



planes

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CIVIL AVIATION HAS BIG ROLE IN DEFENSE

Major Powers Of World Turning To New Jet Aircraft

The world's major air powers are rapidly converting to jet-powered fighters and most have placed jet bombers into production.

This means the speed of combat aviation is roughly 200 mph greater than it was in World War II. The U. S. is building its air power to meet or surpass possible jet opposition.

Current fighter aircraft orders for the U. S. Air Force and the Navy air arm, including the Marines, are almost exclusively for jets. Although not generally realized by the public, Air Force fighter orders during fiscal years 1949 and 1950 also were 100% for jets. During fiscal 1949 and 1950, Navy orders for fighters were approximately 90% for jet propelled types and for fiscal 1951, based on information currently available, jets comprise 100% of the orders.

U. S. Types in Service

The Air Force has in service four jet fighter types and one jet bomber. Deliveries are beginning on another jet fighter and another jet bomber. The Navy air arm is equipped with six different types of jet fighters, and an additional type is now in production.

As far as is known, no new types of fighters or bombers on American design boards employ reciprocating engines—all are jet or turbo-jet types.

How the same trend is evident in foreign countries is shown by a compilation of the known types of other military or potential military powers:

Russia Hikes Production

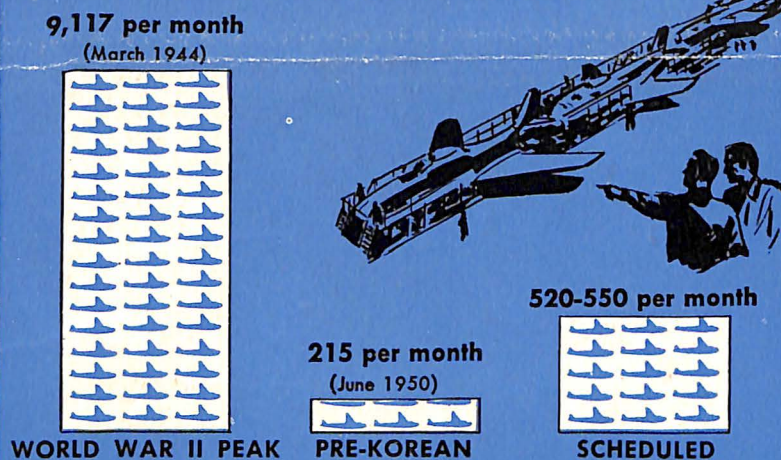
Russia—While information on Russian developments is extremely limited, at least five types of jet fighters are known to be in service or in production and several jet bombers have been reported. Among jets identified with the Russian air force are the Mig, the Yak 15 and Yak 17, in the fighter categories, and the Ilyushin four-jet bomber and the Tupelov twin-jet bomber. Other bomber and fighter designs have been reported. Recent information indicates that production of Russian jet fighters has been stepped up to the rate of 10,000 per year. (This compares with the U. S. pre-Korean rate of approximately 2,500 a year of all military types.)

Great Britain—Among jet fighters the Vampire, the Sea Vampire,

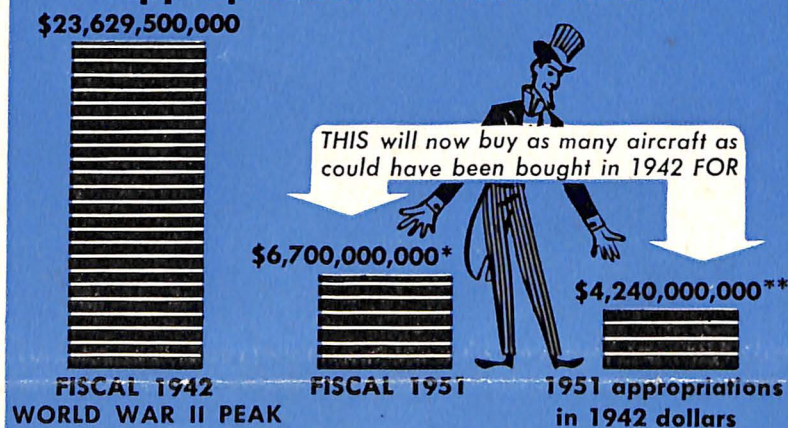
—See NEW JETS page 4—

The New Aircraft Production Program COMPARED WITH WORLD WAR II PEAK

Rate of Aircraft Production



Appropriation for New Aircraft



*Does not include Army and MDAP.

