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Doctor Robert T. Clark Heads Agency's CARI

Dr. Robert T. Clark has been named Deputy Director of the FAA's Aeromedical Research Institute in Oklahoma City.

The Institute, under the direction of the FAA's Office of the Civil Air Surgeon, has been established to carry out research to meet both existing and anticipated aeromedical problems to promote air safety. Dr. Clark will have the overall responsibility for the human factors research conducted there.

Buildings at the former Naval Air Technical Training Center at Norman, Okla., will be used as temporary headquarters for the Institute pending completion of a permanent multi-million dollar Institute at the Aeronautical Center in Oklahoma City.

Plans to locate the Institute at the Aeronautical Center were carried in the January issue of FLY-BY. At the time it appeared, the Institute was called the Civil Aeromedical Center. To avoid confusion of two "Centers" at one location, the name of the Aeromedical Center was changed to Aeromedical Research Institute.

Dr. Clark comes to the Agency from the U.S. Air Force Aerospace Medical Center at Brooks Air Force Base in San Antonio, Texas. He had served there as head of the Department of Physiology and Biophysics and later as Head of the Division of Space Medicine.

A native of Tennessee, Dr. Clark received his B.S. from Harding College, Ark.; his M.S. from the University of Tennessee, and his PhD from the University of Rochester Medical School in Rochester, N.Y. He will reside with his family in the Oklahoma City area.

Research at the FAA's Aeromedical Research Institute in Oklahoma City will stress the development of the advance medical data necessary to meet

General Aviation VFR Flying Survey Shows West Weather Best in U.S.

A survey of general aviation visual flight rules (VFR) flying shows there is more general aviation good weather flight plan flying in the Far West than anywhere else in the United States. The survey is the first ever made by sampling visual flight rules (VFR) flight plans each day over an extended period of time.

General aviation represents all domestic civil flying except that performed by certificated, supplemental and intra-state air carriers. In hours and miles flown, general aviation is always ahead of other categories.

The city with the airport having the highest count of good weather general aviation flight plans is Las Vegas, Nevada. Other top ten airports are lo-

cated in Phoenix and Tucson, Ariz; Wichita, Kan; Orlando, Fla; El Paso, Texas, Farmington, N. M., and Denver, Colorado.

The FAA publication, "Air Traffic Pattern for VFR General Aviation", presents factual information based on 839,720 VFR General Aviation flight plans filed with FAA during the 10-month period ending June 30, 1959. Of these, 41,986 plans were selected for detailed examination. Each 20th flight plan received was set aside by the controller or communicator who received it at one of FAA's 430 Air Traffic Communication Stations or Combined Station Towers throughout the 50 States.

Information was coded, punched into IBM cards and processed to summarize the data included in the publication. Since the publication indicates, that on a national basis, one flight plan is filed for each 6.69 VFR General Aviation itinerant flights made, the survey represents 5,500,000 such itinerant flights made during the 10-month period, plus some 4,300,000 local flights for an estimated grand total of nearly 10 million.

Although the extensive data in the 465-page publication is intended primarily for use of FAA personnel and others interested in general aviation, it does highlight some findings of general interest. Of the 1976 airports listed in the survey, only 175 had five or more VFR flight plans per month. This pattern resembles the one for aviation as a whole.

Nationally, the altitude most favored was 3,000 feet above sea level, the most popular air speed in knots was about 150, and the numbers of flights were almost evenly divided between days of the week. Over half of all flights were of less than two hours duration.



Dr. Robert T. Clark

anticipated operational problems as civil air operations move into higher altitudes and greater speeds.

Flight Information Manual Placed on Public Sale

A new loose-leaf 128-page edition of the FAA Flight Information Manual, the "pilot's encyclopedia," has been placed on public sale.

This manual, which supplements the bi-weekly Airman's Guide, contains information helpful in some degree to every pilot.

The new issue, Volume 13, contains many revisions to the previous edition, plus new chapters on Radar, CONSOLAN, Continental Control Area, Radar Flight Advisory Service for Jet Routes, Positive Controlled Airspace and Preferred Routes.

Chapters extensively revised in the new edition include: Air Navigation Radio Aids, LORAN Data, VOR Receiver Check Points, Air Navigation Lighting Aids, Radar Weather Advisory Service, Weather Bureau/FAA Information Service, Direction Finding Data, Aircraft Emergency Procedures, Good Operating Practices, Search and Rescue, and Air Traffic Control Procedures.

A new feature offered to Manual subscribers is an amendment service. Amendments, issued no oftener than once a month, will be included in the initial subscription price. In most instances, the test of the amending material will appear as a Special Notice in the Airman's Guide. As soon as the monthly amendment is sent to Manual subscribers, the corresponding material will be deleted from the Airman's Guide.

The Manual may be purchased for \$2.50 (\$3.50 foreign) from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. At the end of one year's amendment service, if the Manual is not to be completely reissued, the Superintendent of Documents will notify all subscribers of the price to continue receiving the amendment service for another year.

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Region 4's Virginia Trolinger Becomes 2nd Place Winner In Southern Calif. Contest

Mrs. Virginia Trolinger from Region Four didn't win the title, "Miss Federal Employee". But she did take second place. The contest, sponsored by the National Federation of Federal Employees Council and by the Federal Personnel Council of Los Angeles, was open to all Federal agencies in Southern California.

Judging of the contest was based on each contestants display of extraordinary ability, her concern for fellow employees, and her insight and leadership with her agency.



Mrs. Trolinger is Chief of the Placement Section for Region Four. During her 11 years with the Agency, she has developed a group of projects which helped solve many agency problems. One of these was a new program for the recruitment of electronic maintenance technicians; another was a program of new rates for test pilots. She also assisted in developing a training program for technicians in maintenance engineering. She has received two Outstanding Performance ratings, a cash award for Superior Performance, and many other commendations.

