



# planes

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## DON'T RISK AIR SECURITY - MAHON

By Hon. George H. Mahon  
Democrat, Texas, Chairman

Subcommittee on Military Appropriations  
U. S. House of Representatives

We are studying the new defense budget critically. We intend to do everything possible to eliminate waste and unnecessary spending and to hold down the cost of defense. At the same time, the Congress has an overriding responsibility to see to it that our national security is not jeopardized.



Rep. Mahon

While we must scrutinize each aspect of national defense in its proper perspective, I believe that our air power program, and I include the Navy air arm, is of particular sig-

nificance in the new budget. Air power is still our first line of defense. This is not to say that I discount the importance of the Army and that part of the Navy which is not associated with the Navy air arm.

However great our reliance upon the atomic bomb, and whatever steps we have actually made toward the so-called "wonder weapons," air power is still the only vehicle which today can carry these weapons of destruction to the heart of the enemy. And air defense is far and away our best hope of softening hostile blows at the heartlands of our country and its allies. As far as we can see into the future, it will continue to be the one essential and deciding force in home defense and in carrying the war to an enemy.

### Russia Outbuilt Us for 5 Years

We have the bitter picture in Korea right now of Red air forces numerically stronger than our

own, and it is clear we cannot rush masses of fighting planes there from bases at home and abroad lest we so weaken our strength as to invite new threats of aggression in other vital spots of our defense position. Meanwhile, we know that behind the Iron Curtain, Russia up to very recently has been turning out modern, high-performance aircraft much faster than the United States. We hope we are now gradually closing the gap. Nevertheless, the planes built by Russia and the United States during the past five years determine the relative air strength of the two nations today.

### Must Anticipate Events

We know, too, that the fighters and bombers we buy this year cannot be built and sent into the air before 1954 at the earliest. Therefore, the reaction of Congress to the budget must be based on anticipating events some two to three years in the future. An im-

portant installment on our insurance against possible overwhelming air attack a few years hence must be bought now!

### The Price of Security

Clearly there can be no meat cleaver economy approach to the question of air power, and I am sure the Congress has no disposition to use such tactics. Unfortunately, the cost of modern airplanes is high. Ways to reduce the price must be sought with greater energy. But if we are going to have air power, we have got to pay a high price for it. This is a part of the price of our quest for security.

One reason our present costs are high is because we are trying to replace some 8,000 obsolescent planes and at the same time provide additional new planes for the expanded program. The very low levels of aircraft production in the postwar years gave us an extreme-  
(See "MAHON," Page 3)

## U.S. Airplanes See Global Use Under Point IV

In South West Asia and the Middle East, American-built aircraft—comparatively new weapons in an age-old war—have joined the fight against the destructive desert locust, a pest which has plagued mankind and his crops since Biblical times.

American planes, in addition, have searched Saudi Arabia's arid regions for new water sources in a water development survey; have conducted aerial mapping projects in the Republics of Liberia and Bolivia, in Africa and South America.

In all, State Department contracts totaling over a half million dollars were awarded private U. S. organizations in 1951 for carrying out aerial projects in six different countries under the Point IV program of technical cooperation.

