



planes

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AIR BUILDUP THREATENED, SAYS FINLETTER

Taxpayers Hit By Stiff Rail Rates On Plane Parts

The nation's defense effort is being penalized by extortionate rail rates designed to give shipping subsidies to non-defense industries.

As a result, American taxpayers—underwriting the present multi-billion dollar defense buildup—are forced to pay exorbitant rates on rail shipments of aircraft parts, guns and parts, military vehicles and explosives.

Out of 261 commodities shipped on the nation's railroads, none have higher freight rates than these four categories of defense goods—all of which ultimately are shipped at the taxpayers' expense with funds appropriated to build America's armed forces.

Under present rates, the railroads earn more than twice as much per car (and 27 times as much per ton) in hauling aircraft parts as they do in hauling other commodities, the plane manufacturers have shown in a case filed before the Interstate Commerce Commission.

Lower Tariffs Asked

Asking for rates commensurate with those charged for other rail shipments, the Aircraft Industries Association points out that excessive freight charges become a part of the high cost of today's military aircraft—and that the money to pay the tariff must come largely from the taxpayers' pockets.

For every dollar of expense incurred by the railroads in hauling (See RAIL RATES, page 2)

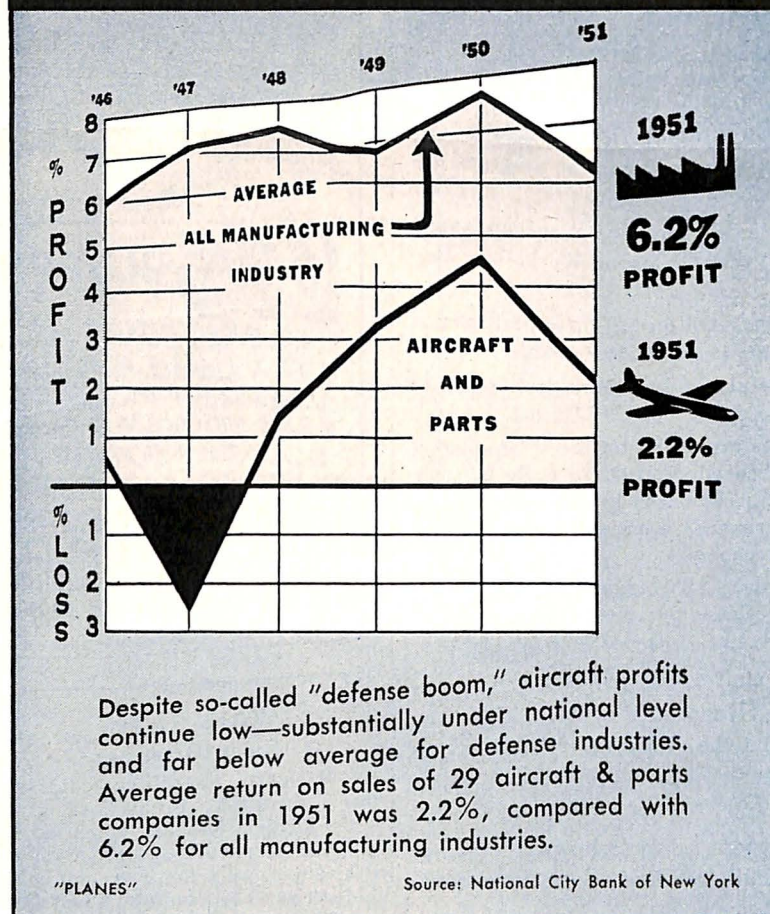
Intelligence Reports Show Heavy Russian Combat Plane Lead

The Soviet Air Force has about 20,000 aircraft in combat units—several thousand more than are in combat units of the U. S. Air Force and naval air arm combined, American intelligence reveals.

This figure does not include an almost equivalent number of Russian aircraft in reserve, nor several thousand more planes in possession of Soviet satellites in Europe.

Moreover, Russia is continuing a great expansion of its long-range air force—planes that will deliver its (See RED AIR FORCE, page 3)

SHARP DECLINE IN AIRCRAFT PROFITS



More Cutbacks Due If Planes Funds Limited

Congressional cuts in Air Force appropriations threaten additional delays in rebuilding America's fighting forces and equipping them with modern aircraft, Air Force Secretary Thomas K. Finletter warned this week.

"There definitely will have to be a cut in the number of ready wings in case of a reduction in the appropriations; this point I want to emphasize," the Air Force official said on a national broadcast sponsored by the American Legion.

