Journal of Accountancy

Volume 54 | Issue 2 Article 2

8-1932

Air Transportation: Organization and Accounting

Robert F. Riseling

Air Transportation

ORGANIZATION AND ACCOUNTING

By Robert F. Riseling

Introduction

Commercial transportation by air is our newest big industry. It is so new that plans of organization and accounting which are modern and now in use are products of the last two years' development.

The industry is unique among all commercial enterprises as it represents an epochal change in our lives, namely, the conquering of and use of a new agent wherein we are conveyed from point to point. In all man's ten thousand years of recorded history his travels have been confined to earth and water, until so recent a time that the start of commercial air transportation is within the memory of most people alive today. Yet who among us now has vision to foresee the amazing extent of progress that will surely occur within the next forty years? It seems doubtful, at present, that air conveyance will ever displace railroad transportation in the handling of large bulky freight; certain it is that costs must be reduced and airplanes made larger and safer before this can happen. It is probable that for many years to come the carrying of passengers, mail and light, compact and valuable freight will be the extent of the air transportation business.

There have been practically no profits from the conveying of passengers alone. Companies have accumulated profits from contracts for carrying United States government mail, although the attitude of the government indicates that air mail rates are in the nature of a subsidy granted to foster the industry. The chief reason for operating losses in passenger transportation is the tremendously high investment in aircraft and facilities for each passenger carried. This is partly due to the size and costliness of the planes in comparison to the available passenger space and partly to general fear of the public in getting their "feet off the ground." This fear is being overcome rapidly, however, as passenger statistics of the larger companies show. It seems that the future of the industry depends largely upon the working out of plans whereby planes may be safer yet less costly.

Radio broadcasting and lines of night beacons have played important parts in making air transportation safer. All large

lines now have broadcasting service reaching their pilots constantly during flight, enabling them to know of weather and fog conditions miles ahead over their flying courses. Also, large electric beacons have been established, not only at airports, but more particularly along the transcontinental lines of flight. Now one may leave his office in Los Angeles Sunday morning and be on hand for work Monday morning in his New York office.

Classes of Service

To provide a better understanding of the scope of the industry an outline of the various services that are being rendered by aviation companies is given. As the industry is changing and expanding rapidly this list does not pretend to be complete, but there are probably few important activities omitted. Perhaps no one company is now rendering all classes of services which are described here. There are small companies which confine their business to conducting flying schools; some furnish transportation service only; others render miscellaneous services, while some of the larger ones are active in nearly all classes of service.

The various sources of income are:

Revenue from transportation:
- Carrying mail:
  - Through contracts with government post-office department
- Passenger service:
  - Divided between passengers carried on mail and non-mail flights
- Express and freight service:
  - Divided between service on mail and non-mail flights
- Excess baggage charges:
  - Divided between service on mail and non-mail flights
- Special chartered flights

Miscellaneous sources of revenues:
- Hangar space rentals:
  - (a) Lease covering definite space for specified duration
  - (b) Monthly storage charges
  - (c) Transient storage: (a) and (b) are usually billed and collected monthly; (c) should be collected before the plane leaves the hangar.
- Percentages of fees collected from passengers of a lessee who uses the airport landing field
- Fees charged for burning beacons or landing lights for lessee users of landing fields

Rentals of planes to licensed pilots
Sightseeing and taxi flights
Flying schools
Repair work on privately owned planes and engines
Profits from sales of aircraft
Profits from sales of aircraft accessories and supplies
Gasoline and oil sales
Photography service:

Besides regular commercial service, companies may take stock pictures of sections in rapidly growing communities and sell quantities of the pictures after elapsed periods have shown marked changes in development of the same sections. Later pictures of the same sections are taken and sold as comparisons.

Dusting of crop pests
Seeding crops
Exterminating mosquitoes by spraying swamps
Newspaper delivery
Advertising service
Timber cruising
Mapping
Forest patrol
Airport concessions:

Parking spaces for automobiles
Restaurants and lunch stands
Magazine and cigar stands
Amusement features
Hotels
Parcel room storage

From the varied nature of activities, especially at the airport, it is apparent that the organization must be large enough and the accounting system sufficiently flexible to account properly for all direct costs of the activities. An intelligent and adequate system of dividing general overhead costs must also be devised so that the management may be able to discontinue or reorganize those departments which show continued losses.

Organization

On account of the nature of the principal classes of service rendered, the organization structure, to some extent, resembles that of railroad transportation companies. In June, 1929, the United States post-office department issued a classification (revised and re-issued July 1, 1930) of accounts for contracting aviation operators engaged in carrying mail.

The classification manual appears to contain rather comprehensive accounting instructions for aviation operation, with the possible exception of miscellaneous operations and services not concerned with the carrying of mail. On the whole, however, it is an excellent guide of accounting for the operating section of the industry and its study is recommended. A copy of the department's annual report should be procured. This is based on the accounting manual but contains in addition forms for statistical information useful in the industry.

The classification appears to have been adapted from the interstate commerce commission's accounting classifications for railroads. So far as mail service is concerned the air industry will, no doubt, be influenced by governmental supervision, not only in accounting matters, but also in organization and operations. While this governmental assistance benefits air-mail carriers, the companies engaged only in furnishing passenger and miscellaneous services must work out their own salvation.

