

1943

The Empire of Pan American Airways

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BOSTON UNIVERSITY
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THESIS
The Empire of Pan American Airways

by
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(B.S. in B.A. Boston University 1943)

submitted in partial fulfillment of
the requirements for the degree of

Master of Business Administration

1943

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INTRODUCTION

The Pan American Airways System, although a private corporation, has been primarily responsible for the development of the international air commerce of the United States and has played a large part in the shaping of the air policy of this country. For these reasons a study relating to the expansion of this company into the largest international air transportation system should be of much significance and importance.

It is the purpose of this thesis to discuss the following factors pertaining to the company:

1. The methods by which Pan American has created and has molded an organization equipped to cope with the multitudinous problems of international flying.
2. The extent to which the United States has assisted the company financially, legally, diplomatically and politically.
3. The value of the System to the United States under peace-time and war conditions.
4. The contributions which the company has made to the social and economic betterment of the countries in which it operates.

As far as can be determined no books have been published dealing with the various aspects of international air commerce in general or of Pan American Airways in particular. However, a few pertinent chapters have been found in books on air transportation. Although analytical reports on Pan

American can be obtained from financial services, in most cases the information given is brief and leaves much to be desired in the way of a full exposition of the company. Therefore, much of the material, ranging from technical to general data, was derived from industrial and general business magazines. The latest available information has been used as much as possible but it must be remembered at all times that various changes have very likely been made which, due to the war, have not been made public.

I. THE FORMATION OF PAN AMERICAN AIRWAYS CORPORATION

A. Air Routes to the South Prior to 1927

A summary of the events leading up to the formation of Pan American Airways Corporation in 1927 and its subsequent growth into the most expansive and successful system of international air routes is necessary in order to form a complete picture of the background upon which Pan American Airways was formed and from which has grown a company of unprecedented size in its field with seemingly limitless expansion possibilities.

In the early 1920's the idea of an air line from the United States to the south, the first endeavor of air transportation from this country to a foreign country, had been tried by Inglis M. Uppercu. He founded Aeromarine Airways which flew from Miami and Key West to Havana and Nassau and which was subsequently dissolved. Then in 1926 there were numerous rumors of Caribbean air lines, flying between New York and Havana.

B. Three Groups Interested in Setting up Lines to the Caribbean

1. Capt. Montgomery, G. Grant Mason and Richard B. Bevier

Three outstanding groups were aiming at the Caribbean area. The first of these was made up of Capt. John K. Montgomery of the United States Army, G. Grant Mason, Jr.,

who later became Pan American's manager in Cuba, and Richard B. Bevier. On March 14, 1927 they formed a company called Pan American Airways, Inc. (Not to be confused with Pan American Airways Corporation)

2. Reed Chambers and Eddie Rickenbacker

About the same time a second group, headed by Reed Chambers, who later became Vice President of United States Aviation Underwriters, Inc., and Eddie Rickenbacker, formed a company under the name of Florida Airways which for nine months during 1926 ran between Atlanta, Jacksonville and Miami. When and if new legislation was enacted to allow the Post Office to give contracts for flying foreign mail, this newly-formed company intended to extend its route across to Cuba.

Although the company was backed by a very impressive group, including Percy A. Rockefeller, Charles A. Stone, Charles Hayden, George Mixter, Richard Hoyt and Anne Morgan, it lost so much money that the financial backers let it go into bankruptcy. However, the members of the organization planned that when prospects seemed advantageous they would form a company to be called Atlantic, Gulf and Caribbean Airways.

3. Juan Terry Trippe

The third group which successfully carried out its early plans was headed by Juan Terry Trippe, president of Pan American Airways Corporation since its inception. A short summary of Mr. Trippe's background prior to the

establishment of this company is important because his integrity, his ability, his foresightedness and perseverance are very largely responsible for its success. (1)

Mr. Trippe, who attended Yale where he launched a collegiate flying club, had been a Naval pilot during the World War and thereafter was entirely engrossed with the possibilities of flight. For a year after graduation he tried working as a bond salesman but by 1923 he knew that his interests lay entirely in the field of flying. He consequently bought, with several ex-Yale flying friends, nine unused Navy planes which were left over from the war for \$500 and started a speculative enterprise called Long Island Airways, in which he was president and chief pilot. It was while operating this company that he learned all phases of operation including bookkeeping, repair and flying. The company which primarily ferried passengers about Long Island, chartered planes to sportsmen and functioned intermittently for movie shorts, thrived until the planes disintegrated.

It was the first outstanding effort of a man who realized the commercial possibilities to be derived from the airplane. During this period people were ridiculing such prospects but Juan Trippe defied public sentiment and started one of the few undertakings in commercial air transportation in the United States prior to 1930. (2)

(1) Fortune, "Pan American Airways," Vol. 13, No. 4, April, 1936, pages 85-87

(2) Busch, Noel F., "Juan Trippe," Life, Vol. 11, No. 16, October 20, 1941, page 117

Following the collapse of the Long Island Airways, Mr. Trippe found two persons in agreement with his ideas on air transportation, John A. Hambleton, a Baltimore banker, and Cornelius Vanderbilt Whitney, and as a result organized the New York Airways which made a bid for the Boston-New York mail contract against the Colonial Air Transport Company. Neither won and the two companies combined interests under the name of Colonial Air Transport Company in 1924. It was not long afterwards that Mr. Trippe, the managing director, proposed that the company expand by adding a route to Miami or Havana. Foresightedly he saw that by this process the Colonial could cover the eastern seaboard. The other directors who would not understand Mr. Trippe's reasoning became alarmed and he was ousted.

Following this venture Mr. Trippe, Mr. Hambleton and Mr. Whitney put \$25,000 apiece into Aviation Corporation of America drawn up by Robert Thach and invited eight well-to-do men to follow their example with the result that the total paid-in capital amounted to \$300,000. Their purpose was to buy into air enterprises. It was while negotiations were going on with Pan American Airways, Inc., that the latter company won the United States mail contract to Havana and the Cuban contract to Key West.

Although services had to be inaugurated by October 19, 1927, an agreement was not reached until October 3, at which time a holding company named Atlantic, Gulf and

Caribbean was organized. This later became Aviation Corporation of the Americas, incorporated in Delaware on June 23, 1928, and still later on April 29, 1931 its name was changed to Pan American Airways Corporation. The original Pan American Airways, Inc., was retained as an operating company with a nominal capitalization.

With only a few weeks to create a line complications arose. Trippe and his friends set to work while promoters and bankers were handling the stock and other financial matters. A skeleton force had to be collected; some Fokkers were purchased; a mud flat at Key West had to be made into an airfield; passenger stations and hangars had to be built; Key West had to be made an official port of entry; maritime clearance regulations had to be changed for airplanes.

Since the Post Office refused to grant an extension of time there was a mad rush to save contracts and financial structure but luckily when the October 19 dead line came a ship was actually flown across the 90-mile stretch of water to Havana by an obliging friend who acted as a company agent. Such a crisis during the formation of its first route was a valuable lesson and Mr. Trippe since then has had a perfect record for meeting operating contracts when he has set up subsequent lines.

In the group which had charge of establishing the company Mr. Trippe was the only man who was not in some other business. At the age of 28 he was ready to devote all his

time to the company. In the following years he always put its interests before all others and can without hesitation be considered the person to whom the most credit is due for the System's success in operations over the period of the last fifteen years.

With few exceptions the group around Mr. Trippe consisted of pilots and their knowledge of airplanes and their operations were of considerable value. Then, too, because they were rich pilots they did not need the backing of bankers who were for the most part unfamiliar with air transportation and who might hinder the daring chances which had to be taken. Being responsible to no one they organized their lines by a very practical but ideal method.

C. Method Used in Setting up Routes

The method which was used to set up the first line between Key West and Havana is in the main representative of the process which was followed in the establishment of subsequent routes. The system in laying out a new route was: (1) to get the landing rights; (2) to acquire equipment; (3) to make the maximum bid allowable by the Post Office Department. His rivals often made lower bids but did so without first establishing adequate guarantees of ability to perform within the specified period.

The company was fortunate in having selected and obtained successful and capable men for its personnel in whom it could put implicit faith that they would manage their

departments with wisdom and enthusiasm and that each duty and each order would be done and done well.

There were many different types of work which had to be accomplished. Engineers and explorers were sent out to learn the dangers of the route to be established and to plan the airfields, ground facilities and other engineering aspects. At the same time legal men and ex-State Department men were employed to investigate the legal aspects, such as to learn what the governments to be served would demand if and when the service was established across their borders. After their investigations were successfully made, options and contracts were required to operate regular and efficient air service. Pan American's officials have been exceedingly foresighted in that they have tied up things in such a way that no other company could operate between two points without being at a decided disadvantage. (1)

(1) Fortune, "Pan American Airways", Vol. 13, No. 4, April, 1936, page 159

II. AIR ROUTES OF PAN AMERICAN AIRWAYS (1)

Since the first route between Key West and Havana was established in October, 1927, the routes of Pan American Airways have shown unusual growth. Chart I and Chart II, giving the route mileage and flight miles, respectively, flown over the company's network from 1929-1941, give a graphic picture of its remarkable development. In addition, all the routes which the company has set up are presented on a map on page 32. This map will assist the reader in following the expansion of routes to be discussed in this section.

A. Latin American Area

When Pan American Airways had been operating between the United States and Havana only a few months, Mr. Trippe learned that France was trying to acquire the air rights in Peru. Moving quickly, he arranged a contract for an air line with the Peruvian Government after which he offered half interest in the new line to the owners of W. R. Grace & Company, an American transportation firm which operates in that part of the world. The latter company accepted his proposition

- (1) Material for this section was taken primarily from:
 Annual reports of Pan American Airways, 1929-1941
 Fortune, "Pan American Airways," Vol. 13, No. 4,
 April, 1936, pages 160-164
 Kirk, Grayson, "Wings over the Pacific," Foreign
 Affairs, Vol. 20, No. 2, January 19, 1942 pages 290-302
 Standard Corporation Records (P-S), Standard and Poor's
 Corporation, New York, 1942.

CHART I

Year	Route Miles	1929-1941
1929	12,265	
1930	17,861	
1931	20,664	
1932	26,652	
1933	30,982	
1934	31,259	
1935	40,479	
1936	40,896	
1937	52,267	
1938	53,548	
1939	62,305	
1940	72,615	
1941	98,582	

CHART II

Year	Flight Miles	1929-1941
1929	3,519,460	
1930	4,929,564	
1931	5,122,672	
1932	6,008,034	
1933	7,304,419	
1934	9,275,396	
1935	10,307,030	
1936	11,794,910	
1937	13,645,992	
1938	13,507,156	
1939	14,445,934	
1940	17,526,625	
1941	24,358,346	

Source: Annual Reports of Pan American Airways, 1929-1941

and in 1928 Pan American and the Grace interests, each putting \$500,000 into a corporation called Pan American-Grace, purchased the assets of two small air lines in Chile and Peru.

In July, 1928, the Post Office granted the System contracts to Puerto Rico and the Canal Zone and options on routes to Trinidad, Colombia, Venezuela and Brazil. In August Pan American bought out a company operating between Santiago, Santo Domingo and Puerto Rico. In October, 1928, it obtained a contract to fly between the United States and Nassau and with British consent began operation in January, 1929. During that month operations were also begun to Puerto Rico. Early in February, 1929, the company opened a route through Central America to the Canal Zone.

In Mexico during 1928 Pan American had discovered that operations could only be conducted by a Mexican company and since there was only one company, Cia Mexicana de Aviacion, in possession of a franchise to Mexico City steps were taken to purchase the company. On January 5, 1929 the Post Office Department advertised for bids on a Brownsville-Mexico City route and eleven days later Pan American purchased the above company. Following this purchase, though Pan American was the highest bidder, it obtained the Post Office contract because it owned the only company entitled to fly mail on the Mexican part of the route.

As a result of its unusual growth the System which flew a 251-mile route at the end of 1928 was operating over

a 12,265-mile network in 28 different countries and colonies at the end of 1929. The system of routes was as follows. One route led from the United States to Havana across the Caribbean to Yucatan. From there it went southward to British Honduras, Honduras, Nicaragua, Costa Rica, Panama and the Canal Zone. Here it connected with the Pan American-Grace lines which continued southward through Colombia, Ecuador, Peru and Chile to Argentina. From the Canal Zone the company had another route which flew eastward as far as Caracao off the coast of Venezuela. Another line from Havana extended southeastward over Cuba, to Haiti, the Dominican Republic, Puerto Rico, St. Thomas, St. John, St. Lucia and Port of Spain, Trinidad, off the South American coast. From there it followed the coast line south as far as Dutch Guiana.

The year 1930, like 1929, was unusual because of the great expansion of the System. There were three principal additions to the network during this year. The first was the linking of operations in Mexico with those in Central America, by the starting of a route between Vera Cruz and San Salvador and the connection of the Yucatan route with the Central American line at San Salvador. This provided the United States with two direct routes through Mexico to Argentina. Second, a route between Florida and Barranquilla, Colombia, was established by way of Kingston, Jamaica, and the Canal Zone. Third, service was extended from Dutch Guiana around the bulge

of Brazil with stops at Para, Pernambuco, Bahia, Rio de Janeiro and other important cities of Brazil.

In February, 1931, service was started between Maracaibo, Venezuela, and Port of Spain, Trinidad. This route brought all the countries in the Caribbean area into the System's sphere of operations. In the same year Pan American completed its encirclement of the South American Continent by continuing its route from Brazil to Buenos Aires, Argentina. The 1931 year also witnessed the purchase by the company of a substantial interest in Sociedad Colombo-Alemana de Transportes Aeros (Scadta), an air transport company operating extensively in Colombia, and the Uraba, Medellin and Central Airways, Inc., a company which held long-term exclusive operating rights in the Gulf of Uraba section of Colombia.

Thus was established in the short space of four years the framework for the Latin American empire of the System. Since 1931 there have been various changes and extensions in the southern routes but throughout this period the company has continued to maintain its original pattern which stretches out over the republics to the south like a huge bottle with its neck to the north.

In 1932 the System purchased from North American Aviation control of the Compania Cubana de Aviacion, S.A., an air transport company operating local routes in Cuba.

In August, 1933, the System established service between Guatemala City, Peten, Puerto Barrios and Tela, under contract with the governments of Guatemala and Honduras. In November service was started in Brazil between the seaport of Para and the important inland city of Manaus on the Amazon, a distance of 932 miles.

In March, 1934, a local service was inaugurated by the System between Para and Rio de Janeiro to accommodate smaller cities not served by the international lines. In April a route was established to Tegucigalpa, Honduras, thereby providing service to all the Central American capital cities. In May a Mexican affiliate of Pan American, Aerovias Centrales, S.A., extended service between Hermosillo, Mexico and Los Angeles, California, thus setting up a 12-hour schedule connecting Los Angeles with the international system of Pan American in Mexico City.

Compania Mexicana de Aviacion, S.A., through extensions provided effective service throughout the republic in 1935. At the same time on the west coast of South America scheduled service was inaugurated by Panagra, the air line owned by Pan American-Grace Airways, Inc., between Arica, Chile, and La Paz, Bolivia.

In 1936 there were two outstanding additions to routes. A high-speed service was established between the United States and Brazil, using a direct route from Puerto Rico to Port of Spain rather than the longer route by way of

the Leeward Islands. Second, Panagra placed into operation an additional service connecting Cordoba, Argentina, with Santiago, Chile, and Buenos Aires, Argentina.

During 1937 a diagonal route was set up on the west coast of South America, running from Arequipa, Peru, to La Paz, Bolivia, and thence to Cordoba, Argentina. Services were also commenced between Rio de Janeiro and Bello Horizonte, an important city in the State of Minas Geraes, Brazil, and between Manaus and Rio Branco, the capital of the Acre Territory, Brazil. In December the establishment of the east coast diagonal route by way of Sao Paulo, Brazil, and Asuncion, Paraguay, to Buenos Aires completed the extension to each of the 21 republics of Central and South America. During the same month a new trunk-line service was commenced to Cristobal via Kingston, Jamaica, to speed up through traffic between the United States, the Canal Zone and the west coast of South America.

In the next two years, 1938-1939, besides increasing schedules throughout the entire Latin American network Pan American made four worth-while changes in its routes. First, it made noticeable increases in its operations in Brazil. However, service to Rio Branco, Brazil, was dropped and the end of the line was established at Porto Velho. Second, it set up an internal route within Ecuador. Third, it commenced a trunk-line service from Cuba to Balboa, Canal Zone. Finally, it started a bee-line route from Port au Prince, Haiti, to Maracaibo, Venezuela.

In 1940 Pan American inaugurated a route known as the Brazilian "cut off". An overland airway was constructed across the bulge of Brazil from Para, at the mouth of the Amazon River, to Rio de Janeiro and Buenos Aires, saving an entire day and a thousand miles of travel. Furthermore, the Havana-Mexico-Central America air lane, which had undergone many changes since its inception, was permanently established during this year. This route stretched from Havana via Yucatan to Mexico City where connections were made with the Central American route of the System. Also during this year, in cooperation with the Colombian Government, it completely reorganized Scadta, changing the name of the former German company to "Avianca" and maintaining substantial interest.

In 1941 Pan American Airways, with the assistance of the United States and Brazilian Governments, expanded its routes to most of the territory which had previously been served by Axis-controlled air lines within Brazil. During that year, too, the German-controlled Lloyd Aereo Boliviano, which since 1925 had conducted domestic air transportation operations in Bolivia, was nationalized. Pan American-Grace Airways, cooperating with the United States and Bolivian Governments, extended its operations in Bolivia to include a line to Brazil, thus establishing a new transcontinental route. The other services of the former German line of approximately 2,200 miles are now being operated by Pan American-Grace under a management contract plan. A new

high-speed route between New York and San Juan, Porto Rico was also started during this year.

Continuing the pace set in former years Pan American in 1942 increased schedules throughout its entire Latin American network. Two new extensions were also added during the year. In June the Civil Aeronautics Board announced that President Roosevelt had approved a third trans-Andean service between Antofagasta, Chile, and Salta, Argentina. In September this route was officially commenced. In June, 1942, Panagra extended operations to include a route between Quito, Ecuador, and Ipiales, Colombia, which was a substitute for the German air line, Sedta, whose routes were canceled in September, 1941.

B. Pacific Area

1. The China National Aviation Corporation

In March, 1933, Pan American Airways purchased from North American Aviation the entire American interest, which amounted to 45%, in the China National Aviation Corporation. The routes of this company ran from Shanghai to Peiping and from Shanghai up the Yangtze River, a distance of 1,200 miles, to Chengtu. The company also held a franchise covering the coast route from Shanghai to Canton. In October, 1933, service was inaugurated from Shanghai, via Wenchow, Foochow, Amoy and Swatow, to Canton.

Since the time of its purchase the routes of this air transport company have been changed many times, following the seat of the Chinese National Government as it was pushed farther inland by the aggression of Japan. An important extension of the routes of the company occurred during the early part of 1939 when negotiations between the Chinese Government (owner of 55% of the company) and the British resulted in permission being granted the company to operate between Chungking and Rangoon via Kunming and Lashio. China National Aviation Corporation made its first regular flight to Rangoon in October, 1939. A route was also opened to Hanoi, French Indo-China, during the same year.

Although the war between the United Nations and Japan has resulted in the loss of Burma, the company has continued with connections to the outside world. This has been accomplished by establishing a route between Chungking and Calcutta, India.

2. Transpacific Operations

After four years of preparation Pan American opened an 8,000-mile route from San Francisco to Manila by way of Honolulu, Midway, Wake and Guam in 1935. This route was extended to the Portuguese colony of Macau and to Hong Kong, a distance of 700 miles in 1937, where direct connection was made with the European airline system serving the Dutch East Indies, Straits Settlement, Siam, Burma, India and the countries

of the Near East. Contact was also made with the China National Aviation Corporation which was at that time operating a route from Hong Kong to Chungking.

During this period diplomatic and operational difficulties prevented the opening of a proposed southern route to Australia. In 1935 the System had been able to obtain landing rights from the New Zealand Government and although many survey flights and one scheduled flight, which resulted in disaster, were made over the proposed route to New Zealand no regular service had been established at the outbreak of the European war. The war greatly increased transportation demands in the Pacific and Pan American, seeking to take advantage of a large market, hurried forward its work on the New Zealand route. In July, 1940, it commenced regular service from the United States to Auckland, New Zealand, a distance of 8,000 miles.

The first route to Auckland from the United States was from San Francisco via Los Angeles to Hawaii, then southward to Canton Island and Noumea, New Caledonia, and thence to Auckland. In 1941 arrangements were made with the British Government for the use of Suva in the Fiji Island group as a port of call between Canton Island and Noumea. The first regular stop was made at Suva in October, 1941.

As the war in Europe progressed and the Japanese menace in Asia grew, Britain became more and more in need of

rapid transportation facilities. For this reason Pan American was allowed to extend its northern Pacific route to include the Singapore Straits Settlement and in May, 1941, it made its first flight over the new route. This extension made it possible for a person in New York to reach Singapore in less than a week.

Since the war began between the United States and Japan operations over the company's transpacific routes have been curtailed considerably. It is clear that future developments in the Pacific by the System will depend a great deal upon the type of peace which will be made at the end of the war. If Japan maintains control of the southern Pacific the present lines will be abruptly terminated. However, if the United Nations win in all probability Pan American will be given the freedom to expand her present routes.

C. Alaskan Area

The System made its first move in Alaska in 1932 when it purchased the ground facilities, aircraft and mail contracts of two American lines, the Alaska Airways, Inc., and the Pacific International Airways of Alaska, Inc. These companies were operating in competition with the only other reliable form of transportation, the dog sled. In 1934 Pan American acquired the assets of another Alaskan air transportation company operating in southwestern Alaska, called the Alaska Southern Airways, Inc.

Since that time Pan American through its subsidiary, Pacific Alaska Airways, into which all three above-mentioned companies were merged and which in turn was merged into Pan American Airways, Inc., in 1941, has built up a network of routes connecting the important interior city of Fairbanks with the capital city of Juneau. This latter city is 900 miles from the nearest point in the United States. The route from Juneau is northwest via White Horse, Hot Springs and thence to Fairbanks. From Fairbanks there is a route to Nome via Tanana, Mulato and Golovin and a second route to Bethel via McGrath and Flat with a branch connecting Ophir with McGrath and Flat.

