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DEPARTMENT OF COMMERCE
AERONAUTICS BRANCH

INFORMATION BULLETIN NO. 7

AIR COMMERCE REGULATIONS

Effective as amended June 1, 1928



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON
1928

629.13

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no. 7,

CONTENTS

	Page
Chapter 1. Licensing of aircraft.....	1
Chapter 2. Inspection of aircraft.....	15
Chapter 3. Operation of aircraft.....	17
Chapter 4. Marking of licensed and unlicensed aircraft.....	19
Chapter 5. Licensing of pilots.....	22
Chapter 6. Licensing of mechanics.....	28
Chapter 7. Air-traffic rules.....	30
Chapter 8. Miscellaneous.....	34
Index.....	35

AIR COMMERCE REGULATIONS

CHAPTER 1

LICENSING OF AIRCRAFT

Section 1. Licensing Law.

“*Air commerce*’ means transportation in whole or in part by aircraft of persons or property for hire, navigation of aircraft in furtherance of a business, or navigation of aircraft from one place to another for operation in the conduct of a business.” (Sec. 1, air commerce act of 1926.)

“*Interstate or foreign air commerce*’ means air commerce between any State, Territory, or possession, or the District of Columbia, and any place outside thereof; or between points within the same State, Territory, or possession, or the District of Columbia, but through the air space over any place outside thereof, or wholly within the air space over any Territory or possession, or the District of Columbia.” (Sec. 1.)

“The Secretary of Commerce shall, by regulation * * * provide for the granting of registration to aircraft eligible for registration, if the owner requests such registration * * *.” (Sec. 3 (a).)

“It shall be unlawful * * * to navigate any aircraft * * * in interstate or foreign air commerce unless such aircraft is registered as an aircraft of the United States.” (Sec. 11 (a) (2).)

“To navigate any aircraft registered as an aircraft of the United States * * * without an aircraft certificate, or in violation of the terms of any such certificate.” (Sec. 11 (a) (3).)

“Any person who (1) violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of \$500 * * *.” (Sec. 11 (b).)

Aircraft means “any contrivance now known or hereafter invented, used, or designed for navigation of or flight in the air, except a parachute or other contrivance designed for such navigation but used primarily as safety equipment.” (Sec. 9 (c).)

Aircraft of the United States means “any aircraft registered” under the air commerce act. (Sec. 9 (f).)

Sec. 2. Application of the Law.

Aircraft must be licensed before engaging in—

(A) *Carrying persons or property for hire, or the United States mails—*

(1) Between two or more States, or to or from foreign countries, as from Chicago to Cleveland, Ohio, or from New York to Portland, Me., to Montreal, Canada.

(2) Between two points in one State if a part of the flight is over another State, as from Buffalo to New York via Susquehanna, Pa.; or

from Buffalo, thence over any part of Pennsylvania, and thence back to Buffalo.

(3) Between two points in one State if it is a part of a through carriage between points in different States, or countries, as from Los Angeles to San Francisco, Calif., as a part of the carriage between Los Angeles and Seattle, Wash., or from San Antonio, Tex., to Laredo, Tex., as a part of the carriage between San Antonio and Monterey, Mexico.

(4) Within the air space over the District of Columbia, or any Territory or possession of the United States.

(B) Aircraft used solely for pleasure or noncommercial purposes need not be licensed, although engaged in flying between States, but, at the option of the owner, may be licensed, in which event it must observe all the requirements of licensed aircraft. Whether licensed or not, all aircraft must display the assigned identification mark.

Sec. 3. Aircraft Belonging to the United States.

Aircraft belonging to the United States will be licensed by the Secretary of Commerce if the operating agency so requests.

Sec. 4. Aircraft Belonging to States, etc.

Aircraft belonging to States, Territories, or possessions of the United States, or to political subdivisions thereof, will be licensed by the Secretary of Commerce and rated as to airworthiness in the same manner as other craft if request for licensing is made and such aircraft are used exclusively in the governmental service.

Sec. 5. Foreign Aircraft.

(A) Where civil aircraft of the United States are permitted to fly in or over a foreign country without registration and rating and licensing of their airmen, the aircraft of such foreign country, not a part of its armed forces, and the airmen serving in connection therewith, may operate without a license in the territory over which the United States has jurisdiction. Such foreign aircraft shall not engage in interstate or intrastate air commerce and must observe the air-traffic rules.

(B) Aircraft owned by resident aliens will be granted identification marks but shall not engage in interstate or intrastate air commerce.

(C) Registered aircraft of the United States shall not be flown or operated in air commerce in the United States or its possessions, by, or in behalf of any individual, partnership, firm, or corporation not eligible to license for such registered aircraft.

Sec. 6. Requisites of Licensing and Registration.

An aircraft, to be entitled to license and registry, must be airworthy and equipped in accordance with requirements of the Secretary of Commerce and owned by—

(A) A citizen of the United States and not registered under the laws of any foreign country; or

(B) A partnership of which each member is a citizen of the United States; or

(C) A corporation organized under the laws of the United States, a State, Territory, or possession of the United States, and of which the president and at least two-thirds of the directors or managing

officers are citizens of the United States, and of which at least 51 per cent of the voting interest in the corporation is controlled by citizens of the United States; or

(D) The Government of the United States, a State, Territory, or possession, or a political subdivision thereof.

Sec. 7. Registration, Meaning of.

Registration means entry of licensed aircraft in an official license registry of the Secretary of Commerce as aircraft of the United States. Unlicensed aircraft, though entered of record for purposes of identification as required by law, are not registered aircraft within the meaning of these regulations.

Sec. 8. Airworthiness, Law of.

*"The Secretary of Commerce shall by regulation * * * provide for the rating of aircraft of the United States as to their airworthiness * * *. The Secretary may, from time to time, rerate aircraft as to their airworthiness upon the basis of information obtained under this subdivision." (Sec. 3 (b).)*

*"It shall be unlawful * * * to navigate any aircraft registered as an aircraft of the United States without an aircraft certificate or in violation of the terms of any such certificate." (Sec. 11 (a) (3).)*

*"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of \$500." (Sec. 11 (b).)*

Sec. 9. Airworthiness, Meaning of.

Airworthiness means a condition meeting the minimum aircraft requirements as set forth herein.

Sec. 10. Airworthiness Requirements.

(A) AIRWORTHINESS FACTORS.—In determining the airworthiness of airplanes the following factors are taken into consideration:

(1) The structural strength of wings, ailerons, tail surfaces, fuselage including engine mount, fittings, control system, and landing gear, as shown by stress analyses.

(2) Cockpit, cabin, and control arrangements.

(3) Power plant and power-plant installation.

(4) Equipment and instruments.

(5) Propellers.

(6) Design of fittings.

(7) Materials and workmanship.

(8) Flying characteristics and qualities.

Certain of these items may be demonstrated by theoretical analyses and drawings, others by visual inspection, and others by tests.

(B) LOAD-FACTOR REQUIREMENTS.—The load-factor requirements for the structural members of an airplane shall be determined as follows:

(1) *Flying conditions.*—Figure 1 hereof, and hereby made a part of these regulations, shall be used to determine the load factors for the high angle of attack condition of landplanes and float-type seaplanes. Reference shall be made to it and the factor obtained for the appropriate weight and horsepower loading, the factors for gross weights which lie between 2,500 and 12,500 pounds being determined by interpolation between the appropriate curves. For multi-engined

airplanes the horsepower to be used for computing the loading in pounds per horsepower shall be that necessary to maintain level flight with full load at sea level. For flying boats and amphibians of 5,000 pounds gross weight or less the factor for 5,000 pounds shall be used; for gross weights in excess of 5,000 pounds the factors shall be those indicated by the actual weight and power loading.

In the low angle of attack condition the load factor shall be 65 per cent of the high angle of attack factor, but in no case less than 3.

For the inverted-flight and nose-dive conditions the load factor shall be 40 per cent of the high angle of attack factor, but in no case less than 2.

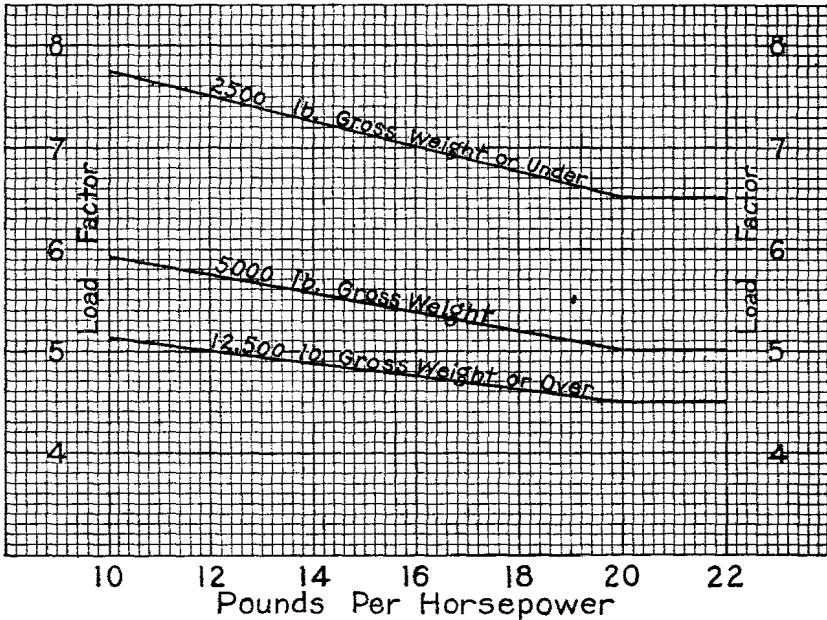


FIG. 1.—Load factors—High angle of attack

For flying boats and amphibians of 5,000 pounds gross weight or less, use the 5,000-pound gross weight factors. Horsepower loading shall be based on rated engine horsepower except that for multi-engined airplanes the horsepower shall be taken as that necessary to maintain level flight with full load.

