My Career by Masuru, Matsumura

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By
Masaru, Matsumura

Senior Problem
Period VII

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Chapter 1
My Career

My career is to be a aeronautical engineering. Ever since when I was small, I was crazy about airplanes. On Sundays, I go down to the airport to watch the planes takeoff and land. One day I stand there half day watching them.

When I was the age of seven, I started to learn to make model airplanes, that fly with rubber bands. It took me couple years to learn to make one. When I made the body good, the wind was always off and when I made the body and wing good, the paper job was all short. That the way I started out. When Christmas or my birthday come along, I always got an airplane model. At the age of ten, I started to make the airplanes so that it will fly. I used to spend many dollars on airplanes. I had to buy rubber, glue, pens, airplane paper, balsawood, airplane dopes {uncertain}, propeller, celluloid, and paint brush and many other things. When I entered junior high school, they had an airplane club and I soon entered. During after school we spend hours making airplane model. We had contest during school but I never took first prize. Whenever there is an airplane move come to our town, I always go see the picture.

All the airplane picture movies I saw was: Test Pilot, Sky Giant, I wanted wings, Dive Bomber, and Don Patrol. Some day I might be an aeronautical engineer.

Chapter – II
Training for Aviation

The Bureau of Air Commerce lists 497 organization and individuals offering flight instruction and ground school training, and 110 universities, colleges and technical schools offering some kind of aeronautical education.

There are many of the "one man flying" school where one veteran pilot operates an aerial taxi service and trains students.

The organized flying school is much like any other college, with formal courses of study, specialist in all subject of ground instruction, pilot instructors who teach beginners and others who handle the advanced student. Some of these flying schools teach drafting and engineering, and their courses are as thorough as could be taught in any college, the graduate receiving degrees and other honors similar to those conferred by the large universities. In some college of the air the work and discipline are as strict as one would find at West Point or Annapolis.

As an aid to the prospective student pilot, and to assist the flying schools in establishing and maintaining standards by which the public can judge their work, the Bureau of Air Commerce has regulations applying to flying schools and a procedure for approving an institution and rating its instructors. These official school approvals are not mandatory. They are voluntary. A school does not have to be approved in order to operate but if it does apply for approval, meets the requirements and is awarded a certificate. In those schools lacking the certificate of the Bureau the student must judge for himself. Many of these school not on the approval list are in fact excellent; but many are equipped to give only limited instruction in many courses.

There are 22 approved flying schools located in 11 states. California, Colorado, Illinois, Indiana, Maryland, Massachusetts, Nebraska, New York, Oklahoma, Oregon, and Texas.

For the neophyte the first step in becoming an airplane pilot is to report to a Bureau of Air Commerce medical examiner for a physical test. There are 600 medical examiners in the United States, each qualified to determine physical fitness for flying.

The examination is thorough, and includes test of your eye, ear, heart, lungs, nervous system and digestive system.

The applicant pays $10 for this examination that and a subsequent fee of $6 when the student has become a pilot and comes up to renew his license are the only cost involved. They are paid to the physicians for professional services, and are not paid to the Bureau. Having qualified as a student the prospective pilot is ready for instruction.

The average course leading to an amateur license requires 10 weeks and costs about $276. The average for a private license is 17 weeks and $505. For the limited commercial license the average is 20 weeks

and the costs is $553. To get a transport pilot license the average course requires a student put in 46 weeks and spend $1,777.

A student is eligible to apply to the Bureau of Air Commerce for an amateur license after 25 hours of solo flying. At 50 hours he may come up for either a private or limited commercial license. After 200 hours he may apply for the transport grade, although the air lines actually require considerably more time before they will even consider an applicant for a job as transport pilot. Then some of the times add a great deal of training before letting the pilot take the controls of a scheduled air liner. There are written examination and flight test for each grade, and they are conducted by the 80 inspectors employed by the Bureau of Air Commerce. They fly about the country visiting airports and carrying on department business, and they are always available within reasonable time.

There were nearly 30,000 active student pilot license at the beginning of 1937.