There are some 30,000 women employees in Federal agencies in the Southern California area. When you stop to figure that from this number Mrs. Trolinger was selected as one of the top five finalists, then went on to place second, you get some idea of how proud Region Four is of Mrs. Trolinger. But as someone from the Region said after the awards dinner, "Virginia is still our queen."

Exchange of Personnel Between British and FAA

Three research and development specialists from the FAA have been assigned to the British Ministry of Aviation for two years as part of an exchange program of personnel and information.

Two members of a counterpart British team have already arrived in Washington for a similar tour with FAA.

The FAA team consists of David J. Sheftel, an electronics engineer; Charles E. Dowling, Jr., an air traffic control specialist; and Lt. Commander Homer D. Savage, USN, an operations specialist. The three men, all from the FAA's Bureau of Research and Development, will work with the British on problems of communications, traffic control and navigation--particularly transatlantic air navigation problems.

The two officials of the British Ministry of Aviation who have been assigned to FAA are Wing Commander Henry I. Wood, Royal Air Force (Retired), Deputy Director of air traffic control operations; and W. H. Garnett, an assistant chief telecommunications engineer. Two other Ministry specialists are scheduled to arrive and will be assigned to NAFEC.

FAA is also discussing with French, Japanese and Federal German air officials the possibilities of closer working cooperation with their countries. The purpose of these programs is to exchange information on techniques and systems used by individual countries for the solution of common aviation problems.

Dr. Steinkamp Designated

Dr. George R. Steinkamp has been designated Acting Chief of the FAA's Review and Records Control Branch in the Office of the Civil Air Surgeon.

Dr. Steinkamp will have the overall responsibility for supervising the Agency's airmen medical records, which total about 250,000 a year. Dr. Steinkamp is assigned to the FAA from the United States Air Force where he holds the rank of Lieutenant Colonel. Prior to his present assignment he was stationed at the U.S. Air Force School of Aviation Medicine, Brooks Air Force Base, San Antonio, Texas.

A native of Little Rock, Ark., Dr. Steinkamp received his Medical Degree from the University of Arkansas School of Medicine. His military career began in 1942 when he received his commission in the U.S. Army Air Corps. From 1943 to 1950, he was in private practice in Little Rock. He was recalled to active duty in 1950.

Crash Survivors Are Rescued By Alert Maintenance Crew

The following story, submitted to FLY-BY by Region Four, appeared in that Region's February issue of its newly-named house organ, "OMNIVOICE."

On January 13, a "Learstar" crashed and burned near Minersville, Utah. Four survivors, though burned and injured, walked from the scene along a desolate road when they were spotted by Robert Cook, Clarence Reese and Robert Leibert, maintenance crew of the Cedar City ATFO. En route to service some remote facilities, they had that day elected to go via this infrequently travelled dirt road rather than the highway which they felt would be slick and dangerous due to heavy snowfall.

The crew then called the Cedar City ATCS and reported the crash in detail, giving all needed information for the accident report. This was the first information the ATCS received on the aircraft for which they had been searching for over an hour. Cook, Reese and Leibert then proceeded to service the VORTAC on a business as usual basis.

CAB-FAA To Provide Medical Participation

The Agency is working closely with the Civil Aeronautics Board to provide medical participation in the investigation of fatal accidents.

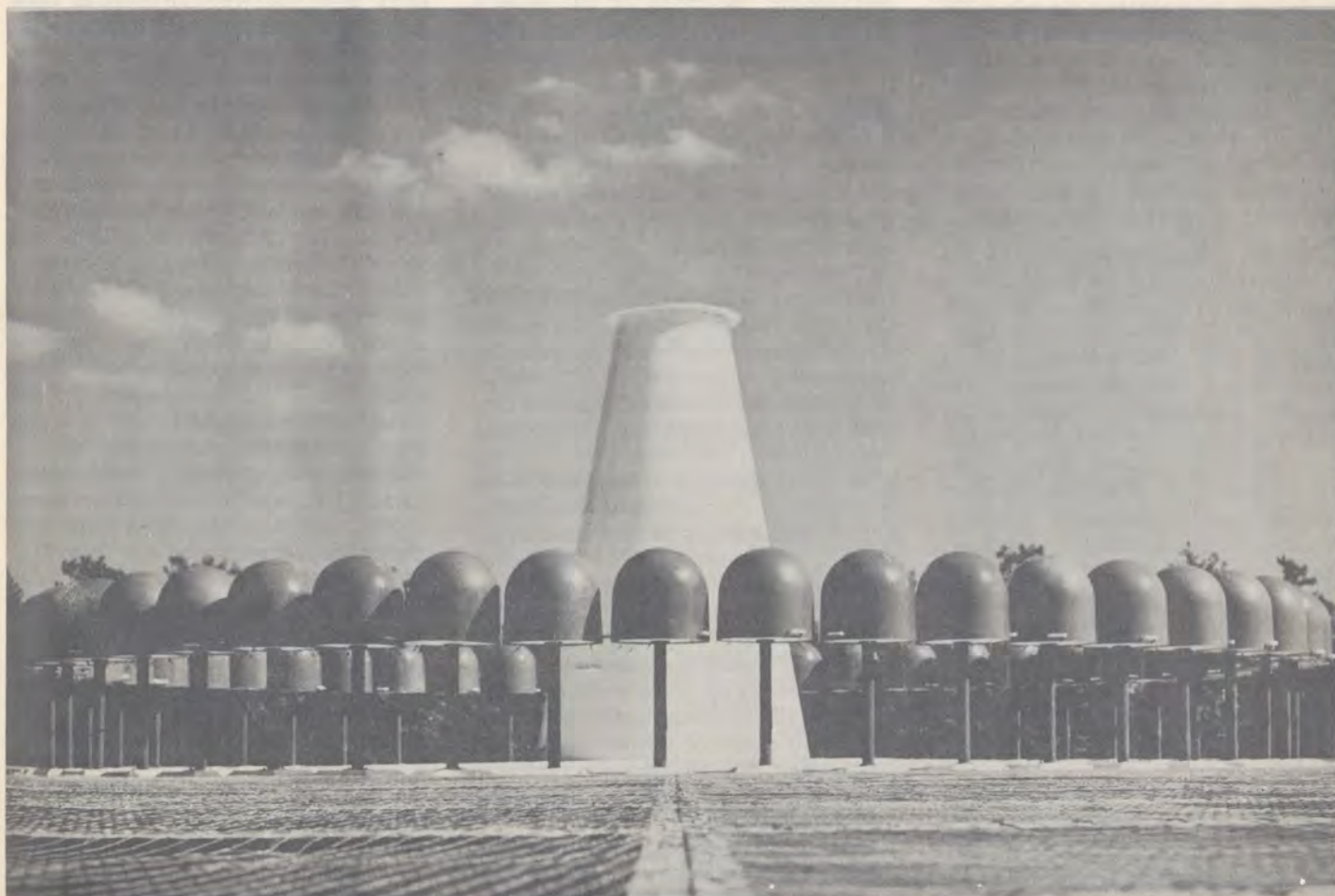
Concerned over the more than 300 casualties in commercial airline operations in 1959, the CAB has taken steps to broaden the scope of their investigations by assigning a "human factors team" to each fatal accident as a routine procedure. The team will carry out investigations to determine whether any physical disability of the human mechanism may have contributed to the accident. By a study of the human aspects, it will attempt to reconstruct the events which led to the mishap. The team has been in operation since last October. It has participated in investigations at the scene of aircraft accidents in Buffalo, Texas; Charlottesville, Va.; Gulfport, Miss.; Chicago, Ill.; Williamsport, Pa.; and Bolivia, N.C.

