"PLANES AND BUTTER' ABSURD -- VINSON

Huge Presses Will Expedite Plane Output

Mammoth forging presses, ranging in size from 5,000 to 25,000 tons, and extrusion presses, ranging from 25,000 to 8,000 tons, will save the American taxpayer millions of dollars by turning out huge single-piece metal sections for U.S. military aircraft.

Formerly created by complex machining of small bits and pieces, big aircraft parts will be made by compressing and squeezing giant pieces of aluminum, magnesium and steel to meet exacting production requirements.

Replacing "Bit and Pieces"

By substituting single operations and large sections for the "bit and piece" construction now required in many aircraft, it is anticipated that millions of man-hour production time will be saved.

First step in a program for securing heavy presses is the production of a $210 million Air Force project, in which the aircraft industry is cooperating with the Air Force in gauging the extent of the program, the Aircraft Industries Association recently surveyed U.S. manufacturers to determine the industry's present, potential and future needs for the big presses.

Survey made by AIA

Aircraft builders reported on large forgings now being manufactured for existing aircraft, parts for current production aircraft and parts for new production aircraft which could be used as forgings or extrusions if larger capacity presses were available, and for large structural parts which could be forged or extruded if presses of adequate capacity were made available.

To date, forging press builders have been given a go-ahead on two 50,000-ton presses, the 35,000-ton presses and three 25,000-ton presses. In addition, work is starting on one 20,000-ton, four 12,000-ton and one 8,000-ton extrusion presses.

First result of the AIA survey, still being evaluated by the Air Force, was confirmation of a pre-

WHY DEFENSE COSTS MORE

FOR EVERY 1 ENGINEERING MAN-HOUR ON A TYPICAL WORLD WAR II PLANE THERE ARE 100 ENGINEERING MAN-HOURS ON TODAY'S TYPICAL GUIDED MISSILE

"PLANES" SOURCE: Typical Aircraft Company.

Cost-Conscious Plane Builders Save Time, Money with Many New Methods

Despite the vast sums of money now required to build military airplanes, cost conscious aircraft manufacturers are continuing to accomplish substantial savings in production costs through improved manufacturing techniques and policies, according to a government study.

The new methods have resulted in savings of strategic materials in supply and of critical time by cutting man hours. In some instances, they have lessened the industry's requirements for certain critical items.

Efficiency Constantly Improved

Specially developed tools and processes, and more efficient use of plant space are some of the ways manufacturers are saving dollars.

One aircraft corporation is speeding production of a fighter plane by using electric powered assembly line. The new system is expected to cut man hours by 40 hours per plane and reduce work space 23 per cent.

The corporation also expects to cut the cost of its fighters, transports and bombers. New massive machinery, including the largest hydraulic metal-forming press of its type in the world, will make possible production of wing sections and other solid pieces as large as 10 by 30 feet.

These self-strengthened pieces will replace units now composed of scores of small parts welded and riveted together. The result: saving in man hours and simplified assembly procedures will ultimately mean a lowering of plane costs.

An inexpensive joggle machine, which notches and forms metals, has been developed by a large plane manufacturer on the west coast. The new joggle machine costs less than one-twelfth that of any comparable machine in production. Since few subcontractors have the expensive special machines formerly required for joggle parts, the aircraft corporation licensed a Texas company to build its new machine for other firms.

Many Tooling Costs Cut 50 per cent

The same aircraft manufacturer recently installed three new machines which will save up to $24,000 per month. The devices are salvage machines which will speed up the job of reclamation of materials and help alleviate critical shortages.

In another case, a firm placed into use its first automatic certifying hardness tester. The machine's output of accurately tested and stamped small parts equals the work of five inspectors, and it has resulted in the saving of 400 man hours per week.

This firm also reports tooling costs have been cut about 50 per cent on many forming operations.

What Congress Does Now Vital To '56, He Says

Written especially for PLANES

By Hon. Carl Vinson, Democrat

Chairman, Committee on Armed Services
U. S. House of Representatives

"The Air Force we have today is the one we bought 3 and 4 years ago. The Air Force we need today is the one we failed to buy at that time." — Gen. Nathan F. Twining, Vice Chief of Staff, USAF.

Congress, in its present session, should heed closely this warning by one of our foremost aviation authorities, since this time factor is with us today and will be with us tomorrow. The actions of this Congress, in 1952, will determine whether we have adequate modern air power in 1956 and 1957.