On June 20, 1940, passenger, mail and express service was commenced between Seattle, Washington, and Juneau, Alaska. This new extension constituted the first direct air route between the United States and Alaska. At Juneau direct connection was made with the other Alaskan operations of the System.

D. Atlantic Area

After a long period of preparation involving the construction of suitable aircraft, technical survey flights, the training of personnel, observation of meteorological and climatic conditions and a considerable amount of diplomatic and political difficulties, Pan American inaugurated a service from New York to Bermuda in June, 1937. During that year, too,

enough progress had been made in the solution of various political problems to permit the start of transatlantic survey flights.

Due to these same problems it was not until May, 1939, that the System commenced service to Marseilles via Bermuda, the Azores and Lisbon. From Lisbon a branch route was established to Southampton, England. The United States terminals for this mid-Atlantic route were Baltimore and New York.

In late June Pan American started transatlantic operations over a northern route via Botwood, Newfoundland, and Foynes, Ireland, to Southampton, England. This was known as the Great Circle route and the United States terminal was New York. Three months after these services had started it became obvious that war was about to commence in Europe. For this reason the System found it necessary to withdraw the terminal of the Great Circle route from England to Ireland and also on the mid-Atlantic route to withdraw from Marseilles to Lisbon.

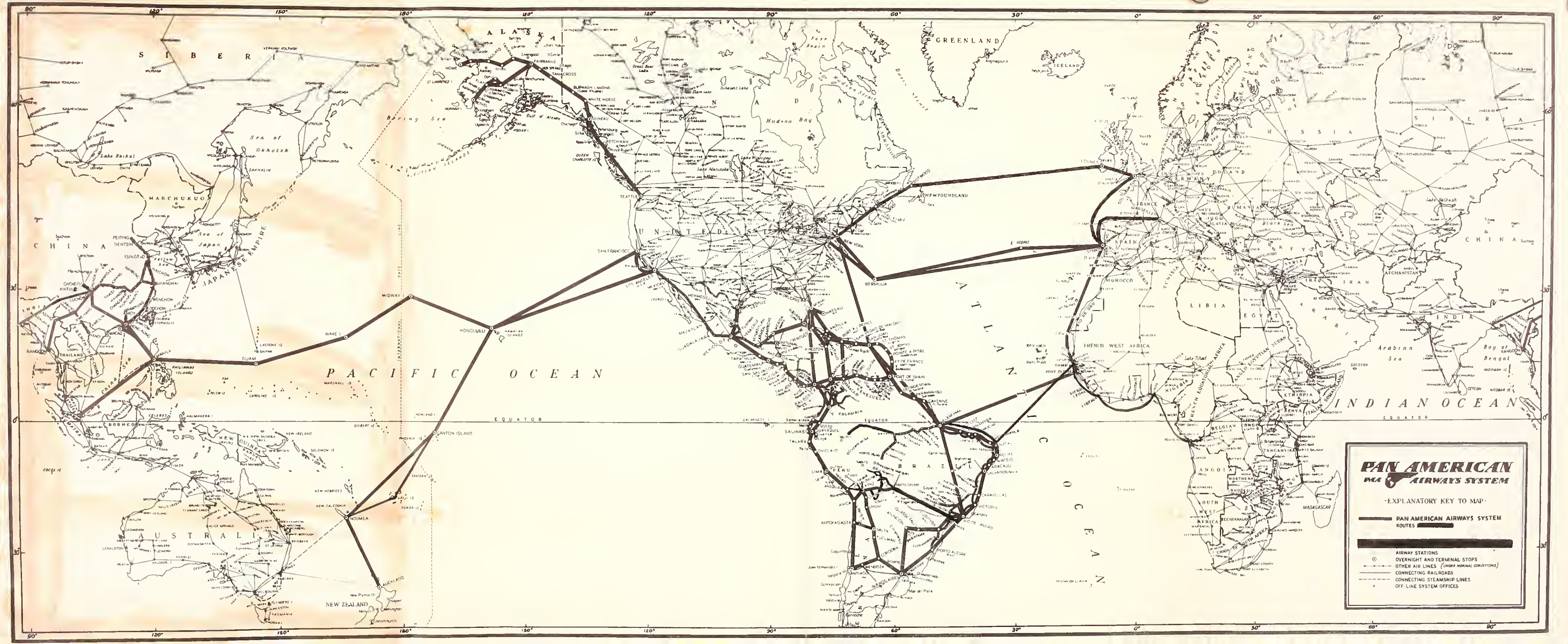
In October, 1939, weather conditions on the Great Circle route resulted in the consolidation of both services along the mid-Atlantic route. In the spring of 1940 the Great Circle was not re-established because the United States Neutrality Act would not permit it. However, recently this northern route was reinstated.

In 1940, due to difficult winter operational problems in the mid-Atlantic, westward flights were routed by way of Bolama on Portuguese West Africa to Para, Brazil, thence via Puerto Rico to New York. This route, while 4,085 miles longer than the Lisbon-Azores-Bermuda-New York route and therefore more expensive to operate, was nevertheless worth while due to the increased percentage of schedules completed and the larger number of passengers and mail moved from Europe to the United States.

At the same time that this new westward route was being flown a new line flying nonstop from Bermuda to Lisbon was being used by the System. By overflying Horta in the Azores on eastern trips throughout the winter and following the South Atlantic route on westbound trips, the Clippers were able to complete 50% more westward crossings than during the 1939-1940 winter at a time when the demand for such crossings was many times the available supply.

During 1941 the System began operations between Miami, Florida, and Africa via Para and Natal, Brazil, to Bathurst, Gambia, and Lago, Nigeria, thence to Leopoldville, Belgium Congo. In the same period Pan American, cooperating with the Government of the United States, opened an air route to the Middle East by way of the Atlantic Ocean and Africa. While the exact location of this route has not been made public it is known that it is but a temporary route designed to make possible the delivery of military supplies.

Perhaps since the United States has entered World War II many other routes have been established. However, the setting up of such routes will doubtless remain a secret for some time to come due to the value this information would be to the enemies of the United States.



PAN AMERICAN
PAAC AIRWAYS SYSTEM

EXPLANATORY KEY TO MAP

- PAN AMERICAN AIRWAYS SYSTEM ROUTES**
- AIRWAY STATIONS OVERNIGHT AND TERMINAL STOPS**
- OTHER AIR LINES (UNDER NORMAL CONDITIONS)**
- CONNECTING RAILROADS**
- CONNECTING STEAMSHIP LINES**
- OFF-LINE SYSTEM OFFICES**



III. PERSONNEL

A. Pilots

The personnel of the company consists of persons with outstanding ability and a thorough knowledge in their respective fields. Of the various positions held by employees of Pan American Airways the pilots perform the most attractive, exciting and most responsible work. A survey of the rigid training which each man experiences before he becomes a full-fledged pilot shows well enough how expertly the company trains its pilots.

1. Training Centers

Many years ago at several far-flung bases Pan American set up flight instruction projects. Prior to that time the early pilots taught themselves and from the lessons which they learned evolved the training procedure for making flying experts out of ordinary pilots. Today the company maintains eight well-equipped training centers.

2. Pilot Qualifications and Training (1)

The qualifications for training at one of the various centers are many and difficult to fulfill. To qualify for the lowest rating the applicant must be in most cases a university graduate or an aeronautical engineer who holds a transport license. The system of education aims to make

(1) Material for this sub-section was taken mostly from: Fortune, "Pan American Airways," Vol. 13, No. 4, April, 1936, page 162.

CHAPTER 1

SECTION 1.1

Introduction to the study of mathematics. This section covers the basic concepts and definitions of mathematics, including the use of numbers and symbols. It discusses the importance of logic and reasoning in mathematical proofs and the role of mathematics in science and technology.

DEFINITIONS

Mathematics is the study of quantity, structure, space, and change. It is a discipline that uses logical reasoning to explore the properties of numbers and shapes. The language of mathematics is precise and unambiguous, allowing for the development of rigorous proofs and the discovery of new mathematical truths.

THE LANGUAGE OF MATHEMATICS

The language of mathematics is a unique and powerful tool for communication. It consists of numbers, symbols, and words that are used to describe mathematical concepts and relationships. The use of precise language is essential for the development of mathematical theories and the solution of complex problems.

flying a career rather than just a job. Each course is ended with examinations and there are six degrees.

After the applicant has qualified for the first degree, that of Apprentice Pilot, this "cub", as he is called although he is already an expert flyer, is sent out through all the different departments--traffic, communications, meteorology, etc.--to help the mechanics, to assist in the radio operations and to act as steward of the crew. When he is not busy, he studies to become a Junior Pilot and after completion of this degree he is a licensed engine mechanic, a licensed radio operator and a celestial navigator. He is required to be entirely familiar with the problems along the route he flies and must pass examinations in international clearances, international law and must know one language and seamanship. (Since the flying boat is regarded as a vessel members of its crew are considered to be seamen and consequently must know maritime laws and practices. In fact, Pan American has carried this idea so far as to require nautical terminology--it speaks of knots instead of miles, time is counted in bells and the crews stand watch.)

After the pilot has fulfilled the above-mentioned requirements he is eligible to fill the position of Second Officer, the junior post on the ocean flying boat. The next degree is that of Flight Engineer, demanding further specialization on engines and radio. Following this training comes the Senior Pilot degree with a captain's rating. The chief difference between this and the next lower grade besides the

advanced engineering training is that the former has had land and water experience. He has qualified himself through research and study to attain the rank of Master of Ocean Flying Boats. This rank signifies that the individual has demonstrated sound judgment throughout his professional career and is expert in all phases of piloting. It takes at least five years to obtain the top rating of a master ocean-flight Captain. He must know meteorology, navigation, marine law, at least one foreign language, the history of the countries over which he flies and how to handle a ten-man crew.

By this method of instruction the crew is composed of members who can perform the functions of all others and thus their duties are interchangeable. In emergencies this arrangement is ideal and insures the safety of the plane and its occupants to the highest possible degree in every circumstance. Their training is more rigorous than that given by any domestic air line. It has to be because instead of following a well-defined beam they must be able to navigate by the stars, cross 2,000 miles of water and land on a minute island. The company also insures that these crewmen will keep up to the minute in all duties by giving them periodic reviews and check-outs of abilities which they must pass. This is a good practice since it prevents the men from becoming lax and careless after having once received their degrees. It also determines whether each member is familiar with all new improvements, inventions and aids.

3. Divisional Instrument Training (1)

At the present time, as well as teaching pilots the routine flight problems, each training station instructs in special operational problems to be encountered in the particular division. All students become acquainted with the conditions, approaches and landings to be encountered in their respective sections. Then, too, sound basic instrument flight training is essential to successful operations of a scheduled line.

Pan American follows the formula shown below to produce expert instrument ability:

High Standard	
Plus	
<u>Good Instruction</u>	Plus Actual Practice = Expert Instrument
<u>Good Equipment</u>	

Most preliminary training in this respect is done on aircraft spared from actual operations. After the pilots are well trained in flight problems they receive their final instructions on the actual type of aircraft they will fly.

According to recent information there are approximately 16 training planes available which are located as follows:

	<u>Number of Training Planes</u>
Atlantic Division at New York	3
Eastern Division at Miami	6
Pacific Division at San Francisco	1
Western Division at Brownsville	2
Seattle, Washington	1
Colombia, South America	1
Brazil	1
Peru	1

(1) Information for this sub-section was taken primarily from:
 Roberts, Henry W., "Turning Out Instrument Pilots,"
 Aviation, Vol. 41, No. 5, May, 1942, pages 196-197, 243

Such divisional instrument training is done under the direction of a senior instrument flight instructor. As an example of the process of training through which the student goes we shall use the Atlantic Division training project. At that particular field there are three Grumman Widgeons, each equipped with two complete pilots' compartments, one behind the other. The instructor and co-pilot are seated in the forward cockpit while the pilot undergoing training sits in the rear cockpit which is completely equipped with a dual set of all instruments, radio apparatus and flying controls. During the instructions the curtain separating the two cockpits remains closed and thus the student is separated from all forward visibility. Besides, the windows in the rear cockpit are screened for totally "blind" flight instruction.

The use of these two cockpits at the same time has also proven a successful method of testing various makes of flight instruments and radio apparatus. With two makes installed in the two cockpits direct comparisons are made possible under identical operating conditions. This latter feature has been extremely valuable to Pan American in testing all new equipment.

In addition, the course includes routine instrument flight procedure, radio range and direction-finding navigation and instrument approach and landings. These are made in metropolitan waters under conditions which are identical with all landing facilities of Pan American's Atlantic ports of call.

4. Regular Flight Technique (1)

The technique used to perform a successful operation of each actual flight consists of what the company terms a "Multiple Flight Crew." This terminology was first conceived for the four-engined Sikorsky Flying Boats for transcaribbean service which required a four-man crew--a pilot, co-pilot, radio operator and a flight engineer. When the Boeing airplane was brought into service the standard crew in the Atlantic and Pacific was increased to eleven men--a captain and ten in the crew. Since there are many duties eleven members are needed in order to provide for relief watches which take over 50% of the flight time on long trips.

A description of the duties performed by such a crew follows.

The Captain, the chief administrative officer, is responsible for the safety and well being of persons and cargo carried and for the aircraft and completion of flight according to his orders. His normal station is the left-hand pilot seat occupied during all take-offs, landings, emergency conditions and during the time he serves at the controls. During flight he supervises the crew and prescribes the speed, track and altitude of the aircraft.

The First Officer, second in command, alternates with the Captain as senior on watch. He occupies the right-hand seat and assumes complete control in the absence of

- (1) Material for this sub-section was gathered mostly from:
Aviation, "Flying the Atlantic," Vol. 40, No. 10,
October, 1941, pages 49, 184, 186

the Captain. He also has the detailed responsibility of the crew and official papers for the aircraft at all ports. He is responsible for proper loading and unloading of cargo; he inspects the aircraft including a check on air controls, ship's documents, stowaways; he has final verbal or written reports from each responsible Flight Officer.

The Second Officer, a Senior Pilot-in-Training, is responsible for safe and efficient navigation of the aircraft and the complete complement of navigation instruments and equipment. He checks over equipment prior to flight and supervises care during flight. He also records in the aircraft Log the record of navigation procedures and operational statistics.

The Third Officer, a Junior Pilot-in-Training, assists and/or relieves other officers in their duties. He aids the First Officer in the preparation of the Weights and Balance Manifest and supervises loading. He ascertains prior to the take-off that all bulkhead doors are closed and reports to the Captain. After take-off he conducts a visual examination of all major external structural components and reports to the Captain. Before landing, when required, he receives a report from the Steward. He handles the bow mooring line when casting off and mooring. During flight he primarily is used to relieve the Second Officer.

The Flight Engineer is responsible for the mechanical condition and operation of the plane and the power plants. He is also responsible for loading the fuel and oil and he

measures them aboard before departure as well as participates in the inspection. During flight he maintains sections of the Log which pertain to mechanical conditions.

The Flight Radio Officer is responsible for the efficient utilization of the radio equipment and for maintenance of constant communication with the radio control stations ashore. He is constantly receiving weather reports, hearing from the ground stations and is in turn himself taking bearings upon stations or upon any available ships.

The Flight Steward is responsible for the handling of the passengers, baggage, mail and express, for all ship's papers pertaining to the mail, express and baggage and clearance of aircraft and persons aboard. He sees that the passengers' baggage receives proper care, arranges receipt and discharge of all express and mail, is responsible for procurement, storage and service of foodstuffs used, checks cleanliness and appearance of passengers' quarters, equipment and supplies, looks out for the comfort and pleasure of passengers, directs the organizing of recreations and, lastly, advises hotel accommodations, taxi service and other assistance.

All the above men who are specialists are relieved at stated intervals. The crew is rounded out by a Fourth Officer, an Assistant Flight Engineer, an Assistant Flight Radio Officer and an Assistant Flight Steward.

Thus the duties of the pilots, their extensive and valuable training and the qualifications that they possess are all factors which insure that Pan American Airways' services are maintained on a very high standard.

B. Other Personnel

The greatest care is taken in the hiring of all personnel. The company makes every effort to obtain an excellent type of personnel. The calibre of the men is very high and the factor of selection exceedingly important. In addition to the pilots themselves, the men in charge of training are most experienced and the company has an adequate staff of supervisors and inspectors at all times. All the work involved in the company's operations requires a check and a recheck.

The size of the company's personnel has grown substantially. From a figure of 1,500 persons employed in 1930, the number was increased to 3,000 by 1934, 4,700 by 1937, 7,477 by 1940 and 21,663 by the end of 1941. (1) Each employee has shared in the growth of the company and has contributed in some way to the record of which Pan American is the proud owner. The sharp increase in the number of men and women employed during 1941 was due to the fact that they were engaged for emergency projects. Facilities were also enlarged for the training of new flight and ground personnel (a discussion of the training of the latter will appear in Section IV) to meet the constantly expanding needs of operations pertaining to the war. At the present time the employees are actively cooperating in meeting the national

(1) Annual Reports of Pan American Airways System from
-1930 through 1941

emergency, often undertaking assignments far beyond the requirements of their normal duties.

C. Labor Relations (1)

1. The Railway Labor Act

The labor relations of Pan American Airways with the exception of wages for pilots and copilots and employees covered by the rules of foreign governments are regulated in a manner almost identical with the regulations of labor relations on the railroads. The Civil Aeronautics Act provides that any air carrier which wishes to operate must comply with Title II of the Railway Labor Act.

The general purposes of the Railway Labor Act are set forth in Section 2 of the law as follows:

"(1) to avoid any interruption to commerce or to the operation of any carrier engaged therein; (2) to forbid any limitation upon freedom of association among employees or any denial, as a condition of employment or otherwise of the right of employees to join a labor organization; (3) to provide for complete independence of carriers and of employees in the matter of self-organization; (4) to provide for the prompt and orderly settlement of all disputes concerning rates of pay, rules, or working conditions.

(1) Material for this sub-section was taken from the following sources:

Puffer, Claude E., Ph.D., "Air Transportation,"
Blakiston Company, Philadelphia, Pa. 1941,
pages 529-530, 545-553
New Horizons, Pan American Airways House Organ, issues
of July and August, 1942
Annual Report of Pan American Airways System for 1941

"(5) to provide for all prompt and orderly settlements of all disputes growing out of grievances or out of the interpretation or application of agreements covering rates of pay, rules or working conditions."

The 1936 amendment to the Railway Labor Act which extended to commercial air carriers the type of control over labor relations which existed on the railroads was a wise move. This act attempts to bring about a settlement of controversies through voluntary action on the part of the opposing parties and has no provision compelling them to submit to arbitration if either side feels this would be unwise. Compulsory settlement of labor disputes has never been very successful. This act sets up a mechanism which encourages the parties to get together and failing that brings all the facts to the attention of the public so that public opinion may bring pressure to bear for a settlement.

The act guards public interest by forcing the postponement of strikes for 30 days during voluntary arbitration or compulsory investigation. This rule makes the stoppage of services less probable. At the same time these weapons have not been entirely eliminated but must be used only after careful consideration. This tends to increase the possibilities of successful mediation of disputes.

2. Maximum Hours and Minimum Wages

In addition to the requirement that all commercial air carriers which wish to operate must comply with Title II of the Railway Labor Act, the Civil Aeronautics Act includes

a definite maximum hour and minimum wage restriction on two classes of employees; the pilots and copilots. However, because the pilots and copilots of the Pan American Airways are engaged in overseas, foreign or intraterritorial commerce the System is relieved from the part of the act which applies to hours and working conditions. But the company must pay the pilots and copilots on an annual basis, no less than the minimum wage which is required to be paid interstate air carriers under the act. This ruling was made because seasonal variations in overseas, foreign and intraterritorial flying are as a rule greater than in interstate flying.

The minimum wage scale for pilots is composed of four parts:

1. Base rate
For the first year \$1,600 with an increase of \$200 for each additional year of service until a maximum of \$3,000 is reached.
2. Additional payment per flight hour according to the following table;

<u>Flight Speed (Miles per Hour)</u>	<u>Wage per Flight- Hour Day</u>	<u>Wage per Flight- Hour Night</u>
Under 125	\$4.00	\$6.00
125-139	4.20	6.30
140-154	4.40	6.60
155-174	4.60	6.90
175-199	4.80	7.20
200 or over	5.00	7.50

3. Additional payment for each mile flown at a speed in excess of 100 miles per hour.

The first part of the paper discusses the general principles of the method. It is shown that the method is applicable to a wide range of problems. The second part of the paper is devoted to the application of the method to the problem of the stability of the equilibrium of a system. It is shown that the method can be used to determine the stability of the equilibrium of a system in a wide range of cases. The third part of the paper is devoted to the application of the method to the problem of the stability of the equilibrium of a system in a wide range of cases. It is shown that the method can be used to determine the stability of the equilibrium of a system in a wide range of cases.

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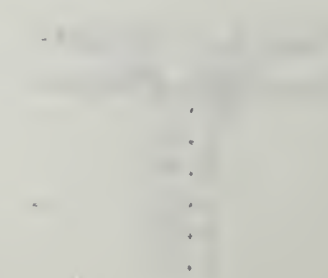
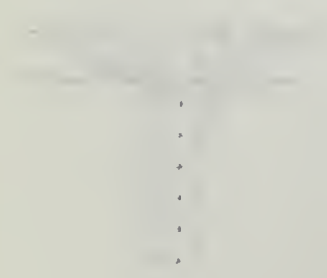


Fig. 1. Diagrams illustrating the application of the method to the problem of the stability of the equilibrium of a system.

This payment is calculated on the following scale:

<u>Miles Flown per Month</u>	<u>Cents per Mile</u>
Under 10,000	2¢
10,000-11,999	1½¢
12,000 and over	1¢

This part is somewhat ambiguous because it could be interpreted as either a block rate or a step rate. In applying the scale the United States commercial air carriers have used the second of these two interpretations which is much more to the benefit of the companies.

4. Additional payment for flying over hazardous terrain.

3. Minimum Wage Scale for Copilots

In this respect the Civil Aeronautics Act merely provides that differentials existing on October 1, 1933 shall be maintained. There is much confusion over this part of the decision with no one in the industry or in regulatory agencies being positive regarding its meaning and application.

4. Wage and Hour Provisions for Other Employees

There are no maximum hours or minimum wages for employees of air carriers who are not pilots or copilots. The Fair Labor Standards Act specifically exempts them from its provision. Collective bargaining under Title II of the Railway Labor Act remains as their principal means of securing favorable labor conditions.