The FAA's Office of the Civil Air Surgeon and the Armed Forces Institute of Pathology is providing appropriate

personnel to the human factors team to carry out the medical phase of the investigations. In addition, the Office of the Civil Air Surgeon is arranging to secure expert aviation pathology consultant services at strategic locations.

The CAB has the responsibility for determining the probable cause of aircraft accidents. The FAA participates in such investigations to determine if its safety rules and procedures have been followed and whether changes in them are necessary to prevent future accidents. The establishment of a human factors team to participate in accident investigations is in keeping with the Board's team approach to accident investigation.

The medical approach to accidents is carried out in a fashion similar to the study of epidemic diseases in terms of aircraft accidents. These involve study of the operating personnel, the aircraft and the conditions aloft. Similar highly specialized teams carry out research on the power plant, air frame, operations, weather, and other areas.



VOR (very high frequency omnirange) indicates a single-site transmitting facility which radiates a directional signal rotated through 360°.

Cockpit Pictorial Display Tested for Area ATC

A pictorial display device utilizing VOR/DME information is capable of enabling aircraft pilots to fly predetermined courses assigned to them by air traffic controllers. Tests of terminal area air traffic procedures demonstrated its capability. Two display devices utilizing VOR/DME information were used in the six-week test program.

VOR (Very High Frequency Omni-directional Radio Range) gives a pilot continuous bearing to a ground station. It has been the international short-range navigational standard since 1949. DME (Distance Measuring Equipment) gives a pilot his exact distance from a ground station. The combined VOR/DME information accurately defines the position of an aircraft in flight.

The tests also showed that use of a pictorial display device reduced significantly the number and total transmission time of required voice contacts between pilots and traffic controllers.

During the test program a total of 220 actual flights were flown in all-weather conditions, both day and night, and 240 flights were simulated. The first part of the test was devoted to determining the accuracy with which aircraft equipped with the pictorial display could fly designated courses, including approaches, departures, and holding operations.

Simulated flights were used in the second part of the tests to determine whether pictorial display procedures used in conjunction with a surveillance radar, in high density terminal areas and utilizing accelerated approach procedures, would reduce the communications workload for the pilot or controller. Later, actual flights were flown to confirm the results of the simulated flights.

The two visual display devices used in the tests consisted of an FAA Pictorial Display and an Avion Pictorial Navigation Display, both small and light enough to be carried on a pilot's lap.

With the FAA device, bearing and distance information obtained from a VOR/DME ground station are presented to the pilot in the form of a spot of light to indicate position, followed by an arrow of light to indicate the aircraft's ground track. The Avion device also utilizes VOR/DME bearing and distance information to position a rectangle, or "bug," on the display map. The bug moves across the map showing the aircraft's ground track.

Test flights were monitored by radar.

New Trends in Civil Aviation Revealed In FAA Statistical Handbook of Aviation

If you like to delve into figures on civil air operations, then the 1959 edition of the "FAA Statistical Handbook of Aviation" will give you all the answers. The handbook, a standard reference which contains complete figures on civil aviation operations through calendar year 1958, may be purchased for 60 cents from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

The following is just some of the information contained in the handbook.

In spite of a business recession and a series of labor disputes in 1958 which halted or in some cases reversed the upward trend in aviation, the active civil U.S. aircraft fleet at the end of the year numbered 69,718. This was an increase of nearly 4 percent over the 67,153 planes registered the previous year. Of the total, 1879 were air carrier aircraft while the remainder were largely executive and privately owned planes. Multiengine aircraft in general aviation use increased nearly 400 to a total of 5416.

Domestic scheduled U.S. air carrier mail and cargo ton-miles showed substantial increases. Mail ton-miles totaled nearly 106 million, an increase of 7 percent over the 1957 figure. Express and freight ton-miles of 292 million increased about 10 percent over 1957. Revenue miles flown in scheduled service

showed a decrease of less than one percent over the previous year, and revenue passengers enplaned showed a slight drop from 48.5 million in 1957 to 48.1 million in 1958. Coach operations, however, continued to increase. In 1958, passenger-miles flown in coach service totaled more than 10 billion, representing almost 40 percent of all scheduled domestic passenger-miles.