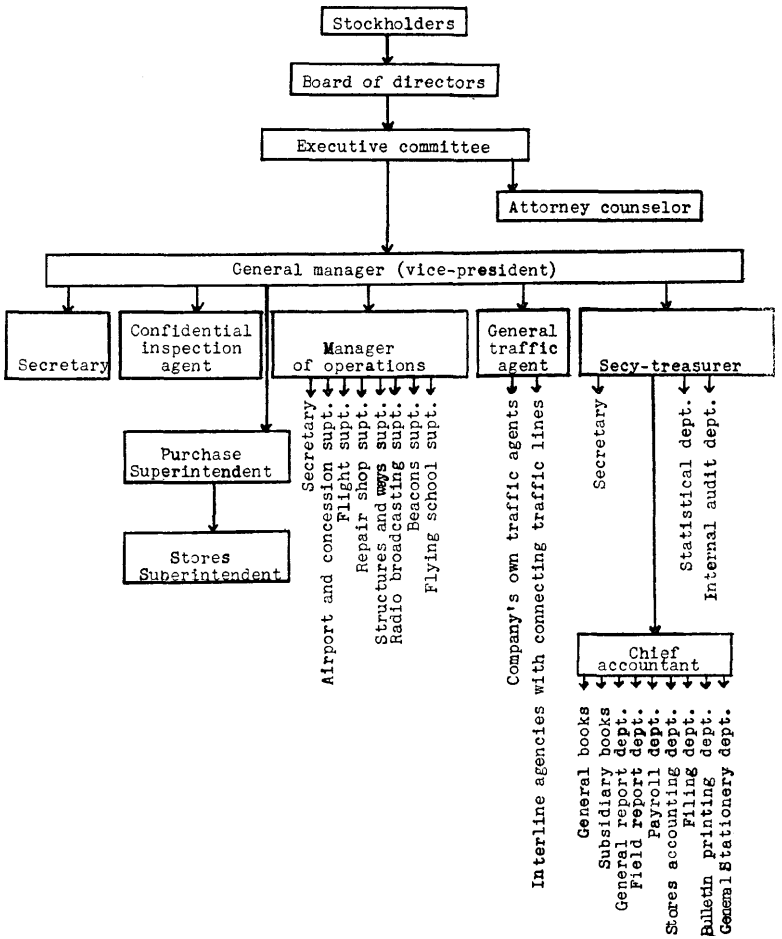
As a preface to discussion of particulars of the plan of organization, a somewhat condensed chart is presented on the following page.

Smaller companies usually have all their offices and activities concentrated at one place, the airport. While the organization of such a company is, of course, much simpler than that of one with transcontinental or international lines, still the general plan must be the same. The principal differences will consist of amplifications of the basic plan and the inclusion of features peculiar to transcontinental flights and the laws and customs of foreign countries. It should be borne in mind that the present survey deals primarily with a large organization, although it must be apparent that smaller companies can use the basic plan.

In the following description of activities of the several departments, no attempt will be made to describe minutely the work of every employee nor will the numerous necessary forms be given. It is the intention merely to outline the principal work of the departments and their coördination with each other. Such details as the reporting of payroll of employees in each department (with certain exceptions) are excluded.

Stockholders, boards of directors and executive committees function as in any commercial business. It will be of distinct advantage if the board of directors is composed of prominent business men who are taking actual part in the conduct of other businesses and participate extensively in civic activities.

CHART OF ORGANIZATION



As aviation is a new industry, advantage must be taken of all means for improving service and of generally promoting the future of the individual company and all air service in general. Consequently, provision should be made to have superintendents and department heads attend certain designated meetings of the board of directors, at which prepared papers may be presented or discussions take place. New suggestions or plans which are the direct means of creating improvements should be rewarded by some appropriate recognition.

The attorney counselor naturally deals most directly with the board of directors or executive committee, but he should also be available to officers and managers for consultation and advice.

The general manager of the company preferably should be president or vice-president. Because of the peculiar nature of the business, he will undoubtedly occupy a position of prominence in the community and, if the company is a transcontinental one, will be known nationally. Naturally he should be a big man in every way, fully equipped mentally and physically to carry on a complicated and rapidly expanding endeavor. He must also be a man who has the rather rare ability of building up under him an efficient organization to which he can delegate all details and actual operations, thus leaving his mind free to observe the articulation of the whole organization. The financing of large loans and contact with bankers may best be part of the general manager's work, thus leaving the manager of operations free to devote all his energy and attention to operations.

The entire operation of the company may be delegated to four men who, as designated on the chart, are the manager of operations, the general traffic agent, purchase superintendent and secretary-treasurer. In addition, the general manager should have available, and entirely under his control, a confidential inspection agent, whose time and activities should be devoted to following up such irregularities or to such research as the general manager may think necessary.

The confidential inspection agent (he may bear any title considered more appropriate) has manifold duties. He should be a man of native shrewdness, capable of prying quietly and unobtrusively into baffling situations and ferreting out the causes for irregularities. At times he may need to augment his activities by employing assistants. Losses in supply inventories, irregularities in reporting ticket sales, irregularities in the accounts and reports of airport superintendents, agents, etc., are suggested as part of the work of this officer. The principal condition imposed upon this officer is that he must at all times be under the control of the general manager and entirely uninfluenced by any other officer or by any department.

The secretary is, of course, a confidential agent of the vice-president and general manager.