5. Group Insurance Plan

On August 26, 1932 Pan American Airways offered to its personnel a group life insurance plan. In 1942, which was the tenth anniversary of the plan's inauguration, \$15,736,571 of insurance had been taken out by 5,408 of the company's personnel. Benefits since 1932 totaled \$527,835 paid to 108 personnel or beneficiaries, of which 94 were death benefits and 14 were permanent and total disability benefits.

The plan is an unusually fine one and is offered by the System at reasonable rates. Its advantages are:

1. Life insurance, including permanent and total disability benefits.
2. Uniform low premium rates for all personnel regardless of age or work.
3. Payment through payroll deductions.
4. Insurance is offered compensurate with salary from \$1,000 to \$10,000.
5. Pan American pays part of the total premium cost.

Personnel can make a considerable saving under the plan. For example, ordinarily a man of 35 years of age would be required to pay on an annual premium of \$54 on a \$5,000 life insurance policy. A member of Pan American Airways' plan for \$30 annually can buy the same policy. Thus a saving of \$24 is made possible by the plan in this instance. At the age of 40 the premium on such a policy would for an outsider go up to \$63.60. Though premiums on the company's group life insurance also increase with the age of the insured, the

company's personnel continues to pay only \$30 annually, the company paying the increase in premium in every case.

6. Retirement Plan

On March 1, 1941 Pan American announced the inauguration of a cooperative retirement income plan. The plan provides for the cooperative purchase of retirement annuities to supplement Federal social security benefits, enabling employees to look forward to an independent old age when they are no longer capable of earning. Two of the principal life insurance companies of the United States have underwritten and will administer the plan.

To participate in the plan personnel must fulfill four conditions:

1. Completion of at least one year's service with Pan American Airways.
2. Approval as permanent member of Pan American's personnel.
3. Men in ground service must be more than 29 years old and less than 65; women and members of flight crews must be more than 24 and less than 60 years of age.
4. Annual earnings of \$900 or more.

At the end of 1941 nearly all eligible personnel were participating in the plan. Pan American contributed \$172,000 to this cooperative plan during 1941. The management and directors feel that it will be an important factor in the maintenance of cordial labor relations throughout the System.

IV. EQUIPMENT, MAINTENANCE AND SAFETY

A. Pan American's Air Fleet

The System's air fleet has expanded substantially over the years as its routes have increased. While this growth has been in land as well as sea planes, the flying boat is the type of aircraft of which the company is most proud, as it is in this field that the company has pioneered.

1. The Development of the Ocean Flying Boat (1)

In 1927 no marine type aircraft had been developed in the United States suitable for air transport operation. Therefore, the first plane used by the company was a Fokker F-7 trimotored land plane, which was equipped with three engines of 220 horsepower, could carry a gross weight of 9,700 pounds and had a speed of 90 miles an hour. The company equipped this plane with marine accessories, including flotation equipment for safety and with this additional burden the plane was capable of carrying eight passengers and a small load of mail.

In 1928 a larger American-built Fokker was added to the equipment, known as the F-10, which was a vastly improved trimotored land plane equipped for marine flying.

(1) Material for this sub-section was obtained primarily from pages 4-13 of an address given by Juan T. Trippe before the Royal Aeronautical Society, London, England on June 17, 1941

During the same year the first American-developed marine air transport was also added. This plane, known as the Sikorsky S-38 amphibian, was powered with two 420 horsepower engines and was an exceedingly seaworthy craft capable of carrying seven passengers and mail. Its gross weight limit was 10,480 pounds.

The first twin-engined American flying boat built by Consolidated began operations over the routes of the System in 1929. These boats were known as the "Commodores" and featured more powerful engines and a considerable change in hull and wing design. While the Commodores could fly the distances required it was discovered that they were not capable of carrying commercially practical loads. The company, therefore, decided that four-engined marine aircraft was the type needed for its purposes and the Sikorsky S-40 was introduced, the first of three entering service in 1932. These new flying boats were capable of carrying 40 passengers and had a gross weight of 34,600 pounds.

The Sikorsky S-42 was brought into service by the System in 1934. This plane proved that large aircraft was commercially sound. With a passenger capacity of 32 persons it was equipped with four 700 horsepower engines and had a speed of 160 miles per hour. It had a gross load rating of 38,000 pounds (increased in later models to 42,000 pounds) and a ratio of useful-to-gross load of 36%, an unusual percentage at that time. These planes were of such value that

a total of ten were purchased by the System, one of which was equipped with extra gas tanks and was used on the Pacific and Atlantic survey flights.

In 1935 two Martin M-130s were delivered to the company followed in early 1936 by a third. These were equipped with four 900 horsepower engines and had a gross load rating of 52,000 pounds and an empty weight of 29,500 pounds. This Martin Clipper was capable of carrying a payload of mail and ten passengers on a nonstop flight of over 2,000 miles.

Contracts were given to the Boeing Aircraft Company in 1936 for six four-engined ocean flying boats, known as the Boeing 314, and in 1939 six were delivered. Powered with four 1550 horsepower engines these planes had a gross loading capacity of 84,000 pounds and were capable of carrying 30 passengers in berths across a 2,000-mile flight section. New features in these ships were companion ways to permit accessibility to engines in flight and a flight deck large enough for the entire flight crew, which was completely separated from the passenger compartment. The B-314 Clipper is the latest and largest type of ocean transport aircraft which the System has put into service.

2. Composition of the Fleet

On September 30, 1939 the fleet of the System and its affiliates consisted of approximately 129 aircraft,

including the 47 listed below which were allocated to international routes: (1)

<u>Number</u>	<u>Type</u>	<u>Licensed Gross Utility per Unit (pounds)</u>
<u>4-engined aircraft</u>		
6	Boeing 314	84,000
2	Martin M-130	52,000
6	Sikorsky S-42-B	41,000
2	Sikorsky S-42	38,000
3	Sikorsky S-40	34,600
<u>2-engined aircraft</u>		
6	Douglas DC-3	24,000
7	Sikorsky S-43	19,500
4	Douglas DC-2	18,200
5	Commodore M-16	17,650
1	Sikorsky S-41	13,800
3	Lockheed Electra	10,500
2	Sikorsky S-38	10,480

The Boeing 314 Clippers were used on transatlantic and transpacific flights and the Martin M-130s on transpacific routes. The Sikorsky S-42-Bs and the S-42s served the trade artery from the United States to Brazil and Argentina and the transcaribbean route to the Canal Zone and Bermuda. The Sikorsky S-40s carried the Miami and Havana and Miami and Nassau traffic. The Sikorsky S-43 amphibians and flying boats were used on the snorter runs in the West Indies and along the east coast of South America. The Douglas DC-3s and DC-2s were land planes flown on overland routes. The 81 planes not mentioned in the above tabulation covered for the most part the interior service in China, Alaska, Mexico, Cuba, Peru, Chile, Brazil and Colombia.

(1) Moody's Manual of Investments--Industrial Securities, New York, 1942

Since September, 1939, additional planes have been added from time to time. During 1940 three Boeing 307 Stratoliners (the first four-engined land transport planes developed in the United States and also the first in the world to be equipped with pressure cabins to permit high altitude flight operations) and 12 Douglas DC-3A land planes were delivered, which were to be used for Latin American routes. (1)

During 1941 three Boeing 314A transoceanic flying boats (larger and more powerful than those previously constructed) were added, together with 18 Douglas DC-3As and 13 Lockheed Lodestars. At the end of that year there were orders outstanding for 16 Douglas DC-3A planes, 40 four-engined Lockheed land planes and three Douglas DC-4s, of which two DC-3As and the DC-4s were for Pan American-Grace. Besides these there were letter agreements with the manufacturers for 19 Douglas DC-4 planes and 27 Douglas DC-3As. Included in this equipment under letter agreement were two Douglas DC-4s and six DC-3As for delivery to Pan American-Grace. (2)

Figures for the 1942 year and for the duration of the war will probably not be made public since such information might prove of value to the Axis. It is known that more than three-quarters of the equipment is now devoted directly or indirectly to the prosecution of the war. Since December 7, 1941 title to the company's transoceanic Clipper fleet has been transferred to the Government under contracts providing

- (1) Annual Report for Pan American Airways for 1940
- (2) Annual Report for Pan American Airways for 1941

for operations by the company. Because many new routes have been set up and others expanded a large number of new planes are now scheduled to be delivered to the company both for its own account and for the operations under contract with the Government.

B. Maintenance

1. Greater Utility by the "Quick Turn-Around" Method

Because of the war there has been a sharp increase in the demand for air services. Due to the lack of new equipment Pan American has had to find a way to use its aircraft on hand for more flying in a definite period. The solution to this problem has been the "quick turn-around" method which greatly increases the usefulness of each plane while at the same time enables the company to keep its equipment in good condition.

By this method four planes can perform the same work for which eight similar planes were formerly required. To obtain this performance Pan American has had to reduce maintenance time on its 84,000-pound Clippers from six days to two days per round trip. In one-third of the time it once took the company can now perform as many items of maintenance on its Clippers between round trips across the 3,890-mile route between Lisbon and New York as when service was first inaugurated.

The means by which Pan American has reduced its maintenance time is noteworthy. In determining how time might be cut down the following items were analyzed: (1)

1. The huge plane itself which scales up all basic elements of maintenance procedure.
2. The four Wright engines which are larger than other power plants in transport service.
3. The extensive and elaborate instrumentation.
4. The control cable, electric circuits and fuel lines, each running thousands of feet.
5. The cleaning and fumigation which are considerable in large planes with 65 windows, 9,000 square feet of upholstery, a floor area equal to an eight-room house and an external surface equal to a third of an acre.
6. Special problems such as salt water which heightens the exposure to corrosion, wear and tear.

As a result of this analysis a process covering about 1,500 items relating to the above list was devised.

The operations on a plane start as soon as the last passenger has disembarked. Within six hours after the plane has been moved to the hangar every first inspection and required work order has been completed and the work is well under way. The minute observations and recordings of the two Engineer Officers who are on board during each flight make it

(1) McVitty, Edward W., "Quick Turn-Around," Aviation, Vol. 40, No. 12, December, 1941, page 178

possible for work orders to be formulated rapidly. Within 48 hours the Clipper is then ready for its next round trip.

2. Maintenance Equipment

Equipment to eliminate time and to lower the cost of maintenance and inspection has been introduced. At La Guardia Field, for example, the company has made elaborate workstands for the crews. Today they have three-decked stands which can be wheeled underneath a wing of a plane as soon as it arrives at the hangar after an 8,000-mile trip to Lisbon. The stand is practically a workshop in itself and represents an investment of about \$20,000. There are also special dollies and trucks, all for definite purposes. (1)

3. Training of the Maintenance Crew

At the present time Pan American is conducting one of the most important and progressive programs in the country for training aviation service mechanics, many of whom will go to war-time jobs. The training is under the supervision of a maintenance personnel instructor and some 70 part-time instructors, all members of the Pan American ground service crews at La Guardia Field. Using the company's workshops, equipment and facilities for demonstration and test purposes, intensive and thorough classes are conducted. Picture screens are used to clarify complicated facts and principles. Each film is elaborated upon by practical working mechanics. The

(1) McVitty, Edward W., "Quick Turn-Around," Aviation, Vol. 40, No. 12, December, 1941, page 180

beginner is first shown film subjects in logical order in class, after which they are rescreened but augmented by a lecture or by a practical demonstration. Then to check the student's understanding examinations are given after each class.

The courses have an average of some 450 employees receiving instruction and the amount of time it takes each student depends for the most part on his previous experience, his ability to learn and the number of subjects needed. These students are schooled to be airplane mechanics, engine mechanics, chief mechanics, master mechanics, foremen, and flight mechanics. Special courses are given for apprentice engineers.

4. Maintenance Crews

Measures are being taken constantly to improve the organization and work efficiency of the crew after they have been properly trained. Of the total staff at the maintenance shop at La Guardia Field, at this time, there are about 185 men who work directly on any Clipper undergoing a quick turn-around and the remainder are assigned to general metal and carpentry shops. The largest division in the overhaul department is the plane service section with the metal working crew second, followed by the cleaning crew. All these sections are on a permanent three-shift basis with a 24-hour day and night shift when a Clipper is in port.

C. Safety

1. Government Regulation

The safety regulations for the System are devised by the Civil Aeronautics Board and the Administrator of Civil Aeronautics. The Board prescribes the safety standards of quality and performance that must be met by aircraft, engines and personnel engaged in foreign commerce. From time to time it investigates, criticizes and suggests improvements in such regulations. The Administrator strictly enforces the rules as to the safety of mail and express and of the lives of both crew and passengers. By this strict supervision fatalities are reduced to a minimum which is an all-important factor for Pan American as a serious accident is likely to prove detrimental to the company. Safety, in other words, becomes the key to every rule made by the Board and by Pan American itself.

2. Scientific Control of Flight Safety (1)

The safety system of each trip of Pan American Airways is worked out in advance and by this process the personnel becomes familiar with all the hazards which may be encountered. The method by which the company has brought about safe and economical operations started eight years before the

- (1) Material for this sub-section was taken primarily from: Leslie, John C., "Scientific Control of Transocean Flight", Aviation, Vol. 40, No. 11, November, 1941, pages 58-59, 188, 190, 192

transpacific route was established. The object was to have safe nonstop flights over long stretches of water. Technicians set about to develop safety equipment and techniques. They were at the same time dealing with the problem of fuel economy because in oceanic flights a reduction or an increase of only a few per cent in the amount of fuel used makes all the difference between a commercially practical and safe operation and no air line at all.

The scientific management control of the actual flight starts with the weather men who are air-line meteorologists working closely with persons of various governments. Each office interprets daily maps, prepares isobaric and wind charts for 5,000 and 10,000 feet levels, analyses radio-sonde reports, and constructs pictorial representation of vertical cross sections along the route. On each trip a forecast, which is a statement of weather conditions that are likely to be met en route, is divided into zones upon the basis of approximate uniform wind conditions, the end of each zone being designated by the total distance in nautical miles from the point of departure. In each zone a forecast is made of the following elements;

1. General weather
2. Amount, type, base and top of low clouds, and of middle clouds
3. Altitude of freezing weather visibility
4. State of sea

5. Wind direction and velocity at altitudes of 1,000, 4,000, 8,000 and 12,000 feet.
6. Conditions expected at terminals and alternates.
7. Description of isobaric configuration, location of fronts, expected weather conditions at fronts and remarks pertaining to execution of flights.

Upon departure the captain is given the above details. On every flight there is a meteorologist on duty at one or more offices who follows the flight and furnishes information when needed. Before each flight the captain and crew, operation technicians and meteorologists prepare a "flight time analysis", which considers the complete range of the mechanical ability of the aircraft with respect to the conditions to be encountered.

Each transoceanic flight is therefore planned before the take-off. Since the service must be accurate Pan American's operating personnel has developed an easily usable yardstick to insure such performance. This is a graphic solution in the form of the "Howgozit Curve", the purpose of which is to present to the crew aloft and to the flight watch ashore a continuous chart of information concerning any deviations from predicted fuel consumption, winds and track and the effect of such deviations on the fuel reserve remaining aboard for the completion of the flight to the destination or to return to the point of departure or for proceeding to a designated alternate.

Actually, the "Howgozit Curve" consists of five curves which are required to present clearly the above picture. The first curve is one of miles versus gallons, showing normal four-engined fuel consumption for the flight in hand. The second curve shows gallons versus hours of flying. The third curve shows hours versus miles. Since it must be assumed in every flight that three-engined operation may be necessary at any time, the fourth and fifth curves show necessary information for three-engined operation. Also on the "Howgozit Curve" is plotted the point in flight beyond which the aircraft cannot return to its original starting point.

V. CARGO CARRIED (PART I)

A. Air Mail (1)

In this section and in Section VI the types of cargo carried by the System will be discussed. Under the general headings of air mail, express and passengers consideration will be given to the development and to the present condition of traffic over the company's routes. In addition, the problem of rates and regulations will be considered at some length.

1. History

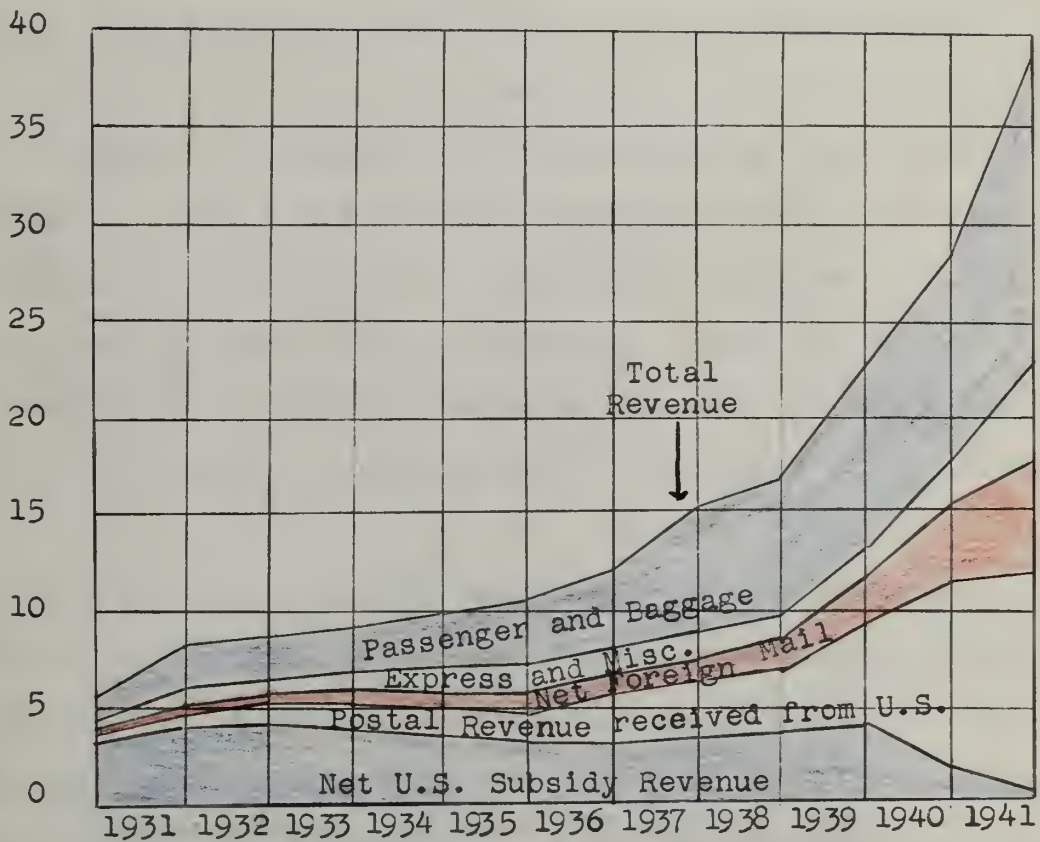
Mail contracts have always been of immense importance in the operation of the Pan American Airways System and have aided materially in its rapid development, as Chart III reveals. This chart, showing the consolidated revenues from 1931 through 1941, is enlightening particularly with regard to the trend of financial aid given by the United States Government in the form of air mail subsidy. The United States subsidy revenue which in 1930 equaled 57.9% of the total revenue was 29% in 1935 and by 1941 was only 1.1%.

The history of Pan American's carriage of air mail may be divided into two eras:

- (1) Material for this section was obtained primarily from:
 Moody's Investors Service--Current Industrials, New York, 1942
 Moody's Manual of Investments--Industrial Securities, New York, 1937-1942
 Puffer, Claude E., Ph.D., "Air Transportation," Blakiston Company, Philadelphia, Pa., 1941 pages 263, 278-279
 Standard Corporation Records (P-S), Standard and Poor's Corporation, New York, 1942

CHART III
CONSOLIDATED REVENUES
of
PAN AMERICAN AIRWAYS
1931-1941

Millions
of
Dollars



Source: Annual Report of Pan American Airways, 1941

1. The pioneering and diplomacy era.
2. The current era of Government regulation.

2. Foreign Air Mail Act of 1928

The first era started with the passing of the Foreign Air Mail Act of 1928, which lasted for ten years. This act authorized air mail payments on a base rate up to \$2.00, although in practice the rates were set from \$1.80 to \$2.00 a mile. Pan American during this period, through diplomacy, drew up many mail contracts, the rates on which were set by the Post Office Department. When the Civil Aeronautics Act of 1938 was enacted it provided that these contracts should be continued for an indefinite period of time.

In 1934 during an examination of the air mail situation by the Government the affairs of the Pan American Airways did not escape attention. It was concluded by the investigating committee that the preceding Republican Administration had been too friendly to the company and that in all but one instance, although Pan American had been the highest bidder on mail contracts, it had won. It was also held that in almost no case had sufficient time been allowed for possible competitors to get ready.

When the Postmaster General was convinced of the above situation he set about to cancel the company's mail contracts. However, the Secretary of State, Mr. Hull, stepped

in with a statement to the effect that cancellation of such contracts with the consequent disruption of service in 30 foreign countries would adversely affect hundreds of international trade agreements and result in serious repercussions. This backing of the State Department prevented the cancellation of any mail contracts and saved the company from being subjected to a careful examination. The United States could not afford to attack Pan American which had come to represent the North American Continent and whose prestige was bound up closely with the trade of the United States.

3. Civil Aeronautics Act of 1938 and its Effect upon the System

The second era was inaugurated by the Civil Aeronautics Act of 1938. It required, among other things, the licensing of air carriers. Unlike the Foreign Air Mail Act of 1928 this act gave the System its first assurance of continuity.

Under this act carriage of the mail of foreign countries is placed under the control and regulation of the Government of the United States. Rates for foreign air mail inward bound over the transatlantic and transpacific routes are arranged by the United States Post Office Department with the countries in question and compensation is collected direct from foreign post offices by the Post Office Department, which turns the money over to Pan American. On these same routes

the rates for the carriage of mail sent from the United States of its possessions are determined by the Civil Aeronautics Authority.

The Postmaster General may, if he feels that it is in the public interest, approve any rates for the carriage of foreign mail to the United States already existing between a foreign country and the Pan American Airways on any route over which service was begun before January 1, 1938, or he may permit the System to make new arrangements with a foreign country to carry its mail at rates fixed in advance by the Post Office Department. Finally, he may allow the company to change the rates which it charges a foreign government for its mail transportation within that country or between that country and some other foreign country. However, contracts to cover this type of mail service are made directly by the System with the country.

