



planes

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CITIES URGED TO PLAN NOW FOR HELIPORTS

Airlines Operate Fleet Equivalent To 35 AF Wings

Every member of the combat divisions of the U. S. Army based in the United States could be moved coast-to-coast by America's scheduled airlines in less than four days.

Operating a fleet equivalent to almost 35 USAF heavy transport wings, the commercial airlines today have 1,269 transports and 19 helicopters—a constant backlog of standby air power.

The Army's combat divisions based in the continental United States now number approximately 229,800 officers and men in infantry, airborne and armored divisions. To move them from coast-to-coast, it would be necessary to ferry the planes back to their originating point after each transcontinental flight—but the job could be done in less than 96 hours.

Such an operation, should it be (See AIRLINE PLANES, page 4)

8 Aircraft Companies Now Support 1,292 Scholarships, Survey Shows

It takes more and more engineers to build today's complex, high-performance aircraft, and plane manufacturers are doing their bit to encourage the interest of the nation's youth in the engineering fields.

A recent survey of eight major aircraft manufacturers reveals that at least 1,292 scholarships are available from these companies for students interested in engineering or allied business fields.

The scholarships range from programs for employees' children to graduate fellowships in advanced engineering.

200 Summer Fellowships

One company offers 200 summer fellowships to high school science and mathematics teachers; another is granting financial assistance to more than 700 employees who are taking engineering courses at colleges of their own choosing while

working part-time, on full leaves of absence, or who are taking extension courses while working a standard work week.

Graduate Scholarships

In addition to undergraduate scholarships, there are scholarships, fellowships and research grants in electricity, physics, physical sciences, chemistry, metallurgy, marketing, manufacturing, employee relations, public relations, business administration, electrical engineering, and instrumentation.

No summary of scholarships is available, but information regarding scholarships and fellowships can be obtained by writing colleges of engineering throughout the country.

Among colleges and universities at which aircraft industry scholarships are available are:

University of Southern California, (See 1,292, page 4)

Downtown Sites, Local Laws Are Key to Benefits

By Don Ryan Mockler
Director, Helicopter Council
Aircraft Industries Association

Within 30 months, commercial versions of big multi-engined military helicopters should be available for a national network of rotary-winged civil air transportation.

These commercial helicopters will usher in a new era in American short-haul transportation.

When these new air transport vehicles are available for commercial use, the airlines are expected to inaugurate service on some of their existing routes. Already, one trunk-line carrier is operating a helicopter in experimental operations around one of its major terminal areas, and one local service carrier has started service on some of its regular routes. Three helicopter transport services are operating in Chicago, Los Angeles and New York City.

Action Needed Today

For U. S. communities to take full advantage of helicopter air service, however, it is imperative that planning be started today for heliport locations.

A special committee of the AIA Helicopter Council, composed of helicopter manufacturers, has just completed an 18-month study of U. S. heliport requirements. Drawing on the background of the manufacturing organizations which will produce the commercial rotary-winged transports of the near future, this committee has set up detailed criteria and specifications for heliport planning—and has consulted at length with Government agencies and commercial organizations.

Heliports Relatively Small

Although the required heliports will be relatively small and simple, compared to modern airports which now dot the country, the committee's report indicates that communities must take action today if they are to solve numerous problems which would restrict full integration of the helicopter into the national transportation network.

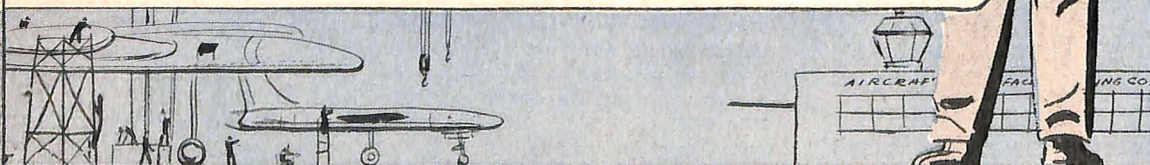
One of the greatest hurdles on the road to maximum exploitation of (See ACTION, page 3)

MANPOWER FOR AIR POWER

Top Five Manufacturing Employers

INDUSTRY WORKERS

1	AIRCRAFT AND PARTS	823,900
2	AUTOMOBILES	786,000
3	STEEL, BLAST FURNACES, ROLLING MILLS	594,900
4	COMMUNICATIONS EQUIPMENT	503,700
5	BROAD-WOVEN FABRIC MILLS	489,900



More Americans depend for their livelihood upon the aircraft industry than upon any other U.S. manufacturing industry.