Mr. Finletter subsequently said that limitations on military spending during fiscal 1953 would stretch out the program even further. He referred to recent House of Representatives' action which placed a ceiling of \$46 billion on fiscal 1953 expenditures and reduced aircraft procurement appropriations by \$710 million. The measure now awaits Senate action.

Program Already Cut

Referring to the fact that Air Force plane schedules already have been cut-back sharply, Secretary Finletter said the recent production "stretch-out" was caused by budgetary limitations. Air Force planners were forced to change plans to build 1,250 planes per month in September, 1953, "because the money would not be available to buy more than 950."

If appropriations are cut by Congress, he said, Russia's plane production lead can be expected to continue for a longer time. The date on which America will equal Russia's warplane output "depends very largely not so much on our productive capacity, which is very great although not being fully used, but rather on the amount of money we get to buy the planes," the Secretary reported.

Delays Still Possible

He emphasized that the present air buildup is not occurring under conditions of full mobilization. "This is not an all-out war where you go out to produce everything you can," he said. "This is something which is limited by appropriations."

"You very often hear the question, 'Why, with all those appropriations we got in fiscal 1951 and fiscal 1952, aren't the planes coming (See FINLETTER, page 3)

Aircraft Profits Drop Sharply In '51; Stay Far Below National Level

Despite the so-called defense "boom," profits in the aircraft and parts industry dropped precipitously in 1951, falling substantially below national averages for both civilian and defense industries, according to the National City Bank of New York.

After taxes, materials, labor and other costs were paid, aircraft manufacturers averaged only 2.2c from each sales dollar for purchase of new machinery, expansion of plant facilities, research and development, and dividends to thousands of stockholders. This 2.2c (less than half the previous year's figure) compares with 6.2c for all manufacturing industries.

National City Bank reports that 29 representative aircraft and parts companies had net earnings (after

taxes) of \$57,560,000 in 1951—a drop of 32% or approximately \$27 million from 1950.

All U. S. manufacturing industries reported an average of 14.4% return on net assets during 1951, while aircraft and parts averaged 8.9%. The aircraft industry ranked 23rd among U. S. industries in terms of net assets, but was 42nd (among 46 industries surveyed) in percentage of return on net assets.

This same low ranking applied to percentage of profits compared with total sales. In this category, only two U. S. manufacturing industries (both producers of "soft" goods) ranked lower than the aircraft and parts industry.

In compiling its report on the 46 U. S. industries, National City Bank surveyed 1,763 companies.

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.

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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

'Potential' Production Cannot Win A War

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

Twenty-two months ago, hostilities began in Korea. Fifteen months ago, the scope of U. S. industry effort in the military rearmament program was outlined.

Special emphasis in this buildup was on expansion and modernization of our air forces which—in the "economy" years following World War II—were permitted to become obsolescent.

Communist pressures have continued unabated during these past months while truce talks in Korea have reached one impasse after another.

In the face of these facts, how successful has been America's effort to re-equip its air forces? And where do we stand today?

Initially, the aircraft industry began its expansion toward a production rate of 2,300 planes per month to be reached late in 1952 or early in 1953. This expansion had not progressed very far, however, before there were a series of schedule reductions, resulting primarily from the conflicting demands of defense needs and the civilian economy.

These cutbacks culminated in December, 1951, when the then-going schedule for reaching an output of 1,800 planes per month in September, 1953, was reduced to a rate of 1,250 planes to be reached at that time.

In recent weeks, the House of Representatives has proposed a "ceiling" on defense expenditures for fiscal 1953. If approved by the Senate, the effect of this action would be to stretch out the previously "stretched-out" air rearmament program. It would further reduce or delay the planned military plane production peak.

In other words, instead of having a modern air force in *early* 1956, we would be unable to equip such a force until *late* 1956—some three years later than contemplated under earlier schedules.

The present buildup has been far different from that in World War II, when all Governmental energies were directed to breaking bottlenecks. Today we lack the overriding priorities of all-out war. When bottlenecks have occurred, production schedules have been tailored to fit going production rates. There have been no fixed schedules establishing minimum defense needs.

In fiscal 1951 and 1952, some \$30 billion have been appropriated for aircraft procurement. This sum is equivalent to about 20,000 warplanes. But in all probability, not more than 500 planes provided for by this money have been delivered to date, of which only a relative few are combat types. The combat planes built since Korea were bought from funds appropriated before hostilities broke out; and these funds did not support the aircraft production levels which would equip the forces now required.

