

From L. P. Cohen

AMERICAN AIRWAYS
Southern Division

Operations headquarters of the Southern Division of American Airways is located at Dallas, Texas. Executive Offices are at the Municipal Airport. The division is under the management of C. R. Smith, General Manager and Vice-President of American Airways who receives a salary of approximately \$15,000 annually. All department heads on the division are responsible to him. This includes operations, treasury, traffic, maintenance, public relations, purchasing, airports and buildings departments. Communications reports direct to the Operations Department and Auditing and Insurance Departments report to the Treasury Department head.

Before going into operations and maintenance it might be interesting to discuss briefly a few of the other departments mentioned above. The Purchasing Department is under the direction of two men, one of whom is the Purchasing Agent. This department handles all of the purchases for the line with the exception of the national contracts, which are arranged by the central purchasing office at New York. With the New York office providing the central purchasing it is hard to understand why most of this work is not handled there, thus eliminating the necessity of carrying this department at Dallas. I should imagine that better purchase prices could be obtained by grouping these purchases in central orders. The payroll of this department is now \$410 per month.

The Treasury Department is under the direction of V. C. Schorlemmer. There are 22 employees in this department with a monthly payroll of \$3,450. This department keeps practically all of Southern Division's accounts, gets up all earnings statements and furnishes required information to the Post Office Department. When it is realized, however, that there are only 27 men in the United Air Lines' main accounting office and a total of only 24 on the lines, making 51 in all including all clerical help, there arises a question as to whether this department is not too large. The trouble is either at Dallas or at the New York office.

Public Relations on the southern transcontinental division is handled by three men, who report to Silliman Evans, Director of Publicity of American Airways in New York. One of these publicity men is located at Dallas and has one stenographer. Their combined salaries amount to \$390 per month. There is one publicity man in Atlanta and one in Los Angeles. There is much doubt in my mind as to whether it is necessary to keep this department in operation. The most that the line should have is one man who should do a great deal of political work in addition to his publicity activities.

The Traffic Department reports directly to the General Manager, Mr. C.R. Smith. He has two assistants; one covers the eastern part of the division and the other the western part. Since most of this work is supervised by the General Traffic Manager of American Airways in New York, however, I should hardly think that the two assistants are at all necessary. The three Division Traffic Managers on United Air Lines have no assistants and they each cover nearly as much territory as the Southern Division. Furthermore, I should think that the Traffic Department would work much closer with operations. Pilot and co-pilot discipline in handling passengers, of which more will be written later, was very poor and I am certain that the Traffic Department is not familiar with this fact.

There is also a department known as Airports and Buildings which has charge of new construction work on the airway. While the company was engaged in lighting and providing emergency fields for the southern transcontinental there was probably

work for such a department, although the company could probably have saved money by letting out such contracts. There are also several draftsmen in the department. I believe that this entire department could be done away with, without the loss of any efficiency.

Reporting to the Treasury Department is a Superintendent of Insurance. He handles a certain amount of the insurance for the line but most of this work is done in New York. This position seems unnecessary.

Operations of the Southern Division is supervised by Hugh Smith, Operations Manager. There is one Assistant Operations Manager, in addition to one Assistant to the Operations Manager. Mr. Smith has supervision over all communications and for immediate direction of this work he has a Supervisor of Radio. In addition, Operations is responsible for all field mechanics, field clerks and ticket agents, pilots, radio operators, terminal managers, etc. He has no supervision over maintenance, as this department reports directly to C. R. Smith, the General Manager of the Division. There are four Division Superintendents, one each at Atlanta, New Orleans, Los Angeles and Dallas, where the Assistant Operations Manager also acts as the Division Superintendent. The duties of the Division Superintendents consist of all dispatching authority in their territories, supervision over pilots, flight control, inspection of emergency landing fields, routine maintenance and servicing in their districts, and occasional relief of pilots during vacation periods. The territory under the Los Angeles Superintendent includes that part of the transcontinental line between Los Angeles and El Paso. The Dallas Superintendent is responsible for the line between El Paso and Dallas and for the local runs north and south. The Atlanta Superintendent's district runs from Dallas to Atlanta and the New Orleans Superintendent supervises the operations between Atlanta and Houston. Whenever the ceiling is less than 500 feet and the visibility less than two miles at any intermediate stop, the Terminal Manager at this field must radio or telephone to the Division Superintendent of his district for permission to clear the plane. This present set-up of division superintendents is quite satisfactory and there seems to be a real need for this organization, although it might prove a saving and be fully as efficient to have the Division Superintendent act as terminal manager at his base.

