, J. F.	4	Seattle, Wash.
Hutchinson, R. A.	FM	Washington, DC	Vick, G. R.	2	El Paso, Tex.

**DS-201**

NAME	REG	STATION	NAME	REG	STATION
Boalet, M. D., Jr.	5	King Salmon, Alaska	Gray, R. D., Jr.	1	Worcester, Mass.
Carlile, J. L.	2	Terminal, Tex.	Longshore, M. W.	4	Sacramento, Cal.
Chamberlain, R. M.	4	Phoenix, Ariz.	Mack, R. C.	1	Nantucket, Mass.
Chapman, W. R., Jr.	2	Ft. Worth, Tex.	Missel, G. J.	6	Canton Island
Clark, D. W.	4	Aurora, Colo.	Reibelle, R. J.	1	Norfolk, Va.
Davison, R. E.	2	Ft. Worth, Tex.	Ramsey, W. J.	2	Fayetteville, Ark.
Forrester, J.	4	Elko, Nev.	Tillman, B. G.	PT	Oklahoma City, Okla.
Gavio, A. P.	2	Montgomery, Ala.			

**DS-202**

NAME	REG	STATION	NAME	REG	STATION
Albert, F. J.	2	Key West, Fla.	Jones, I. L.	1	S. Norfolk, Va.
Davidson, W. M.	4	Oakland, Calif.	Mateo, R.	6	Aiea, Oahu, Hawaii
Dunning, G. B.	4	Miller City, Mont.	Nakasawa, S.	1C	Japan
Ester, W. L.	PT	Beaufort, S.C.	Thompson, J. O.	3	Cedar Falls, Iowa
Flores, R. Y.	4	Albuquerque, NM	Tillman, B. G.	PT	Oklahoma City, Okla.
Gault, W. C.	2	Big Spring, Tex.	Winn, J. W., Jr.	2	Bahia, Hgts, C.Z.
Johnson, G. T.	PT	Norman, Okla.			

**DS-203**

NAME	REG	STATION	NAME	REG	STATION
Brooks, T. J.	2	Lafayette, La.	Melendez, A.	4	Denver, Colo.
Cox, C. E.	PT	Oklahoma City, Okla.	Tillman, B. G.	PT	Oklahoma City, Okla.

**DS-204**

NAME	REG	STATION	NAME	REG	STATION
Knudsen, R.	4	Albuquerque, NM	Tucker, U. L.	2	Wilmington, NC
Littleton, D. A.	4	Casper, Wyo.	Weatherby, T.	4	Boise, Idaho
Norman, P. E.	2	Miami, Fla.			

**DS-208**

NAME	REG	STATION	NAME	REG	STATION
Clark, D. W.	4	Aurora, Colo.	Gault, W. C.	2	Austin, Tex.
Franklin, F. E.	4	Chico, Calif.	Weatherby, T.	4	Boise, Idaho

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSES IN 300 SERIES**

NAME	REG	STATION	NAME	REG	STATION
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**DS-301**

NAME	REG	STATION	NAME	REG	STATION
Cavanaugh, T.	EST-4	Los Angeles, Calif.	Singletary, G. D.	6	Canton Island
Forrester, J.	4	Elko, Nev.	Tompkins, J. B.	4	Ontario, Calif.
Hasefield, G. F.	2	Waco, Tex.	Winstone, J. W.	PT	Oklahoma City, Okla.
Park, M. T. H.	6	Honolulu, Hawaii	Wright, M. C.	2	Cross City, Fla.

**DS-302**

NAME	REG	STATION	NAME	REG	STATION
Boyd, R. S.	3	Joplin, Mo.	Landers, T. J., Jr.	2	Lubbock, Tex.
Cloud, G. W.	FM	Oklahoma City, Okla.	Laping, B.	6	Ewa, Oahu, Hawaii
Deadrick, E. L.	3	Detroit, Mich.	Park, A. W.	6	Oklahoma City, Okla.
Hagan, A. J.	2	McAlester, Okla.	Park, M. T. H.	6	Honolulu, Hawaii

**DS-303**

NAME	REG	STATION	NAME	REG	STATION
Dorony, G. J.	1	Lakewood, Ohio	Ryan, J. G.	1	Old Town, Maine
Park, A. W.	6	Kapaa, Hawaii	Vance, A. G.	4	Lyman, Wyo.
Park, M. T. H.	6	Honolulu, Hawaii	Yoneshige, R. R.	6	Wake Island

**DS-304**

NAME	REG	STATION	NAME	REG	STATION
Morgan, A. C.	4	Hoquiam, Wash.	Park, M. T. H.	6	Honolulu, Hawaii

**DS-305**

NAME	REG	STATION	NAME	REG	STATION
Blocker, A.	2	Shreveport, La.	Nafas, C. W.	4	Resido, Calif.
Covert, O. A.	4	Ukiah, Calif.	Wilcox, D. E.	5	Mid Edgecumbe
Jones, J. D.	2	Pasadena, Tex.			

**DS-311**

NAME	REG	STATION	NAME	REG	STATION
Costello, J. E.	2	Cayce, S.C.	Mack, G. P.	1	Rochester, N.Y.
Crooks, R. E.	1	Sewickley, Pa.	Murphy, K. W.	1	Rochester, N.Y.
Fraxier, H. M.	4	Albuquerque, NM	O'Connor, J. F.	EST-1	Atlantic City, NJ
Gutierrez, D. M.	FM	Oklahoma City, Okla.	Polk, N. W.	4	Hayward, Cal.
Hoops, L. B.	6	Honolulu, Hawaii	Polinsoli, V.	1	Newark, N.J.
Hunter, D. G.	2	Chattanooga, Tenn.	Ryan, J. G.	1	Bangor, Maine
Interlicchia, D. D.	1	Rochester, N.Y.	Shell, L. H.	PT	Los Angeles, Cal.
Kemmer, F. R.	2	College Sta., Tex.	Smith, H. H.	4	Belgrade, Mont.
Kranhold, K. G.	EST-4	Boseman, Mont.	Taylor, D. A.	2	Oklahoma City, Okla.
Love, M. T.	2	West Columbia, SC			