The Bureau of Air Commerce lists 78 schools training aircraft mechanics. There were more than 80,500 active mechanic license in the United States at the beginning of 1937. Hundred of High schools and elementary grades were teaching some form of aeronautics. Hundred of school student were learning to fly.

The Aeronautical University, Chicago, offers courses for aeronautical engineers, pilot and mechanics. It reported that all graduates in engineering and licensed mechanic's courses had been successful in obtaining desirable position

Calif; a division of United States air lines added two new courses to its curriculum in 1936, a dispatching and meteorology course and sheet metal courses. The former is designed to teach a student the routine of air line operation, so that he can become a dispatcher, and with the advanced knowledge in meteorologist, including air mass analysis, make each dispatcher a meteorology. Shortage of sheet metal worker in aircraft factories led to the latter course, required three months to make a student competent to become a sheet metal apprentice in a factory.

The one year course in the air line mechanic give a basic foundation during the first nine months, with three months specialization in a major phase, or the student may take a 24-month course, which would include four {on the back of this page is an image of a Boeing factory} major subjects during his second year. The air line pilot courses, training co-pilot, gives 350 hours of flying and one or two year of ground instruction. In 1935 the Boeing school started instrument and radio beam flight instruction at the beginning of the students flight training and the results were so good that student are now put under a hood and taught instrument flying at the start. After a few hours in the open cockpit they are soloed, than put pack under the hood for more advanced instrument flying. Boeing school, with 32 full time instructor, had about 200 student in school eight hours a day.

Park Air College, East St, Louis Ill. With faculty of 33 had a student enrolment of 275, including 41 in the professional flight executive school, 16 in the aviation operation and executive school 102 in the master mechanic's flight school and 103 in the engineering school.

Park Air College prepares for air transport service. The college use a fleet of ten planes for training.

The Curtis-Wright Technical Institute at Grand Central Air Terminal, Glendale, Calif specializes in training expert artisans for the industry; and its hundreds of graduates every year are immediately place in jobs among important units of the industry. The Grand Central Flying School, at the same airport, specializes in blind flying training, and for this purpose the student are taught in two planes especially equipped for teaching instrument and radio flight, and also seven other ships for regular flight training, including cross-country and night flying.

The Casey Jones School of Aeronautics, Newark, N.J. specializes in training aeronautical engineers and master mechanics, with a capacity enrollment of 400 students. One of the entrance requirements is a high school diploma. The courses include aeronautical engineering, two years straight through winter and summer tuition $950 master mechanic 14 month straight through winter and summer, tuition $526.

The Ryan school of Aeronautics, San Diego, Calif. reports 100 student including those taking transport pilot and master mechanic courses. Student also have the privilege of purchasing a Ryan plane at the beginning of their training and thus, using their own ship, receive a transport pilot courses for about $300 above the cost of the plane.

Lincoln Airplane Flying School, “where Lindbergh learned to fly”, at Lincoln, Nebr. reported an annual enrollment of 300 students in its pilot and mechanic courses. Students were offered flight training on four types included in the school fleet of 11 machines.

The Spartan School of Aeronautics, Tulsa, Okla. with 18 planes in its training fleet and 12 instructors, offered courses for special transport pilot, with 66 weeks of ground school work and 225 hours of flying; courses for regular transport license taking 12 months a six month limited commercial courses with 50 hours flyting time, a six month private courses with 40 hours flight training and a six or 12 months mechanic course with 15 hours flight training.

The Stewart Technical Trade School, New York City, reported four aviation courses, including aeronautical engineering requiring 14 months Diesel engineering, requiring one year and diesel mechanics four months.

The University of Washington, Seattle, Wash. reported an increase in the number of students enrolled for the course in aeronautical engineering. The University of Virginia, Charlottesville, VA. provided a basic engineering training with optional courses in aeronautics.

The University of Oklahoma, Norman, Okla., gave aeronautics as an optional courses in the school of mechanical engineering, with special emphasis on fuel and lubricant laboratory study and experimentation, and also regular degrees in aeronautical engineering. That university founded the aeronautics fraternity, Tau Omega. The University of Florida , Gainesville, Fla. offered an aeronautical engineering degree courses in its mechanic engineering department. The University of California, Berkeley, Calif. was one of the first to offer regular aeronautical degree courses, and it has a large alumni prominent in the industry, with an average of 70 new students each semester.

