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INTRODUCTORY NOTE

This manual contains material interpreting and explaining approved airman agency requirements as specified in Civil Air Regulation 50, as amended. It supersedes:

CAM 50, dated May 15, 1946
CAM 50 Supplement No. 1, dated June 15, 1949
CAM 50 Supplement No. 2, dated July 20, 1949
CAM 50 Supplement No. 3, dated August 15, 1949
CAM 50 Supplement No. 4, dated August 15, 1949

In those cases where the manual material may be contradictory to portions of the following releases, the manual material shall govern:

SRR 244, dated May 14, 1947
SRR 245, dated May 20, 1947
SRR 254, dated July 14, 1947
SRR 274, dated February 24, 1948

The numbering system for this material follows exactly that of like material published in the Federal Register. The quotation of the Civil Air Regulations uses the numbering system established by the Civil Aeronautics Board and the Federal Register. CAA material is identified by appending a dash to the regulation number and then numbering consecutively by the interpretive material relating to the pertinent section of Civil Air Regulation 50.

CERTIFICATE

CAR 50.1 *Issuance.* An airman agency certificate will be issued to an applicant who complies with the minimum requirements for one or more school ratings.

§ 50.1–1 *Issuance (CAA policies which apply to § 50.1).* Application for the issuance of an airman agency certificate will be made upon Form ACA–387, Application for Airman Agency Certificate and Rating, and Inspection Report, prescribed by the Administrator, obtainable at the local CAA Aviation Safety District Office. When completed, the form will be submitted to the local Aviation Safety Agent who will make the necessary inspection.

CAR 50.2 *School ratings.* (a) Basic ground school.
(b) Advanced ground school.
(c) Primary flying school.
(1) Airplanes.
(2) Helicopters.
(3) Gliders.
(d) Commercial flying school.
(1) Airplanes.
(2) Helicopters.
(3) Gliders.
(e) Instrument flying school.
(f) Flight instructor school.

§ 50.2–1 *School ratings (CAA policies which apply to § 50.2).* Under existing regulations governing school ratings, the Administrator may approve only those courses wherein a student pursues a given curriculum leading to private, commercial, instrument, or flight instructor pilot ratings. The Civil Air Regulations do not provide for approval of curriculums leading to category, class, and type ratings only.

REQUIREMENTS

CAR 50.10 *Ground school requirements.* (a) Classrooms adequately heated and lighted, of sufficient size to accommodate the greatest number of students scheduled for attendance at any one time.

(b) Sufficient classroom equipment to insure adequate instruction in all required subjects.

(c) At least one regularly available principal instructor possessed of a ground instructor certificate with ratings for each of the required subjects of the curriculum.

§ 50.10–1 *Classrooms (CAA interpretations which apply to § 50.10 (a)).* The applicant must provide a space of permanent nature properly heated, lighted, and ventilated. Ample separate space must be provided for classrooms and equipment, sufficient to accommodate the largest number of students scheduled for attendance at any one time. If more than one classroom is provided, at least one of them must accommodate a minimum of 20 students. Each student must be provided with a desk-chair or chair and desk suitable for writing examinations. Classrooms must be maintained in neat, clean, and renovated conditions, and must be lighted with illumination of sufficient intensity to promote study without eyestrain. A blackboard large enough for explanation by means of diagrams must be provided.

§ 50.10–2 *Equipment (CAA interpretations which apply to § 50.10 (b))*—(a) *Basic classroom equipment.* Basic classroom equipment must consist of sufficient texts and related reading material to cover Civil Air Regulations, meteorology, aerial navigation, radio, general service of aircraft and pertinent operational data.

(b) *Advanced ground school equipment.* Advanced ground school equipment must consist of the following in addition to the equipment required for a basic ground school:

(1) Two wing panels, each of a different construction.

(2) Two different makes of aircraft engines, one of which may be liquid cooled. One should be cut down to show engine construction and operation.

(3) Sufficient material to instruct in the theory and use of modern high-powered aircraft components. This should include, either in model or blue print diagram form:

Controllable pitch propellers, electric and hydraulic.
Flaps.
Retractable landing gear.
Manifold pressure gauge.
Superchargers.
Cowl flaps.
Oil temperature control.
Instruments (dual tachometer, dual manifold pressure gauge, temperature-pressure group, gyro horizon, gyro compass, turn and bank indicator, rate of climb indicator, radio compass, and automatic pilot).
Deicing equipment.
Electrical systems, including generators,

voltage regulators, aviation batteries, fuses, and circuit breakers.

Accessories, including fuel pumps, oil pumps, magnetos.

§ 50.10–3 *Instructors (CAA interpretations which apply to § 50.10 (c)).* All instruction must be supervised by a certificated ground school instructor who holds ratings appropriate to the courses given. Instruction administered by uncertificated personnel must be directly supervised by a principal instructor who holds a ground instructor certificate with ratings covering all subjects offered in the school curriculum.

CAR 50.11 *Ground school curriculum.* A ground school curriculum approved by the Administrator for at least one of the following:

(a) *Basic ground school.* 50 hours of classroom instruction in the subjects of Civil Air Regulations (the regulations in this subchapter), including air traffic control practices and procedures, navigation, meteorology, and general servicing of aircraft.

(b) *Advance ground school.* 150 hours of instruction in the subjects of Civil Air Regulations, including air traffic control practices and procedures, navigation, meteorology, aircraft and engines, including the general servicing and maintenance of aircraft and engines.

§ 50.11–1 *Basic ground school curriculum. (CAA rules which apply to § 50.11 (a)).* The applicant shall provide a basic ground instruction curriculum which is satisfactory to the Administrator. The minimum acceptable curriculum shall include not less than 50 hours of instruction in the subjects listed below, followed by examination on each subject.

(a) *Civil Air Regulations.* At least 5 classroom hours of instruction to include:

Part 1: Certification, Identification, and Marking of Aircraft and Related Products.

Part 20: Pilot Certificates.

Part 43: General Operation Rules.

Part 60: Air Traffic Rules, including air traffic control practices and procedures.

Part 62: Notice and Reports of Aircraft Accidents and Missing Aircraft.

(b) *Meteorology.* At least 15 classroom hours of instruction to include:

Recognition of weather, icing, fog, and frontal conditions.

General cloud formations.

Study of weather maps, teletype sequences, and elementary weather forecasting.

Pressure areas, including motion of air masses, isobars, and winds aloft.

Humidity and its relation to visibility.

Temperature-dew point relationship and precipitation.

How to use knowledge of meteorology in private flying in promoting safety.

U. S. Weather Bureau facilities and weather assistance service.

(c) *Aerial navigation.* At least 15 classroom hours of instruction to include:

Study of aeronautical charts, including explanation of how charts are made, with emphasis on the Lambert conformal projection.

The navigational methods, including piloting, dead reckoning, and radio.

Navigational instruments: Types, errors, and practical usage.

Practical navigation problems: Dead reckoning, piloting, ETA's, flight plans, wind-triangle solutions using a simple computer, and maximum endurance problems.

Use of CAA publications (Airman's Guide, etc.).