The Postmaster General has established rates for the transportation of mail of foreign countries over three of the System's routes:

1. The transatlantic route
2. The transpacific route from Hong Kong to San Francisco
3. The New Zealand route to San Francisco

Rates were established in postal gold francs, valued at about \$0.3267 each per kilogram of mail.*

* See Table I for the rates established.

Compensation for the carriage to the United States and its possessions of air mail from Latin American countries served by the System is at the present time determined and paid for according to a practice which existed before the enactment of the Civil Aeronautics Act. This compensation was established by contracts between Pan American and the respective countries served. Such compensation is payable by the various countries directly to the carrier.

In regard to the carriage of United States mails to the countries of Latin America Pan American at the present time contracts with the Postmaster General in most cases. These contracts provide that the System should be compensated by the United States Government.

Under the provisions of the Civil Aeronautics Act a continuation was extended to the System on its contract for the mail to Alaska. The contract was to remain in effect until the Authority fixed new rates. Due to the war rate schedules are not being issued for the Alaskan route. However, there is no evidence that the rates have been changed by the Authority.

During 1939 and 1940 the Civil Aeronautics Authority set rates for two of the System's route areas: 1. the Atlantic; 2. the Pacific. On the transatlantic route all rates were set on the basis of a flat sum per outbound trip from the United States to European terminals. Each sum is for a maximum mail load of 1,600 pounds with \$4.00 per pound paid for excess loads. If the load is less than 1,600 pounds the same flat

TABLE I

Rates Established by the Postmaster General
for the Transportation by Air
of Mail of Foreign Countries

<u>Route</u>	<u>Postal Gold</u> <u>Francs per</u> <u>Kilogram</u>	<u>Equivalent</u> <u>in Dollars</u> <u>per Pound</u>
Between airports in Europe	9.60	\$1.42
Between airports in Europe and Azores	27.00	4.00
Between Azores and Bermuda	48.60	7.20
Between Azores and U.S.A.	54.00	8.00
Between Europe and Bermuda	68.00	10.08
From Bermuda to U.S.A.	31.05	4.60
From Europe to U.S.A.	73.40*	10.88
From Newfoundland to Canada	15.00*	2.22
From Newfoundland to U.S.A.	24.60*	3.65
From Shediac, Canada, to U.S.A.	9.60	1.42
From Hong Kong to U.S.A.	170.75**	25.30
From Hong Kong to Manila	15.50	2.30
From Hong Kong to Guam	46.50	6.89
From Hong Kong to Hawaii	108.75	16.12
Between Auckland and New Caledonia	31.05	4.60
From Auckland to Canton Island	62.10	9.20
From Auckland to Hawaii	93.15	13.80
From Auckland to San Francisco	155.25**	23.01
Between Noumea and Auckland	31.05	4.60
From Noumea to Canton Island	31.05	4.60
From Noumea to Hawaii	62.10	9.20
From Noumea to San Francisco	124.20**	18.41
Between Canton Island and Honolulu	31.05	4.60
Between Canton Island and U.S.A.	93.15	13.80

*This is a through rate including onward service on domestic routes in the U.S. or Canada, where mails can be advanced thereby, for which 5.40 francs is apportioned.

**This is a through rate including onward service on domestic routes in the U.S., where mails can be advanced thereby, for which 16.90 francs is apportioned.

Source: Puffer, Claude E., Ph.D., "Air Transportation,"
Blakiston Company, Philadelphia, Pa., 1941,
page 264

sum is paid. The weight is figured on each trip rather than on a monthly average.

A lower rate is provided for each outbound trip when frequency of flights is two per week rather than one. Furthermore, the amount depends upon the European terminal used. If only one flight a week is operated the company receives \$28,700 for a trip to London over the northern route, \$31,500 for a trip to London over the southern route or \$31,200 for a trip to Marseilles over the southern route. If two flights a week are flown the above sums become \$21,500, \$23,600 and \$23,400 per trip respectively. Although the above rates have been established for Marseilles they have not been used due to the closing of the route as a result of the war in Europe.

The company receives pay on any trip only in case the flight proceeds as far as Lisbon, Portugal, or Foynes, Ireland. If either of these points are reached but the flight is not continued a deduction of \$2.20 per mile is made for each mile which the mail is short of its destination.

On the New York to Bermuda route, compensation is paid at the rate of \$1,700 per outbound trip for the first 400 pounds or fraction thereof. Any excess weight is carried at \$0.75 per pound additional.

On the transpacific the rate was set at \$3.35 per airplane mile flown in both directions from San Francisco to Manila. The base weight is 1,000 pounds or fraction thereof.

An additional \$7.00 per pound per 1,000 statute miles or pro rata thereof for greater or less mileage is paid for any excess load. For that portion of the route between Manila and Macau, Hong Kong and the Singapore Settlements a flat rate per outbound trip was ordered depending upon the distance covered.

For transoceanic flights the mileage used as a base is the number of statute miles on the most direct route from airport to airport as determined by the United States Hydrographic Office.

4. Rate Revisions by the Civil Aeronautics Board

Since the above rates were established the Board has made some revisions as well as additions. It has also changed some rates which had previously been set by the Post Office Department for carriage of United States mail to foreign countries. It was the Board's contention that Pan American was being paid too much. At rate hearings in July, 1941, the Board charged that the System had overstated its investments and that the company had failed to make deductions for fully depreciated equipment. The Board also stated that the company's reported expenses could be reduced by requiring its Mexican and Brazilian subsidiaries to bear a larger share of the expenses of their systems. At this time two other suggestions were given for lowering costs:

1. Flying equipment should be depreciated in smaller annual amounts.
2. The company's self-insurance reserve should be considered a profit until reserves accrued.

The Board maintained that due to this padding the company had realized 20% on its investments.

In September, 1942, the Board established new rates payable to Pan American over its transpacific routes in operation before December 7, 1941. This action resulted in a change in the rates which were in effect on the North Pacific route between San Francisco, Hong Kong and the Singapore Straits Settlement and in a determination of rates on the South Pacific route from San Francisco to Auckland, New Zealand.

On the South Pacific the Board set the rate from July 1, 1940, the date on which the route was started, through October 31, 1940 at \$3.1112 per airplane mile flown on scheduled trips. The Board stated that for this four-month period Pan American's average investment was \$2,345,588 and that a return of 7% on such an investment would have to be adequate.

On the North Pacific from November 1, 1940, which was the date on which the Board instituted proceedings for a review of mail rates of service, through December 13, 1941 the Board set a revised rate of \$2.0021 per airplane mile flown on scheduled mail trips for both routes from San Francisco to Auckland, New Zealand, and from San Francisco to Hong Kong and Singapore. The Board considered the two routes as one

and found Pan American's average investment for the combined routes to be \$7,318,645, from which the System realized a profit of 13.1% on its average investment for this period. The new rate for the North Pacific is lower than the rate of \$3.35 per airplane mile flown set in 1939 but the System will not be forced to pay back to the Government the difference between the old and new rates.

The Board in the fall of 1942 announced a reduction in mail rates payable to Pan American over its Latin American routes from Brownsville, Texas, to Trinidad via Mexico City and Balboa, Canal Zone, and from Miami to Buenos Aires via Rio de Janeiro. It ordered the new rate to be made effective September 1, 1942 at \$0.1783 per revenue mile, considering the needs of the carriers over the Latin American routes as a unit instead of separately. The 1941 mail rate for these combined routes was \$0.8199 per revenue mile, providing Pan American with about \$6,910,000 for the transportation of mail during the year.

Under the new rates the Board estimates that Pan American will receive \$1,771,000 for the transportation of mail during the year beginning September 1, 1942. During the same period the carrier will receive payment for the transportation of foreign mail which will amount to about \$1,773,000. Thus the total cut in Pan American's United States mail pay will be about \$3,366,000.

5. Future Outlook for Air Mail Rates

In connection with the tendency of the Civil Aeronautics Authority to reduce the mail rates paid to the company it should be stated that because Pan American is so important for obvious strategical and commercial reasons the Authority is unlikely to cut mail rates to such an extent as to impair the company's regular activities. There is no other company at the present time which can take its place. Moreover, it is to the advantage of the Government to support this System now rather than to wait a generation or so and to attempt to support other systems which would then be faced with much stiffer competition. Nevertheless, Pan American can expect a steady cutting of United States mail subsidy when its increasing revenue from all other sources may make such a reduction feasible.

Foreign government payments, however, seem less likely to be reduced because it is not probable that the Civil Aeronautics Authority will ever encourage foreign governments to reduce the compensation paid by them for carriage of air mail by the System. Such a step would necessitate an increase in subsidy payable by the Government to the company.

VI. CARGO CARRIED (PART II)

B. Express

1. History

One of the greatest achievements which Pan American Airways has made during its existence has been the development of air express. Revenues from this source, as indicated by Chart III, have been increasing yearly. In 1929 Compania Mexicana de Aviacion, a Pan American subsidiary, inaugurated air express in Mexico and from this rather small beginning the air express handled by the company has shown a rapid growth, especially since the United States entered the war.

Despite the fact that air express was started earlier its real development dates from August, 1934, when the entire network was linked with the domestic air express system of the Railway Express Agency, which gave more than 23,000 express stations in the cities and towns of the United States the facilities for shipping to any point in Pan American's System. The contract between the two organizations, which runs for twenty years, is ironclad. The benefits to the two parties are mutual. On the one hand, the continents of the world are made available to the Express Agency which was formerly confined to domestic transportation. On the other hand, it has opened for Pan American the possibility for greatly enlarged intercontinental trade.

At the same time that the above contract was agreed to the Pan American Airways document was introduced. This was a

single bill replacing dozens of papers hitherto required to get an article across an international border. Now more often than not the only additional document involved is the United States Shippers Export form. After years of negotiations this bill is accepted practically anywhere in the Western Hemisphere and ranks as negotiable paper for discounting at banks.

The first rates established for the carriage of express were high but these were reduced in 1931 after Pan American had gained by experience the knowledge necessary to establish an efficient system. Some typical examples of the reductions which have been made are: (1)

<u>Destination</u> (from Miami)	<u>Original Pound Rate</u>	<u>Present Pound Rate</u>
Puerto Rico	\$1.25	\$0.53
Trinidad	2.00	0.79
Rio de Janeiro	6.05	1.50
Canal Zone	2.00	0.76

Early shipments consisted of moving picture films, mining machinery, auto parts, airplane parts, serum and other similar items.

International air express was commenced by the System over the Pacific when the routes were first set up. However, due to special conditions imposed by the war, the transatlantic air express was not instituted until September, 1941, when a service was established connecting the United States with Lisbon. Pan American was prepared to offer facilities in the

(1) Air Transportation, "Pan Am's First 15," November, 1942, page 10

fall of 1939 but the start of the war resulted in great demands upon passenger space, causing a delay in the express service.

Since December 7, 1941, the amount of air express has increased substantially. In addition to ordinary business which has been large, many shippers previously using boats began to substitute the facilities of the System because of the reduction in sailings to the West Indies and Central and South America. Heavy war risk insurance for steamers plus increased rates for surface shipping result in many cases in higher charges by steamer than by air. Furthermore, shippers feel that they are more certain that their merchandise will reach its destination if shipped by the latter method.

At the present time on the Pacific as well as on the Atlantic there are practically no commercial shipments being made since most of the space is used by the Government. However, large quantities of commercial products have been carried to Bermuda because there are few steamers operating to that point.

The Alaskan division, which started operations in June, 1940, has so increased its carriage of air express since the United States entered the war that recently the Government found it necessary to put an embargo on commercial cargoes flown over the route unless they were covered by priority.

Pan American's Chinese affiliate, China National Aviation Corporation, has also been transporting tremendous

quantities of goods. During 1941 it carried almost one million pounds of express.

The unusually rapid development of air express traffic over the System is indicated by comparing the figures of 1930 of 12,156 pounds and those of 1931 of 135,745 pounds with the following more recent years: (1)

<u>Year</u>	<u>Number of Shipments</u>	<u>Weights in Pounds</u>
1938	243,479	3,585,939
1939	283,878	4,416,045
1940	535,506	5,557,794
1941	679,312	7,518,473

Express carried by Pan American in Latin America has grown tremendously during this time. Total poundage in 1941 was 5,533,190 as compared with 4,417,404 in 1940, an increase of more than 25%.

In August, 1942, Pan American-Grace started the first scheduled commercial all-express service by an international air carrier certified by the Civil Aeronautics Board. Services were commenced on Panagra's route from Balboa to Lima, Peru. In two and a half months Panagra transported nearly 80,000 pounds by means of this new service.

2. Costs

The rates established by Pan American for the carriage of air cargo as well as air mail and passengers have declined rapidly over the past twelve years, but they are still substantially above those of surface transportation. These

(1) Air Transportation, "Pan Am's First 15," November, 1942, page 12

declines have been made possible by increased operating efficiency, some factors of which are listed below: (1)

1. Greater load capacity per unit
2. More skillful use of plane capacity
3. More constant use of planes per day
4. More careful supervision of fixed costs
5. Lower fuel cost per horsepower generated
6. Greater power from smaller engines

Another advantage is that Pan American does not face the expense of transferring from one means of surface transportation to another, a cost which confronts all other types of competing transportation facilities. It has also been able to diminish costs by cutting down the distance of required travel between points on the earth's surface and by reducing the time needed to travel the shorter distance.

As further technological improvements are made in equipment and more strategically located airports are developed designed to shorten the distance and time between points, it is reasonable to assume that the cost of air travel will in many instances be reduced to that of surface facilities and may in some cases be slightly below the cost of the surface transportation.

(1) "Air Transportation--A Growth Industry," Merrill Lynch, Pierce, Fenner & Beane, 1942, page 8 .

3. Types

When Pan American began the carriage of air express the space available for cargo was relatively small and while it has increased as time has passed the items of cargo which the System carries are relatively light and small. Examples of the cargo carried are: radio sets, X-ray machines, tools, automobile and tractor parts and the like.

Shipments of such items by air have been of value because of the time-saving factor. Due to this, foreign representatives and dealers in the various countries of the world served by the System can rely on delivery within a very few days. Furthermore, it means that the dealers are not required to carry huge stocks and sales of American products are stimulated by the availability of replacements. Other items which are shipped because of the time-saving feature are shipping papers, fresh flowers and paper currency. Ideas represented by samples, model clothing, newspapers and picture films are considered most acceptable because of the small amounts of space which they require.

The war has made changes in the types of cargo carried and many strange items have been flown, examples of which are: tin from China, human blood plasma, yellow fever vaccine and quartz crystals from Brazil and other similar products.

The decreasing cost of shipping goods by Pan American will be greatly accelerated by the many improvements being

made in aircraft due to the war. This factor, together with those of versatility and rapidity, will attract an ever-increasing amount of traffic from all modes of transportation which will consist mainly of:

1. articles of high value
2. perishable goods
3. manufactured goods
4. less-than-carload lot, medium- and long-haul freight

Pan American is not likely to carry heavy low-cost bulk freight for many years to come, if ever.

4. Rates (1)

Only a general picture may be given of the process Pan American uses in arriving at express rates as the exact method is a company secret. The rate per pound per 100 miles declines with the distance of the shipment and no reduction is made for heavy shipments. A minimum charge of \$1.00 is placed on each shipment.*

Three factors enter into Pan American's rates for shipment. The first concerns bulky cargo. Any package which weighs less than one pound per 200 cubic inches is calculated

(1) Information for this sub-section was obtained primarily from:

Puffer, Claude E., Ph.D., "Air Transportation," Blakiston Company, Philadelphia, Pa., 1941, pages 416-418

* See Table II for typical Pan American service and rates

TABLE II

Pan American Airways
Representative Express Timetable and Rates

<u>Destination</u>	<u>Leave from</u>	<u>Time by Air</u>	<u>Rate per Lb.</u>	<u>Per Val.</u>	<u>\$100 Ins.</u>
Hamilton, Bermuda	New York	same day	\$.55	\$.25	\$.15
Havana, Cuba	Miami	same day	.20	.18	.10
Nassau, Bahamas	Miami	same day	.20	.18	.18
Mexico City, D.F.	Brownsville	same day	.26	.25	.15
Mexico City, D.F.	Los Angeles	same day	.69	.40	.25
Guatemala City, Guatemala	Brownsville	same day	.53	.40	.25
Juneau, Alaska	Seattle	same day	.56	.25	.15
Cristobal, C.Z.	Miami	same day	.76	.40	.25
Port of Spain, Trinidad	Miami	same day	.79	.40	.25
Honolulu, Hawaii	San Fran.	next day	.93	.40	.25
Guayaquil, Ecuador	Miami	next day	1.04	.40	.25
Para, Brazil	Miami	next day	1.13	.50	.30
Lima, Peru	Miami	2 days	1.18	.50	.30
La Paz, Bolivia	Miami	2 days	1.25	.50	.30
Santiago, Chile	Miami	3 days	1.38	.50	.30
Rio de Janeiro, Brazil	Miami	2½ days	1.50	.50	.30
Buenos Aires, Argentina	Miami	3½ days	1.56	.50	.30
Auckland, N.Z.	San Fran.	4½ days	2.00	.50	.30
Manila, P.I.	San Fran.	5 days	2.00	.50	.30
Hong Kong	San Fran.	6 days	2.19	.50	.30
Singapore, Str. Settlement	San Fran.	6 days	2.38	.65	.45

Source: Express Timetable of Pan American Airways

on the basis of volume rather than weight. The second deals with a valuation charge which is levied against every shipment instead of being charged against only those shipments above a minimum amount. The shipper declares the value of his shipment and a charge is made for each \$100 declared. A package valued at less than \$100 is subject to a proportionate decrease in the valuation charge. These charges are not very great. For example, in Table II the valuation charge is \$0.40 between Brownsville and Guatemala City.

The third factor is the charge for insurance which is optional. The System offers insurance at varying rates covering all risks except legal seizure, war or hostilities. The minimum rate is \$0.10 per \$100 with a proportionate charge for packages less than \$100 and the maximum is \$0.50 a \$100. As is indicated in Table II, insurance to Lima, Peru from Miami, a trip of two days, is \$0.50 per \$100 valuation.

Special rates have been established for two groups of commodities. The first rate schedule applies to a shipment of fresh cut flowers from points in Colombia, Venezuela, Ecuador and Mexico to Miami, Brownsville, Cristobal and Panama City. The rate for this commodity is about two-thirds of the regular class rates. The second schedule applies to shipments of newspapers, magazines, periodicals and catalogues in quantities of not less than 11 pounds, which are charged at half the regular rate. This schedule is available on practically all routes except the transatlantic and Alaskan services.

C. Passengers

1. History

The trend of passenger miles and passengers carried, as indicated in Chart IV and Chart V, is enlightening. From the 1929 figure of 20,728 the annual number of passengers carried has increased to 375,732 for the 1941, representing an increase of 18 times the 1929 figure. (1)

At least 45% of this increased passenger traffic is commercial. The most distant countries of Latin America are now within three and one-half days from Miami, while Auckland, New Zealand, is only four and one-half days away from San Francisco. American firms are sending out many representatives on regular scheduled trips by Pan American throughout the countries touched by the System. It has been discovered that these countries can be broken up into sales districts and that salesmen can do their rounds in from one to three months.

Passenger traffic over the routes has shown a marked increase since the inception of the war as the danger of air travel is much less than that of surface transportation. The rise has been particularly noticeable over the Latin American routes for the war has not only increased business, political and military ties, and tourist trade, but has also hampered the activities of Pan American's foreign competitors in that

(1) Annual reports of Pan American Airways, 1929-1941

CHART IV

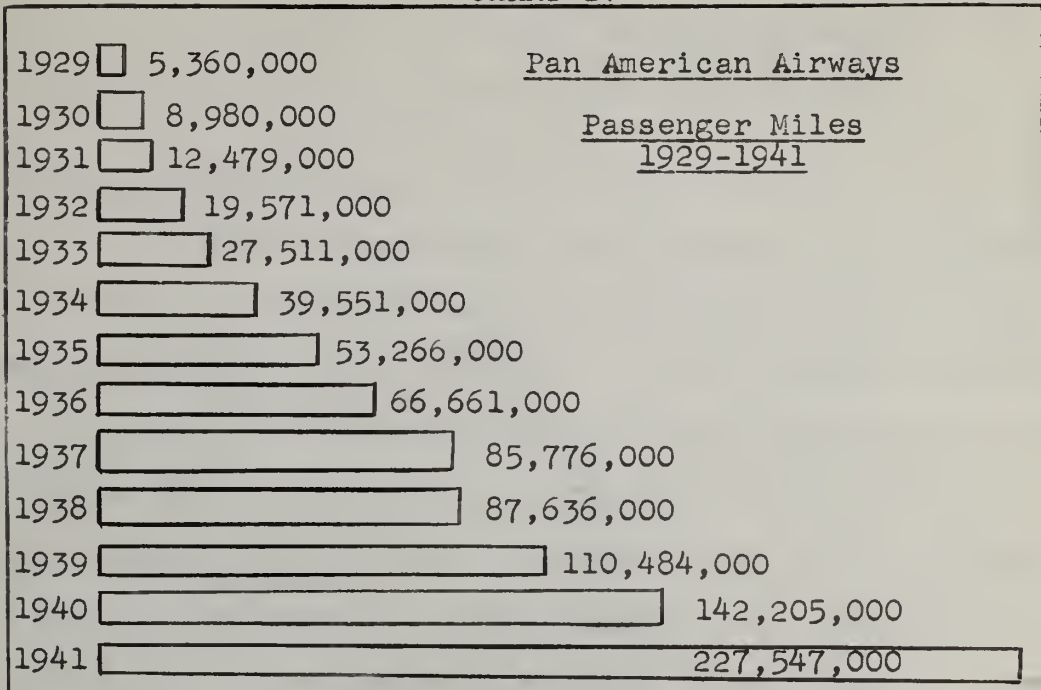
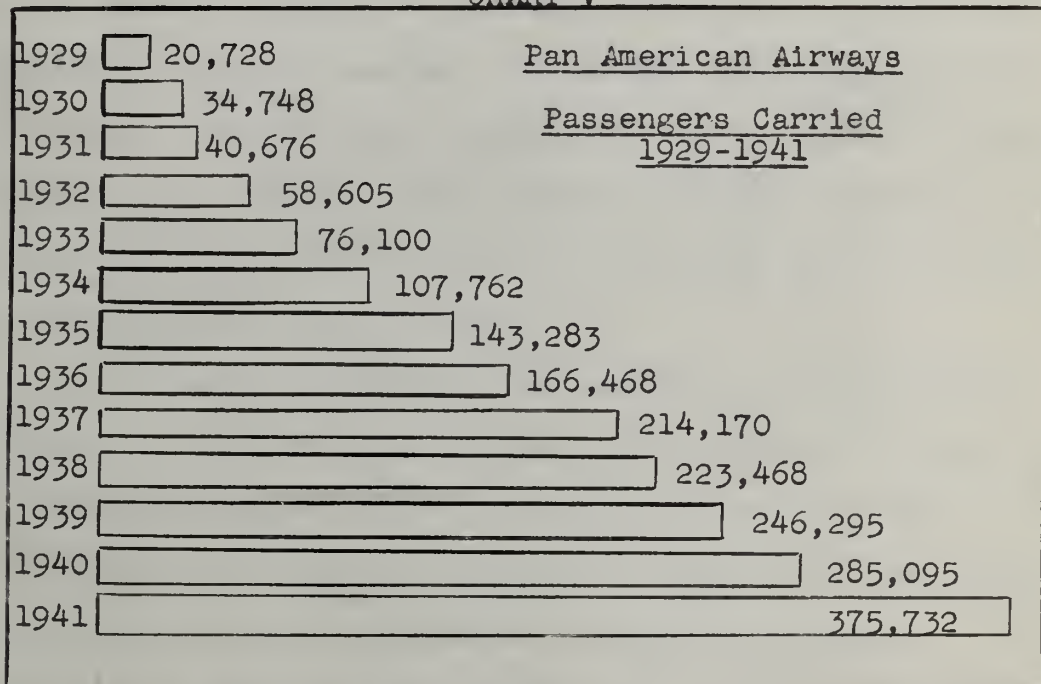


CHART V



Source: Annual Reports of Pan American Airways, 1929-1941

region. The company now uses flying equipment at top capacity to handle its passenger needs and its main problem in that vicinity is how to get more equipment.

