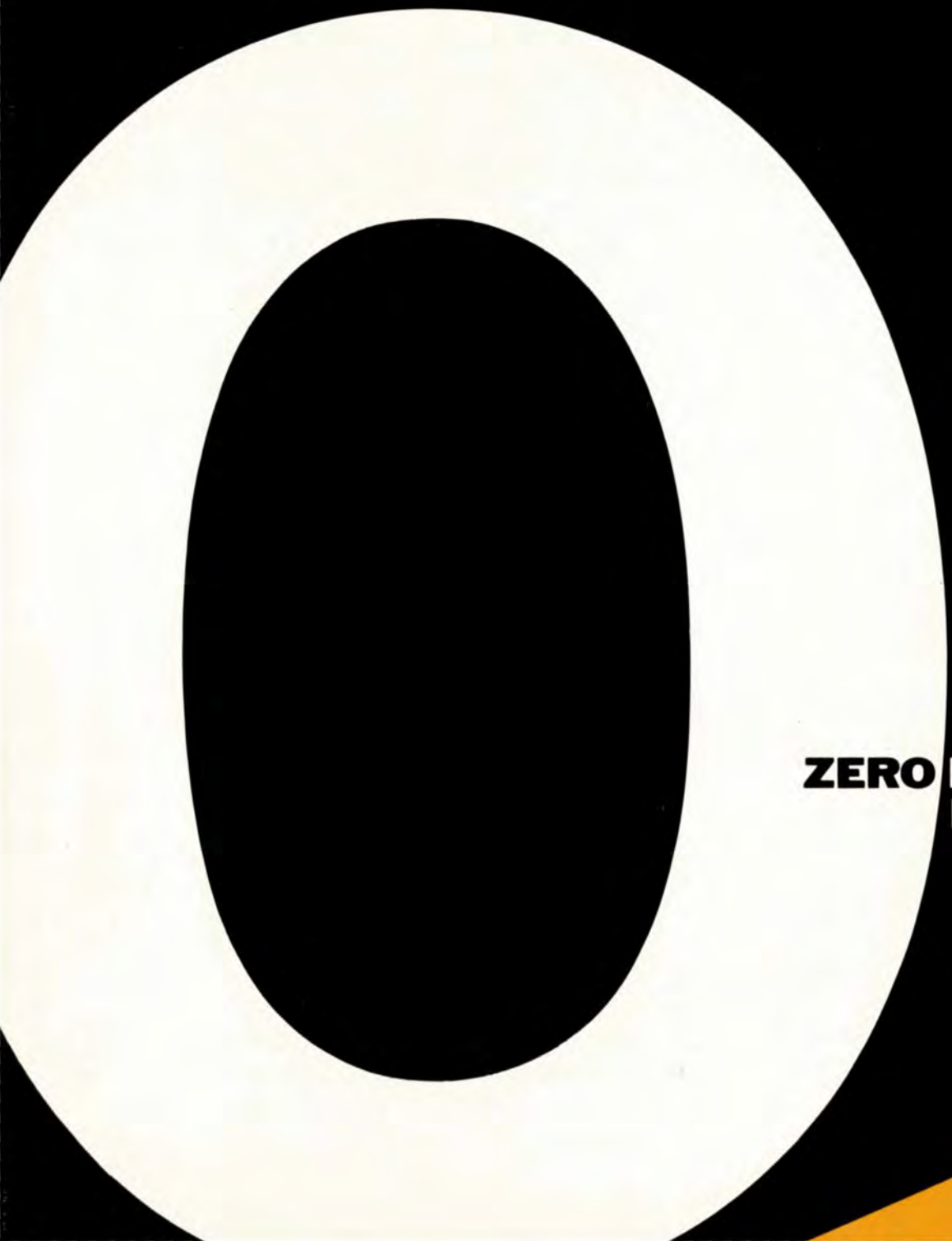
FM WORLD

January 1978



ZERO BASE BUDGETING

SPECIAL
WRIGHT BROTHERS PORTFOLIO
in center of magazine

FAA WORLD

JANUARY 1978
Volume 8 Number 1

Secretary of Transportation, Brock Adams
Administrator, FAA
Langhorne M. Bond
Assistant Administrator—Public Affairs,
Peter Clapper
Chief—Public & Employee Communications Div.,
John G. Leyden
Editor, Leonard Samuels
Art Director, Eleanor M. Maginnis

FAA WORLD is published monthly for the employees of the Department of Transportation/Federal Aviation Administration and is the official FAA employee publication. It is prepared by the Public & Employee Communications Division, Office of Public Affairs, FAA, 800 Independence Ave. SW, Washington, D.C. 20591. Articles and photos for FAA WORLD should be submitted directly to regional FAA public affairs officers: Mark Weaver—Aeronautical Center; Clifford Cernick—Alaskan Region; Joseph Frets—Central Region; Robert Fulton—Eastern Region; Neal Callahan—Great Lakes Region; Michael Benson—NAFEC; Mike Ciccarelli—New England Region; David Myers—Northwest Region; George Miyachi—Pacific-Asia Region; David Olds—Rocky Mountain Region; Jack Barker—Southern Region; K. K. Jones—Southwest Region; Eugene Kropf—Western Region

EDITORIAL

FAA CARRIES FORWARD THE WRIGHT LEGACY

Seventy-five years ago — in 1903 — the age of powered flight began. Two determined brothers made four short hops on a windy December day, and the world has not been the same since. Airborne on their longest flight for less than a minute, the Wright Brothers proved theories that ultimately led to the continent-spanning air commerce that we enjoy today.

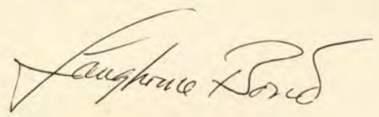
From that day at Kitty Hawk, N.C., to this, the story of aviation has been a story of rapid and continuous gains in speeds attained, distances covered and loads carried. Aviation has linked nations and people as no other form of transportation has been able to do. In 75 years, the airplane has become an essential ingredient of our national and international life.

The Federal Aviation Administration and its predecessor agencies since 1926 have played a vital role in the maturation of air travel. FAA employees, who bear a heavy responsibility to see that the progress of safe flight continues, have been instrumental in compiling today's aviation record, which, in 1977, included:

- IFR aircraft handled ..... 24 million
- Aircraft operations logged by towers ..... 64 million
- Passengers carried by scheduled airlines ..... 205 million
- Certificated pilots 742,000
- Air carrier fleet 2,500
- General aviation fleet 168,000

The eight busiest airports in the world are in the United States. Of the 25 busiest, 16 are in this country.

The activities that resulted in these remarkable figures are in the hands of FAA employees, who in a real sense are continuing what the Wright Brothers started. Without your efforts, this progress would not have occurred. With your continued dedication, aviation will contribute even more to our society.



LANGHORNE M. BOND
Administrator

FAA WORLD launches the Wright Brothers' diamond jubilee year with a 12-page portfolio in the center of this issue, which you may wish to save.

STARTING FROM SCRATCH

When Jimmy Carter crisscrossed the country in 1976 promising to introduce zero-base budgeting at the Federal level if he became President, he caused a lot of quizzical looks and head scratching. And perhaps some yawns.

At the time, zero-base budgeting wasn't exactly a household word, and audiences must have wondered where he had come up with that idea. Besides, it's not the kind of topic you expect to hear introduced during a Presidential campaign customarily filled with lofty cliches and familiar rhetoric.

Yet, while ZBB may never rival "a chicken in every pot" or "a car in every garage" as one of the all-time great campaign promises, unlike most of its more memorable counterparts, it has survived the campaign.

If there is any doubt about that, just ask Federal budget officers who have had to grapple with ZBB since President Carter directed agencies last Valentine's Day to prepare the Fiscal Year 1979 budget using the zero-based process.

Dan Aragona of FAA's Office of Budget in Washington headquarters is one of those who was involved in the agency's first go-around with ZBB. He admits that it was "trial and error" and that he and his colleagues had to burn a lot of midnight oil putting it together on time.

The biggest problem initially, said Aragona, was trying to figure out from the instructions handed down by the Office of Management and Budget just what the President wanted.