International overseas air carrier traffic increased in all categories. Revenue miles increased 6.3 percent from 156.6 million in 1957 to 166.5 million in 1958. Enplaned passengers numbered 4.6 million, flying nearly 6 billion passenger-miles, an increase of 4 percent in each category.

Manufacturers turned out 6882 civil aircraft in 1958. Although this was 77 more units than were produced in 1957, the dollar value was off 27 percent and airframe weight was off 24 percent. These decreases were due to a drop of 445 in the number of multiengine planes and helicopters produced, while the single-engine category increased by 522 planes. Production of transport type aircraft was down 32 percent in number, dropping from 322 in 1957, to 218 in 1958. A total of 595 transport type aircraft were on order at the end of 1958, a reduction of 106 from the number reported at the beginning of the year. However, included in the orders were 392 turbojets which have approximately twice the annual seat-mile capacity of the largest piston engine transports in service.

Student pilot licenses issued totaled 58,107, the second largest number issued in the past 10 years. Pilot population showed an increase over 1957 to a total of 731,078 certified airplane pilots.

For the first time since 1955, statistics on the number of airmen in each age group are shown. As of January 1, 1959, the largest number of active pilots fell within the 25-29 age group. Four years before, the 30-34 age group had the largest number.

In addition, this year's edition has new tables and graphs on general aviation flying developed from a survey of aircraft use in 1957. New graphs show hours flown in general aviation by type of flying, average annual utilization per aircraft flown, and number of helicopters and hours flown by primary use.

Record Branch

March 14 marked an historical day for the FAA's Aircraft and Airmen Records Branch when they displayed a "Business as usual" sign at their new location in Oklahoma City.

The move from Washington, D.C. to Oklahoma City began March 1. Transfer of the Branch was made because the examination and record functions of that unit can be performed in Oklahoma City with the same efficiency as in Washington but with less cost.

The move was also in keeping with the Administrator's policy to have the Washington headquarters of FAA consist, insofar as possible, of employees concerned with the overall planning, direction and coordination of the affairs of the Agency.

The Examination and Records Division is concerned with preparing and administering all knowledge examinations for the certification of airmen and ground instructors. The Division also registers all civil aircraft and airmen and issues airmen certificates.

Transaction of business with the public is now being conducted by the Aircraft and Airmen Records Branch at its new location in the Home State Life Building, 621 North Robinson Ave., Oklahoma City 2, Okla.



NIGHT SCENE at Renton—Production line of 707s at Boeing Aircraft Company's huge Renton (Washington) Transport Division.

No Clock Governs Work Hours on Prototype Airplanes

Manufacturing Inspectors--Safety at the Source

It used to be that airplanes were built, rolled out, and then approval was obtained before starting production. The procedure now, is to go into a production line, take the first few planes off, flight inspect them, iron out the "bugs", and then go back and incorporate the changes on all the other planes to follow.

To those who are in the business of making and selling aircraft, there are many outstanding factors. Two of these are economics and industry competition.

Bearing the economics and industry competition factors in mind, it is quite easy to see how they dictate early release of production aircraft--particularly with respect to transport type aircraft. It is also quite easy to understand that, from a safety standpoint, all components of an aircraft, all changes and all corrections must be inspected. This is where the FAA's manufacturing inspector and the manufacturer's FAA designee come into the scene.

A typical supervising inspector's office is located in a government-rented building at Boeing Field along Airport Way in Seattle, Washington. Heading this office is the supervising inspector, Vernon L. Gardner. His assistants are Russell L. Van Note, Leroy Gammon and Wing C. Chin. Their particular assignments are centered around Boeing's Plant 1, Plant 2 and its Renton Transport Division.

When you stop to consider the sprawling areas that these plants displace, and couple this with the fact that some 1500 subcontractors throughout the U.S. are manufacturing parts to the 707's design, you get some idea of the inspection job on hand. You would be quite correct in

saying that to do the job and do it right--and with but four men--it would be impossible.

Assistance is provided by Designated Manufacturer Inspection Representatives (DMIRs). These men--eight of

them--are Boeing employees, paid by Boeing and who work 100 per cent for the FAA.

Boeing's planes are built at its Renton Transport Division about 10 miles away as the crow flies from its Plants 1 and 2 at Boeing Field. As they roll off the assembly line they are once again checked before being flown to the 10,000-foot runway at Boeing Field.

Unless there is a special flight test at the main plant, Van Note does most of his work at the Renton Transport Division. His office is set up in the Renton factory for the reason of surveillance of the aircraft in the process of building (fabrication). He makes and maintains files of engineering changes which are broken down to different parts of the various models of the different airplanes.

His job takes him through the Division where he checks on the assembly of the aircraft. Primarily, company inspectors on production aircraft give final inspection on each part and assembly of the airplane. And before each assembly is approved it must be given a final inspection by an FAA designee or an FAA representative. This includes, among others, fuselage sections, inner wings, and control surface assemblies. All jigs and tooling are inspected for evidence of Boeing inspection within the last 60 or 90 days.

Blueprints are reviewed to see that they are not out-of-date. And the Area Record Board (known as the Operation and Inspection Sheet) is checked over to see that the actual job has been done and that it has been initialed off. Sheets on these boards can be from one to two dozen for

DMIRs at Boeing

The DMIRs (Designated Manufacturer Inspection Representatives) at Boeing have the prime responsibility of conformity inspection of production aircraft and issuance of original certificates of airworthiness. They work on a full-time basis for the FAA and have no other duties with the Boeing Aircraft Company.

These men are selected from top inspection management and their names are recommended to the FAA for appointment as manufacturing inspection designees.

