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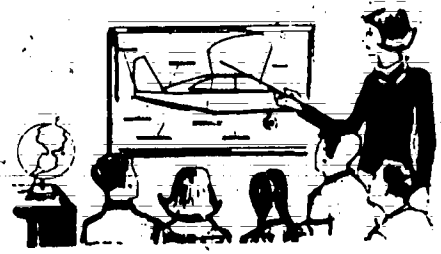
IDENTIFIERS \*Aviation Occupations

ABSTRACT

This booklet, one in a series on aviation careers, outlines the variety of careers available for airplane pilots and flight engineers. The first part of the booklet provides general information about careers for pilots and summarizes the information in a table. In the main part of the booklet, the following 11 job categories are outlined: flight instructor, corporate pilot, air taxi or charter pilot, commercial airplane or helicopter pilot, patrol pilot, ferry pilot, agricultural pilot, test pilot, airline pilot or captain, airline co-pilot or first officer, and flight engineer or second officer. For each job classification, information on the nature of the work, working conditions, where the jobs are, qualifications, wages, opportunities for training, and outlook for the future is provided: (KC)

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# AVIATION EDUCATION

DEPARTMENT OF TRANSPORTATION/FEDERAL AVIATION ADMINISTRATION  
OFFICE OF AVIATION POLICY/WASHINGTON, D.C. 20591

Aviation Careers Series

## PILOTS AND FLIGHT ENGINEERS

by  
Walter Zaharevitz

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## GENERAL INFORMATION

While the various kinds of piloting jobs involve a variety of special circumstances, there are also a number of conditions that are common to all pilots.

- (1) All pilots flying for hire have progressed through a flight training program and have earned a commercial pilot's license. Most likely they have one or more advanced ratings (such as instrument or multi-engine ratings) depending upon the requirements of their particular flying jobs.
- (2) A pilot's "office" is the cockpit which contains all controls, instruments, and electronic communication and navigation equipment necessary to operate the aircraft. Some noise and vibration are noticeable, particularly in propeller aircraft.
- (3) They have a concern for safety including the safe condition or airworthiness of the plane; weather factors affecting the safety of the flight; and flight regulations, air traffic control procedures, and air navigational aids designed to provide maximum safety in the air.
- (4) They have a dual responsibility. They must not only satisfy their employer, who might be an air taxi operator or an airline, but they must also demonstrate to the Federal Aviation Administration (FAA) that their flying skills, knowledge and state of health are at all times acceptable for the particular flying jobs they perform.
- (5) They must undergo frequent physical examinations and meet certain medical standards which vary according to the license which the pilot holds. A Class I Medical Certificate requires the highest standards for vision, hearing, equilibrium, and general physical condition. The pilot must have an exceptionally good health history with no evidence of organic and nervous diseases or mental disorders. A Class II Medical Certificate demands less rigid standards but still requires a high degree of physical health and an excellent medical history. A Class III Medical Certificate has the least stringent physical requirements. All three classes of medical certificates allow the pilot to wear glasses provided the correction is within the prescribed limits of vision. Drug addiction and/or chronic alcoholism disqualify any applicant.

The greater the number of flying hours and the more complex the flying skills, the more varied are the opportunities for advancement as a pilot. There are many chances to transfer from one kind of pilot job to another as flying hours are accumulated and additional skills are mastered. Frequently pilots double as flight instructors and air taxi pilots, or they may also operate an aircraft repair station with flight instruction and air taxi operations as sidelines. Many good aviation and airline flight crew jobs qualify pilots for jobs with governmental agencies, such as the Federal Aviation Administration (FAA).