**Based on 1942 BLS Industrial Prices Index of 95.5 and July, 1950, Index of 150.7.

"PLANES"

Stepped Up Aeronautical Research Pushed By U.S. Aircraft Industry

Aeronautical research, widening at a constantly accelerated pace in recent years, has become such an important part of the aircraft industry as to place it—in the concept of ability to maintain adequate national defense—on a par with American manufacturing ability itself.

A review of the annual reports of the major aircraft manufacturers discloses that virtually all of them have stepped up specific research activities from 20 to 40% during the past two years, in terms of both expenditures and

manpower assigned to the task. Aircraft firms literally comprise one of the nation's front lines of researchers.

A sizeable percentage of present-day aeronautical research is being invested in special weapons—pilotless aircraft, guided missiles, rocketry, electronics devices, servo-mechanisms.

A large portion of the research work and the cost of special equipment and facilities is financed by the aircraft companies themselves, both in the improve-

—See RESEARCH page 4—

Full Recognition By Government In War Plans Needed

By
Rep. Lindley Beckworth
Democrat, Texas, Chairman
Transportation Subcommittee, Interstate
and Foreign Commerce Committee

Civil aviation, which prior to World War II was only a promising infant, stands ready in the current emergency to serve as an integral part of our vital transportation system. The radically-increased contribution civil aviation now is making to our defense effort should, accordingly, receive adequate recognition in our economic and military planning.



Rep. Beckworth

The increased stature of civil aviation is exemplified first by the airlines. Before World War II, they operated less than 400 aircraft and carried less than two million passengers annually. Now more than a thousand much larger aircraft fly the airlines and carry 15 million passengers annually. Air transport is unquestionably vital to defense.

The growth in non-scheduled aviation is even more striking. Before World War II, feeder airlines, charter and cargo operations were virtually non-existent. Now they give employment to thousands.

Personal aviation before 1940 was largely a luxury or sport. Its main function in the national defense was to contribute to pilot training. Now there are more than 30,000 aircraft owned and operated by corporations, business firms, ranchers and farmers plus another 30,000 used for training, charter service and for pleasure. More than 5,000 fixed-base operators provide employment for some 32,000 persons.

Recent government and industry publications have listed more than 100 individual and separate industrial uses for personal aircraft. Non-scheduled aviation, particularly privately-owned aircraft, unquestionably has become a major component of the country's transportation system. This has been brought out very forcibly in the comprehensive report entitled *America's Civil Air Power* prepared for the administrator of the Civil Aeronautics Administration by his Aviation Development Advisory Committee.

—See CIVIL AVIATION page 4—

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

Problems of a Partial Mobilization

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

Many of the problems confronting the aircraft industry during the next several months stem from the fact that we as a nation are engaged in only a partial, and not in a full-scale, mobilization effort. The acute national concern over the situation in Korea tends to divert attention from the relatively limited magnitude of our defense program. Moreover, the establishment of the new economic controls—although they, too, are of relatively limited scope—likewise creates an impression that full-scale mobilization is underway.

However, many criteria clearly show the limited nature of our current production and mobilization programs. The appropriations for aircraft procurement, shown elsewhere in this issue, afford one measure. The peak rates of production to be reached under the present program some two years from now are only about 1/15th of those attained in World War II. Officials of the defense establishment have stated that, barring a further serious deterioration in the world situation, plans do not contemplate the reactivation of currently-idle World War II aircraft production plants. The Administration has announced that there will be no wage or price ceilings instituted for the time being. An intention to rely upon voluntary allocations and a limited system of military priorities rather than any comprehensive or all-inclusive controlled materials plan such as was found necessary in World War II has been clearly indicated.

This limited or partial mobilization makes for a number of difficult problems for the aircraft industry in meeting its current production assignment. Most mobilization plans, including those developed by the Munitions Board, the National Security Resources Board and the industry itself, envision all-out, full-scale mobilization for global war. Obviously, time has not been available to the agencies concerned to design, develop and finalize policies and procedures tailored to fit the peculiar requirements of partial mobilization.