The Dallas terminal passenger station has twelve employees. These include a terminal manager, an assistant terminal manager, 2 dispatchers, 1 ticket agent, 3 radio operators and 1 night watchman. It certainly looks as though this number could be reduced.

The flight movements and the routing of ships is about as economically arranged as possible under the present schedules. It should be a cheap operation. The operations of the division include the following schedules:

1. One round trip daily between Dallas and Los Angeles. Mail rate at 88¢ a mile in both directions. One trip originates at Los Angeles, ship going to El Paso and being changed there (remaining plane acting as spare for the day). One trip originates at Dallas and goes straight through to Los Angeles. Also spare is located at Los Angeles. Route is flown by seven pilots and seven co-pilots. Four of them are on the Los Angeles-El Paso leg and three between El Paso and Dallas. The Los Angeles-El Paso pilots are based at Los Angeles. They go to El Paso one day, back the next and then have two days off. Between El Paso and Dallas they make the flight to El Paso one day, back the next, and have one day off. There are in addition, two round trips made without mail revenues between Phoenix and Tucson. One F-10 is used for this run and two pilots. Whenever major checks are needed on this plane it is changed for a transcontinental ship at Phoenix and flown to Dallas.

2. One round trip daily between Fort Worth and Atlanta. Mail rate at 88¢ a mile in both directions. Trip originates at Fort Worth with the ship that came in the previous evening. On arriving at Dallas, ships are changed. One trip originates at Atlanta and goes straight through to Fort Worth that day. The route is flown by four pilots and four co-pilots. They make the through trip in one day, go back the next, and then have two days off. They are based in Fort Worth. On the entire transcontinental route there is a total of 10 Fokker F-10s including one for blind flying instructions.

3. One round trip between Dallas and Brownsville. Mail rate at 56¢ a mile in both directions. One plane originates at Dallas, goes through to Brownsville arriving there early in the afternoon and returns to Dallas the same day. The route is flown by 3 pilots, who make the trip one way one day, back the next, and then have a day off. The single-engine Pilgrims are used on this route.

4. One round trip schedule daily between San Antonio and Fort Worth. This originates at San Antonio in the morning, goes to Dallas, then Fort Worth and returns the same day. Whenever periodic maintenance checks are needed the ship is changed at Dallas. There is no mail carried on this round trip schedule. The route is flown by two pilots. They fly one round trip a day for two days straight and then have two days off. They are based at San Antonio. Pilgrims are used on this schedule. There are a total of three Pilgrims on the entire Southern Division for the flying of both #3 and #4 schedules, which indicates that they are putting a great deal of time daily on each plane. It is a good idea and works out very efficiently. The weather is such that there are few times when schedules are not made and therefore equipment is not tied up and little ferrying is occasioned. Present schedules call for 48,680 miles to be flown during a 30 day month by three Pilgrims. This is a total of 15,560 miles per plane or nearly 150 hours per month. This is the greatest number of flying hours per plane per month I came across.

5. One round trip schedule between Houston and Amarillo via Dallas. Mail is carried on this schedule only between Dallas and Amarillo, the rate being 79¢ a mile. One plane originates at Houston and goes through that day to Amarillo. Another ship originates at Amarillo and goes through to Houston. They each lay over at their respective terminals one night. Whenever the routine checks are needed the ships are changed at Dallas. Fokker Super-Universals are flown on this run. There are three pilots used, one flying one trip one day, back the next, and then a day off. They are based in Houston.

6. One daily round trip schedule between Dallas and Galveston. The trip originates at Dallas, goes through to Galveston and then turns around and comes back the same day. There are two pilots on the route based in Dallas, flying one round trip a day and then one day off. Both schedules #5 and #6 are flown by five Super-Universals. They are scheduled to fly in a 30 day month 56,280 miles, or 11,256 miles a piece. This is about 105 hours a month. The mail rate paid for this trip amounts to 49¢ a mile.

7. One round trip daily between Big Spring and San Antonio. The mail rate totals 77¢ a mile. There are no passengers carried on this route. The schedule originates at San Antonio in the morning and goes to Big Spring where it makes connection with the transcontinental run to Los Angeles. It returns the same afternoon from Big Spring when the transcontinental arrives from the West. The route is flown by two pilots who fly a round trip for two days in succession and then have two days off. There are two J-6 Stearmans used on the run. Present schedules call for only 12,960 miles per month flying, which is 6,480 miles per ship, or around 62 hours, a low figure for both pilots and planes.