Next in importance is the manager of operations, hereafter referred to simply as the "manager." While not imperative, it

would be of distinct advantage if the manager were an ex-pilot. An ex-flyer knows instinctively the nature of most of the daily problems that arise. He must be a man having knowledge not only in flying but also of repairs to aircraft, construction of hangars, preparation of landing fields, location of and operation of airports, routes of airways, and the purchasing (and requisitioning) of stores supplies. He should also have some knowledge of accounting, so that he can understand the significance of reports presented to him. This is a rather large order but, as the manager of operations occupies probably the most important position with regard to the success of the company, it is imperative that he possess the qualifications enumerated.

The airport and concession superintendent has direct charge of such activities as:

The arrival and departure of aircraft. In this he will naturally coöperate with the flight superintendent.
The leasing and operation of hangars and collection of rentals therefrom.
The rental of the landing field to lessees.
Maintenance and repair of airport buildings, equipment and fields, beacons, etc.
Miscellaneous airport concessions such as parking spaces, restaurants, amusement features, hotels, magazine and cigar stands, etc.

The flight superintendent has charge of all airplane flights of every description, with the possible exception of flying-school aircraft. The flight superintendent's duties consist principally of the maintenance of logs showing the arrival and take-off of aircraft for all purposes. Not only is he concerned in the arrival and departure of passenger and air-mail planes but he observes and reports on flights of all other kinds, such as photography service, dusting, seeding, pest spraying, advertising, timber cruising and mapping, forest patrol, sightseeing, etc.

His reports form the basis for ascertaining the flying hours of planes to determine overhaul and repairs, to determine the pay of pilots and co-pilots (emergency pilots), and to provide rather voluminous statistical information required in governmental regulation and for general improvement of the industry. Naturally another phase of his duties is a knowledge of the location of the planes at all times, an activity similar to that of the train despatcher in railroad transportation. He must also have in-

formation, revised daily, showing the hours flown by all planes so that the exact moment of overhaul may not be overlooked. This period of hours flown between general overhaul dates will of course be determined by the company's experience and policy as to safety. It will probably be regulated by governmental supervision following the development of the industry. At present, from two hundred and fifty to six hundred flying hours sometimes elapse between overhauls, depending upon conditions, type of aircraft, kind of service, etc., so it can readily be seen that no exact standards have been definitely established.

The repair-shop superintendent is concerned primarily with the repair and overhaul of planes and motors in service. His other activities include the repair and overhaul of planes in private service. Complete reports of material and labor used daily must be recorded on appropriate work or job orders, the labor must be "tied in" with the payrolls and the materials with requisitions on stores. Orders on repair work for which charges are to be made to outsiders must contain complete data for billing. Shop machines and equipment must also be kept in repair.

A general supervision must be maintained of the expectancy of arrival of planes for overhaul and the date of completion of those being overhauled. The superintendent of this department must be vitally interested in the accuracy and thoroughness of the tests and observations made on planes and motors. The work done in the testing block and assembly rooms, in the opinion of experts, is the most vital in assuring safety in air transportation. Unfailing vigilance in this department provides the pilot with craft which he can rely upon in all emergencies.

In the case of transcontinental air companies, there may be repair shops at intermediate points as well as at the principal airports. Where this condition prevails it is probably best to have all repair shops in charge of one head, so as to maintain uniformity of service and efficiency throughout the system.

The structures and ways superintendent's duties for the most part are the purchase and leasing of landing fields and airports and the construction and purchase of hangars, shops, office and other buildings, as well as the maintenance of all these buildings. The nature of his work will probably require him to be moving from point to point. He must be familiar with the drawing of leases (through the help of the company's attorney). He must know about the proper leveling off and oiling or concreting and laying

out of landing fields and must also work in coöperation with the superintendent of beacons.

The purchase superintendent should work directly under the general manager as a separate department and not directly under the manager of operations. His department is an important one and involves not only the budgeting ahead of requirements by the manager of operations, but also the budgeting of money requirements by the secretary-treasurer's department and, in addition, the general manager's supervision of the financing and requirement provisions. Great care must be exercised to avoid overstocking, while at the same time the stock of needed supplies must not be allowed to fall short of operating requirements.

The purchase superintendent should be in charge of all purchases of every description. Naturally, there should be a perfectly working requisition system.

The radio broadcasting superintendent should be in charge of all information given to pilots and others over the air. In transcontinental systems there are several stations with assistants in charge but these must all work under the head superintendent.

This department is responsible primarily for the transmittal of air messages, almost constantly, to the pilots of mail and passenger aircraft while in flight, or while resting ("sitting down") during flight. These messages tell of fog, wind, temperature, rain and other weather conditions ahead and enable the pilot, by computing his flying time, to know almost the exact time when he would pass through unfavorable air or storm. Upon receipt of adverse storm reports ahead, the responsibility of resuming the flight usually rests with the pilot, as he must know whether he can make certain points in his journey before encountering dangerous areas.

Commercial messages also may be transmitted to passengers during flight, although this has not yet progressed very far.

Maintenance of the radio broadcasting equipment must be thoroughly understood by the superintendent of this department.

The radio broadcasting department also transmits intercompany messages between departments and offices and thus greatly facilitates management, traffic and accounting.