It is important that the American public recognize that three or four years are required to translate appropriations into fighting aircraft. Unless adequate appropiations are made years in advance of anticipated needs, and provisions made for priorities to meet established schedules, a future war could be lost before America's tremendous industrial potential could be mobilized.

In this atomic air age, the ability of the aircraft industry to produce 15,000 planes during the first year of an all-out war is more important to America's security and survival than is the aircraft industry's potential ability to turn out 150,000 planes per year after a substantial period of time has elapsed.

PLANE VIEWS

'HOPPER STOPPER'

SPRAYING POISON BRAN ON 2,700,000 ACRES OF WESTERN RANGE LANDS, AIRPLANES KILLED ENOUGH GRASSHOPPERS IN TWO WEEKS TO WEIGH 175 THOUSAND TONS. PILED UP, THEY WOULD FILL AN AVERAGE CITY BLOCK TO A HEIGHT OF 400 FEET!



175 THOUSAND TONS!

AIR SAFETY

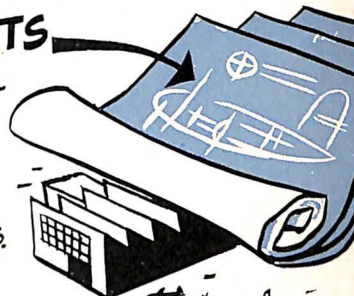
A LEADING LIFE INSURANCE COMPANY QUOTES THE FOLLOWING EXTRA PREMIUMS PER \$1,000 OF INSURANCE:

AIRLINE PILOT....\$2.50
HOUSE PAINTER...\$2.50
BRIDGE PAINTER...\$5.00
RAILROAD DETECTIVES AND WATCHMEN...\$5.00



BIG BLUEPRINTS

AN EAST COAST AIRCRAFT FIRM USES ENOUGH BLUEPRINT PAPER EVERY YEAR TO COVER EVERY SQUARE FOOT OF ITS FLOOR SPACE THREE TIMES. THE PAPER WEIGHS AS MUCH AS FIVE FULLY LOADED TWO-ENGINED TRANSPORT PLANES.



By AIRCRAFT INDUSTRIES ASSOCIATION OF AMERICA

RAIL RATES

(Continued from page 1)

aircraft parts, the rail companies today make a profit of \$1.60. This financial penalty imposed on defense shipments serves to subsidize abnormally low rates for other industries. For example, under present rate schedules, wine can be shipped by rail at less than actual transportation costs. Soft drinks can be shipped for 78% of actual cost, breakfast foods for 85%, crude petroleum for 66%. Although farmers pay 133% of transportation costs in shipping wheat to market, millers after converting the wheat to flour pay only 74%.

Industry Cutting Costs

Purpose of the present case filed by the Aircraft Industries Association before the ICC is to compel the nation's railroads to abandon their practice of penalizing defense shipments and subsidizing non-defense shipments, by forcing the taxpayer to pay "doubled" freight rates. The suit was filed as part of the aircraft industry's long-range cost-consciousness and cost-reduction program. It has been pointed out that these unusually high rates prevail at a time when Congress, the military services and the aircraft industry are attempting to cut all military costs to the minimum.

The AIA said in a brief filed recently before the ICC:

"It is declared by Congress to be the National Transportation Policy 'to provide for fair and impartial regulation of all modes of transportation subject to the provisions of this Act, . . . to encourage the establishment of reasonable charges for transportation services . . . adequate to meet the needs of the Commerce of the United States . . . and the National Defense.'

'Rates Without Parallel'

"The evidence in this case shows the extremely high rates imposed on the transportation of aircraft parts, rates without parallel for the volume of traffic involved. Earnings on cars with only *three tons* of aircraft parts for hauls approximating or exceeding the national average reflect car mile earnings far in excess of that for all freight loaded *with 40 tons* of commodities. Railroads in assessing such charges cannot in reason be said to be meeting the needs of the national defense.

"It is clear that the ratings in the classification under attack here contravene the National Transportation Policy."

Tool engineers for a major aircraft manufacturing company have designed a milling machine which reduces manhours expended on a single operation from 44 hours to only seven minutes!