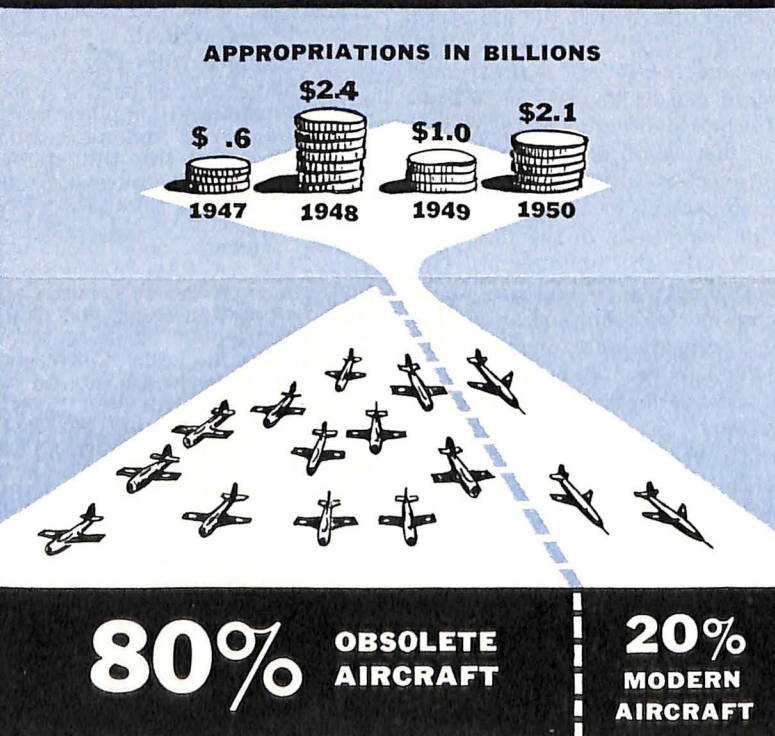
### More Operations in 1952

Spraying-planes, using the new and powerful U. S. insecticide, Aldrin, destroyed locusts on nearly 75,000 acres in Iran, Pakistan and India, saving many valuable crops and preventing further spread of the infestations.

This year, a vital one in the present plague, U. S. Point IV aid will provide 25 small, fixed-wing aircraft and two helicopters for spraying operations in these and other countries in the orbit of the desert locust.

(See "GLOBAL," Page 2)

## WHY THE U. S. IS A SECOND RATE AIR POWER



### U. S. MILITARY AIR POWER 1952

Although Congress appropriated all funds asked of it, meager aircraft procurement funds during 1947 through 1950 resulted in out-of-date U. S. military airpower in 1952. Because of this, 1951 through 1953 appropriations of \$39.7 billions have been requested to rebuild production capacity and create minimum modern airpower by 1956.

"PLANES"

SOURCE: Gen. Vandenberg, USAF Chief of Staff, and Federal Budget

## Extended Plane Parts Delivery Retards Output

During 1951 delivery time for virtually all aircraft parts and raw materials was extended—in some cases more than doubled. The longer time required for the fabrication of these essential items has extended production lead time and has postponed delivery of completed planes.

This delay in deliveries of critical parts is not the fault of the suppliers, but is due to the tremendous increase in requirements of our expanded military aircraft production program, acute shortage of machine tools, scarcity of materials, and lack of adequate priorities to assure a steady flow of these "ingredients of production."

For example, orders for air speed indicators placed in January 1951 could then be filled in five months. Manufacturers must now wait twelve months for the same items. Seven months has also been added to delivery time for electrically-driven fuel pumps since January a year ago.

Other parts selected at random show, for the same period, corresponding increases in delivery time required.

Delivery time for gear boxes jumped from five to ten months; pilot controls from three to eight months; and flame arrestors from four to nine months.

(See "PARTS," Page 3)

## 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

## Aircraft Production to Increase—Despite "Stretch-Out"

By DeWitt C. Ramsey (Admiral, U.S.N., Ret.),  
President, Aircraft Industries Association

Target dates for the air power build-up have been delayed some 18 months. The minimum strength officially pronounced necessary to national security will not be achieved in late 1954, as planned, but in 1956.

These revised goals, which involved a 143-wing Air Force and a proportionate increase in naval air, became public knowledge when Secretary of Defense Lovett and Secretary of the Air Force Finletter so advised a committee of Congress recently. This followed notification to the aircraft industry that its production rates would be slowed to fit the new schedules provided for in the 1953 Federal Budget.

There is no question that this change eases the ultimate burden of the aircraft industry to a considerable extent. To attain the earlier schedules would have required a much heavier draft on the lifeblood of consumer industries — materials, manpower and machine tools. We would have required priorities far higher than any we have had so far. The national policy, founded on the theory that a healthy civilian economy is needed to support rearmament and the maintenance of a large military establishment over an unpredictable number of years, would have had to give way to a serious extent.

The American aircraft industry proved that it could expand rapidly and outproduce the world in warplanes. In World War II the industry's production rose from 6,000 military aircraft in 1940 to 96,000 in 1944, and in effecting this achievement it became the largest industry the world has ever known. But no such record can be imposed on a business-as-usual economy. And, tense as the world situation is today, our leaders see no need yet for the privations that would be inflicted by the staggering debt of an all-out wartime production effort.