The beacons superintendent is hardly necessary as a separate officer in other than large transcontinental companies. However, in those companies the importance of his department is apparent when it is remembered that there is constant night flying on the

through air lines. This means that a line of powerful, flashing electric searchlights stretches from the Atlantic to the Pacific, along the selected airways, located so that the beams of one are barely lost when those of the next are discerned.

The beacons superintendent must see that his equipment is modern, is maintained in the best of order at all times, and that there are no failures of operation. This involves constant vigilance in maintaining the lights and emergency supplies of parts at various places along the beacon line to insure reaching them without delay in case of breakdowns.

The flying-school superintendent is in charge of all flying-school work. Such schools are usually run by companies organized for that purpose alone. Students are given different classes of instruction, intended to fit them either for private service or commercial passenger service. In the latter case they are licensed by the government. Where it is possible, the courses are paid for in advance. The receipts are carried in a deferred income account and credits are transferred to income as earned through actual flying time of the student.

The flying-school superintendent is responsible for the approval of students' contracts, the reporting of hours of instruction, both ground and flight (which is the basis for determining the amount earned), maintenance of the planes in proper condition and the collection of instruction fees, especially where fees are paid during the course. The latter plan is not nearly so satisfactory as payment in advance, and it is being discontinued rapidly.

The general traffic agent should be in complete control of all general traffic, i. e., the booking and routing of passengers, mail and freight, and special chartered flights. He is concerned with the arrival and departure of aircraft and is constantly looking ahead to the securing of passenger and freight traffic so that the planes may be filled to capacity. Naturally, the comfort and security of passengers require constant attention.

His further duties consist of control over the sale of passenger tickets and freight service and the reporting on quantity of mail carried. In general the work of which he has charge falls into two divisions, namely, (1) the company's own ticket or traffic agencies, and (2) traffic originating in other air-line companies, usually designated as "Interline."

As passenger tickets are sold for cash, it is obvious that the company selling the through ticket over connecting lines receives

all the money and owes the connecting or "interline" company a portion of it. The company will probably have amounts due it from other originating lines and at the same time may owe other lines for portions of its ticket sales.

As there are numerous ticket offices, over a transcontinental line, the general traffic agent must be prepared to exercise constant supervision over ticket sales and should approve all ticket sales and freight service reports transmitted to the general manager. This, of course, includes reports of interline ticket sales.

Reports also must be submitted covering the expenses of ticket offices and waiting rooms maintained by the company. Some agents furnish quarters and expenses and retain a commission for their services.

The secretary-treasurer, in his position as the head of accounting activities occupies a position of importance. Reports of all productive operations must pass through his department and be properly recorded. The financial statements showing the company's net worth and results of operations are the most important, but there are many statistical reports, as well as departmental costs, to be compiled and presented, especially under governmental supervision.

The secretary-treasurer must necessarily be a thoroughly well-trained accountant, preferably a public accountant of experience.

The secretary-treasurer assists in the financing of loans and has charge of the minute books capital stock records and other corporate records. He must also possess executive ability as his department will have many subdivisions and require a considerable force of accountants and clerks.

A secretary must be assigned to assist the secretary-treasurer. All incoming mail and reports must be distributed to the proper sub-divisions. The secretary must have in mind a perfect picture of the activities of the various sub-divisions under the secretary-treasurer and be able instantly to furnish data and reports of each section.

The chief accountant is the right hand man of the secretary-treasurer and is responsible for the several further sub-divisions of accounting activities outlined in chart 1.

The general books may be maintained by the chief accountant, or by his assistant, depending greatly on the size of the organization. The work of this department is similar to that of the

ordinary trading or manufacturing company, with the exception that departmental operation costs are carried further. The subsidiary books are in general any ledgers maintained to record detailed accounts with debtors and creditors and sub-departments which are each controlled by accounts in the general ledger.

The general report department attends to the compilation, distribution and filing of the complete financial and statistical reports that are to be issued periodically. This entails coöperation with the field report and statistical departments.

The field report department is the receiving or assembly place for all reports from operating departments of the entire organization. Naturally, in smaller companies this department may be omitted as the field reports will go direct to the several departments.

The stores accounting department is the department which receives reports of materials and supplies taken from the company's various stores over the transcontinental route.

The filing department should be under the control of one person. Careful study must be given to simplicity of the filing system, as well as adequacy for expansion as years go by and the records accumulate.

The bulletin printing department has charge of the maintenance and operation of the mechanical apparatus such as multigraphs, mimeographs, and other printing machines used for printing the various communications to employees and to the public. These bulletins are of many kinds such as, notices of changes in arrival and departure of aircraft, changes of policy and procedure in departments, price tariffs and changes, bulletins to the public for distribution at airports and on aircraft, forms for company use, copies of reports, sundry instructions, etc.

The statistical department is kept busy gathering and compiling data in addition to the general financial and accounting reports. Such information as hours flown, passengers carried, passenger miles, pounds carried (mail and freight), fuel used, special flights, forced landings, employees' service and compensation, casualties and damages, etc., engage the attention of this department. The information used is incorporated in monthly and yearly reports to the United States post-office department for mail contract service and in sundry statistical reports compiled for the company's use. Incidentally, the reports to the United States post-office department now require that much of this information

be divided as between single-motor, twin-motor, tri-motor and four-motor planes.