Aircraft manufacturers endeavoring to expand their production have encountered difficulty in getting needed prompt deliveries of aluminum, steel, machine tools and other critical components and parts. Whether this situation will become sufficiently serious to necessitate the imposition of mandatory priorities, and even a controlled materials plan, is something that cannot now be foreseen.

Reflecting the effects of the new wave of wage increases and other factors, the costs of a large number of components utilized in aircraft manufacture have increased from 5% to as much as 40% since July 1. Such cost increases may force the Air Force to ask for another supplemental appropriation, according to Undersecretary McCone.

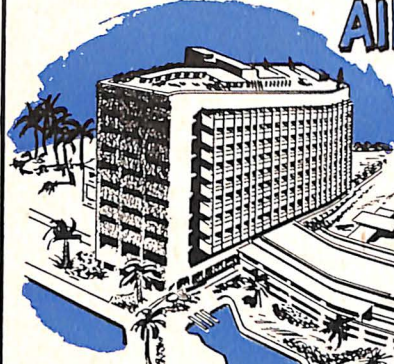
In the field of manpower, no controls over wages, salaries or hiring are planned for the present. The aircraft industry, therefore, will have to compete for the skilled employees it must recruit in the months ahead with producers of civilian goods now operating at record levels and currently engaged in placing into effect "a fifth round" of wage increases.

The industry is, of course, actively producing transport, personal aircraft and helicopters for the civilian market. While some of our military contractors have found numerous suppliers unable to fill military orders because of booming civilian demand, other producers of commercial craft are often told that military needs have absorbed the materials and components desired for transports and personal planes.

Scarcely any of the problems cited would occur in the form described under an all-out mobilization with curtailed production of civilian goods such as took place during World War II. Yet, every one of

PLANE VIEWS

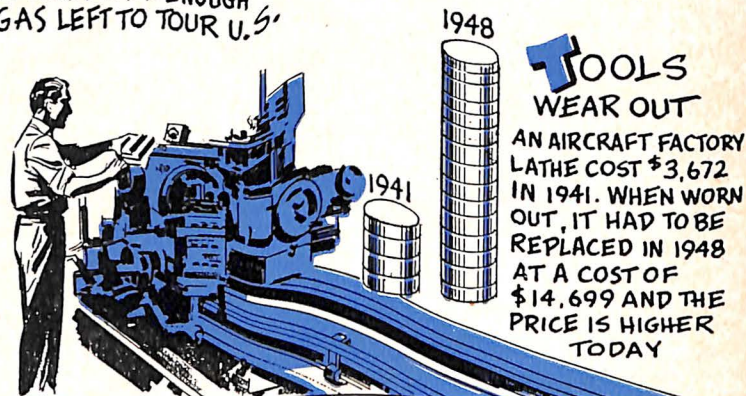
AIRBORNE HOTEL



EVERY STICK OF FURNITURE IN THE CARIBE HILTON HOTEL WAS FLOWN FROM NEW YORK TO SAN JUAN... TO SAVE ON TIME, CRATING, AND BREAKAGE.

(Nine hrs. by air, three days by ship)

21,016 GALS. OF GASOLINE IN A BIG U.S. BOMBER'S WING TANKS WOULD SEND AN AUTOMOBILE AROUND THE GLOBE 16 TIMES WITH ENOUGH GAS LEFT TO TOUR U.S.



1948

TOOLS WEAR OUT

AN AIRCRAFT FACTORY LATHE COST \$3,672 IN 1941. WHEN WORN OUT, IT HAD TO BE REPLACED IN 1948 AT A COST OF \$14,699 AND THE PRICE IS HIGHER TODAY

1941

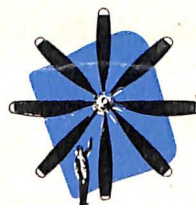
BY AIRCRAFT INDUSTRIES ASSOCIATION OF AMERICA

"PLANES"

PLANES QUIZ ✈️

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

1. American air carriers are now authorized to serve (a) 150 foreign cities; (b) 239; (c) 310?



2. The world's largest propeller has a diameter of (a) 15 feet; (b) 19 feet; (c) 24 feet?

3. The record flight for a U. S. turboprop aircraft is (a) four hours; (b) six hours; (c) eight hours?

4. Fuel consumption of a jet engine at sea level is about three times that at 30,000 feet at a given rpm. True? False?

5. Since 1939 average hourly labor rates in the aircraft manufacturing industry have increased (a) 60 per cent; (b) 87 per cent; (c) 106 per cent?