(d) *Radio.* At least five classroom hours of instruction to include:

Explanation of radio aids to flight.

Use of simple receiver and transmitter, including tuning and voice procedure.

CAA communication facilities and flight assistance service, including search and rescue procedures.

International code: Memorizing of code, sufficient to provide ready recognition of radio range identification signals.

Use of loop antenna in homing on broadcast and other stations.

Distress signals and visual signals (on parking line).

(e) *General service of aircraft.* At least 10 classroom hours of instruction to include:

Care of aircraft: Line inspection, procedures, and general safety precautions.

Care of engines: Octane ratings, detonation, warming up and idling precautions, full throttle operations, and icing.

Operations limitations: Performance characteristics as affected by full load, altitude, and temperature conditions. Reason for placard limits, acceleration limits, air-speed limitations in rough air, and other restrictions in the interest of safety.

Inspections required.

Use of aircraft instruments and errors inherent in them.

Use and care of parachutes.
Use of logbooks.
Explanation of major and minor repairs.
Explanation of aircraft operation record.

§ 50.11–2 *Advanced ground school curriculum (CAA rules which apply to § 50.11(b)).* The applicant shall provide an advanced ground instruction curriculum which is satisfactory to the Administrator. The minimum acceptable curriculum shall include not less than 150 hours of instruction in the subjects listed below, followed by examination on each subject. Students who have successfully completed an approved basic ground school course may be given appropriate credit when applying for the advanced ground school course. The determination of credit for previous ground school work is left to the discretion of the airman agency, with the understanding that a graduate shall have completed all course requirements.

(a) *Civil Air Regulations.* At least 15 classroom hours of instruction to include:

Part 1: Certification, Identification, and Marking on Aircraft and Related Products.
Part 20: Pilot Certificates.
Part 43: General Operation Rules.
Part 60: Air Traffic Rules, including air traffic control practices and procedures.
Part 62: Notice and Reports of Aircraft Accidents and Missing Aircraft.

(b) *Meteorology.* At least 35 classroom hours of instruction to include:

General cloud formations.
Pressure areas, including motion of air masses, isobars, and winds aloft.
Humidity and its relation to visibility.
Temperature-dew point relationship and precipitation.
Recognition of weather masses, icing, fog and frontal conditions as to reasonably forecast the weather accompanying these masses.
How to use knowledge of meteorology in flying to promote safety.
Study of weather maps, teletype sequences, and coded weather data sufficient to permit ready interpretation of all symbols used.
U. S. Weather Bureau facilities and weather assistance service.
Weather map analysis, including pressure areas and fronts.

(c) *Aerial navigation.* At least 35 classroom hours of instruction to include:

Study of aeronautical charts, including explanation of how charts are made, with emphasis on the Lambert conformal projection.
The study and use of all forms of navigational methods, with emphasis placed on pilotage, dead reckoning, and the use of radio.
Study, use, and limitations of all types of navigational instruments, navigational aids, and the daily use of CAA publications (Airman's Guide and Flight Information Manual).
All types of practical navigational problems, including radius of action to an alternate airport and maximum endurance under economy conditions, as well as the precision planning of a flight, the filing of a flight plan that allows for a climb to altitude and descent therefrom, check and reporting points, alternate airports, the use of radio compass and direction finder equipment and radio ranges, sectional and world aeronautical charts.

(d) *Radio.* At least 15 classroom hours of instruction to include:

Explanation of radio aids to flight.
Types, usage, and limitation of radio receivers and transmitters, the effects of proper and improper tuning, frequency control, static and night effects, as well as antennaes and microphone techniques.
The use and limitations of all types of radio aids to air navigation, including very high frequency and omni-directional facilities.
Sufficient study in International code to allow ready recognition of radio range identification signals.
Use of loop antenna in homing on broadcast and other stations.
The coding and use of aeronautical lights, true lights, and distress signals.
The detailed explanation and use of airways traffic control, approach control, and airport traffic control.

(e) *Aircraft engines.* At least 20 classroom hours of instruction to include:

Principles of the internal combustion engine.
Fuels: Octane rating and detonation.
Construction and design: Metals, tolerances, compression ratios, and horsepower.
Classification and construction of engine components.
Lubrication and cooling systems.
Carburetion and ignition.
Propellers: Fixed, adjustable, controllable, constant speed, and full-feathering.
Disassembly.
Inspection and maintenance.
Overhaul, repair, timing, and assembly.
Trouble shooting.

Logbooks and other records.

Practices: Precautions in the operation of engines, such as starting, warm-up, idling, testing, and full-throttle operation.

(f) *Aircraft.* At least 20 classroom hours of instruction to include:

Aerodynamics and theory of flight.

Factors of aircraft design, construction, and rigging.

Aircraft operation placard: Necessity for limitations as to speed, load factors, rough air, gross load, and center of gravity limits; how to determine safe loadings, with C. G. limits.

Aircraft construction and materials used.

Repair and maintenance.

Airplane operations manual.

Logbooks and records.

Aircraft accessories.

The remaining 10 hours of the required 150 hours prescribed for the advanced ground school course to be utilized by the operator in accordance with the individual student's need.

CAR 50.12 *Flying school requirements.* (a) An airport adequate for the aircraft to be used and safe for the flight instruction to be given.

(b) Adequate hangar facilities housing all aircraft used for flight instruction.

(c) Adequate office, rest room, and ready room facilities.

(d) A sufficient number of certificated aircraft appropriate for the flight instruction to be given.

(e) Adequate shop, or readily available facilities suitable to insure proper maintenance of the aircraft to be used.

(f) A sufficient number of certificated mechanics readily available to provide for the inspection, maintenance, and repair of all aircraft used for flight instruction, unless other arrangements are approved by the Administrator.

(g) A sufficient number of regularly available and appropriately rated flight instructors.

§ 50.12–1 *Airport requirements for approved flying schools (CAA interpretations which apply to § 50.12 (a))*—(a) *Airports.* A minimum effective runway length of 1,500 feet at sea level, plus 7 percent increase in length for each 1,000 feet of elevation above sea level must be provided. The minimum width of the landing area must be 200 feet. All landing strips must be located and oriented so as to permit take-offs and landings to be accomplished 95 percent of the time with cross-wind components of less than 15 miles per hour. The minimum allowable approach angles must permit a twenty-to-one glide path to the ends of the minimum allowable length of the landing strips. Runway grade changes should be such that there will be an unobstructed line of sight from any point 5 feet above the runway to any other point also 5 feet above the runway within a distance of at least 500 feet plus one-half the length of the runway. Where night flying is required in the curriculum, lighting facilities must be furnished in accordance with Appendix D An approved glider school must meet these landing area requirements.

(1) An approved flying school applicant using only airplanes equipped with cross-wind landing gear need not comply with the cross-wind component portion of the airport requirements.

(2) Auxiliary landing fields may be used in conjunction with approved school operations, provided the landing area meets the requirements of § 50.12–1 (a) of the rules, policies and interpretations of the Civil Aeronautics Administrator.