2. Rates and Regulations (1)

The Civil Aeronautics Board requires that the System file a tariff of its rates and regulations for the carriage of passengers as well as for express. If Pan American wishes to make a revision in its tariff once it has been filed the Civil Aeronautics Act provides that thirty days' notice must be given. As soon as the tariff has been filed it is examined by interested shippers or other persons and by the Board. Any individual may complain in writing to the Board if he feels that the rates and regulations are unjust and the Board will take what steps it deems necessary to rectify any injustice which is being done. The Board has interfered very little with the rate-setting of the company. For example, in 1939 when Pan American reduced the fare on its transpacific flights about 22% the Board expressed no disapproval.

Although passenger rate schedules on the Alaska, transatlantic and transpacific services of Pan American are not published at the present time due to the war, Table III gives examples of the rates of travel which have been established over the Latin American routes of the System.

- (1) Information for this sub-section was taken primarily from:
Puffer, Claude E., Ph.D., "Air Transportation,"
Blakiston Company, Philadelphia, Pa., 1941, pages
388-389, 392, 406-408
Timetables of Pan American Airways

TABLE III

Pan American Airways
Representative List of Passenger Rates

Between.....	Browns- ville Texas	Buenos Aires Arg.	Los Angeles Calif.	Miami Fla.
and (One-Way Rates)				
Arequipa, Peru	\$395	\$195	\$485	\$395
Arica, Chila	417	180	506	417
Balboa, Canal Zone	160	440	225	160
Barranquilla, Colombia	190	480	270	160
Belem, Brazil	-	245	-	295
Buenos Aires, Argentina	550	-	645	550
Cali, Colombia	216	377	290	216
Cayenne, Franch Guiana	-	300	-	265
David, Panama	146	-	211	-
Fort-de-France, Martinique	-	400	-	180
Georgetown, Brit. Guiana	-	340	-	235
Guatemala City, Guatemala	88	-	157	-
Guayaquil, Ecuador	264	335	353	264
Havana, Cuba	120	540	185	20
Kingston, Jamaica	-	510	-	85
La Paz, Bolivia	445	145	540	445
Lima, Peru	354	245	443	354
Managua, Nicaragua	116	-	183	-
Maracaibo, Venezuela	210	-	298	160
Mexico, D.F., Mexico	35	545	100	100
Port au Prince, Haiti	-	490	-	85
Port of Spain, Trinidad	265	375	360	200
Quito, Ecuador	266	350	355	266
Rio de Janeiro, Brazil	545	110	640	450
San Jose, Costa Rica	131	-	197	-
San Juan, Porto Rico	-	450	-	115
San Salvador, El Salvador	96	-	164	-
Santiago, Chile	498	80	593	498
Sao Paulo, Brazil	555	100	640	460
Tampico, Mexico	20	-	116	-
Tegucigalpa, Honduras	105	-	172	-

Source: Passenger Timetable of Pan American Airways

Round trip and circle fares are usually 10% less than the sum of two one-way fares. It is possible for a passenger who has completed a trip on a regular one-way ticket to purchase a return ticket to his original departure point at a 10% discount. Some rates for excursions are quoted with restrictions upon the period for which they may be used. Combination air and steamship or air, steamship and rail trips are also provided at deductions of about 10%.

Children under two years of age, carried in the arms of a parent or guardian, are allowed to travel free over the System. If a child is two or over and under twelve one-half the normal fare is charged and the right for it to occupy a seat is granted. However, where passage is purchased in Colombia for children's passage on Avianca the following rules apply:

1. A child under 15 years of age and weighing less than 25 kilos may travel at one-third fare.
2. A child under 15 years and weighing 25 kilos or more but less than 50 kilos may travel at two-thirds normal fare.

Provision has been made by the System for the issuance of credit transportation contracts to firms or individuals who buy large quantities of air transportation. If the total amount of travel made under one of these plans amounts to more than \$10,000 per year, a discount of 12½% is given; if the total reaches \$25,000 or more, a discount of 15% is given.

Favorable rates are granted by the System to a considerable variety of persons. Employees of the Government are

given a reduction of 25% from the published one-way fares when traveling on official business. In some cases these employees are given similar reductions on private business travel. Employees of other nations are granted privileges similar to those given in the United States and in quite a few cases are carried free.

Free transportation is also given to inspectors of the Civil Aeronautics Board, to officials of the Post Office Department and others who are traveling on official business in connection with air mail or regulatory activities.

Employees, officials and directors of other carriers are given reductions ranging from 25% to free transportation, depending upon whether the carrier concerned offers a similar reduction to the officers and personnel of the System and upon the purpose of the travel.

Travel agents and employees who sell passenger travel for the System are also given reductions which range from 25% to free transportation, depending upon whether they are travel agents or travel agents conducting parties and upon whether their travel is for educational purposes or on definite assignments for Pan American.

In practically every one of the above cases members of the immediate family of the persons eligible for special fare may obtain similar privileges.

Groups of people using the facilities are given substantial reductions in fares. Groups of five to nine people



receive a discount of 15% on fares while groups of ten or more obtain discounts ranging from 20% to 30% depending on the distance flown. Travelers to and from conventions, fairs and the like are also given reductions amounting from 15% to 20%, depending upon the distance.

The amount of baggage covered by the System at no extra charge to the passengers is greater than that permitted on most air carriers in the world. If the cost of a fare between two points is less than \$400, 55 pounds will be carried free; if the cost is from \$401 to \$500, 66 pounds of luggage may be carried. All baggage in excess of the free allowances is charged at the rate of 1% of the one-way fare per kilo (2.2 pounds) from origin to destination. Baggage declared at a value in excess of \$100 is subject to additional charges at the rate of \$0.15 per 100 pounds per \$100 or fraction thereof.

Complimentary meals are served aloft or on the ground depending upon the schedule. On most long trips complimentary light refreshments are also available upon request.

The war economy has restricted the travel of passengers over certain routes and reservations made over such routes are subject to official approval. Furthermore, due to the war all baggage, including brief cases, is subject to careful inspection. Certain articles, such as cameras, are not allowed to remain in the passenger's possession during flight and are carried locked in the baggage compartment.

VII. FINANCIAL ASPECTS

To develop an organization as vast as the Pan American Airways System has required well-planned financing. The purpose of this section will be to present the more outstanding features of the financial growth of the company.

A. Capital Stock

The company's capital stock which was outstanding in the amount of 321,000 shares in 1929 had been increased to 1,937,000 shares by the end of December, 1941. The following figures show how this increase was carried out through the years:

TABLE IV

Capital Stock
of
Pan American Airways
1929-1941

<u>Year</u>	<u>Shares Outstanding as of December 31</u>
1941	1,937,000
1940	1,887,000
1939	1,362,000
1938	1,407,000
1937	1,388,000
1936	686,000
1935	644,000
1934	632,000
1933	632,000
1932	513,000
1931	502,000
1930	455,000
1929	321,000

Source: Standard Corporation Records (P-S), Standard and Poor's Corporation, New York, 1942

B. Comparative Income Figures

Table V gives a clear picture of the comparative revenue, net income, per share earnings and dividends paid by the System over a period of 13 years ending December 31, 1941. As can be seen, revenues for this period increased from about \$4,000,000 in 1929 to well over \$39,000,000 for the 1941 year. During the same period the net income increased from a deficit of \$317,000 in 1929 to a profit of over \$3,361,000 for 1941. Due to the company's policy of expansion requiring the use of all available funds dividends to stockholders have been paid in only five years out of the entire 1929-1941 period in spite of the fact that earnings have been made in 11 out of 13 years.

TABLE V

Comparative Income Figures
of
Pan American Airways
1929-1941

<u>Year</u>	<u>Gross Revenues*</u>	<u>Net Income*</u>	<u>Earned Per Share</u>	<u>Dividends</u>
1941	\$39,143	\$3,361	\$1.73	\$1.00
1940	27,334	2,256	1.20	-
1939	20,611	1,984	1.46	-
1938	16,073	47	0.03	0.625
1937	14,729	510	0.37	0.80
1936	10,918	955	1.39	0.50
1935	10,128	1,194	1.85	0.375
1934	9,642	1,064	1.69	-
1933	8,992	898	1.42	-
1932	8,387	699	1.36	-
1931	7,914	105	0.21	-
1930	5,610	d 305	d 0.67	-
1929	3,908	d 317	d 0.99	-

*000 omitted

d Deficit

Source: Moody's Manual of Investments--Industrial Securities, New York, 1942

C. Property

The equipment of the company with respect to the number of airplanes owned has already been discussed.* As for the property directly owned or leased, figures as of December 31, 1941 are the latest available. At that time the organization owned or leased 300 airports and marine terminals together with airport improvements, hangars, passengers stations, overnight facilities, shops, and radio facilities, including approximately 175 radio control stations and other facilities.

Figures for the value of property owned by the System are given for comparative purposes from 1934 through 1941, as it was in the 1934 year that these figures were subdivided according to the method used in the following table:

TABLE VI
Value of Property
of
Pan American Airways
1934-1941
(000 omitted)

<u>Year</u>	<u>Land</u>	<u>Building and Airport Improvements</u>	<u>Flight and Ground Equip.</u>	<u>Unfinished Construction and Equip. Blnces.</u>	<u>Total</u>
1941	\$937	\$5,884	\$19,260	\$841	\$26,923
1940	887	5,924	22,495	1,137	30,445
1939	860	5,746	18,772	441	25,819
1938	722	5,527	13,165	1,411	20,825
1937	710	5,109	13,933	1,027	20,779
1936	504	4,299	12,103	632	17,538
1935	486	3,862	9,938	577	14,863
1934	456	3,400	7,375	375	11,231

Source: Standard Corporation Records (P-S), Standard and Poor's Corporation, New York, 1942

*See Section IV

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. The second part outlines the procedures for handling discrepancies and errors, including the steps to be taken when a mistake is identified. The third part provides a detailed breakdown of the financial data, including a summary of income and expenses. The final part concludes with a statement of the total balance and a recommendation for future actions.

Date	Description	Amount
2023-01-01	Opening Balance	1000.00
2023-01-15	Income from Sales	500.00
2023-01-20	Payment to Supplier	200.00
2023-02-01	Income from Services	300.00
2023-02-10	Salary Payment	150.00
2023-02-25	Income from Interest	50.00
2023-03-01	Closing Balance	1500.00

During 1941 the company spent \$9,650,000 for the acquisition of new flying equipment and ground facilities excluding property provided under emergency government contracts. In spite of this large expenditure the transfer of the System's transoceanic Clipper fleet to the Government brought about a reduction in the valuation figure for flight and ground equipment for the 1941 year. For military needs airport facilities useful for the defense of the Western Hemisphere and the war effort of the United Nations have been constructed in the United States. Due to the war in the Pacific, losses to date incurred on the Pacific bases and to flight equipment have been estimated at \$910,849, which amount has been filed with the War Damage Corporation. (1)

The principal operating and maintenance bases for international transportation are located at: (2)

Miami, Florida
 Brownsville, Texas
 Rio de Janeiro, Brazil
 Baltimore, Maryland
 Treasure Island, San Francisco
 California
 New York Municipal Airport
 La Guardia Field, New York

Other operations or terminal facilities of existing or proposed international service, according to information available as of December 31, 1941, include: (3)

Havana, Cuba
 Barranquilla, Colombia
 Port of Spain, Trinidad

- (1) Standard Corporation Records (P-S), Standard and Poor's Corporation, New York, 1942
- (2) Moody's Manual of Investments--Industrial Securities, New York, 1942
- (3) Moody's, Ibid

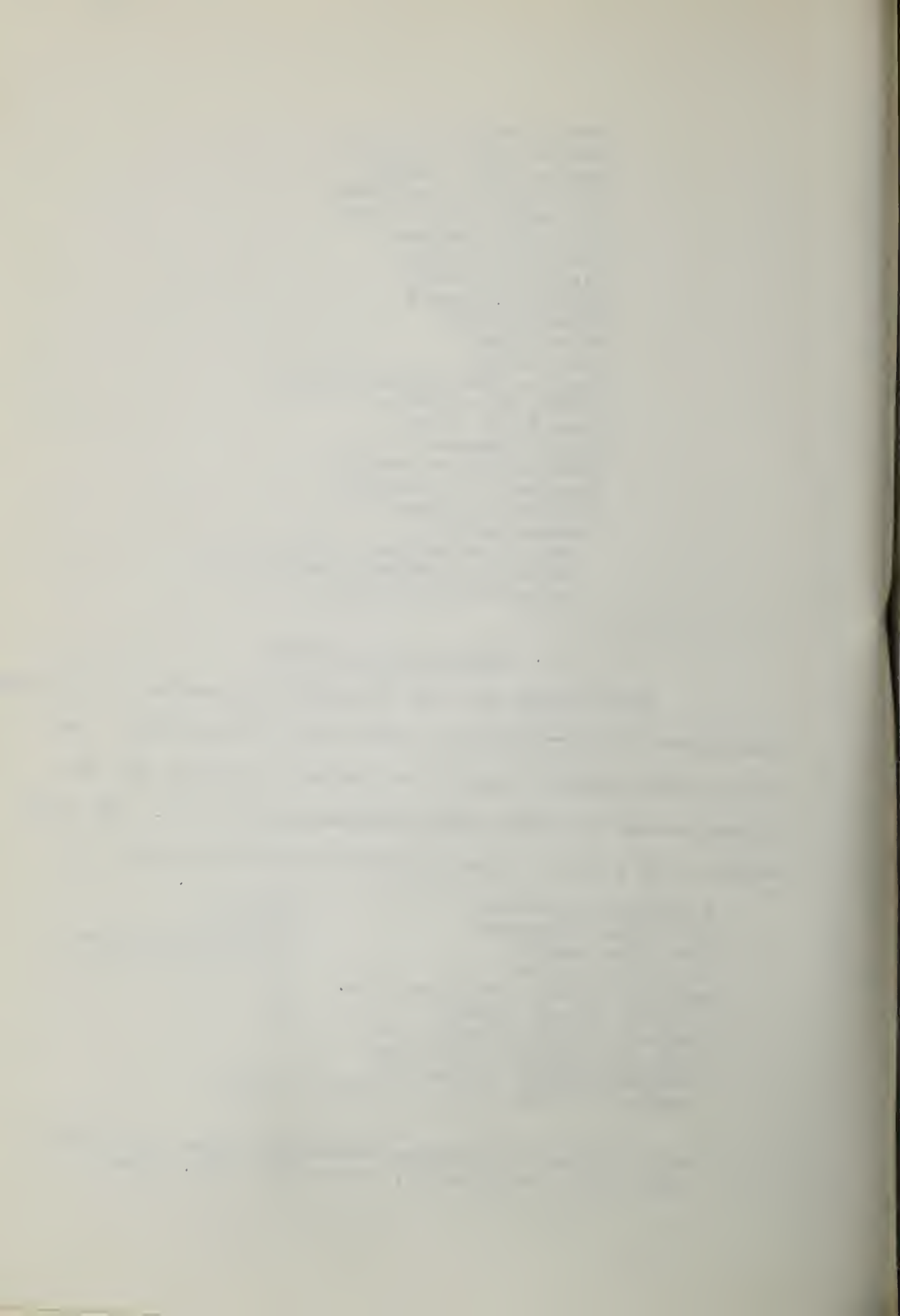
Para, Brazil
 Buenos Aires, Argentina
 Mexico City, Mexico
 Los Angeles, California
 Cristobal, Canal Zone
 Hamilton, Bermuda
 Horta (the Azores)
 Lisbon, Portugal
 Honolulu, Hawaii
 Midway Island
 Wake Island
 Guam Island
 Manila, Philippine Islands
 Macau, South China
 Hong Kong, China
 Canton Island
 Noumea, New Caledonia
 Auckland, New Zealand
 Fairbanks, Alaska
 Juneau, Alaska
 and other points in the
 Western Hemisphere and on the
 Atlantic and Pacific.

D. Depreciation Policy

The company uses the straight line method of figuring the amount of depreciation on each item of equipment. The annual rates are believed to be adequate to write off the property over its estimated remaining useful life. The rates used on the various types of property are as follows: (1)

4-motored airplanes	13 1/3%
all other airplanes	20%
twin row motors	4,000 hours of use
all other motors	3,000 hours of use
hangars, shops, stations, etc. in the United States	5%
hangars, shops, stations out- side the United States (or proportionately larger if leased for less than 15 years)	6 2/3%

(1) Poor's Financial Records--Industrial Manual, Standard and Poor's Corporation, Wellesley, Mass., 1941



communications and meteorological equipment	25%
hangar and ship equipment, fueling and storage equipment, launches, barges, furniture and fixtures, aircraft instruments, flying and hotel equipment	20%
autos, trucks and tractors	33 1/3%
aircraft propellers	50%

According to the above policy depreciation figures for the 1935-1941 years are as follows:

TABLE VII
Depreciation on Property
of
Pan American Airways
1935-1941
(000 omitted)

<u>Year</u>	<u>Value of Property</u>	<u>Depreciation</u>
1941	\$26,923	\$4,506
1940	30,445	3,346
1939	25,819	2,505
1938	20,825	2,135
1937	20,779	1,988
1936	17,538	1,470
1935	14,863	1,181

Source: Standard Corporation Records, (R-S), Standard and Poor's Corporation, New York, 1942

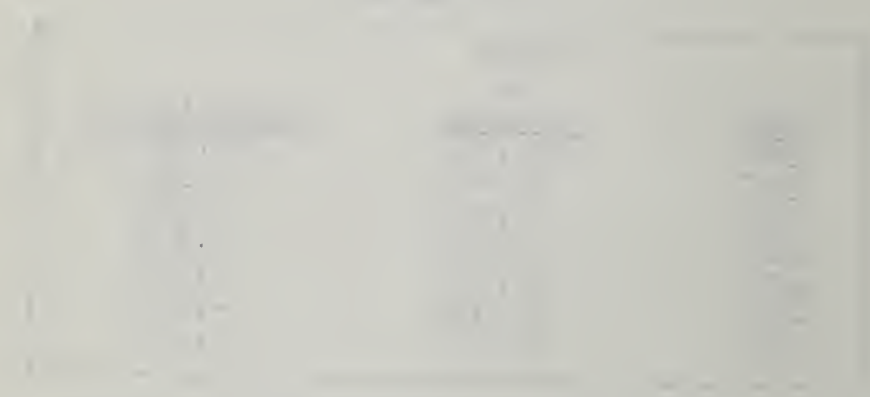
E. Subsidiaries

As of December 31, 1941 the company had a 100% voting power in the following subsidiaries: (1)

- (1) Moody's Manual of Investments--Industrial Securities, New York, 1942

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Pan American Airways, Inc., New York
This division includes Latin American,
transpacific, transatlantic and
Alaskan operations

Pan American Airways Air Ferries, Inc. (Del.)
Originated in 1941 to ferry aircraft
from the United States to the west
coast of Africa and points inland.
(On October 4, 1942 the War Depart-
ment announced that the Army would
take over this subsidiary. Contract
expired on October 31 and thereafter
the ferrying of lease-lend and other
aircraft was to be handled by the
Air Transport Command.)

Pan American Airways Africa, Ltd. (Del.)
Originated in 1941 to engage in
aeronautical activities wholly
within Africa

China Airways Federal, Inc., U.S.A.

Pan American Airways Manufacturing and
Supply Corporation, New York

Pan American Airways Sales Corporation
Marine Airport, New York

Panair do Brasil, South America

Compania Mexicana de Aviacion, South America

Compania Nacional Cubana de Aviacion, Cuba

The following are subsidiaries in which the company
has less than 100% voting power: (1)

Uraba, Medellin & Central Airways, Inc., (Del.)
Aerovias Nacionales de Colombia

The corporation also owns 50% capital stock in
Pan American-Grace and owns indirectly through China Airways
Federal, Inc., U.S.A., 45% of the capital stock in China
National Aviation Corporation. In addition, there are four
other companies in which Pan American has 40%-50% interest.

(1) Moody's Manual of Investments--Industrial Securities,
New York, 1942

F. Merger (1)

On June 4, 1942 the stockholders of Pan American Airways Corporation approved the merger of the company into its wholly-owned subsidiary, Pan American Airways, Inc., its principal operating company. Such a merger is to become effective as soon as the Civil Aeronautics Board has given its approval to the petition of Pan American Airways, Inc., to acquire "Avianca", a South American subsidiary. The purposes of such a merger are to eliminate the parent holding company, to simplify intercorporate relations, to effect savings in taxes and to reduce expenses and labor incidental to maintaining a holding company which performs no operating functions.