NOTE.—It is to be noted that the load factors given in this chart are not sufficiently high to conform to the international requirements throughout the entire range of horsepower loading. Manufacturers designing airplanes for export should take into account the load factors and design requirements of the country to which the airplane is to be exported.

(2) *Landing conditions.*—The load-factor requirements for landing conditions shall be obtained from Table 1. If the landing gear is designed to absorb landing shocks by the flow of a liquid through an orifice (the oleo or oleo-pneumatic type), the design load factors for the landing gear may be reduced by not more than 25 per cent from those shown in Table 1, but suitable provision shall be made to carry taxiing shocks after the absorber has been forced to the full extent of its travel.

For float seaplanes the floats and the members to which they are attached, including the "carry-through" tubes in the fuselage, shall be designed for a factor in landing of 8.0.

The shock absorber in the chassis of a landplane or amphibian shall be designed to absorb the energy generated by a free drop of the airplane from the height specified in Table 1 without subjecting the airplane or landing gear to forces greater than those corresponding to the load factors for landing.

The tail-skid shock absorber shall be designed to resist a free drop in the three-point landing attitude equal to that shown in Table 1 without imposing loads on the tail skid or fuselage greater than those corresponding to the load factors for landing.

(3) *Tail surfaces and ailerons.*—Tail surfaces and ailerons shall be designed to withstand the loads specified in Table 1.

TABLE 1

Class	Factor for landing conditions	Height of free drop for design of shock absorber (inches)	Loads per square foot on ailerons and horizontal tail surfaces	Vertical tail surfaces
2,500-pound or less.....	6.5	24	30	} 75 per cent of load required on horizontal surfaces.
5,000-pound.....	5.5	22	25	
12,500-pound.....	5.0	20	20	
12,500-pound or over.....	4.5	18	20	

(4) *Seaplane floats and boat hulls.*—Flying-boat and seaplane-float bottoms shall be designed to withstand, without permanent set, the following loads:

(a) Eight pounds per square inch over that portion of the hull lying between the first step and a section 25 per cent of the distance from the step to the bow; (b) 4 pounds per square inch from that section to a section at 75 per cent of the distance from the step to the bow; (c) 4 pounds per square inch between the first and second steps; and (d) 4 pounds per square inch between the rear step and a section 50 per cent of the distance to the stern. If but one step is used, this load shall extend over that portion of the hull between the step and a section 50 per cent of the distance from the step to the stern.

The submerged displacement of the main floats shall be at least 190 per cent of the full load of the airplane. Main floats shall be divided into at least five water-tight compartments.

In designing the bow portion of the hull due attention must be paid to the effect of striking floating objects.

(C) CONTROL SYSTEM.—The control system shall be designed to withstand a load of at least 300 pounds in a fore-and-aft direction and 150 pounds in a lateral direction applied at the grip on a stick control; on a wheel control it shall withstand at least 300 pounds in a fore-and-aft direction applied at the center of the wheel and a couple equal to 125 pounds times the diameter of the wheel applied tangent to the rim of the wheel. The rudder controls shall be designed to withstand a load of not less than 300 pounds applied at the point of contact with the foot. On airplanes having a gross weight of 1,000 pounds or less, two-thirds of the above values may be used. In any case, the strength of the control system shall be sufficient to withstand loads on the control surfaces 25 per cent greater than those specified in Table 1 for the design of the surfaces. The

entire control system shall be so designed that the rudder, elevators, ailerons, and other movable parts thereof will not jam, and, if necessary, control stops shall be provided to prevent it.

Dual controls on airplanes carrying passengers for hire shall be so constructed or arranged as to prevent passengers from interfering with the course of flight of the airplane.

(D) CONSTRUCTION OF COCKPIT AND CABIN.—The cockpit or cabin shall be constructed to afford suitable ventilation, adequate vision to pilot under normal flying requirements, and reasonable protection to pilot and passengers against possible propeller breakage.

Closed cabins of airplanes carrying passengers for hire shall have not less than two exits, affording maximum ease of operation. One of such exits may be an emergency exit, in which case the size, location, and method of operation shall be subject to the approval of the Secretary of Commerce.

(E) POWER-PLANT REQUIREMENTS.—Engines which have passed the regular endurance tests of the United States Army Air Corps or the United States Navy Bureau of Aeronautics will be approved by the Department of Commerce. Other engines submitted for approval will be tested by the Department of Commerce at the Bureau of Standards.

The log shall include the following:

Piston displacement, compression ratio, type of ignition, carburetor and spark plugs; barometric reading and complete list of instruments and apparatus used for the test. The length of brake arm and gear ratio if propeller is geared shall also be given. The test shall be such as to develop the following data:

(1) A plot of power developed at various revolutions per minute with the throttle wide open.

(2) Record of log showing readings, at approximately 30-minute intervals, of—

- (a) Revolutions per minute.
- (b) Brake load in pounds.
- (c) Oil pressure and temperatures.
- (d) Water temperatures.
- (e) Air temperature at carburetor intake.
- (f) Blast velocity.
- (g) Maximum cylinder temperature, head and barrel.
- (h) Manifold depression in inches of mercury.
- (i) Fuel time in seconds for at least 5 pounds.
- (j) Oil in pounds.
- (k) Brake horsepower.
- (l) Remarks, including breakages and replacements.

The 50-hour endurance test shall be run in 10 five-hour periods. During the first 5 hours the engine shall be run with the throttle wide open, the speed being at least equal to the rated speed and the power being at least 10 per cent in excess of the rated power. During the remaining 45 hours the engine shall be run at approximately rated speed and the horsepower developed should at no time be less than the rated horsepower.

(3) Photographs showing set-up of the testing apparatus used and of any parts which failed or showed excessive wear.

(4) List of instruments and apparatus used.

(5) After completion of the test, and a complete tear down, a report of detailed inspection of engine parts, particular attention to be paid to excessive wear and signs of failure.

An engine, after successfully passing the required block tests, shall be installed in an airplane and given actual service tests.

A newly constructed engine of a type and design which has been tested in accordance with the provisions hereof must not be installed in an airplane until bench tested for at least two hours, during at least one-half hour of which the engine must be run at full throttle.

An engine which has been in storage for more than one year must not be installed in an airplane until it has been reconditioned in accordance with accepted safety practices.

A reconditioned engine must be run for at least 20 minutes at full throttle before it shall be used in propelling registered aircraft carrying persons or property for hire.

(F) **POWER-PLANT INSTALLATION.**—With water-cooled engine installation a fire wall of terneplate, galvanized steel, asbestos-aluminum combination, or equivalent thereof, shall be installed, insulating the engine section from other parts of the airplane. Aluminum or aluminum-alloy fire walls will be satisfactory for air-cooled engine installations. Openings made in the fire wall to allow the passage of pipes or wires shall be provided with suitable glands or gaskets.

Carburetor air intakes must open outside the cowling and shall be suitably drained. Exhaust manifolds shall be installed outside of cowling unless specifically authorized by the Secretary of Commerce.

Throttle-control and ignition switches on multi-engined airplanes shall be arranged to permit separate and simultaneous control.

Suitable ventilation shall be provided for the engine compartments.

Air-pressure gasoline-feed systems shall not be used without approval of the department.

Airplanes carrying passengers for hire shall have installed an adequate reserve-gasoline supply tank, or satisfactory, reliable apparatus for indicating to the pilot a depletion of the gasoline supply.

(G) **PROPELLERS.**—Propellers which satisfy any of the following requirements will be acceptable:

(1) Designs from which a propeller has been flown for 150 hours without failure on an engine of equal or greater power than that for which the approved rating is sought. Affidavit specifying the number of hours of satisfactory service on a given engine and aircraft, the name of the operator, operating firm, and other pertinent data shall be forwarded to the Secretary of Commerce, together with detailed drawings of the propeller.

(2) Designs which embody only minor modifications from propellers accepted and used by the United States Army or Navy, the contractor to state specifically the departure, if any, from Government design.

(3) Designs which are approved designs, cut down to smaller diameters without reduction of the maximum ordinates, except in the immediate neighborhood of the tip.

Propellers not in accordance with the foregoing shall be tested in the manner prescribed by the Secretary of Commerce.

Propellers must have a ground clearance of at least 6 inches when the airplane is in a horizontal position.

On multi-engined airplanes a clearance of at least 1 inch must be provided between the tips of the propellers and the fuselage or any part of the structure.

The seats shall be so arranged that pilots and passengers are more than 12 inches forward or aft of the propeller disks. Surfaces near the propeller tips must be suitably stiffened against vibration.

(H) PERFORMANCE REQUIREMENTS.—(1) The following flight tests with the design gross load shall be required:

(a) General flight, which includes a half-hour flight test with full load, to determine stability.

(b) General maneuverability, which includes, among other things, a flight with full load around two pylons or buoys 1,500 feet apart, making five successive figure 8's at 1,000 feet without varying more than 200 feet in height in a radius not to exceed the following:

Five hundred feet for airplanes of full load not in excess of 5,000 pounds.

Seven hundred and fifty feet for airplanes of full load over 5,000 pounds and not in excess of 12,500 pounds.

One thousand feet for all other airplanes.

(2) The landing speed shall not exceed 60 miles per hour when the airplane is provided with a braking device, or 50 miles per hour when not so provided. Landing speed may be assumed equal to the calculated stalling speed. If the foregoing landing speeds are exceeded, the following flight tests with full load shall be required:

(a) Take-off within 1,500 feet.

(b) Climb at least 250 feet the first minute after taking off.

(c) Land, coming to a full stop without external aid, within 1,000 feet from the point where the landing gear first touches the landing area.