But it is important that, in the readjustment of the nation's air power sights, we do not lose sight of the magnitude of the task as it stands. The industry has *not* slowed down; it is still building up. Our production rates are increasing and must continue to increase for at least another two years. Our materials and machine-tool and manpower needs have not slackened. Indeed, they will continue to grow. The bottlenecks which have plagued us in the last year show promise of giving way under increasing production of basic materials and machine tools, but they will recur without the constant vigilance of the industry, the military and the civilian Government agencies.

There is no alleviation in the serious shortage of engineers, of which the aircraft industry has warned again and again. The output of graduates of engineering courses in the colleges and universities is still diminishing, year by year. While the need will not be so great, there will still be an insistent demand for skilled manpower. Before the end of 1952, the total manpower of the industry will increase to about 750,000, as compared to current employment of some 600,000.

So important a readjustment in scheduling, however realistic it may be, cannot help but have some adverse effects. There is certain to be an increase in the unit cost of aircraft, produced in lower monthly quantities. And there will be losses among many subcontractors and suppliers as prime contractors recall some of the production work farmed out in the base-broadening preparation for heavier schedules.

The industry recognizes that the Government is taking a calculated risk in stretching out the air power build-up. It recognizes the economic basis for such a move. It will do everything possible to maintain these new schedules and at the same time prepare itself for greater production, if the march of events should demand it.

## PLANE VIEWS

### HEAT ON HIGH

A NEW HEATING SYSTEM FOR THE USAF INTERCONTINENTAL BOMBER CAN PRODUCE 4 MILLION BTU'S PER HOUR. THIS WOULD HEAT 53 SIX-ROOM HOUSES COMFORTABLY.

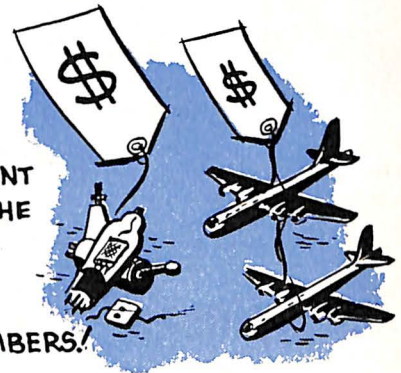


**TOM THUMB RADAR**  
A FIVE-TUBE RADAR AMPLIFIER NO LARGER THAN A CIGARETTE PACKAGE IS THE PRINCIPAL FACTOR IN STEERING ONE MODERN GUIDED MISSILE.



### PRICE TAG ON SECURITY

THE COST OF ELECTRONIC EQUIPMENT ALONE IN SOME OF THE NEW JET BOMBERS IS MORE THAN THE ENTIRE COST OF TWO WORLD WAR II HEAVY BOMBERS!



By Aircraft Industries Association of America

### GLOBAL

(Continued from Page 1)

The planes will be part of a pool of equipment and supplies, available to the Food and Agriculture Organization of the United Nations, which can be moved readily as needed among countries which are infested.

The aircraft pool idea was adopted at the FAO International Conference on Desert Locust Control, convened in Rome last October, and attended by delegates of 13 governments. The Conference agreed that the locust was an international problem and sought means to combat it on that basis.

Locust-spraying operations under Point IV, in 1951, were most extensive in Iran which reportedly suffered its worst plague in 80 years. The U. S. acted promptly on an urgent appeal for assistance from the Iranian government, and spraying was begun about two weeks after the appeal was made.

#### Vast Areas Covered

Over 130,000 square miles of cultivated lands were threatened by swarms of locusts which evaded local ground control efforts to contain them and reached the valuable barley, wheat, date and other crops.

Eight spray-type small planes, tons of insecticide, nine pilots and a mechanic were delivered to Iran by a private U. S. airlines charter service which flew the small planes, disassembled, to Tehran,

then reassembled them.

In all, 18 localities were sprayed in 632 trips by the pilots for a total of 691 flying hours. More than 54,000 acres were sprayed, and locusts were killed on more than 50,000 acres.

The Iranian government provided fuel for the planes and housed and fed the pilots. For the spraying operations and the training of Iranian pilots in locust control, the airlines charter service received U. S. subsidized contracts in the amount of \$213,000.

#### Program Means Good Will

Reporting on the success of the operations in Iran, which he directed, W. B. Mabee, U. S. entomologist, states that aerial spraying with Aldrin has proved a valuable supplement to the long-range locust control program in that country.