The DMIRs report their findings as they occur to the Los Angeles office through the Seattle office. By the same token, if the Los Angeles office has anything to pass on to the DMIRs, it is done through coordinated correspondence through the Seattle office.

These are the DMIRs at Boeing: Robert D. Anacker, Senior Designee; Howard A. Duncan and Gustav T. Gullberg (Renton Factory); Joseph Bennett and Donald Diedrick (Renton Flight Line); Robert Puckett and Clarence Paulson (Seattle Delivery Center) and Walter Hubbard (Seattle Flight Center).



FAA Inspector Van Note pours over engineering changes from Boeing. He will then have to see that approved changes are actually done.



Robert D. Anacker, Senior DMIR, and R. L. Van Note check manufacturing inspection area station to make sure that the actual job has been done and that sheet has been initialed.

small jobs but could go to 100 sheets for just one section of a complete airplane in final assembly.

As each of these sections is cleared by Boeing inspection and confirmed by the designee (or FAA), they are initialed and made a part of the permanent inspection file of each airplane. Manufacturers are required to keep these inspection files on record for at least two years after delivery of the airplane. This is done in case of accident or structural failure on any component of the airplane.

The records are available for complete inspection.

Although there is some type certification work done at Renton, the main function is production work. All engineering changes from Boeing come in to Van Note's office. These could amount to anywhere from 100 to 200 a day. It's up to Van Note to check them and follow up that plane, wing, etc., and check for that particular change and to see that the FAA approved change listed by Boeing is actually done on the airplane.

If you were to walk around the different plants with any of these inspectors you would note that they are strictly business. A hand slides across a section of a wing component to make sure that there are no sharp surfaces which would cut through under stress; a quick glance takes in the initial stamps alongside each rivet or welded area; and there's always the looking, walking and checking.

Mr. Gardner and Mr. Van Note are "old timers" in the aviation game. Gardner's aviation life started in 1917 as an aviation blacksmith while in the Navy making fittings for the aircraft, and as an aviation quartermaster and aviation rigger. Actually, he had three stints in Naval aviation; from 1917 to 1919, from 1925 to 1939 and again 1941 to 1945. He was in the CAA from 1939 to 1941 and rejoined the CAA/FAA from 1945 to the present time.

Van Note's aviation time started in 1920 with four years' military service in the old Aviation Section of the Army Signal Corps. He was a mechanic, crew chief and military observer with the Marine Corps Aviation from 1924 to 1928. From 1928 to 1940 he was with the airlines. Then, in January 1940, he became associated with the CAA and has been with the CAA/FAA since that time.

Leroy Gammon started his career in the aircraft industry in 1936. During World War II he served as an instructor for the Defense Department both here and overseas. After the war he was employed with a U.S. airline in Paris. From 1951 to 1957 he was a representative for the Navy Department's Bureau of Aeronautics involved with jet engine production. Mr. Gammon joined the FAA in 1957 with his first assignment at Seattle.

Mr. Chin is new with the FAA. He has a



Another view of the Renton production line. In the foreground and second row, wings are being joined to the bodies of 707s. Manufacturing inspectors will check the operations.

background of three years of college training in aircraft engineering. He has been employed in private enterprise as a chief inspector with a company which modified aircraft. Besides holding an Aircraft and Engineering ticket, Mr. Chin has been approved as an authorized inspector. He is continuing his college education on a part-time basis.

There are many different reasons why anyone would want to build an airplane. For instance, there is:

- The man who wants to build the plane for his own amazement and is feeling around.
- The man who wants to go into full production simultaneously with development of the type.

This article deals with the latter and concerns such builders as Boeing, Lockheed, Convair, etc. But even before they start, there are many things to be taken into consideration--drawings, building the prototype, production, and trying to get the plane type certificated.

Since there are many certificates that must be issued, perhaps this is as good a time as any to name, clarify, and explain just when they enter the picture. These certificates are continuously being modified to expand the operation and to include FAA certification flight test and function and reliability tests.

Experimental Certificate--Issued by the supervising inspector's office to the aircraft with appropriate limitations to permit the manufacturer to conduct his



Manufacturing Inspector Leroy Gammon points out structural defect on Boeing 707 body structure to Supervising Inspector V. L. Gardner. Defect will be corrected before plane is approved.

own flight test and evaluation. The FAA's Seattle supervising inspector's office establishes limitations under which the plane may be flown as part of the experimental certification.

In other words, if the plane is a new model then it can be flown only a short distance. As it proves itself, the range

is increased until the engineers can say now we have a plane and this is it. FAA inspectors check the plane over and see that it does meet the design.

After a preflight board meeting, the Los Angeles office issues a Type Inspection Authorization. This is only issued by the Division Chief after powerplant, air-

Boeing 707 lands at Flight test Center at Boeing Field in Seattle, Washington, after taking off from short runway at Renton Factory.



frame and engineering are generally satisfied and enough static tests have been conducted to satisfy the Los Angeles office that the aircraft is safe for FAA to start a flight test program.

Various tests and inspections are made. Some of these might seem minor. But it becomes quite important to the FAA inspectors--especially when one of them is riding in the tail section and calls for the plane to climb and, with the nose going up, the FAA inspector in the cockpit notices that the control gauges read that the plane is going down. The inspectors make these flights at any time of the day or night, including Saturdays and Sundays to try to bring out these "minor" defects. One of the FAA inspectors puts it this way, "There is no clock covering the work hours on a prototype airplane."

Provisional Type and Airworthiness Certificate--May be issued for aircraft

that do not fully meet the requirements for Standard Certification to permit the manufacturer to train crews prior to acceptance of their first aircraft. To explain this, maybe there are four planes and one comes the closest to meeting the requirements. Perhaps seats or oxygen masks are missing but it could still be considered good enough to meet the requirements. The Seattle office has the function of determining that none of the non-conformance items will affect the airworthiness of the aircraft for the operation intended.