A Federal budget and program officer for 22 years with the Air Force and the FAA, where he has been for the past 10 years, Aragona long ago had mastered traditional budget concepts and language. But terms like "decision unit" and "decision package" were part of a new budget lingo he had to learn.

Yet, despite the fact that ZBB is a fairly new budgetary process with a brand new vocabulary, the basic idea behind it is not all that novel. Housewives, for example, have been using it for years. Faced with rising prices and growing families, they just naturally scrutinize everything in their budgets and cut out items their families don't strictly need. But, they wouldn't be heard calling it anything fancy like zero-base budgeting; they just call it common sense.

And that's how Robert C. Pearson of Texas Instruments, Inc., prefers to think of ZBB. In a *Wall Street Journal* article earlier this year, he described it exactly that way: " . . . very simple, nothing more than common sense."

Zero-base budgeting was first introduced at Texas Instruments in 1962 by Peter A. Pyhrr, who has written a book on the subject and who was later consulted by OMB when the Carter Administration was preparing to

By Gerald E. Lavey

introduce ZBB in the Federal government.

Some major companies like Westinghouse, General Electric, Xerox and Allied Van Lines also use ZBB, but the idea didn't attract widespread attention until Governor Carter tried it in Georgia and then began touting its benefits as a Presidential candidate.

Reduced to its essentials, zero-base budgeting is rather simple. It requires managers to justify their programs annually from the bottom up, whereas using the traditional budget process they only had to justify any requested increases in programs. Nothing is sacrosanct under ZBB; every program has to start from scratch.

Aragona explains that one of the first tasks in the ZBB process is the identification of "decision units" — i.e., deciding how to divide the organization so that top management within FAA, DOT and later OMB and the White House and Congress can examine the agency piece by piece and see exactly how and on what programs the FAA's money is being spent.

Aragona said that FAA conceivably could have been splintered into 400-500 decision units, but that would have bogged down management, particularly further up the ladder, in too much detail. On the other hand, if the agency's largest organizational components — such as Air Traffic, Airway Facilities and Flight Standards Services — had been picked as decision units, decision makers would have been given too much of the big picture and not enough detail.

So, as a happy medium, the Office of the Secretary in DOT, which is responsible for preparing the budget for the entire Department of Transportation, settled on twenty-six decision units for FAA.

The next step was for budget personnel in the FAA headquarters offices and services to start developing decision packages for the various decision units. A decision package consists essentially of a brief written description and justification that gives top management a quick briefing on a program and provides them with a basis for making a budgetary decision.

Ted Brient, chief of the Planning and Program Branch in the Flight Standards Service, and his staff, for example, had the responsibility for drafting packages for the four decision units — or basic program areas — within Flight Standards: 1) regulatory operations; 2) aircraft operations; 3) facilities and equipment; and 4) facilities, engineering and development. Somehow, every program or activity within Flight Standards falls into one of those four categories.

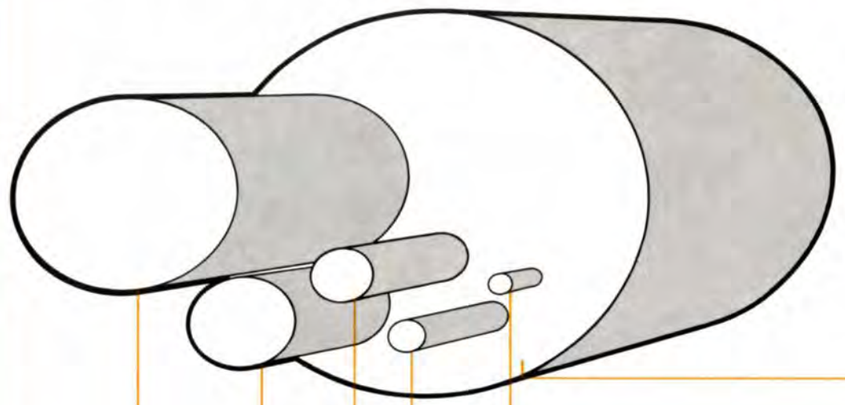
If they had been required to prepare only one decision package for each unit, that wouldn't have been so bad, said Brient. But, he explained, they had to do four packages for each one, and that took some doing, he added, particularly with the tight time schedule they were working under. First, there was a two-page overview, which included a description of the program, long-range goals, major objectives, alternative ways to accomplish the major objectives and accomplishments to date.

That part was easy and not unlike what they had to do with the traditional budget, said Brient. The tough part came when they had to take each decision unit and prepare four separate decision packages, not to exceed one-page each, predicated on four different levels of funding: 1) minimum level, or 80 percent of the current FY 1978 level; 2) intermediate level, or 90 percent of the current level; 3) current level; and 4) improved level, or any increases over

continued on page 6

Ted Brient (standing), chief of the Flight Standards Planning and Program Branch, shows a humorous flip-chart comment as he reviews the Fiscal 1979 budget proposal with (left to right) budget analyst Carol Leonhard, budget officer Joe Flaim and Gene Imes, project manager of the Aircraft Programs Division.

Where the Money Goes



Maybe those people who talk about the "good old days" have a point. In many ways, life certainly was a lot less complicated then, and things didn't cost so much. Take Fiscal Year 1927, for example, the first full year the Federal government was officially involved in civil aviation. In preparing the budget for that year, the Department of Commerce figured its Aeronautics Branch would need about $550,000 for airway development and other services, including regulation. Then, Charles Lindbergh took off for Paris and things were never the same again.

The FAA's new budget/ contract authority for the current fiscal year (1978), on the other hand, comes to almost $2.7 billion — 4,909 times more than the poor Aeronautics Branch had to work with in 1927 and about the size of the entire Federal budget for that year.

Funds for today's FAA programs come from two sources — the general fund of the Treasury and the Airport and Airway Trust Fund.

The general fund is exactly that: It's where most of the monies collected by the Treasury — such as corporate and personal income taxes — are deposited, and it's the source of most Federal agency programs.

The Airport and Airway Trust Fund, on the other hand, was established in 1970 for the specific purpose of assuring a continual funding reservoir for airport and airway development, and the money from that fund can be used only for those purposes. Tax revenues for this fund are derived from six sources: 1) domestic passenger ticket tax, 2) waybill tax, 3) general aviation fuel tax, 4) passenger ticket tax for international flights departing the U.S., 5) aircraft user tax and 6) aircraft tire and tube tax.

The funds appropriated by Congress to FAA are spent in six basic program areas:

GENERAL FUND

Operations — For the most part, this category includes salaries for the more than 55,000 agency personnel. Some money is transferred from the Airport and Airway Trust Fund to the general fund to finance a portion of airway maintenance costs.

Operation, Maintenance and Construction at Washington Metropolitan Airports (Washington National and Dulles)

Facilities, Engineering and Development — On-going programs in such areas as aircraft safety, environmental protection and aviation medicine.

AIRPORT AND AIRWAY TRUST FUND

Grants-In-Aid for Airports — Grants to public and private agencies for airport planning, development, construction and improvements.

Facilities and Equipment — Airport and enroute traffic control facilities, flight service stations, various navigational aids, instrument landing systems and visual landing aids.

Research, Engineering and Development — Improved enroute and terminal air traffic control systems, aircraft separation assurance, microwave landing system, and other such programs.

continued from page 4

current level.

The idea was to show what can be accomplished with those different amounts of money.

Brient said initially they had a hard time making convincing cases for the 80 and 90 percent levels, since they feel that Flight Standards is operating under a bare-bones budget as it is. As a result, he said, the early drafts were pretty negative — "We kept saying what we couldn't do. We soon discovered that OMB wanted to know what we could do." So, when the packages kept getting kicked back for rewrite, he said with a grin, he and his staff soon began developing a knack for drafting more positive packages.

Sometimes, despite their best efforts, they couldn't make a credible justification. He cited the example of one decision package — which Gene Imes of Flight Standards aircraft programs had to field — where the amount of money available at the 80 percent level would allow them to buy only part of an aircraft. Unfortunately, unlike with the proverbial half loaf of bread, they decided they just couldn't settle for half an aircraft.