The internal audit department is intended principally for accounting supervision of departments outside the general office. It requires the services of one or more traveling auditors. A more or less constant check should be maintained of stores, depots, ticket offices, repair shops, airport offices, etc., and as these are, in the case of transcontinental lines, scattered over the land, an itinerary should be arranged that will cover the several points throughout the year.

This department should be directly under the control of the secretary-treasurer, and the information compiled should be regarded as of a confidential nature intended only for the secretary-treasurer and such departments as he may designate.

Special Accounting Features Peculiar to the Industry

Depreciation, obsolescence and amortization. Depreciation and obsolescence are closely allied in considering the life of aircraft. There are rapid improvements in types of planes and engines, all tending to improve service and particularly to insure safety. For this reason provision for depreciation and obsolescence on aircraft must be considered concurrently and reflected in the rates applied against the assets.

A few years ago when the present air-mindedness was getting under way the ordinary method of yearly rates was used to provide for depreciation on planes and engines. It soon became apparent, however, that this method had little relation to the useful life of planes and engines, so some other method was sought which would reflect, more nearly, the wear and tear according to the actual use of the equipment. It was believed that the hours flown by the plane or engine would be the closest measurement of its span of useful life so, for the last three years, depreciation and obsolescence have been charged off on the basis of flying hours.

There is great variation in the flying-hour lives of the different makes and types. The general range is from 1,500 to 3,000 flying hours, although in many individual instances engines and planes may last longer. (Of course, obsolescence has been considered in these flying-hour life ranges.)

Individual equipment and depreciation records are maintained for each engine and each airplane, and a flying-hour life is ap-

portioned to each unit when it is placed in flying commission. Accurate flying records are kept in the flying log-books that accompany each airplane in flight, copies of which, through the flight superintendent, find their way to the depreciation records.

Thus the equipment record shows at any time the cost, estimated flying-hour life, number of hours flown monthly, the depreciation rate per flying hour (determined by dividing cost by total flying-hour life) and the accrued depreciation. In addition, the equipment record should contain information about general overhaul and repairs. This is more particularly described in a later section under "general overhaul of aircraft."

Owing to the few years of accumulated experience available, the lives of planes and engines are not yet well known, but the further experience of the industry will no doubt produce information whereby these data will be definitely fixed.

Amortization in the aviation industry applies particularly to the writing off of buildings erected upon and improvements made on land not owned. Such improvements, besides buildings, may include leveling of landing fields and oiling or paving them, walks, driveways, fences, architects' fees, sewage systems, commissions to real estate brokers, etc. Naturally, the improvements should be written off to operating expenses over the life of the lease, less any salvage or compensation which the terms of the lease may allow.

General overhaul of aircraft. Minor repairs are constantly being made to airplanes and engines and, naturally, supervision is exercised during flight and at each landing. It is obvious, however, that such repairs cover only defects which are apparent to the eye or ear of the inspector. For safety's sake the aircraft must be given a more thorough inspection from time to time. To provide for this feature, the engines of an airplane are usually overhauled oftener than the plane, but the plane is finally brought in and overhauled. The general overhaul is very thorough. As an example, I observed recently the overhauling of three motors taken from one of the tri-motored airplanes of a large western air passenger company. Each motor was taken to the assembly shop and torn apart, even to the smallest nut and washer, the various assemblies being placed in metal compartments to insure against loss or mixing of small parts. The greasy mess was given a gasoline bath, the metal emerging shining clean. Each part was then given caliper, microscopic, tensile and other tests and the defective parts were junked and replaced by new ones. After care-

ful inspection and reassembly, each engine was placed on a block in the testing room and roared away at full flying revolutions for fifteen hours without a stop. After this the engine was torn down and each part cleaned and tested as before. It was then reassembled and placed on the testing block for another five-hour run and given careful observation as to its performance. If it emerged satisfactorily it was then ready to be placed in the airplane for flying. Incidentally, passenger planes are set out and the engines "idled" for a quarter or half hour before actual takeoff. This is partly to warm up the motors, but also to observe before flight any defect which might exist.

Minor repairs are usually charged direct to operating expenses. The cost of general overhaul is so charged in the United States post-office department manual of accounts for carriers by air. It is customary, however, among aviation operators to spread the cost of general overhaul of planes and engines more evenly over the year's operations by charging operating costs to "general overhaul of airplanes and engines" and by crediting an appropriate reserve account. The basis of this monthly charge is a rate applied against the flying hours of plane and engine and is in addition to and distinct from the depreciation provision. There are no well-established rates for this charge. Rates of $1.50 to $4.50 an hour have been employed but the operating company's experience in each instance must determine the rates to apply.

Actual overhaul costs are charged against reserve account, but it is advisable that reserve accounts be adjusted at the close of the fiscal year, so that the credit balances will be equal to an amount obtained by multiplying the total flying hours of each plane and engine since last general overhaul by the hourly overhaul rate of each unit. This adjustment tends to throw the major overhaul costs against the proper year's operations.

Insurance. Perhaps no one thing (mail rates are a possible exception) gives commercial aviation companies more concern than the many forms of insurance that must be carried, especially that covering liability for passengers and planes in forced disastrous landings commonly known as "crashes."