(3) Tests are to be calculated upon the basis of air of a specific weight of 0.07635 and still-air conditions.

(4) The applicant must provide the person to make the flight tests, but an inspector from the Department of Commerce may pilot the airplane during such parts of the tests as may be deemed necessary.

(5) No persons other than the crew necessary to conduct the flight shall be carried during performance tests. Sand or similar ballast shall be carried as a substitute for the passengers or cargo ordinarily carried as pay load.

(I) EQUIPMENT AND INSTRUMENT REQUIREMENTS.—The equipment and instruments required, which must be serviceable and in operating condition, are:

(1) *Equipment.*—(a) Fire-extinguishing equipment, of design approved by the Secretary of Commerce. Cabin airplanes carrying passengers for hire must be equipped with at least one portable extinguisher accessible to the passengers.

(b) First-aid kits on airplanes carrying passengers for hire.

(c) Safety belts or equivalent apparatus for pilots and passengers in open-cockpit airplanes carrying passengers for hire. Seats or chairs in cabin planes shall be firmly secured in place.

(d) Electrical equipment and installation must be approved by the Secretary of Commerce.

(2) *Instruments.*—(a) Tachometer for each engine.

(b) Oil-pressure gauge where oil-pressure systems are employed.

(c) Water thermometer for water-cooled engines and oil thermometer for air-cooled engines.

(d) Altimeter.

(3) *Compass requirements.*—An airplane flying cross country 100 or more miles and an airplane, including a seaplane, operating over large bodies of water beyond the sight of land must be equipped with a compass.

(J) **MANUFACTURER'S IDENTIFICATION DATA.**—(1) The date of manufacture or date of remodeling and the name of the manufacturer or remodeler, together with the manufacturer's serial number and type of engine, must be permanently affixed in a visible location by means of a metal plate in the pilot's cockpit or compartment, of each airplane, in order that it may be distinguished from all other aircraft.

(2) The following specifications shall be stenciled or otherwise displayed on the outside of the fuselage or cabin at a point adjacent to the entrance into the cockpit or cabin in such manner as to be readily visible to persons proposing to enter the same: Over-all span; over-all length; weight empty; useful load; gross weight; seating capacity, exclusive of crew; gasoline capacity; oil capacity.

(3) Upon airplanes manufactured under an approved type certificate the manufacturer thereof may display the insignia shown herewith, in conjunction with the above data required to be stenciled on the airplane.

DOE AIRCRAFT MFG. CO., INC.		
		
Overall span	Ft.	In.
Overall length.....	Ft.	In.
Weight empty.....	Lbs.	
Useful load.....	Lbs.	
Gross weight.....	Lbs.	
Seating capacity exclusive of crew.....	Persons	
Gasoline capacity.....	Gals.	
Oil capacity.....	Gals.	

FIG. 2

The insignia, if used, shall be 16 inches in width and 3 inches in height and shall be identical with that shown except that the name of the manufacturer shall appear above it in the manner indicated, and the number of the approved type certificate under which the identical airplane was manufactured shall appear in the circle thereof. The stenciled data shall appear under it in the manner and proportion shown. This insignia shall only be used on airplanes for which application for license has been made, or for which license

has been issued, and must be obliterated in the event the airplane is subsequently disapproved for license.

Sec. 11. Approved Type Certificate, Requirements for.

(A) APPLICATION.—A manufacturer of airplanes, engines, or propellers in quantities and of an exact similarity of type, structure, materials, assembly, and workmanship may, at the option of the manufacturer, file with the Secretary of Commerce an application under oath for an approved type certificate accompanied by the data specified, in duplicate. The design or test data must bear the signature of the responsible engineer.

(B) AIRPLANES.—In order to represent the structure of an airplane satisfactorily the data submitted shall include—

(1) A general assembly drawing of each wing, with the sizes and locations of spars, drag struts, drag wires, leading edge, trailing edge, and members supporting the ailerons and controls clearly indicated.

(2) Drawings of a typical rib, showing method of attachment to the spars and leading edge.

(3) Line diagrams of the external wing bracing, showing truss dimensions, sizes of struts, and wires.

(4) Layout of the fuselage structure, showing sizes of all members of the primary structure.

(5) Drawings of the tail surfaces, showing sizes of spars, torque tubes, internal and external braces, location of hinges, and masts.

(6) Chassis drawings giving a layout of the landing gear that shows sizes of struts, axle, bracing wires, shock-absorber spindles, spreader tubes, and other important members and the method of connecting them. Drawings of the tail skid, showing the skid, its connection to the main fuselage structure, and the method of steering it, if any.

(7) For seaplanes, drawings of the floats, showing their lines, general dimensions, and a layout showing sizes of struts and wires and method of attachment to the fuselage.

(8) Detail drawings of the mechanisms used to adjust the stabilizer, fin, wing flaps, or similar surfaces while in flight.

(9) Drawings showing the main wing fittings and the control system are required. The analyses must cover the investigation of the strength of the main members of the wings, tail surfaces, landing gear, including tail skids, fuselage, fittings, and control systems for the load factors required in section 10. The analysis of secondary members carrying heavy loads and the investigation of main members subjected to eccentric loads are required.

(10) Stress analysis of the control surfaces and control systems may be supplanted by tests made on these units, assembled as in flight, if the tests show that the unit will carry 125 per cent of the design load, and if the stick, rudder bar, etc., withstand the loads specified in section 10 (C).

(11) The stress analysis shall state the material used for members, whether or not it is heat-treated, and what physical properties are guaranteed, not assumed, by the manufacturer. If metal members of special design are used, test data showing their strength properties under loads similar to those to which they will be subjected in the structure must be submitted.

(C) ENGINES.—Data on engines, showing that the requirements of section 10 (E) and (F) have been complied with, and a complete set of drawings, must be submitted in duplicate by the engine manufacturer when applying for an approved type certificate.

(D) PROPELLERS.—Data on propellers, specified in section 10 (G), and a complete set of drawings must be submitted in duplicate by the propeller manufacturer when applying for an approved type certificate.

(E) INSPECTION AND FLIGHT TESTS OF AIRPLANES.—If the submitted design is approved and the aircraft meets the requirements stated herein, it will be inspected for exact similarity with the submitted design and specifications. Upon passing such inspection, the airplane must undergo the flight tests prescribed in section 10 (H). If such tests are passed, an approved type certificate will be issued to the manufacturer.

(F) CONSTRUCTION UNDER APPROVED TYPE CERTIFICATE.—The approved type certificate will be issued upon the condition that each quarter the manufacturer will file his affidavit with the Secretary of Commerce, showing the number of airplanes, engines, or propellers constructed under the approved type certificate during the quarter, with a statement that no airplane, engine, or propeller is being constructed, under such certificate, deviating from the terms thereof.

(G) CHANGES.—Changes in airplanes constructed under an approved type certificate are permissible, with the approval of the Secretary of Commerce.

(H) MANUFACTURER'S AFFIDAVIT.—Upon the sale by the manufacturer of airplanes of an exact similarity of type, structure, materials, assembly, and workmanship with the specimen for which the approved type certificate is issued, the manufacturer may deliver to the purchaser a manufacturer's affidavit, copies of which will be furnished the manufacturer upon request.

Sec. 12. Application for Aircraft License.

Before an aircraft license will be issued, the owner must file, under oath, with the Secretary of Commerce, an application for the license upon blanks provided by the Secretary of Commerce. Copies thereof will be forwarded upon request.

Sec. 13. Licensing and Expediting the Licensing of Approved Type Airplanes.

(A) For the purpose of expediting the licensing of airplanes constructed under approved type certificates and in the original possession of the manufacturer or dealer, the following provisions may be invoked, at the option of the manufacturer or dealer. The manufacturer or dealer may present the manufacturer's affidavit showing that the aircraft is exactly similar to the specimen of the approved type and have the airplane flight tested. If the flight tests prescribed in section 10 are passed and the aircraft inspector finds that the airplane is exactly similar to the specimen, a flight certificate will be issued for such airplane, good for 90 days after date and renewable for 90-day periods upon findings of the Secretary of Commerce that the airplane is in substantially the same condition as when the original certificate was issued. The manufacturer's affidavit and the flight certificate may be delivered to any purchaser

and will be given such effect as is provided therefor in paragraph (B) of this section.

(B) An airplane constructed under an approved type certificate and in the possession of and owned by an eligible owner of aircraft of the United States will be licensed as follows:

(1) If the application is accompanied by the manufacturer's affidavit, the airplane will be inspected for similarity to the specimen and will be given the flight tests prescribed in section 10. If such inspections and tests are passed and the airplane is found to be equipped as required by these regulations, it will be licensed.

(2) If the application is accompanied by both the manufacturer's affidavit and a valid flight certificate, it will be licensed if found to be equipped as required by these regulations.

(3) If the application is not accompanied by the manufacturer's affidavit and the flight certificate, it will be licensed under the provision of section 14 hereof.

Sec. 14. Licensing of Airplanes not Constructed under Approved Type Certificates.

(A) For an airplane constructed after October 1, 1927, and not manufactured under approved type certificate, the application for the license must be accompanied by the information specified in the requirements for approved type certificate.

(B) *Tests.*—(1) For an airplane constructed after October 1, 1927, in conformity to the airworthiness requirements of these regulations and which passes the flight tests specified in section 10, an aircraft license will be issued by the Secretary of Commerce.

(2) For airplanes constructed prior to October 1, 1927, and found by the Secretary of Commerce to be of proper design, assembly, and workmanship, and of suitable materials and equipped in accordance with these regulations, aircraft licenses will be issued after such airplanes have passed the flight tests specified in section 10.

Sec. 15. Licensing of Special Classes of Airplanes.