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSE 401**

NAME	REG	STATION	NAME	REG	STATION
Andrews, G. F.	2	Miami, Fla.	Newman, S.	NAFEC	Atlantic City, NJ
Charnick, B. E.	FM	Washington, DC	Owens, H. G.	3	Kansas City, Mo.
Hilton, R. C.	PT	Oklahoma City, Okla.	Skolnick, B.	EST-1	N. Y., N. Y.
Holland, W. G.	PT	Oklahoma City, Okla.	Spataro, J. B.	2	Maxwell AFB, Ala.
Jepson, R. W.	PT	Oklahoma City, Okla.	Sulsky, B.	EST-1	Jamaica, N.Y.
Loucks, D. P.	AT	Albuquerque, NM	Whittaker, G. W.	EST-2	Ft. Worth, Tex.

**SEPTEMBER GRADUATES IN DIRECTED STUDY COURSE 441**

NAME	REG	STATION	NAME	REG	STATION
Beasley, G. E.	4	Cheyenne, Wyo.	Johnston, W. A.	2	Montgomery, Ala.
Brown, K. J.	2	Montgomery, Ala.	Raymond, G. E.	4	Los Angeles, Cal.
Ennis, R.	1	Coventry, R. I.			

# ILS CLASS 183 CONVENED SEPTEMBER 5, 1960, TO SEPTEMBER 30, 1960

NAME	REG	STATION	NAME	REG	STATION
Jeanvetti, A. B.	1	Vineland, N. J.	Levy, G. D.	2	Ft. Worth, Tex.
Borowski, S.	1	Allentown, Pa.	Most, A.	1	Atlantic City, NJ
Canfield, W. D.	4	Seattle, Wash.	Nesley, B. D.	2	Oklahoma City, Okla.
Cheatham, J. W. B., Jr.	4	Casper, Wyo.	Nishimura, G. S.	6	Honolulu Hawaii
Della Penna, Henry	1	Berea, Ohio	Prater, H.	5	Anchorage, Alaska
Dodge, L.	4	Fresno, Calif.	Ream, P. H.	3	Sioux Falls, SD
Edwards, J. W.	4	Washington, DC	Reese, L. A.	3	Dearborn, Mich.
Gilmore, E. J.	1	Bradford, Pa.	Salasino, J.	3	Williamsville, NY
Hardy, R. P.	1	Bradford, Pa.	Schellenberg, H. K.	2	Charleston, S.C.
Hartman, J. A.	3	Sioux Falls, SD	Wilson, L. B.	AC	Norman, Okla.

# ILS CLASS 184 CONVENED SEPTEMBER 19, 1960, TO OCTOBER 14, 1960

Allen, G. D.	1	New York	Patrick, D. A.	3	
Clapper, R. J.	1	Danville, Va.	Pettit, A. G.	4	Stockton, Calif.
Coyle, R. F., Jr.	1	Norfolk, Va.	Raese, E.	2	New Braunfels, Tex.
Frederick, O. D.	2	Ft. Smith, Ark.	Rahman, U.	OIC	
Garland, R. J.	4	Elmer, Wyo.	Roberts, J. L.	2	Ft. Worth, Tex.
Griffin, R. W.	4	Casper, Wyo.	Sharp, C. D.	1	Nashville, Tenn.
Kelly, L. A.	3	Anderson, Ind.	Towery, F. D.	AC	Blanchard, Okla.
Loux, D. D.	4	Stockton, Calif.	Wampler, E. L.	WO	Radford, Va.
McDowell, J. D.	2	Miami, Fla.	Young, R. W.	4	Pacific, Calif.
Mendoza, L.	OIC	Bolivia			

# RADAR CLASS 148 CPM-16 CONVENED SEPTEMBER 6, 1960, TO SEPTEMBER 9, 1960

NAME	REG	STATION	NAME	REG	STATION
Acuna, R. L.	3	Lincoln, Nebraska	Issac, W. O.	5	Anchorage, Alaska
Allin, M. G.	3	Lincoln, Nebraska	Kesler, M. P.	1	Rome, N. Y.
Burroughs, H. A.	4	San Mateo, Calif.	Lynch, D. E.	1	Rome, N. Y.
Caldwell, H. J., Jr.	1	Wright-Patterson	McCutcheon, D. E.	5	Anchorage, Alaska
Errickson, M. W.	4	Fairchild AFB	Steward, R. H.	5	Fairbanks, Alaska
Fike, W. S.	1		Sweeney, J. T.	3	Wichita, Kansas

# RADAR CLASS 148 AMPLITRON CONVENED SEPTEMBER 6 TO SEPTEMBER 9, 1960

Barrett, W. J.	4	Oakland, Calif.	Kibbe, L. L.	2	Ft. Worth, Tex.
Bradford, C. V.	2	Houston, Tex.	Low, S. G.	1	Danville, NY
Brueske, R. W.	3	St. Louis, Mo.	Murillo, A. D.	4	San Diego, Cal.
Bushnell, D. E.	2	Memphis, Tenn.	Robinson, W. H.	4	Salt Lake City, U.
Diller, R. L.	4	Oak Int Airport	Trebot, F. B.	1	Cleveland, Ohio
Gleason, R. L.	4	Phoenix, Ariz.	Wolf, J. T.	3	Indianapolis, Ind.
Harvey, J. T., Jr.	2	Miami, Fla.	Wolf, C. P.	4	Salt Lake City, U.
Hoesing, H. C.	3	Omaha, Neb.			