PLANES

Planes is published by the Aircraft Industries Association of America, Inc., the national trade association of the manufacturers of military, transport, and personal aircraft, helicopters, flying missiles and their accessories, instruments and components.

The purpose of *Planes* is to:

Foster a better public understanding of Air Power and the requirements essential to preservation of American leadership in the air;
Illustrate and explain the special problems of the aircraft industry and its vital role in our national security.

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ALL MATERIAL MAY BE REPRODUCED—MATS OF ALL CHARTS ARE AVAILABLE FREE

Airmen—Key To Air Power

Poised on runways of U. S. air bases throughout the free world are the most powerful military aircraft ever conceived. They represent millions of hours of research and development by the American aircraft industry.

No nation in the world today can match the striking power of this American air-atomic might.

In developing the planes which make up this air strength, the United States government, the military and the aircraft industry have worked as a single team. The end product of their efforts is American air power with such massive capabilities that any nation must surely pause before plunging the world into a major conflict.

The planes in this air force are complicated machines, built for defense in an age of nuclear bombs and supersonic speeds. The electronic equipment on some of these planes costs as much as two complete World War II bombers. And just one of today's heavy bombers can deliver destruction equal to a million times the punch of all the B-17's that bombed Berlin in the last World War.

But these airplanes are just one part of total air power. The time and money spent in building them is useless unless there are enough trained and experience men to maintain and operate them.

It takes months of study and additional months of experience to prepare the men who must look after this air fleet. Lead time is essential in the training of skilled manpower just as it is in the manufacture of airplanes.

Since war broke out in Korea, in mid-1950, the aircraft industry has delivered more than 33,000 planes to our military services. Approximately 22,000 of these were for the Air Force, and we are now rapidly building toward the 1957 goal of 137 wings.

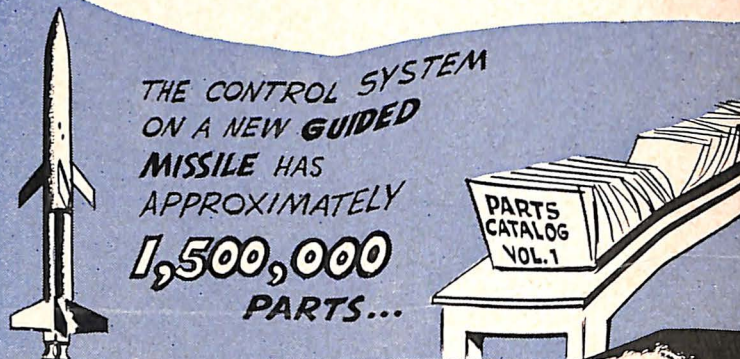
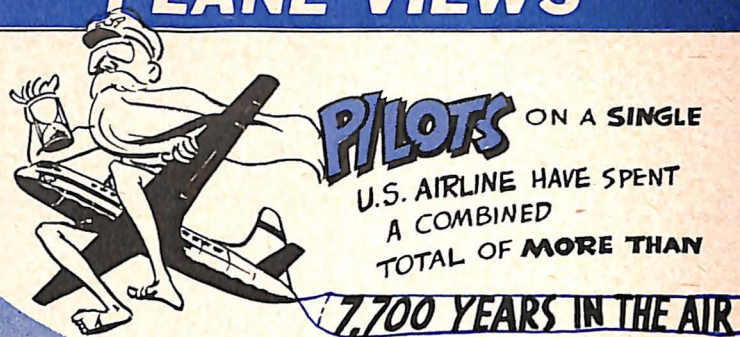
To properly maintain these aircraft, thousands of specialists and technicians are required. There must be 942 aircraft maintenance men in *each* medium jet bomber wing, for example, and 86 expertly-trained technicians are required for electronic and hydraulic systems work. Yet the Air Force is this year confronted with the problem of replacing 200,000 trained men, men who entered the service during 1950-51 and whose enlistments are now running out. They are experienced men—and their loss creates a serious, if not critical, problem.