The third and final step in the ZBB process — at least as far as the agency is concerned — is the ranking of decision packages. FAA put in priority order the decision packages from all its offices and services and sent them to the Office of the Secretary where a consolidated package for DOT was prepared and submitted to OMB and the White House. There, the decision packages of all Federal departments and agencies were reviewed and worked over until the entire Federal budget was approved by the President, carried up to Capitol Hill and dropped on the doorstep of Congress.

If the FAA's proposed budget is any indication of the size of the entire Federal budget, Congress should be concerned about its doorstep, because the FAA's budget alone is 472 pages long and four inches thick and weighs about four to five pounds.

That's one of the drawbacks to zero-base budgeting, according to both Aragona and Brient: It involves a lot more paperwork because of the additional justification. But, they both agree that the benefits of ZBB far outweigh the disadvantages.

Aragona says that ZBB "lays out the budget in a much more thorough and systematic fashion," and it should, therefore, be more helpful to those who have to make major budget decisions.

Brient thinks one of the major benefits of ZBB is that "it forced us to focus our thinking on what really is important and helped us shape our priorities for our own use within Flight Standards."

He also sees some additional positive fallout from ZBB.

"It's a vehicle to tell our side of the story to higher-ups. The number of personnel in the Flight Standards Service, for example, has declined by 258 positions over the past nine years, despite the fact that our workload has increased about fifty percent during that period," Brient said, "So, through ZBB, we have a good chance to explain that sort of thing to managers up the line so they can take that into account when making their decisions."

Since this is the first year for zero-base budgeting, the jury is still out on ZBB, but it's an idea whose time has come.

Until the Budget and Accounting Act was signed into law in 1921, there was no such thing as a coordinated executive budget submitted to Congress. Earlier, Alexander Hamilton and Thomas Jefferson, among others, had favored the idea, but Congress for a variety of reasons preferred to deal with the Executive Branch on a piecemeal basis.

For the most part, that arrangement worked fairly well for most of our history, when government budgets were measured in thousands and millions rather than billions of dollars, and there were only a handful of Federal agencies.

But, today when the careful allocation of its limited resources is one of the Federal government's biggest challenges, it appears that if a technique like ZBB hadn't already existed, somebody would have had to invent it.

Straining under the weight of FAA's zero-based budget proposal for FY 1979 is Dan Aragona, budget and programs officer in the Office of Budget, who helped put it together.

DIAMOND JUBILEE OF POWERED FLIGHT

It's Oct. 31, 1902, and a new era is about to begin. Wilbur and Orville Wright have just returned to Dayton, Ohio, from their third trip to Kitty Hawk for gliding experiments and have resolved to try their hands at powered flight.

The brothers intend to design and build a new aircraft to which they will add a small gasoline engine and two pusher-type screw propellers. Their objective is now to make a powered, sustained and controlled flight in this heavier-than-air machine and to land on ground as high as that from which they took off.

Their criteria meant that the airplane had to take off under its own power without an assist from gravity, had to sustain itself in the air with its own propulsive force and had to respond to the control of the pilot.

Some people believe that the Wrights were little more than ingenious mechanics who had more than their share of good luck. Actually, they were outstanding experimental engineers, who made important discoveries in applied science. Their early glider experiments had convinced them that the aerodynamic tables then extant were inaccurate. The Wrights built a wind tunnel — the first in the United States — thoroughly reworked their aerodynamic problems and compiled their own tables of air pressure. It was on these tables that their subsequent, successful work was based.

After their glider flights of 1902, they were confident that they could use their tables and calculate in advance the performance of a flying machine.

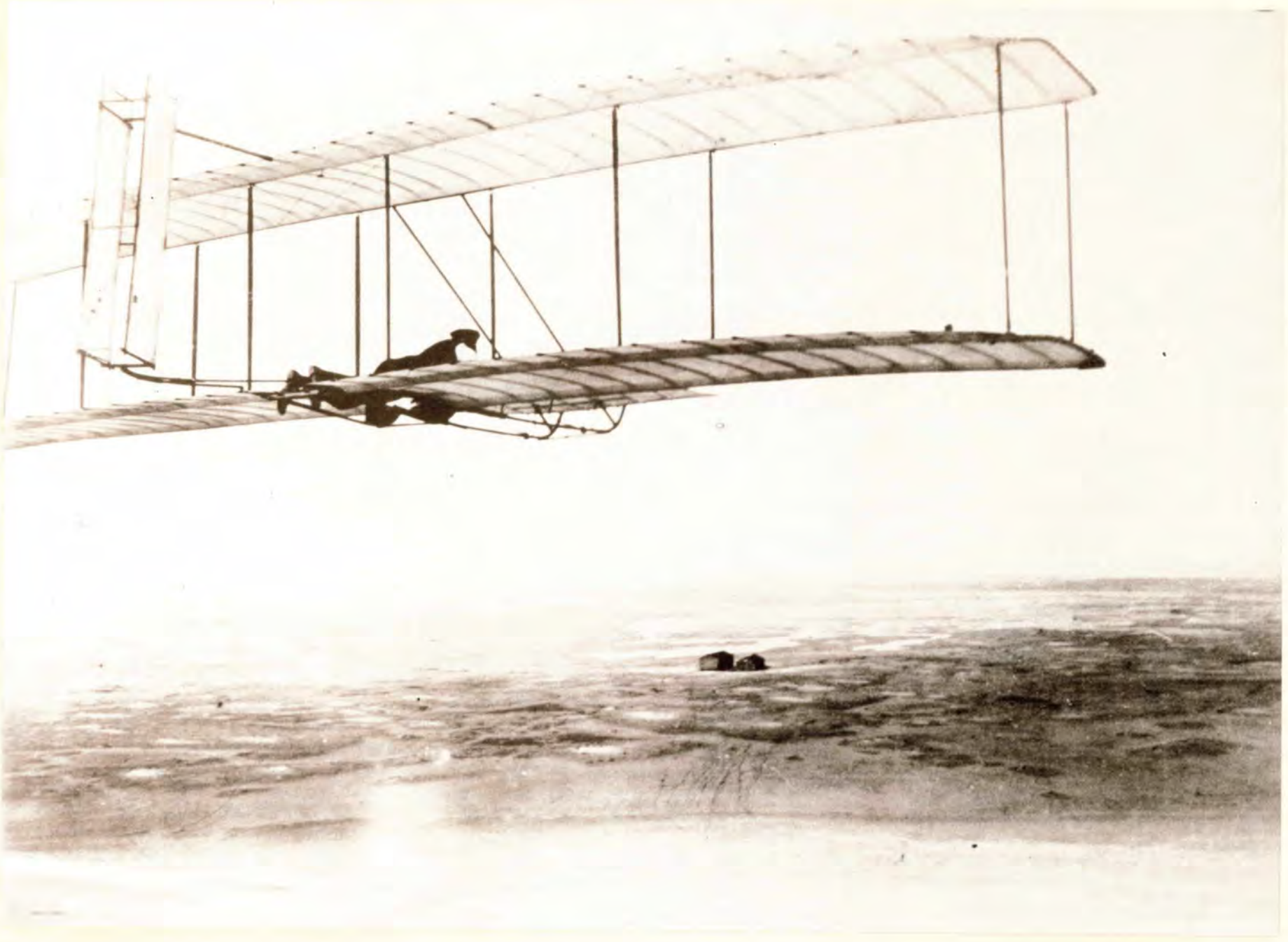
They had conducted their gliding experiments not only to gather valuable aerodynamic data but also to acquire skill and experience in flying. In observing birds perform extraordinary feats in the air, the brothers were struck more by the marvelous skill with which birds used the equipment that nature had given them than by the equipment itself. "The soaring problem," Wilbur Wright said in June 1903, "is apparently not so much one of better wings as of better operators."

Other workers in the field approached the problem differently. S. P. Langley, for example, who was working on his "Aerodrome" at the same time as the Wrights were building their first powered machine, saw the airplane as something akin to a winged automobile to be driven in the air by brute force of engine and propeller and sedately steered about the sky as if it were a land vehicle that had been transferred from a layer of earth to a layer of air.

As a result, Langley and other disciples of this school of thought attempted unsuccessfully to take off in machines before they had the remotest idea of what flight control was all about.