# RADAR CLASS 148 VRF/DF CONVENED SEPTEMBER 6 TO SEPTEMBER 9, 1960

Chase, R. W.	2	Jacksonville, Fla.	Phillips, R. J.	2	Houston, Tex.
Dilunas, B. K.	1	Covington, Ky.	Powell, D.	1	La Guardia
Herbick, W. J.	1	Atlantic City, NJ	Roman, K. C., Jr.	1	Baltimore, Md.
Hwang, J. W.	OIC	Korea	Rupert, W. C.	1	Charleston WVA
Irwin, U. M.	4	San Francisco, Cal.	Schindler, W. A.	1	Cleveland, Ohio
Ortleon, H. W.	1	New York			

# RADAR CLASS 149 RML T/R CONVENED SEPTEMBER 12 TO OCTOBER 7, 1960

Babetski, A. R.	1	Benton, Pa.	Kibbe, L. L.	2	Ft. Worth, Tex.
Booker, J. L.	2	Houston, Tex.	Magin, W.	1	Danville, N. Y.
Bushnell, D. E.	2	Memphis, Tenn.	McCutcheon, D. E.	5	Seward, Alaska
Clack, D. C.	2	Montgomery, Ala.	Mee, C. R.	2	Raleigh, N. C.
Cordle, J. L.	3	Olathe, Kansas	Nelson, C. D.	1	Quonset Point, R. I.
Darden, W. W.	2	Delhart, Tex.	Park, A. W.	6	Honolulu, Hawaii
Dillard, R. L.	4	Oakland, Calif.	Pearce, H. L.	2	Mobile, Ala.
Dubose, R. A.	1	Burlington, Vt.	Reld, T. L.	4	Ontario, Calif.
Errickson, M. W.	4	March AFB, Cal.	Ruesen, J. T.	1	Quonset Point, R. I.
Fairbanks, C. E.	2	Atlanta, Ga.	Scrivner, L. E.	3	Omaha, Nebraska
Gleason, R. L.	4	Phoenix, Ariz.	Smith, P.	3	Minneapolis, Minn.
Harvey, J. T., Jr.	2	Miami, Fla.	Smith, R. E.	2	Orlando, Fla.
Herbick, W. J.	1	Atlantic City, NJ	Traynor, W. P.	4	Fairchild AFB, Wash.
Hippo, K. D.	2	Mobile, Ala.	Webster, D. E.	4	Great Falls, Montana
Karol, G. E.	1	Atlantic City, NJ	Williams, N. H.	2	Jacksonville, Fla.

# RADAR CLASS 149 ARSR-1 CONVENED SEPTEMBER 12 TO SEPTEMBER 30, 1960

Adomatias, W. B.	3	Chicago, Ill.	Montello, B. B.	3	Omaha, Nebraska
Byrd, R. C.	2	San Antonio, Tex.	Parish, T., Jr.	4	Albuquerque, N. M.
Cheek, J. R.	2	Charleston, S.C.	Piper, G. D.	3	Lambert Field, Mo.
Contreras, A.	2	San Antonio, Tex.	Ramsey, G. W.	4	Las Vegas, N. M.
Crabtree, Z. G.	2	Mobile, Ala.	Richard, R. L.	2	Denison, Tex.
Dart, D. R.	4	Mather AFB, Cal.	Scott, J. A., Jr.	4	Mather AFB, Calif.
Davis, H. H., Jr.	2	Mobile, Ala.	Smith, Moreland	4	Klamath Falls, Ore.
Fitzroy, J. R.	1	Jamaica, N. Y.	Spada, C. P.	3	Inkster, Mich.
Gjika, W.	1	E. Boston, Mass.	Stopp, R. E.	4	Oakland, Calif.
Goodson, R. E.	2	Jackson, Miss.	Teuda, R. K.	4	Los Angeles, Calif.
Head, E. C.	2	Texas, Ark.	Walden, A. G.	4	Los Angeles, Calif.
Hoops, L. B.	6	Honolulu, Hawaii	Rice, R. E.	1	
LeBlanc, A. A.	2	New Orleans, La.			

# RADAR CLASS 149 ASR-3 CONVENED SEPTEMBER 12 TO SEPTEMBER 30, 1960

Cortez, J. H.	2	El Paso, Tex.	Lynch, M. W.	4	Los Angeles, Calif.
Duncan, H. L.	2	Atlanta, Ga.	Serpico, R. M.	1	Jamaica, N. Y.
Dunn, J. L., Jr.	2	San Antonio, Tex.	Stevens, F. C., Jr.	5	Fairbanks, Alaska
Hoogerwarf, N. F.	5	Fairbanks, Alaska	Thompson, F. O.	2	Macon, Georgia
Labrie, J. E.	1	Atlantic City, NJ	Witten, J. E.	2	
Laffoon, B. L.	5	Fairbanks, Alaska			

# RADAR CLASS 149 PAR-2 CONVENED SEPTEMBER 12 TO SEPTEMBER 23, 1960

Acuna, R. L.	3	Lincoln, Nebraska	Hohlbauch, R. E.	4	Seattle, Wash.
Aksamit, G. D.	3	Kansas City, Mo.	Kelsey, D. L.	4	Seattle, Wash.
Allin, M. G.	3	Lincoln, Nebraska	Launing, R. E.	3	Lincoln, Neb.
Church, R. W.	3	Indianapolis, Ind.	Osborn, J. T.	2	Dallas, Tex.
Dodson, A. F.	2	Dallas, Tex.	Owens, R. A.	4	San Francisco
Fong, R. W.	4	Oakland, Calif.	Phillips, R. J.	2	Houston, Tex.
Glover, L. M.	3	Kansas City, Mo.	Russell, T. B.	3	Lincoln, Neb.
Grant, D. J.	1	Pittsburgh, Pa.	Schindler, W. A.	1	Cleveland, Ohio
Harford, C. M.	1	Pittsburgh, Pa.	Tierney, J. J., Jr.	1	Newark, N. J.
Harford, R. J.	3	Indianapolis, Ind.	Martindell, J. P.	3	Indianapolis, Ind.
Heinle, P. J.	2	Dallas, Texas			