Type Certificate--A document indicating FAA design approval. This certificate is issued for Boeing by the Los Angeles Division Chief after the FAA's Aircraft Engineering Division has given the nod in the right direction and Flight Test and Manufacturing inspectors involved have made their recommendations. In any

case, the manufacturer must have a Type Certificate on the prototype or prototypes before he can produce duplicate articles.

Production Certificate--Issued to the manufacturer to build as many planes as he pleases as long as the duplicate articles conform with the approved prototype or approved changes to the prototype. But this is done only after manufacturing personnel have conducted a complete inspection of the factory to make sure that the manufacturer's plant has what it takes to produce them. The facilities include the control of materials, tooling, processes, drawings and deviations in drawings. Then the FAA production certification board forms inspection teams to make a complete inspection of the factory and holds a final conference with the factory management personnel before this certificate is issued.

Once the manufacturer has been issued a production certificate authorizing the production of duplicates, the FAA manufacturing inspector maintains continuous surveillance utilizing a system known as the Manufacturing Control Area Surveys (MCAS). Under this operation, the FAA manufacturing inspector goes into any prime manufacturer's plant to monitor the system. Each quarter a map is made by the inspector of the facilities which show the active areas. This is for the records and monitoring only.

There are 24 established areas of work at each facility. Each of these can be subdivided into several areas which would depend upon the size of the plant or the amount of work being done.

For example, take the area called "Receiving". Inspectors watch how personnel handle their job, how they are getting along, if there are enough qualified personnel and if they are actually doing the job according to specifications and approved quality control data. This is done in a great many causes just by talking with the personnel.

When it comes to the overall facility, inspectors check to see if there is adequate space, and that they have the necessary tools and equipment to carry on the business. This includes a check on all tools to make sure that they are calibrated and up-to-date. Technical data too, must be up-to-date for personnel to use which includes blueprints, specifications, etc. Also periodically checked is the function by the facility to maintain records of all inspections accomplished.

Part of the inspector's job is to find out if the facility has a satisfactory source of supply, how much inspection they are doing, and that the system is running smoothly.



R. L. Van Note, with Material Review Board inspector, prepares to enter the bond room to look over rejected and defective parts which will again be checked by Review Board.

A major component of the inspector's position is to see what control the facility has over damaged or rejected parts. For this particular part of the operation, the facility must see that the damaged or rejected part is placed in a "bond" room or isolated crib. This room is locked and an authorized person is responsible to see that none of these parts get into the useable issuance stock. In fact, it takes a three-man board to decide whether these parts are going to be reworked, are useable as is, or will be scrapped.

If an unsatisfactory item is found during the MCA survey, an MCA unsatisfactory report is indicated by the inspector, discussed with the appropriate supervisor of the facility, and corrective action is taken. This usually happens on the spot.

There are 12 facilities and close to 200 areas to be covered under the MCA program which range anywhere from one mile to 1500 miles from the Seattle office. Designees cannot help on this program. This means that each area utilizes anywhere from an hour to several days of an FAA inspector's time.

Inspectors from the Seattle office (like inspectors at other district offices throughout other Regions) also check articles manufactured under a parts manufacturing approval. These manufacturers are scattered throughout the District office area. These parts, too, must be inspected before they are used on a Type Certificated aircraft.

Any parts manufactured prior to issuing a Parts Manufacturing Approval must be inspected and have a tag made out which shows compliance of the part design approval. This tag, which is sealed to the part, allows the user to install this part or put it into use. Once the parts manufacturer is approved he is authorized to



Flight line at Renton. Planes are being prepared for flight to Delivery Center at Seattle.

use the symbol "FAA-PMA" on parts to indicate approval in lieu of the FAA tag.

Certain parts which cannot be completely inspected at the engine or airframe manufacturer's plants are purchased from subsidiary manufacturers. Boeing either maintains personnel in the subcontractor's factory or has periodic checks made, according to the magnitude of the operation. FAA inspectors review Boeing's outside quality list to determine at which factories it is necessary for the FAA to maintain direct surveillance in the same manner as described above.

When these parts are ready for use, the larger ones come in to Renton and the smaller ones to Plant 2. Again they are inspected, either on a sampling basis or, if considered necessary, 100 per cent. This inspection can include X-Ray,

Zyglo, magnetic particle inspection, ultrasonic, etc., depending on the classification as to the effect on airworthiness.

Many parts are manufactured for Boeing by subcontractors whose factories are located in other FAA Regions. Suppose that one of these factories were located in Cleveland. In this case, FAA supervising inspectors working out of the district office in Region 1 would do the inspecting and make periodic reports on what activity has taken place. Again, there would be a possibility that the parts would be spot checked on arrival at Renton or Plant 2.

Components for which it is necessary to maintain surveillance over production of parts produced in a foreign country (such as Rolls-Royce, Ltd., Derby, England) requires coordination through the FAA's



With briefcase in hand, Leroy Gammon bids Wing Chin adieu as he prepares for departure to participate in certification flight tests.



Manufacturing inspectors Leroy Gammon and Wing Chin inspect a flap carriage stop on a 707 during a regular tour of inspection.

FS-100 office in Washington and the foreign government involved.

Standard Airworthiness Certificate-- This is issued only when the aircraft fully conforms with its approved type design and is safe for operation. Before this happens, any unsatisfactory items are brought to the manufacturer's attention for correction. In some instances, this may bring about a modification to the aircraft. Here are a couple of typical examples.

Discussion: It was revealed that a subcontractor's brake return springscrews did not have satisfactory locking devices. When these screws became loose they could possibly cause the brakes to drag. This was considered to be a safety item and, therefore, corrective action was requested.

Conclusion: The brake return spring attachment would be revised to incorporate suitable locking means. This condition would have to be remedied prior to Airworthiness Certification.

Action: This condition was remedied by the complete redesign of the brake anchor system.