Racing and experimental airplanes and airplanes of unusual design will be granted special aircraft licenses, and other aircraft may be specially licensed for other purposes and shall be operated only in accordance with the conditions specified in such licenses.

Sec. 16. Places for Airworthiness Tests.

The Secretary of Commerce will fix the time and place for all inspections and tests for airworthiness.

Sec. 17. Licenses—Contents.

Aircraft licenses will be issued for a period of not exceeding one year and will identify the airplane, specify the authorized type of the engine and the authorized gross weight, and will be granted subject to compliance with these regulations.

Sec. 18. Sale of Licensed Aircraft.

On the date of sale or transfer of title of licensed aircraft the vendor shall report in writing to the Secretary of Commerce the date and place of sale or transfer, and the name and residence of the vendee, and on said date return to the Secretary of Commerce the aircraft license and the metal plate furnished by the Secretary of Commerce.

If the sale is to an ineligible owner of aircraft of the United States, the aircraft license terminates as of the date of such sale. If the vendee is an eligible owner, he is responsible for filing with the Secretary of Commerce a properly executed purchaser's renewable application, if such vendee desires to have the aircraft licensed in his name for the unexpired term of said license. In the event the vendee does not elect to have the aircraft relicensed or is not an eligible owner, application, in duplicate, for identification mark shall be made to the Secretary of Commerce. In such case the vendee shall cause to be removed or obliterated from the aircraft the letter or letters which precede the license numeral or numerals.

The vendee, if an eligible owner of licensed aircraft, may, under the license number already assigned, operate the aircraft for a period of 20 days from the date of mailing the application or delivering the same in person to the Secretary of Commerce. In no case shall this period extend beyond 30 days from the date of sale. In all cases the vendee must attach to his application the bill of sale or a certified copy thereof.

Between the date of sale and the posting in the mails or delivery in person to an authorized representative of the Secretary of Commerce of the purchaser's renewable application or application for identification mark the aircraft is considered unlicensed and unidentified, and the operation thereof constitutes a violation of these regulations.

Sec. 19. Relicensing of Aircraft.

Upon the expiration of the term of an existing aircraft license the aircraft will be relicensed for additional periods of not exceeding one year upon the application of the licensed owner for relicensing and the finding of the Secretary of Commerce that the aircraft is airworthy and is owned by an eligible owner.

Sec. 20. Display and Surrender of License.

The aircraft license must be carried in the aircraft whenever it is in service and must be conspicuously posted where it may be readily seen by passengers or inspectors. Whenever the craft is unairworthy the license must be removed from the craft, and when the license is suspended or revoked, or when it is no longer in force, it shall be surrendered to the Secretary of Commerce. The license must be presented for inspection upon the demand of any passenger or of any authorized official or employee of the Department of Commerce or State or municipal officials charged with enforcing local regulations or laws involving Federal compliance.

Sec. 21. Licensing of Airships and Balloons.

Until otherwise provided by regulations, the licensing of airships and balloons shall be in accordance with special orders of the Secretary of Commerce.

Sec. 22. Meaning of Airplane.

Except as otherwise specifically shown, the word "airplane" as used in this chapter includes seaplane, or any combination of landplane, seaplane, or boat.

Sec. 23. Canceling Licenses upon Request.

Upon the request of the licensed owner the aircraft license will be canceled by the Secretary of Commerce.

Sec. 24. Revocation and Suspension of Licenses—Law.

*“The Secretary of Commerce shall by regulation * * * provide for the * * * suspension and revocation of registration (and) aircraft certificates.” (Sec. 3 (f).)*

Sec. 25. Ground for Revocation or Suspension.

Aircraft licenses will be suspended or revoked for—

- (A) Violating the air commerce act or any of these regulations.
- (B) Failing to make proper and seasonable reports.
- (C) Making false statement in application or information accompanying the application for the license, or in any report required under these regulations.
- (D) Equipping the airplane with a type of engine not specified in the license or approved by the Secretary of Commerce.
- (E) Remodeling the engine and using it to propel licensed aircraft without the aircraft having been first rated as airworthy by the Secretary of Commerce.
- (F) Remodeling the airplane structure and flying the airplane without having it first rated as airworthy by the Secretary of Commerce.
- (G) Operating the airplane in excess of the authorized useful load specified in the license.
- (H) Operating with passengers in excess of the original designed seating arrangement. Infants under 2 years of age are excepted, provided the maximum allowable useful load is not exceeded.
- (I) Using or displaying license for fraudulent purposes.
- (J) Using or displaying license in any manner contrary to the public safety or interest.

CHAPTER 2

INSPECTION OF AIRCRAFT

Sec. 26. Continuous Duty as to Flying Condition.

After an aircraft is licensed, and between the times that it is inspected for airworthiness by an inspector, the owner is charged with the continuous duty of maintaining the aircraft in a good and proper state of repair and flying condition. For violation of this duty or of the inspections required in the next succeeding section the aircraft license will be suspended or revoked.

Sec. 27. Daily and Periodic Inspections.

(A) A licensed airplane shall be given a line inspection by the owner or a licensed mechanic at least once within each 24 hours preceding flight, and the result thereof shall be entered in the log under the signature of the person making such inspection. The line inspection must be made to ascertain the working condition and state of repair of the—

- (1) Open control wires, all control wires and pulleys open to inspection through apertures, and all hinges on control surfaces.
- (2) Landing gear, wheels, fittings, and shock absorbers.
- (3) Fuselage parts open to visual inspection.
- (4) Main plane external bracing, including fittings and struts, external wires, cables, turnbuckles, and fabric or covering.
- (5) Control surface fabric or covering.
- (6) Engine-exhaust manifolds and exhaust-pipe extensions. The engine shall be given a warming-up test, during which the proper functioning of the engine instruments shall be ascertained.
- (7) Carburetors and fuel-feed lines open to visual inspection to insure proper functioning.
- (8) Cooling system and connections.
- (9) Cowling, to insure that the cowlings are properly secured and safetied.
- (10) Propellers, as to condition.

(B) After each 100 hours of flight, in addition to the line inspection, the airplane must be given a "periodic inspection" by the owner, and the result thereof must be entered in the log by the person making such inspection. This inspection must be made to ascertain the working condition and state of repair of the—

- (1) Engine installation.
- (2) Control systems throughout.
- (3) Propeller alignment.
- (4) Fuselage, including fittings, tail skid, and tail-skid shock absorbers.

Sec. 28. Government Inspections.

The inspector or other authorized officer of the Secretary of Commerce shall be permitted by the owner or operator to inspect the licensed aircraft at any time and place for the purpose of determining its flying condition and state of repair. For such purposes the owner or operator shall give to such inspector or officer free and uninterrupted access to the aircraft and the field or shelter where the craft is located.

CHAPTER 3

OPERATION OF AIRCRAFT

Sec. 29. Solo Flights with Passenger Planes.

In addition to the requirements of section 10 (*E*), licensed airplanes with newly installed engines, old, new, or reconditioned, and airplanes upon which major repairs have been made to the plane structure, must be first test flown by a licensed pilot without passengers for hire.

Sec. 30. Carrying Passengers at Night.

Licensed aircraft, when engaged in carrying passengers for hire any time between one-half hour after sunset and one-half hour before sunrise, must be equipped with electric landing lights and navigation lights.

Sec. 31. Supplies and Equipment for Flights over Water.

An airplane flying over large bodies of water must be provided with an adequate supply of food and potable water, and, if engaged in carrying passengers for hire, it must be equipped with a Very's pistol or approved equivalent and life preservers or other flotation devices approved by the Secretary of Commerce.

Sec. 32. Repairs after Accident Reports.

After repairs have been made on a licensed aircraft which has been seriously damaged, the licensed owner shall make full report to the Secretary of Commerce of the kind and extent of repairs made to the craft.

Sec. 33. Flying Seriously Damaged Airplanes.

A licensed airplane which is seriously damaged must not be flown with passengers for hire until it has been fully repaired and its flying condition approved by an inspector.

Sec. 34. Accident Reports.

Where serious injury to person or property is suffered or death results in operating licensed aircraft, the owner of such aircraft shall immediately report, by telegraph or telephone, to the Secretary of Commerce, the license number or identification number of the aircraft and the time and place of the accident. All accidents in the operation of licensed aircraft which result in injury to the aircraft shall be reported without delay on the form provided for that purpose.

Sec. 35. Logs and Navigation Reports.

The owner or operator of every licensed aircraft shall keep a navigation and engine log book and shall quarterly transmit to the Secretary of Commerce a navigation summary report, in duplicate, showing the number of hours and the approximate number of miles

the aircraft has been flown during the quarter, the duration of the use of each engine, the engine installation and repairs, and the plane structure and rigging changes and repairs.

The log books shall be carried in the aircraft at all times when such aircraft is away from its home airport.

Sec. 36. Foreign Air Commerce.

Until otherwise provided, the laws of the United States and regulations made thereunder with respect to the entry and clearance of vessels engaged in foreign commerce are hereby made applicable to aircraft engaged in foreign air commerce.

CHAPTER 4

MARKING OF LICENSED AND UNLICENSED AIRCRAFT

Sec. 37. Marking of Aircraft, Law of.

*"The Secretary of Commerce shall by regulation * * * establish air traffic rules for the * * * identification of aircraft * * *."* (Sec. 3 (e).)

Sec. 38. Identification Marks for Government and Special Classes of Aircraft.

(A) For aircraft belonging to the Government of the United States identification marks or symbols will be assigned in accordance with arrangements to be made with the affected departments.

(B) Licensed airplanes engaged in racing or experimental work, or specially licensed for other purposes, will be assigned special identification numbers or symbols.

Sec. 39. Identification Marks for Licensed Aircraft.