# RADAR CLASS 149 RBDE-2 CONVENED SEPTEMBER 12 TO SEPTEMBER 30, 1960

Berklund, W. E.	6	Honolulu, Hawaii	Laurentino, V. A.	1	Jamaica, N. Y.
Blythe, R. E.	2	Atlanta, Ga.	Polk, S. A.	1	Washington, DC
Horgan, J. H., Jr.	1	E. Boston, Mass.	Rausch, D. L.	1	Jamaica, N. Y.
Kitson, L. E.	6	Agana, Guam			

# RADAR CLASS 152-A CONVENED SEPTEMBER 19, 1960, TO DECEMBER 2, 1960

NAME	REG	STATION	NAME	REG	STATION
Alexander, T.	4	Hill AFB, Utah	Gallo, F. R.	1	Jamaica, N. Y.
Allen, R. W.	5	Fairbanks, Alaska	Golias, B. G.	1	N. Cumberland
Amos, J. A.	4	Denver, Colo.	Harrod, J. B.	5	Fairbanks, Alaska
Bandopadhyay, B. B.	OIC	New Delhi, India	Henry, H. G.	1	Cleveland, Ohio
Boye, N. A.	3	Chicago, Ill.	Hill, G. R.	2	Miami, Fla.
Brown, P.	2	Houston, Tex.	Hoppe, W. J.	4	El Toro, Calif.
Cartwright, W. D.	4	Santa Anna, Cal.	Ivill, S.	2	Miami, Fla.
Collins, W. R.	2	Valdosta, Ga.	Kalifoot, G. J.	1	Fairborn, Ohio
Daum, R. W.	2	New Orleans, La.	Kroll, G. A.	3	Milwaukee, Wis.
Dean, J. E.	2	Tallahassee, Fla.	Lattantio, M. D.	1	Washington, DC
Fatta, J. A.	OIC	Washington, DC	Major, R. E.	2	Birmingham, Ala.
Finch, W. G.	2	Memphis, Tenn.	McDonald, H. H.	2	Alcoa, Tenn.
Fisher, R. W.	1	Syracuse, N. Y.	Moseley, T. T.	2	New Orleans, La.
Ford, D. P.	2	Waco, Texas			

# RADAR CLASS 152-B CONVENED SEPTEMBER 19, 1960, TO DECEMBER 2, 1960

Nicolaia, M. S.	1	Newark, N. J.	Siteman, J. M.	4	El Torro, Calif.
Okamoto, Soji	OIC	Washington, DC	Sprecher, D. L.	1	Washington, DC
O'Sullivan, E. J.	2	Washington, DC	Strange, S. V.	1	Texas, Ark.
Parker, J. G.	2	Briggs AFB, Tex.	Terry, E. L.	2	Jackson, Miss.
Patrick, H. R.	1		Thomason, G. H.	3	Ft. Wayne, Ind.
Perry, R. W.	4	Dubuois, Idaho	Thornon, J. R.	4	
Piereson, D. R.	2	Denison, Tex.	Tichenor, G. W.	2	
Potenza, J. E.	1	Norfolk, Va.	Tipton, F. W.	2	Abilene, Tex.
Power, J. D.	2	Atlanta, Ga.	Valenzo, R. T.	1	Washington, DC
Powhatan, D. A.	2	Ft. Worth, Tex.	Varano, A. J.	1	Philadelphia, Pa.
Qualls, J. L.	2	Oklahoma City, Okla.	Wilkinson, R. W.	2	Ft. Worth, Tex.
Rushart, C. D.	2	Ft. Worth, Tex.	Wylie, S. R.	3	Inkster, Mich.
Ryan, J. L.	4	Los Angeles, Cal.	Zschiesner, F. R.	5	Anchorage, Alaska
Seddon, E. J.	1	Phillipsburg, Pa.			

# RML REPEATERS CLASS 15 CONVENED SEPTEMBER 12 TO SEPTEMBER 30, 1960

Hill, J. J.	2	Spartanburg, SC	Old, T. J.	2	Texas, Ark.
Land, J. L.	2	Charlotte, NC	Rudisill, L. E., Jr.	2	Savannah, Ga.
Lowmire, R. H.	2	Valdosta, Ga.	Westlund, A. E.	3	Lincoln, Neb.
McClure, H. S.	2	Montgomery, Ala.	Wilson, J. M.	2	Raleigh, N. C.
Morgan, B. L.	3	Inkster, Mich.	Wright, E. L.	4	Denver, Colo.
O'Brien, B. G.	3	Hutchinson, Kan.			

# ELECTRO-MECHANICS CLASS 17 CONVENED JULY 11 TO SEPTEMBER 30, 1960

Anneal, R. H.	3	Dickinson, ND	Lough, W. L.	1	Glen Falls, N. Y.
Apple, J. R.	2	Dallas, Texas	Maier, F. H.	2	Mourne, La.
Armstead, C. A.	3	Freeland, Mich.	Moore, F. G.	5	Cape Yalcataga, Alaska
Bartell, H. R.	3	Minot, N. D.	Seyler, W. C.	1	Pittsburgh, Pa.
Carruthers, P. M.	1	Cleveland, Ohio	Spears, J. M., Jr.	2	Ft. Worth, Texas
Hill, C. R.	3	Quincy, Ill.	Sperling, H. J.	6	Wake Island
Jarvis, J. M., Jr.	2	Mobile, Ala.	Thomas, R. A.	3	Jamestown, N. D.
Jackson, A. D.	3	Peoria, Ill.	Udick, M. E.	3	Rapid City, S. D.