(b) *Seadromes.* A minimum effective length of 3,500 feet at sea level, plus 7 percent increase in length for each 1,000 feet of altitude above sea level. The minimum effective width of the landing area must be 300 feet. The water within the landing area must be not less than 3 feet in depth. The approach angles at the end of each landing area must permit a twenty-to-one glide path to the ends of the minimum allowable length of the landing area.

(c) *Heliports.* The minimum allowable length for a heliport must be 600 feet of effective surface. The minimum allowable width must be 200 feet, exclusive of building area. Landing strips must be so located as to allow into-the-wind approaches and take-offs at least 50 percent of the time with a cross-wind component of less than 15 miles per hour. The landing approach clearance angles must be at least ten-to-one in the mag-

netic direction and reciprocal of the prevailing wind. The entire area must have an approach angle obstruction clearance of at least five-to-one.

In cases where these standards are not fully met, the matter may, if the interests of safety are served, be referred to the CAA Regional Administrator for final consideration.

§ 50.12-2 *Hangar facilities (CAA interpretations which apply to § 50.12 (b)).* The applicant must provide a hangar or hangars of permanent construction adequate to house all flight equipment to be used in approved training. Training aircraft are to be continually housed therein, except during periods of operation. This building must meet all local building and safety codes, and be possessed of a sound roof, sides, and doors. The hangar floor must consist of material such as wood, asphalt, concrete, brick, tile or any other surface that permits adequate daily cleaning and will not deteriorate rapidly.

If training aircraft remain overnight at auxiliary fields used by the school, hangar facilities must be provided.

§ 50.12-3 *Office, rest room, ready room facilities (CAA interpretations which apply to § 50.12 (c)).* The office, rest room, and ready room facilities must be continually maintained in a clean and orderly condition.

(a) *Office.* Applicant must provide suitable space of a permanent nature, properly heated, lighted, and ventilated, to house adequately equipment necessary to the proper conduct of business matters and the preparation of records appropriate to the flight operation. (This equipment should include chairs, desks, filing cabinets, and typewriters.)

(b) *Rest room.* The rest room must be conveniently located to the student's ready room and meet the local sanitary code for such facilities. Rest room facilities must be provided at auxiliary fields when instruction periods are originated and terminated there.

(c) *Ready room.* A separate space of a permanent nature heated, lighted, and ventilated, must be provided to accommodate flight students waiting to receive flight instruction. This space must be provided with chairs, clothes racks or lockers, bulletin boards, and appropriate aeronautical charts. Ready room facilities must be provided at auxiliary fields when instruction periods are originated and terminated there.

§ 50.12-4 *Required flight equipment. (CAA interpretations which apply to § 50.12 (d)).* All aircraft used for flight instruction of students enrolled in an approved airman agency must be properly certificated and registered in the name of the applicant or operated under lease, the terms of which must be satisfactory to the Administrator. Each aircraft must be continuously maintained in a safe and airworthy condition.

(a) *Primary flying school*—(1) *Airplane rating.* At least one airplane must be provided for each 15 students regularly enrolled as certificated flying school students. Such airplane must be capable of carrying two persons and two parachutes without exceeding the gross weight limitations set forth in the Aircraft Operation Record, and must be suitable to perform the maneuvers necessary to accomplish the flight test prescribed for a private pilot certificate.

(2) *Helicopter rating.* At least one helicopter must be provided for each 15 students enrolled under the terms of the airman agency certificate. Each helicopter must be capable of carrying at least a student, instructor, and full fuel tanks without exceeding the center of gravity or gross weight limitations. Ownership and lease arrangements, as well as the maintenance of the airworthiness condition requirements and flotation gear requirements when operated over water, must conform to those specified for an approved primary flying school (airplane). Sufficient ballast must be provided and utilized to insure proper weight and balance condition during student solo flight practice.

(3) *Glider rating.* At least one 2-place glider must be provided for each 15 students enrolled under the terms of the airman agency certificate. Each glider must be capable of carrying at least 2 persons and 2 parachutes without exceeding the gross weight or cen-

ter of gravity limitations. All tow planes to be used must be certificated with towing arrangements installed and proper authority for use obtained for the operation of the glider-tow plane combination.

(b) *Commercial flying school*—(1) *Airplane rating.* All airplanes provided by an applicant for a commercial flying school rating must be in excess of 50 horsepower. Airplanes with both tandem and side-by-side seating arrangements must be provided. (Training in single-place airplanes may be permitted in the commercial flight curriculum only.) The airplanes required may be owned or registered in the name of the applicant or under lease, the terms of which must be satisfactory to the Administrator.

At least one of the airplanes provided for instruction must be equipped with wing flaps, two-way radio, controllable propeller, and a manifold pressure gauge.

At least one airplane must be provided which is properly equipped for visual night flying as set forth in § 43.30 (b) of this chapter.

(2) *Helicopter rating.* In addition to the helicopter requirements for a primary flying school rating, an applicant for a commercial flying school rating (helicopter) must provide a helicopter capable of carrying at least a student, instructor, and full fuel tanks without exceeding the center of gravity or gross weight limitations, and be equipped for night flying as set forth in § 43.30 (b) of this chapter. Ownership and lease arrangements, as well as the maintenance of the airworthiness condition requirements and flotation gear requirements when operated over water, must conform to those specified for an approved commercial flying school (airplane). Sufficient ballast must be provided and utilized to insure proper weight and balance condition during student solo flight practice.

(3) *Glider rating.* At least one 2-place glider must be provided for each 15 students enrolled under the terms of the airman agency certificate. Each glider must be capable of carrying at least 2 persons and 2 parachutes without exceeding the gross weight or center of gravity limitations. All tow planes to be used must be certificated with towing arrangements installed and proper authority for use obtained for the operation of the glider-tow plane combination.

(c) *Instrument flying school.* At least one aircraft must be provided for each 15 students enrolled under the terms of the airman agency certificate. Each aircraft used for instrument flight instruction must be equipped for instrument flight in accordance with § 43.30 (c) of this chapter. Such aircraft must be equipped with a suitable hood which will completely exclude all outside visual reference to the pilot on instruments yet not restrict the vision of the safety pilot or observer. Further, the aircraft, with necessary crew, parachutes, fuel, and oil aboard, must be capable of maintaining a climb of 300 feet per minute at 2,000 feet above ground elevation and must permit accomplishment of all maneuvers listed in § 20.42 (c) of this chapter.

(d) *Flight instructor school.* At least one aircraft must be provided for each 15 students enrolled under the terms of the airman agency certificate. All aircraft provided by an applicant for a flight instructor school rating must be in excess of 50 horsepower and must be suitable to perform the maneuvers as prescribed for the flight instructor rating test. Aircraft used must be equipped with suitable interphone or cockpit communication system.

(e) *Parachutes.* The applicant must have available at least 2 parachutes manufactured under a valid type certificate and maintained in accordance with the Civil Air Regulations. Sufficient additional such parachutes must be furnished to prevent undue delay in the normal progress of all students undergoing flight training.