To effect this merger the wholly-owned subsidiary, Pan American Airways, Inc., is to authorize capital stock in the amount of \$10,250,000, consisting of 2,050,000 shares of \$5.00 par, of which 1,937,000 shares will be issued in equal exchange for outstanding shares on the New York Stock Exchange. The shares of the subsidiaries now owned by the parent company will be extinguished in this way.

The surviving company is to assume the obligations of the parent corporation under the management stock purchase plan of July 1, 1938, in which certain selected officials holding responsible positions in the company's organization

(1) Material for this sub-section was gathered primarily from:
Moody's Investors Service--Current Industrials, New
York, 1942

had the opportunity to increase their interest in the company through acquisition of its stock upon definite terms and conditions. On December 31, 1940, according to this plan 62,645 shares were allotted or subject to allotment. On July 1, 1943 the participants are to be given the privilege, exercisable during four months ending October 31, 1943, of purchasing shares of the capital stock at \$12.50 per share.

VIII. PAN AMERICAN AIRWAYS,
THE UNITED STATES GOVERNMENT
AND
INTERNATIONAL LAW

A. International Air Law

Since its very beginning the System has been confronted with difficult legal and diplomatic problems in connection with the establishment of its air routes. These problems have arisen due to the fact that the air space over the surface of the earth is not considered to be free and any air transport operator wishing to provide air service in and between the countries of the earth runs into the international law of air travel as well as numerous political and diplomatic difficulties.

There are three important reasons why the freedom of the air has been restricted:

1. The airplane is dangerous from a military standpoint. It is very easy to observe from aircraft the kind of military preparation which is taking place in a nation.
2. Too much freedom would make it difficult for the various nations to enforce traffic and safety rules. However, there is no reason why an international code of traffic and safety rules could not be enforced.
3. The desire on the part of certain nations is to exact a high price for flying and landing rights.

The principles of international air law which restrict the freedom of air space over the nations of the world are as follows: (1)

1. Each state has complete jurisdiction over the air space above its territory including its territorial waters.
2. Each state has complete discretion as to the admission of any aircraft to the air space under its jurisdiction.
3. The air space above the high seas and over the other parts of the surface of the earth not subject to any state's jurisdiction is free to aircraft of all states.

It is evident from these rules that the System would find it impossible to operate if it could not obtain from the countries in and over which it operates the required flying and landing rights. Needless to say, to obtain such rights from foreign governments has at times required a considerable amount of careful and skillful bargaining both on the part of the System itself as well as on the part of the United States Government.

B. United States International Air Policy

From the time when the question of laws for air commerce first arose the United States has favored freedom of the air. Even when the World War showed the airplane to be a powerful military weapon the United States still believed that international air transportation should be given a

(1) Lissitzyn, Oliver F., "The Diplomacy of Air Transport," Foreign Affairs, Vol. 19, No. 1, October, 1940, page 156

considerable amount of freedom from restriction. However, when the nations of Europe established a highly restrictive set of international air laws the United States could not afford to give great freedom and receive none in return. Accordingly, in the Air Commerce Act of 1929 the Government established a general principle of reciprocity for the granting of air navigation privileges. This principle was continued in the Civil Aeronautics Act of 1938 and is at the present time the policy of the United States.

C. Government Aid to the System

In Latin America and in the Pacific area Pan American with one exception obtained flying and landing rights by direct bargaining with the countries concerned. The exception was that in 1926 the United States negotiated an agreement with Colombia providing for reciprocal flying and landing rights. In spite of the fact that the Government has contributed but little direct aid in these areas it has helped the company considerably in an indirect manner. It has never been favorably impressed by foreign efforts to compete with the System in the Caribbean and in the Pacific, turning down the applications for flying and landing rights of all foreign air carriers which could possibly compete in these areas. Furthermore, it has been the policy of the State Department to smooth the way for the company by every means short of actual negotiations. The United States has not wanted to

negotiate directly because it was felt that the reciprocal privileges that would have to be granted might be used by a third nation, such as Germany, Japan or England, to start operations to the United States under the guise of an air transport company registered in some small country but actually controlled by interests in these countries.

Because the United States has refrained from direct negotiations with the republics to the south as well as with the nations in the Pacific area Pan American has found it difficult at times to negotiate. This is due to the fact that the System has never been in the position to commit its Government to a grant of reciprocity. In some cases the company has managed to get around this difficulty by agreeing to accept cancellation of the rights by the granting government if the United States refuses the government reciprocal rights, when and if it desires them. Such a cancellation would, of course, be a decided blow to the company but the chance of the United States refusing reciprocal privileges in such a case is rather small in view of its evident consideration of Pan American Airways as an instrument of national policy.

The policy of the United States on the transatlantic routes of the System has differed from that which it has adopted on its other routes. Flying and landing rights in this area have been negotiated for directly between the United States Government and the foreign governments involved.

The reasons for this change have not been made known but some of them are evident: (1)

1. Some European states insist that applications for air navigation be made directly by the government of the operator concerned.
2. Important European nations are not likely to grant air rights to Pan American without being assured of reciprocal rights in the United States.
3. Pan American, if allowed to negotiate for itself, might be able to obtain a monopoly of transatlantic service under the American flag. Landing rights when obtained by the Government may be apportioned among various American companies.

D. The Effect of International Air Law on Pan American Airways

Without doubt the growth of Pan American has been greatly retarded by the international law of the air due to its requirement that the company bargain for landing rights. The development of the System's routes would undoubtedly have been considerably different if freedom of air transportation had prevailed in the establishment of its routes.

A good example of the changes in policy which have resulted from diplomatic considerations is the establishment of the transatlantic route to England. In 1937 Great Britain gave Pan American the right to land in Newfoundland, England

(1) Lissitzyn, Oliver F., "The Diplomacy of Air Transport," Foreign Affairs, Vol. 19, No. 1, October, 1940, page 160

and Bermuda. At the same time permits were also obtained from Canada and Erie. The permit given by Britain was conditioned upon the start of transatlantic operations by a British company to begin at the same time as those of Pan American. The right for such operations was given by the United States Government.

Consequently, during the year transatlantic survey flights were completed by the System and it was ready to start operations the following year. However, the British company was not ready and while Pan American attempted to have the above condition waived the British Government refused its request. This put the company in the position of having to mark time until a British company was ready to operate.

It was not until 1939 that operations were finally commenced to Britain by the System. These operations were not begun because a British company was ready with a similar service but because, aided by the Government, Pan American had acquired the right to operate in France and Portugal which provided the System with facilities for a southern transatlantic crossing.

When these rights were acquired the British Government apparently felt that holding out on the northern route would be unprofitable and allowed Pan American to commence operations on the northern route in February, 1939. In May of that year Pan American started regular operations over this route.

By this example it is made clear how the requirement of international bargaining may be the cause of delaying indefinitely the establishment of commercial air routes between nations.

E. Freedom of the Air

The question of whether freedom of air space over the surface of the earth should be allowed after the war has been the subject of much debate recently both in England and in the United States. A consideration of the arguments for and against such freedom would be of value at this time in view of the effect that any such change in international air policy would have on the System.

The group opposed to freedom of the air believes that such a policy could very easily result in a dangerous world monopoly by some well-entrenched, efficient company such as Pan American. Governments, according to this group, have strategical as well as financial interests requiring them to insist on restricted air space.

The second group feels that freedom of the air would produce much more economical operations, while at the same time it would not necessarily result in a dangerous monopolistic condition. The proponents of this policy feel that free competition in international air transportation would cause the less efficient operators either to go out of business or to combine with a company which was more efficient. This

weeding out process would in the long run result in the survival of the fittest companies. Such companies would then have the freedom to develop the best possible routes and to offer their air facilities at greatly reduced rates.

The solution of this problem will depend first upon the winning of the present war and then upon the decisions of the various nations of the world regarding this highly theoretical and controversial subject.

IX. CONTRIBUTIONS TO THE UNITED STATES
AND TO OTHER COUNTRIES SERVED

A. Services to the United States

1. Carries Prestige of the United States
throughout International Trade Routes

The work of international air transportation performed by Pan American Airways is a powerful instrument of national policy. It is at once military, commercial, cultural and political and serves the national aims of prestige and propaganda. In spite of the fact that Pan American is controlled by a group of capitalists like any other United States corporation, it represents the United States Government and the rights of its citizens on the airways and holds them in the name of the American people.

The competitors of the System at the present time are not United States air lines, except in a few instances, but are the foreign lines set up as the official representatives of their governments. For this reason it has been the policy of the Government to encourage the System wherever it seems expedient in order to aid it in its work of carrying the flag to remote corners of the earth. (1)

For many years the prestige of the United States along the surface routes of international trade has been at a low ebb. Since the clipper ship era the merchant marine of the United States has been dwindling in importance despite

(1) Fortune, "Pan American Airways," Vol. 13, No. 4,
April, 1936, page 76

money poured into it by the Government in an attempt to regain lost trade. This loss is due to the fact that other countries can operate their merchant marine at much more economical levels. Now Pan American offers the American people an opportunity to regain this lost prestige by means of international air transportation, a mode of communication which may in the future become the most important form yet developed.

2. Aid to the "Good Neighbor" Policy

Without doubt the greatest single contribution Pan American has made to the Government and to the people of the United States has been the aid it has given in the creation of friendly relations between this country and the other nations of the Western Hemisphere.

This help has been in many and varied ways. When President Roosevelt announced the "good neighbor" policy, almost instantaneously there was apparent widespread interest on the part of the United States toward the republics to the south. Immediately there began a southward trek of writers, press correspondents, radio men, interpreters and teachers of United States culture, scientists and just plain tourists.

As soon as the policy was announced Pan American set into motion the mechanism necessary to aid the Government. It arranged exploration trips for scientists and lecture trips for writers, newspapermen, businessmen and scholars; it charted a series of tourist trips, and in cooperation with the Government it planned numerous good-will tours throughout Latin America.

In 1937 an educational plan was developed cooperatively by the United States State Department, the Pan American Union and the Pan American Airways System. It was called the Pan American Airways Travel Fellowship. The purpose of the plan was to enable a selected number of advanced students of Latin American countries to travel to various colleges for post graduate and research work in the United States. Pan American Airways provided the air transportation and a scholarship for maintenance, with tuition being given by a United States college or university.

These fellowships, coordinated with those of United States universities, have made it possible, as of the end of the 1942-1943 academic year, for 63 Latin American students to absorb the education and ideals of the United States and to return home to spread understanding and good will in their own lands. Selections of students for the fellowships are made through the facilities of the Institute of International Education in New York.

In 1939 the System's fellowships were extended, at the suggestion of the State Department and a number of outstanding educational institutions in this country, to include fellowship awards to United States students for Argentina, Brazil, Chile, Peru, Mexico and Venezuela. The scholarship qualifications for such students were set very high. So far, 24 United States students have received these grants. (1)

(1) New Horizons, Pan American Airways House Organ, October, 1940

An outstanding contribution which the System has made to the promotion of better relations between nations in the Western Hemisphere has been the friendships formed in the various countries by the management and personnel of the company. The young men who have been sent out to various posts in South America have made good friends for themselves and the System by establishing homes, learning the language and raising their families in the different countries.

Over a period of years the management has also lost no opportunity to cement relations between the other nations and the United States. Its policy has always been to befriend government officials and to learn the problems of the countries in which it operates while at the same time it attempts to bring about a better understanding between each country and the United States.

3. Incorporates Other Countries into United States Economy

In hand with the "good neighbor" policy is the desire on the part of the Government to establish stronger economic ties with other nations, particularly among the South American republics. The Government aims to bring about a willingness to trade by these countries, which, it realizes, can be effected only through mutual understanding of the benefits and availability of communications and transportation.

Pan American Airways is playing a big part in setting up such trade relationships. The Clippers are making it possible to establish necessary commercial contacts rapidly and by this means a firm foundation is being laid for future expanded trade. The express being carried is expediting the swift exchange of samples, commercial papers and bills of lading, while international air mail is providing the means for speedy interchange of vital information and business agreements.

The war has made the location of new sources of raw material essential to the United States. Many of these critically needed products are now being transported by Pan American from South America and from other friendly countries and when additional air cargo space is available much more of this type of work will be done.

South America has been the proving ground for the System's international air express program. This relatively new concept is giving the United States the golden opportunity of establishing trade relations at a time when she needs them most. The chance is now at hand for the American people to develop a tradition of a square deal and to create a foundation of good will while other large nations of the world are too busy or find it too difficult geographically to compete. If such opportunities are fully realized the United States will be well entrenched at the end of the war in other friendly nations. (1)

(1) Read, Leonard E., "Aviation Makes Good Neighbors,"
Aviation, Vol. 41, No. 4, April, 1942 pages 226-227

B. Services to Other Countries as well as
to the United States

1. Provides Transportation Service
to Inaccessible Communities

The basic struggle in many countries along the routes of the System is that of man against nature. In the countries of Latin America and in Alaska and China this never-ending struggle of man has not yet advanced sufficiently to provide adequate surface transportation. Needless to say, this lack of transportation has greatly retarded the growth of these countries.

Pan American has aided materially in their recent development by carving airports into hitherto inaccessible jungles, forests and steppe-lands. In other cases, the System has shortened by weeks and months the distance between two points where formerly very circuitous routes of surface transportation, such as railroads, automobiles, buses, trucks, river boats, burros, carts and dog sleds over mountain trails, were required.

Central America offers a good example of the service Pan American has performed. From Guatemala City to the capital of El Salvador a road exists over which it takes about eight hours to traverse 110 miles. Between El Salvador and Honduras there are no communications except by air. The journey could be made by boat and burro but it would be some adventure. Likewise, no connections exist between Honduras

and Nicaragua other than by air. These two countries are 65 minutes apart by plane but a letter not sent by air mail must be routed by boat, thus taking two weeks in transit. Neither is there any direct land route between the capitals of Nicaragua and Costa Rica.

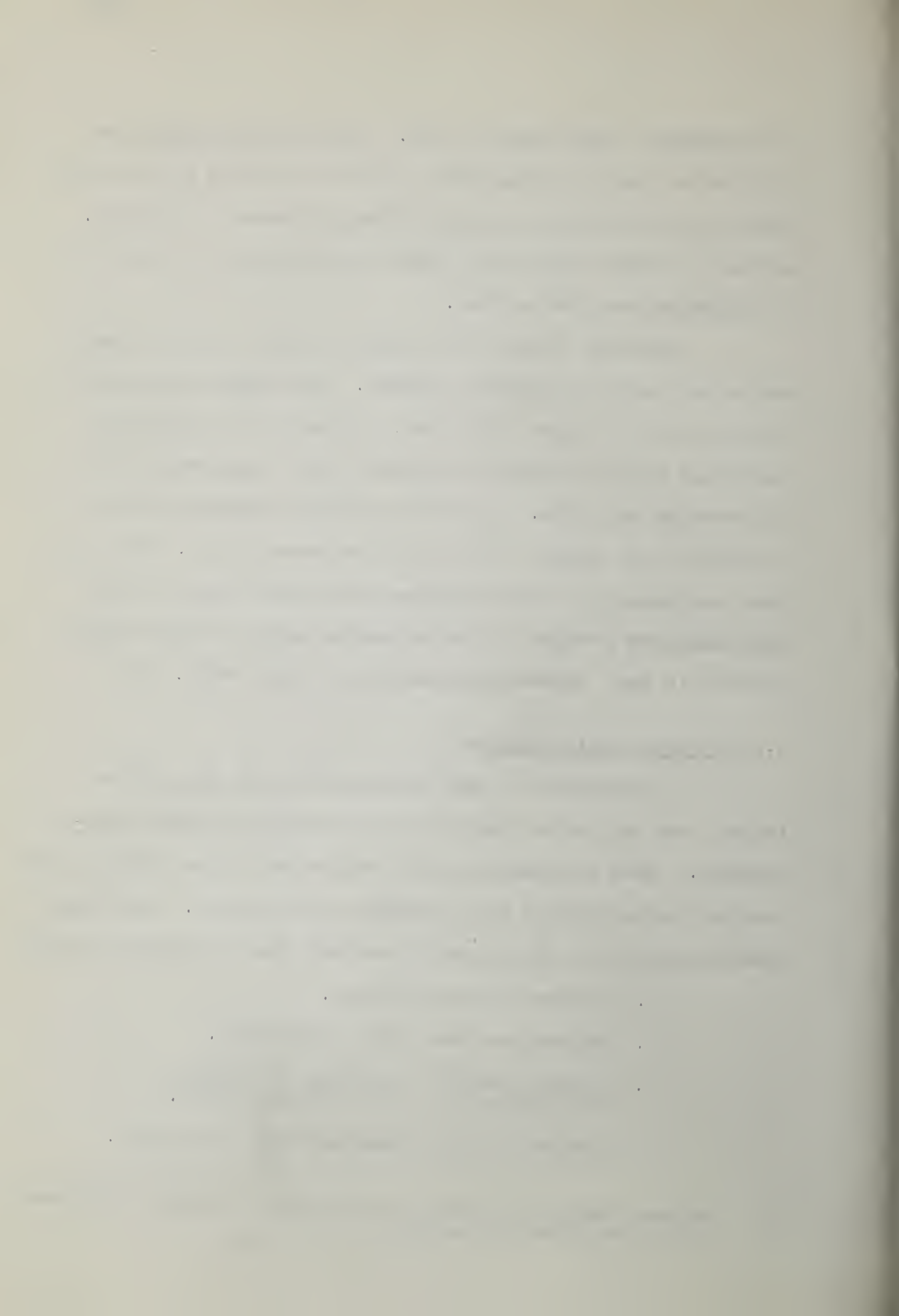
Contrast these poor surface routes with Pan American's air lanes in Central America. The System links all the capitals of these countries. A person may fly from Guatemala City to Panama in an easy day, stopping at all intervening capitals. A similar journey overland would literally take weeks, if it could be made at all. This is just one example of the miracles which the planes of Pan American have wrought by transforming days of travel into minutes in many undeveloped nations of the world. (1)

2. Provides Swift Service

The planes of Pan American are now many times faster than any other mode of transportation between continents. This superiority will become much more evident with further technological improvements in equipment. There are four reasons for this greatly reduced time of travel by air:

1. Routes are more direct.
2. Routes are free from congestion.
3. Planes provide a continuous means of transportation over land and water.
4. Planes are the speediest mode of travel.

(1) Gunther, John, "Inside Latin America," Harper & Brothers, New York, 1941, page 123



The above factors are in direct contrast with the circuitous and congested condition of surface transportation routes between continents and nations with limitations either to land or water and the consequent necessity for frequent transfers.

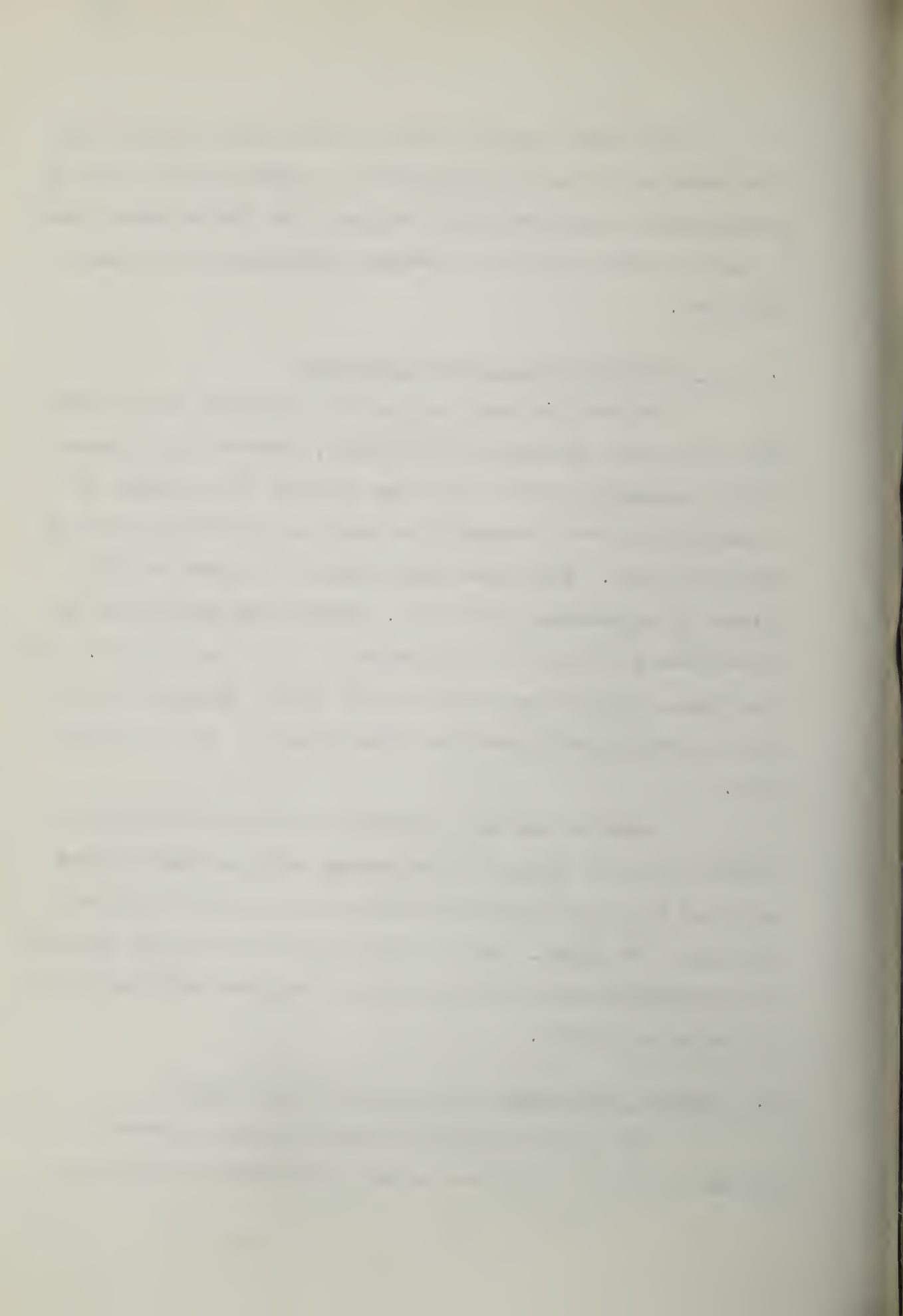
3. Knits Nations More Closely Together

Because Pan American Airways operates in and over land and water, mountains and valleys, deserts and forests, traffic-congested cities and open country, its service is considered the most versatile as well as the fastest mode of transportation. Such speed and versatility have had the effect of compressing the world. Remote and previously inaccessible areas are now available for full development. The resources, products and services of widely separated nations and continents are therefore within reach of all who desire them.

