The United States needs more and better engineers and scientists to develop superior weapons for the nation's defense as we are to meet the threat of the U.S.S.R., according to Gen. Thomas D. White, Air Force Vice Chief of Staff.

The Soviet Union, General White warned in a recent nationwide address, has come from a period in which most of the population was illiterate to a point where their present output of scientists and engineers exceeds that of the United States, and they are now showing signs of technological maturity.

Red engineers come out of Russian schools and universities in the past few years, he said, almost equal to the total numbers graduated in the United States during the same period, and in trained scientists the Soviets have surged ahead.

Even though many of their spectacular successes have been the result of duplicating basic equipment taken from the Free World nations, the Soviets have accomplished many things that our experts said they could not do. Even more surprising, some of the things the Russians were supposedly unable to do all, they not only did, but did in a hurry.

As examples of this, Gen. White cited:

- The B-29 — It was thought in this country that it would take the Reds six or seven years to duplicate it. It took them two.
- The jet engine — It was estimated that it would take a good copy of a British jet engine. Russia produced a better version of this engine in less than a year.
- The atomic bomb — American experts predicted that it would take from six to ten years to produce a similar bomb, if they were able to produce it at all. The Soviets rocked the world with a nuclear explosion in about three years.

Gen. White said that this knowledge is evidence of the modern technology of the Soviets and the advances which are being made by them.

America's answer to this growing Red threat lies in "Power for Peace," he said, and this power lies in having forces in being and in developing superior weapons systems which will keep the United States ahead of the enemy.

U.S. Air Passenger Revenues, Excluding Commutation, Top Railroads' in 1954

Soviet Aerial Progress Poses Real Threat Air Chieftain Warns

No Competition
If you should travel around the world by air, using the airlines of each country traversed, the chances are at least 10 to 1 that you would be flying on American-built commercial airliners. That is as true today as it was at the inception of international air travel in 1927, when America took a long lead in the export of commercial aircraft. This map illustrates the extent of U.S. domination of these world markets. No other nation has yet been able to match this country’s combination of low seat-mile and ton-mile operating costs as a function of superior design, and low unit cost through quantity production know-how.

Source: IATA and Aircraft Industries Association
Sharing the Load

The aircraft industry, perhaps more than any other, is largely dependent on allied industry in meeting the highly-fluctuating assignments given it in peace, in emergency, and in war. Even in the relatively tranquil periods of peacetime, aircraft manufacturers lean more heavily on suppliers and sub-contractors than do consumer industries, which have predictable production schedules and are much inclined to maintain their own operations. Under emergency situations, the percentage of contract dollars which go to other manufacturers and suppliers soars to high figures.

This is well illustrated by a survey, just completed by the Aircraft Industries Association, of sub-contracting and supplying within 35 companies of the aircraft industry during 1954. This survey shows clearly that outside business, and especially small businesses (those which employ fewer than 500 people), have received more than their fair share of the dollars paid out by the prime contractors during the year, exclusive of taxes.

Thus, with the aircraft industry operating at a fairly high level of production in the last five years, sub-contractor and supplier participation has increased largely as a result.

The AIA survey covered 35 major aircraft companies—including 20 airframe, 8 aircraft engine and 7 large component and accessory manufacturers.

These companies reported total fiscal year disbursements, excluding taxes, of $8,744,270,000. Of this amount, $4,759,320,000 (54 per cent) was paid for services and products received from some 50,000 suppliers and sub-contractors throughout the United States and in 18 friendly foreign nations. The remaining $3.9 billion (46 per cent) was spent for wages, plant operation, reinvestment in the business and dividends to stockholders.

Small business firms, the analysis shows, comprise 83 per cent of the suppliers and sub-contractors whose products were purchased by the industry. Small businesses were paid $2,030,000,000 by the aircraft companies directly, for parts, equipment, components, and supplies. But an additional estimated $1 billion was channeled to these same firms through second, third and higher-tier supplier and sub-contracting activities throughout prime government contracts. So small business actually received more than $3 billion in business from the aircraft industry in 1954. It is interesting to note, too, that many small businesses, which received contracts from the aircraft companies promptly became large businesses.

The fact that 83 per cent of the nation's 50,000 aircraft suppliers and sub-contractors are small business firms comes as no surprise to the industry. The signal achievement of the aircraft industry during World War II in producing the greatest aerial armada the world has ever known is a case in point. This production record was not achieved solely by a few big airframe and engine manufacturers. It was the joint effort of all—who had a big and a small—that produced 96,000 military aircraft in one year. That picture has not changed. Absolutely vital, of course, is the basic aircraft industry—the large prime contractors with their management, scientific, engineering, technical and manufacturing capabilities and resources. They cannot undertake their producing responsibility alone. They must have help from other industry in direct proportion to the magnitude of their own commitments.

But increasing complexity in modern military aircraft has brought new problems in the utilization of outside industry. The mounting performance requirements, the engines of tremendous power, electronics detection, guidance, communications and fire control systems, and heating, cooling and pressurization needs, to the present demand close-tolerance work of the highest quality. Much of this work can be performed only by a limited number of experienced primary and secondary producers.

Outside industry, large and small, is necessarily geared to the fortunes of the aircraft industry. The sudden demands placed on the aircraft manufacturing emergency, which extreme demands are placed on the aircraft manufacturing emergency, where normal procedure to place more and more work with allied industries. The aircraft production is low, it is natural that less work is concerned. When aircraft production is low, it is natural that less work is given to outside industry.

Much that would be so farmed out in peak periods placed on the outside. Each prime contractor in order to make maximum use of their resources, hold together their engineering and production teams, which are vital to security of the country.

Company Research
Cut Plane Costs

The thousands of miles that will be flown by America's future supersonic fighter plane have been shrunk, temporarily, to a 20-foot high, air-refueling laboratory, made to simulate a flying altitude of 10 miles.

The laboratory, part of the 125 million dollar research installation, is a typical development of one major aircraft company to economically and efficiently insure qualitative superiority of American aircraft.

As the full-scale model plane is “flown,” researchers record temperatures and pressures at 25 key locations as fuel is taken aboard at several hundred gallons a minute. By rolling and pitching the plane and varying the temperature and pressure in its fuel system, engineers can set up mid-air refueling conditions existing in various climates at altitudes up to 50,000 feet.

Initiating plumbing enables these planes to take aboard several hundred gallons of fuel a minute and distribute it from one intake connection to a large many tanks of various sizes all over the airplane. The speed of the operation enables the pilot's task of flight control and for refueling rendezvous by a flight of planes—during which they might be vulnerable to enemy action.