§ 50.12–5 *Maintenance and repair facilities (CAA interpretations which apply to § 50.12 (e)).* A suitable space, properly heated and lighted, completely isolated or separated from the storage hangar, preferably by fire-resistant walls, must be provided to conduct all necessary periodic inspections, repairs, and other maintenance functions. Suf-

ficient tools, mechanical devices, and appropriate aircraft and engine manufacturers' manuals, must be provided to adequately perform all maintenance operations. In the event the shop space cannot accommodate the assembled aircraft, space may be provided in the storage hangar for the conduct of periodic inspection, if such space is adequately heated and lighted and the aircraft may be completely isolated therein while undergoing such inspection. Maintenance and repair facilities may be provided by contractual agreement. Under this provision it will be the responsibility of the airman agency to insure that all periodic inspections, major repairs, and overhauls are accomplished by the maintenance contractor. Exceptions to this will be permitted only when the aircraft require repairs while away from the home base or when maintenance or repairs involve technical operations which the contractor is not equipped to handle; example, radio and instrument repairs. The services, facilities, location, and any changes in the maintenance contract must be acceptable to the Administrator.

§ 50.12–6 *Maintenance personnel (CAA interpretations which apply to § 50.12 (f)).* Applicant must have sufficient certificated personnel, either regularly employed or under contract, to maintain aircraft used for flight instruction in full airworthy condition at all times. Not more than 5 uncertificated personnel may be under the supervision of one aircraft and engine mechanic at any one time.

§ 50.12–7 *Flight personnel (CAA interpretations which apply to § 50.12 (g)).* (a) Each person giving, or employed to give, flight instruction must possess a valid pilot certificate, with commercial, flight instructor, and pertinent category and class ratings.

(1) A flight instructor in an instrument flying school must possess a valid pilot certificate with commercial, instrument, and pertinent category and class ratings.

CAR 50.13 *Flying school curriculum.* A curriculum approved by the Administrator for at least one of the following:

(a) *Primary flying school.* (1) Airplanes—35 hours of flight time,

(2) Helicopters—35 hours of flight time,

(3) Gliders—8 hours of flight time.

(b) *Commercial flying school.* (1) Airplanes—160 hours of flight time,

(2) Helicopters—160 hours of flight time,

(3) Gliders—20 hours of flight time.

(c) *Instrument flying school.* 30 hours of instrument flying instruction of which at least 20 hours shall be in actual flight; and 30 hours of ground instruction in the subjects of Civil Air Regulations (the regulations in this subchapter), navigation, meteorology, and radio orientation and procedure, as applied to instrument flying.

(d) *Flight instructor school.* 25 hours of flying devoted exclusively to the science of flight instruction, and 40 hours of theoretical instruction in subjects covering the fundamentals of giving flight instruction and the analysis and performance of flight maneuvers.

§ 50.13–1 *Primary flying school curriculums; airplanes; land and sea; 35 hours flying time (CAA rules which apply to § 50.13 (a) (1))*—(a) *Airplanes—land.* The applicant shall provide a primary flight curriculum satisfactory to the Administrator. This curriculum shall include not less than 35 hours flying time and shall be arranged so as to allow a minimum of 15 hours dual and 13 hours of solo flight time. Flying time devoted to student progress or stage checks may be credited as dual instruction for the purpose of meeting the requirements of primary flying school curriculums. Such flights may be conducted by the regularly assigned flight instructor, agency check pilot, or Aviation Safety Agent. A minimum of 8 hours dual instruction shall be given prior to solo flight. A minimum of 4 hours dual and 8 hours solo cross-country flying shall be provided. The solo cross-country experience shall include at least one flight to a point more than 100 airline miles from the base of operation. During the flight at least two full stop landings shall be made. The landing at destination may be credited to-

ward meeting the en route landing requirement. The required dual instruction in cross-country flying shall be given after the student's initial solo. During the course of the flight instruction, ground discussion shall be given at the ratio of at least 15 minutes per hour of flight time. This shall include familiarizing the student with the aircraft in regard to controls, instruments, fuel system, electrical system, radio and accessories. The use and care of parachutes, safety precautions consisting of eliminating hazards to spectators, starting and stopping of engines, and securing of aircraft shall be thoroughly discussed. Each student shall be completely familiar with the pertinent local air traffic rules and patterns prior to initial solo. Pre-flight and line inspections shall be accomplished by the student whenever possible.

Dual instruction prior to solo shall consist of at least the following:

Determination of wind direction, on the ground and in flight.

Taxiing, into wind, cross-wind and downwind.

Engine run-up prior to take-off, use of airplane check list when check lists are involved.

Straight and level flight.

Shallow, medium and steep banked turns, right and left.

Climbs, glides, including turns, right and left.

Coordination exercises, elementary eights, and S-turns across ground reference lines.

Slow flight.

Stalls and recovery with and without power.

Normal take-offs and landings.

Slips.

Emergency procedure.

Maneuvers following solo. Flight at various power settings so as to accomplish straight and level flight and turns in both directions without loss or gain of altitude.

Precision turns of shallow, medium and steep banked attitudes, emphasizing constant bank, speed and altitude.

Dragging areas.

Demonstration and practice in short field or soft field takeoffs and approaches to landing.

Left and right climbing and gliding turns at normal and minimum controllable speeds.

Power-on and power-off stalls and recovery entered from all normally anticipated flight attitudes.

Execution of turns around reference points on the ground. This shall include the execution of 720° power turns around such reference points. During this maneuver the banked attitude shall be varied so as to maintain a track of equal radius around the selected point. The 720° power turns shall be performed so that a banked attitude of more than 45° may be attained during the maneuver.

Cross-wind take-offs and landings.

Simulated emergency landings from high and low altitudes.

Precision landings with engine throttled using slips or flaps to facilitate landing within desired area.

Power approaches to landing.

Wheel landings.

Cross-country flying: 4 hours dual and 8 hours solo flying time. During the student's cross-country training, landings and take-offs should be made at as many different airports as possible. This phase of the curriculum shall consist of instruction in at least the following:

Pre-flight cross-country planning. Plotting course.

Determining magnetic course.

Computing distance and estimating time of arrival.

Checking weather.

Study of navigational facilities and airports to be used including alternate airports.

Determining fuel requirements for flight.

Selecting altitude.

Loading of aircraft.

In flight. Determining compass course to destination.

Estimating time between check points.

Determining course to alternate airport.

At destination. Securing aircraft.

Cross-country planning for return trip.

(b) *Airplanes; sea.* Where flight instruction is given in a seaplane, the following shall also be included in the curriculum:

(1) Pre-flight instruction:

Explanation of float action.

Retraction of water rudders.

Determination of wind direction.

Fundamentals of water handling.

Fundamentals of aviation seamanship.

Use of life preservers.

General care of seaplanes.

(2) Additional maneuvers to be included:

Semi-stall and full-stall landings.
Power approaches and power landings given under average water conditions and on glassy water.
Where practicable, landings and take-offs on various bodies of water such as a bay (tide action) and streams (currents).
Precision sailing (with and without power).
Precision docking, beaching, and mooring.
Forced landings, executed to buoy markers.