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REQUIREMENTS

<u>Type of Pilot</u>	<u>Education</u>	<u>Licenses &amp; Ratings</u>	<u>Hours Flying Experience</u>	<u>Physical Exam</u>
Flight Instructor	No mandatory level. At least high school normally necessary to absorb instruction.	Commercial, flight instructor's rating, instrument rating.	Minimum of 200 hours	Class II
*Corporate Pilot		Commercial or Air Transport (ATR) for heavy aircraft & jets. Multi-engine & instrument ratings, A&P mechanics license, for corporate co-pilot.	1,500 hours 500 hours required for corporate co-pilot.	Class II
Air Taxi or Charter Pilot		Commercial, instrument rating.	1,000 to 2,000 hours	Class II
Commercial Pilot (Patrol, ferry, helicopter, aerial survey, photography, advertising, sightseeing, ambulance, etc.)		Commercial, helicopter (some). Instrument rating, seaplane rating (some) A&P mechanic (some).	Varied	Class II
Agricultural Pilot		Commercial	500 hours accident-free, precision, low-level fly-experience. Completion of specialized flight training in agricultural applications is preferred.	Class II
Test Pilots Experimental or Engineering Test Pilot - Production Test Pilot - Airline Test Pilot	Engineering degree preferably aeronautical engineering	Commercial rating.	500-2,000 hours airline test pilot; 3,000-5,000 hours flying as airline pilot. In all cases, some experience as a military flight test pilot is preferred.	Class I
Airline Pilot (Captain)	College preferred	ATR and Instrument rating.	*	Class I with 20/20 vision as corrected. 21 - 35 years of age Height sufficient to operate all controls
Airline Co-Pilot (First Officer)	College preferred	Commercial instrument rating - ATR preferred	*	Class II (Class I preferred)
Airline Flight Engineer (OR Second Officer)	High School or 2 years college preferred	Commercial instrument rating, A&P mechanic flight engineering rating	350 - 1,000 hours	Class II & able to obtain Class I (Class I preferred)
Airline Flight Instructor	College preferred	ATR and Flight Engineering	2,500 airline flight hours	Class I

\*No starting figures are given as first officers move up to captaincies as vacancies occur.

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WAGES AND BENEFITS

<u>Typical Annual Starting</u>	<u>Basic Wages Maximum</u>	<u>Additional Wages and Benefits</u>	<u>Typical Benefits and Privileges</u>
\$3.00/hour	\$10.20/hour	Some receive base pay plus hourly rate for flight time or commission when students advance to new ratings. Salary varies with single-engine or multi-engine aircraft.	
\$12,000 to \$19,500	\$19,200 to \$46,500	Salary depends on experience and type of aircraft flown. Lowest salaries are for pilots of single-engine planes; highest salaries for pilots of twin-jet and four-engine turboprop and jets.	Most companies have retirement plans, stock options and paid vacations.
\$3.60/hour	\$10.20/hour	May also earn extra pay for hours flown above a minimum, or a commission on extra business the pilot produces above a specified minimum gross company income.	
\$10,000	\$24,000		
\$ 8,000	\$20,000	Some pilots receive 25-40% of the gross receipts they produce. As work is seasonal, they may earn wages in off-season from other commercial flying jobs that make their total annual income as much as \$30,000 to \$35,000	
\$15,000	\$33,000	Some receive an additional amount per hour for hazard pay during test flights	Insurance paid by company plus other benefits given to aircraft manufacturer or airline employees in general (paid vacation and sick leave, etc.)
\$30,000	\$80,000*	Salary varies with type of airplane, day and night trips, international or domestic routes, passenger or cargo plane.	Paid vacation, insurance-retirement plan, travel privileges, sick leave, group health insurance. Choice of routes and base depending on seniority.
\$ 8,000	\$53,000	Salary varies with type of airplane, day and night trips, international or domestic routes, passenger or cargo plane.	Paid vacation, insurance-retirement plan, travel privileges, sick leave, group health insurance. Choice of routes & base depending on seniority.
\$ 6,000	\$46,000		
\$13,000	\$53,000	Salary varies with size of the airline.	Paid vacation, insurance-retirement plan, travel privileges, sick leave, group health insurance.

\*Pilots flying large jets, such as the Boeing 747 on foreign routes may earn additional wages.

