

*the outlook
for*

Jets



a message_____

OF INTEREST TO THE
STOCKHOLDERS

of

AMERICAN AIRLINES, INC.

TO: THE STOCKHOLDERS

American Airlines, Inc.

the outlook

for

Jets

When the outlook for the airline industry in the United States is considered, it is not surprising that the outlook for the industry is generally optimistic. The principal reason for this is the fact that the industry is expected to continue to grow at a rapid rate in the years ahead. This is due to the fact that the industry is expected to continue to be one of the most important and profitable in the United States.

As the industry grows, it is expected that the number of airlines will increase. This will result in a greater number of routes and a greater number of flights. The industry is also expected to continue to be one of the most important and profitable in the United States. This is due to the fact that the industry is expected to continue to be one of the most important and profitable in the United States.

THE FUTURE

The future of the airline industry is expected to be very bright. This is due to the fact that the industry is expected to continue to grow at a rapid rate in the years ahead. This is due to the fact that the industry is expected to continue to be one of the most important and profitable in the United States. This is due to the fact that the industry is expected to continue to be one of the most important and profitable in the United States.

THE CURRENT SITUATION

The current situation of the airline industry is expected to be very bright. This is due to the fact that the industry is expected to continue to grow at a rapid rate in the years ahead. This is due to the fact that the industry is expected to continue to be one of the most important and profitable in the United States.

TO: THE STOCKHOLDERS
of
American Airlines, Inc.

We are often asked when the airlines of the United States will be operating jet transports. You, as a stockholder in a principal airline, are interested in that. To keep informed, and to judge the potential effect on airline operation, let's discuss the jet transport situation as we find it today.

TWO GENERAL TYPES

As you know, there are, generally, two types of turbine engines; one, with the power plant geared to a propeller, called the turbo-prop; the other, without a propeller, using its power to "thrust" against the outside air mass, called the turbo-jet. The latter is the engine commonly referred to when talking about the "jet". Each engine type has certain advantages over the other.

THE TURBO-PROP

An airplane equipped with the turbo-prop engine will operate efficiently at low altitude, will operate with better fuel economy than the turbo-jet, requires shorter runways for takeoff and landing and is much quieter than the turbo-jet for ground and air operation. It will usually be faster than an airplane equipped with reciprocating engines and slower than an airplane equipped with turbo-jet engines.

THE TURBO-JET

An airplane equipped with the turbo-jet engine is not efficient at low altitude; its best performance is around 40,000 feet. It will accelerate more slowly and longer run-

ways are required for take-off. It has no propellers to be reversed, to slow the aircraft after landing, and longer runways are required for landing operation. Some of the turbo-jet transports should be capable of speeds 500-600 miles per hour.

ENGINE AND AIRPLANE DEVELOPMENT PROGRAM

The very high cost of developing turbine engines has been borne principally by the military services, based on necessity for higher powers and higher speeds in combat aircraft. The turbo-jet engine, with its better ability to provide very high speeds, has been emphasized in the military development program more than the turbo-prop, and its development is more advanced.

We would have preferred a transport development program going from the reciprocating engine—to the turbo-prop—to the turbo-jet. That would have permitted speeds going from more than 300 miles an hour, with the reciprocating engine, to more than 400 miles per hour, with the turbo-prop, to more than 500 miles an hour, with the turbo-jet. The speed and economy of the turbo-prop would have provided a sensible intermediate step between the reciprocating engine and the turbo-jet.

But, as you know, aircraft design is premised largely on the ability of the power plants available. Turbo-jet engines will sooner be available than turbo-prop engines and it may be we must go directly from the reciprocating engine to the turbo-jet engine. I believe, however, there remains a logical place for the turbo-prop engine and I am sure it needs to be developed. That is especially so for military air transportation, and there is some evidence that further development of the turbo-prop power plant will have a more

prominent place in the military-civil aircraft program.

WHEN WILL JETS BE OPERATING?

It is probable that there will be some jet transports in domestic operation, principally on the long transcontinental runs, about 1958. There may be a limited number flying before that time, on an experimental basis.

DESIGN PROGRAM

At least three manufacturers, Lockheed, Douglas and Boeing, are studying the specification for a domestic jet transport. The engineers of the airlines are working closely with them. American Airlines has been studying the problem for about three years and has acquired considerable experience. Most of the work to date consists of engineering studies and drawings, with some work done on wind tunnel testing of miniature models. No manufacturer in the United States is now prepared to offer a transport for sale and, to the best of my knowledge, no domestic operator has now any intention of placing an order.