(c) *Alternate curriculum; primary flying school.* An applicant for an approved airman agency primary flying school may utilize a curriculum different from those prescribed in this manual, provided prior approval is obtained from the Administrator.

Request for approval may be made to the local CAA Aviation Safety District Office. Two copies of the proposed curriculum shall accompany such a request.

§ 50.13–2 *Primary flying school curriculum; helicopter (CAA rules which apply to § 50.13 (a) (2))*—(a) *Helicopters; 35 hours flying time.* A curriculum satisfatcory to the Administrator shall include not less than 35 hours of flying time. This course shall be arranged to give each student a minimum of 15 hours dual and 13 hours of solo flight time. A minimum of 8 hours dual instruction shall be given prior to solo flight and is to be included in the 15 hours of required dual.

It may be found necessary to modify or eliminate certain flight maneuvers because of the wide variation in flight characteristics that exist in helicopters of different manufacture. In general, however, any curriculum to be satisfactory to the Administrator shall include the following:

(1) Familiarization, including control usage, starting, warm-up, run-up, and stopping of engine, limitation placards, engine and flight instruments, fuel and electrical system, servicing precautions, safety belts, and hazards to spectators; local airport rules and regulations.

(2) The dual instruction prior to solo shall include both theoretical and practical instruction in:

Taxiing (into wind, downwind and cross-wind).
Take-offs (upwind and cross-wind).
Landings (into the wind).
Hovering (into wind and cross-wind, downwind hovering should be demonstrated).
90° hovering turns.
Sideward and backward flight.
Rectangular course (hovering altitude constant heading).
Climbing and descending.
Minimum steep turns (not to exceed 30°).
Normal, 30° angle, approaches to landing.
Traffic pattern flying.
Elementary autorotative approaches.
Simulated emergency landings.

(3) The above should be followed by additional dual and solo practice. Periodic checks should be given throughout the course. Dual instruction and solo practice shall also be given on the following maneuvers.

Hovering downwind.
Hovering turns, 90° through 360°.
Settling with power and recovery.
Accuracy landings: normal, slow-steep, fast-low, flare and no-flare type approaches.
Autorotative approaches: straight, 90°, 180°, and 360°.
Dual and solo cross-country. A minimum of 2 hours dual and 3 hours solo cross-country experience shall be provided in the curriculum. This shall include a solo cross-country flight with two intermediate full-stop landings, one leg of which shall be at least 50 miles in length.
At least one hour of dual instruction shall be given at an altitude sufficiently high to demonstrate the misconceptions of attitude and movement which may occur when flying a helicopter at altitude by outside visual reference only.
Turns, medium steep bank (30° to 45°).
S-turns along ground reference line (varying speeds).

§ 50.13–3 *Primary flying school curriculum; glider (CAA rules which apply to § 50.13 (a) (3))*—(a) *Gliders; 8 hours flying time.* An applicant for a primary glider flying school rating shall provide a flight curriculum satisfactory to the Administrator. This curriculum shall include not less than 8 hours of total flight time. Any curriculum, to be satisfactory to the Administrator, shall include the following:

A minimum of 3 hours of dual and check time.

A minimum of 5 hours of supervised solo flight time.

A minimum of 80 gliding flights.

Flight instruction shall include, but not be limited to, the following maneuvers:

Straight glides.
Confidence maneuvers.
Turns.
Coordination exercises.
Stalls.
Airplane tow technique.
Glidepath technique.
Use of spoilers.
Cross- and down-wind technique.
Landings.

Additional dual instruction and solo practice should follow to obtain proficiency in all maneuvers. The apportionment of dual and solo time and the amount of instruction and practice in each maneuver should be adequate to enable the student to sufficiently demonstrate his proficiency in each, to a degree required of a private glider pilot.

§ 50.13–4 *Commercial flying school curriculums; airplanes; land and sea (CAA rules which apply to § 50.13 (b) (1))*—(a) *Airplane—land.* An applicant for a commercial flying school rating shall provide a flight instruction curriculum satisfactory to the Administrator. Such curriculum shall consist of not less than 160 hours of flying time for the purpose of qualifying persons for commercial pilot certificates. Any curriculum to be satisfactory to the Administrator shall meet the following requirements:

(1) A minimum of 50 hours dual and check time. 8 hours of such instruction time shall be given prior to first solo flight.

(2) A minimum of 105 hours of supervised solo shall be given.

(3) A total of 10 hours of pilot-in-command, dual, or solo night flying shall be given. Whenever practicable, at least 3 hours should be devoted to night cross-country flying. During this phase of training, at least 5 hours, including 10 take-offs and 10 landings, should be accomplished while solo, or while serving as pilot-in-command and the sole manipulator of the controls. Normally the practicability of conducting the cross-country portion of the night flying requirement will be established by the local CAA Aviation Safety District Office. In making this determination, consideration shall be given to such items as nature of terrain, navigation facilities, alternate landing areas, etc.

(4) A minimum of 5 hours of dual and 20 hours solo cross-country flying shall be given. During the course of instruction, at least one solo cross-country flight shall be made to a point not less than 350 miles distant from the point of departure. During such flight, at least 3 full-stop landings at different points along the route shall be made. In the course of the student's training, his flight record shall indicate one flight wherein all radio aids to air navigation that are available, have been utilized and shall include the preparation and use of a predetermined flight plan.

(5) A minium of 10 hours solo shall be given in tandem seating aircraft.

(6) A minimum of 10 hours solo shall be given in side-by-side seating aircraft.

(7) A minimum of 10 hours solo shall be given in aircraft equipped with wing flaps, two-way radio, controllable propeller, and a manifold pressure gauge.

(8) The first 35 hours of instruction and solo practice shall be identical with the Primary Flying School Curriculum. Students who have successfully completed such curriculum in a certificated flying school, or possess a private pilot certificate, may be given appropriate credit when applying for the commercial pilot flight course. The determination of credit for previous flight experience is left to the discretion of the airman agency, with the understanding that a graduate has completed all course requirements.

(9) The flight curriculum shall be arranged so as to give instruction and solo-flight practice on all maneuvers necessary to enable a student to demonstrate proficiency to a degree required of a commercial pilot. Such maneuvers, in addition to those taught and practiced in the primary course, are:

Eights on pylon (steep and shallow banked).

Precision landings from 180° side approach, use of key position should be emphasized.

720° power turns, left and right, executed at a banked attitude of at least 60°.

Steep gliding (spiral) turns executed at a banked attitude of not less than 60°.

Lazy eights.

Chandelles.

(b) *Airplanes; sea.* Where flight instruction is given in a seaplane, the following shall also be included in the curriculum:

(1) Pre-flight instruction:

Explanation of float action.
Retraction of water rudders.
Determination of wind direction.
Fundamentals of water handling.
Fundamentals of aviation seamanship.
Use of life preservers.
General care of seaplanes.

(2) Additional maneuvers to be included:

Semi-stall and full-stall landings.

Power approaches and power landings given under average water conditions and on glassy water.

Where practicable, landings and take-offs on various bodies of water such as a bay (tide action) and streams (currents).

Precision sailing (with and without power).