8. One round trip a day between Atlanta and Houston via New Orleans. The

mail rate is 55 $\frac{1}{2}$ ¢ a mile for the early morning schedule out of Atlanta as far as New Orleans, and 41¢ a mile from New Orleans to Houston. The rate from Houston to New Orleans returning is 41¢ a mile and from New Orleans to Atlanta 40 $\frac{1}{2}$ ¢ a mile. One trip originates at Atlanta in the early morning and goes to New Orleans, where the ship is changed. Another ship leaves New Orleans and goes through to Houston. The trip originating out of Houston goes straight through to Atlanta. There are five Stearmans used on this run and five pilots. A pilot originates his flight one day out of New Orleans and goes to Houston; he returns to Atlanta the next day and on the third day comes back to New Orleans where he has two days off. The schedule calls for approximately 95 hours per month on each of the Stearmans and pilot flying of 95 hours. All pilots are based in New Orleans.

Total schedules of American Airways Southern Division calls for 307,840 miles flying per 30 day month. This total is flown by 10 Fokker F-10s, 5 Fokker Super-Universals, 7 Stearman J-6s, and 3 Pilgrims. This is a total of 24 airplanes. They therefore average flying per month some 12,500 miles per ship, or roughly 115 hours, an excellent figure. The route is flown by 30 pilots. The average flying time is approximately 100 hours per month, also an efficient figure.

Pilot's pay is based on an hourly time basis depending upon the type of equipment used. There is no base pay but the pilots are given bonuses ranging from \$12.50 per month to \$50 per month, depending on the type of country the pilot is flying over, and a bonus of from \$15 to \$52.50 per month, depending on the length of time he has been with the company. Hourly pay is given on the basis of the scheduled flying time, so that no change is made if a pilot arrives ahead of time or is delayed. No pay is given for attempted trips. If they get to a certain point where the mail can be forwarded, however, they are paid. The pay basis is as follows: \$4.50 day and \$6.75 night for Stearmans, \$5.00 day and \$7.50 night for Super-Universals, \$5.50 day and \$8.25 night for Fokker F-10s and Pilgrims. The salaries of the pilot range from around \$625 a month to as high as \$750 in some cases. The average is probably somewhere around \$670 per month, which is a very fair average considering the amount of hours the pilots fly. However, it would seem that the pay on the Pilgrims, Supers, and Stearmans could come down somewhat. They fly over excellent country, with superb weather conditions and I think that there should be quite a large difference of pay between this flying and the transcontinental work. Pilots are furnished with a room at their terminals by the American Airways but must furnish all their meals so that no expenses except in forced landings are given.

Co-pilots are paid a flat monthly rate running between \$200 at the start to \$250 a month top. This depends on length of time with the company. This rate also is higher than that of other lines. United, for instance, limits their co-pilots to \$225 a month and they have to work in the hangar during off days. Transcontinental & Western Air pay their co-pilots only \$190 a month. All flying personnel must be examined physically every six months which is the Department of Commerce ruling. The division has one doctor on the payroll which seems unnecessary.

Although the pilots on this division of American Airways probably have as much experience as on any other line in the country outside of Boeing, the discipline is very poor. This is probably due to the fact that the Operations Department, particularly the Division Superintendents, have not been at all strict in watching the conduct of pilots, and as a matter of fact, I have doubts as to whether any attempt has been made to set up any rules or regulations for pilots or co-pilots in the handling of passengers. Whereas every other line I went over had a manual of operations service instructions which touched upon practically every subject, there was none on the Southern Division of American Airways. True, there

are a few miscellaneous bulletins issued from time to time but they are not kept in order and they were anything but a comprehensive group of airline rules and regulations. There were numerous incidents encountered on the trip that indicated poor crew discipline, probably due to lack of any rules set for them by the Operations Department.

Number of personnel in Dallas and along the line was larger than encountered on most operations. To be specific, in Los Angeles, which is the far western terminal for the southern transcontinental, there are 11 employees in the Operations Department. They handle only one schedule in and one out of the terminal and do inspection and routine maintenance on the one plane. Included in this total of 11 is 1 terminal manager, 1 assistant, 2 dispatchers, 2 radio operators, 3 mechanics, and 2 general helpers. The Dallas terminal of N.A.T., which has two daily schedules in and out, one at night and one at day, and has more maintenance work to do in that both a tri-motor and single-motor ship are checked, serviced and maintained, employs only eight men. P.A.T.'s terminal at San Diego also has two daily schedules in and out and the same maintenance to do as the Dallas N.A.T. base and it also employs only eight men. Another example is at Jackson, Mississippi. This is only a servicing stop with no maintenance work to be done, servicing four ships a day; two on the southern transcontinental and two on the Memphis-New Orleans route. There are four employees based here. This includes a terminal manager, 1 mechanic, 1 dispatcher, and 1 radio operator. As mentioned before, the Boeing line at stops similar to this will have a crew of five men, servicing six ships a day on a 24 hour schedule. The Jackson field operates only in the day, having no night schedules. El Paso, Texas, with only two ships in and out a day, and those somewhere near the same time, has nine men in operations, in addition to one traffic representative and two ticket agents on the Traffic Department payroll. Tucson, Arizona, which handles no servicing whatever, and has two ships in and two out a day, has two employees, one a radio operator and the other a terminal manager. New Orleans handles two ships in and out and does the maintenance work on the single engine mail planes flying this route, no passengers being carried, with 18 men on the operations payroll and one in traffic.