6. Although the principle of jet en-

gine operation is simple, some types have as many as (a) 65 accessories; (b) 96 accessories; (c) 109 accessories?

7. Bombs can be dropped safely and accurately at aircraft speeds of over 500 mph. True? False?



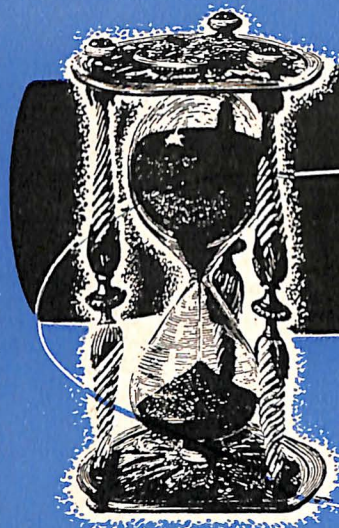
8. Freight carried by air increased during the past 10 years by a greater percentage than all other types of freight transportation increase combined. True? False?

9. Aircraft factory floor space needed for the expanded production program will be only (a) one-fourth, (b) one-third, (c) one-half of the World War II peak?

10. Smaller U. S. communities are now served by a total of (a) eight, (b) twelve, (c) sixteen "feeder" airlines?

these problems promises to increase the cost of aircraft or seriously to delay scheduled production or both.

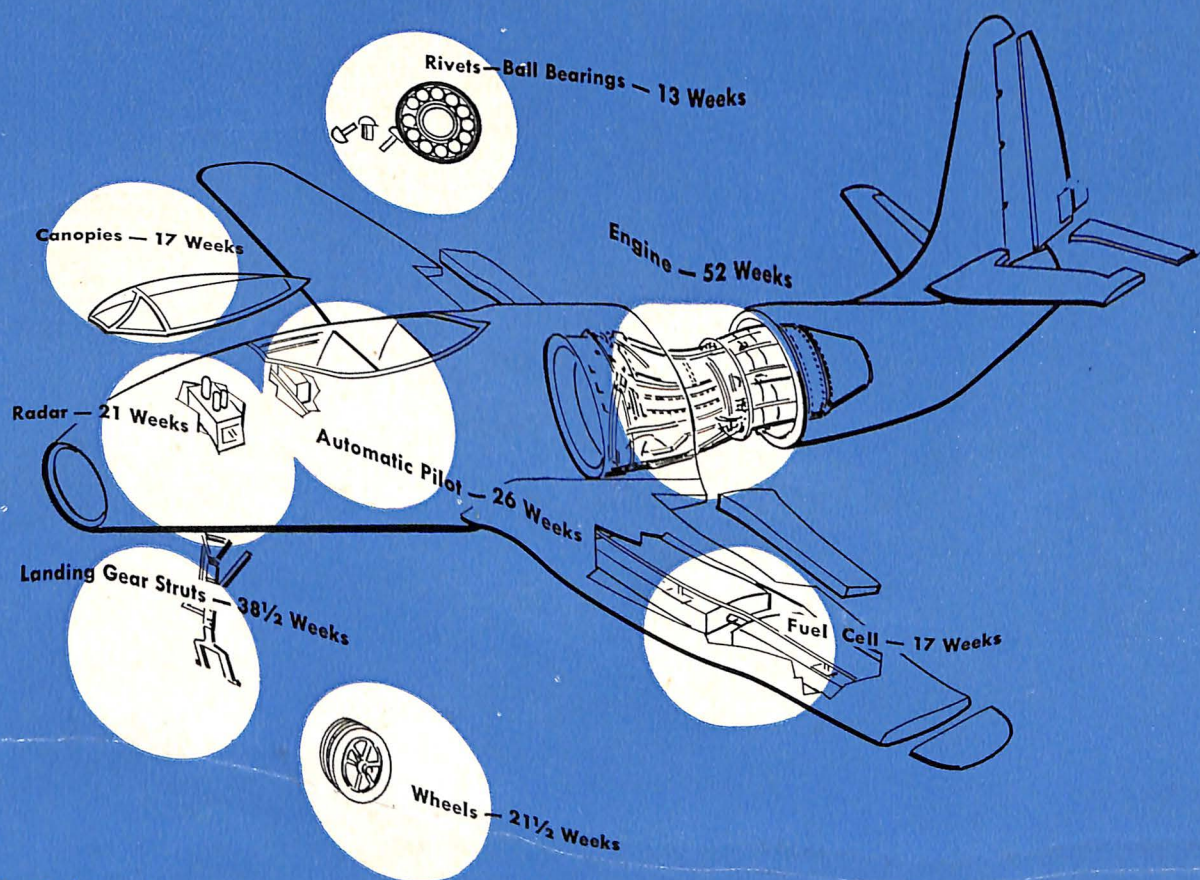
Fortunately, the same management skills which so successfully met the production challenge of World War II are available to the country today. We can find satisfaction, therefore, in the knowledge of the existence of this invaluable reservoir of experience upon which the responsible government agencies may draw in surmounting the problems of partial mobilization.