A licensed aircraft shall bear an identification mark consisting of the license number of the aircraft preceded by—

The Roman capital letter S (meaning State) for aircraft used solely for governmental purposes and belonging to States, Territories, possessions or political subdivisions thereof, and

The Roman capital letter C for all other licensed aircraft.

Aircraft not licensed, but eligible and for which application for license has been filed with the Secretary of Commerce, will be assigned only a temporary number pending the issuance of license.

The letter N must precede the license symbol and numerals on licensed aircraft engaged in foreign air commerce and, at the option of the owner, may precede it on other licensed aircraft. *The identification mark will be assigned to licensed aircraft when the aircraft license is issued, and a separate application is not required.*

Sec. 40. Identification Marks for Unlicensed Aircraft.

(A) Unlicensed aircraft must display, when in flight, an identification mark assigned by the Secretary of Commerce. The mark will be assigned upon the application of the aircraft owner and must be permanently affixed to the aircraft. It will consist of a number only. The nationality mark shall not be made a part of it, nor shall any other letter, design, symbol, or description be added thereto.

(B) On the date of sale or transfer of title of unlicensed identified aircraft the vendor shall report in writing to the Secretary of Commerce, advising the date and place of sale or transfer, and the name and residence of the vendee, and on said date shall return to the Secretary of Commerce the metal plate furnished by the Secretary of Commerce and the identification-mark assignment issued for such aircraft.

(C) Upon such sale the identification mark may be reassigned to the vendee, provided he files an original application for identification

mark, in duplicate, with the Secretary of Commerce, requesting such reassignment and attaches to the application the bill of sale or a certified copy thereof.

(D) The vendee may operate such aircraft under the identification mark already assigned for a period of 20 days from the date of filing the application. In no event shall such period extend beyond 30 days from the date of sale.

(E) Between the date of sale and date of posting in the mails or delivery in person to an authorized representative of the Secretary of Commerce of the new application the aircraft is considered unidentified, and its operation will constitute a violation of these regulations.

Sec. 41. Places and Dimensions of Marks.

Identification marks shall be located as follows:

(A) ON AIRPLANES.—On the lower surface of the lower left wing and the upper surface of the upper right wing, the top of the letters or figures to be toward the leading edge, the height to be at least four-fifths of the mean chord; provided, however, that in the event four-fifths of the mean chord is more than 30 inches, the height of the letters and figures need not be more but shall not be less than 30 inches. If the lower left plane is less than one-half the span of the upper left plane, the letters or figures thus described shall be on the under surface of the upper left plane, as far to the left as is possible. In the case of a monoplane the mark shall be displayed on the lower surface of the left wing and the upper surface of the right wing in the manner thus described. The marks shall also appear on both sides of the rudder, of size as large as the surface will permit, leaving a margin of at least 2 inches.

(B) ON AIRSHIPS.—On both sides near the maximum cross section and on the lower under surface of the nose, the height to be equal to at least one-twelfth of the circumference at the maximum transverse cross section of the airship, but it need not exceed 8 feet.

(C) ON BALLOONS.—Twice, near the maximum horizontal circumference, as far as possible from one another, the height to be equal to at least one-twelfth of the circumference of the balloon, but it need not exceed 8 feet.

(D) The width of the letters and figures of all marks shall be at least two-thirds of the height, and the width of the stroke shall be at least one-sixth of the height. The letters and figures shall be painted in plain black type on a white background or in any color on any background, but there must be a strong contrast between the two. The letters and numbers must be uniform in shape and size. A space equal to at least one-half of the width of a letter shall be left between each figure or letter.

Sec. 42. Other Symbols and Marks.

Except with the approval of the Secretary of Commerce, no design, mark, character, symbol, or description shall be placed upon aircraft if said design, etc., modifies, adds to, or subtracts from, or confuses the assigned mark or impairs or destroys its visibility.

Sec. 43. License and Identification Plates.

The license number or identification mark, with the name and residence of the owner, will be inscribed upon a metal plate fur-

nished by the Secretary of Commerce. It must be affixed to the fuselage in a prominent place, but this section shall not apply to public aircraft of the United States used exclusively in the governmental service.

The plate will distinguish on its face between licensed and unlicensed aircraft.

CHAPTER 5

LICENSING OF PILOTS

Sec. 44. Pilots, Law of.

*"The Secretary of Commerce shall by regulation * * * provide for the periodic examination and rating of airmen serving in connection with aircraft of the United States as to their qualifications for such service." (Sec. 3 (c).)*

"The term 'airman' means any individual (including the person in command and any pilot, mechanic, or member of the crew) who engages in the navigation of aircraft while under way, and any individual who is in charge of the inspection, overhauling, or repairing of aircraft." (Sec. 9 (k).)

*"It shall be unlawful * * * to serve as an airman in connection with any aircraft registered as an aircraft of the United States * * * without an airman certificate or in violation of the terms of any such certificate." (Sec. 11 (a) (4).)*

*"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of \$500." (Sec. 11 (b).)*

Sec. 45. Application of the Law.

For the purpose of this chapter, persons in command of or piloting licensed aircraft in flight will be classed as pilots.

Sec. 46. Classification of Pilots.

Licensed pilots are classed as commercial or private pilots. Commercial pilots are licensed as transport, limited commercial, or industrial pilots. Private pilots are designated as private pilots (without other qualifications) or as student pilots. A person may hold a plurality of licenses, such as a pilot's and mechanic's license. A transport pilot will not be issued other classes of pilot's licenses.

Sec. 47. Privileges and Restriction of Licensed Pilots.

Except as otherwise provided in these regulations, the privileges conferred and restrictions imposed upon licensed pilots are as follows:

(A) Transport pilots may pilot any type of licensed aircraft but not unlicensed aircraft carrying persons or property for hire. Transport pilots shall have all of the privileges of navigating aircraft conferred upon other classes of pilots, which shall include the right to instruct students in the operation of aircraft in flight.

(B) Limited commercial pilots shall have all of the privileges conferred and be subject to all of the restrictions imposed upon transport pilots, except they shall not pilot aircraft carrying persons for hire outside of the areas mentioned in their licenses, nor shall they, for hire, instruct students in the operation of aircraft in flight.

(C) Industrial pilots may pilot any type of licensed aircraft not carrying persons for hire but shall not pilot unlicensed aircraft carrying either persons or property for hire and shall not, for hire, instruct students in the operation of aircraft in flight.

(D) Private pilots, not designated as students, may pilot licensed aircraft but shall not carry persons or property for hire in licensed or unlicensed aircraft. Private pilots designated as students are licensed only for the purpose of piloting licensed aircraft when receiving flying instructions and such student pilots shall not pilot licensed aircraft carrying persons or property for hire or for any other purpose than receiving flying instructions nor within any other area than that specified in their licenses. Private pilots shall not, for hire, instruct students in the operation of aircraft in flight.

Sec. 48. Applications for Pilots' Licenses.

An application for a pilot's license must be filed, under oath, with the Secretary of Commerce upon blanks furnished for that purpose. An applicant for a pilot's license, including a student's pilot license, must appear for a physical examination before a physician designated by the Secretary of Commerce and pass such examination, unless he is exempt under these regulations.

Sec. 49. Character, Age, and Citizenship Qualifications.

An applicant for a pilot's license must be of good moral character. The minimum age requirements are 16 years for private pilots and 18 years for industrial, limited commercial, and transport pilots. A private pilot may be a citizen of any country. An industrial, limited commercial, or transport pilot must be (1) a citizen of the United States, or (2) a citizen of a foreign country which grants reciprocal commercial-pilot privileges to citizens of the United States on equal terms and conditions with citizens of such foreign country, or (3) an alien who has filed his declaration of intention to become a citizen of the United States and advises the Secretary of Commerce of the serial number of such declaration, the date thereof, and the court in which filed. He must diligently and successfully prosecute the naturalization proceedings under penalty of the revocation of his pilot's license and from time to time must keep the Secretary of Commerce advised of the status of such proceedings.

Sec. 50. Flying Experience Requirements.

An applicant must have at least the following flying experience:

(A) **TRANSPORT PILOTS.**—Two hundred hours of solo flying, of which at least five hours must have been within the last preceding 60 days prior to the filing of the application.

(B) **LIMITED COMMERCIAL PILOTS.**—The same solo flying required of industrial pilots.

(C) **INDUSTRIAL PILOTS.**—Fifty hours of solo flying, of which at least 5 hours must have been within the last preceding 60 days prior to the filing of the application.

(D) **PRIVATE PILOTS.**—Private pilots not designated as students, 10 hours solo flying, of which at least 2 hours must have been within the last preceding 60 days prior to the filing of the application.

Sec. 51. Pilot's Physical Qualification.

The physical examinations provided for herein must be accomplished before the practical and theoretical tests will be given. The qualifications are as follows:

(A) **PRIVATE PILOTS.**—Absence of organic disease or defect which would interfere with safe handling of an airplane under the conditions of private flying; visual acuity of at least 20/40 in each

eye; less than 20/40 may be accepted if the pilot wears a correction in his goggles bringing his vision approximately to normal and has normal judgment of distance without correction (however, in the case of student pilots this will not apply, but if a student has 20/50 in one eye and 20/40 or better in the other, with normal judgment of distance, without correction, he may be accepted if his physical condition is satisfactory, and if his vision can be corrected approximately to normal by goggles); good judgment of distance; no diplopia in any position; normal visual fields and color vision; no organic disease of eye or internal ear.

(B) **INDUSTRIAL PILOTS.**—Absence of any organic disease or defect which would interfere with the safe handling of an airplane; visual acuity of not less than 20/30 in each eye, although in certain instances less than 20/30 may be accepted if the applicant wears a correction to 20/20 in his goggles and has good judgment of distance without correction; good judgment of distance; no diplopia in any field; normal visual fields and color vision; absence of organic disease of the eye, ear, nose, or throat.