While I was in Dallas certain reductions were being made in the number of personnel and salaries. The following table shows the number of personnel and salaries per month of all American Airways, Southern Division, as of January 1, 1932, and after all proposed changes on March 15, 1932. This does not include, however, pilots or co-pilots.

<u>General Office</u>	<u>Jan. 1</u>	<u>March 15</u>	<u>Jan. 1</u>	<u>March 15</u>
Executive	4	4	\$1,925	\$1,625
Treas. & Acct.	26	22	4,112	3,450
Purchasing	2	2	545	410
General Office	6	6	480	470
Miscellaneous	10	6	2,183	1,250
Traffic	6	3	1,200	665
Publicity	3	2	590	390
Radio	3	3	585	545
Operations	5	4	1,745	1,235
Maint. & Service	9	8	1,840	1,587
	<u>74</u>	<u>60</u>	<u>\$15,205</u>	<u>\$11,627</u>

(Continued on following page)

<u>Line Personnel</u>	<u>Jan. 1</u>	<u>March 15</u>	<u>Jan. 1</u>	<u>March 15</u>
Abilene	2	2	\$325	\$285
Amarillo	3	3	385	365
Atlanta	22	23	3,300	3,040
Austin	2	2	140	150
Big Spring	6	6	660	650
Birmingham	3	4	460	510
Brownsville	4	4	445	490
Dallas (Term. office)	13	12	1,675	1,410
" (Downtown traffic)	3	3	380	360
" (Radio Maint.)	5	3	335	465
" (Line Serv. Tri-Mot.)	33	26	4,002	3,184
" (Line Serv. Single ")	9	8	1,220	965
" Reclaiming	2	3	250	312
Douglas	2	2	200	250
El Paso	11	12	1,440	1,486
Fort Worth	15	15	2,045	1,885
Galveston	2	3	185	195
Guadaloupe	1	1	150	110
Houston	6	6	765	730
Indio	1	1	160	160
Jackson	4	4	656	500
Los Angeles	15	16	2,575	2,562
Monroe	2	1	225	125
New Orleans	27	20	3,151	2,456
Phoenix	7	7	935	950
San Antonio	9	9	1,255	1,200
Shreveport	3	3	395	395
Tucson	3	2	385	285
Waco	6	6	780	720
Wichita Falls	2	1	160	150
San Angelo	1	1	35	35
Mobile	1	1	40	40
Beaumont	1	1	30	30
Total field personnel	<u>227</u>	<u>212</u>	<u>\$29,738</u>	<u>\$26,522</u>
<u>Overhaul Shop, Dallas</u>				
Motor Overhaul	35	23	\$4,855	\$3,205
Aircraft Overhaul	79	29	10,585	3,648
Supply Department	<u>11</u>	<u>8</u>	<u>1,165</u>	<u>816</u>
Total Overhaul	125	60	\$16,605	\$7,669
Grand Total	426	332	\$61,549	\$45,820

The above total of the monthly payroll, excluding certain general and administrative expenses which are probably borne by American Airways, the holding company, amounts to 14.8¢ per mile flown.

COMMUNICATIONS

Communications on the division is under the direction of M. R. Swanson, Supervisor of Radio. He has one assistant, and one clerk. The department is responsible directly to the Operations Department. There are four men located in Dallas, in addition, on radio maintenance work. Mechanics do all radio maintenance on the line. The Dallas Communications Department also spends a good deal of its time on the line watching its operations, maintenance, etc.

All planes of the division are equipped with radio facilities. Most of

them are two-way but on certain types the planes only carry the long wave receiver. The Western Electric Type A or Type D receivers are used. Aircraft radio equipment on all Fokker F-10s and Pilgrim airplanes consists of a standard Western Electric 50 Watt radio telephone transmitter using 100% modulation operating on 5602.5 K.C. and 3232.5 K.C., and high frequency and Department of Commerce receivers. The planes are all completely bonded and shielded. All Department of Commerce radio stations located along the company's routes are used by the planes in receiving regular weather broadcasts and in event of emergency are used in broadcasting necessary messages. All planes equipped with the two-way radio are required to report their position half-hourly. The procedure followed on this is for the station to call the plane first, this being the method in general use.