INTERMEDIATE AIRCRAFT

There will be an intermediate development before the jet transport. Douglas is building a new airplane, the DC-7, around specifications prepared by American Airlines. Delivery should begin about September of 1953. American Airlines has twenty-five of the DC-7's on order and expects to begin their operation on January 1, 1954. Three other airlines have also entered orders for the DC-7, for deliveries following those of American. The DC-7 will cost \$1,600,000 each, compared with \$1,100,000 for the DC-6B and about \$600,000 for the original DC-6.

The DC-7 will be longer than the DC-6B and will cruise about 50 miles an hour

faster. It should cruise at 360 miles per hour. It will have greater fuel capacity and, therefore, longer range than the DC-6B. It should be capable of going from coast to coast in about eight hours, non stop. The new airplane will permit substantial improvement in the schedules operated by American.

Lockheed will also have a faster model of the Constellation. Both of the models, Douglas and Lockheed, gain their increased speed from greater engine horsepower, a more powerful, more efficient reciprocating engine, the Curtis compound engine.

The new models, the Douglas DC-7 and the Constellation, will probably be the last of the large transport aircraft with reciprocating engines. After them will come aircraft powered with turbo-prop and turbo-jet engines.

But for many years after the introduction of the new power plants the majority of flights will continue to operate with the conventional type of aircraft, for the airplane with reciprocating engines is relatively efficient for short and middle distances.

NO MYSTERIES

There are no inherent mysteries about a jet transport. Several have been built, and reasonably efficient ones, and it would be easy enough to begin building a better one without delay. The basic problem is that no one has yet been able to build a jet transport which will operate with profit. And it may take several years to perfect an engine and airplane design which will provide the economy permitting profitable operation.

CONSUMES TOO MUCH FUEL

The "nut" of the problem is that the turbo-jet engine consumes a relatively enor-

mous quantity of fuel. A jet transport of reasonable dimension will require about 5 tons of fuel each flight hour, 10,000 pounds. The cost of that quantity of fuel is high, whether it be gasoline, kerosene or some intermediate fuel. But the real problem is the cost of transporting so much fuel weight. When you need to put aboard another ton of fuel you need to eliminate a ton of revenue-producing payload. Too high a proportion of the lift ability of the airplane is devoted to transportation of fuel, and too low a proportion to the transportation of revenue-producing passengers, mail and cargo.

The problem for the engineers is to produce a turbo-jet engine with better fuel economy. Until that is done there will be few jet transports in operation. In military airplanes it may be essential to have very high speed, irrespective of operating cost, but a jet transport must be able to operate with economy, and profit, for it needs to be self-supporting.

BRITISH OPERATION

The British are able to advertise that they operate jet transports, although the number in operation is limited. The British have done a good job of pioneering in the jet field, and their work will be beneficial to all.

The British have said in the press that their jet operation, to date, has shown a nominal profit. Many of our operating people doubt that, but it is possible. One reason it may be possible is that the load factors on the limited British operation have been very high, much higher than can be anticipated in normal, volume operation. Another reason is that the air fares on the run to South Africa are much higher than comparable air fares in the United States, often 50% higher than our domestic

fare of 5½¢ per mile. I believe the British experience provides no sound foundation for concluding that jets of present design can be operated on United States routes, at existing fares, with profit.

UNITED STATES COMPETITIVE POSITION

The United States manufacturers can and I believe will build jet transports superior to those available in England. It is the consensus that we are ahead of the British now in some of the higher thrust engines. The airframe of the plane should present no unusual problem.

But it is doubtful that either the British or American manufacturers will be able to sell the airlines any quantity of jet transports until they reasonably prove they can be operated with profit. That has not yet been done.

The trend of development is in the right direction and more economical engines may be anticipated. But much more needs to be accomplished and that will take time. I believe that the estimate for 1958 is a reasonable one. It should be met if the present rate of progress continues.

There may be jet transports in the overseas field, for entirely competitive reasons, before they are operated in the domestic field. But in either field they would now meet the test of profitable operation with difficulty.

MANUFACTURING AIR TRANSPORTATION

Air transport operation is a "manufacturing" business. We manufacture air transportation. The airplane is our productive machine.