In contrast, the Wrights recognized that the pilot must be a part of the machine and that he must control it as a horseman controls his mount. They therefore intentionally built an aircraft that was unstable and that could be kept flying only by the pilot's skill.

So, by the time of their return to Dayton, they had already developed reliable aerodynamic data, had devised a satisfactory system of flight control and had amassed skill in flying. Now, what remained was building a new airframe and designing an engine and propeller, which they would accomplish in little more than a year — just 75 years ago ....



The basic airframe for the successful Wright Flyer was that of the Wrights' 1902 glider, which they continued to fly over Kitty Hawk, N.C., until it wore out a month before their first powered flight.

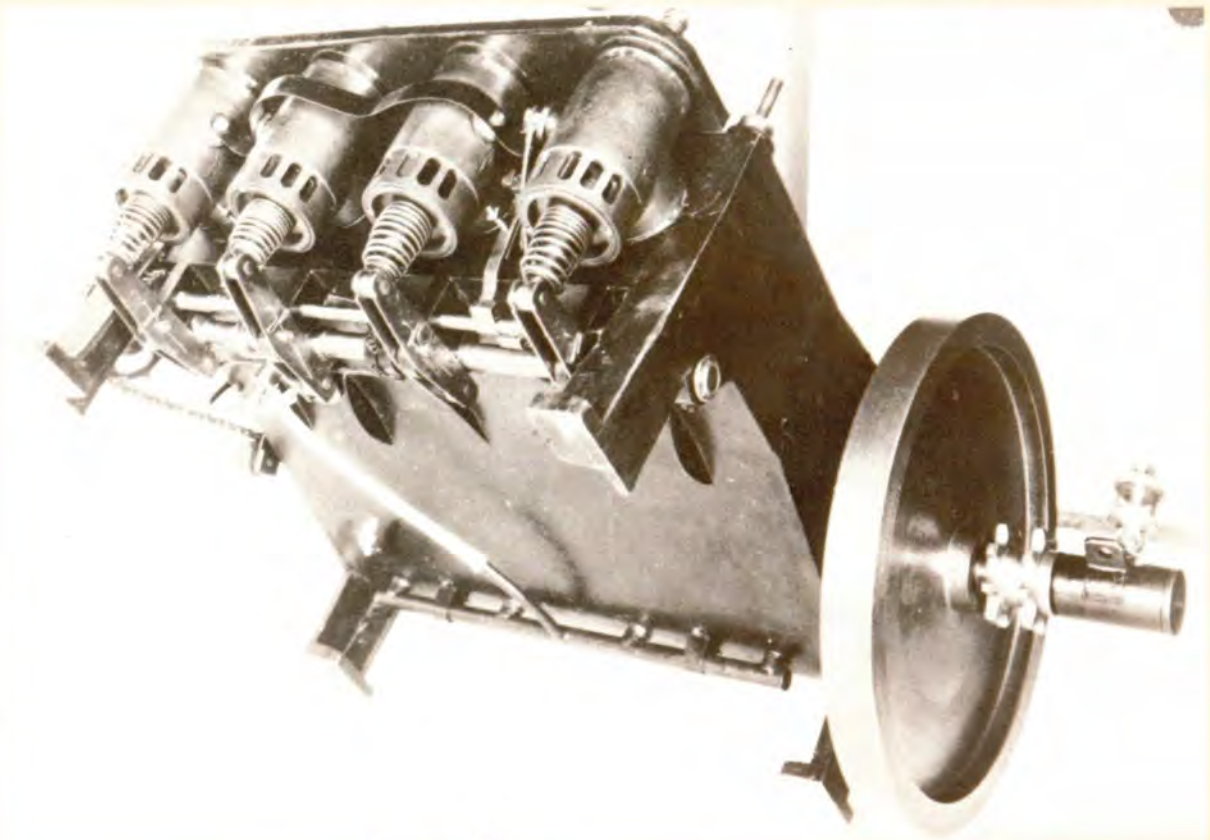
December 3, 1902:

The Wright Brothers write to a number of manufacturers inquiring about the possibility of obtaining a gasoline engine weighing no more than 180 pounds, or an average of 20 pounds per horsepower. These manufacturers were to inform the Wrights later that their specifications cannot be met. Undeterred, the brothers decided to build an engine themselves.

December 9, 1902:

Long-time friend and supporter, engineer and aeronautics expert, Octave Chanute relays to Wilbur Wright a "cheeky" invitation to the Wrights from S.P. Langley of the Smithsonian Institution to "visit Washington at my expense, to get some of their ideas . . ., if they are willing to communicate them."

Since no manufacturer felt he could meet the Wrights' specifications for an engine, the brothers built their own in 1903, which developed 15.6 H.P.



December 11, 1902:

Wilbur Wright, in the process of informing Chanute that neither he nor his brother will find it possible to visit Professor Langley, tells him of "our intention next year to build a machine much larger and about twice as heavy as our present machine" and equip it with a motor.

December 15, 1902:

The Wrights commence their plans for a new flying machine equipped with a homebuilt engine and propellers by launching an experiment using a 28-inch-diameter screw.

February 12, 1903:

The Wrights test their newly built airplane engine for the first time.

February 13, 1903:

Their father, Bishop Milton Wright, notes in his diary: "The boys broke their little gas motor in the afternoon." The engine's casting had been broken when dripping gasoline froze the engine's bearings.

March 23, 1903:

The Wright brothers apply for a patent on their flying machine, but the patent wasn't issued until May 22, 1906.

April 2, 1903:

Octave Chanute delivers a lecture before the Aero-Club de France on the Wrights' gliding experiments of 1901-1902.

April 4, 1903:

Chanute writes to Wilbur Wright: *"L'Aerophile* wants your picture and that of your brother Orville to publish with the article I have agreed to prepare. You are therefore . . . to go to the photographer and be 'took' . . ."

April 20, 1903:

Bishop notes in his diary: "The boys received their aluminum casting for their light-weight engine today."

May 11, 1903:

Wilbur writes to Chanute: "While we were waiting to get our courage screwed up to [get our photographs taken], Orville managed one day to get a grain of emery in his eye, which has been giving him a great deal of trouble . . ."

May 15, 1903:

Chanute responds to Wilbure: "I am ashamed that men whom I have praised so highly in Europe should have so little courage to face a camera."

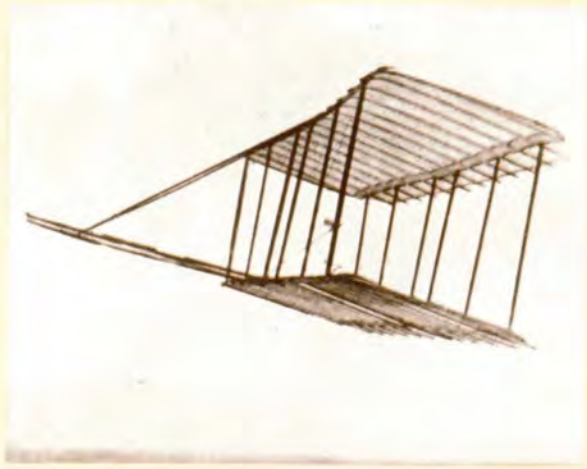
May 25, 1903:

Wilbur again writes to Chanute: "We have the plans for our new machine about settled and are engaged in constructing some of the parts."

June 7, 1903:

Orville writes to Dr. George A. Spratt, a sometime Chanute associate: "We worked out a theory of our own on [propellers] and soon discovered, as we usually do, that all the propellers built heretofore are all wrong . . . . Isn't it astonishing that all these secrets have been preserved for so many years so that we could discover them?"

The Wright Brothers' first airframe was this glider, here being flown as a kite, that they built in 1900.



June 18, 1903:

Wilbur writes to Chanute: "Our engine develops at the brake 15.6 horsepower, and we are convinced that is very close to what we will be able to reach as a maximum.