Atomic-Powered Plane Could Circle Earth 80 Times on One Pound of Fuel

Atomic-powered airplanes which, conceivably, might beat the clock—fly around the world at local midnight—and complete the circuit 80 times on one pound of fuel, are being developed by two airframe and two aircraft engine manufacturers, each pair working jointly.

Details are veiled by a "top secret" classification, but the program, known originally as NEPA—Nuclear Energy for the Propulsion of Aircraft—has now progressed well beyond the theoretical phase. Work is actually underway on a nuclear-powered aircraft engine and atomic airframe under development contracts awarded by the Air Force and Atomic Energy Commission.

General Hoyt Vandenberg, Air Force Chief of Staff, has stated that atomic flight is closer than most persons realize.

Could Fly for Days

The far-reaching implications of an atomic airplane, besides those already mentioned, are that it could stay aloft for many days; could fly at maximum speed at a given altitude for its entire mission. This is all predicated on the relatively low fuel supply which would be required.

One pound of Uranium-235 on undergoing fission gives off heat equivalent to the energy liberated by burning 1,700,000 pounds of gasoline. Thus, when nuclear energy can be converted into thrust, aircraft fuel consumption will be measured not in thousands of pounds per hour, but in pounds per day.

An airplane which could encircle the earth under cover of darkness represents a distinct advantage over modern-day bombers. Any target would be within easy reach, and

night flying confers lower vulnerability.

Development of materials capable of withstanding the intense heat and the dangerous radiation produced by a nuclear reactor has been a formidable problem in building an atomic powerplant. Construction of the airframe has been complicated by the great weight of a shield that must be installed to protect the crew.

Proposed Powerplants

Many types of powerplants have been proposed to harness nuclear energy to propulsion machinery, including a turbo-jet engine in which the reactor would replace the combustion chambers, and a ram-jet with similar substitution of a reactor for the combustion apparatus.

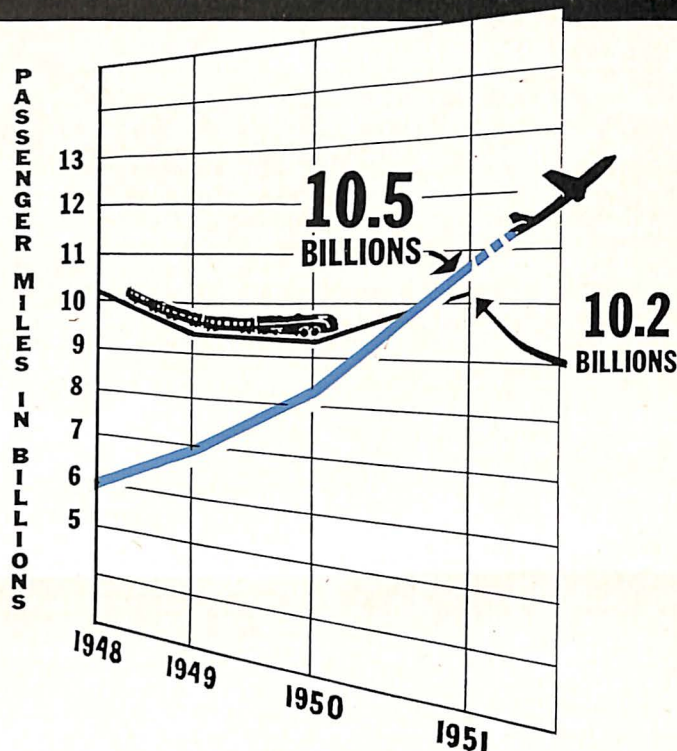
In all cases, except that of the ram-jet and other air cycles, it is required that the heat be transported from the reactor to propulsion machinery in a coolant. Ordinary lubricants cannot be used because radiation causes them to deteriorate or solidify.

It is probable the first atomic aircraft will be a sizable one, perhaps a redesigned bomber. The great weight of the shield required has been estimated from 50 to 100 tons. This might be balanced off against the chemical fuel load normally carried by the bomber.

The fuel loads of modern aircraft range up to the neighborhood of 75 tons or more. Redesigning of the bomber as an atomic plane must allow for the concentrated weight of the shield and the nuclear engine at one point in the airframe.

Air Force and industry officials alike still decline comment on when an atomic plane may become reality, but steady progress in this direction can be reported.

AIR TRAVEL EXCEEDS FIRST CLASS RAIL



AIRLINE TRAFFIC in passenger miles exceeded first-class rail traffic for the first time in 1951. Scheduled U. S. domestic, territorial and feeder airlines flew 10,556,139,000 revenue passenger miles last year, while parlor and sleeping car traffic on class one railroads totaled 10,225,525,000 revenue passenger miles.