It cost approximately \$25,000 to train each of them, and it is estimated that the abnormal turnover of personnel in the Air Force is costing the American taxpayer more than two billion dollars a year.

This is an acute problem for the Air Force and for the American people. It could easily jeopardize our national security.

All aviation, and particularly the military air services,

PLANE VIEWS



Over 1000 Teachers Attending Workshops In Aviation Education

More than 1,000 teachers are participating in air-education workshops in the United States and Puerto Rico this summer.

The workshops, sponsored by the Civil Air Patrol, the Air Force, the aircraft industry, and other agencies, are conducted to help teachers better understand the role of aviation in modern life and to help them prepare comprehensive studies for their own classes.

Ten colleges and universities in the continental United States and the University of Puerto Rico will be hosts during the summer months to school teachers of all grade levels attending the sessions.

Nationally prominent educators and aviation experts are participating as guest speakers and instructors, and at most of the workshops academic credit is given to those who attend.

PLANE FACTS

- Forty medium bombers carry a total of 10,000 electronic tubes in their communications, navigation and fire-control systems.
- Last year, 17,941,172 pieces of air parcel post were carried by the nation's airlines. The Post Office averaged a profit of 25.43 cents per piece, in contrast to a loss on non-local fourth class or surface parcel post of 15.48 cents per piece.
- During World War II, the Air Force needed approximately two engines to support each engine installed in a bomber. Today, only one "backup" engine is required for every two installations.
- The United States Air Force has 179 installations in the continental United States. They are located in 42 states and the District of Columbia.
- Gas temperatures in rocket motors run as high as 6000°

must recapture the spirit and enthusiasm of American youth and must make them aware of the many advantages to be gained through a military aviation career.

This nation has demonstrated that it can build superior planes in quantity, but without the trained manpower to back them up these planes can never accomplish their mission.

ACTION URGED ON HELIPORT PLANS

(Continued from page 1)

the helicopter, according to the committee, is the requirement for heliport planning by local communities.

Among recommendations contained in the report are:

- "Local authorities [should] begin now to investigate their eventual heliport requirements in order to make early and adequate provisions in their basic community planning."
- "Local authorities should immediately initiate a study of traffic flows inside and outside their local areas, in order to make the best possible tentative estimates of helicopter service potential and from this the general location and dates for the necessary heliports."

Keep Sites Available

- "All steps should be taken to protect the future availability of these heliport sites, including studying, and if necessary revising, local planning, zoning requirements, building regulations and other local laws."
- "Since the downtown heliport will be the key to the heliport plan and will also generally present the greatest problem, major attention should be focused on centrally-located downtown sites for development as needed."
- "It is desirable that heliports at airports with large traffic volume be structurally incorporated with the main terminal building."

Close to Traffic Sources

- "Since the basic advantage of the helicopter lies in its ability to take the traffic close to where it wants to go, heliports must be located close to traffic sources in order for the helicopter to perform the most useful public service."
- "Particular attention should be paid to local aviation laws and regu-

Large Job Is Done By Small Business In Air Expansion

The small businessman plays a big part in building America's air power.

An Air Force survey shows that since the start of the Korean War the purchasing departments of major USAF contractors have placed, or are planning to place, an estimated \$7,450,000,000 in subcontracts with small concerns.

Seven out of 10 of the major aircraft manufacturers' subcontractors and suppliers are small businesses, most of them with fewer than 100 employees.