# ELECTRO-MECHANICS CLASS 19 CONVENED SEPTEMBER 6 TO OCTOBER 25, 1960

Bowell, G. D.	1	Erlanger, Ky.	Taylor, W. T.	2	Ft. Worth, Texas
Hansen, A. H.	1	Idelwild, N. Y.	Tessdahl, A. E.	4	Spokane, Wash.
Harry, R. R.	5	Northway, Alaska	Tucker, C.	2	El Paso, Texas
Neuhaus, G. S.	3	Indianapolis, Ind.	Wolford, R. F.	1	Akron, Ohio

# TMC CLASS 5 CONVENED SEPTEMBER 6, 1960, TO SEPTEMBER 30, 1960

Berndt, W. E.	3	Rockford, Ill.	LaRiviere, W. N.	3	Minneapolis, Minn.
Bethel, L. R.	3	Joplin, Mo.	LeBlanc, L. J.	2	San Antonio, Tex.
Borgelt, K. G.	1	Toledo, Ohio	Lehman, R. R.	3	Vichy, Mo.
Bosacletti, P. M.	3	Grand Forks, ND	Leslie, G. W.	2	Ft. Worth, Tex.
Collins, C. W.	3	Imperial, Neb.	Lott, D. L.	2	Midland, Tex.
Cook, F. W.	1	Nantucket, Mass.	Lumblad, B. J.	3	Mason City, Iowa
DeJardins, J. W.	3	Ft. Wayne, Ind.	Myers, K. L.	2	Lubbock, Texas
Gobe, C. A., Jr.	1	Arlington, Va.	Roberts, D. E., Jr.	3	Fargo, N. D.
Guinn, R. W.	3	Terre Haute, Ind.	Rogers, R. C.	2	Lometa, Tex.
Hawkins, W. A.	3	Grand Rapids, Mich.	Shaffer, J. K.	4	Medford, Ore.
Hemath, K. P.	3	Aberdeen, S. D.	Story, G. C.	4	Casper, Wyo.
Hendricks, G. M.	2	Oklahoma City, Okla.	Tomasser, J. J.	4	Pendleton, Ore.
Johnson, V. G.	3	Farmington, Mo.	Voss, R. E.	3	Chadron, Neb.
Jones, J. D.	2	Houston, Texas	Wasmundt, K. F.	4	Eugene, Ore.
Juenemann, R. G.	3	Detroit, Mich.	Wilson, W. A.	2	Birmingham, Ala.
Kolodzie, S.	2	San Antonio, Tex.	Woodruff, C. E.	4	Colorado Springs

# TMC CLASS 6 CONVENED SEPTEMBER 19, 1960, TO OCTOBER 14, 1960

Athey, L. M.	3	Pierre, S. D.	Lett, R. G.	3	Hutchinson, Kan.
Baker, H. M.	3	Salina, Kan.	McMaster, J. E.	3	Hutchinson, Kan.
Bartlett, E. L.	1	Nantucket, Mass.	Mitchell, C. S.	2	Atlanta, Ga.
Boehm, R. W.	1	Hills Grove, R. I.	Moeller, C. S.	2	Charlotte, NC
Britton, A. B.	2	Knoxville, Tenn.	Newell, E. D.	3	Fargo, N. D.
Bruce, J. L.	4	Casper, Wyo.	Nike, C. D.	3	Wichita, Kan.
Brummett, J. W.	2	San Antonio, Tex.	Oniz, C. P.	3	Green Bay, Wis.
Davidson, E. P.	2	Ft. Worth, Tex.	Paulson, W. J.	1	Erie, Pa.
Folsom, R. R.	2	Tallahassee, Fla.	Piereson, R. A.	4	Denver, Colo.
Fulstone, L. S.	2	Jacksonville, Fla.	Quandt, C. F.	3	Rapid City, SD
Gauldin, J. W.	3	Waterloo, Iowa	Raffiti, R. L.	4	Spokane, Wash.
Gavin, L. L.	3	Sioux City, Iowa	Randall, L. D.	3	Burlington, Iowa
Hayden, J. C.	1	Lexington, Ky.	Rudisill, R. H.	2	San Antonio, Tex.
Heathot, J. H.	3	Minneapolis, Minn.	Rylander, D. T.	3	Fargo, N. D.
Jones, J. L.	3	Evansville, Ind.	Seibert, R. T.	2	Ft. Worth, Tex.
Kaufman, G. G.	4	Colorado Springs, Colo.	Sharp, R. G.	2	El Dorado, Ark.
Lake, R. J.	2	W. Palm Beach, Fla.	Smith, C. G.	3	Goodland, Kan.
Learn, J. R.	4	Casper, Wyo.	Stefonak, F. T.	3	Jamestown, ND
LeClaire, G. F.	3	Flint, Mich.	Taylor, R. E.	3	Garden City, Kan.
Liles, C. H.	2	Jackson, Miss.	Warden, R. R.	3	Dodge City, Kan.

COMMUNICATIONS EQUIPMENT CLASS 162 CONVENED SEPT. 6 TO NOV. 25, 1960

NAME	REG	STATION	NAME	REG	STATION
Andersreg, V. E.	3	Springfield, Mo.	Kostopoulos, C.	OIC	Athens, Greece
Baker, K. D.	3	Emporia, Kan.	Lambert, D. G.	2	Ft. Worth, Tex.
Borman, A. S.	3	Indianapolis, Ind.	Levens, B. G.	2	LaGrange, Ga.
Burgos, B.	1	San Juan, P. R.	Malstrom, K. L.	4	Burbank, Calif.
Clofelter, J. H.	1	Washington, D. C.	McLean, B. C.	2	Raleigh, N. C.
Daneau, J. A.	1	Atlantic City, N. J.	Milani, E. P.	4	Hayward, Calif.
Doolittle, R. W.	4	Phoenix, Ariz.	Nisic, S.	OIC	Athens, Greece
Dudics, R. V.	1	Pittsburgh, Pa.	Powell, R. L.	4	Medford, Ore.
Dunham, R. A.	4	Phoenix, Ariz.	Reaves, G. O.	3	Springfield, Mo.
Evanko, D. A.	1	Allentown, Pa.	Ryden, G. J.	2	Wilmington, NC
Fredrickson, R. A.	5	Fairbanks, Alaska	Scott, M. L., Jr.	4	Long Beach, Calif.
Hanson, T. E., Jr.	4	Seligman, Ariz.	Stealer, W. A.	4	Los Angeles, Calif.
Hartless, D. N.	1	Denver, Colo.	Tanous, G. D.	4	Delta, Utah
Hasselwood, J. R.	1	Richmond, Va.	Timmons, J. C.	4	Salt Lake City
Jamison, G. R.	2	Ft. Worth, Tex.	Triplett, A. R., Jr.	4	Sacramento, Cal.
Jurkiewicz, T. J.	1	Cleveland, Ohio	Wilkins, J. W.	2	Robins AFB, Ga.
Keasling, J. W.	3	Indianapolis, Ind.	Williams, D. E.	2	Anniston, Ala.
Kershaw, H. M. II	1	Atlantic City, NJ			