New York University, New York City reported the acquisition of new equipment for its aeronautical engineering course, notably a towing basin for testing seaplane and flying boat hulls and pontoons, this augmenting the equipment in the engineering college which as a wind tunnel and other research facilities.

Chapter – III
The Beginnings of Aviation

Leonardo Di Vinci, the {unclear} artist, engineer and soldier, several sketches of flying machine were found, one which resembled the airplane in form, several incorporating wing flapping mechanism, that copied from a bird. In early years of the 1800 century experiments who stalked the first principles of aeronautics were increasingly {illegible}, even before that period all manner of daring mechanical devices and flying gear had been constructed in hope of finding a means of locomotion for man through air.

Montgolfier brothers to complete the first partial balloon design in June 1793. Their 35 foot paper bag inflated with hot air and smoke from burning damp straw, and sailed away from the little French village of Annonay. After learning of the unusual event summoned the Montgolfier to request the demonstration in the Capital. While the brothers were fashioning their second balloon, a Paris physician named Charles, assisted by the Roberts brothers, instrument makers, and sent it aloft inflated with by hydrogen gas in August 1783. A month later, when the elder Montgolfier arrived in Paris and learned of the ascension of the Charles balloon, he decided to surpass his competitors by placing a sheep, a rooster, and a duck as passengers aboard his balloon. This flight from the courtyard at Versailles was successful. Then a young gallant of that day named De Rosier decided to be the first man in the world to make a balloon flight, and in spite of the opposition of King Louis IVI he sailed over Paris in November, 1783 in a balloon of Montgolfier construction while hundreds of Parisians applauded.

Sir George Cayley made an airplane in 1809. It did not fly, but it did embody aeronautical principles have since been proved correct. Thirty years later, Henson built a plane in which he placed a steam engine. A German, Otto Lilienthal, perfected a glider that made a successful flight.

In England the names Pilcher and Maxim were distinguished in experimentation, as were the names Chanute and Montgomery in American. The real progress in aviation began with the accomplishment of the Wright brothers in 1903 when their glider, equipped with a small motor and twin propellers, darted down an improvised track and shot out into the air above the sand dunes at Kitty Hawk. The first flight lasted only a short time and the plane covered but several hundred feet. Nevertheless the first flight of man in heavier-than-air craft, equipped with motor, was successful. On October 5, 1905, a plan flown by one of the brothers covered a distance of twenty four miles at a speed of thirty eight miles per hour.

The year 1908 covered a period when aviation was conserved for the first time by the public as worth the notice. Aeronautics at the time and for a number of years following was looked upon as dangerous

and thrilling. Daring bid men and women spent their time stunt-flying for the benefit of critical onlookers.

From 1910 until the World War many notable flights were made. The first airplane exposition was held at Brussels in 1910.

During this period a number of aviation meets were held in this country where daring stunt and {Image of early Bleriot monoplane – 1911 on back of page} endurance-flight records were made. Glenn Curtis, a pioneer in aviation, flew from Albany to New York in two hours and fifty minutes. During 1911 the speed of air flight was increase and new altitude records were made. The first night flight was done by P.C. Hamilton, C.P. Rodgers completed the first flight across the continent from Long Island to Los Angeles, making many stops along the wand to arriving in Los Angeles after considerable hardship and in 1911 a plane carried mail a short distance on a trial flight.