In the same period since Korea (to April 1, 1954), the Air Force placed 1,959,103 contracts or purchase orders with small business concerns—placing them at the rate of 2,000 per day. Total value of these contracts, the Air Force's Office of Small Business reports, is \$2,462,683,000—a rate of more than two and a half million dollars per day during the 45-month period.

lations dealing with such matters as licensing of airports, prohibiting the landing and take-off of aircraft except at airports, and prescribing minimum operational altitudes for aircraft for the purpose of making adjustments in them necessary to recognize helicopter operations."

Avoid Premature Regulation

• "Federal, state and local authorities have, in general, wisely refrained from promulgating detailed laws and regulations governing commercial helicopter operations and heliports. Any attempt to do so at this time would be ill-advised. Such regulations should be founded on the proven characteristics, reliability and limitations of the machine itself, and the helicopter today is going through a period of such rapid growth and development that only time and further experience can provide a sound foundation for future regulation."

Instrument Flight Prospects

• "Up to 1960, scheduled helicopter operations will, with few exceptions, be conducted under visual flight rules. Scheduled instrument flying with passengers should be feasible by 1960, with the availability of suitable electronic equipment,

suitable multi-engined equipment, and the development of flight techniques.

• "The ground-level heliport is generally preferable on economic grounds to the structural type and should be utilized wherever possible. In mid-city locations, considerations of available space, property values and tax rates may dictate a structural heliport. For structures specifically designed as heliports, passenger handling considerations suggest that optimum height will usually be less than 100 feet and not more than four floors. Heliport structures with an anticipated life past 1960 should be stressed to accommodate helicopters of at least 50,000 pounds gross weight." [Gross weight of a typical modern twin-engined airline transport plane is approximately 50,000 pounds.]

Guide to Planners

The comprehensive survey and report on heliports is intended to serve as a guide to community planners. It covers basic policy and technical factors concerned with the planning, construction, development and regulation of helicopter landing sites. The report is being published by American Aviation Publications, 1025 Vermont Ave., N. W., Washington 5, D. C. It is priced at \$1 per copy.

Air Quotes

"In a way, ours is a simple job, rather straight-forward. We know who the potential enemy is, and we know what we are likely to run up against. All we have to do is to be ready.