IT TAKES TIME TO BUILD A MODERN AIRPLANE

Many Weeks Required to Make and Deliver Intricate Components for Final Aircraft Assembly

Hundreds of different manufacturing plants are required to turn out the precise parts which go into a complex modern airplane. This picture story shows the material procurement time for a few of these items—the time needed for initial shipments from the vendor's plant after placement of the order. This applies when the design is fixed. In cases of new design, more time is needed for tooling, die making, forgings, etc. Finally, the procurement time chart does not indicate the full time needed for manufacture of an airplane, since additional weeks are required for assembly of the components.



- Superchargers — 30 Weeks
- De-icing Boots — 13 Weeks
- Batteries — 17 Weeks
- Dynamotors — 30 Weeks
- Generators — 21½ Weeks
- Gun Mounts — 17 Weeks
- Oil Filters — 17 Weeks
- Thermostats — 21½ Weeks
- Altimeters — 17 Weeks
- Compasses — 21½ Weeks
- Gyro Controls — 25¾ Weeks
- Tachometer — 25¾ Weeks
- Pitot Tubes — 21½ Weeks
- Brakes — 21½ Weeks
- Oxygen Gages — 17 Weeks
- Radio Amplifiers — 21½ Weeks
- Needle Bearings — 21½ Weeks
- Bolts, Standard — 17 Weeks
- Landing Lights — 14 Weeks
- Microswitches — 8½ Weeks
- Gaskets — 13 Weeks
- Special Pulleys — 17 Weeks
- Air Ducting — 8½ Weeks
- Spark Plugs — 4¼ Weeks
- Rubber Hose — 8½ Weeks
- Inconel Sheet — 13 Weeks
- Magnesium Sheet — 34 Weeks
- Crew Seats — 17 Weeks
- Galvanized Steel — 17 Weeks
- Vibration Mounts — 17 Weeks
- Special Washers — 13 Weeks
- Aluminum Cable — 17 Weeks
- Copper Cable — 13 Weeks
- Brass Wire — 13 Weeks
- Aluminum Sheet — 17 Weeks

- Throttle Assemblies — 17 Weeks
- Cable Assemblies — 15 Weeks
- Nylon Tank Spacers — 17 Weeks
- Zippers (Pressurized) — 13 Weeks
- Aluminum Castings — 8½ Weeks
- Cements and Glues — 4 to 6 Weeks
- Magnesium Extrusion — 13 Weeks
- Honeycomb Flooring — 13¾ Weeks
- Aluminum Forgings — 17 Weeks
- Radio Coaxial Cable — 19 Weeks

- Bronze Antenna Cable — 10¾ Weeks
- Close Tolerance Screws — 21½ Weeks
- Stainless Steel Forgings — 17 Weeks
- Plexiglas Windows — 13 Weeks
- Curved Windshield — 17 Weeks
- Magnesium Forgings — 13 Weeks
- Chrome Moly Steel — 13 Weeks
- Aluminum Bar and Rod — 13 Weeks
- Magnesium Bar and Rod — 13 Weeks
- Metallic Hose Assemblies — 17 Weeks