The following is a list of the company's ground stations equipped with two-way radio facilities. They are all equipped with standard Western Electric 400-watt high-frequency radio telephone transmitters (except Waco, Texas, 50-watt) using 100% modulation and operating on 5602.5 and 3232.5 K.C. Each station is equipped with two high-frequency receivers. Those stations marked with an asterisk are also equipped with point-to-point code transmitters of 150-watt output (except Waco, 50-watt) operating on 2356, 4115, 6550 and 8015 K.C. In addition there are two stations (Blythe, Calif., and Houston, Texas) equipped with only point-to-point code transmitters of 150-watt output and operating on the above kilocycles.

- *Atlanta, Ga.
- Birmingham, Ala.
- *Jackson, Miss.
- Shreveport, La.
- *Dallas, Texas
- Abilene, Texas
- *Big Spring, Texas
- *Guadeloupe, Texas
- *El Paso, Texas
- *Douglas, Ariz.
- Tucson, Ariz.
- *Phoenix, Ariz.
- *Indio, Calif.
- *Burbank, Calif.
- *Waco, Texas
- *San Antonio, Texas
- Brownsville, Texas
- *New Orleans, La.

The communications expense on American Airways, I venture, is substantially higher than that of United Air Lines in that United uses no code transmission for its point-to-point communications, thereby reducing necessary field personnel, and further since United has no remote-controlled stations. I believe that the setting-up of a similar communications system to that used by United may be well worth considering. There are so few schedules anyway on the division that the frequency would scarcely be "cluttered up" by use of the plane frequency for ground point-to-point communications.

The division relies pretty generally on the U.S. Weather Bureau for most of its weather reports along the line and, as a consequence, no full-time meteorologist is employed. Due to the absence of complete weather teletype service over the company's lines, most of the reports come in to the nearest American Airways base by telephone or telegraph just before scheduled departures. Some of these "scheduled movement" reports are furnished by the Weather Bureau from

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part-time weather observers and others are paid for by the Company. In case of questionable weather there are a number of "call stations" at intermediate points where a report of weather conditions at that particular place may be obtained. So much a call is paid for this service. In some cases the Weather Bureau furnishes the report and in others the company pays the charge.

Between Atlanta and Dallas there is no government teletype service. All weather information comes in by telephone or telegraph to the terminal prior to the plane's departure. The Weather Bureau supplies all these regular reports with the exception of two which are paid for by the company. Between Dallas and El Paso the company uses the government teletype for reports. There are also two telegraphic "scheduled movements" that come in regularly which are paid for by the Weather Bureau. Between El Paso and Los Angeles no teletype is used and weather information comes in from Weather Bureau stations by telephone or telegraph. The company supplies its own weather information at five intermediate points, but has to pay for this service at only three of them, as they maintain ground radio stations at the other two intermediate points and the radio operator supplies the information. On the other routes operated by the southern division there is no teletype, and information comes in by telegraph and telephone, and, with the exception of only two points, it is supplied by the Weather Bureau.

MAINTENANCE AND OVERHAUL

This department is directed by R. E. Taylor, Superintendent of Maintenance. He has one assistant, Mr. Ward. This department does not report to the operations department, but to Mr. C. R. Smith, General Manager. There are eight employees in maintenance and servicing in the general office, including Taylor and his assistant. These men do clerical work in regard to log books, motor parts life, etc. There is also one servicing and maintenance engineer. I can't understand why so many employees are needed for clerical work in this office. None of the other lines I inspected had a force for this work. Generally, the maintenance superintendent's stenographer was capable of handling these records, or at most one clerk was sufficient. It is quite possible that they may be handling some work in this office that otherwise might be taken care of by the accounting department, but if this is the case, the accounting department is too large. Five men is quite a large number to take care of plane and engine logs, motor parts life, etc.

All major maintenance work and overhaul on the southern division is taken care of at Dallas with the exception of maintenance on the J-6 Stearmans flying the Houston-Atlanta and the Big Spring-San Antonio routes. Maintenance work on these planes is done at New Orleans for the Houston-Atlanta division and at San Antonio for the Big Spring-San Antonio route. All overhauls both on these planes and motors are done at Dallas.