Precision docking, beaching, and mooring.

Forced landings, executed to buoy markers.

§ 50.13–5 *Commercial flying school curriculum; helicopter (CAA rules which apply to § 50.13 (b) (2)).* (a) An applicant for a commercial flying school rating (helicopter) shall provide a flight instruction curriculum satisfactory to the Administrator. Such curriculum shall consist of not less than 160 hours of flying time for the purpose of qualifying persons for commercial pilot certificates.

(b) It may be found necessary to modify or eliminate certain flight maneuvers because of the wide variation in flight characteristics that exist in helicopters of different manufacture. In general, however, any curriculum to be satisfactory to the Administrator shall meet the following requirements:

(1) A minimum of 70 hours dual and check time. 8 hours of such instruction time shall be given prior to first solo flight.

(2) A minimum of 90 hours of supervised solo shall be given.

(3) A total of 10 hours of pilot-in-command, dual, or solo night flying shall be given. During this phase of training at least 5 hours, including 10 take-offs and 10 landings, should be accomplished while solo, or while serving as pilot-in-command, and the sole manipulator of the controls.

(4) A minimum of 25 hours of dual and solo cross-country flying shall be given. During the course of instruction, at least one solo cross-country flight shall be made to a point not less than 150 miles distant from the point of departure. During such flight, at least 3 full-stop landings at different points along the route shall be made.

(5) The first 35 hours of instruction and solo practice shall be identical with the helicopter private pilot flight curriculum. Students who have successfully completed such curriculum in a certificated flying school, or possess a private pilot certificate with helicopter rating, may be given appropriate credit when applying for the commercial pilot (helicopter) flight course.

(6) The flight curriculum shall be arranged so as to give instruction and solo flight practice on all maneuvers necessary to enable the student to demonstrate commercial pilot proficiency in the maneuvers characteristic of the helicopter type on which his training was received. In addition to those maneuvers taught and practiced in the primary course or initial 35 hours of training, theoretical and practical instruction shall be provided in the following:

Running take-offs.

S-turns along ground reference line (varying speeds).

Pattern flying changing headings at hovering altitude.

Rapid decelerations (quick stops).

§ 50.13–6 *Commercial flying school curriculum; gliders (CAA rules which apply to § 50.13 (b) (3)).* An applicant for a commercial flying school rating (glider) shall provide a flight instruction curriculum satisfactory to the Adminis-

trator. Such curriculum shall consist of not less than 20 hours of flight and shall meet the following requirements:

(a) A minimum of 8 hours of dual and check time: 3 hours of such instruction time shall be given prior to first solo flight.

(b) A minimum of 12 hours of supervised solo shall be given after solo.

(c) A minimum of 100 gliding flights or 5 hours of soaring flight time shall be given.

(d) The first 8 hours of instruction and solo practice shall be identical with the private glider curriculum.

(e) The following maneuvers shall be included in addition to those taught and practiced in the private glider pilot course:

Emergency maneuvers such as recovery from stalls, entered from both level and steeply banked attitudes.
Spirals.
Cross-wind take-offs and landings.
Soaring techniques.
Lazy eights.
Accuracy landings.

§ 50.13–7 *Instrument flying school. (CAA rules which apply to § 50.13 (c))*— (a) *Ground school curriculum.* The applicant shall provide an instrument ground school curriculum satisfactory to the Administrator. Such curriculum shall include not less than 30 hours of classroom instruction on the subjects listed below:

(1) *Civil air regulations.* At least 2 classroom hours of instruction to include:

Part 1: Certification, Identification, and Marking on Aircraft and related products.
Part 20: Pilot Certificates.
Part 43: General Operation Rules.
Part 60: Air Traffic Rules, including air traffic control practices and procedures.

(2) *Meteorology.* At least 5 classroom hours of instruction, of which one should be practical weather observation and the identification of weather conditions, to include:

Those subjects listed for advanced ground school rating.
Detailed study of conditions found under instrument flying conditions, with emphasis on icing conditions.
Advanced meteorology: Weather maps, fronts, and analysis.

(3) *Aircraft and theory of flight.* At least 3 classroom hours of instruction to include:

Study of aircraft equipment: deicing equipment, static eliminators, effect of ice on propeller, and wing efficiency.
Power required under various load conditions, and change in stalling speeds therein.

(4) *Navigation.* At least 5 classroom hours of instruction to include:

Navigational problems under instrument conditions.
Use of computer.
Methods of obtaining fixes.
Correction of drift to regain position.
Alternate airport problems.
Airman's Guide, Flight Information Manual, Radio Facilities, and Instrument Approach Charts.
Radio orientation (at least 3 methods).

(5) *Instruments, radio and navigational aids.* At least 5 classroom hours of instruction to include:

Review of all instruments and errors that may be encountered under instrument conditions.
Study of radio aids to instrument flight.
Tuning radio, and use of volume control.
Description of various radio aids.
CAA communications facilities and flight assistance service, including search and rescue operations.

(6) *Instrument flight procedures.* At least 10 classroom hours of instruction, to be given in phase with or before actual flight training, to include:

Technique of instrument flight.
Beam and bracketing procedures.
Let-down procedures.
Air Traffic Control procedures.
Flight plans.

Each person giving, or employed to give, ground school instruction in an instrument flying school must be certificated as required by § 50.10 (c).

(b) *Flight curriculum.* (1) This curriculum shall include not less than 30 hours of flight instruction, of which not more than 10 hours may be given in a flight simulator. That portion of the

instruction which is conducted in a flight simulator shall remain in phase with the flight instruction.

(2) The curriculum, to be satisfactory to the Administrator, shall include at least the following:

Climbs and climbing turns.
Level flight.
Timed turns.
Steep turns (over 45°).
Stalls, and approaches to stalls.
Recovery from abnormal attitudes.
Slow flight and controlled descent.
Radio range orientation, including at least three methods.
Beam bracketing.
Station identification.
Airport and Airway Traffic Control holding and emergency procedures.
Final approach.
Missed approach.
Practical speed, wind, drift problems.

(3) The CAA wishes to encourage the use of VHF range systems. VHF facilities may be used in training and in accomplishing as much of the present flight test as is practicable; however, until the low frequency range system becomes obsolete and is supplanted by the new systems, orientation and the execution of a standard instrument approach, utilizing the low frequency system will be required. This portion may be accomplished in a simulator, provided a low approach is successfully made during the flight test utilizing VHF facilities.

§ 50.13–8 *Flight instructor school (CAA rules which apply to § 50.13 (d))*—(a) *Ground school curriculum.* An applicant for a flight instructor flying school rating shall provide a ground school curriculum satisfactory to the Administrator. Such curriculum shall include not less than 40 hours instruction on "Analysis and Performance of Maneuvers" and "Psychology, Technique and Methods of Flight Instruction." A curriculum satisfactory to the Administrator shall include, but not be limited to:

(1) Steps in teaching students how to fly:

Preparation—knowledge of what to say and how to say it.
Definition of what is to be taught in a a specific lesson. (Statement of Aims.)
Explanation of maneuvers. (Presentation.)
Demonstration of maneuvers.
Student's practice.
Determination of student's progress and review of weak points.