## FLIGHT INSTRUCTOR

Nature of the Work. Flight Instructors teach students to fly. They explain principles of flight, aerial navigation, weather factors and flying regulations in ground school classes. They demonstrate operation of aircraft and equipment in dual-controlled planes. They observe solo flights and determine students' readiness to take examinations for licensed ratings. They also assist advanced students to acquire commercial, instrument, multi-engine, and air transport ratings.

Working Conditions. Hours of work are irregular depending on students' available time and the weather. Flight Instructors may work as many as 80 hours a week during the summer and can expect to work every weekend having good flying weather anytime during the year. The ground school classes may be scheduled during evening hours. Instruction duties rarely require being far from home base. When not teaching, flight instructors may supplement income by serving as an air taxi pilot or by operating an aircraft repair station as a fixed base operator.

Where The Jobs Are. About 10,000 women and men are actively employed as full time or part time flight instructors. Usually they are based at airports having general aviation aircraft repair stations or an air taxi service where the operator provides flight instruction as an additional source of income. Flight instructors in areas with major airports having heavy air traffic usually operate out of the smaller airports in the community so beginning students can avoid heavy air traffic patterns.

Opportunities for Advancement. The job of flight instructor often is considered a stepping stone to higher paying pilot jobs. Flight instructors can quickly accumulate the necessary high numbers of hours of flight experience to qualify for jobs as corporate pilots or co-pilots, or for the position of air transport co-pilot. Many instructors prefer to remain in the teaching field, and if they have attained certain high standards, they can qualify for the Federal Aviation Administration's "Gold Seal" which identifies them as superior teachers and can lead to higher salaries. When the number of students is large enough, a flight instructor might organize a flying school, directing the activities of a number of instructors.

Outlook for the Future. General aviation is experiencing growth in the number of people who want to learn to fly. Some of this growth has been generated by the aircraft manufacturers who wish to develop potential customers; much of it has resulted from the acceptance by business as to the value of aircraft as a tool, and by the public as to its value as a means of personal transportation and recreation. All this activity has created a demand for flight instructors. Today's general aviation fleet numbers 200,000 aircraft. By 1990 this figure is expected to increase

to 310,800. A conservative estimate of at least 95,000 to 120,000 new students begin flying lessons each year. In addition, there is a constant demand by pilots to upgrade their skills and acquire advanced licenses and ratings. All this is reflected in the increases in general aviation instructional aircraft hours. A recent estimate points to a minimum requirement for more than 20,000 new flight instructors in the 1980s, making the position of flight instructor key to the continued growth.

#### CORPORATE PILOT

Nature of the Work. Corporate Pilots fly aircraft owned by business and industrial firms, transporting company executives on cross-country flights to branch plants and business conferences. They arrange for in-flight passenger meals and ground transportation at destinations, and are responsible for supervising the servicing and maintenance of the aircraft and keeping aircraft records.

Working Conditions. The job is often demanding, but challenging, as the pilot is expected to fly in all kinds of flyable weather into many unfamiliar airports. The aircraft may be a light twin-engine plane, a small executive jet, or even an airline type. The pilot is at the call of company executives so he or she is subject to irregular hours. Often the pilot may be away from home overnight. (Studies show that a significant percentage of round trips are over 1,000 miles.) If the company owns a fleet of planes, pilots may fly a regular schedule. If the aircraft weighs more than 12,500 pounds, a co-pilot usually assists. Compared with the airline pilot, corporate pilot flying assignments are far from routine.

Opportunities for Advancement. A corporate pilot can acquire enough flight experience and skill on the job to qualify as an airline co-pilot. If the pilot prefers to remain in general aviation and the firm has a fleet of aircraft, she or he may eventually move up to the position of Chief Pilot, directing all the aircraft operations of the firm.