Chapter – IV
Different Kind of Planes

{Image of Consolidated Model 29}
Consolidated Model 29

Type:	36 or 62 plane. Closed, sea, monoplane
Dimensions:	Length, 69 ft, 3 in Height, 25 ft, 4 in Span 115 ft
Weights:	Gross weight loaded 65,000 lbs. Wing loading 36.5 lb per sq ft power loading 13.5 lb per H.P.
Performance:	Level flight (high speed) 226 M.P.H. at 7800 ft. Cruising speed 210 M.P.H. at 75% power at 10,000 ft. Stalling speed (landing) 70 M.P.H. Climb at sea level 690 ft 1st min. Service celing 18,000 ft. Maximum range 5200 mile.
Construction:	Wing, cantilever, skin stressed, all metal, fuselage monoroque, aluminum alloy. Empennage, aluminum alloy, full cantilever.
Standard Equipment:	flight instruments full compliment; engineer instrument, full compliment

{Image of Boeing 307-B Stratoliner}
Boeing 307-B Stratoliner

Type:	38 place, closed, land, monoplane.
Dimensions:	Length overall, 74 ft, 4 in. Height overall, 20 ft, 9.5 in. Span, 107 ft 3 in.

Areas: Wing, 1486 sq ft.

Weights: Empty, 30,000 lbs. Useful load 15,000 lbs. Gross weight loaded, 45,000 lbs. Wing loading 30.2 lbs per sq ft. Power loading 12.5 lb per H.P.

Power Plant: Wright GR-1820-G105A Cyclones, four (1100 H.P. each). Engine limits, normal rating 900 H.P. at 6,7000 ft. Maximum of 1100 H.P. available for take off.

Performance: Placard speeds: Level flight (high speed) 250 M.P.H. at 16,200 ft; cruising speed, 222 M.P.H. at 19,0-00 ft; stalling speed (landing) with flaps, 70 M.P.H.; Climb at sea level, 1200 ft first min. Usable ceiling 24,000 ft; Maximum range 2340 mi with {illegible} pay load.

{Image of Douglas DC-5}
Douglas DC-5

Type: 19-25 place, closed, land, light wing, monoplane.

Dimensions: Length, 62 ft, 2 in. Height 19 ft, 10 in. Span 78 ft.

Areas: Wing (incl. ailerons), 823.6 sq ft. Ailerons, 78.6 sq ft. Rudder, 35.5 sq ft. Fin, 38.6 sq ft. Elevators, 75.4 sq ft. Stabilizers, 71.2 sq ft. Flaps, 92 sq ft.

Weights: Empty, 14,555 lbs. Useful load, 6445 lbs. Maximum pay load, 3660 lbs with gas load of 355 gals and oil load of 18 gals. Pay load, 2370 lbs. Gross weight loaded, 21,000 lbs. Wing loading of 25.5 lbs per sq ft. Power loading 11.7 lbs per H.P.

Power Plant: 2 Wright Cyclone Model GR1820-G102A. Engine limits (maximum except takeoff) 900 H.P. at 6700 ft, 34. 4 ft.

Performance: Speed: level flight (high speed) 225 M.P.H.; cruising speed, 197 M.P.H. at 10,000 ft; with flaps extended, 130 M.P.H.; stalling speed (landing) with flaps, 65 M.P.H.; stalling speed (landing) without flaps 78 M.P.H. Climb at sea level, 1300 ft first min. Usable ceiling, 21,900 ft. Maximum range with 550 gals of gas, 1400 mi, at 65% power, 1130 min.

{Image of unspecified plane}
Type: 2-place, closed, land, monoplane

Dimensions: Length overall, 23 ft, 7.125 in. Height overall, 7 ft 8 in. Span, 35 ft, 7.125 in.

Areas: Wing (incl. ailerons), 185 sq. ft. Ailerons, 13.02 sq. ft. Rudder, 10.9 sq ft. Fin, 12.58 sq ft. Elevators, 17.12 sq ft. Stabilizers 21.2 sq ft. Flaps 22.7 sq ft.

Weights: Empty 2014 lbs. Useful load 585 lbs. Maximum pay load 190 lbs, with maximum gas load of 34 gals and 4 gals of oil. Gross weight loaded 2600 lbs. Wing loading 14.05 lb per sq ft. Power loading 17.94 lb per H.P.

Power Plant: 1 Warner Super Scarab 165-D, 165 H.P. Engine limits (maximum except takeoff) 165 H.P. at sea level, 2100 R.P.M. Maximum of 175 H.P. available for takeoff.