We must manufacture in relatively great quantity, otherwise our production cost will be higher than our potential sales

price. We must be able to sell a high proportion of the product manufactured, and it must be sold before it is manufactured. There is no way to "carry an inventory" of air transportation after it is manufactured. Unsold capacity is a dead loss immediately the airplane takes off. Something like a theatre; when the curtain goes up the unsold seats represent a loss for that performance.

LOW, COMPETITIVE FARES

To sell our product in quantity its price must be competitive with that of other forms of transportation. Charges must be low enough to encourage an increasing number of people each year to travel and ship by air. The determination to broaden the market, to sell more air transportation to more people, must be a continuing one.

The airlines have done remarkably well in maintaining low fare levels. The average air fare today is about 7 per cent above 1940 and many individual fares are below the 1940 level. As a result of the economy of air travel we have been able to double our business since 1948. We operate with high volume and low profit margin. We must continue to operate on that basis.

LIMITED MARKET FOR HIGHER FARES

On the basis of present estimates of cost we cannot operate a jet transport with profit at the existing fare levels. There are a limited number of people willing to pay higher fares to go 500 miles an hour. But there are not enough of them to make a volume business. The average passenger is unwilling to pay more. He would be glad to have additional speed, at the present price or at a nominal increase but he is not willing to pay the substantial premium which jet transport operating costs would now require.

If we need to raise the price of air transportation to "break even" on the cost of operating jet transports, and if we substitute jets for a high proportion of our present transports, we lose the business of the "average" customers. If we lose a high proportion of that group we lose the ability to produce, and sell, large quantities of air transportation.

THE OPPORTUNITY FOR THE JET

It all gets down to this:

There will be *limited* opportunity for the jet machine when it can operate with economy equal to the DC-6 or DC-7.

There will be *great* opportunity for it when its relatively high speed can provide a substantial reduction in operating cost.

In the past, as each new airplane has been faster than its predecessor we have expected the increased speeds, resulting from a more efficient machine, to produce operating economies, and we have always had them. That is the principal reason we can sell air transportation in 1952 with so little increase in price over 1940, in spite of higher costs for all purchases. But, as yet, the jet machine demands a higher unit operating cost, not a lower one. There will be no widespread demand among the operators for the jet transport, as a productive machine, until that trend is reversed.

OTHER ELEMENTS OF COST

I have spoken of fuel costs (fuel purchase price and the cost of transporting it in the airplane) as being the principal element of increased operating cost. There are other elements. The jet engine is not yet as reliable as the reciprocating engine. Day to day maintenance costs will be higher, and it will need to be overhauled more often. The initial capital cost, per engine and per unit of power developed, is

substantially higher. Its cost per hour of total life operation may be ten times or more the cost for the reciprocating engine, dependent on how long the jet engine will last in scheduled operation. And we do not know that yet.

DEVELOPMENT COST

The cost for the development of a new jet transport is estimated at \$30,000,000, and nearly all of that will be expended before a single production model is available. The production models will thereafter be expensive. No manufacturer is yet willing to quote a firm price, but estimates vary from \$2,000,000 to \$4,000,000 for a single airplane, dependent on size and quantity produced.

DIFFICULT TO JUSTIFY

In "manufacturing" terms it is difficult to justify a new, very large capital investment to secure a newer model machine with a higher unit production cost than the machine you now own. Until the new machine can assure a substantial operating economy or other tangible economic benefits there is little justification for its purchase.

COMING, BUT NOT "AROUND THE CORNER"

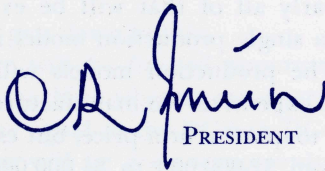
In summary, the progress of air transportation has been tied closely to the development of more efficient power plants. Turbine engines are a modern development with good promise for the future. It is safe to predict that power from turbine engines will ultimately become the principal form of power for air transportation. Progress in the design and production of better jet engines has been very heartening. I have no doubt the trend will continue.

We recognize the long-range potential

ties of jet power, and we will continue to do all we can to accelerate its development. We must, however, be very realistic in evaluating the danger of making large capital investments in jet transports at the present stage of their development.

Jet power seems a certainty for the future, but it is not "just around the corner".

Sincerely yours,



PRESIDENT

November 20, 1952