Despite the war inexpensive travel and exchange of culture over the routes of the System are possible in some sections and when nations are again at peace Pan American will span the globe. In this connection the company has and will contribute the gift of a fuller and more enjoyable life to the entire world.

4. Creates New Markets and Sources for Materials

The service which Pan American has performed in aiding nations to find new markets for their products and



new sources of materials is nowhere more noticeable than in Latin America due to the war. The commerce of the republics to the south was ripped to shreds when the war in Europe began as it closed normal sources of supply for many important articles as well as cut off the ordinary outlets for the exports of the Latin American countries, such as coffee, meat, hides, wool, rubber, tin and many other items. At the same time the United States required markets in which to sell goods and new reservoirs of raw materials. When the Japanese captured many of the Far-Eastern resources upon which the United States depended the need was even more greatly intensified.

To satisfy these requirements the United States turned to Latin America while at the same time the southern republics were eyeing the United States market.

When this situation occurred it became necessary for the businessmen in the 20 different countries in the Latin American trade area and for the businessmen in the United States to become familiar with each other's difficulties caused by the sharply divided differences in race, language, climate, geography, temperament and methods of doing business.(1)

To aid in the solution of these problems Pan American appointed itself an ambassador for both groups and cooperated with each in every way that would promote trade between the

(1) Read, Leonard E., "Aviation Makes Good Neighbors," Aviation, Vol. 41, No. 4, April, 1942, page 224

various parts of the Western Hemisphere. If a businessman in the United States wanted to contact representatives in Latin America, Pan American would assist him. If a Latin American wanted to sell straw hats in Seattle, Washington, the company would collect data for him on prices, competition, politics and hat consumption. If a United States merchant wanted to know his chances of being successful in the sale of shoes in Chile, Pan American would attempt to determine all facts about the market and would suggest the best way of exploiting such a market. Wherever possible, the System has aided the two groups of merchants when they were in trouble.

This same service is offered to all businessmen in every country served by Pan American and it has been heartily recommended and praised by all users. Certainly such a device, designed to bind the businessmen of the world closely together into a large community busily engaged in supplying the wants of other people as well as their own, sets a fine example for a world determined to achieve a democratic peace at the end of the war.

X. COMPETITION

A. Latin American Area

1. Foreign Competitors

The European war has brought about many changes in the operations of foreign air lines along the routes in South America. This has resulted in reduced competition for Pan American Airways' various lines and during the past few years the company's business has been increasingly profitable. Any reversal of this trend should not be expected for the duration at least.

The State Department has for several years been in the process of inducing Latin American republics to nationalize air lines and oust the Nazi and Italian employees. Under the plan which was devised United States equipment and air-line personnel would be imported to set up operations, to train national pilots and to control management for ten years. This, too, was a valuable phase of new policy for assisting Latin America to develop its countries and to reduce their dependence on European markets. To this end Pan American was given a large sum of money for extra economic improvements of airports and communications. In several countries to date Pan American has carried out this procedure.

The System's foreign competitors until recently, consisting in the main of German, French and Italian air lines, were established long before the company took an interest in that section of the hemisphere. Consequently, when Pan American

first began to make arrangements to set up lines the company was faced with many problems of competition. The most outstanding examples of the methods by which Pan American competed and in practically every instance wiped out such competition are described below.

After World War I in an effort to regain their old markets European powers sent air planes to Latin America. The ships of that time could not fly the Atlantic on schedule but Europe was familiar enough with diplomacy to know that the establishment of air routes no matter how crude would lead to valuable rights in the future. As early as 1919 an Austrian war ace, Dr. Peter Paul von Bauer, erected a commercial line in Colombia, mostly with German capital. His enterprise was called SCADTA, an abbreviation for the full name Sociedad Colombo Alemana de Transportes Aéros. For many years it was considered to be the best entrenched German air line on the continent and during its lifetime performed miracles in opening up communications.

That such an efficient German line with good planes and pilots who had had great experience should be flying so close to the Panama Canal soon proved very awkward to the United States. Then negotiations were commenced to squeeze out SCADTA. The process was a difficult one partially because Pan American had become its biggest stockholder and the System was reluctant to lose its investments. The American ambassador, Spruille Braden, arranged that while SCADTA was flying its planes a Colombian officer should accompany each plane. Then

American authorities put pressure on Pan American and she finally agreed to a new arrangement which was much to her advantage. In 1939 the German pilots were dismissed and the old line broken up. A company called "Avianca" was formed which was partly owned by Pan American and partly by the Colombian Government.

As of May 25, 1942 the law of the Republic of Colombia prescribed that not less than 51% of the stock of any Colombian air line must be owned by Colombian nationals and/or the Colombian Government. Negotiations prior to this date were instituted between Pan American and the government which resulted in sale by Pan American of some of its stock. (1)

As early as 1925 the Germans got into Bolivia forming the Lloya Aéreo Boliviano, which with companies in other South American countries became a powerful branch of the Deutsche Lufthansa. The Germans pushed planes and equipment into South America on long-term easy-payment notes and provided pilots and technical crews. Such personnel accumulated much valuable knowledge for military use concerning routes, topography, etc. In May, 1941, the Nazi control was eliminated when the Bolivian Government expropriated the company. At that time a United States Government mission was sent to Bolivia where it devised an organizational and financial agreement of mutual advantage.

(1) Altschul, Selig, "Pan American's World-Wide Airways," Barron's, November 17, 1941

The United States offered fast and modern planes, easy access to gasoline, capital, management and service and the agreement gave Panagra (Pan American-Grace) a five-year management contract to operate as far as Corumbá on the Brazilian frontier where Panair do Brasil took over.

Thus the German air line crossing the continent (through contact with the Peruvian Lufthansa and Condor in Brazil) was broken and an American line put in its place. The Bolivian Government promised not to give any concessions to Europe during the life of the Panagra contract, to use only equipment made in the Americas, and to employ none but American pilots and technicians. The United States through the Defense Supplies Corporation of the Federal Loan Administration lent Bolivia \$660,000 to pay for new planes and the country promised to give the line \$192,000 per year as subsidy. (1)

In Ecuador a German air line called "Sedta" linked various local towns. Early in 1941 attempts began to squeeze out the company. First Pan American-Grace Airways (the west coast affiliate of Pan American) set up a rival domestic service. The next move was that International Petroleum Company of Peru, the only company from which Sedta could get gasoline, refused it fuel. Since International Petroleum was a Canadian corporation such a move was to be expected. On September 5, 1941, the Ecuadorian Government officially

(1) Gunther, John, "Inside Latin America," Harper & Brothers, New York, 1941, page 230

grounded the German Sedta line and Panagra replaced the 590 miles flown in Ecuador.

In 1928 and 1929 the French were trying to get into Peru and Mr. Trippe, president of Pan American, realizing that something would have to be done immediately to preserve the Peruvian air rights to the United States, arranged a contract through an American firm in Peru for an air line with the Peruvian Government. When it was completed Pan American turned to the strong Grace concern*, which had the main United States commercial supremacy in that part of the world, and invited it to take half interest in the new Peruvian Airways as well as in a contemplated Chilean Airways.

In Brazil the Panair do Brasil, the local Pan American subsidiary, had strong competition from Condor for some time. Condor was nominally Brazilian but was actually a subsidiary of the Deutsche Lufthansa. This company was considered to be the biggest and most important German line on the continent, flying every inch of the exposed Brazilian bulge and penetrating deep inland. When the line first started in 1927 the pilots were German citizens but as soon as nationalism arose in Brazil the German officials and pilots became naturalized. In 1934 President Vargas issued a decree which the German company as well as Pan American had anticipated requiring pilots of Brazilian-registered planes, whether serving on an international or domestic route, to be Brazilian nationals.

*See page 16.

In 1940 came another decree demanding that all pilots of Brazilian-registered planes be born in Brazil. This authorization was aimed directly at Condor since by that time Panair do Brasil had trained a sufficient number of Brazilian pilots. Such a decree proved harmful to Condor as did the shortage of new planes and spare parts. Since President Vargas has proven that his country is in complete accord with the Allied cause the German company is no longer operating.

There is one country, Venezuela, in which Pan American is free from competition because of arrangements which were made by the country with the company when air transportation service was first introduced. In 1939 President Gomez, who was suspicious of all foreigners, held a casual conversation with Charles Lindbergh, who was at that time a technical advisor for Pan American, and was so impressed with the possibilities of aviation that he let in Pan American. This opening made possible a complete circuit of the South American Continent.

2. Domestic Competitors

Competition from domestic companies in the Central and South American area has been slight so far although it is on the increase. It is to be expected that the System will be faced with ever-growing competition because the countries to the south are attractive markets and will become more so as this hemisphere becomes woven closely together politically and economically.

There are several outstanding cases in which Pan American has had trouble with other companies of the United States in the Latin American area. In Central America there has been acute rivalry for some time between the company and TACA (Transportes Aeros Centroamericanos), a system of air lines operating in six countries. Whereas Pan American concentrates on international passenger, express and mail service TACA's interest is in the development within each country, particularly Honduras. In 1940 it carried more freight than any other air line in the world and its contribution to opening up otherwise isolated regions is great.

Realizing its value American Export Lines was negotiating with TACA. Since Pan American regards Latin America as its special territory it had been warring with TACA because of parallel routes by both companies between San Salvador and San José, Costa Rica. TACA began to run into difficulties. In Guatemala when its contract expired the company was asked to leave the country and a new air line with Pan American support was started. In Costa Rica, Pan American accepted a government offer to set up an internal air line and the TACA contract was cancelled there. At the same time the Civil Aeronautics Board denied the petition of American Export Lines to acquire TACA, thus precluding any serious competition from this company.

On May, 1942, it was announced that American Airlines had been granted a certificate for an international

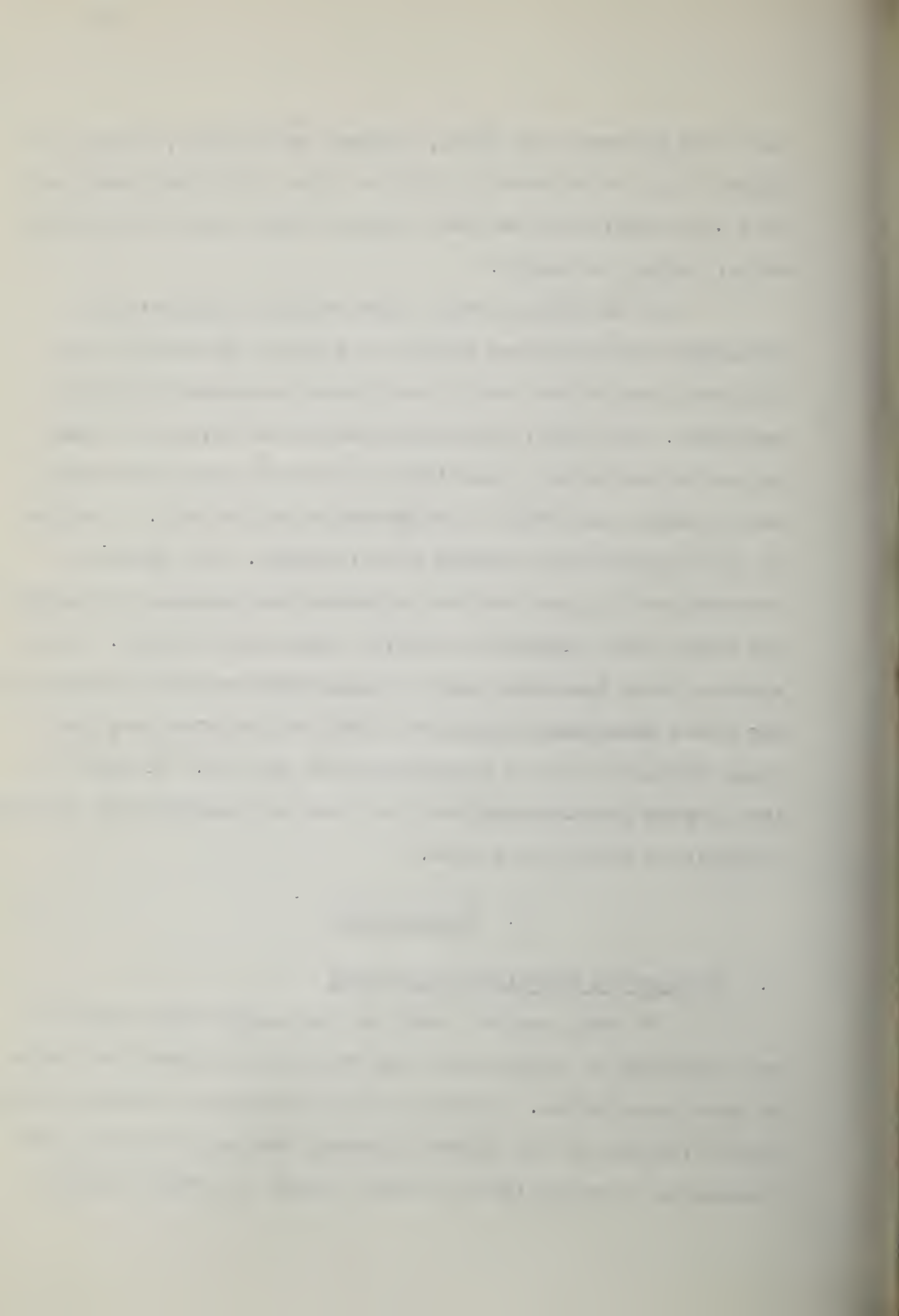
air route between Fort Worth, Dallas, and El Paso, Texas, and Mexico City via Monterey. This new line will doubtlessly cut into the traffic carried over Pan American's line from Brownsville, Texas, to Mexico.

By December, 1942, a serious air transportation bottleneck had developed between the United States and the Caribbean due to the lack of sufficient equipment to carry war goods. The Civil Aeronautics Board was forced to issue an invitation to any qualified companies to apply for route certificates and invited foreign companies as well. A number of applications have already been received. Pan American contends that if she had been allotted the necessary equipment she could have carried the traffic with less overhead. It is expected that the operations of applicants who are accepted by the Civil Aeronautics Board will only be temporary and that their services will be suspended after the war. If such is the outcome Pan American need not feel any anxiety over postwar competition from this source.

B. Pacific Area

1. Foreign and Domestic Competitors

In the Pacific itself at the present time there is not the worry of competition for Pan American which she faces in most other areas. Before the New Zealand and Hawaiian lines were first set up the Matson Steamship Company had given consideration to establishing a route across to Hawaii but Pan



American eliminated this potential competition by inviting Mr. Matson as a stockholder. By 1935 all air routes of the United States across the Pacific were cleared for exclusive use of the Clippers.

C. Alaskan Area

1. Foreign and Domestic Competitors

As far as can be determined there has been no competition in the Alaskan area. Back in 1932 Pan American formed the Pacific Alaska Airways, Inc., when it took over the ground facilities, aircraft and mail contracts acquired by the corporation in July of that year from Alaskan Airways, Inc., and Pacific International Airways of Alaska, Inc. This in turn was merged into Pan American Airways, Inc., in 1941 and was subsequently dissolved.

Also Pan American acquired the assets of Alaska Southern Airways in August, 1934. Having full control of this territory it eliminated any competition. However, with Alaska being brought nearer since the completion of the Alaskan Highway and the subsequent growth which the country will no doubt enjoy the possibility of other air lines trying to establish services to that territory will be very likely increased.

D. Atlantic Area

1. Foreign Competitors

Although the Atlantic area is a comparatively new field for air lines of the United States, foreign countries

have for many years been flying the ocean. Air France and Lufthansa were spanning the South Atlantic on and off from 1930 until the war intervened. Germany began scheduled service in 1933. In 1935 the two rivals operated a combined twice-a-week service for mail only.

Pan American was faced with strong foreign competitors who had set up lines to seize trade routes as official representatives of their governments. It was not until 1939 that Pan American's Atlantic route was finally set up after the company had made agreements with Britain, France, and Portugal for landing rights to fly mail. England also opened mail service that year. The outbreak of hostilities affected foreign competitors adversely. The North Atlantic route was cut off for all countries and the French and German lines were suspended in the South Atlantic.

The competition which Pan American faced prior to the war was exceedingly keen and it will probably be even greater after the war. President Trippe himself has said that if it were not for the war, three nations and perhaps six would now be participating actively over the North Atlantic and perhaps five nations would have established operations in the South Atlantic. (1)

2. Domestic Competitors

In 1939 there were no domestic companies to compete actively with Pan American for transatlantic services. During

(1) Altschul, Selig, "Pan American's World-Wide Airways," Barron's, November 17, 1941 .

that year, however, a second American firm, American Export Lines, made a strong bid for a share in the operations. In the summer it carried on several round-trip survey flights and by the year-end the company was submitting evidence to the Civil Aeronautics Board to prove that it should be permitted to establish a service via Spain to Rome for the duration of the war and thereafter to share Pan American's routes to England and France.

The company had also worked out an agreement with Pan American setting up spheres of Atlantic exploitation for both companies. They agreed to divide the possible European areas so that each company could go ahead with its plans and operations without any further competition and interference from the other. American Export Lines agreed to stay out of the northern part of Europe and Pan American out of the southern and eastern sections except Russia. Service to Russia was to be carried on by Pan American over Poland while American Export Lines was to run to Russia over a country south of Poland. Germany and France were to be served by each company with an equal division of round trips and landing rights. In the event that either company was unwilling or unable to begin service to France and Germany at the time when the other company wished to start the slower company would have to give up one-half the rights to the first one.

The arrangements did not meet with the Board's approval. It declared that the determination of areas to be served was

reserved for its own authority and the final agreement about the slower company might lead to monopoly. Also it stated that the agreement, as it stood, might result in a service not suited to the needs of United States commerce, of postal service, and of national defense. It might impair the economic conditions of the two operators and prevent the coordination of air transportation.

In 1940 the Civil Aeronautics Authority examiner recommended the approval of the application of American Export Lines but no decision was handed down by the Authority itself. American Export was to concentrate on mail and express until September 1, 1941 when it wanted to inaugurate a passenger service. Pan American objected to services paralleling its routes but the Board said that such direct competition would assure a sound development of air transportation, would stimulate research for better equipment and would improve operating methods. Services set up in such a manner would be beneficial to travelers and shippers and to national defense. Even though Pan American had competition with foreign lines the saturation point had not been reached. Also because the Board had little control over passenger and express rates this made competition desirable to assure the protection to users of the lines. (1)

After a long period of waiting the Board authorized transatlantic service for American Export Lines and on

(1) Puffer, Claude E., Ph.D., "Air Transportation," Blakiston Company, Philadelphia, Pa., 1941, pages 510-511

March 11, 1942, the company announced that a nonstop service from La Guardia Field to Foynes, Ireland, would start in April, 1942. With the establishment of this route Pan American is now faced with competition from a domestic company.

C. Postwar Competition

From time to time since Pan American first established air routes in various countries the company has been able to eliminate competition from foreign and domestic companies with much success. The resulting monopoly, so to speak, and the methods which have been used to establish such a monopoly have frequently evoked much sharp criticism. Pan American too has had strong reasons and arguments to back her policies and only time will tell what the outcome of these varied views will be.

Against such charges Mr. Trippe has a strong defense. In almost every instance his opposition is a monopoly controlled by a foreign government and this, he feels, is certainly competition enough. He asserts that at the present time no other course is possible. After the war since the world will probably be dominated by powerful state-controlled foreign monopolies the United States must also follow a similar pattern. The advantages to be derived from such a policy would be numerous: (1)

(1) Fortune, "The Coming Struggle for the Air Lanes,"
Vol. 23, No. 3, March, 1941, page 156

1. Pooled buying.
2. More resources for air development.
3. Concentrated trading power in foreign fields which would prevent foreign governments from playing one company against another.

The United States has not yet defined her foreign air policies. There are only two broad possibilities open so far as future air policies are concerned. The first leads to monopoly under strict government control possibly patterned on the British form with the government sitting on the Board of Directors. The second possibility would be controlled competition but if this were to be the case a few of the following questions arise:

1. What form should it take?
2. Should it be regional competition and should Pan American under this plan be cut up into parts?
3. Should there be a direct paralleling of routes with open competition between two or more carriers?

Some advocates for open competition feel that the present control of foreign air routes by Pan American in almost all cases tends to leave traffic undeveloped. Their arguments are that:

1. No company can operate air fleets on all oceans and markets.
2. No company can stand off foreign competition.

They give as an example Latin America where they feel that the South American service falls short even though Pan American

has increased schedules, has introduced new Strato Clippers and is leading all competing lines in the traffic it carries. Over the Atlantic also because of the war European mail has piled up due to the lack of shipping and has taxed Pan American Clippers to the limit. (1)

Such are the arguments for and against the monopolistic trend which the company has been establishing. The final results will not be determined until after the war when normal routes are again operating. At that time we shall see whether monopolistic control of air transportation, controlled competition or free competition wins.

At the conclusion of the war Pan American's transatlantic monopoly, in particular, will undoubtedly be seriously threatened not only by American carriers but by foreign enterprises as well. The British Overseas Airways Corporation which at present is authorized to make two round trips per week between a terminal point in the United States and England will no doubt establish regular commercial service. Furthermore, there are evidences that this company will also provide strong competition for Pan American on other international trade routes. The heavily subsidized lines of other countries may also again offer intense competition when the war is over.

Another consideration concerns the many foreign routes which are now being operated for the Air Transport Command and which have been designated for the duration only.

(1) Fortune, "The Coming Struggle for the Air Lanes,"
Vol. 23, No. 3, March, 1941

It can be expected that after the war some of the air lines will request and receive permission to operate foreign routes on a commercial basis. There will be very likely an enormous demand for direct, high speed transportation between widely separated nations. Such speed and versatility will give the air plane a decided advantage over the railroads and steamships.

The Government's postwar policies and the consideration as to whether Pan American is sufficiently well entrenched along the international air routes will decide the fate of the company and its control over the competition which it is bound to encounter after the current war.