As a matter of fact, the Big Spring-San Antonio route handles very little mail and carries no passengers whatever, and the operation of the line causes quite an operating problem in that a sub-maintenance base is required at San Antonio and motors must be shipped to Dallas for overhaul. It would seem wise to ask the Post Office Department's permission to abandon this line and utilize the funds for some other of its routes. Although I understand the airway on the Houston-New Orleans-Atlanta route is in not too good a condition, it is difficult to understand why the company has not installed a passenger service on this run. It reaches several strategic cities, and operates in a good-weather territory, so that, if opened up, it should develop a fair amount of passenger business. If passenger service were installed on this division instead of the mail schedule, and the Big Spring-San Antonio route abandoned, the New Orleans, Atlanta, Houston, San Antonio and Big Spring forces could be cut

down considerably. A Wasp or Hornet transport could be used on the Atlanta--Houston passenger run which could be shunted to Dallas over the Dallas--Houston run for regular checks and motor overhauls. This would do away with the J-6 motor overhauls entirely at the Dallas base and the planes could be put elsewhere on the American Airways on some night mail run.

The maintenance system used on the Southern Division is quite satisfactory and all equipment looks to be in good condition. This system is based on three different hourly checks; one of these is given after 10 hour flying time periods, and it is generally given at the terminals where the plane has a day or night layover before returning. Thus on the transcontinental route this check is given at Dallas, Los Angeles and Atlanta whenever a ship comes off the run. It also must be given at El Paso where the eastbound ship is changed, and at Phoenix which is an overnight terminal for the Tucson-Phoenix shuttle service. The "10 hour check" is more of a close inspection and correction of any irregularities noted about the plane's performance from the pilot's flight report book. On this operation the rocker arms are greased without pulling the caps. The 10 hour check also includes a fairly complete power plant ground test. This check is made out in duplicate by the mechanic who signs his name to each required operation as performed. One of these copies is forwarded to Dallas to be filed in the Dallas Maintenance Office and one copy stays with the pilot's flight report book until the next hourly check is performed on the plane.

The second check is given to the plane and motor after a 20 hour period. Equipment is generally routed so that the ship always receives this check at Dallas. It includes in addition to the 10 hour check, pulling push rods, filling rocker boxes, and draining oil and gas pumps. All reports of this check are also filed at the Dallas Office with copies remaining in the flight book until the "thorough check" has been given. This is given at between 40 and 50 flying hour intervals. It includes all routine 10 and 20 hour checks in addition to checking the magneto breaker points, checking flares by drop testing (incidentally all parachute flares are unpacked and dried out every 30 days), draining all oil and checking valve clearances. This check is not made out in duplicate but is sent to the Dallas Maintenance Office where it is filed and referred to prior to plane or motor overhaul. Every 40-50 hour check the propellers are torn down and inspected for flaws. They are etched every 300-350 hours at motor overhaul periods. Spark plugs are changed only every other "thorough check".

The above forms for the various hourly maintenance checks are kept in the back of the pilot's flight report book. This book always remains with the ship. It contains, in addition, three different forms which constitute the pilot's flight report. Each of these forms occupies a half page in the book and are all attached to each other but may be torn out separately. The first one occupies a top half-page. This shows total hours and hours since overhaul for plane and motor. It also shows the number of hours the plane and motors have had since the "thorough check" and since the oil drain. It contains the serial numbers of all motors and props, and in regard to the latter, shows number of hours since the last propeller etchings. This information is brought up to date before the flight has been made. Immediately below these logs, is filled in by the pilot times of arrivals and departures from all stops, elapsed and ground times, gallons of gasoline and quarts of oil put in, and remarks for delays. This report is made out entirely by the pilot who has it checked by the Terminal Manager when he leaves the ship. This is then torn out and sent to the Treasury Department at Dallas where it acts as the pilot's flight pay voucher.

This form is actually made out in duplicate on form #2 which is directly behind it at the top of the second page. This next form, however, contains, in

addition to the information of form #1, a space where the Terminal Manager adds the logs prior to the flight the times on the trip that has just been completed. The complete log may then be brought forward on the new form #1 before the next flight. This form is sent to Dallas where the information is transferred to the company's Master Log Book. The third form is attached on the second page below form #2. This is called the pilot's maintenance report and gives the pilot's remarks on the operation of plane structure, controls, motor, instruments, radio, any miscellaneous remarks, oil pressure, r.p.m. and ignition condition of all motors. The back of this form shows any repairs or changes made at the intermediate stops. This third form remains in the book and is not torn out until the plane has had a "thorough check".