There has never been a time more important than the present moment for an absolute and no-cuts decision that we—the Congress and the people—will not again let our air power lapse into a second rate category, or worse.

In warfare today, air power and new weapons of mass destruction have changed the entire concept of strategy. While our air defense system has been vastly improved, nevertheless we must face the unpleasant fact that no nation can completely defend itself against an air attack, and if the air battle is lost, the war is certain to be lost.

We have a long way to go to build the 143-wing force agreed upon by the Joint Chiefs of Staff as essential to safety. Our aircraft industry is accelerating its output and doing a highly commendable job, even in the face of inevitable shortages which stem from the superimposing of civilian on a booming civilian production program. While a philosophy of guns and butter is, in my opinion, unsound, a philosophy of planes and butter is absurd. It troubles
Can't Have Business as Usual
And Warplanes at Same Time

From the Annual Report of
DeWitt C. Ramsey (Admiral, U.S.N., Ret.)
President, Aircraft Industries Association

With the war in Korea continuing unabated and now situations of utmost gravity developing in other parts of the world, the Aircraft Industry continues to apply itself to rebuilding our air power to meet the emergency which has existed during the past year of our operations. While some progress has been made toward this objective, there can be no question that we have fallen short of the production goals that were believed, a year ago, to be necessary to bring our military air establishment up to strength. Our principal gains have been in the number of facilities available for the production of military aircraft. This does not mean, unfortunately, that we have really expanded either our production base or our production capabilities to a satisfactory degree. The production base involves not only additional shelter and tools, but, more importantly, a going rate of production.

It is in this particular that we have been unable to fulfill the expectations of a year ago. Any sizeable expansion of production is attended by many obstacles. The length of the delays that result are dependent upon the time required to break the bottlenecks which develop. This has been a problem in other emergencies, but it is a much more difficult one today, for several reasons.

At the time the nation began its present program of rearmament, it was decided that America could support this industrial mobilization only through preservation of a strong civilian economy. This policy, wise though it be, has naturally aggravated our problems. It has not been possible to have our materials, machine tools and manpower when we needed them. Furthermore, the enormous complexity and resulting high cost of modern military aircraft have made every phase of our development, engineering and production many times more difficult than they were in World War II.

The cumulative effect of shortages and strikes has resulted in some downward adjustments of our delivery schedules. This is the first concrete evidence that we have a difficulty short, and there is every reason to believe that there will be little appreciable improvement in the near future. Our industry cannot shrug off such a portentous fact with the national safety at stake.

Far from quarreling with the policy of preserving a strong civilian economy concurrently with rearmament, our Industry has supported it heartily, and supports it today. But surely this is a matter of degree. We would be derelict if we failed to bring to the attention of the American public, to their representatives in Congress, and to the officials and officers of the Government, the fact that preservation of a high-level civilian economy is in collision with the assigned task of air rearmament. If, as the military insists, the national safety depends largely on air power as the first line of defense, then, the civilian economy must give way to whatever degree is necessary to achieve it.

It must be decided, and soon, whether and to what extent civilian production may be further affected if aircraft production goals (especially if the 140- or 150-wing Air Force program is adopted) are to be met. I deem it necessary to repeat again that the nation cannot have business-as-usual, in the full sense of the term, and rapid rearmament at the same time.

It is fair to observe at this point that we would be much further advanced, in development, in capacity and in production potential, had the nation recognized earlier the importance of a sound, long-range air power policy. Many of our difficulties today are directly traceable to things we did not and could not do in 1943-44-47 when the Industry's developmental, production and financial capacities were allowed to atrophy. It still takes from four to seven years, from development to service, to create a new aircraft type. It still takes from 18 to 24 months to place an approved type in production.

I take this occasion to clarify our position, as I interpret it, because it is incumbent upon our Industry and all its members to keep the record clear and to point constantly to those problems which must be evaluated if we are to achieve the urgent objectives of rearmament.

PRESSURES
(Continued from Page 1)

Insecticide spraying, mostly from airplanes, saved more than $6,000,000 worth of Oklahoma wheat in 1950.

This information was revealed by Dr. S. A. Rohwer, Assistant-Chief of the Department of Agriculture's Bureau of Entomology and Plant Quarantine in a recent report.

Insecticide spraying helps in reducing the number of insect pests which destroy crops. Dr. Rohwer stated that the average cost of spraying is $5,000 per acre. He said that the insecticides are applied to the plants in such a way that the insects are killed or repelled.