Outlook For The Future. Studies of the growth of the business aircraft fleet indicate an accelerating interest in corporations owning aircraft in the years ahead. The advantages offered to business executives in time saving, privacy, and flexibility of schedules, plus improved aircraft especially designed for business use, are two important factors in the growth to 50,000 company-owned planes in 1978. In 1978, business aircraft represented about 27 percent of all general aviation; however, they did 75 percent of the general aviation flying. General aviation activity amounted to 76 percent of the total aircraft operations at airports with FAA airport traffic control towers. To operate this expanding fleet will require about 1,200 new pilots each year, not including additional pilots to replace those who retire, transfer, or who are removed for other reasons. Companies are expected to be in competition with the airlines in the hiring of qualified pilots, most of whom will be instrument rated.



## AIR TAXI OR CHARTER PILOT

Nature of the Work. The Air Taxi or Charter Pilot flies fare-paying passengers "anywhere -- any time" but usually for short trips over varying routes in single-engine or light twin-engine planes.

Working Conditions. These pilots fly passengers and cargo as service demands, but normally in daylight hours if the aircraft is a single-engine plane. Flights are mostly of short duration and pilots can count on returning home at the end of the working day. If the pilot works for a company with a fleet of aircraft, she or he may fly on regular schedules over the same routes, much like a small airline. Pilots may be required to wear a uniform when on duty.

Where The Jobs Are. Air taxi operators are located at major airports and at other airports where sufficient passenger traffic can be generated. Interline agreements with airlines account for a substantial part of air taxi business, therefore operators are frequently located at airports having airline service.

Opportunities for Advancement. As is the case with the flight instructor, the air taxi pilot can build up enough flight experience in a relatively short time to qualify for the position of corporate pilot or air transport co-pilot. If the pilot elects to remain in the air taxi and charter business, he or she may generate enough business to offer "commuter airline service" or scheduled service over specified routes similar to the operation of a small airline.

Outlook For the Future. Air taxi operators claim the fastest rate of growth among all segments of general aviation. In 1975, 11.7 million passengers were flown, with estimated increases each year to about 19 million in 1980. This growth reflects the increase in airline travel and the increased use of air taxis to "fly all the way" from any of the more than 500 airports served by the airlines to the remaining 13,200 airports in communities without airline service. Many airlines have agreements with air taxi companies to promote the use of air taxi service to airports not served by the airline and to issue through tickets. It also reflects a growing desire by the air traveler to by-pass crowded metropolitan streets and use air taxis to reach destinations in outlying areas rather than rented cars. Scheduled air taxi service is expanding rapidly. A study made in 1966 revealed that in less than two years the number of scheduled air taxi operators grew from 12 to 78. Today, the number of scheduled and nonscheduled air taxi operators totals 3,400. The U.S. Postal Service's practice of contracting with air taxi operators to deliver mail will further increase scheduled air taxi business. If the present rate of growth continues in this field, more than 17,000 air taxi pilot jobs will become available by 1980.

### COMMERCIAL AIRPLANE OR HELICOPTER PILOT

Nature of the Work. The Commercial Airplane or Helicopter Pilot performs a variety of flying jobs. If piloting a fixed-wing plane, the pilot may engage in such flying jobs as aerial photography, aerial advertising, sightseeing, geological survey, fish and game census, highway patrol, or checking federal airways and navigational aids. Helicopter pilots may fly on a regular schedule carrying workers and supplies to off-shore oil rigs, or fly accident victims to a hospital heliport, lift heavy loads to tops of buildings or to remote mountain sites, rescue people stranded by floods, carry smoke jumpers to fight forest fires, or deliver Santa Claus to shopping center parking lots.

Working Conditions. Flights are usually of short duration. The pilot usually works for an operator whose services are chartered. Helicopter pilots are often required to do precision flying hovering over a particular spot or landing on small cleared areas.

Where The Jobs Are. As the use of general aviation aircraft and helicopters is so varied and widespread in the U.S., pilots are employed just about everywhere there are airports or heliports.

Opportunities For Advancement. These pilots can aspire to advanced status as they build up hours of flying experience and skills. If they work for an operator who owns a fleet of aircraft or helicopters, they may advance to the job of Chief Pilot, or they may build up enough business to employ other pilots and direct their operations.