June 24, 1903:

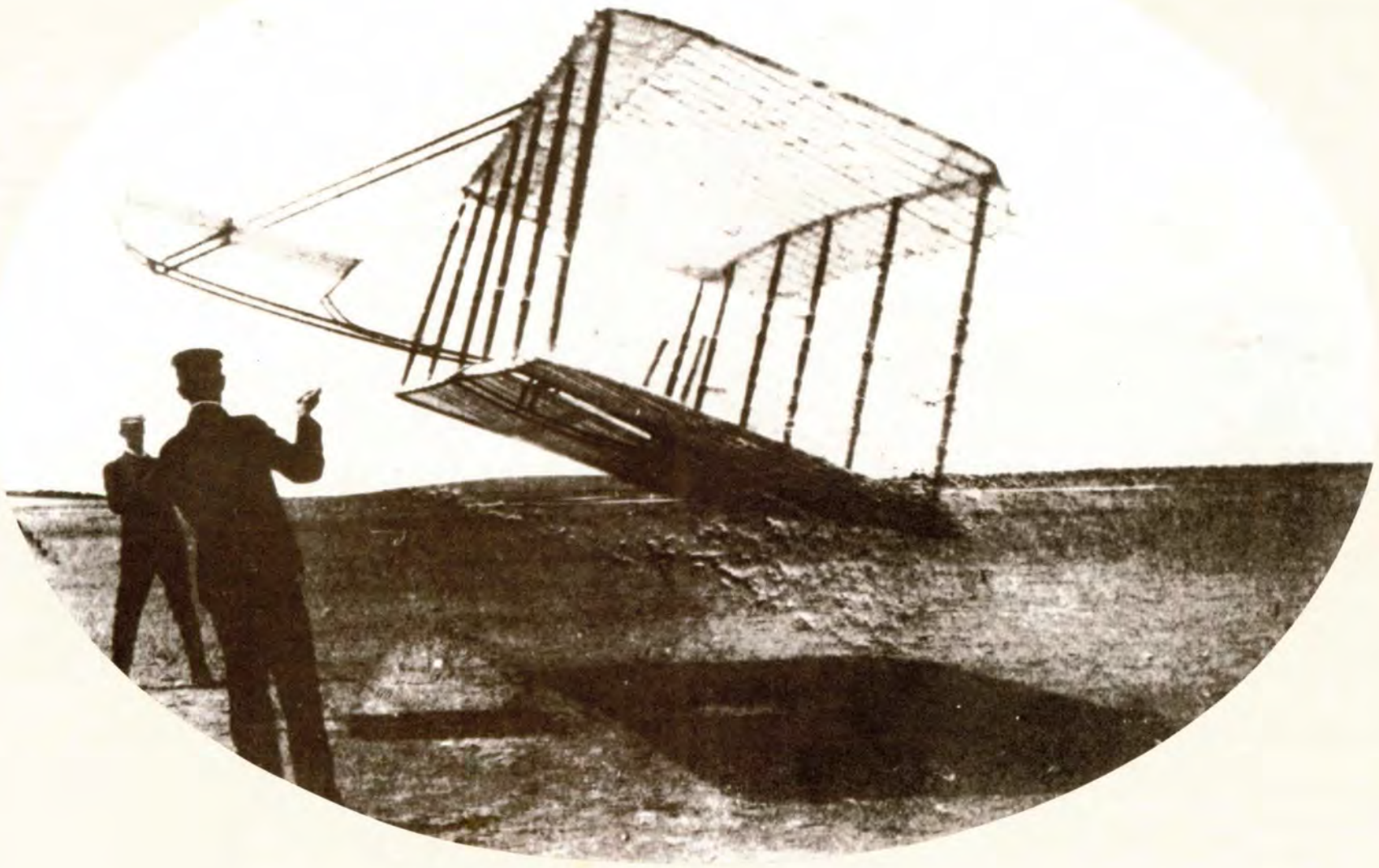
Wilbur delivers an address before the Society of Western Engineers in Chicago on the gliding experiments conducted at Kitty Hawk in September and October 1902.

July 2, 1903:

In commenting on an article by Stefan Drzewiecki on propellers, Wilbur writes to Chanute: "Some of his conclusions seem to Orville and me to be rank heresy, but, of course, we are like the theologians and judge the 'soundness' or 'unsoundness' of others by the closeness of their agreement with ourselves."

July 22, 1903:

Wilbur to Chanute: "It would be interesting to attempt a computation of the possible performance of [Langley's] machine in advance of its trial . . . . It is a sure thing that the speed will not be from 60 to 90 miles and hour with an expenditure of 25 horsepower, as the papers have reported. . . "



Wilbur (left) and Orville fly their 1901 glider as a kite at Kitty Hawk (above), continuing to gather aeronautical data and develop their understanding of flight control.

Wright Cycle Company

DAYTON, OHIO.

May 30 1899.

The Smithsonian Institution

Washington.

Dear Sirs:

I have been interested in the problem of mechanical and human flight ever since as a boy I constructed a number of toys of various sizes after the style of Cayley's and Penaud's machines. My observation since have only convinced me more firmly that human flight is possible and practicable. It is only a question of knowledge and skill just as in all acrobatic feats. Birds are the most perfectly trained as gymnasts in the world and are splendidly well fitted for their work, and it may be that man will never equal them, but as one who has watched a bird chasing an insect or another bird can doubt that feats are performed which require three or four times the effort required in ordinary flight. I believe that simple flight at least is possible to man and that the accumulated experiments and investigations of a large number of independent workers will result in the accumulation of information and knowledge and skill which will finally lead to accomplished flight.

The works on the subject to which I have had access

Wright Cycle Company

DAYTON, OHIO.

on Mayers and Jamieson's books published by Appletons and various magazine and cyclopaedic articles. I am about to begin a systematic study of the subject in preparation for practical work to which I expect to devote what time I can spare from my regular business. I wish to obtain such papers as the Smithsonian Institution has published on this subject, and if possible a list of other works in print in the English language. I am an enthusiast, but not a crank in the sense that I have some pet theories as to the proper construction of a flying machine. I wish to avail myself of all that is already known and then if possible add my mite to help on the future worker who will attain final success. I do not know the terms on which you send out your publications but if you will inform me of the cost I will remit the price.

Yours truly

Wilbur Wright

The death of Otto Lilienthal during a glider experiment in 1896 spurred the brothers' interest in flying, leading Wilbur to write for further information from the Smithsonian Institution in 1899.

September 9, 1903:

Wilbur to Chanute: "We shipped some goods [to Kitty Hawk] today and will ship the balance next week .... The erection of a building will probably occupy us for a week, and it will take several weeks to set up the machine, so we will not be ready for a trial much before October 25th."

September 16, 1903:

A fire at Elizabeth City, N.C., destroyed the Norfolk & Southern freight depot, through which the Wright's goods had to pass. Fortunately, their shipment passed through before the fire, though the Wrights would not know this until they reached Kitty Hawk.

September 23, 1903:

The Wright brothers leave Dayton for Kitty Hawk.

In September and October of 1903, the Wrights erected home and hangar on the beach at Kitty Hawk and began assembling and covering the Flyer.

September 24, 1903:

Orville notes in his diary: "Reached Norfolk at 11:30, and Elizabeth City at 5:30 p.m., where we took the *Ocracoke* to Roanoke Island. We reached Manteo at 1:30 a.m. Friday [September 25]."

September 25, 1903:

Orville writes in his diary: "Took trip over to Kill Devil Hills ... and arrived at camp at one o'clock. We found provisions and tools already there...."

September 26, 1903:

Orville notes in his diary: "Spent morn. arranging kitchen and making 'French drip' coffeepot. In afternoon, we began foundation for new building ..." which would be used to assemble and house their new machine.

September 28, 1903:

The Wrights, finding the weather conditions so favorable, stop work on the building and begin experiments with their 1902 glider. Orville writes in his diary: "We made somewhere between 60 and 100 glides during day."

October 3, 1903:

The brothers modify the 1902 glider and improve its performance by enlarging its tail surface and changing the method of attaching the rudder.

October 5, 1903:

The new building is completed.

October 6, 1903:

Orville notes in his diary: "Will and I worked on a new cradle [for the pilot to lie in], which we upholstered to be softer than the old one."

October 7, 1903:

The Wrights modify the 1902 glider so that the rudder can be operated directly from the cradle. Today, Samuel Pierpont Langley's attempt to launch his "Aerodrome" ends in failure when the machine plunges into the Potomac River as soon as it leaves its launching track atop a houseboat.