- Welding Rod and Solder — 6 Weeks
- Power Transmission Assemblies — 21½ Weeks
- Fire Extinguisher Equipment — 17 Weeks
- Rolled Aluminum Section — 21½ Weeks
- Turn and Bank Indicator — 21½ Weeks
- Aluminum Alloy Extrusion — 17 Weeks
- Special Self-Locking Nuts — 21½ Weeks
- Textiles and Fabrics — 13 Weeks
- Aluminum Tubing — 17 Weeks
- Electrical Condensers-Capacitors — 17 Weeks

SOURCE: Analysis of Material Procurement Time, Typical Aircraft Company (Revised Aug. 10, 1950)

"PLANES"

Increase Since 1939 in Cost of Military Equipment



143%



145%



471%



733%

Increased current costs reflect both increased prices and qualitative superiority of current equipment compared to prewar equipment.

"PLANES"

SOURCE: Department of Defense

NEW JETS

(Continued from page 1)

the Supermarine Attacker, and Meteor are in service. The deHavilland 113, the D. H. Venom and the Meteor NF 11 are being produced to replace reciprocating engine fighters currently in use. Great Britain also is in production on the Canberra, a twin-engine jet bomber, and has announced development of a new four-jet bomber. In the prototype stage are the Fairey 17, the Short S.B. 3, and the Westland Wyvern, turbo-prop, carrier based, anti-submarine aircraft. Among other British prototype developments are the Hawker P. 1040, P. 1052 and P. 1081, and the Vickers Supermarine 510. Saunders Roe has developed the SR/A1, a prototype flying boat jet propelled fighter.

France—The British Vampire built in France under license is being used by the air force as its first line fighter. Prototypes, some of which may now be in production, include the SO 6000 Triton and the SO 6020 Espadon, fighters; the SO 4000 bomber, and the SE 2410 fighter-attack plane. Arsenal has designed the VG 90 and VG 70 jet fighters and Aerocentre has designed the NC 270 twin-jet bomber, the NC 1080, Navy fighter, and the NC 1071 and NC 1072 fighters. Breguet has projected designs for a combination turbo-prop and turbo-jet Navy fighter.

Canada—Royal Canadian Air Force is using British Vampires and Meteors while deliveries of the first Canadian-built U. S. F-86's are beginning. Avro Canada is building the first Canadian-designed and built jet fighter, the CF 100.

Australia—Its air force is

equipped with Vampires and is reported getting the Canberra bomber, a C.A.C. all-weather fighter, and a Hawker fighter believed to be the P. 1081, some of which will be built in Australia.

Argentina—Is using the Meteor as a first line fighter and has built the IAe 27 Pulqui, first jet fighter to be designed and flown in South America.

Other Countries—British Vampires are being used as first line or standard fighters in the air forces of Italy, Sweden, South Africa, India, Norway, Venezuela and Switzerland. The Meteor is being used by The Netherlands, Belgium, Denmark and Egypt. The Swedish aircraft industry is building two fighter types for the Swedish Air Force, the J 21R and the J 29. The first Italian-designed jet, the G-80, is being built by the Aeritalia Company. There are persistent reports that Turkey is discussing the acquisition of jet fighters from the U. S.

Exchange of Design Data Will Aid Aircraft Firms

In a move to minimize duplication of manpower, time and money expenditures, aircraft companies have agreed upon a plan for a regular exchange of data on design and development of better aircraft antenna, a project of great importance in today's high speed planes.

The plan was worked out by the Aircraft Technical Committee of the Aircraft Industries Association in cooperation with the Air Force's Air Materiel Command. Plans are also under way to extend the co-operating program to Navy contractors.

CIVILIAN AVIATION

(Continued from page 1)

Thus, in any system of allocations or priorities, the equipment and materials needed to maintain the contribution of civil aviation should be provided on the same basis as is accorded other components of our transportation system. The supply of transport and other planes used in business, and replacement parts therefor, is clearly adaptable to national defense and should be made as available as is the supply of equipment and replacement parts for the railroads and the steamship lines.