Aerial Spraying
Saving Millions

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4,000 Varieties of Raw Materials Make Aircraft Inventories Complex

The aircraft industry's unique materials inventory problem, perhaps the most complex in today's mobilization economy, was recognized recently in a perceptive report of the Small Business Committee. This has resulted in recognition by defense, mobilization, and legislative leaders that aircraft builders cannot comply with government directives holding them to a 30-day supply of each item in their inventories.

Over 4,000 different sizes, shapes and kinds of raw materials go into a modern jet fighter, the Committee reported. From these 4,000 varieties of materials are fashioned, for example, the 137,600 parts in a typical new patrol bomber.

Complicated Planning

In the case of aluminum, materials workers in the aircraft industry must keep track of 160 different orders, for example, 50 kinds and sizes of plate, 396 aluminum castings, 264 aluminum forgings, and rolled sections, 200 kinds and sizes of bar, 120 kinds and sizes of tube, and 280 kinds of raw materials such as wire, strip and hinge.

Each of these thousands of materials needed against future requirements, must be checked, warehoused, drawn out of inventory and spotted on production lines in one of the most complicated inventory operations in modern manufacturing.

Easy to Distort

The problems involved in keeping these items in balance were disclosed by the Small Business Committee when it reported:

"The measurement of the aluminum inventory on an over-all basis in the aircraft industry must make allowance for certain factors which, if not taken into consideration, may distort the inventory picture to such an extent as to prove it meaningless.... Any one or combination of these factors can cause a normal inventory on paper when in reality, the opposite may be true." 

Continuing, the Committee pointed to the fact that materials inventories in the aircraft industry are subject to daily variations. Military orders are revised frequently depending upon fluctuating defense requirements. Design changes are made by the hundreds, each causing a change in the pace at which individual materials are chewed up in the production process. Raw material producers often are unable to meet promised delivery schedules, throwing certain items into long lines and others into short supply.

Try to Avoid 'Dead Money'

At other times, the Committee reported, military requirements for spare parts eat heavy—and unexpectedly—into inventories. And manufacturers constantly face the problem of ordering in economical quantities—and of ordering according to minimum mill runs set up by the materials producers.

Despite these constant problems, the Committee concluded, aircraft companies are maintaining a "strong drive to maintain inventories at the lowest practical level," and are aware that money tied up in inventories is 'dead money.'

The report emphasized "that the financial situation in the aircraft industry is sufficiently tight to maintain constant pressure against tying money in stocks beyond the immediate need.

"In the case of aluminum, manufacturers are maintaining a "strong drive to maintain inventories at the lowest practical level," and are aware that money tied up in inventories is 'dead money.'"

COST CUTTING (Continued from Page 1) by the use of plastic tools. Drawn-in dies, spinning chuck blanks for stretch forming, and tube-bending mandrels are some of the tools made from magnesium which are far cheaper than tools made of critical materials.

A leading supplier of bombers is using plastics to conserve short supply metal stocks with the added advantage that the forming process for plastics requires a relatively small outlay of tooling... one of the most critical items for the defense production effort at this time.

Recently a group of production experts from one large aircraft manufacturing firm completed a nation-wide survey of eight major firms in the plane industry as part of a program to study cost-cutting processes. The special manufacturing techniques developed by each of the companies involved were discussed, and a complete report of these methods was planned for the industry.

"This sort of planning and the free interchange of manufacturing ideas is a good example of industry cooperation on mutual problems, and it gives assurance that cost-cutting in the building of military aircraft will continue as production increases."

Air Quotes

"In the long-lead-time items which are the heart of the military program—the complex new aircraft and tanks—little of this (1951) activity is yet reflected in delivery figures. Much of the work being done will not appear in the delivery column until late 1952, 1953, and even later years.

"It is not easy to grasp the immensely complex job that is involved in producing an effective modern mechanism of war such as a plane or tank.

"The higher speed, increased size, and more versatile performance of modern aircraft have required a virtual revolution in production methods in the few years since World War II.

"Today's Navy or Air Force fleet fighter, for example, weighs nearly as much as the old D-17 bomber. Automatic devices—many of them electronic—to provide the plane with greater and more accurate fire power or bombing performance, more maneuverability, day and night combat capability, and a better chance of combat success, require tons of equipment in a plane where a few hundred pounds used to be enough. Stronger construction to withstand high-speed conditions demands tougher and heavier materials.