October 8, 1903:

The parts for the new aircraft arrive from Dayton.

October 9, 1903:

In the course of commenting on Langley's failure, *The New York Times* opines that "the flying machine which will really fly might be evolved by the combined and continuous efforts of mathematicians and mechanicians in from one million to ten million years ..." And today, the Wrights begin assembling their new machine.

October 10, 1903:

The Wrights made two glides each. During Orville's second glide, a strong gust of wind takes the machine up rapidly, "and in bringing it down, I lit upon Will's head with the rear left-hand corner." Both the front and rear upper spars were broken.

October 12, 1903:

Orville notes in his diary: "We worked all day in making connections of sections of upper surface [of new machine], putting in wires at rear edge & hinges."

October 13, 1903:

Orville notes in his diary: "We worked all morning on upper suface, in afternoon in making repairs on old machine and changing the end control back to its original system of operating all sections."

October 14, 1903:

Orville in his diary: "We worked all day on stretching cloth and putting on hinges on upper surface [of new machine]."

October 15, 1903:

The Wrights begin assembling the lower surface of the new machine.

October 16, 1903:

Orville notes in his diary: "Worked on lower surface all day. Got it ready for hinges at section points and for stretching cloth." Wilbur writes to Chanute: "I see that Langley has had his fling and failed. It seems to be our turn to throw now, and I wonder what our luck will be."

October 21, 1903:

The Wrights spend the day gliding, achieving, according to Orville, "by far the highest gliding we have ever done."

October 22, 1903:

Orville writes in his diary: "We worked all day on lower surface and tail. We were too sore from yesterday's gliding to take machine out."

October 24, 1903:

In a letter Wilbur, Chanute writes: "It is a marvel to me that the newspapers have not yet spotted you."

November 2, 1903:

The Wrights begin installing their engine on the new machine.

November 4, 1903:

Orville notes in his diary: "Have machine now within half day of completion." The work on the launching track is finished.

November 5, 1903:

The Wrights, in testing the engine and screws, break two propeller shafts, and the shafts are sent back to Dayton for repairs.

November 6, 1903:

Octave Chanute arrives at the Wrights' camp, staying until November 12.

November 12, 1903:

The Wrights terminate their glider experiments because of the dilapidated condition of their glider.

November 15, 1903:

Orville writes to his father and his sister Katharine: "The weight of our machine complete with man will be a little over 700 pounds, and we are now quite in doubt as to whether the engine will be able to pull it . . . [Chanute] said that he nevertheless had more hope of our machine going than any of the others. He seems to think that we are pursued by a blind fate from weich ie are unable to escape.

November 20, 1903:

The repaired propeller shafts arrive from Dayton.

November 28, 1903:

A propeller shaft cracks again during testing.

November 30, 1903:

The Wrights decide not to waste any more time on the old propeller shafts. Orville, therefore, leaves Kitty Hawk for Dayton to make new shafts of more durable material.

December 8, 1903:

Langley's "Aerodrome" again plunges into the Potomac River.

December 9, 1903:

Bishop Wright notes in his diary: "Orville started at nine o'clock, with his new propeller shaft, for Kitty Hawk . . . ."

December 11, 1903:

Orville returns to Kitty Hawk.

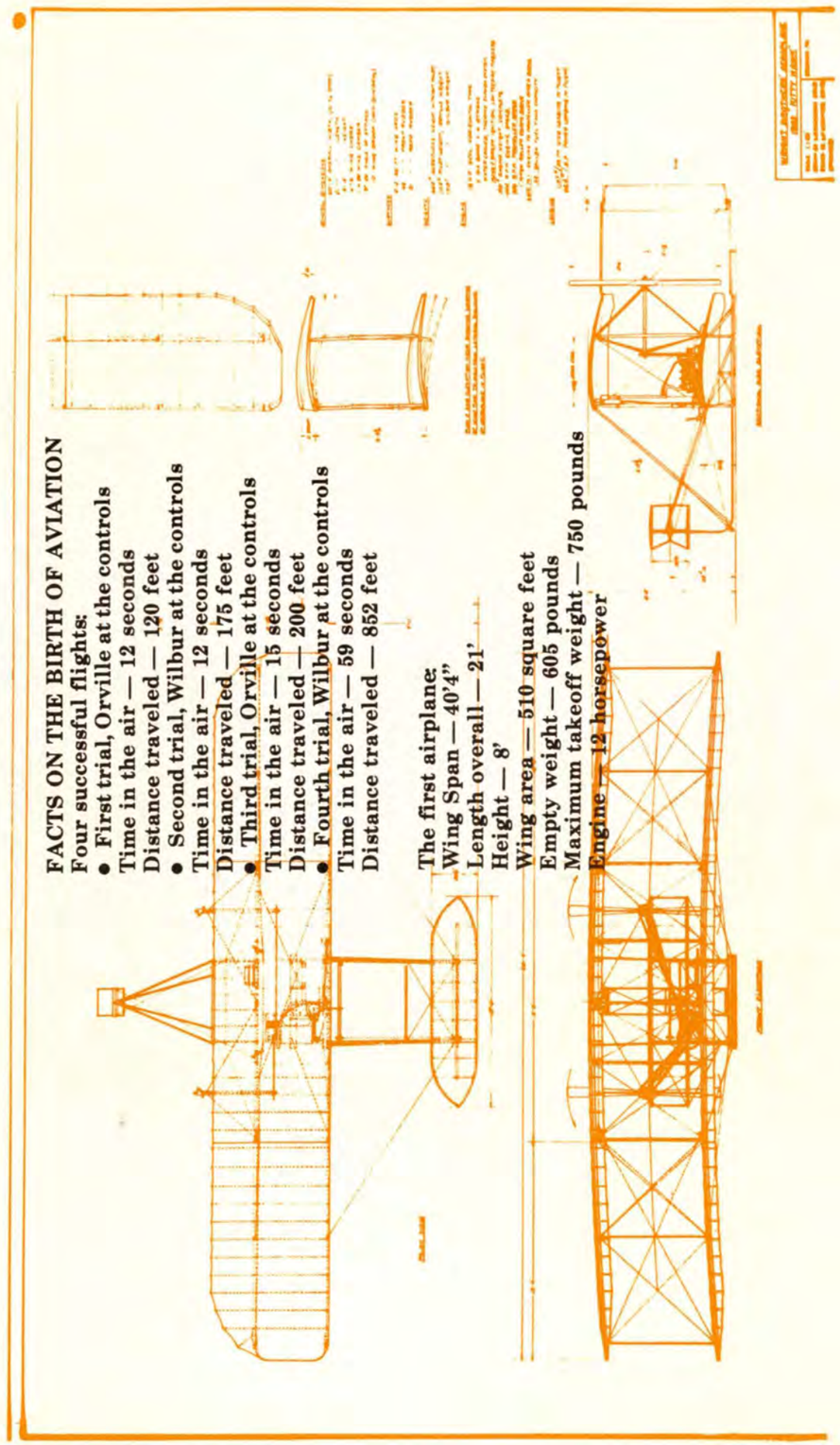
December 14, 1903:

The Wrights make their first and unsuccessful attempt to achieve powered flight from the slope of Big Kill Devil Hill. With Wilbur at the controls, the machine stalls after 3.5 seconds in the air and settles to the earth 105 feet below. (Note: Even if this trial had succeeded, it would not have counted as the first powered flight because the Wrights took advantage of gravity in trying to launch their aircraft.)

December 17, 1903:

Orville wires his father: "Success four flights Thursday morning all againt twenty-one mile wind started from level with engine power alone average speed through air thirty-one miles longest 57 seconds inform press home Christmas." (This is how the telegram was sent — without punctuation). The airplane was wrecked by a sudden gust of wind shortly after the fourth trial.

On Dec. 17, 1903, Wilbur watched Orville take off in the first of four successful powered flights.



DIRECT LINE

Q Please define the term "emergency annual leave." Would it appear proper that one person could be in debt to FAA for over 200 hours of this category of leave and still be able to use it?