"PLANES"

SOURCES: Interstate Commerce Commission
Civil Aeronautics Board

PLANES QUIZ ✈️

Seventy per cent score on this quiz is excellent. Sixty per cent is good. Answers on Page 4.

- More than 25,000 tools are required for the manufacture of a current light jet bomber. Of this total, sub-contractors, essential members of the aircraft production team, will furnish (a) one-seventh; (b) one-third; (c) one-half?
- Today's military aircraft require tremendously large quantities of parts which must be assembled in hundreds of factories. One U.S. production jet-bomber requires over 50,000 individual parts. True? False?
- Advances in the crucial field of jet fuel supply have raised the percentage of a barrel of crude oil that is usable fuel from 6% to about (a) 10%; (b) 26%; (c) 50%?
- A new method for warming engine oil has cut warm-up time for aircraft in sub-zero temperatures from four hours to about half an hour, even at 65 degrees below. True? False?
- Some 30-odd instruments are included in the pilot's compartment of a



typical USAF fighter today. The Wright Brothers' flying machine which first flew in 1903 had only a fraction as many. Is the fraction (a) one-tenth; (b) one-seventh; (c) one-fifth?

- A light jet bomber recently flew the Atlantic in the record time of 4 hours, 18 minutes, averaging 481.12 miles per hour for the trip. This is nearly five times faster than Charles Lindbergh flew across 25 years ago. True? False?
- How many metropolitan areas are certificated for transportation of passengers and mail by helicopters?
- The number of fatalities per 100 million passenger miles of scheduled



- Does any U. S. college or university teach airline operations by actual operation?
- Modern jet fighters fly four times as high as did single-place warplanes at the outset of World War I. True? False?

airline flights in 1951 decreased from 1938 by (a) 75%; (b) 50%; (c) 25%?

FINLETTER

(Continued from page 1)

off production lines in great numbers?" the Secretary said. "That question usually carries with it somewhat of an implication that the aircraft industry is not up to what it should be.

"Well, I want to make it entirely clear that there is no justifiable criticism of the aircraft industry.

"The point is that you can't get planes until you order them and you can't order them until you've got the appropriations."

Because of the long lead-time required in aircraft production, he said, appropriations made after the Korean war began cannot be expected to result in a substantial flow of military aircraft until about January, 1953.

RED AIR FORCE

(Continued from page 1)

A-bomb. Several hundred TU-4's—improved adaptation of a U. S. World War II bomber—are now at the Reds' disposal.

Even more sobering is the fact that a bomber of original design, reportedly having intercontinental capabilities comparable to the largest U. S. bomber, has been observed in flight over Moscow.

During the past six years, Russia's aircraft production has exceeded by several times production of U. S. military planes.

"Sandwich" Research To Aid Plane Makers

The constant demand for more rigid and yet lighter aircraft, capable of even faster speeds and greater performance, is focusing increased attention by the military services and the aircraft industry on sandwich construction.

Bonded parts weigh less than solids, and research and development in this field is steadily improving the strength characteristics of sandwich materials. Sandwiches can be substituted for critically short materials in some cases.

Seventeen research and development projects are now planned by the Forest Products Laboratories, Madison, Wisconsin, with top priority on quality evaluation of sandwich parts by nondestructive tests, and design curves for sandwich construction.

FPL proposes to undertake these projects based on expressions of the Air Force-Navy-Civil 23 Panel, a federal aeronautical group concerned with the use of bonded parts in airframes, and on priority ratings fixed by the aircraft industry, through the AIA Research & Testing Committee.

Other of the projects receiving high preference include a study of the advantages of high peel strength adhesives; a survey of limitations of current metal bonding adhesives; and development and evaluation of a high temperature resistant laminating resin.

Plane Builders' 'Grass-Roots Economy' Saves Taxpayers Millions of Dollars

Savings to American taxpayers through cost-reduction efforts by aircraft manufacturers have far exceeded expectations of the Aircraft Industries Association, which recently undertook a survey of economy methods now being practiced by the aircraft industry.

These savings amount to "hundreds of millions of dollars," according to Adm. DeWitt C. Ramsey, president of the AIA.