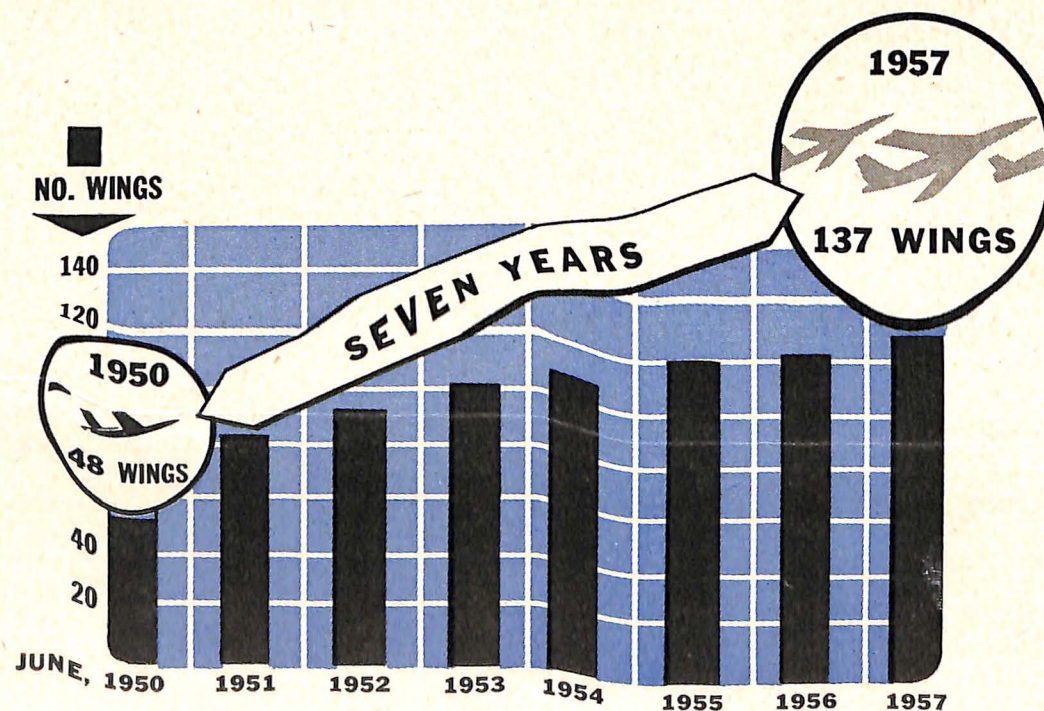


"When? Tomorrow? Next week? Next year? We certainly do not know when we might be called into action, and earnestly hope the answer is 'never'. Yet, we must assume that the time is now, today. Everything we do, every motion we make, is based on that assumption—today."—Gen. Curtis E. LeMay, Commander, Strategic Air Command, USAF, May 21, 1954.

Gas Station in the Sky

On an average of once every 15 minutes, seven days a week, big flying tankers of the USAF make contacts with other airplanes in flight for aerial refueling.

IT TAKES YEARS TO BUILD AIR POWER



In 1950, when the Korean War started, the U.S. Air Force consisted of only 48 inadequately-equipped wings. Although the nation's air power buildup began at that time, it will be 1957 before the present target—137 wings—is reached.

'PLANES'

SOURCE: AIRCRAFT INDUSTRIES ASSOCIATION

Research Today on Guided Missiles Equals That on Piloted Airplanes

The aircraft industry today is putting as much research and development effort into guided missiles as it is into conventional aircraft.

For every dollar spent on research and development on conventional aircraft since fiscal 1952, the Department of Defense has spent approximately an equal amount for guided missiles. The annual research and development budget in each of these major fields is now running about \$300-million.

Work on New Problems

This means that countless research and development projects in aircraft companies throughout the nation are now aimed at the solution of problems blocking the way toward faster and better pilotless weapons. Almost every aircraft manufacturer is at work on guided missiles, missile parts, or missile components.

DOD Expenditures

Since World War II, the Department of Defense has invested between \$4-billion and \$5-billion in its over-all guided missile program. In the fiscal years 1946 through 1954, amounts obligated for major aspects of the guided missile program were

Airline Planes Are Transport Reserve For Emergency Use

(Continued from page 1)

necessary, would involve only those planes which the airlines operate in U. S. domestic service. They could put 512 four-engined aircraft and 757 twin-engined planes in the air at one time—and could transport personnel in quantities well in excess of 60,000 men at one time.

'Secondary Air Force'

Forming a tremendous "secondary air force" that can be called upon in case of emergency, the commercial airlines operate the world's most modern air transports, all built in America.

The newest and largest of these planes are currently in scheduled service, carrying passengers and cargo from New York to Los Angeles in about eight hours. They have a top speed of 400 m.p.h. and carry 69 passengers in first-class accommodations. Others carry up to 88 passengers on each flight.

Other Airliners Available

If the occasion demanded it, the additional aircraft operated by American overseas airlines and U. S. civil air freight lines could also be pressed into service for essential transportation.

Pilots, technicians, mechanics and other essential personnel of the scheduled airlines number over 100,000 today, and back up the U. S. civilian airline fleet with know-how and experience which would be required on short notice under emergency conditions.

approximately as follows:

For research and development, \$1.6-billion.

For procurement, \$2.4-billion.

For development and test ranges and facilities, \$200-million.

New Missiles

Although a number of the pilotless aircraft are already in quantity production, perfection of the missile has not, in all respects, been accomplished. Among basic problems on which manufacturers are at work are jam-proof guidance and control systems, fuel economy, and over-all reliability. Already in view are missiles with speeds of the multiples of sound, uncanny accuracy, and with ranges adequate to meet all foreseeable military requirements.

Aircraft Company Efforts Cut Costs On Big Bombers

The nation's aircraft manufacturers are constantly seeking new ways to reduce costs.