When it came to the use of aluminum alloy bolts, the following took place.

Discussion: FAA questioned the use of aluminum alloy bolts in the landing gear emergency control system and in certain control system "fairlead" pulleys. The

Silence is Golden

Because the runway at Renton is short--5400 feet--the 707s that have rolled off the assembly line take off on a 10-mile flight to the 10,000-foot runway at Boeing Field with a light load to the north over the lake except when winds exceed 15 miles per hour.

If a plane takes off to the south, it would mean flying over the nearby hospital. The usual practice in this case is for a Boeing representative to call the hospital to notify them that they would like to have a plane take off at a certain time. This allows the hospital to check in case they have a major operation scheduled at the same time.

If a major operation is scheduled, the flight is either set ahead or delayed.

manufacturer advised that such useage was more or less a standard procedure for weight saving and that there were numerous other places throughout the structure where aluminum alloy bolts were employed. FAA observed that the bolts of this type, in the landing gear emergency control system, had been replaced with steel bolts on the three flight test airplanes presumably from a safety or reliability standpoint, and that one of the chief concerns was the possibility of intermixing in service and the inadvertent installation of aluminum

alloy bolts where steel bolts were definitely identified under the applicable AN Bolt standard.

Conclusion: The manufacturer agreed to review this situation and reach a decision regarding whether or not to replace aluminum bolts with steel bolts. In the event they wished to continue using aluminum bolts they agreed to forward their comments as to the maintenance procedures which should be adopted. Final FAA action would be held in abeyance pending the manufacturer's decision. Although this item need not delay FAA flight tests it would have to be satisfactorily resolved before certification.

Action: The manufacturer saw fit to replace all the aluminum bolts with steel.

Aircraft destined for foreign delivery are issued Certificates of Airworthiness for Export in lieu of a standard Airworthiness Certificate. When this certificate is issued and the airplane is delivered via flyaway, a ferry permit is also issued by the supervising inspector's office to authorize the export delivery flight.

When all inspections have been completed, then--and only then--is the aircraft considered safe to carry passengers or cargo under the CARs set down by the FAA.

This, then, a never-ending circle of inspections for aviation safety, is the job of the FAA's manufacturing inspector.



R. L. Van Note and DMIR Robert Anacker check over inspection records at the Renton Factory. These records are kept on file for at least two years after delivery of the airplane.



R. L. Van Note inspects for reported difficulty with cracked stringer during production of 707.

Colonel Menter Named To General Counsel's Office

Colonel Martin Menter, USAF, has been named Chief Attorney, General Law, in the FAA's Office of the General Counsel.

A career officer of the United States Air Force, Colonel Menter was a student at the Industrial College of the Armed Forces at Fort McNair, prior to his present assignment to FAA.

A native of Syracuse, New York, he received both his Bachelor's Degree and his Law Degree from Syracuse University, and a Master in Law Degree at George Washington University in the District of Columbia.

Before entering military service in August 1940, Colonel Menter was engaged in private law practice. He received his regular commission in the armed forces in July 1946 and promotion to his present rank in November 1948. During World War II, Colonel Menter served in the Far East as Staff Judge Advocate of the Twentieth Air Force. Other military assignments included a tour as Chief of the Legislative Division in the Office of the Judge Advocate General, USAF and as Staff Judge Advocate, Far East Air Forces.

Colonel Menter is a Judge Advocate of the USAF, and a member of the Bar of the State of New York, of the Supreme Court of the United States and of the Supreme Court of Japan.

Traffic at Washington

Passenger and aircraft traffic at Washington National Airport reached an all-time high during 1959, when 5,050,690 passengers passed through the airport terminal and 313,418 aircraft operations were handled by the Washington control tower.

The aircraft operations handled by the Washington tower during the year averaged out to an aircraft operation every 100 seconds, day and night throughout the 365 days. The busiest day of the year and the highest in the history of the airport was on June 10, 1959 when the tower handled 1205 operations, or an average of one every 72 seconds.

In terms of airline operations, Washington National was second high in the nation, and thus the world, during 1959, with a total of 249,414 airline take-offs and landings. Only Chicago Midway Airport with 345,170 operations had more air carrier movements than Washington National during the year.

L.A. Airport Gets Noise Rule

The first in a series of regulations to attack the problem of noise at major airports will become effective April 4, 1960. The new regulation, Special Civil Air Regulation No. 438, sets up special aircraft rules for both civil and military aircraft operating in and out of the Los Angeles International Airport. It is designed to maintain the safety of all aircraft operations in the vicinity of the airport and lessen the noise arising out of increased air traffic activity and jet aircraft operations.

This regulation will be followed by similar regulations for New York and Washington in the near future.

In formulating the rule, the FAA's primary consideration was the safety of aircraft and the flying public as well as the safety of persons and property on the ground.

Administrator Quesada emphasized that the new regulation will not be a complete solution to the aircraft noise problem. He pointed out that while special procedures and approach and departure patterns offer the most effective means at the present time for combatting the noise problem, they are only one facet in what must be a unified effort by all concerned. Government and aircraft manufacturers are engaged in research and development projects to develop more effective noise suppression devices and improve aircraft design and flight operational techniques.

Mr. Quesada stated, however, that local communities also have a responsibility to help alleviate noise problems by passing more adequate local zoning laws with respect to runway proximity to communities and in airport master planning to provide for buffer zones to cushion aircraft noise.

The new regulation establishes a Los Angeles International Airport Traffic Pattern Area which extends upwards to 2000 feet and covers a radius of five miles from the geographical center of the airport. En route aircraft are prohibited from entering this area.

Two-way radio communications must be established with the control tower at Los Angeles before landing and departing except in cases where authority is obtained in advance by pilots of aircraft not equipped with functioning two-way radio.