Outlook For The Future. General aviation employed about 42,500 commercial pilots in 1973. It is estimated that there will be 2,000 average annual openings for commercial licensed pilots. These figures do not include pilots flying personal aircraft.

### PATROL PILOT

Nature of the Work. The Patrol Pilot flies cross-country at low altitudes along pipelines or power lines, checking for signs of damage, vandalism and other conditions requiring repairs. Patrol pilots radio to headquarters the location and nature of repair jobs.

Working Conditions. Flies flight aircraft over all kinds of terrain, frequently at tree-top level. Usually works for an operator who contracts with an oil pipeline or electric power company to furnish aerial patrol service.

Where The Jobs Are. Patrol pilots fly wherever electrical power transmission lines or oil and gas pipelines exist. Many power transmission lines run through mountainous regions where water sources and dams produce electrical power. Oil and gas pipelines spread out in underground networks from oil and gas fields, many of which are located in mid-western and southern states. Some pilots are employed by U.S. Immigration Service to patrol the international borders.

#### FERRY PILOT

Nature of the Work. The Ferry Pilot flies new aircraft from the manufacturing plant to dealers' showrooms and to private customers' home airports.

Working Conditions. After delivering new aircraft to customers and dealers, the pilot returns to her or his home base on a commercial airliner or by another form of transportation. The pilot may be away from home overnight, depending on the distance required by the ferry flight. Ferry flights may require flying to foreign countries.

Where The Jobs Are. Operates out of cities having light aircraft manufacturing plants, most of which are concentrated in Kansas, Oklahoma, Florida and Pennsylvania.

Outlook For The Future. The production of general aviation aircraft numbered 14,165 in 1974 and 17,811 in 1978. Expected growth in production will require a proportionate increase in ferry pilots to effect prompt delivery of aircraft to customers.

#### AGRICULTURAL PILOT (Aerial Applicator)

Nature of the Work. The agricultural pilot flies specially-designed aircraft (including helicopters) to apply herbicides, insecticides, seeds and fertilizers on crops, orchards, forests, fields, and swamps. Some jobs require aerial surveys of cattle and crops or fighting forest fires by dumping fire retardant materials.

Working Conditions. These pilots fly at low levels with heavy loads, in a regular pattern over the ground avoiding trees, power lines, fences and other obstacles. Most flying is done during the early hours of the morning and again in early evening when the air is still. Takeoffs are often made from country roads and open fields close to the area to be treated. Work is seasonal, ranging from six to nine months in southern areas to two months in northern sections. The operator usually furnishes the aircraft, trained ground crews, and specialists who decide how the land is to be treated. The pilot works very close to poisonous liquids and chemicals and must wear protective clothing and masks.

Where The Jobs Are. Agricultural pilots are in demand mostly in California and in the southern tier of states where the crop growing season is at its longest. Many pilots follow the crops north as the season progresses, while others find work in northeastern and western states with extensive forest areas.

Outlook For The Future. The number of agricultural operators in the U.S. has grown to 3,300, employing more than 25,000 people and operating some 8,600 aircraft, which make applications to more than 275 million acres of farmland each year. Experienced agricultural pilots continue to be needed.

#### TEST PILOT

Nature of the Work. Experimental or Engineering Test Pilots fly newly designed and experimental aircraft to determine if the plane operates according to design standards and make suggestions for improvements. Production test pilots fly new planes as they come off assembly lines to make sure they are airworthy and ready to turn over to customers. Airline test pilots flight test airliners after major overhauls before the planes are put back into service. They also flight test new aircraft to be sure they are up to airline standards before the airline accepts them from the manufacturer. Test pilots for the FAA fly FAA planes with experimental equipment aboard to test performance of the equipment, or they fly FAA planes to test new kinds of ground based navigational aids such as radar or runway lighting.