He said also that the mission was well received, popular, and has done much to promote good will between our nations. It is believed the aerial spraying projects in three countries last year will generate new markets for U. S. products.

One large aircraft company has a training course in electronics for radio and radar technicians. It runs eight hours a day, five days a week for a total of 600 hours and pays the students \$1.76 per hour to start. Four hundred trainees are needed.

## Air Quotes

"My life has been spent in solving production difficulties and I am not going to quit now. But I wish people would get the idea that, when Congress



Wilson

appropriates money for clouds of jet planes to be directed by electronic elves, you don't order them from a Sears - Roebuck catalogue and expect delivery by return parcel post.

"The Jet Age might be called the high temperature age. This fact very profoundly distinguishes the materials and metallurgical problems that exist today as compared with those that existed during World War II. . . .

"The revolution in aircraft extends not only to the manufacture of jet engines and frames, but to matters of armament and fire control. . . . So, along with the jet engine revolution we have also the electronics revolution. Electronics must find the target, direct the gun and pull the trigger. . . .

"The fact is that the nation is buying an insurance policy. Though the premiums are very heavy, it would be the most tragic kind of folly to drop the policy. We are buying time; I hope and believe we are buying peace; and, in the last analysis, if war should come, we are buying victory. No price is too high to assure those objectives because the alternative is unthinkable."—Charles E. Wilson,

Director of Defense Mobilization, Jan. 28, 1952.

## MAHON

(Continued from Page 1)

ly small industrial base from which to expand. Research and development have outmoded our vast stock of World War II aircraft. It would be the height of folly to rely heavily on the World War II backlog.

### Must Overcome Obsolescence

The old planes, the obsolescent models must be replaced as rapidly as possible.

The Congress, especially the House of Representatives, has consistently supported a strong air power procurement program. Twice it voted even larger funds than had been requested. Its foresight is borne out in the situation we have today. In 1949 some \$700,000,000 voted by Congress for aircraft was not utilized. It was withheld by the budget in an economy move. Yet, had it been used then, the aircraft industry would have been better able to provide the planes and engines we need now. We would have had greater air power in being, and it would have been achieved at less cost to the taxpayer.

### Air Power Needed First

Ironically, air power with its long lead time (the time between the placing of an order and the manufacture and assembly of all the parts) required for the production of engines, airframes, and electronics, is the first military weapon to be committed in any war today. Made up of unbelievably complex mechanisms, it is also subject to the greatest technological obsolescence and, therefore, requires constant modernization, research and development. This is one reason the costs are very high. But we have to pay high costs when the alternative is the possible loss of our national security.

During the past three years, Congress has appropriated some \$25 billion, and we are asked in the 1953 budget for \$14.1 billion more for aircraft procurement.

## Increased Complexity of Today's Planes Requires More Research and Testing



1.4% of total factory space: research and testing laboratory



20% of total factory space: research and testing laboratory

"PLANES"

SOURCE: Typical Aircraft Company

These are large sums, but I for one would not seriously consider reducing the number and quality of the aircraft requested by the services in the current budget.

I cannot see how the funds for aircraft procurement and for air power build-up can be drastically reduced. Since 1940 average wages have doubled, planes have become twice as large and twice as complex, and unit costs have sharply increased. Fortunately, as costs have increased so has our national ability to pay these increased costs. The gross national product last year was \$326.8 billion compared to only \$91.3 billion in 1939.

### Drastic Reductions Unwise

Military strategists are generally agreed that the atom bomb, our air power and our production capacity have been the greatest deterrents to a third world war. But Russia's emergence with numerical air superiority and her known possession of the atomic "secrets" are causes enough for the gravest concern as to the adequacy of our defense preparations. Without supremacy in the air, all our other defense measures would be of minimum value.

### No Security in Bargain Basement

Korea has become a proving ground for Russian air power. We would be foolhardy if we did not recognize fully the enormous capabilities it has demonstrated. In 1941 we were not adequately prepared to strike quickly and decisively at a potential enemy—and we had Pearl Harbor. We dare not sit back complacently and risk an incredibly greater Pearl Harbor, or a series of them, within our own borders.

It is a fact that the threat to our security is immediate and inescapable. Our best hope is in a sustained policy of strength.