Manufacturers' Recognition

Adoption of this principle will necessitate recognition by our government agency charged with priorities and allocations of recent trends within civil aviation and its increased capacity in relation to other branches of transportation and in the economy as a whole. For example, a plan which merely allowed the manufacture of planes, parts and equipment at the current or 1949 level, or any percentage of these periods, would penalize all branches of civil aviation. This is because production of transport and personal planes and the equipment therefor was at a very low rate in 1949 and early 1950, a time when the rest of the nation's economy was booming. Deliveries of transport aircraft were only 166 in 1949 and 47 in the first half of 1950, compared to 263 in 1948 and 279 in 1947 and more than 400 in 1946. Personal aircraft production in 1949 totaled only 3,379 compared to more than 15,000 in 1947 and 34,000 in 1946.

These figures graphically illustrate the reason for the statement contained in the report on civil air power:

"... thought must be given to increasing our supply of smaller aircraft, and to manufacturing the quantity of parts which will be necessary to keep our present civil air fleet operating through time of crisis. . . ."

Answers to Planes Quiz

- (b) 239 foreign points on all continents.
- (b) A 19-foot, eight-bladed, dual rotating propeller made by a U. S. firm.
- (c) A 60-ton, turboprop-powered U. S. flying boat flew eight hours and six minutes in tests made during August, 1950.
- True.
- (c) Aircraft labor rates have increased 106% since 1939—32% since 1944.
- (c) Some jet engines have 109 items classed as accessories while Air Materiel Command lists only five accessories for a reciprocating engine.
- True. Successful bomb drops have been made from a 500 mph U. S. jet bomber; the fastest in World War II was 350-400 mph.
- True. For the 1939-1949 freight gains, Interstate Commerce Commission gives an index figure of 1,041 air freight compared to a total of 681 for barges, railroads, pipelines and trucks combined.
- (b) One-third, according to Brig. Gen. H. A. Shepard, Air Force Director of Procurement and Industrial Planning.
- (c) Sixteen.

Facts and Figures

Miami's International Airport took in more than a million and a quarter dollars during its last fiscal year and had a net profit of \$351,297.33.

Air Quotes

"There's never been anything like this in my experience," veteran 1st Cavalry Commander Major General Hobart R. Gay



Maj. Gen. Gay

told us a little while ago at a regimental command post, huddling for protection against a towering 50-foot rock. "Without air support we simply would have been pushed into the water a month ago."—Reported by Bob Considine in *New York Journal American*, August 11, 1950.

"The contribution of the Far Eastern Air Forces in the Korean conflict has been magnificent. They have performed their mission beyond all expectations." — *General Douglas MacArthur*.

"For the record, I will state that this cooperation and coordination between the ground and air forces is enabling us to contain an enemy force which is superior in numbers. When we assume the offensive, this same cooperation and coordination will be a vital feature in the ultimate defeat of the enemy."—*Maj. Gen. W. B. Kean, CG 25th Infantry Division in Korea, on Sept. 5, 1950.*

RESEARCH

(Continued from page 1)

ment of commercial planes and military planes.

Besides the more spectacular programs such as jets, atomic energy and supersonic planes, specific research undertakings during the past two years include:

Ram-jet engines, gas turbines, in-flight refueling equipment, tractor-type landing gear, high velocity fueling systems, brake attachments to prevent skidding, automatic rudder stabilizer.

Fire-control radar systems, missile guidance systems, telemetering devices, antennae for airborne use, ground handling equipment, passenger ramps, cargo conveyors, flexible fuel cells, electronic turbines, flameproofing for fabrics.

Air inlet ducts for jet fighters, afterburners to increase the thrust power of jet engines, crew ejection seats, fire and heat detector systems, new automatic computing and measuring devices, compressors, supersonic propellers.

Cabin superchargers, air conditioning units, jettisonable fuel tanks, reversible pitch propellers, non-inflammable hydraulic fluid, square-tipped propellers for reduction of noise.

Much work has been done in the development of metal alloys which can withstand the terrific temperatures and speeds of modern aircraft and conserve strategic minerals. There has also been much research in plastics and light honeycomb construction materials. One large current project is research on use of magnesium in wing structures.