Performance: Placard speed; level flight (high speed) 163 M.P.H. Cruising speed, 145 M.P.H. Placard speed with flaps extended, 105 M.P.H. stalling speed (landing) with flaps 56 M.P.H. Climb at sea level, 700 ft first min.

{Image Johansen JA-3}

Johansen JA-3

Type: 2-place, closed, land, monoplane

Dimensions: Length overall, 26 ft 9 in. Height overall 6 ft, 8 in. Span, 36 ft.

Areas: Wing 185 sq ft. Aileron, 16 sq ft. Rudder 6.8 sq ft. Fin 6.0 sq ft. Elevators 12.5 sq ft. Stabilizers 20.0 sq ft.

Weights: Empty 700 lbs. Useful load 525 lbs. Maximum payload 257 lbs with gas load of 15 gals and oil load of 1 gal. Gross weight loaded 1225 lbs.

Power Plant: 1 Lycoming O-145-B1 or B2. Engine limits (maximum except takeoff) 65 H.P at sea level at 2550 R.P.M. Maximum of 65 H.P. available for takeoff.

Performance: Speed: level flight (high speed0 108 M.P.H. Cruising speed 96 M.P.H. Stalling speed (landing) 39 M.P.H. Climbing at sea level, 680 ft first min. Usable ceiling 15,000 ft.

{Image of Kellett KD -1B}

Kellett KD-1B

Type: 1-plane, closed, land, antagiro

Dimensions: Length, 28 ft. 10 in. Height 10 ft. 3 in. Rotor span, 40 ft

Areas: Blade area, 55.2 sq ft. Fudder, 3.2 sq ft. Fin 12 sq ft. Stabilizers, 22 sq ft.

Weights: Empty, 1630 lbs. Useful load, 620 lbs. Maximum pay load, 300 lbs with gas load of 30 gals and oil loads 4 gals. Gross weight loaded, 2250 lbs.

Power Plant: Jacob L4MA. Engine limits(maximum except takeoff), 225 H.P. at sea level.

Performance: Placard speed: level flight (high speed) 127 M.P.H. cruising speed, 102 M.P.H. Stalling speed (landing) 0. Climb at sea level 1060 ft first min. Usable ceiling, 14,000 ft.

Construction: Rotors, NACA 2300 series, airfoil section, wood frame, fabrice covered, steel spar. Fuselage, tubular steel, fabric covered, landing gear, non-retractable tread, 144.5 in.

{Image of Lockheed Lodestar – 18}

Lockheed Lodestar – 18

Type: 17-plane, closed, land, monoplane

Dimensions: Length overall, 49 ft, 9.87 in. Height overall, 11 ft 10.5 in. Span, 65 ft, 6 in.

Areas: Wing (incl. ailerons): 551 sq ft. Ailerons, 35 sq ft. Rudders 34.8 sq. ft. Fin 29.3 sq ft. Elevators, 40.4 sq. ft. Stabilizers 93.6 sq ft. Flaps, 107.5 sq ft.

Weights: Empty, 11,632 lbs. Useful load, 6868 lbs. Maximum pay load, 4268 lbs. When gas load of 325 gal and oil load of 24 gals. Payload, 2234 lb. Wing load 33.50 lbs per sq ft.

Power Plant: Two Wright G.P. 1820-G 102A Engine limits (maximum except takeoff), 450 H.P. each at 67,000 ft 35.4 in Hg. Manifold pressure, 2300 R.P.M. Maximum of 550 H.P. each available for takeoff. Fuel capacity 644 gals. Oil capacity, 40 gals.

pg 24 {Image of “Mustang”}

pg 25 {Image of TBF “Avenger”}

pg 26 {Image of with wing fold T.B.F.}

pg 27 {Image of Grumman “Goose”}

pg 28 {Image of PBY drops a torpedo, Image of BPY patrol planes}

pg 29 {Image of P.B.M.}

pg 30 {Image of Glider}

pg 31 {Image of P-38, Image of Navy P.B.Y. Flying Boat}

pg 32 {Image of Curtis X503C-1}