Owing to the large number of accidents in earlier years and also because there was a lack of experience from which to obtain data for rates, the insurance companies either refused to write the risks or made rates that were prohibitive. For these reasons it was quite common for aviation companies to "carry their own

insurance"; in other words, a chance was taken on being able to pay the losses as they arose. During the last two years, however, insurance companies have issued policies covering crash and liability insurance, but the rates are still very high compared with those in less hazardous enterprises.

Forms of insurance covering airplanes assumed by fire insurance companies are:

1. Fire insurance:
   (a) Fire while plane is in flight or during take-off or while landing. The amount of damage from fire must be ascertained before the crashed plane burns after it strikes the earth.
   (b) Fire at all times, except while in flight or during take-off or while landing or while aircraft is being transported. As indicated by the title, this is full coverage fire insurance while planes are on the ground or in buildings.
   (c) Fire at all times. This coverage of course includes everything that is excluded in the two preceding forms and could be written by fire insurance companies not specializing in aviation insurance. Crash damage is not included in any of the three forms above. Such losses are covered by accidental damage insurance.

2. Theft, robbery and pilferage:
   This covers theft of tools, accessories, etc., from aircraft (except by company's employees) and damages done to planes by thieves.

3. Hurricanes and tornadoes:
   This insurance covers damages or loss to aircraft while on the ground, whether in hangars or in the open. Damages to aircraft by hangars falling down during a storm are included. However, damages to unprotected planes in the open during cyclones are not recoverable. Even damages from fire, provided the fire is a direct result of collapse of the hangar, are recoverable under this form of policy. Tornado damages to aircraft while in flight are not covered under this section but are usually included under accidental damage insurance.

4. Accidental damage:
   This is what is usually known as "crash insurance" and covers damages to and losses of aircraft by their coming into contact with the earth or any other object in a way

which causes damage. This also includes collision damage while taxiing, taking off or landing.

5. Fire to building and property in buildings:

   This does not differ from that covering like insurance in commercial companies.

Forms of insurance assumed by casualty companies:

1. Property damage:

   This covers damages by the insured to property of others which may be injured by aircraft falling or otherwise colliding with properties of others. Special forms are written which insure against damage caused by articles or parts dropped from airplanes.

2. Workmen's compensation:

   This is insurance against damages arising from injuries to employees and is regulated by the requirements of state laws governing compensation insurance.

3. Personal accident:

   This is similar to the general forms of accident insurance policies obtainable for years. It is used by aviation companies principally for pilots, co-pilots, stewards and any other employees whose duties require traveling in aircraft. Passengers, of course, may avail themselves of this form of insurance.

4. Public liability:

   Under this form the aviation company is insured against losses arising out of injuries to the general public. This form does not include coverage for damages paid to passengers.

5. Passenger liability:

   The aviation company is insured under this form against damages to or loss of life of passengers while they are riding in the plane. However, after passengers have alighted from the plane, even while planes are "sitting down" en route, any damages or injuries sustained are not covered by this form of insurance.

6. Airport liability:

   Under this form the aviation company is insured against losses arising from injuries sustained by the general public and prospective passengers, or passengers en route, while they are in airport fields, landing fields,

on tours through repair shops, and in general while on or near the company's property.

Operators that "carry their own insurance" (usually confined to accidental damage or "crash" insurance) generally charge an operating expense account monthly, on an estimated loss basis, and make a contra credit to a "reserve for crash insurance" account. Losses are charged against the reserve account. This plan has the advantage of spreading losses more evenly over the year and of providing a reserve which would not be dissipated through dividend payments, but it does not allow all the losses of a certain year to be charged against the income of that year. The United States post-office department in its manual of accounts for air carriers allows this practice.

Where the operators carry "crash" insurance with insurance companies, the insurance recovery should be credited to the maintenance or repair account which bears the cost of rehabilitating the plane or, in case of destruction, to the net book value (asset book value less depreciation reserve) of the unit destroyed. The resulting net loss or gain should not be regarded as an operating loss or gain but should be included under miscellaneous charges or income.

Some companies carry crash insurance under the co-insurance plan, which involves a composite form of accounting, including miscellaneous losses or gains as well as part charges against the co-insurance reserve account.

As long as earned surplus is left with substantial balances, there seems to be no particular advantage in setting aside reserves for crash insurance by charges against earnings. The charging of all crash losses to operations as they arise would be the more conservative way and would make each year's operations stand on their own feet. However, opinions of operators are certainly not yet unanimous about the handling of crash losses, and the United States government does not order the use of one specific method. Undoubtedly, further experience is required to solve this as well as other problems in aviation accounting.

Compensation of pilots. While the salaries of practically all employees of an aviation company are paid on the same weekly, monthly or daily bases as in a manufacturing or trading business, the compensation paid to pilots is unique. In most companies pilots receive a nominal monthly or yearly salary, termed the "base pay," and in addition they receive compensation covering

either the mileage or hours flown in a period at certain agreed rates.

Accurate records of flying time must be kept. It is customary to have a pilot's salary voucher form, which consists of excerpts from the aircraft log showing date, starting point, destination, hours flown or mileage, rate and total extra pay due the pilot. Expenses also may be included on this form. Naturally, the salary voucher is signed by the pilot and contains also the approval signature of the flight superintendent. It should be dispatched to the field report department by the flight superintendent.

The mileage or hours-flown compensation is usually considerably more than the base pay, sometimes two or three times as much. Obviously, it is quite important that there should be a thorough supervision of the reporting of pilots' pay to avoid padding or other false reports. The services of the internal traveling auditor are helpful here.