ESTABLISHMENT CLASS 12 CONVENED SEPTEMBER 19 TO OCTOBER 14, 1960

NAME	REG	STATION	NAME	REG	STATION
Bodily, L. D.	4	Los Angeles, Cal.	Lindley, R. A.	3	Kansas City, Mo.
Fortman, C. J., Jr.	3	Kansas City, Mo.	Vonzath, F. M.	3	Kansas City, Mo.
Frederick, H. D.	3	Kansas City, Mo.	Welsh, J. T.	2	Ft. Worth, Tex.
Lajauwie, C. J.	2	Memphis, Tenn.			

MULTI-CHANNEL RECORDERS CLASS 1 CONVENED SEPT. 6 TO SEPT. 16, 1960

NAME	REG	STATION	NAME	REG	STATION
Bosdech, R. J.	3	Offutt AFB, Neb.	Meeks, D. D.	5	Anchorage, Alaska
Brown, H. D.	2	Raleigh, N. C.	Patterson, R. L.	1	Covington, Ky.
Hanks, J. R.	2	Tampa, Fla.	Pleche, G. A.	3	Inkster, Mich.
Hodges, T. B.	2	Miami, Fla.	Santana, A.	2	San Juan, P. R.
Holderbaum, H. G.	6	Honolulu, Hawaii	Savitsky, J.	2	Miami, Fla.
Jones, H. A.	3	Hutchinson, Kan.	Slater, R. H.	1	Washington, DC
Joy, R. T.	1	Jamaica, N. Y.	Stiger, H. L., Jr.	2	Wichita Falls, Tex.
Joyal, M. E.	1	Washington, DC	Taylor, D. E.	2	San Juan, P. R.
Lanford, H. A.	2	Spartanburg, SC	Thraasher, B. A.	2	Terminal, Tex.
Massie, G. R.	2	Columbia, S. C.	Freeman, V. L.	2	Jacksonville, Fla.

COMMUNICATIONS EQUIPMENT CLASS 163 CONVENED SEPT. 19 TO DEC. 9, 1960

NAME	REG	STATION	NAME	REG	STATION
Anwar, M.	OIC	Afghanistan	Jones, J. W.	4	Denver, Colo.
Baburi, H.	OIC	Afghanistan	Jones, M. L.	3	Emporia, Kan.
Baker, D. G.	1	Swanton, Ohio	Kramer, R. R.	1	Norfolk, Va.
Ballance, E. L.	4	Albuquerque, NM	Kohistani, M.	OIC	Afghanistan
Bianchini, A. W.	1	Millville, N. J.	Kuntz, K. W.	3	Lafayette, La.
Bloomfield, M. S.	1	Pittsburgh, Pa.	Linnenkamp, J. J.	4	Denver, Colo.
Costello, R. T.	1	New Cumberland, Pa.	Nieuwswamp, M. R.	4	Campbell, Calif.
Dandridge, L.	4	San Francisco, Cal.	Nikolaus, G. G.	4	Rock Springs, Wyo.
Dowdy, G. G.	2	Ft. Worth, Tex.	Robertson, R. L.	4	Carlsbad, N. Mex.
Elwell, R. C.	3	Wichita Falls, Tex.	Slaughter, J. C.	2	Graham, Tenn.
Farner, G. X.	2	Watertown, S. D.	Todd, W. H., Jr.	2	Baton Rouge, La.
Floyd, M. L.	3	San Antonio, Tex.	Tyler, J. C.	4	Prescott, Ariz.
Friedrichsen, R. P.	4	Columbus, N. M.	Waddons, T. C.	4	Pueblo, Colo.
Gough, L. M.	5	Fairbanks, Alaska	Waggoner, E. M.	3	Webb City, Mo.
Griffin, H. M.	5	Anchorage, Alaska	Way, R. M.	4	Mullan, Idaho
Hann, W. F.	2	Lafayette, La.	Wertman, V. E.	4	Caesar, Wyo.
Hargrove, L. B., Jr.	3	Anthony, Kan.	Wortham, W. G.	2	Will Rogers, Okla.
Henderson, R. J.	1	Warick, R. I.	Yates, J. C.	2	El Paso, Tex.

MULTI-CHANNEL RECORDERS CLASS 2 CONVENED SEPT. 19 TO SEPT. 30, 1960

NAME	REG	STATION	NAME	REG	STATION
Barclay, R. H.	2	Robins AFB, Ga.	Wesley, F. D.	2	Tallahassee, Fla.
Clark, M. E.	3	Indianapolis, Ind.	Wyatt, W. B.	2	Memphis, Tenn.
Coulter, J. D.	2	Little Rock, Ark.	Auger, H. W.	1	Atlantic City, NJ
Crumbley, R. T.	2	Macon, Ga.	Bednarik, G. M.	1	Pittsburgh, Pa.
Ellis, S. L.	2	Birmingham, Ala.	Bennett, W. H.	1	Washington, DC
Fox, W. B.	2	Chattanooga, Tenn.	Heide, W. F.	3	Minneapolis, Minn.
Fultz, R. C.	3	Olathe, Kan.	Marion, A. R.	5	Anchorage, Alaska
Intergerson, J. L.	3	Des Moines, Iowa	McGormack, J. E.	4	Great Falls, Mont.
Kam, G. A. C.	6	Honolulu, Hawaii	Montgomery, M. C.	4	Albuquerque, NM
Kuehn, V. W.	4	San Diego, Calif.	Siriydas, J. A.	1	Boston, Mass.
Lewis, N. A.	3	Cedar Rapids, Iowa	Thomas, G.	1	Philadelphia, Pa.
Mathis, F. W.	3	Peoria, Ill.	Underwood, C.	3	Chicago, Ill.
Myer, R. C.	4	Pendleton, Ore.	Winslett, J. R.	2	Robins AFB, Ga.
Sears, R. L.	3	Terre Haute, Ind.			