My subcommittee is definitely concerned with economy in the defense program. We would like to buy air power more cheaply. We do know that the aircraft industry is steadily developing new techniques, tools and methods to hold down the cost. But the technology and complexity of modern aircraft manufacture, the rapid

## Aerial Applicators Association Formed

Improved agriculture through adaptation of the airplane to its problems is the purpose of the Aerial Applicators Association, recently formed in Oklahoma City as the official organization for aerial applicators in fifteen mid-western states between the Mississippi and the Rockies.

H. E. "Hap" Bollard, pilot, farmer and one-time owner of an aerial dusting and spraying service, has been retained by the association as its paid technical representative. John H. Burke is president of the non-profit organization.

Activities already underway include a survey of known techniques and procedures of operators which will be published when completed. The association also has asked CAA to expand its services for aerial applicators.

Mailing address for the association is: Post Office Box 1002, Oklahoma City, Oklahoma.

## PARTS

(Continued from Page 1)

In January 1951, vendors could deliver exhaust equipment to manufacturers six months after getting an order. Today nine months are required.

Delivery time for hydraulic cylinders has been extended from five to ten months; hydraulic motors seven to ten; and lock bolts from three to five months.

It is expected that "flattening-out" of military plane schedules and added facilities for parts production now being completed will reverse this trend and substantially reduce the length of time now required for these critical aircraft parts.

obsolescence, the unremitting research, and all the other factors in today's cost picture put a high price tag on air power. With the safety of our nation—its very existence—at stake, we can't hope to buy security in a bargain basement.

## PLANES QUIZ

Seventy per cent score on this quiz is excellent. Sixty per cent is good. Answers on Page four.

1. The cost of one "engineering man hour" in aircraft construction was .86 in 1935. Today it is (a) \$2.50; (b) \$3.50; (c) \$4.50?

2. How long has a jet fighter remained in the air without landing: (a) five hours; (b) nine hours; (c) 12 hours?



3. The number of commercial airliner flights made across the North Atlantic Ocean in one year runs above (a) 6,000; (b) 8,000; (c) 10,000?

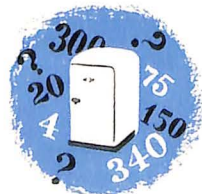
4. What percentage of the North Atlantic commercial flights would you say are made by U. S. air carriers?

5. Currently the most powerful power plant used in a single-stage rocket has (a) 15,000 pounds of thrust; (b) 20,000 pounds; (c) 30,000 pounds?

6. The builder of a modern anti-submarine seaplane purchases com-

ponents and parts from 4,584 subcontractors, vendors and suppliers. By weight, this means that such "outside" firms will produce (a) one-tenth; (b) one-fifth; (c) one-fourth of each airplane?

7. The U. S. Navy has the world's biggest and fastest attack plane operating from aircraft carriers. It weighs more than 25 tons yet can land readily on the deck. True? False?



8. One of the newest U. S. commercial passenger planes has air cooling equipment equal to (a) 140 home refrigerators; (b) 240; (c) 340?

9. A standard troop carrier plane of the USAF can carry 134 fully-equipped troops. True. False.

10. The largest passenger helicopter now flying is (a) eight-place; (b) 10-place; (c) 12-place?

## Amazing Metal May Be Key to Faster Flight

Tomorrow's supersonic aircraft, guided missiles and engines may fly faster and higher because of an amazing metal five times as strong as aluminum, 40% lighter than steel, and capable of withstanding extremely high temperatures.

Research engineers in aircraft plants throughout the nation are investigating the properties of this new metal—titanium—in the constant search for aircraft materials that can maintain strength under the high temperatures of supersonic speeds.

It is still too early to determine titanium's precise applications—but if it can be produced in aircraft quality and at reasonable cost, engineers believe it may well solve some of the biggest problems in current high-speed aircraft and missile design.

### Great Savings in Weight

They believe approximately 8% to 10% may be saved in weight by using titanium alloys in highly-stressed parts such as lower wing skins.

Up to 43% in weight could be saved, it is estimated, by substituting pure titanium for corrosion-resistant steel in firewalls, shrouds, and other non-structural parts. Similarly, titanium alloys could be substituted for low-strength steel fittings, high-strength corrosion-resistant steel sheet or armor plate.

### Ultimate Potentials

One-fourth the present weight could be saved, engineers believe, by using titanium alloys in landing gears, machined forgings, fittings and tubings—as a substitute for highly heat-treated steel parts.