Working Conditions. The experimental test pilot expects the unexpected as a plane is tested to the limits of its design strength and performance capabilities. The test pilot's job involves the most flying hazards. The production test pilot tests a plane on the basis of expected performance and known standards, as does the airline test pilot. All of these pilots sometimes encounter emergency situations which they are expected to handle with the skill and knowledge their job requires. They prepare written and oral reports on their flight experiences and may fly either during the day or at night, depending upon the requirements of the test flight. Airline test pilots often work at night or on weekends, as most aircraft are serviced at that time.

Where The Jobs Are. Experimental and production test pilots are employed at all aircraft manufacturing plants which are located mainly in California, Washington, Kansas, Texas, Georgia, Oklahoma, Maryland, Missouri, Florida, New York, Pennsylvania and Connecticut. Airline test pilots work wherever the airlines have overhaul bases, the largest ones of which are found in San Francisco, Miami, New York, Tulsa and Kansas City.

Opportunities for Advancement. Engineering test pilots may advance to the position of Chief Test Pilot, as can production test pilots. Airline test pilots eventually may advance to the airline's engineering or maintenance administrative staff. Test pilot jobs are also available with the FAA.

Outlook For The Future. The demand for engineering and production test pilots will fluctuate with the development and production of aircraft. Over the next decade the production of general aviation aircraft is expected to increase, while that of commercial air transports will level off due to the introduction of the jumbo jets. Predictions regarding the production of military aircraft are difficult to make.

#### AIRLINE PILOT OR CAPTAIN

Nature of the Work. The Airline Pilot plans each flight with the airline's flight dispatcher and meteorologist, checking weight, fuel supply, alternate destination, weather and route. The pilot also briefs the crew, checks out takeoff procedures, ascertains that the plane is operating normally before takeoff, gets takeoff clearance from the air traffic control tower, flies the plane over the designated route, lands the plane, and at the final destination files a trip report. During the time the airline pilot is aboard the aircraft, he or she supervises the work of the crew, gives instructions, and makes all decisions. The Captain is in command of the plane and is responsible for the safety of the aircraft, its passengers, crew and cargo. The aircraft flown may range from a twin-engine DC-3 on a 100-mile hop to a four-engine Boeing 747 jet crossing the ocean.

Working Conditions. By law, an airline pilot may not fly more than 85 hours a month of 1,000 hours a year. However, the average pilot works more than 100 hours a month counting ground duties such as filing flight plans, working on reports, briefing crews and attending training classes. The airline pilot spends most of the working day in the left-hand cockpit seat with additional time in the airline dispatcher's office and in training classrooms. Work schedules average sixteen days a month and usually provide for consecutive days off. Schedules for pilots employed by transcontinental and international airlines require pilots to spend some nights away from home. In these cases, hotel, transportation and meal expenses are paid by the airline. A flight requires considerable pilot concentration during takeoff and landing maneuvers. Automatic piloting devices free the pilot for other cockpit duties and lessen the strain of the job during cruising flight. The airline pilot is required to wear a uniform while on duty. Night flights are often required, especially for air cargo operations.

Where The Jobs Are. Scheduled airline flight crews are based at major terminals on their respective airline routes. These bases are found mainly in New York, Chicago, Los Angeles, San Francisco, Seattle, Detroit,

Newark, Atlanta, Miami, Washington, DC, Denver, Dallas and Cleveland. Flight crew job opportunities are also available with all cargo airlines and with non-scheduled and supplemental airlines that provide charter service.

Opportunities for Advancement. Promotion is regulated by seniority. When hired as a second officer, or co-pilot, the person is assigned the bottom position within the airline. As the second officers, co-pilots and pilots retire, resign or are removed from the list for other reasons, the newly hired pilot moves upward. All through the career with the airline, the earnings, route assignments and vacation time preferences are governed by seniority. Second officers or flight engineers may advance to co-pilot position within a year, but it usually takes from seven to twelve years to become a pilot or captain, depending on the size of the airline and rank on the seniority list. By law, pilots must retire when reaching age 60. All through the pilot's career he or she must lay the job on the line every six months at the time of a rigid physical exam. If unable to pass the physical, the pilot must stop flying.