(C) **LIMITED COMMERCIAL PILOTS.**—The same physical qualifications prescribed for transport pilots.

(D) **TRANSPORT PILOTS.**—Good past history; sound pulmonary, cardiovascular gastrointestinal, central nervous, and genito-urinary systems; freedom from material structural defects or limitations; freedom from disease of the ductless glands; normal central, peripheral, and color vision; normal judgment of distance; only slight defects of ocular muscle balance; freedom from ocular disease; absence of obstructive or diseased conditions of the ear, nose, and throat; no abnormalities of equilibrium that would interfere with flying.

(E) **WAIVERS.**—In the case of trained, experienced flyers the Secretary of Commerce may grant waivers for physical defects designated as disqualifying by these regulations when in his opinion the experience of the pilot will compensate for the defect. A waiver once granted will hold indefinitely so long as the defect for which it was granted has not increased or unless canceled by the Secretary of Commerce.

Sec. 52. Exemption from Prescribed Physical Examination.

An applicant for a pilot's license (or its renewal) will be exempt from the physical examination prescribed in these regulations upon filing with the Secretary of Commerce a certified copy of the examination for flying in the United States Army, Navy, or Marine Corps made within six months of the date of filing his application for his pilot's license or its renewal, provided his physical qualifications as shown by such copy of the examination are not less than those required by these regulations for the class of license for which he applies.

Sec. 53. Pilots' Examinations and Tests.

Unless exempt under these regulations, candidates must pass the following examinations and tests:

(A) **TRANSPORT PILOTS.**—(1) Examination on the air traffic rules and those portions of the Air Commerce Regulations pertaining to pilots' privileges and limitations and to the inspection and operation of aircraft.

(2) Practical and theoretical examination in elementary engine and plane mechanics and rigging and a theoretical examination in the fundamentals of meteorology and air navigation.

(3) Practical flight test, as follows:

(a) In addition to normal take-offs and landings, the following maneuvers will be required: From 1,500 feet, with engine throttled, make a 360° turn and land in normal landing attitude, by wheels touching ground in front of and within 200 feet of a line designated by examiner for the Department of Commerce.

(b) From 1,000 feet, with engine throttled, make a 180° turn and land in normal landing attitude, by wheels touching ground in front of and within 200 feet of a line designated by examiner for the Department of Commerce.

(c) A series of five gentle and three steep figure 8 turns from 800 to 1,000 feet, respectively. Spiral in one direction from 2,000 feet, with engine throttled, and land in normal landing attitude by wheels touching ground in front of and within 200 feet of a line designated by examiner for the Department of Commerce.

(d) Fly in emergency maneuvers, doing spirals, side slips, climbing turns, and recovering from stalls.

(e) Fly over a triangular or rectangular course at least 100 miles, landing at place of take-off within at least five hours. This flight shall also include two obligatory landings, not at point of departure, when craft must come to rest. The course will be designated and the candidate will be furnished with route information by the examiner for the Department of Commerce at time of departure, and the examiner for the Department of Commerce will determine whether the course was correctly followed and whether obligatory landings were satisfactory. Upon the presentation of satisfactory proof that the candidate has engaged in solo cross-country flights a distance of at least 100 miles within one year preceding the date of his application, the flight specified in this subsection will be omitted.

(f) Cross-wind landings and take-offs.

(B) LIMITED COMMERCIAL PILOTS.—The same examinations and tests as are prescribed for transport pilots, except the cross-country flight and the examination on elementary meteorology and navigation.

(C) INDUSTRIAL PILOTS.—(1) Examination on the air traffic rules and practical and theoretical examination in elementary engine and plane mechanics and rigging and those portions of the Air Commerce Regulations pertaining to pilots' privileges and limitations and to the inspection and operation of aircraft.

(2) The practical flight tests prescribed for transport pilots, except the distance for the cross-country flight shall be 60 miles.

(D) PRIVATE PILOTS.—(1) Examination on the air traffic rules and those portions of the Air Commerce Regulations pertaining to pilots' privileges and limitations and to the inspection and operation of aircraft.

(2) The practical flight test specified in subparagraph 3 (c) of section 53 (A) and three satisfactory landings to a full stop. A private pilot, classed as a student, will be licensed without being required to pass the examination and tests prescribed in this subparagraph.

(E) **REEXAMINATION.**—Applicants for pilots' licenses who have failed to successfully accomplish the prescribed theoretical or practical tests may apply for reexamination at any time after the expiration of 90 days from the date of such failure.

If the physical examination has expired for the class of license for which application has been made, a new physical examination must be submitted.

The minimum passing grade for any subject in the foregoing theoretical examinations shall be 70 per cent.

Practical tests must be accomplished to the satisfaction of the examiner for the Department of Commerce.

Sec. 54. Place, etc., of Examinations.

Examinations for pilots' licenses will be held at such times and places as the Secretary of Commerce shall designate. Such examinations and tests will be conducted by an examining officer designated by the Secretary of Commerce. Candidates for pilots' licenses must furnish the airplanes in which the flight tests are to be made, unless the Secretary of Commerce makes other provisions therefor.

Sec. 55. Duration and Renewal of Pilots' Licenses.

(A) Unless sooner revoked, transport and limited commercial pilots' licenses shall remain in force for six months and industrial and private pilots' licenses one year from date of issuance. Before any license is renewed, the Secretary of Commerce may, in his discretion, require the holder of such license to undergo any of the theoretical or practical tests prescribed as requisites for the original license.

(B) Licenses will be renewed for like periods where the prescribed physical condition of the holder is shown by the same method as when the original license was issued, except that a transport or limited commercial pilot must prove that he has had at least 10 hours of solo flying within the last 60 days, industrial pilots at least 25 hours within the last year, and private pilots at least 10 hours within the last year.

(C) If an applicant for renewal has not had the required solo flying and applies for a renewal within six months after the expiration of his last license, a new license will be issued to him upon proof of his physical qualifications and the passing of the flight tests required for the class of license he last held.

(D) Upon application to and permission of the Secretary of Commerce the area for permissible flying of aircraft carrying passengers, for hire, designated in the license of limited commercial pilots, will be changed to other areas.

(E) Upon application and for good cause shown the licenses specified in this chapter may be extended for 60 days.

Sec. 56. Personal Possession of Pilots' Licenses.

The pilot's license shall be kept in his personal possession when he is piloting aircraft and must be presented for inspection upon the demand of any passenger or any authorized official or employee of the Department of Commerce or State or municipal officials charged with enforcing local regulations or laws involving Federal compliance.

Sec. 57. Pilots' Flight Records.

A licensed pilot must keep an accurate record of his flying time in a log book. It is the pilot's responsibility to obtain and maintain this log book.

Sec. 58. Carrying Passengers in Various Classes of Airplanes.

A licensed pilot, authorized to transport passengers, for hire, shall not do so in a type of aircraft which he has not previously operated within the last preceding 90 days for at least two hours, including 10 landings, 3 of which must have been to a full stop.

Sec. 59. Seaplane Piloting.

A licensed pilot shall not carry passengers, for hire, in a seaplane unless he has piloted a seaplane for at least two hours within the last preceding 90 days, except where he makes practice flights in the seaplane for at least one-half hour and takes it off and lands it at least ten times. At least three of the landings must be to a full stop.

Sec. 60. Pilots' Night-Flying Qualifications.

A transport or limited commercial pilot who has not had at least two hours of night solo flying within the last preceding 90 days shall not pilot aircraft carrying passengers, for hire, between one-half hour after sunset and one-half hour before sunrise, except where he takes off and lands between one-half hour after sunset and one-half hour before sunrise, at least ten times solo. At least three of such landings must be to a full stop.

Sec. 61. Meaning of Solo Flying.

As used in these regulations, a person is engaged in solo flying when he is the sole operator of the controls and is in command of aircraft, in flight.

Sec. 62. Suspension or Revocation of Licenses.

Pilots' licenses will be suspended or revoked for—

(A) Violating any provision of the air commerce act of 1926 or these regulations.

(B) Carelessness or inattention to duty.

(C) Unsound physical condition or any demonstration of incompetency in the operation or repair of aircraft.

(D) Being under the influence, or using, or having personal possession of intoxicating liquor, cocaine, or other habit-forming drugs while on duty.

(E) Refusal to exhibit license upon proper demand.

(F) Violating air traffic rules.

(G) Making any false statement in application for license or in any reports required to be submitted by these regulations.

(H) Carrying passengers who are obviously under the influence of intoxicating liquor, cocaine, or other habit-forming drugs.

(I) Piloting aircraft carrying passengers in excess of the original designed seating arrangements of the aircraft. Infants under 2 years of age are excepted, provided the maximum useful load is not exceeded.

(J) Doing any act in connection with aircraft which is contrary to the public safety or interest or detrimental to the morale of pilots or mechanics.

CHAPTER 6

LICENSING OF MECHANICS

Sec. 63. Mechanics, Law of.

*"The Secretary of Commerce shall by regulation * * * provide for the periodic examination and rating of airmen serving in connection with aircraft of the United States as to their qualifications for such service." (Sec. 3 (c).)*

"The term 'airman' means any individual (including the person in command and any pilot, mechanic, or member of the crew) who engages in the navigation of aircraft while under way, and any individual who is in charge of the inspection, overhauling, or repairing of aircraft." (Sec. 9 (k).)

*"It shall be unlawful * * * to serve as an airman in connection with any aircraft registered as an aircraft of the United States * * * without an airman certificate or in violation of the terms of any such certificate." (Sec. 11 (a) (4).)*

*"Any person who violates of subdivision (a) of this section * * * shall be subject to a civil penalty of \$500." (Sec. 11 (b).)*

Sec. 64. Application of the Law.