During a recent production run on more than 200 heavy bombers, a major aircraft manufacturer reduced man-hours per plane from 350,000 to 142,000, cutting their anticipated cost to the Government approximately 15 per cent. This savings was achieved despite increasing wage and materials costs during the period.

The manufacturer points out that while manhours and costs were being reduced, the company processed so many changes that the first and last of the bombers had only 20 per cent common parts. Each plane was delivered on schedule.

As an illustration of the immensity of the production job on these bombers, the company reports that each plane consists of 184,000 pieces. On a 200-airplane contract, therefore, the work-in-process inventory reaches staggering proportions — involving some 36,800,000 aircraft pieces!

1,292 Scholarship Awards Granted by Aircraft Firms

(Continued from page 1)

UCLA, University of Washington, Washington State College, Seattle University, Kansas University, Kansas State University, Wichita University, California Tech, Stanford, Iowa State College, University of Illinois, Purdue, Massachusetts Institute of Technology, University of Minnesota, University of Texas, Texas A&M, University of Oklahoma, University of Michigan, Notre Dame, Georgia Tech, University of Colorado, Rensselaer Poly Tech, Case Institute of Technology, Cornell University, and the University of Arizona.

THE PAYOFF: AIR SAFETY

The average U.S. airline spends 15,795 manhours a year maintaining each of today's big commercial transports . . .



Travel by scheduled airline today is five times safer than travel in an automobile. The modern high-speed transports produced by the U.S. aircraft industry are checked after each flight and thoroughly inspected periodically by safety-conscious airline maintenance personnel. The result: Constantly-increasing dependability, safety and reliability of air transportation.

'PLANES'

SOURCE: AIRCRAFT INDUSTRIES ASSOCIATION

U.S. Businessmen Own 21,500 Planes, Now Fly 903-Million Miles Annually

American businessmen have taken to the skies in such numbers that today's fleet of business planes is almost 17 times larger than that operated by the nation's fleet of domestic airlines.

In fact, U.S. businesses own almost twice as many of the big multi-engined transport planes as do the scheduled domestic carriers.

Latest figures show that business planes now number 21,500—of which 2,437 are multi-engined and 19,063 are single-engined.

The sharp rise in use of aircraft by corporations and professional men, as well as by small businesses, has made this type of flying one of the major factors in the U.S. civil aviation picture.

Out-Fly the Airlines

Last year, these planes spent an estimated 6,450,000 hours in the air, covering approximately 903-million miles on business trips. That compares with a total of 525,164,996 plane-miles flown by the scheduled airlines.

Commenting on the rise in use and performance of business aircraft, Joseph T. Geuting, Jr., manager of the Aircraft Industries Association's Utility Airplane Council, recently pointed out:

"Fifteen years ago, before World War II, an average automobile could travel the road at 70 miles per hour; its gasoline consumption was about 18 miles per gallon; it held the road well, started easily and required little maintenance. Today, though design and appearance have changed—more chromium and gadgets, and

some improvements like power steering and power braking have been added, the automobile's basic performance is essentially the same.

Today's Planes Better

"But not so with today's airplanes. They are faster, safer, more economical and more comfortable; and they fulfill more needs due to greater utility and give excellent service with little maintenance.

"A typical business plane is flown 300 hours or more in the course of a year. This would be equivalent to driving an automobile 40,000 or 50,000 miles. About the only cars that are driven that many miles are taxicabs."

How to Stretch The Aircraft Dollar

- A new machine developed by an aircraft manufacturer cuts and sizes 11½-inch lengths of .041 gauge wire at the rate of one per second. A job that formerly took 452 hours can now be done in 18½ hours.
- A major aircraft manufacturer saved \$32,500 through use of a plastic assembly (costing \$30) in place of a sheet metal assembly (costing \$76).
- Use of a commercial putty compound for molding dams when pouring molten metal and plastics in tool fabrication is making possible a savings of more than \$3,500 annually at a Midwest aircraft plant.