A Emergency annual leave is leave which has not been planned, requested or approved in advance. In emergency situations, the employee must notify his supervisor before or as soon as possible (normally not more than one hour) after the time at which he is scheduled to report for duty to explain the circumstances and request approval for the absence. Your question would seem to be referring to advanced annual leave. An employee may be authorized to use, in advance, the amount of leave that he will earn within a leave year. It is the responsibility of management to determine when the leave may actually be taken. The individual you're thinking of may still have had a usable balance. We suggest that if you have more questions concerning the use of annual leave, you contact your Personnel Management Division.

Q In your March issue of FAA WORLD, your answer to a question in the Direct Line section was inaccurate — that the Surgeon General did not make any reference to the effects of cigarette smoke as a hazard to non-smokers. Dr. Jesse L. Steinfeld, when Surgeon General, did, in fact, find the presence of a non-smoker in a room with smokers to be hazardous to the non-smoker's health. I think the record should be set straight.

A The office of the Federal Air Surgeon has found that the literature, excluding newspaper and magazine articles, on the subject of health hazards of tobacco smoke to nonsmokers can be summarized as follows: An atmosphere contaminated with tobacco smoke can contribute to the discomfort of many individuals. The level of carbon monoxide attained in experiments using rooms filled with tobacco smoke, has in some cases, exceeded the time-weighted occupational threshold limit value of 50 ppm (parts per million) for a 40-hour workweek, which has been in effect in the FAA for several years. Hundreds of "real world" spot checks at various facilities made by FAA medical personnel have not detected carbon monoxide at concentrations hazardous to health at any of the places checked. Other components of tobacco smoke, such as particulate matter and the oxides of nitrogen, have been shown in various concentrations to adversely affect animal pulmonary and cardiac structure and function. The extent of the contributions of these substances to illness in humans exposed to the concentrations present in an atmosphere contaminated with tobacco smoke is not presently known. Due to the wide variation in ventilation at FAA workplaces, no attempt has been made to specifically identify areas where the smoking of others may cause certain employees to be uncomfortable or to be concerned with their health. The Office of Aviation Medicine supports the concept of local management and local bargaining units meeting to discuss this very touchy subject and to agree between themselves which areas will be smoking areas and which will not, on a case-by-case basis.

Q As a developmental ATCS at a center, I am in radar training (dy-sym) and assigned to the training department. I have been scheduled to work the 14:30 to 23:00 shift alternating weeks. Our class was assigned this shift in training for the manual controller up-grading with no shift differential being paid. Upon completion of this class, we were assigned alternating shifts on-the-job training and paid differential. Why aren't we eligible for the differential while assigned to the training department, as the instructors are? What is the difference in being assigned to the training department and OJT? I am told that the up-grade training is for our benefit and permits completion of the training on time without holding up our promotions. Our alternative is to withdraw from training and wait for a class during business hours, which would then hold up our promotions, although I don't know when such a class would be available.

A Under the Government Employee's Training Act, there is a general prohibition against the payment of premium pay (overtime, night, Sunday and holiday pay) to employees receiving training. Under the Act, the Civil Service Commission may authorize an exception to the general prohibition when warranted. One of the CSC exceptions covers an employee given training during a work period for which he is already receiving premium pay. This exception permits the agency to give an employee training during a scheduled tour of duty, for which he is receiving premium pay, without terminating his premium pay for the training period. However, this exception does not apply to an employee assigned to training in a full-time, formal training situation. Thus, an employee receiving OJT in an operational environment is eligible for premium pay, while an employee receiving training in a classroom environment is not. Instructors conducting training sessions are eligible for premium pay since they are performing their assigned regular work during a scheduled tour of duty.

Q I have a problem with my career, and it appears I need some help. I have talked to the regional personnel officer to no avail. I have tried to join a local union with no results. Other FAA career groups seem to have greatly benefited from their unions. They told me in school that engineers were supposed to be professional people, but I no longer believe this. I didn't want to join a union, but this may be the only source of help. Is there a union for me?

A Although you are not a member of an appropriate bargaining unit certified by the Department of Labor, there are no prohibitions on your joining any union(s) willing to accept you as a member and to represent you on an individual basis. We suggest you contact the Department of Labor for a listing of various unions operating in your area.

HELFRICH'S LILLIPUT

Not too far from Disneyland, creating his own "Small World," is Don Helfrich, chief of the Local Nav/ Com Unit at the Ontario, Calif., Sector Field Office. In addition to being an accomplished artist, he enjoys sharing his wife's passion for miniatures by designing and building miniature furniture for her projects.

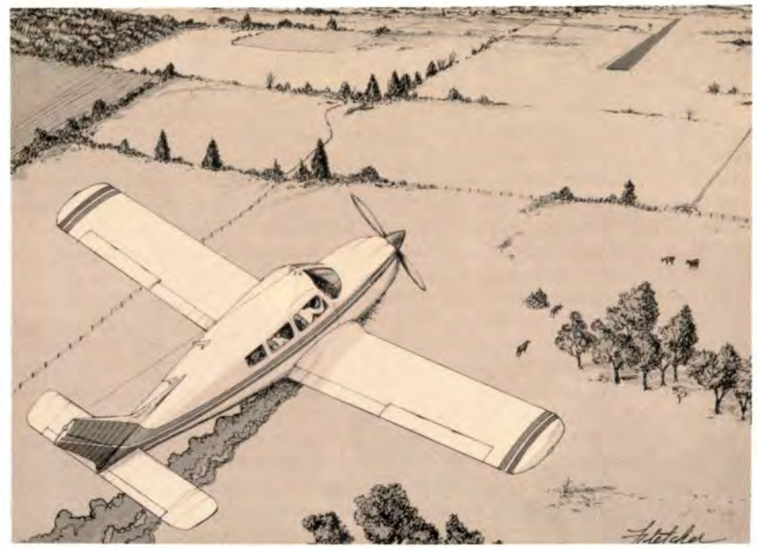
The Helfrichs now have 24 miniature rooms complete to the last detail, including miniature clocks with works that keep time. The scale on everything is one inch to the foot. He also designs and builds full-scale clock cases, mostly grandfather and heavy wall clocks, in exotic woods. Not too surprising is the fact that the Helfrichs also are avid antique collectors, much in evidence in the decor of their home.

His fellow employees at the SFO have had the opportunity to enjoy Don Helfrich's painting in oils and acrylics, for these he sometimes displays in the office.

By Barbara Abels

Professionalism Enhances Safety

Andrew M. Lander



The smoothest flight assists take place when there's the calm and cool of professionalism on both ends of the microphone. It's expected with controllers and airline pilots, but it's a real boon when encountered in general aviation pilots

Cleveland Center controller Andrew M. Lander was covering the Toledo-Findlay sector when the pilot of a Piper Turbo Arrow came on the frequency and said calmly and quietly, "We got a mayday — blew something on the engine; give me the closest run to Bluffton Ohio, please."

Just as calmly, Lander asked, "Six five hotel, make a left there, and do you want an approach to Bluffton or a heading to Bluffton?"

"Just a heading, sir; we can't get the engine back," the pilot replied. He received the heading and then said, just before radar contact was lost as the aircraft descended, "Okay . . . don't know whether we'll make it; we'll give it a go."

"Six five hotel," Lander called back, "last radar contact showed you three miles south of Findlay VOR; the Bluffton Airport might be further to the right there, maybe at one o'clock."

"Roger, sir, we have it; no strain," was the reply.

What happened from there on and what had caused the mayday was revealed in an appreciative letter sent to center chief John R. Ryan by the pilot, Hugh K. Ledoux, news director of a Toledo, Ohio, radio station.

"I was flying southbound at 6,000 feet when the engine exploded," Ledoux wrote." A rod punched through the engine case in two spots, starting an oil fire and causing a total power loss. On board was my wife and family and close to 100 gallons of fuel. The situation was poor."

Ledoux said Lander's heading brought him directly to the end of the runway. "A minute later [after radar contact was lost], I saw the runway and held the best glide for dear life. I landed downwind and came to a halt dripping oil, engine parts and sweat, but the aircraft was without a scratch. Please tell your controller I crossed the runway with 50 feet to spare.

"Thank you, whoever you are," Ledoux continued. "Same from my wife, kids and dry cleaner. My wife is now convinced you fellows wear white hats. She is a 20-hour student with a new appreciation of the FAA and Cleveland Center.