(2) Common errors in instruction:

Lack of planned instruction.
Variations in terminology used in flight instruction.
Giving instruction in flight which could better be given on ground.
Failure to stress important or key points.
Poor speech habits, e. g., failure of instructor to speak clearly, etc.
Bad personal habits—impatience, lack of promptness, etc.
Failure to overcome prejudices with respect to other people's "peculiarities."
Emphasizing pet "hobbies" or "peeves."

(3) How students learn:

Importance of directed practice as compared with mere repetition.
Effect of old habits on learning how to fly. (Habit interference.)
Difficulties in trying to learn too much, too fast.
Value of training aids, e. g., charts, models, films, etc.

(4) Adapting training to individual students:

Slow versus fast learners.
Under-confident versus over-confident students.
The "problem child."
Preparatory planning of each student's lessons in order to deal with his individual problems.

(5) Keeping student interested:

Judicious use of praise and blame.
Informing student of his progress.
Importance of instructor appreciating student's problems.

(6) Keeping student fit:

Minimizing student fatigue.
Dealing with questions regarding health in relation to flying, e. g., ear trouble, the common cold, air sickness, etc.
Dealing with problem of "muscular tension."
Maintaining emotional stability.

(7) Finding out how student is progressing:

Reasons for standardization of check flights.
Subjective observation:
CAA rating procedures and other rating scales.
Training in use of above.
Objective evaluation:
Flight inventory.
Graphic methods.
Use of above techniques.
Difficulties in observing student's performance:
Errors of observation.
Elimination of errors.

(8) Checking up on your ability as an instructor.

Need for periodic check-up.
The teaching "Self-Audit."

(9) Summary of points to remember in flight instruction.

Plan instruction, on ground and in air, to meet student's problems.
Give all instruction possible on ground so that student has a clear idea of what is expected of him before start of flight lesson.
Keep instruction in air simple, clear, and concise.
Keep student interested and try to understand his problems.
Give student ample opportunity to review maneuvers already learned.
Direct student's solo practice along lines in which he is most inadequate.
Emphasize importance of judgment and necessity to "plan ahead."

(10) Civil air regulations.

(11) Analysis and performance of maneuvers.

(12) Final examination.

Each student will "instruct" the class on topics assigned in advance. Student's method of presentation will be criticized in light of principles of flight instruction discussed in course.
Analysis and performance of maneuvers.

(b) *Flight curriculum.* An applicant for flight instructor flying school rating shall provide a flight instruction curriculum satisfactory to the Administrator. Such curriculum shall consist of not less than 25 hours flying time for the purpose of qualifying persons for the flight instructor rating. A curriculum satisfactory to the Administrator shall include the following:

(1) A minimum of 10 hours dual and solo practice in the performance of all elementary, intermediate, and advanced maneuvers, to enable the student to demonstrate these with smoothness and precision and to assist him to develop an easy, confident manner when flying.

(2) A minimum of 15 hours in the practice of giving flight instruction in all elementary, intermediate, and advanced maneuvers, where the instructor will ride as trainee, simulating the usual errors of the novice pilot, and the student acts as instructor. The purpose is to develop proficiency in the analysis of maneuvers and to evolve a technique of imparting this knowledge under actual flight conditions. The curriculum shall include, but not be limited to, the following:

(i) Elementary maneuvers.

Taxiing, into wind, cross-wind and downwind.
Straight and level flight.
Shallow, medium, and steep banked turns, right and left.
Climbs, glides, including turns right and left, at normal and minimum controllable speeds.
Power-on and power-off stalls and recovery entered from all normally anticipated flight attitudes.
Slow flight.
Spins.
S-turns along ground reference lines.
Medium and steep banked eights around pylon.
Slips.
Normal take-offs and landings.
Simulated emergency landings from high and low altitudes.

(ii) Intermediate maneuvers.

Eights "on" pylons.
Maximum climbing turns.
Gliding spiral turns, banked attitude of at least 60°.
Short field take-offs and approaches to landing.

Slips, forward and side.
Controlled slipping turns.
90° approach for a landing.
180° side approach for a landing.
360° approach for a landing (simulated).
Cross-wind take-offs and landings.
Downwind landings, moderate winds, and when permissible.

Flight at various power settings so as to accomplish straight and level flight and turns in both directions without loss or gain of altitude.
Accidental and cross-control spins.
Dragging areas.
Power approaches to landing.
Wheel landings.

(iii) Advanced maneuvers.

Lazy eights.
Chandelles.
Precision spins, 1½, 2, and 3 turns.
720° power turns, left and right, executed at a banked attitude of at least 60°.

(3) A minimum of 15-minute discussion periods shall be provided before and after each flight.

(4) Where seaplanes are used the following shall be included:

(i) Additional maneuvers.

Semi-stall and full-stall landings.
Power approaches and power landings given under average water conditions and on glassy water.
Where practicable, landings and take-offs on various bodies of water such as a bay (tide action) and streams (current).
Precision sailing (with and without power).
Precision docking, beaching, and mooring.
Forced landings executed to buoy markers.

(5) It may be found necessary to modify or eliminate certain flight maneuvers because of the wide variation in flight characteristics that exist in helicopters of different manufacture. In general, however, any curriculum to be satisfactory to the Administrator shall meet the following requirements:

(i) Elementary maneuvers.

Taxiing (into wind, downwind, and cross-wind).
Take-offs (upwind and cross-wind).
Landings (into the wind).
Hovering (into wind and cross-wind).
90° hovering turns.
Sideward and backward flight.
Rectangular course (hovering altitude constant heading).
Climbing and descending.
Minimum banked turns (not to exceed 30°).
Normal, 30° angle, approaches to landing.
Traffic pattern flying.
Elementary autorotative approaches.
Simulated emergency landings.

(ii) Intermediate maneuvers.

360° hovering turns.
Accuracy landings: normal, slow-steep, fast-low, flare and no-flare type approaches.
Autorotative approaches: straight, 90°, 180°, and 360°.
S-turns along ground reference line (varying speeds).
Medium steep banked turns (30° to 45°).
Rapid decelerations (quick stops).
Pattern flying changing headings at hovering altitude.
Cross-wind take-offs and landings.

(iii) Advanced maneuvers.

Running take-offs and landings.
Accuracy landings from autorotative glides: 90°, 180°, and 360°.
Vertical autorotation.
Settling with power and recovery.
Altitude flying; this to be accomplished at an altitude sufficiently high to demonstrate the misconceptions of altitude and movement which may occur when flying a helicopter at altitude by outside visual reference only.
Downwind hovering.

GENERAL

CAR 50.20 *Application.* Application for an airman agency certificate and rating shall be made upon the form prescribed and furnished by the Administrator, and shall be accompanied by two copies of any proposed curriculum.