Traffic department—revenue and interline traffic participation. All air passenger traffic is reported and accounted for in general through the following forms and procedure:

1. Booking sheet
2. Passenger ticket
3. Daily dispatch report
4. Daily traffic receipt report
5. Pilots' flight report

1. Booking sheet. This originates in the traffic department in advance of the contemplated flight and is comparable with the booking ahead of boat and Pullman passengers. The booking sheet shows the date of flight, route, destination, name of passenger, place where reservation was made, book number, ticket number, airport or landing where passenger is to be picked up and date of departure. The booking sheets provide the means of checking ticket sales and other related reports and also apprise the flight superintendent in advance regarding passenger capacity requirements.

2. Passenger ticket. The larger transport companies use a ticket form which is becoming more or less standard. The ticket shows the point of departure, destination, name and address of passenger, also telephone number, date of making reservation, date of flight, office of issue, ship and price paid for fare. It is

also signed by the passenger. The tickets are usually surrendered upon entering the airplane. Stubs or copies are provided, so that the passenger retains an identification form in addition to his regular ticket, the selling agent retains a stub and one is sent immediately to the secretary-treasurer or chief accountant. The passengers' tickets, when taken up, are also sent in and checked with the stubs.

Where the ticket sold covers flight over air lines of other companies, a special ticket form is provided which shows different lines traversed. A number of transportation companies, pooling their interests to simplify the traffic problem, formed the American Air Transport Association. One of its first meritorious tasks has been the preparation of a uniform ticket embodying a standard contract. It is especially designed to meet the interline or participating conditions.

3. Daily dispatch report. This is merely a daily report showing in summary form the airships arriving at the airport, or departing therefrom, with information regarding the schedule on which the flight is made, the ship number, capacity, total miles flown, actual flying time, route and date.

4. Daily traffic receipt report. This report records the actual sale of tickets and the cash received. In addition to the date and location of reporting office, the report contains such information as ticket form and number, name of purchaser, destination and stopover, total cash received, commission withheld, miscellaneous receipts, excess baggage receipts, etc. In addition, where interline tickets are sold the amounts to be paid other air carriers are shown.

All ticket sales covering flights over the originating company's own air lines should be credited to a deferred-income account. At the same time, all used tickets taken up should be charged to this deferred-income account and the corresponding credit made to passenger-revenue account. The unused balance in the deferred-income account should equal the unused portion of tickets sold and outstanding.

That portion of ticket sales covering flights over coöperating lines should be credited to traffic balances payable and a daily report should be sent to the other lines, notifying them of their portion of the ticket sales. From this information the participating line will charge traffic balances receivable and credit its passenger-revenue account.

5. Pilots' flight report. This is a rather important report and is a daily log of airship and its engines. This report contains information approximately as follows:

Date
Route or division number
Airplane make
Airplane number
Engine numbers (for each motor)

Columns are provided for the following information:

Type of work (space for symbol indicating whether "M"–mail, "P"–passenger, etc.)
Time of departure
Stations
Time of arrival
Ground time
Air time
Miles
Remarks (description of delays, etc.)

Spaces at the bottom of the reports provide for the signatures of the pilot and co-pilot, as well as approval signatures of the flight superintendent, airport superintendents, landing field agents, etc.

Overhead and its distribution. Referring again to the United States post-office department's manual of accounts for carriers by air, it is quite apparent that no apportionment of any overhead is contemplated, in fact, the only "clearing" accounts mentioned are those covering "stores department" and "shop department" expenses.

Instead of this clear and simple system of presentation, some companies apportion the general and administrative division of expenses over the other four groups of expense accounts, apparently in the belief that some advantage is gained by having each operating group of accounts bear part of the general expenses. If this is done, the distribution should be effected by having one credit account in the general and administrative section bear all amounts so transferred to other groups. In other words, the balances in the general and administrative section of accounts should not be disturbed by any credit apportionment entries. If it is desired to transfer the entire general expense each month, then the credit balance in the apportionment account will, at all times, equal the total debit balances in the general and administrative group of accounts.

The stores and shop department clearing accounts are dealt with clearly in the post-office manual and, as their names indicate, are used monthly to record and distribute the expenses of operating these two departments. Naturally, the larger part of these expenses will concern maintenance and transportation costs, though some will be charged to customers, when repairs are made to equipment of outsiders.

Joint participation in terminal rents and expenses. One of the hardest problems now confronting air carriers is apportionment of airport terminal operating expenses and overhead where several companies use the terminal facilities. In general, these facilities are owned as follows:

By one large commercial air carrier company
By two or more air carrier companies
By municipalities
By terminal companies

Where the terminal airport facilities are owned by municipalities and separate terminal companies, the problem is simplified by the charge of rentals or fees for the several classes of services rendered. The problem should be comparatively simple, as a tariff of rental charges must be evolved that will cover operating expenses, overhead, depreciation and a fair return on the investment. With these expenses known, the next step is to ascertain the volume of business entering and leaving the airport and then to establish bases of charges.

Where the operating company owns the terminal outright, it is in the same position as the municipality or terminal company, in that it must make charges to outsiders for use of facilities, but it differs in this respect: it need only recover part of the cost of operation as it uses the other part.