COMMUNICATIONS EQUIPMENT SPECIAL CLASS 3 CONVENED SEPT. 19 TO DEC. 9

NAME	REG	STATION	NAME	REG	STATION
Baker, R. W.	4	San Francisco, Cal.	Katenkamp, D. M.	1	Pulaski, Va.
Basler, A. L.	3	Salmon, Idaho	Ketzer, C. P.	1	Vandalia, Ohio
Boguslaw, F. P.	1	Williamsport, Pa.	Knight, D. J., Jr.	4	The Dalles, Ore.
Brown, K. D.	1	Danville, N. Y.	Lehoullier, P.	1	New Castle, Del.
Canale, R. E.	4	Seugman, Ariz.	Marshall, C. G.	1	Lexington, Ky.
Coleman, C.	1	Jamaica, N. Y.	Martin, C. E.	1	Vandalia, Ohio
Easton, M. D.	4	Medford, Ore.	Palombi, A.	1	Pittsburgh, Pa.
Hughes, C. E.	1	Columbus, Ohio	Souder, R. D.	1	Columbus, Ohio

TELETYPEWRITER CLASS 9 CONVENED SEPTEMBER 6 TO SEPTEMBER 30, 1960

NAME	REG	STATION	NAME	REG	STATION
Aalto, J. L.	1	Bradford, Penn.	Jones, J. C.	3	W. Lafayette, Ind.
Allen, F. J.	2	New Orleans, La.	Loomis, J. C.	4	Fallon, Nev.
Allen, A. W., Jr.	3	Garden City, Kan.	McClellan, R. C.	2	Mobile, Ala.
Aurandt, M. B.	1	Altoona, Penn.	Margball, S. W.	5	Anchorage, Alaska
Barnett, J. C.	2	Barksdale AFB	Moore, C. L.	5	Anchorage Island
Beckett, C. W.	3	Champaign, Ill.	Noe, A. E., Jr.	4	Cheyenne, Wyo.
Berkley, W. L.	4	Salt Lake City, Utah	Ohme, D. J.	4	Phoenix, Ariz.
Bosendorfer, R. H.	3	Indianapolis, Ind.	Pea, J., Jr.	4	Long Beach, Cal.
Burch, T. W.	2	Montgomery, Ala.	Record, W. E., Jr.	2	Ft. Worth, Tex.
Calhoun, J. Y.	2	Shreveport, La.	Scarboro, J. P.	2	Nashville, Tenn.
Centeno, M. R.	OIC	Honduras, C. A.	Scott, H.	2	Memphis, Tenn.
Clayton, R. R.	4	Olympia, Wash.	Storch, L. V.	2	Valdosta, Ga.
Cody, L. W.	4	Great Falls, Mont.	Stout, A. L.	3	Indianapolis, Ind.
Deisinger, H. E.	2	Fayetteville, Ark.	Thornton, L. C.	3	Des Moines, Iowa
Durante, A. J.	2	Tulsa, Okla.	Tinsley, W. J.	2	Lake Charles, La.
Furubayashi, P. S.	6	Kahului, Hawaii	Unterkircher, G. R.	1	Boston, Mass.
Grove, W. B.	4	Spokane, Wash.	VanWinegarden, W. J.	4	San Francisco
Hall, L. A.	2	Ft. Worth, Tex.	Wallace, T. B.	2	Columbia, S. C.
Jensen, E. J.	3	Sioux City, Iowa			

VOR CLASS 187-A CONVENED SEPTEMBER 5, 1960, TO SEPTEMBER 30, 1960

NAME	REG	STATION	NAME	REG	STATION
Burrows, R. L.	3	Bismarck, N. D.	Michel, A. J.	2	Ft. Worth, Tex.
Decker, D. L.	3	Huron, S. D.	Owicz, J. C.	3	South Bend, Ind.
Dickie, G. H.	1	Seaside, Calif.	Rosenblum, I. A.	1	Cleveland, Ohio
Gray, R. D., Jr.	1	Worcester, Mass.	Schmidt, E. S.	4	Bakersfield, Cal.
Hancock, J. W.	1	Granite City, Ill.	Treichel, D. C.	5	Aniak, Alaska
Hughes, W. W.	4	Colorado Springs	Tressler, C. J.	4	Colorado Springs
Jatway, M. A.	3	San Antonio, Tex.	Utterback, C. E.	1	Youngstown, O.
Lament, C. F.	1	Elyria, Ohio	Weaver, F. J.	4	Aurora, Colo.
McGinn, A. B.	4	Denver, Colo.			