And the metal has virtually unlimited potentialities in the engine field—in turbine blades, for example, and afterburners.

Today, however, world output of the metal is only about 600 tons per year, insufficient for appreciable use by the aircraft industry. Though the world's fourth most abundant metal, it is still scarce because the technique of converting it from ore to usable metal still has not been completely mastered.

### Better Techniques Sought

Big problems still face the aircraft industry before the metal can come into widespread use. Fabrication and forming techniques have to be developed. Additional service experience with present experimental applications is needed. The present low rate of titanium production must be increased. And the high cost of the material must be reduced. (Today, titanium sponge costs about \$5 per pound and titanium sheet about \$25 per pound.)

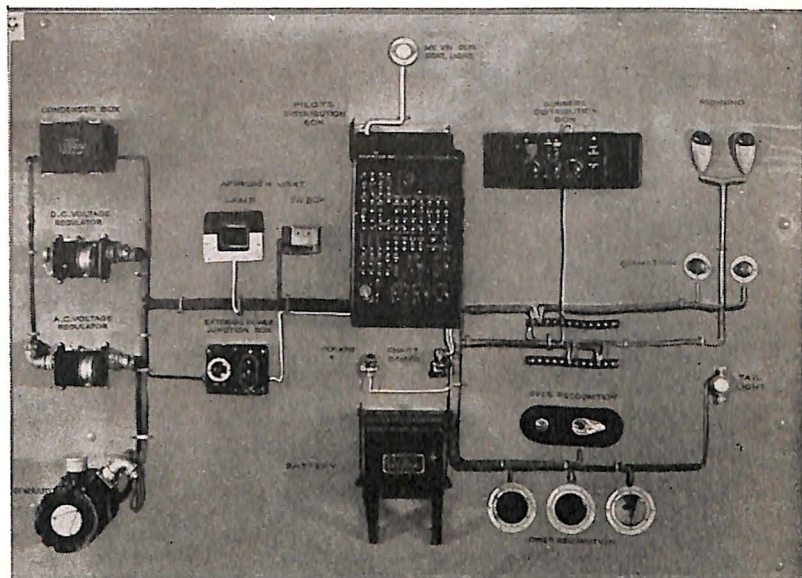
If these problems are overcome—and the industry is working constantly to solve them, while at the same time titanium costs tend to lower as production increases—titanium may well become a key metal of the supersonic age.

## High Performance Planes Require Complex New Systems

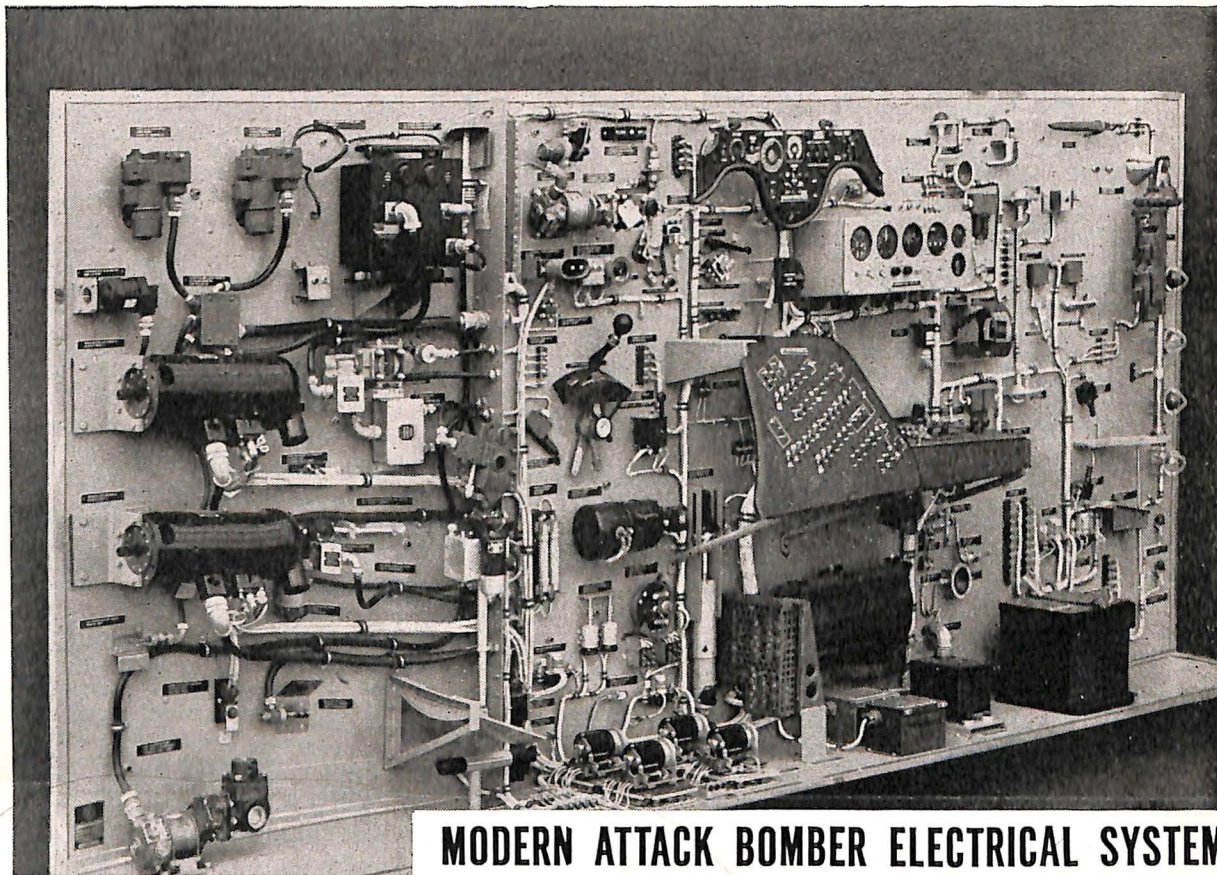
The accompanying photographs graphically show the complexity of one of the major systems in today's high speed, high performance aircraft when compared to its World War II counterpart.