A recent nationwide check by the Association reveals that cost-reduction efforts extend to all phases of aircraft design and manufacturing—engineering, tooling, production, manpower and new invention. A philosophy of "grass roots economy" has resulted in broad-scale cost-consciousness from top echelons to the production lines.

Industry Works With AMC

The aircraft industry, in continuing its strong emphasis on cost reductions, is collaborating closely with the Air Force's Air Materiel Command. Lieut. Gen. E. W. Rawlings, commanding general of AMC, is known for his vigorous economy measures and has undertaken a broad program both in industry and in the AMC in an effort to obtain the largest possible return for the air procurement dollar.

The AIA survey shows that one aircraft manufacturer reduced by more than 100% the selling prices on certain major military items in the past four years, a period during which materials and manpower costs skyrocketed and the general level of prices over the country rose sharply.

Another plane builder saved the Government \$17 million by instituting an intensive employee-suggestion system. This same manufacturer was able to cut manhours on a current production aircraft by more than 66%.

Parts Prices Reduced

An aircraft components manufacturer reduced prices on jet engine parts by 50% in the years since 1946, with 10% reduction coming since the Korean War started. This

Answers to Planes Quiz

- (c) Subcontractors are making about 13,000 tools of the total required.
- True. A total of 52,000 parts are required.
- (c) 50% with further increases to come. Improved distillation processes are responsible.
- True.
- (a) The Wright Brothers flying machine had three instruments, including a stop watch.
- True. Lindbergh averaged about 100 miles per hour in the "Spirit of St. Louis."
- Two. New York and Los Angeles.
- (a) The number decreased from 5.2 fatalities in 1938 to 1.3 in 1951.
- Yes. Purdue University's Air Transportation course is unique among world colleges. Practical training is given students at the school's own airport, operated on a full-scale basis with a fleet of 14 airplanes.
- True. At the outset of the first world war, single-seat airplanes had a ceiling of 12,000 feet. Today's fighter aircraft fly at altitudes over 45,000 feet.

was accomplished in the face of a 54% jump in materials prices and a 63% rise in wage rates.

Last year on the West Coast alone, aircraft manufacturers saved the military services \$30 million in production costs by using improved materials conservation methods.

The AIA survey indicates that the industry's efforts to reduce costs have resulted in constant additions of new and more efficient facilities throughout the country. Obsolete equipment is being eliminated, existing machinery and tools modernized and overhauled, and more economical tooling installed.

Emphasis on Cutting Costs

Throughout the industry, emphasis is placed on review of methods and procedures applicable to engineering, machining and assembly labor. Plant layouts, manufacturing processes, possibilities of replacing critical or expensive materials, parts simplification—all are under study in efforts to give the Government a maximum return for the air procurement dollar.

Commenting on the industry's cost reduction efforts, Admiral Ramsey said:

"Without these efforts aimed at cutting costs and increasing efficiency, aircraft manufacturers and, indirectly, the military services would have suffered greatly from the economic effects of inflation, low and erratic rates of production, and the hazards of developing and producing complex equipment to the most rigid specifications."

Other Cost Factors

The AIA president pointed out that factors beyond the manufacturers' control have operated to place in obscurity the cost reduction accomplishments of the aircraft industry.