TELETYPEWRITER CLASS 10 CONVENED SEPTEMBER 19 TO OCTOBER 14, 1960

NAME	REG	STATION	NAME	REG	STATION
Allison, M. E.	2	Childress, Tex.	Gerrita, S. E.	2	Wink, Texas
Bahr, G. L.	4	Roswell, N. M.	Miller, S. E., Jr.	2	Paso Robles, Cal.
Beckman, G. A.	3	Cedar Falls, Iowa	Nathman, C. A.	4	Minneapolis, Minn.
Bell, P. M.	4	Trinidad, Colo.	Nelson, J. L.	3	Covington, Ky.
Blansette, B.	3	Indianapolis, Ind.	Patton, R. L.	1	E. Boston, Mass.
Bowen, L. B.	4	Oakland, Calif.	Pison, C. J.	3	Kansas City, Mo.
Carroll, H. R.	2	Jacksonville, Fla.	Reid, D. M.	3	San Antonio, Tex.
Champlain, R. K.	1	Pittsburgh, Pa.	Samples, B. I.	2	Wilmington, Del.
Collins, D. D.	3	Springfield, Mo.	Schofield, J. P.	1	Tucson, Ariz.
Cowan, J. E.	2	Abilene, Tex.	Shreeve, W. C.	4	Phoenix, Ariz.
Crowson, D. M.	4	Ephrata, Wash.	Spears, L. A.	3	Salina, Kan.
Dasary, B. F.	2	Amarillo, Tex.	Stoberg, J. L.	3	Reno, Nev.
Gibbons, R. L.	3	Evansville, Ind.	Stout, B. R.	3	Allentown, Pa.
Guldry, H. R.	4	Oakland, Calif.	Timmons, L. D.	2	Columbus, Ga.
Hillen, R. E.	2	Jackson, Miss.	Tomchik, T. A.	1	McCombsland, Pa.
Ingram, R. D.	4	Denver, Colo.	Weaver, Louis W.	2	Jacksonville, Fla.
Kelso, J. F.	2	El Paso, Texas	Ward, G. J.	1	Jamaica, N. Y.
Leinaw, R. K.	4	Sacramento, Cal.	Williams, G. L.	2	
Locklair, J. L.	2	Charleston, S. C.	Wora, J.	1	
Massie, G. R.	2	W. Columbia, S. C.			

VOR CLASS 187-B CONVENED SEPTEMBER 5, 1960, TO SEPTEMBER 30, 1960

NAME	REG	STATION	NAME	REG	STATION
Auker, D. A.	1	Phillipsburg, Pa.	Lucernoni, A. J.	1	Kellance, Va.
Bailey, R. G.	1	Vandalia, Ohio	McCarthy, R. M.	4	Phoenix, Ariz.
Carroll, S. P.	4	Crescent City, Cal.	Reinhardt, J. W.	2	Myrtle Beach, SC
Costa, R. J.	1	Hope, Rhode Island	Roper, T. F.	2	Gainesville, Fla.
Duncan, M. W.	2	Ft. Myers, Fla.	Russell, M. L.	3	Philip, S. D.
Juhl, G. G.	4	Paso Robles, Cal.	Tottin, J. M.	1	Harrisburg, Pa.
Kean, T. B.	1	Toledo, Ohio	Walker, A.	2	San Juan, P. R.
Lively, P. W., Jr.	4	Werland, Wyo.	Zacharek, G. J.	4	Tonopah, Nev.

VOR CLASS 188-A CONVENED SEPTEMBER 16, 1960, TO NOVEMBER 11, 1960

NAME	REG	STATION	NAME	REG	STATION
Bradley, R. A.	2	Memphis, Tenn.	Pierre, G. N.	1	Rome, N. Y.
Cordoba, C.	1	Jamaica, N. Y.	Post, J. L.	1	Jamaica, N. Y.
Gray, L. A.	4	Seattle, Wash.	Sinclair, I. Q.	3	Austin, Tex.
Ferraro, R. J.	OIC	Argentina	Smith, P. R., Jr.	3	Houston, Tex.
Johnson, R.	1	Jamaica, N. Y.	Soares, A. C.	OIC	Brasil
Longshore, M. W.	4	Sacramento, Cal.	Spadafino, M.	1	Flushing, N. Y.
Millendon, A. L.	4	Los Angeles, Cal.	Tillery, L. H.	2	Macon, Ga.
Miranda, J. M.	OIC	Brasil	Vassallo, J. F.	OIC	
Noe, R. W.	2	Alcoa, Tenn.	Wessa, E. P.	OIC	
Orme, D. W.	2	Huntsville, Ala.	Welp, E.	OIC	Brasil

NAV-AIDS CLASS 10 CONVENED SEPTEMBER 19 TO NOVEMBER 25, 1960

NAME	REG	STATION	NAME	REG	STATION
Doty, J. J.	3	Kansas City, Mo.	Moines, E. M.	1	New York
Hale, C. M.	OMD	Okla. City, Okla.	Ratliff, E. A.	OMD	Okla. City, Okla.
Harbeson, G. L.	OMD	Okla. City, Okla.	Rogers, D. W.	OMD	Okla. City, Okla.
Jackson, P. A.	OMD	Okla. City, Okla.	Scott, R. C.	OMD	Okla. City, Okla.
Kinstle, A. R.	OMD	Okla. City, Okla.	Stiggar, E. S.	OIC	
Lanette, S.	WO	Washington, D. C.	Young, B. J.	2	Ft. Worth, Tex.

VOR CLASS 188-B CONVENED SEPTEMBER 16, 1960, TO NOVEMBER 11, 1960

NAME	REG	STATION	NAME	REG	STATION
Baldwin, B.	2	Birmingham, Ala.	Kinsey, J. W.	4	Daggett, Calif.
Begovich, N. J.	1	Allentown, Pa.	Matsum, G. Y.	6	Agana, Guam
Brown, D. H.	2	Tallahassee, Fla.	Maynard, G.	1	Jamaica, N. Y.
Cartwright, J. E.	5	Anchorage, Alaska	Murdoch, L. D.	4	Marysville, Cal.
Catania, R.	1	Jamaica, N. Y.	Reed, R. G.	3	Muskogee, Mich.
Cole, H. E.	4	Monticello, Utah	Stewart, H. W.	3	Terre Haute, Ind.
Conklin, M. F.	3	Pierre, S. D.	Talley, W. W.	4	Moriarty, N. M.
Cornthwaite, R. H.	1	Baltimore, Md.	Thompson, A. R.	3	Minot, N. D.
Deuso, R. A.	1	Oldtown, Maine	Thompson, L. L.	1	Pittsburgh, Pa.
Karpins, C. A.	4	Burley, Idaho			