In those instances (which should be very rare) where two companies jointly own the terminal facilities and exchange the use of these facilities between them, the problem of equable apportionment is certainly complicated. The plan of joint ownership should be discontinued.

The general trend undoubtedly will be toward transferring the airport terminal assets to a separate corporation.

System of Accounts and Comments

The system of accounts for carriers by air, prescribed by the United States post-office department in its order approved July 1,

1930, appears to be the most complete and intelligent exposition of accounts suitable for the commercial aviation industry that has been evolved thus far.

As the manual is lengthy, it is not reproduced here, although the condensed balance-sheet and profit-and-loss forms are given below with some modifications designed to present the balance-sheet as a commercial statement rather than in a utility form. It must be borne in mind that the government's chart of accounts is obviously adopted from the interstate commerce commission's system of accounts for railroad transportation companies. While liberties have been taken in rearrangement and in description, the titles and the numbers of the accounts have not been changed. The Roman numerals refer to the government's group numbers:

BALANCE-SHEET ACCOUNTS

Assets	*Liabilities*
II. Current assets	VIII. Current liabilities
Less reserve for bad debts	
IV. Prepaid expenses	VII. Long-term debt
III. Special funds	VII. Accounts with affiliated companies
I. Accounts with affiliated companies	IX. Deferred income
I. Investments in affiliated companies	X. Reserves
I. Other investments	VI. Capital stock
I. Real property and equipment account:	Less:
I. Land	V. Reacquired and treasury securities
II. Buildings and improvements	XII. Surplus
III. Equipment	
I. Miscellaneous physical property	
Less depreciation reserves	
IV. Deferred charges	

PROFIT-AND-LOSS ACCOUNTS

Operating revenues:
- I. Transportation
- II. Air service
- III. Incidental

Total operating revenues

Operating expenses:
- I. Maintenance of fields, structures and equipment
- II. Conducting transportation

III. Traffic and advertising
IV. Miscellaneous operations
V. General and administrative
VI. Undistributed expenses
Total operating expenses
Net operating profit

Non-operating income
Gross income

Deductions from gross income
Net income, before federal income taxes

Provision for federal income taxes
Net income

SURPLUS ACCOUNT

Surplus at beginning of fiscal period
Additions to surplus account
Less deductions from surplus account
Surplus at end of fiscal period

It must be remembered that the classification of accounts given here is, with the exception of a few modifications, that of the United States post-office department and therefore varies to some extent from a classification that might have been prepared by a strictly commercial business. Considering, however, that at least the mail and passenger carrying sections will undoubtedly be under some kind of governmental supervision, it is best to adhere to the government's classification as a basis. There will surely be alterations and improvements in the classification.

FUTURE OF THE INDUSTRY

Probably no one can write intelligently enough of the future of this industry to make interesting reading. The experience is new and limited. It is true that much progress has been made in new designs; planes have been made safer and more commodious; but in point of profit the result is almost disheartening—but not quite. There is a wonderful vista ahead; no matter how hard and costly the effort to overcome present difficulties, the industry is one of the outstanding attainments of our time and its progress to early and greater development is as sure as the course of the stars.

The costs of planes and facilities per person carried are so excessive that no profits are possible until conditions are changed. How will this be done? No one knows at present but this, like other great problems, will be overcome. After more people get

over their fear of the air, there will be many times more planes used and they will be run to capacity. It is quite certain that many more planes can be flown over the larger lines with little increase in terminal cost, radio broadcasting, overland beacon cost, and general office overhead cost.

Will the planes be greatly increased in size? Probably not, as the more adaptable plane for pay loads will remain somewhere about a sixteen or twenty passenger capacity. Will it be possible to produce cheaper planes without endangering safety features? Undoubtedly some reduction in cost can be expected, but even the latest research does not indicate that any material reduction is possible. Storms and adverse winds must be met and there is no indication that these will abate as time passes.

What about freight? Will freight planes be built large enough to compete for the immense tonnage carried by railroads and especially the large assembled objects that are carried on freight trains? Probably not for some time to come, but here is where a revolutionary change may take place soon in American aviation. Slower, heavy-freight planes could be used to transport more valuable compact merchandise now than is being carried, especially if passenger carrying increases and the terminal facilities are used more. Another phase of the business which is expected to have a great increase in the near future is the carrying of freight to parts of the globe now inaccessible by boat or train, e. g., the wildernesses of Brazil, Africa, Australia, and the northern part of Canada. It is well known that these places are thinly populated by civilized man and that they can support a great population. It is reasonable to expect that some of our future great colonizations will be supported by airplane communication.

We Americans are prone to think of ourselves as isolated and self-sufficient; we forget that successful commercial aviation on the continent of Europe has been an accepted thing for years in advance of our air development here. Over there the distances traversed are shorter, hence speed is not so important as with us who have a continent of greater distances. With shorter routes, the European countries have given thought to the operation of heavier, slower planes for carrying freight and have advanced beyond us, especially Germany, where great loads are carried.

In conclusion, future development will probably come through lower costs of planes, increase of safety devices and plans of operations, increase of passenger traffic through further

education of the people to travel by air, establishment of light beacons to permit uninterrupted night flying, increase of freight service, and establishment of cheaper air transportation routes to inaccessible places where man can set up colonies. Thus far we see at present; but the progress of the next ten years will probably cause this attempt at prophecy to appear very feeble.