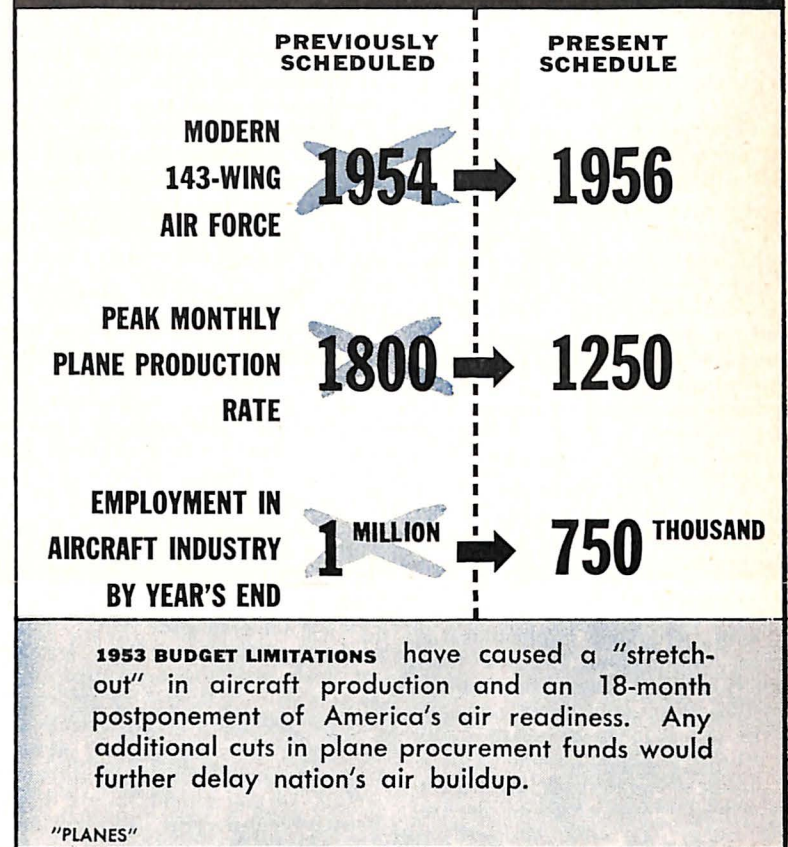
Among these outside influences, all tending to push costs higher, he cited the fact that performance requirements for aircraft have increased tremendously since the end of World War II. Inflation has taken a large bite of the procurement dollar. Low volume has pushed costs higher. Delays in receipt of Government-furnished equipment have forced costly production halts.

Admiral Ramsey added that other factors tending to increase costs include (1) frequent design changes, (2) materials shortages, (3) bottlenecks in machine tools, (4) Government controls and requirements, (5) shortages of skilled manpower and engineers.

"Each of these factors has added an increment of cost," Admiral Ramsey reported. "Even vast savings are overshadowed by the tremendous pressures adding to overall aircraft costs."

"Today, however, the military services are getting more effective air power for their procurement dollar than ever before in history. The aircraft industry's cost reduction programs add immeasurably to the efficiency of the defense production effort and to the purchasing power of the taxpayer's aircraft procurement dollar."

AIR BUILDUP POSTPONED



Amazing Electronic Midget Promises New Advances in Aircraft Equipment

Discovery of the transistor—tiny, simple, yet astonishing new amplifier—promises considerable relief from the bulky burden of ever-increasing electronic equipment required for aircraft and guided missiles.

This electronic midget—the latest model is half the size of a pea—performs many of the functions of vacuum tubes and is more versatile. As a result, future planes and missiles may carry electronic equipment now too heavy and fragile.

Use Less Current

Unlike the vacuum tubes they eventually will replace, transistors do not need power for heating filaments. Consequently, they use much less current and generate very little heat. No cooling system is required to compensate for their heat.

Because they are solids, transistors can withstand much greater shock and vibration than vacuum tubes which, like the ordinary

electric light bulb, use glass to seal in a filament. Filament failure has been a major cause of vacuum tube unreliability.

The transistor was developed by Bell Telephone Laboratories in 1948. The original device, known as a "point contact" transistor, consists essentially of two hair-thin wires resting on a tiny speck of germanium, a semi-conducting metallic element.

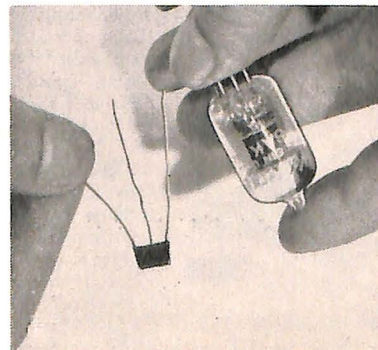
Nearly Ideal Amplifier

These point contacts correspond to the terminals of a vacuum tube, but there is no glass envelope, no vacuum and no heating element to cause warm up delay. The whole apparatus is housed in a metal cylinder about the size of a .22 calibre shell.

Meanwhile, Bell Laboratories have developed an improved device, the "junction-transistor," which is described as a nearly ideal amplifier for very low power applications. It has no point contacts, but instead, consists of a tiny rod of germanium, so treated that it embodies a thin electrically positive layer sandwiched between two electrically negative ends.

This new form of transistor is capable of amplifying 100,000 times. It occupies about 1/400 of a cubic inch, in comparison with a typical subminiature vacuum tube, which occupies about 1/3 of a cubic inch. It consumes far less power even than the older type.

The Defense Department's interest in the transistor was demonstrated last October when the Research and Development Board announced formation of a group to study its development and applications to the Armed Services.



The transistor, dwarfed even by a miniature vacuum tube, does about same job.