For the purpose of this chapter, persons repairing or adjusting licensed aircraft in flight and persons in charge of the ground inspection, overhauling, or repairing of licensed aircraft will be classed as mechanics. A workman or mechanic may engage in the repair or overhaul of licensed aircraft without being licensed if such repair or overhaul is in charge of a licensed mechanic. An application for a mechanic's license must be filed, under oath, with the Secretary of Commerce upon blanks furnished for that purpose. An applicant for a mechanic's license is not required to take a physical examination.

Sec. 65. Classification of Mechanics.

Mechanics are licensed as engine or airplane mechanics. A person may hold a plurality of licenses, such as both classes of mechanic's licenses or a pilot's and mechanic's license.

Sec. 66. Mechanics' Qualifications and Examinations.

(A) An applicant for an engine mechanic's license must have had at least two years' experience on internal-combustion engines, one year of which must have been on aircraft engines. Such applicant will be licensed upon passing an examination on Air Commerce Regulations pertaining to the operation and inspection of aircraft and showing that he has sufficient knowledge of such engines and their accessories, including ignition systems, to properly inspect, maintain, repair, and overhaul the same.

(B) An applicant for an airplane mechanic's license must have had at least one year's actual experience in servicing aircraft. Such an applicant will be licensed upon passing an examination on Air

Commerce Regulations pertaining to the operation and inspection of aircraft, showing he is sufficiently qualified in plane structure and rigging, including control systems, to properly inspect, maintain, repair, and overhaul the same.

(C) The examinations for both classes of license will be both theoretical and practical. The minimum passing grade in each subject covered shall be 70 per cent. A citizen of any country may be licensed if found qualified. Examinations for mechanics' licenses will be held at such times and places as the Secretary of Commerce shall designate. Such examinations and tests will be conducted by an examining officer designated by the Secretary of Commerce.

(D) Applicants for mechanic's licenses who have failed to successfully accomplish the prescribed theoretical or practical tests may apply for reexamination at any time after the expiration of 90 days from the date of such failure.

Sec. 67. Duration and Renewal.

Mechanics' licenses, unless sooner suspended or revoked, will remain in force for two years after date of issue and will be renewed for additional two-year periods upon proof that during the term of the last license the holder has rendered services under his license during at least one-half of the term thereof. Upon application and good cause shown the Secretary of Commerce may extend the license for a period of not more than 60 days. Before any license is renewed, the Secretary of Commerce may, in his discretion, require the holder of such license to undergo any of the theoretical or practical tests prescribed as requisites for the original license.

Sec. 68. Personal Possession of Mechanics' Licenses.

A mechanic's license shall be kept in his personal possession when he is serving in connection with licensed aircraft and must be presented for inspection upon the demand of any passenger in or owner of repaired licensed aircraft upon which such mechanic has worked, or any authorized official or employee of the Department of Commerce or State or municipal officials charged with enforcing local regulations or laws involving Federal compliance.

Sec. 69. Suspension or Revocation of Licenses.

Mechanics' licenses will be suspended or revoked for—

(A) Violating any provision of the air commerce act of 1926 or these regulations.

(B) Carelessness or inattention to duty.

(C) Any demonstration of incompetency in the repair or overhaul of aircraft.

(D) Being under the influence, or using, or having personal possession of intoxicating liquor, cocaine, or other habit-forming drugs while on duty.

(E) Refusal to exhibit license upon proper demand.

(F) Making any false statement in application for license or in any reports required to be submitted by these regulations.

(G) Doing any act in connection with aircraft which is contrary to the public safety or interest or detrimental to the morale of pilots or mechanics.

CHAPTER 7

AIR TRAFFIC RULES

Sec. 70. Law.

"The Secretary of Commerce shall by regulation establish air traffic rules for the navigation, protection, and identification of aircraft, including rules as to safe altitudes of flight and rules for the prevention of collisions between vessels and aircraft." (Air commerce act of 1926, sec. 3 (e).)

Sec. 71. Unlawful Acts.

*"It shall be unlawful * * * to navigate any aircraft otherwise than in conformity with the air traffic rules." (Sec. 11 (a) (5).)*

Sec. 72. Penalty.

*"Any person who violates any provision of subdivision (a) of this section * * * shall be subject to a civil penalty of \$500." (Sec. 11 (b).)*

Sec. 73. Application of the Law.

"In order to protect and prevent undue burdens upon interstate and foreign air commerce the air traffic rules are to apply whether the aircraft is engaged in commerce or noncommercial, or in foreign, interstate, or intrastate navigation in the United States, and whether or not the aircraft is registered or is navigating in a civil airway." (Statement of managers accompanying conference report, air commerce act of 1926.)

Sec. 74. Flying Rules.

(A) RIGHT-SIDE TRAFFIC.—Aircraft flying in established civil airways, when it is safe and practicable, shall keep to the right side of such airways.

(B) GIVING-WAY ORDER.—Craft shall give way to each other in the following order:

- (1) Airplanes.
- (2) Airships.
- (3) Balloons, fixed or free.

An airship not under control is classed as a free balloon. Aircraft required to give way shall keep a safe distance, having regard to the circumstances of the case. Three hundred feet will be considered a minimum safe distance.

(C) GIVING-WAY DUTIES.—If the circumstances permit, the craft which is required to give way shall avoid crossing ahead of the other. The other craft may maintain its course and speed, but no engine-driven craft may pursue its course if it would come within 300 feet of another craft, 300 feet being the minimum distance within which aircraft, other than military aircraft of the United States engaged in military maneuvers and commercial aircraft engaged in

local industrial operations, may come within proximity of each other in flight.

(D) *CROSSING*.—When two engine-driven aircraft are on crossing courses the aircraft which has the other on its right side shall keep out of the way.

(E) *APPROACHING*.—When two engine-driven aircraft are approaching head-on, or approximately so, and there is risk of collision, each shall alter its course to the right, so that each may pass on the left side of the other. This rule does not apply to cases where aircraft will, if each keeps on its respective course, pass more than 300 feet from each other.

(F) *OVERTAKING*.—(1) *Definition*.—An overtaking aircraft is one approaching another directly from behind or within 70° of that position, and no subsequent alteration of the bearing between the two shall make the overtaking aircraft a crossing aircraft within the meaning of these rules or relieve it of the duty of keeping clear of the overtaken craft until it is finally past and clear.

(2) *Presumption*.—In case of doubt as to whether it is forward or abaft such position it should assume that it is an overtaking aircraft and keep out of the way.

(3) *Altering course*.—The overtaking aircraft shall keep out of the way of the overtaken aircraft by altering its own course to the right, and not in the vertical plane.

(G) *HEIGHT OVER CONGESTED AND OTHER AREAS*.—Exclusive of taking off from or landing on an established landing field, airport, or on property designated for that purpose by the owner, and except as otherwise permitted by section 79, aircraft shall not be flown—

(1) Over the congested parts of cities, towns, or settlements, except at a height sufficient to permit of a reasonably safe emergency landing, which in no case shall be less than 1,000 feet.

(2) Elsewhere at height less than 500 feet, except where indispensable to an industrial flying operation.

(H) *HEIGHT OVER ASSEMBLY OF PERSONS*.—No flight under 1,000 feet in height shall be made over any open-air assembly of persons except with the consent of the Secretary of Commerce. Such consent will be granted only for limited operations.

(I) *ACROBATIC FLYING*.—(1) Acrobatic flying means intentional maneuvers not necessary to air navigation.

(2) No person shall acrobatically fly an aircraft—

(a) Over a congested area of any city, town, or settlement.

(b) Over any open-air assembly of persons or below 2,000 feet in height over any established civil airway, or at any height over any established airport or landing field, or within 1,000 feet horizontally thereof.

(c) Any acrobatic maneuvers performed over any other place shall be concluded at a height greater than 1,500 feet.

(d) No person shall acrobatically fly any airplane carrying passengers for hire.

(e) *Dropping objects or things*.—When an aircraft is in flight the pilot shall not drop or release, or permit any person to drop or release, any object or thing which may endanger life or injure property, except when necessary to the personal safety of the pilot, passengers, or crew.

(J) SEAPLANES ON WATER.—Seaplanes on the water shall maneuver according to the laws and regulations of the United States governing the navigation of water craft, except as otherwise provided herein.

(K) TRANSPORTING EXPLOSIVES.—The transporting of any explosives other than that necessary for signaling or fuel for such aircraft while in flight or materials for industrial and agricultural spraying (dusting) is prohibited, except upon special authority obtained from the Secretary of Commerce.

Sec. 75. Take-off and Landing Rules.

(A) METHOD.—Take-offs and landings shall be made upwind when practicable. The take-off shall not be commenced until there is no risk of collision with landing aircraft and until preceding aircraft are clear of the field. Aircraft when taking off or landing shall observe the traffic lanes indicated by the field rules or signals. No take-off or landing shall be made from or on a public street or highway without the consent of the local governing authority and the approval of the Secretary of Commerce.

(B) COURSE.—If practicable, when within 1,000 feet horizontally of the leeward side of the landing field the airplane shall maintain a direct course toward the landing zone.

(C) RIGHT OVER GROUND PLANES.—A landing plane has the right of way over planes moving on the ground or taking off.

(D) GIVING WAY.—When landing and maneuvering in preparation to land, the airplane at the greater height shall be responsible for avoiding the airplane at the lower height and shall, as regards landing, observe the rules governing overtaking aircraft.

(E) DISTRESS LANDINGS.—An aircraft in distress shall be given free way in attempting to land.

Sec. 76. Lights.

(A) ANGULAR LIMITS.—The angular limits laid down in these rules will be determined as when the aircraft is in normal flying position.