For line servicing and maintenance at the Dallas base the company employs 37 men. These men are divided into tri-motor and single-motor work. The tri-motor maintenance and servicing is handled in the main hangar where 26 men are employed. I believe this includes two men who are on duty as timekeepers at the gate of the entrance to the hangar. These men watch over the time clocks, check passes of any visitors and also do some work on spark plug reconditioning. However, I hardly see any reason for timekeeping for so few employees. The total payroll for these 26 mechanics amounts to \$3,184 per month. In a separate hangar all servicing and maintenance work on the single-motor planes is done. There are a total of 8 employees for this work. The payroll averages \$965 for this group per month. In addition, there are three employees, classified under servicing and maintenance, who do all the reclaiming of oil and cleaning naphtha. They also test gasoline, oil, etc. I do not see how this work could require more than 1 employee at the outside. Other lines reclaiming oil generally have a mechanic who spends only part of his time on this work. The entire maintenance crew could be cut down to a certain extent by the adoption of United Air Line's policy of having co-pilots do hangar work during part of their off-time.

The Motor Overhaul Department contains 23 men, exclusive of 8 employees in the Overhaul Supply Department serving both plane and motor maintenance and overhaul. Considering that the shop is overhauling only around 15 motors per month this is a fairly large force although it does include electrical overhaul. T. & W. A. for instance, has 16 men in motor overhaul, 3 in electrical and carburetor work, 3 in instruments, and 3 in propellers. This is a total of 25 men but this force turns out nearly twice the amount of work that the Dallas American Airways shops do. P. A. T. in Oakland is turning out around 12 motors a month with a crew of 10 including electrical, prop and instrument men. Engine overhauls would be in somewhat heavier volume than 15 monthly but the company recently accepted Pratt & Whitney's proposal to retire their motors after 2,000 hours and receive \$1,000 credit on this list price of a new motor. This is the same policy adopted by United Air Lines. The result is that the company is retiring all engines over 2,000 hours when they come due for overhaul. Even normally, however, the overhaul shop should not turn out over 20 motors a month. This is on the present basis of pulling motors after 300 flying hours. This could well be increased to 350 hours. at least, judging by the success on other lines that are pulling motors at 350 and 400 hours.

Average number of man hours on the Wasp and Hornet engines is running fairly high at close to 140. The motor overhaul cost with the exception of Pan American Airway's was the highest of any line in the country. This cost for the year ended December 31, 1931, on 200 Wasp engines averaged a total of \$518.80 per motor, exclusive of any overhead charges. The United Air Line average was roughly \$300. Of the total cost of \$518.80, labor accounted for \$99.32 which is not unusually excessive although nearly \$10 higher than Boeing's. The remaining cost of the overhaul of \$419.48 was the expense for parts replacement. This figure was

considerably in excess of other lines. The latter part of the year, however, the cost was coming down considerably. In October 18 Wasps were overhauled at a cost of \$98.48 for labor, \$549.77 parts, or a total of \$648.25 each. In November 15 Wasps were overhauled at a cost of \$114.21 for labor, and \$317.51 for parts, or a total of \$431.72. Overhauls in December and January were so few that average costs in those months might be misleading. Despite the fact that overhaul costs appeared coming down in the latter part of the year, the present costs are said to be substantially higher than ever before and are now averaging back between \$500 and \$600 a piece. This, it is claimed, is due entirely to a new system of motor replacements instituted by the New York engineering office and is entirely too severe a policy. It is felt that if the New York Office were going to dictate these important policy changes that somewhat more practical experience is needed there.

The Airplane Overhaul Department is currently employing about 29 men. A year ago the company began overhauling all of its Fokker F-10 equipment and completed this work about 2 months ago. The force which formerly amounted to 379 men was therefore reduced to 29 with the completion of this work. Incidentally, it may be of interest to note that the average cost on ten F-10s overhauled during 1931 averaged \$4,073 for labor, \$3,452 for material, or a total of \$7,525 each. Now that the company has caught up on its F-10 overhauls, which constituted the largest part of the overhaul work, it would seem quite possible to reduce this force still further, as practically the only work now being done is on an occasional Super-Universal. None of the Stearmans or Pilgrims have had enough time on them for any major overhaul and the F-10s will not be due for another overhaul for some time yet.

At this point it might be interesting to mention the total flying time of the equipment in use, their average speeds and fuel consumptions. The eleven Fokker F-10s had the following total flying hours as of January 1, 1932: 5,538 - 2,459 - 2,056 - 2,640 - 2,797 - 2,290 - 1,465 - 2,329 - 1,986 - 5,525 - 3,473. For the entire 1931 year these airplanes flew a total of 1,512,968 miles, the average plane consumed 81.64 gallons of gas an hour, 10.84 quarts of oil and averaged a cruising speed of 117.97 miles per hour from check to check. In order to make a comparison with the available F-10 comparison of T. & W.A., the January 1932 performance of these ships were as follows: Cruising speed 118.96 mph, gas consumption 85.51 gallons, and 10.20 quarts of oil. On T. & W.A. in the same months their F-10s showed the following performances: Cruising speed of 121.59 m.p.h. from check to check on gas consumption of 70.84 gallons per hour. No oil consumption of T. & W.A. is available. However, on N.A.T. and P.A.T. the oil consumption of their Fords which is naturally comparable to an F-10 amounted to 9.0 quarts during January. N.A.T.'s Fords for the 1931 year consumed an average of 7.26 quarts of oil per hour as against 10.64 quarts of oil consumed during that period on Southern Division's tri-motor equipment.