The thousands of additional feet of wire, hundreds of additional instruments, relays, resistors, actuators, generators and other comparable equipment provide greater performance, require longer to build, and increase the cost of today's modern aircraft.

Not only have the requirements of modern aircraft greatly increased the need for improved electrical systems—as illustrated here—but also for hydraulic systems, new bomb release systems, armament systems, electronic systems and various other aircraft components and equipment.



WORLD WAR II ATTACK BOMBER ELECTRICAL SYSTEM



MODERN ATTACK BOMBER ELECTRICAL SYSTEM

## 1951 Aircraft Annual Tells Industry Story

Carrying the longest and most comprehensive report on the industry since it was first published 33 years ago, the 1951 Aircraft Year Book appears this month.

The edition is keynoted with a foreword by Admiral D. C. Ramsey, president of the Aircraft Industries Association.

Chief of the industry problems, he points out and the Year Book documents, were over-optimism in scheduled plane production, material shortages, and gun-and-butter economy.

The Year Book totals 464 pages reporting in detail 1951 aircraft production activities, as well as

those of the airlines, personal aircraft, records and statistics, and biographical briefs. A chapter is devoted exclusively to technical progress.

Produced by the Lincoln Press, Inc., Publishers, 511 11th Street, N. W., Washington, D. C., for the Aircraft Industries Association, the Year Book was edited by Fred Hamlin, Arthur Clawson, Robert McLarren, and Eleanor Thayer. The book sells for \$6.

### Answers to Planes Quiz

- (c) One major manufacturer reports that an engineering man hour, including overhead, now costs \$4.50.
- (c) A jet fighter recently stayed aloft 12 hours and five minutes, refueling four times in the air.
- (c) In 1950 a total of 10,555 commercial flights were made across the

North Atlantic, not including those stopping at Bermuda and the Azores. This is almost 29 per day.

- U. S. airlines flew 50.11% of the North Atlantic flights in 1950. United Kingdom was next with 11.19%; The Netherlands third with 10.54%; France fourth with 8.37%.
- (b) With 20,000 pounds of thrust, a new single stage rocket will be fired this spring and is expected to better the altitude record of 135 miles.
- (c) 25% of this plane (by weight) is sub-contracted.
- True. This plane has two turboprop engines and can carry the atom bomb.
- (c) Equal to 340 home refrigerators. It has a capacity of 17 tons of refrigeration.
- True. It can carry 134 troops and is fully pressurized.
- (c) The largest U. S. helicopter now in use carries 10 passengers, pilot and co-pilot.