All large airplanes (12,500 pounds or more) must enter the traffic pattern area at not less than 1500 feet and maintain

not less than 1500 feet as long as practicable before landing at Los Angeles. The new rule segregates the flow of air traffic by requiring that small airplanes, which are less noisy, enter the area at an altitude between 1200 and 1000 feet to avoid other traffic and maintain an altitude between 800 and 1000 feet for as long as practicable before landing at Los Angeles.

All departing airplanes must climb to an altitude of at least 1500 feet as rapidly as practicable, and aircraft taking off to the west (over open water) must not recross the shore line at less than 1500 feet.

Generally speaking, the regulation requires that take-offs be made to the west. If a pilot, for reasons of safety, elects to use another direction for landing or take-off, a written report of his reasons for doing so must be forwarded to the FAA Regional Office in Los Angeles within 48 hours.

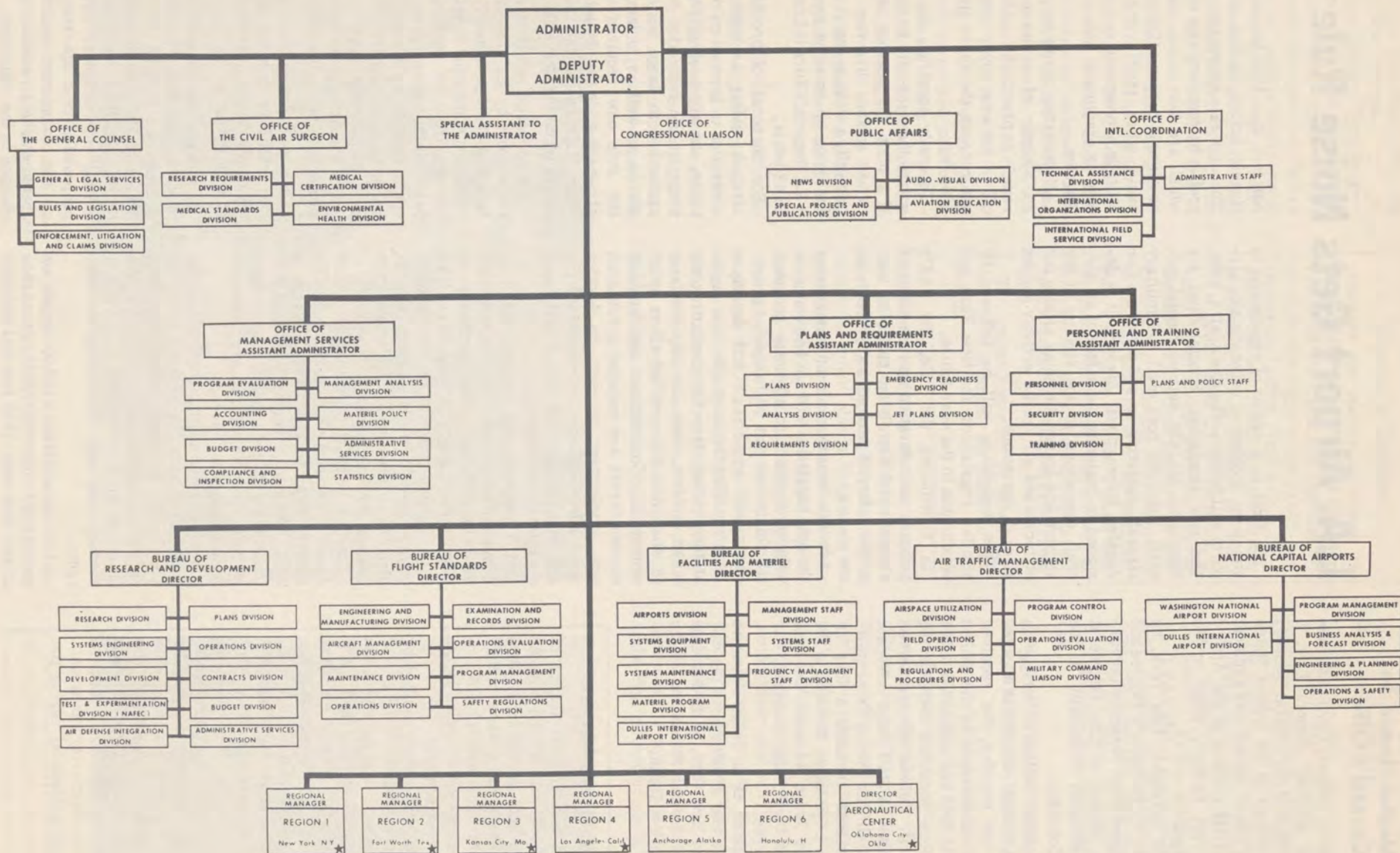
For purposes of providing increased aircraft safety as well as increased protection to persons on the ground from noise, the approach glide path requirement in the regulation has been made applicable to large piston engine airplanes as well as to jets. Accordingly, the rule now requires descent at or above the glide path by all large aircraft when ILS (Instrument Landing System) instrumentation is available.

The proposed restriction on the use of the airport by jet aircraft between the hours of 10:00 p.m. and 7:00 a.m. under certain surface wind conditions has been omitted from the regulation. This was based on the theory that such restrictions could lead to an adverse effect on air commerce. Such restrictions, considered with comparable restrictions at other major airports, could lead to scheduling problems impossible of solution.

The new regulation also provides special traffic procedures for operation at the nearby Hughes, Hawthorne, and Santa Monica Airports.

In formulating the new rule, the FAA took into account the numerous public comments submitted in response to a Notice of Proposed Rule-Making issued October 28, 1959. These comments concerned the technical aspects of the proposed aircraft operating rules as well as the community problem of noise abatement, and resulted in some of the changes in the regulation.

FEDERAL AVIATION AGENCY



★ Major program activities in Regions 1-4 and at the Aeronautical Center are under the direct supervision of their respective Washington Bureaus or Offices.

JANUARY 24, 1960