(B) AIRPLANE LIGHTS.—Between one-half hour after sunset and one-half hour before sunrise airplanes in flight must show the following lights:

(1) On the right side a green light and on the left side a red light, each showing unbroken light between two vertical planes whose dihedral angle is 110° when measured to the left and right, respectively, from dead ahead. These lights shall be visible at least 2 miles.

(2) At the rear and as far aft as possible a white light shining rearward, visible in a dihedral angle of 140° bisected by a vertical plane through the line of flight and visible at least 3 miles.

(C) AIRSHIP LIGHTS.—Between one-half hour after sunset and one-half hour before sunrise airships shall carry and display the same lights that are prescribed for airplanes, excepting the side lights shall be doubled horizontally in a fore-and-aft position, and the rear light shall be doubled vertically. Lights in a pair shall be at least 7 feet apart.

(D) BALLOON LIGHTS.—A free balloon, between one-half hour after sunset and one-half hour before sunrise, shall display one white light not less than 20 feet below the car, visible for at least 2 miles. A fixed balloon, or airship, shall carry three lights—red, white, and red—in a vertical line, one over the other, visible at least 2 miles.

The top red light shall be not less than 20 feet below the car, and the lights shall be not less than 7 nor more than 10 feet apart.

(E) LIGHTS WHEN STATIONARY.—(1) Between one-half hour after sunset and one-half hour before sunrise all aircraft which are on the surface of water and not under control, or which are moored or anchored in navigation lanes, shall show a white light visible for at least 2 miles in all directions.

(2) Balloon and airship mooring cables between one-half hour after sunset and one-half hour before sunrise shall show groups of 3 red lights at intervals of at least every 100 feet, measured from the basket, the first light in the first group to be approximately 20 feet from the lower red balloon light. The object to which the balloon is moored on the ground shall have a similar group of lights to mark its position.

Sec. 77. Day Marks of Masts, etc.

By day, balloon and airship mooring cables shall be marked with tubular streamers not less than 8 inches in diameter and 7 feet long and marked with alternate bands of white and red, 20 inches in width. The object to which the balloon or airship is moored on the ground shall have the same kind of streamers, which must be in the same position as the lights specified herein.

Sec. 78. Signals.

(A) DISTRESS.—The following signals, separately or together, shall, where practicable, be used in case of distress:

(1) The international signal, S O S, by radio.

(2) The international-code flag signal of distress, NC.

(3) A square flag having either above or below it a ball, or anything resembling a ball.

(B) SIGNAL WHEN COMPELLED TO LAND.—When an aircraft is forced to land at night at a lighted airport it shall signal its forced landing by making a series of short flashes with its navigation lights if practicable to do so.

(C) FOG SIGNALS.—In fog, mist, or heavy weather an aircraft on the water in navigation lanes, when its engines are not running, shall signal its presence by a sound device emitting a signal for about five seconds in two-minute intervals.

Sec. 79. Deviation from Air Traffic Rules.

The air traffic rules may be deviated from when special circumstances render a departure necessary to avoid immediate danger or when such departure is required because of stress of weather conditions or other unavoidable cause.

CHAPTER 8

MISCELLANEOUS

Sec. 80. Civil Penalties.

*Any person who (1) violates any provision of subdivision (a) of this section or any entry or clearance regulation made under section 7, or (2) any customs or public health regulation made under such section, or (3) any immigration regulation made under such section, shall be subject to a civil penalty of \$500, which may be remitted or mitigated by the Secretary of Commerce, the Secretary of the Treasury, or the Secretary of Labor, respectively, in accordance with such proceedings as the Secretary shall by regulation prescribe * * * ." (Air commerce act of 1926, sec. 11 (b).)*

Sec. 81. Penalty Proceedings.

The Secretary of Commerce, or his duly authorized representative, will notify all persons of the incursion of penalties subject to mitigation or remission by the Secretary, and any person charged with a civil penalty may transmit to the Secretary of Commerce, within the time prescribed in the notification of such penalty, an affidavit stating the facts upon which the request for mitigation or remission is based. The Secretary of Commerce will then determine whether or not the penalty will be mitigated or remitted, and the person making the request will be notified accordingly.

Sec. 82. Waiver of Regulations.

The Secretary of Commerce may waive any of the requirements of these regulations when, in his discretion, the particular facts justify such waiver.

Sec. 83. Savings Clause.

An aircraft required to be licensed under the air commerce act of 1926 may operate under a letter of authority from the Secretary of Commerce or his duly authorized representative pending the official inspection of such aircraft, provided an application for aircraft license is on file with the Secretary of Commerce and all the provisions of these regulations have been complied with.

In so far as these regulations amend the existing regulations they shall become effective on June 1, 1928, except as to sections 10 and 11, which shall become effective on August 1, 1928.

INDEX

A	Section
Accidents:	
operation, damaged craft.....	33
repairs.....	32
reports.....	34
Acrobatics.....	74 (I) 1, 2
Aircraft licenses. <i>See</i> Licenses.	
Airplane, definition.....	22
Airship, licensing.....	21
marking.....	41 (B)-(D)
Airworthiness:	
control system... T.....	10 (C)
cockpit and cabin.....	10 (D)
definition.....	9
factors.....	10
law.....	8
power plant.....	10 (E), (F)
strength requirements.....	10 (B)
tests, place of taking.....	16
Altitude.....	74 (G), (H)
Approved type certificate.....	11
B	
Balloons:	
licensing.....	21
marking.....	41 (C), (D)
C	
Compass requirements.....	10 (I) 3
Construction requirements.....	10
D	
Damaged passenger craft.....	32, 33, 34
Day marks of masts, etc.....	77
Duty of owner.....	26, 27, 35
E	
Engine requirements.....	10 (E)-(F)
Equipment requirements.....	10 (I), 30, 31
F	
Flight tests.....	10 (H)
Flying rules.....	74
Foreign air commerce.....	36
G	
Giving way, traffic rules... 74 (C)-(F), 75 (A)-(E)	
I	
Identification:	
marks.....	37-42
plates.....	10 (J), 43
Inspection, aircraft.....	27, 28
Instrument requirements.....	10 (I)
L	
Landing rules.....	75
Licenses:	
airplanes—	
application of law.....	2
application for license.....	12
approved type certificate.....	11, 13
cancellation on request.....	23

Licenses—Continued.	Section
contents.....	17
display.....	20
foreign.....	5
law.....	1
not under approved type certificate... 14	
power plant requirements..... 10 (E)-(F)	
prerequisite to.....	6
reconditioned, test flights.....	33
relicensing.....	19
revocation.....	24, 25
sale after license.....	18
seaplanes..... 10 (B) (4), 22	
special classes, racing, etc.....	15
States' aircraft.....	4
strength requirements..... 10 (B)	
surrender.....	20
suspension.....	24, 25
United States aircraft (Federal owned).....	3
airships.....	21
balloons.....	21
mechanics'—	
application.....	64
citizenship.....	66 (C)
classification.....	65
duration.....	67
examinations.....	66
law and application of law.....	63, 64
personal possession.....	68
qualifications.....	66
renewals.....	67
suspension and revocation.....	69
pilots'—	
age.....	49
application.....	48
citizenship.....	49
classification.....	46
display and possession.....	56
duration.....	55
examinations.....	53
exemptions from physical.....	52
extensions.....	55 (E)
flight record.....	57
flight tests.....	58
flying experience.....	50
law and application of law.....	44, 45
physical qualifications.....	51
place of examinations.....	54
practice flights.....	58, 59, 60
privileges and restrictions.....	47
qualifications, general.....	49
renewal.....	55
revocation and suspension.....	62
tests, flight.....	53
waivers.....	51 (E)
Lights.....	30, 76
Logs.....	35, 57

M		S	
Manufacturer's duties:	Section	Sale:	Section
approved type certificate.....	11	licensed aircraft.....	18
number and date of completing plane.....	10 (J)	unlicensed aircraft.....	40
Marking, aircraft.....	37-43	Savings clause.....	83
Marks, day, masts and cables.....	77	Seaplanes:	
Materials, standard.....	10	licensing. <i>See Licenses.</i>	
Mechanics:		operation.....	31
application.....	64	pilot's experience.....	59
citizenship.....	66	seaworthiness.....	10
classification.....	65	Signals.....	78
examination.....	66	Solo flight, definition.....	61
licenses. <i>See Licenses.</i>		Strength requirements for aircraft.....	10 (B)
Navigation reports.....	35	T	
Night flying.....	30, 60, 76	Take-off rules.....	75
P		Traffic rules:	
Penalties for violation:		acrobatics.....	74
aircraft licensing law.....	1	altitude.....	74 (G), (H), (I)
airman's licensing law.....	44, 63	application of law.....	73
mitigation.....	80, 81	approaching.....	74 (E)
registration law.....	8	crossing.....	74 (D)
remission.....	80, 81	deviation from.....	79
Pilots:		dropping objects.....	74 (I) (2) (e)
application.....	48	flying rules.....	74
classification.....	46	giving way.....	74, 75
examination—		landing.....	75
aeronautical.....	53	law.....	70
physical.....	51	lights.....	76
exemptions, physical.....	52	marking of masts, etc.....	77
flight records.....	57	overtaking.....	74 (F)
licenses. <i>See Licenses.</i>		right-side traffic.....	74 (A)
privileges.....	47	seaplanes on water.....	74 (J)
waiver, physical.....	51 (E)	signals.....	75
Propellers.....	10 (G)	taking off.....	75
R		W	
Registration, definition.....	7	Waivers:	
Registry, requisites.....	6	Air Commerce Regulations.....	82
Regulations, effective date.....	83	physical examinations.....	51 (E)
Renewals. <i>See Specific heads.</i>		Weather signals.....	78 (C)
Reports.....	11 (F), 32, 34	Workmanship, standard.....	10