XI. CONTRIBUTIONS TO THE NATIONAL DEFENSE
AND THE WAR EFFORT

A. Aid to the National Defense Program
Prior to the War

Pan American's contributions to national defense may be summarized as follows: propoganda, secret service, communications and training. (1) This much is known generally but more detailed analysis of its contributions will in most cases not be made until after the war. However, there are certain facts concerning its assistance which have been made available.

When the war in Europe began the United States was faced with an increased need for and a diminished means of rapid crossing of oceans. Less than four months prior to the outbreak of the war the transatlantic Clipper service was established. It immediately became the instrument of the United States Government which was anxious to keep its finger on the pulse of war and made possible the only scheduled service between this country and Europe. The State Department couriers were well-known travelers on the System during this period, some of whom made as many as 30 Clipper crossings. (2) Practically every ambassador and minister of the United States and every ambassador of the Allied

(1) Busch, Noel F., "Juan Trippe", Life, Vol. 11, No. 16, October 20, 1941, page 111.

(2) New Horizons, Pan American Airways House Organ, December, 1941

powers used a transatlantic Clipper during the two years prior to Pearl Harbor together with military and naval officers by the score.

The importance of the Clippers to the United States military posts was demonstrated many times. For example, when Bermuda was affected by the cutting of regular steamship schedules, every Clipper seat which was not taken by a European passenger was occupied by a laborer, a sailor, an aviator, a construction expert, or an accountant going to or from Bermuda in connection with United States defense operations there. No less important to national defense has been the transportation of war-time air mail.

With the tightening by the United States Government of transatlantic travel and the addition of a third weekly Clipper schedule to and from Europe transatlantic air express was established on September 25, 1941. (1) Thus the way was made clear for various charitable organizations to send shipments of actual supplies to stricken European areas. Not a single package of these vital supplies has been lost since the Pan American Clipper service was first established.

The Latin American routes of the company have been of inestimable value to national defense. During 1941 the amount of air traffic moving through Pan American went up and up. With this trend went an increasing coordination of

(1) New Horizons, Pan American Airways House Organ,
December, 1941

of all Pan American Airways' Caribbean operations with those of the flight arms of the Army and Navy. Month by month more military aircraft flew over the routes of the System. To expedite these routine transfers of military and naval planes special fuel reserves were set up and all radio and weather activities were synchronized so that Pan American's facilities might be fully used by the Government.

Many times during the two years before Pearl Harbor the System was called upon to carry technical defense personnel to various parts of the globe. An outstanding example of this was the movement in a few months of many hundreds of Army technicians to vital defense areas around the Panama Canal.

In China, the China National Aviation Corporation, in which Pan American has a 45% interest, kept communications open between free China and the outside world. This was accomplished by taking advantage of night and other conditions which made it impossible for the Japanese to intercept the planes of the CNAC.

It was during the period just before Pearl Harbor that the bomber ferry service to Africa was started. This perhaps was the most outstanding instance of Pan American's value as a quasi-military force before the United States was driven into the war. This will be discussed at greater length later on in this section.*

In 1940 at the request of the United States Army Pan American organized a navigation school. At this special

*See pages 141-142

school cadets of the United States Air Force and the Royal Air Force were qualified as long-range and transoceanic navigators. Other schools manned by Pan American's personnel were shortly thereafter organized to train pilots and maintenance experts.

B. Aid to the War Effort Since Pearl Harbor

When the Japanese struck at this nation on December 7, 1941, we immediately faced a gigantic transportation problem. While few details of the operation of the company in war time are available to the public it is known that for months prior to the emergency in the Pacific, the big Clippers and their crews were going through practice routines of preparation just in case a crisis came in that section. The captains and their crews learned every detail of the many alternate courses between the mainland and the numerous islands. Within 24 hours after Pearl Harbor the Clippers were being converted into air transports of war. In a few weeks three-fourths of the entire fleet was being used for war-time operations.

Since the war began Pan American has performed invaluable services to the country. Everywhere war has struck the equipment and personnel of the company have been in action. Management, technical staffs, flight crews, and ground crews are in all sections of the globe cooperating fully with the United Nations.

Between December, 1941, and May, 1942, for example, Pan American flew 12,900,000 route miles carrying 152,000 passengers and about 3,000 tons of express. Some of these flights were in combat areas and nearly all between destinations which were being served at great risk by ships. Its total losses for this period were three aircraft and virtually no cargo. (1)

The work done by the China National Aviation Corporation at Hong Kong is an excellent example of the type of aid given by Pan American during the early days of the war with Japan. While the defense of Hong Kong was at its climax the CNAC evacuated several hundred officials and civilians to safety beyond the Japanese lines. The operation was conducted under enemy fire, flying only at night and under adverse weather conditions.

For its war-time job few new planes were available to the System. The planes already in service were stripped of their nonessentials and were re-equipped to carry every possible pound of load. New maintenance procedures were developed and all bases were operated 24 hours a day. As a result of various technical advances flight time has been speeded up and schedules increased until at the present time the company has practically doubled its peace-time capacity.

This step-up in operations has been accomplished in spite of great difficulties. There have been no weather

(1) Fortune, "War for the Skies: We Must Ship by Air,"
Vol. 26, No. 2, August, 1942, page 86

forecasts, beams, beacons, arrival or departure messages or flight forecasts which might be of even the remotest value to the enemy. Furthermore, many of the routes over which the Clippers were forced to operate had inadequate maintenance facilities and the flight crews had to service and maintain the aircraft with their own facilities aboard.

Meteorologists who forecast the weather and make up weather maps have been added to the regular flight crews. Flight engineering officers have taken over the servicing and overhauling of aircraft ashore as well as the control of its power plants and mechanical controls aloft. In this way Pan American has managed to fly with regularity and dependability at a time when entire routes have been wiped out, when ten years of navigation aids have been made useless and when the United States has become geographically isolated from its Allies by the world's two largest oceans.

Although few details of the System's war-time operations are being made public--for obvious reasons--it can be revealed that as of November, 1942, the Clippers had completed more than 600 overseas flight assignments, carrying government officials, military personnel and supplies to many parts of the world. (1)

In January, 1943, an event which will go down in the annals of Pan American Airways as one of its most

(1) Air Transportation, "Pan Am's First 15," November, 1942, page 12

outstanding achievements is the flight that one of its Clippers made which carried President Roosevelt to his conference with Prime Minister Churchill at Casablanca. That Pan American has played a leading part in the making of this historical event is a service of which the company may rightfully be proud.

The Clippers of Pan American are flying large quantities of strategic raw materials to the United States. Silk, tin and tungsten are flown from China; thousands of dollars worth of platinum are flown from the Persian Gulf ports while other materials being moved are: (1)

1. Balsa wood from Central America.
2. Tantalite, beryl ore, quartz crystals, industrial diamonds and mica from South Africa.
3. Crude rubber from Brazil.
4. Twenty tons of rubber seeds from Liberia for planting in the Western Hemisphere.

The records show that the Clippers have flown over some part of every continent in the world and have spanned five of the seven oceans. They have made nonstop flights to England and have flown to the Orient in four hops.

Due to the need for war-time secrecy the movements of the Clippers are carefully guarded. They fly under cover of darkness and their arrivals and departures are known only

(1) Air Transportation, "Pan Am's First 15," November, 1942, page 8



by a necessary few. No single course is ever followed by an entire flight and no two flights are ever the same. Departure times are varied deliberately. The flight plan is known only to the captains and the control officers. Once underway the variables of wind and weather and the Clipper's frequent change in speed, course, and altitude combine to make it practically impossible for anyone to predetermine a Clipper's flight path. (1)

In following this carefully worked-out procedure Pan American is putting into use many lessons learned by its China company, CNAC, which has survived four years of warfare in the Orient. Through experience the pilots in this air service have learned to make the most of dark nights, poor weather, of flying "blacked-out" and through radio silence. The technique these men have developed is today helping Clipper ships to render service against the same common enemy on a new front.

One of the most valuable contributions which Pan American has made to the war effort is its part in making possible the elimination of Axis aviation in South America. The Axis air lines had three main objectives:

1. Familiarization of German and Italian pilots with the difficult geography of Latin America.

(1) Wings of Democracy, a series of seven pamphlets issued by Pan American Airways System during 1942, date on this pamphlet, July 22, 1942

2. Acquisition of important bases and landing fields in Latin America.
3. Military observation for the Axis admiralities over the South Atlantic.

An example of the aid which this company has given in this connection is the case of Bolivia. During 1941 the German-controlled Lloyd Aereo Boliviano, which since 1925 had conducted domestic air transportation operations in the Republic of Bolivia, was nationalized by the Bolivian Government. Cooperating with the United States and the Bolivian Government Pan American-Grace Airways extended its operations in Bolivia to the Brazilian border. Arrangements were also made under a management contract for Pan American-Grace to carry on the operations of the nationalized air line for a period of five years.

In addition to maintaining the country's essential lines of transportation and communications between the Americas and overseas, Pan American has also undertaken important major projects on behalf of the war program. To organize and to man these, it has drawn from its organization veterans of its own pioneering in and across the Atlantic and Pacific, men whose experiences have particularly fitted them for the work required.

While, for reasons of national security details of many of these projects must be withheld, certain of the company's accomplishments have been made public: (1)

- (1) Wings of Democracy, a series of seven pamphlets issued by Pan American Airways System during 1942, date on this pamphlet July 15, 1942

1. They have built supply routes and airport facilities useful for the defense of the Western Hemisphere and for the war effort of the United Nations.
2. War transport service has been established from the United States to the Far East by way of Africa and the Middle East.
3. A ferry service until recently was operated in cooperation with the Government, thus speeding delivery of aircraft and equipment to the armed forces.
4. The company is continuing its training of navigators for long-range flight operations although as of October, 1942, it ceased training members of the R.A.F. and is devoting its facilities solely to the training of United States cadets. Schools have been established to train pilots and maintenance experts to man America's vital war supply lines.
5. Under a program set up by the United States and Latin American governments Pan American has replaced 30,000 miles of Axis-controlled air services in South America. These services had previously been a threat to the entire Western Hemisphere.

Before concluding this section it would be of value to give an example of the close teamwork which now exists between Pan American and the United States Government. The outstanding work performed by the System in cooperation with the Government in establishing an African route to the Middle and Far East is a most striking example.

When it was decided to set up this route various tasks were assigned to Pan American while others were retained by the Government. The United States was to supply the dollars,

priorities, and shipping. The Army Air Force Ferrying Command planned the operation of the route. Pan American was faced with the job of providing the organization to build the airway and to man the transportation service.

Within a very few months by the close cooperation of the company and the Government not only were air services established between the United States and Africa but operations were set up which extended across Africa to the Middle and Far East. The transoceanic part of the African service touching points along the bulge of Africa's west coast is pretty well known but detailed information of the operations of the African route have remained hidden due to military secrecy.

When this war is over and the full story can be told, the building of the aerial supply line across the jungles and deserts of Africa will be one of the most thrill-packed chapters of the war. It will be a story of a continuous fight against time, delays, heat, weather, disease and the peculiarities of native labor and one of which the Pan American Airways System may well be proud.

C. Will Pan American Airways Be Militarized?

Since the entry of the United States into the war Pan American has been forced to face the unpleasant possibility of being wholly militarized. The first move in this direction made by the Government was the purchase of all Pan American's aircraft operating in combat areas. However, the operation

of the aircraft was left under the direction of the System. In the fall of 1942 when the contract between Pan American and the Government expired and the War Department took over direct operation of the aircraft delivery service to the Middle East the System felt that it was another step nearer to militarization. This move by the Government was made on the grounds that all Africa was a combat zone and the Army wanted aircraft ferried into combat zones by military personnel.

There are three methods by which militarization may be put into effect by the Government:

1. Take over all of Pan American.
2. Allow no increases in their present organization and use the trainees for its own purposes.
3. Turn over to the present management all cargo operation, except tactical.

Pan American has been informed that the Government intends to preserve the air-line organization for contract services on strategic routes with Army-owned aircraft to be turned over to the company when needed. In spite of this assurance, however, serious consideration is being given to the militarizing of all operations outside the Western Hemisphere for both military and political reasons.

It would seem that a wise move on the part of the Government would be to maintain the Pan American Airways on a nonmilitary basis. Without considering the vast postwar problem of demobilization which would result from militarization



the above policy appears to be the most sensible. Pan American is noted for its mastery of air transportation. It has a reputation for flight discipline, sense of organization and an acute knowledge of operational procedures built up over many years of operation. Furthermore, Pan American has more than 7,000 operating personnel which its management says could be expanded ten times in a few months.

To break up a well-knit, efficient organization like Pan American Airways to provide planes and equipment for a transportation system to be set up by the Army would certainly prove harmful to the efficiency of the former. In addition, armies have never been outstanding for their efficiency in transportation and even with a good reputation could not be expected to master the art of air transportation overnight.

D. Favorable Effects of the War
on Pan American Airways

The present war will be of considerable long-range benefit to Pan American Airways. In the first place, the valuable part aviation is playing in this conflict is causing the public to appreciate the advantages of travel by air. As a result of this the desire of people to travel is increasing and by the end of the war the number of prospective users of air services will no doubt have been increased many times.

Another factor which should prove to be of value to the System is the vast amount of aeronautical research which is now going on in the aircraft industry. Many new and

worth-while additions have already been made to the science of aeronautics and many more can be expected before the war ends. As a result of these accomplishments, equipment following the war will be safer, of better design and cost less.

The System will very likely benefit from the equipment and trained personnel which will be available in great numbers. Many planes built to carry military cargoes will be convertible into peace-time cargo planes and the System will probably find the Government more than willing to unload them at greatly reduced prices. Furthermore, when the war ends, skilled pilots and maintenance crews will be available in large numbers. Such a backlog of trained men will provide the company with a highly valuable source for additional operational personnel.

Finally, the longest-range benefit the company is likely to derive from the war will be in the perfection of the instruments and technique of international, transoceanic flight. The war will no doubt bring about many such changes which in peace time will result in greater safety in both the landing and mid-air operations of aircraft.

XII. ANALYSIS AND FORECAST

A. Conclusions Involving Prewar Accomplishments of the System

Under the skillful guidance of Mr. Juan Trippe the Pan American Airways System has performed an unsurpassed feat of transportation pioneering involving the use of a new element on a world-wide scale. Today the airways which make up the empire of the company stretch out like long thin fingers to every continent.

From the very beginning the routes of the System have increased rapidly in both length and number. This expansion has been due to:

1. The unusually effective method employed in their establishment.
2. The careful training of operating personnel.
3. The development of scientific techniques which insure safety in flight even for long distances.

This growth has been accompanied by a vast increase in air mail, passenger and express traffic and by a rapid decline in rates made possible by increased operating efficiency. The three most important reasons for this efficiency have been:

1. The development by the System of the large ocean flying boat.
2. The development of large land planes.
3. The more skillful use of available capacity.

The most remarkable achievement in the traffic field was the growth of air express from an infinitesimal amount in early years to many thousands of tons in 1942. This expansion has been greatly aided by the company's contract with the Railway Express Agency which opened up thousands of domestic outlets to international air commerce and by the use of the Pan American Airways Bill which served to simplify the paper work of international trade.

The System's labor policy has been an important factor contributing to its success. Throughout its existence the company has maintained successful labor relations which have been brought about because of the sympathetic attitude of the company toward the problems of its employees. This is excellently illustrated by the death and disability group insurance plan as well as the retirement plan which enables employees to look forward to an independent old age when they are no longer capable of earning.

Before the war the System underwent a substantial capital growth that was well directed and well regulated. Its income policy was to build up its surplus account and as a result it paid out few dividends in spite of substantial earnings. It can be safely said that during this period the company followed a careful policy which resulted in a strong financial condition.

From the time when it first started operations Pan American has been faced with many difficult legal, diplomatic and political problems arising from the lack of freedom of the

air. While it has solved many of these problems by itself it has been given valuable assistance at times by the United States Government. In its attitude toward the System the State Department has shown in many ways that it considers the company an instrument of national policy. However, it is true that the development of the System has been to a certain extent retarded by the international restriction of air commerce and these restrictions will continue to exist as long as the world is organized on the basis of nation states.

The Government has made three other outstanding contributions to the company's development:

1. It has granted air mail contracts and subsidies which have in many instances meant the difference between a profit and a loss to the System.
2. It has passed labor legislation carefully planned to give the greatest possible assistance in the settlement of labor disputes.
3. It has established safety regulations and set up an organization to supervise them.

Among the various phases of the System's operations which are subject to regulation and supervision by the Government are:

1. Passenger carriage
2. Air mail carriage
3. Express carriage
4. Safety

The System has also been of value to the Government and its outstanding contributions are:

1. It has with notable success carried the prestige of the United States throughout the international commercial air routes.
2. It has aided the "good neighbor" policy by offering scholarships and by transporting representatives to and from the various countries of the Western Hemisphere.
3. The actions of its own personnel have served to create in a small way an international feeling of good fellowship.
4. It has helped to incorporate the countries in which it operates into the United States economy.

Pan American has also made valuable contributions to every country it serves, foremost among which are:

1. It has provided transportation to inaccessible communities.
2. It has provided swift service.
3. It has created new markets and sources for materials.
4. It has aided in the establishment of closer cultural relationships by tying nations together.

It can certainly be said that by these contributions the System has furthered the economic and social welfare of the world.

B. Conclusions Involving the War-time Position of the System

Pan American Airways is well situated in the war economy. Since the war began in Europe the amount of air mail, passengers and express carried over its entire network of routes

has increased substantially. When the Japanese struck at this nation on December 7, 1941 the company at once began full cooperation with the Government in the war effort. Today much of its traffic carries priority ratings.

The flying boats which made up its Atlantic and Pacific fleets have been transferred to the Government and are being operated under contract at a reasonable fee by the company. The South American network has remained intact but is being used more and more by the Government for the requirements of war. Many new routes have been established and others greatly expanded. Due to these substantial increases in operations a large number of new planes are now scheduled to be delivered to the company both for its own account and for its operations under contract with the Government.

The question has arisen as to whether Pan American will undergo militarization. Such a move would very likely result in less efficient operation. This factor together with the difficult problems of demobilization by the company which would arise after the war seem to indicate that the company will be allowed to operate according to the present method of nonmilitarization.

The war has greatly aided the System's competitive situation, particularly in the South American and Atlantic areas. Assisted by the various countries concerned it has been able to take over the operations of many routes formerly served by the company's European competitors. Thus it has

obtained an excellent opportunity to establish a reputation for itself while its rivals are prevented from taking counter-measures due to the war.

Recently the Government through the Civil Aeronautics Board has been reducing the company's mail rates. These reductions have been reasonable and there is no reason to believe that the Government will allow rates to be cut so drastically as to impair the company's regular activities due to its strategical and commercial importance.

The System may well be proud of the contributions it has made to the United States during this period. Prior to the entry of the United States into the war it aided in four outstanding ways:

1. By means of its transatlantic and transpacific routes it provided reliable service to Europe and the Far East for the various political, diplomatic and military representatives of this nation.
2. It carried supplies and personnel to various far-flung military posts.
3. It placed at the disposal of the Government many of its facilities to be used in the ferrying of military equipment.
4. It started schools designed to teach transoceanic flying and navigation to certain men of the Army Air Force.

Since the United States has entered the war the company has played a major role in the nation's war program. Besides continuing the above-mentioned services it has in spite of difficulties transported many vital raw materials,

built supply routes, lent its personnel for various important missions and provided training facilities for ground personnel. It has been estimated that the System is now using about three-quarters of its equipment directly or indirectly to further the war effort.

The company's services to the people of other nations have not been neglected since the inception of war. It has continued to provide South America and Alaska with valuable transportation facilities. Furthermore, it has aided by carrying vital medical supplies to many of the world's stricken nations as well as by removing refugees to zones of safety.

C. Forecast of the System's Postwar Position

The war will have certain favorable effects on the System. First, the public will without doubt be more air minded after the war which should result in increased air traffic. Second, war research will be a factor of considerable peace-time value with its many improvements in equipment. Third, the vast military aviation training program will provide thousands of operational personnel for commercial transportation companies. Fourth, many of the planes that are now used for military purposes will very likely be made available cheaply. Finally, the knowledge which is now being accumulated in regard to long distance flying problems will be of great value to the System in the period following the war.

It is probable that the rates of the System will decline appreciably to competitive levels in the postwar period. This factor together with larger planes will result in the System's attracting much traffic normally carried by other modes of transportation. Furthermore, the fact that goods may be shipped rapidly to distant and inaccessible areas at reasonable rates will stimulate new traffic demands. Perhaps the greatest expansion will be in air cargo, a field whose possibilities are not as yet fully understood or appreciated. It also seems likely that the System will carry much of the international first-class mail of the countries in which it operates. Passenger traffic, too, should register substantial increases due to the widened interest of the people of the world in air travel. More people will realize that the use of the plane for business purposes will save time and money.

Throughout its history the System has maintained an outstanding safety record which has been a powerful factor in convincing the public that the air is a safe means of transportation. The postwar period will no doubt be one in which even greater safety in flight will be developed. This will be brought about by improved planes, equipment and maintenance methods plus strict regulation by the Civil Aeronautics Authority.

In spite of the fact that Pan American has been able to eliminate competition with much success it seems likely that following the war it will be keen not only from foreign companies but from domestic companies as well. Many of the

domestic air lines which during the war are operating foreign routes for the Air Transport Command will without doubt be granted permission to operate foreign routes on a commercial basis. It is certain that foreign competition will take the form of powerful state-controlled monopolies. For this reason the management of the System feels that in order for the United States to compete successfully it will have to follow a policy of monopoly in international commercial aviation or one of carefully-controlled competition.

The System's relations with the Government will become more extensive with the Government continuing its policy of constructive regulation. Recent substantial reductions in rates indicate that during the postwar period the Civil Aeronautics Board will continue to follow the policy of allowing the company from 8% to 10% on its investments. However, when the point has been reached where the air lines can carry mail at a rate of cost plus a reasonable fee it is not probable that rates will be decreased any further. The System will then no doubt be allowed to make over 8% to 10% on other traffic without interference from the Government.

Following the war Pan American Airways will continue its services to the world at an accelerated pace. If it develops in the future as it has in the past it will span the globe, having the effect of compressing the world by its speed and versatility. It will open new markets and sources

of materials to all nations and will pave the way for a swift exchange of culture and understanding between widely separated nations. Following the war the System will be in a position to contribute a gift of a fuller and more enjoyable life to the entire world.

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