"To produce planes like these on a volume basis is by far the most complicated, difficult, and precise mass production job ever tackled. And to a lesser degree, the same is true of other items of military equipment—tanks, weapons, and electronics."—Charles E. Wilson, Director of Defense Mobilization, Quarterly Report to the President, Jan. 1, 1952.

Improvements in one type of aircraft hydraulic pump increased its service without overhaul from 2400 hours to 14,000 hours within a period of two years.
Military Air Transport Capabilities Soar

Battle of the Bulge

Korea

15 to 1

1,000 aircraft were required to provide supplies during the Battle of the Bulge in World War II. The same tonnage has been delivered by 68 planes in the Korean War.

(Average distance is longer for Korea than in the Bulge operation. Bigger and better planes brought the improvement.)

Low Volume Keeps Aircraft Costs Up, But Other Prices Have Risen Faster

While the cost of military aircraft construction is high, due to inflation and the definitely more complex high-performance plans of today, engineering, manufacturing and management efficiency of the industry has kept the cost rise curve much lower than in many other essential activities.

One builder of outstanding military and commercial planes computes the cost of its aircraft at 200% more than in 1939. But by comparison, Army tanks now cost 75% more than in 1939. Navy destroyers cost 41% more. Home construction is up 257% in cost. Such comparisons, however, do not tell all the story. In the aircraft industry, costs are much higher for low volume production and in the case of a typical manufacturer, production today is more than 1/25th of the World War II peak. A modern plane requires vast amounts of engineering and tooling, whether the factory builds one plane or 1,000. Production cuts down this tooling cost per plane sharply. This company reports that in volume, with the same aircraft, tooling for 100 planes would cost $15,000 per plane; for 500 planes it would be $4,000 per plane, and for 1,000 planes tooling would cost $2,500 per plane.

One reason present aircraft costs seem particularly high, compared to costs at the end of World War II, is that big tooling and development costs of most World War II planes were written off long before war-excess proposals were reached. Today's costs include these expensive factors.

In addition, military contracts today often include extra design work and standby tooling, ready for big-scale production in case of emergency. While this is considered a wise policy by defense planners, the extra costs usually charged against the relatively few planes being built, forcing up unit costs from still another direction.

Railways Need Planes Today, Says Official

Use of private utility airplanes by the railroads to conduct many of their essential activities, is recommended by a railroad operating official whose endorsement illustrates not only the business uses of the airplane.

In an article in Railway Age, "Bible of the railroad industry," Charles J. Miller, assistant roadmaster of the Western Pacific Railroad, said the airplane is a "flexible, efficient machine" and should be used by the railroads "as another tool for railroad management and operation and maintenance of facilities."

Among the uses he listed: delivery of messages or parcels, delivery of air parts, last-minute payroll matters, flood or fire control, routine patrol of lines in difficult country, emergency travel, educating of equipment supervisors by more frequent visits to roadways, or more frequent attendance at conferences.

Miller said that in the category of "unorthodox uses" such as flying key men to the scene of wrecks, determining equipment needed, and arrangements for re-routing of trains "an airplane may pay for itself many times over within a few hours."

Answers to Plans Quiz

1. (c) Existing New York-London fare is $395. After May 1 the tourist rate will be $270 one way and $486 round-trip.

2. (c) An engine on an Air Rescue Service plane which recently completed 1,200 hours of flight time for a distance equivalent to seven trips around the world without being changed.

3. Estimated on straight production with normal costs, labor supply, etc., remaining constant: if 100 planes cost $100,000 each, 500 planes would cost $57,750 each, and 1,000 planes would cost $44,600 each.

4. True. Pilots of crop dusting and forest fire control planes have been put on the Labor Department's list of critical occupations.

5. True. Conversion has been made in six hours and 10 minutes.

6. (c) Chip Miller used 14% of plant space for research and testing at height of World War II; today more than 20% of the space is thus used.

7. (c) 1,000 pounds.

8. Edwards, AFB, a jet fighter engine change has been made in 20 minutes and 80 seconds.

9. True. The government paid 16 domestic truck lines about $38,000,000 for carrying mail, compared to the $46,000,000 in 1939—despite a 26%, increase in volume handled.

10. A needed list of agricultural and industrial aircraft operators is available free from General Flight, Civil Aeronautics Administration, CAA, Washington.

A new electronic "brain" holds bombers at a predetermined altitude that varies not more than a yard at 40,000 feet, even though the weight is lowered by dropping the bombload.

Some of today's best jet fighter planes are coming off the assembly line factory-equipped for mid-air refueling.