The company's five Fokker Super-Universals had the following total number of flying hours: 1,769 - 2,526 - 1,588 - 1,805 - 1,761. During the 1931 year these planes flew 158,530 miles at an average of 104.85 m.p.h. with a gas consumption of 27.64 gallons per hour and oil of 4.24 quarts. There are no comparative figures with similar equipment on other lines available.

The company's three Pilgrims which are Hornet powered had the following total flying hours: 763 - 219 - 312. They flew a total of 194,226 miles in the 1931 year at an average cruising speed of 105.77 miles per hour with gas consumption of 38.07 gallons an hour and oil consumption of 5.72 quarts. These ships were put on the line only late in the year. In order to make better comparison with United Air Lines' figures on single-motor Hornet powered planes, January figures

showed the Pilgrims flying 42,086 miles during the month at an average cruising speed of 106.80 miles an hour on a gas consumption of 42.02 gallons and oil of 7.92 quarts. During the same month N.A.T.'s Boeing 95s which are also Hornet powered, averaged gas consumption of 34.80 gallons an hour and oil consumption of 3.55 quarts. Also during January Boeing Air Transport's 40 B4s which are Hornet powered consumed 34.8 gallons of gas and 4.0 quarts of oil an hour.

The J-6 Stearmans had the following total number of flying hours: 857 - 884 - 891 - 1005 - 981 - 408 - 576. There are no available performance figures which could be compared with other lines.

It is rather difficult to trace the reasons for excessive oil and gas consumptions on the Southern Division. The F-10 gas consumption of 85 gallons per hour and cruising speed of 118.96 miles an hour during January, comparing with T. & W.A.'s F-10 performance during the same month and on the same equipment of 121.59 miles an hour and gas consumption of 70.84 gallons per hour, is certainly an enormous difference. N.A.T.'s Fords during the same month showed a cruising speed of 117.7 m.p.h. and gas consumption of 78 gallons. P.A.T.'s Fords averaged 117.6 mph on 76.3 gallons of gas. The oil consumption, particularly on the Hornets, show even a more decided difference. If American Airways' planes were getting an increase in speed over those of the other lines, the increased fuel consumption could be readily understood. However, this is not the case, and it resolves itself probably into two possibilities. The first is lack of pilot discipline and training, mentioned before. Pilots are apparently not using their altitude adjustment as they should and probably because no one has set any rule or precedent regarding it. And, furthermore, they are flying with excessively high fuel pressures. The second possibility is poor overhaul work. One would imagine with the drastic motor parts replacement policies in force that this would hardly be the case but it is entirely possible. If the operating heads of the division had been "on their toes", they would have been after the cause of this trouble long ago.

SUMMARY

The morale along the line appeared to be good. The personnel have been in the business for a long time but unfortunately have never been properly supervised. The result is that in certain instances there is still a touch of the barnstormer days to the operation. There is probably some good material in the organization but it has had little training and experience outside of their own line. One noticeable fact was that most of the important positions were held by a certain group of individuals who were all in the same fraternity at college. This may seem to be a small matter but some of the organization feel that there has been discrimination in favor of these people. For that reason they have not had the best personnel in key positions.

From the executive side, as mentioned before, the line has too many departments, some of which are useless and others which should be handled in New York. Naturally, the keeping of these departments necessitates clerical help, stenographers, and other expenses and many of them could well be done away with. The remaining departments have too many assistants. Being part of American Airways it would seem that the advantages which might have been gained through unification have not been utilized.

From the operating point of view, there are too many employees located at the fields. The pilots are not watched over strictly and there is certainly no discipline in force as regards their handling of passengers. Certainly a thorough investigation should be made of United Air Line's communication system with a view towards supplanting ground point-to-point code transmission with code.

Efforts should also be directed towards the changes in schedules proposed above; i.e. abandoning the Big Spring-San Antonio line and having the receipts applied to some other route which is more advantageous; and installing passenger mail service on the Atlanta-Houston route in place of the present Stearnan mail schedule.

March 30, 1932
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