Outlook For The Future. The outlook for career opportunities for pilots and flight engineers with the airlines is directly related to airline growth. Airline growth is usually measured by an increase in traffic; i.e., an increase in passenger-miles and an increase in ton-miles of freight. The U.S. scheduled airlines transported more than 280 million passengers in 1978 and produced more than seven billion ton-miles of freight and mail service. The scheduled airlines now account for more than 85 percent of public passenger travel between the nation's cities and 95 percent of the travel between the United States and points overseas. The airlines now fly on an average day a total of 14,000 flights. As air fares have gone down in price, airline traffic has increased. Thus, more pilots are needed. One publication indicated that the airlines would hire 2,500 pilots before the end of 1979. The forecast is for increases in traffic that could exceed 300 million passengers this year; however, the sharp rise in fuel costs provides a note of caution.

#### AIRLINE CO-PILOT OR FIRST OFFICER

Nature of the Work. The Airline Co-Pilot or First Officer assists the captain by monitoring the flight instruments, handling radio communications, watching for air traffic, and taking over the flight controls when directed by the captain.

Working Conditions. Approximately the same as for the airline captain.

Where The Jobs Are. Approximately the same as for the airline captain.

Opportunities for Advancement. Can move up to airline captain.

Outlook For The Future. Approximately the same as for the airline captain.

FLIGHT ENGINEER OR SECOND OFFICER

(The latter title applies when the employee is required to have minimum training as a co-pilot.)

Nature of the Work. The Flight Engineer makes a walk-around inspection of the aircraft, checking approximately 200 items. She or he oversees fueling operations, reviews mechanics' reports, and assists the captain with pre-flight cockpit check. He or she also monitors engines, keeps track of fuel consumption, and the heating, pressurization, hydraulic, electrical and air conditioning systems. Flight engineers or second officers troubleshoot and, if possible, repair faulty equipment in flight, check and maintain aircraft log books, report mechanical difficulties to mechanic crew chief, and make a final post-flight inspection of the aircraft.

Working Conditions. Work schedules are approximately the same as for the other pilot categories.

Where The Jobs Are. Approximately the same as for the airline captain.

Opportunities for Advancement. Can move up to airline co-pilot or first officer.

Outlook For The Future. Approximately the same as for the airline captain.

Opportunities for Training (for all pilots and flight engineers). There are several approaches to acquiring pilot training. The first is through flight instruction at FAA certificated flying schools. The student must be at least 16 years of age and be able to pass a third class medical examination. Courses consist of 40 hours of ground school instruction where students learn the principles of flight, aerial navigation, weather factors, and flight regulations. Flying lessons are conducted in dual controlled aircraft (25 hours dual and 10 hours solo instruction). The instructor judges when the student is ready to take the written and flight examinations which are given by FAA inspectors. Upon successful completion of both exams, she or he earns the private pilot's license which entitles the pilot to fly passengers, but not for hire. The private pilot can then undertake advanced instruction, learn to fly on instruments and earn a commercial pilot's license upon acquiring additional hours of flight experience. These achievements open up numerous pilot careers because now the pilot can fly for hire. Further study and experience could eventually earn him or her the Air Transport Rating to qualify as an airline pilot.

A second method of acquiring flight training is through pilot training in the armed forces. This entails no expense to the student. With some additional study, the military pilot can qualify for numerous civilian pilot jobs upon leaving the service. The military services have been a major source of pilots for the airlines.

Thirdly, a growing number of colleges and universities offer flight training with credit toward a degree. The graduate leaves school with a private or commercial license, and in a few cases, an Air Transport Rating plus a degree.

Helicopter pilots can receive training in the armed forces or at special private FAA certificated helicopter flight schools. Agricultural pilots can receive specialized advanced training at agricultural pilot schools.

Some airlines offer training courses for corporate pilots transitioning to new jet aircraft. The airline's experience in jet flight training makes them particularly well qualified to provide this service to business firms.