By Marjorie Kriz

FACES and PLACES

SNIPING AT PROBLEMS — *Neither bazooka nor ray gun is in the hands of Edmund P. Kennedy, Rocky Mountain AF Division assistant chief. It's an infrared heat detector that can spot noise sources on overhead power lines. It can hit a two-inch target at 40 feet.*

RIDING HIGH — *Ernie Gentry (right) of the Phoenix, Ariz., FSDO has the steer in tow as his son, John, readies a lasso for a second roping at a Mormon Lake rodeo. The pair has been at this roping hobby for a good many years.*

NEW TOOL — *Engineer Gerry Trainor (right), Airway Facilities Service, shows Carl Barr, radar technician at the Dulles Airport ASR, one of the 3,000 digital multimeters just supplied to the field.*

HIGH PRAISE — *The International Aviation Service Award and silver medal was recently presented to James D. Cameron, international liaison officer, by Charles O. Cary, Assistant Administrator for International Aviation Affairs, for Cameron's accomplishments in furthering U.S. interests.*

THE MLS WORLD — *Deputy Administrator Quentin Taylor addresses a recent meeting of the Organization of American States in Buenos Aires in connection with demonstrations of the MLS time-reference/scanning-beam system. (Other demonstration flights were slated for New York; Kristiansand, Norway, Brussels; and cities in Africa).*

EDUCATOR'S RECOGNITION — *The 1977 recipient of the Association of Aviation Psychologists' Award of Excellence was James L. Harris, chief of the Aeromedical Education Branch at the Civil Aeromedical Institute (CAMI), for his contributions to aviation safety through the means of education programs based in aviation psychology, human-factors research and communications.*

SAFETY ON THEIR MINDS — *As part of the job of checking aircraft and airmen and safety monitoring the annual Reno National Championship Air Races, Western Region operations specialist Pat Schiffman discusses air race procedures with Jim Leckie, air race monitor and Reno GADO chief. Behind them is a T-6.*

BILINGUAL COMMUNICATIONS — *Great Lakes' traveling aviation-education slide shows were designed to be flexible, permitting localizing by changing a few slides. Now, two of them — "Chicago O'Hare Aviation Wonder of the World" and "The FAA Career Story" — are also available in Spanish on videotape casettes produced at NAFEC. Here, Great Lakes' Spanish-speaking coordinator, Hector Colon, prepares to translate an English slide-show narration.*

A COMMUNITY LION — *Controller T. Purnell Henderson (right), San Angelo, Tex., Tower, was presented a plaque as "Lion of the Year" for 1976-77 by past Lions president Haston Fields. Currently president of the Northwest San Angelo Lions Club, Henderson was selected by sports personalities to be a newspaper football "guest picker."*

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Washington, D.C. 20591

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

Postage and Fees Paid
Federal Aviation Administration
DOT 515

U.S.MAIL

Heads Up

ALASKAN REGION

Wallace L. Thorp moved north from the Edwards AFB RAPCON to become an assistant chief of the Fairbanks Tower . . . Also from warmer climes comes **Norman R. Weeks**, late of the Phoenix FSS, to an assistant chief's slot at the Fairbanks FSS

CENTRAL REGION

Roger N. Clark was selected an assistant chief at the Cedar Rapids, Iowa, FSS.

EASTERN REGION

The deputy/assistant chief at the Wichita, Kan., Tower, **Jackie L. West**, is now deputy chief at the Norfolk, Va., Tower . . . **Robert C. Testa** of Pittsburgh has been named chief of the Atlantic City, N.J., Tower . . . Teterboro, N.J., Tower chief **John H. McPhillips** has become the chief of the Roanoke, Va., Tower . . . The Poughkeepsie, N.Y., FSS has a new assistant chief in **Pasquale D. Codispoti**.

GREAT LAKES REGION

Palwaukee, Ill., Tower assistant chief **Eugene J. Hall** is now assistant chief at the Evansville, Ind., Tower . . . **Luther R. Lang** got the nod as deputy chief of the Cleveland ARTCC . . . **Thomas F. Dundr** of Cleveland-Hopkins has taken on the job of assistant chief at the Columbus OSU Tower in Ohio . . . **Arthur A. Imhof** is now the deputy chief at the West Chicago, Ill., FSS.

NEW ENGLAND REGION

Thomas J. O'Malley has moved up from deputy chief at the Bradley Tower in Windsor Locks, Conn., to chief of the Burlington, Vt., Tower . . . **Jerome F. Biron**, Air Traffic Div. chief, has been named U.S. Administrator for Aeronautics in Berlin Germany.

NORTHWEST REGION

Twin Falls, Ida., Tower chief **William D. Coons** has moved up to chief of the Boise, Ida., Tower . . . **David L. Webster** is making the trek from Cleveland-Hopkins to become chief of the Troutdale, Ore., Tower . . . The Moses Lake, Wash., Tower has a new assistant chief in **Larry E. Case** of the Fairchild AFB RAPCON . . . **Louis W. Rosgen** of the Houston International RAPCON has been selected chief of the Lewiston, Ida., Tower.

PACIFIC-ASIA REGION

Teofisto Tobosa of the Guam CERAP has been named chief of the Maui, Hawaii, Combined Station/Tower . . . Now an assistant chief at the Honolulu FSS is **James H. Murakami.**

ROCKY MOUNTAIN REGION

Boosted to an assistant chief's slot at the Denver ARTCC was **Clarence W. Schilling . . . John D. Coffey** from Grand Junction has become the chief of the Eagle, Colo., FSS . . . **George T. Phillips** has transferred to the Colorado Springs, Colo., Tower as an assistant chief . . . His deputy chief there is former assistant chief **Burton Chandler Jr.**

SOUTHERN REGION

Now assistant chief at the Isla Grande Tower in San Juan, Puerto Rico, is **John Aguiar** . . . Moving up to assistant chief at the St. Thomas Tower, Virgin Islands, is **Edward F. Drury . . . David R. Thornton** has switched as assistant chief from the Atlanta FSS to the Savannah, Ga., FSS . . A new assistant chief at the Miami IFSS is **William W. Curry, Jr.**, who hailed from the Key West, Fla., FSS . . . **Julius D. Brooks** has transferred as chief from the Dothan, Ala., FSS to the Dyersburg, Tenn., FSS . . **James T. Inman** is now deputy chief of the Savannah, Ga., RAPCON.

SOUTHWEST REGION

Selected as chief of the Midland, Tex., FSS was **William H. Haynes** from the Carlsbad, N.M., FSS . . . **Ernest E. Saulmon** got the nod as an assistant chief at the Austin, Tex., Tower . . . **Samuel F. Woods** was promoted from the Fort Smith, Ark., Tower to assistant chief at the College Station, Tex., Tower . . . Chosen as an assistant chief at the Lafayette, La., Tower was **Huey P. Mitchell** of the Moisant Tower in New Orleans . . . **Edward F. Stevens, Jr.**, was selected as an assistant chief at the Midland, Tex., Tower . . . Also picked as an a Midland assistant chief was **Milton D. Blume** of Lubbock, Tex.

WESTERN REGION

Los Angeles TRACON's **Richard J. Joswick** has taken an assistant chief's slot at the Santa Barbara, Calif., Tower . . . Chief **Herman W. Schloo, Jr.**, has left the Merced, Calif., Tower for the chief's spot at the Palo Alto, Calif., Tower . . . The Las Vegas, Nev., FSS has a new assistant chief in the person of **William G. Parker** of Prescott, Ariz. . . . **William H. Pollard** has transferred from headquarters to be chief of the Las Vegas Tower . . . Selected as an assistant chief at the Ontario, Calif., Tower was **Marvin J. Burrier**, who hailed from Chino, Calif. . . . Montgomery Field, San Diego, has lost **Duane C. Rakotz**, who is now an assistant chief at the Fullerton, Calif. Tower . . . Selected as an assistant chief at the San Carlos, Calif., Tower was San Francisco's **Norman B. Brod . . .** Now deputy chief of the Las Vegas Tower is **Luther D. Quarles III . . . William R. White** has been named an assistant chief at the Orange County Tower in Santa Ana, Calif.