§ 50.20-1 *Application. (CAA rules which apply to § 50.20).* (a) The application shall be submitted on Form ACA-387, Application for Airman Agency Certificate and Rating, and Inspection Report. This form may be obtained from the nearest CAA Aviation Safety District Office. The local Aviation Safety Agent will furnish full information as to the execution of this application and will arrange appointments for the inspection of the facilities, equipment, etc. It is suggested that prior to the execution of the application the applicant discuss the rating sought with the Aviation Safety Agent involved.

(b) Unless requested by the local Aviation Safety Agent, it will not be necessary to submit the proposed curriculums in duplicate.

CAR 50.21 *Display.* Display of an airman agency certificate shall be made upon the reasonable request of any person.

§ 50.21–1 *Display (CAA policies which apply to § 50.21).* An airman agency flight or ground school will be furnished with an airman agency certificate which will be forwarded to the applicant upon approval of his application or upon renewal of his airman agency certificate. This certificate should be displayed or kept in the file for reference and be made available upon the reasonable request of any person. This certificate, currently designated as Form ACA–390, is the legal basis for school operation as an approved airman agency.

CAR 50.22 *Duration.* An airman agency certificate shall expire 24 calendar months after the month of issuance.

§ 50.22–1 *Duration (CAA policies which apply to § 50.22).* An airman agency certificate will expire 24 months after the month of issuance. However, the holder may apply for renewal 60 days prior to expiration. See sample Air Agency Certificate, Form ACA–390, contained in Appendix A (Forms).

CAR 50.23 *Renewal.* Application for renewal of an airman agency certificate shall be made on a form furnished by the Administrator and may be mailed or presented to any inspector within 60 days prior to the month of expiration.

§ 50.23–1 *Renewal (CAA policies which apply to § 50.23).* Application for renewal will be made on Form ACA–387, Application for Airman Agency Certificate and Rating, and Inspection Report. It is the holder's responsibility to secure the renewal of his airman agency certificate. Arrangements for this may be made through the local Aviation Safety Agent. An airman agency certificate may be renewed at any time within 60 days prior to the date of expiration. An expired air agency certificate may not be reinstated. In such instances, original certificate procedures will be observed. This will include the assignment of a new certificate number.

CAR 50.24 *Transfer.* An airman agency certificate is not transferable.

§ 50.24–1 *Change in ownership (CAA policies which apply to § 50.24)*—(a) *Change in ownership.* The certificate becomes invalid whenever a change in the ownership of the airman agency occurs. In such cases, the new owner should submit Form ACA–387, Application for Airman Agency Certificate and Rating, and Inspection Report, which will be processed as original issuance. Upon approval of the application, a new air agency certificate, with a new number and bearing the approval date of the new application, will be issued by the regional office involved.

(b) *Change in operating control.* Whenever there is a change in the operating control of an airman agency, a spot inspection will be conducted to determine that the agency continues to meet the requirements of this part.

§ 50.24–2 *Change of name (without change in ownership) (CAA policies which apply to § 50.24).* A change of name of an airman agency, without a change of ownership, does not invalidate the air agency certificate. However, such a change will be reported immediately on Form ACA–387 by the owner to the local Aviation Safety Agent. A new air agency certificate will be issued containing the old certificate number, the new name, and the ratings issued.

CAR 50.25 *Surrender.* Upon the suspension, revocation, termination, or cancellation of an airman agency certificate the holder thereof shall surrender such certificate to an authorized representative of the Administrator.

§ 50.25–1 *Surrender (CAA policies which apply to § 50.25).* (a) An air agency certificate can be rendered invalid only through suspension, revocation, expiration, or cancellation. In such cases, the air agency certificate will be surrendered by the holder.

(b) Voluntary surrender of an air agency certificate may be effected by the holder submitting a letter stating that the certificate has been voluntarily surrendered, together with the latest issuance of the air agency certificate.

CAR 50.26 *Quality of instruction.* The quality of instruction shall be such that at least 80 percent of the students who apply within 60 days after graduation will be able to qualify for pilot ratings appropriate to the curriculum from which they were graduated.

§ 50.26–1 *Quality of instruction (CAA policies which apply to § 50.26)*—(a) *Student flight checks.* The holder of an air agency certificate will, upon request of the local CAA Aviation Safety District Office, submit students for flight proficiency checks. These checks are intended to determine the quality of instruction and adequacy of curriculum. Under normal circumstances approximately 10 percent of all approved school students will be spot checked by the local CAA Aviation Safety Agent after they have completed at least 50 percent of the flight curriculum. The flight test for the pilot certificate, appropriate to the curriculum from which the student has graduated, may be substituted for the above spot check provided such flight test is conducted by an Aviation Safety Agent.

In order to facilitate scheduling of these spot checks, the Air Agency will notify the local CAA Aviation Safety District Office, the names of all students they expect to graduate. This notice will be submitted in writing at least 15 days in advance of the date on which the graduation certificate is to be issued.

(b) *Air agency activity report.* The holder of an air agency certificate will furnish to the CAA an air agency activity report (Form ACA–1784). This report will contain: name of student, date of graduation and date and results of CAA written examination or flight test as required to qualify for pilot ratings appropriate to the curriculum from which the individual student was graduated. This form is used to record and analyze the performance of individual flying and ground schools and to insure compliance with the requirements of this part.

Entries should reflect only the results of the CAA written examination or flight test on which the student was examined within 60 days following graduation. The following certificate should appear on the form: "I certify that the information contained herein is true and correct to the best of my knowledge." This certificate will be dated and signed by an authorized official of the agency and will bear his title. Two copies of this report will be submitted to the local Aviation Safety District Office as soon as the agency has reports on 32 students, or at least once every 6 months.

CAR 50.27 *Student examinations.* Upon the completion of each subject included in an approved curriculum, each student taking the subject shall be given an appropriate examination. The student's written examination, or, in the case of a practical examination, a report thereof, shall be kept by the school for not less than 1 year from the date of the termination of the student's enrollment.

§ 50.27–1 *Student examinations. (CAA interpretations which apply to § 50.27).* The holder of an airman agency certificate must devise and administer appropriate written or practical examinations to each student upon completion of each course covered in the approved curriculum. Further, the school must maintain, for not less than one year from the date of the termination of the students' enrollment, a copy of the students' written examinations; in the case of a practical examination, a report of the examiner's findings must become a part of the file.

CAR 50.28 *Records.* The school shall keep an accurate individual record of each student, which shall include a chronological log of all instruction, attendance, subjects covered, examinations, and examination grades. The entire record shall be certified by an authorized official of the school.

§ 50.28–1 *Records (CAA policies which apply to § 50.28.* The school will keep a current record of each student's activity during course enrollment. Upon course completion or graduation, the entire record or file will be certified by an authorized representative of the school. This student file folder will be retained for a period of one year and made available for inspection upon reasonable request by an authorized representative of the Administrator. See sample forms in

CAR 50.29 *Graduation certificates.* A graduation certificate on the form prescribed by the Administrator shall be given each student graduated from a certificated airman agency school.

§ 50.29–1 *Graduation certificates (CAA rules which apply to § 50.29).* A Graduation Certificate shall be issued on Form ACA–391. It may be obtained from the local Aviation Safety Agent and, in addition to other pertinent data, shall reflect the grades obtained by the individual student on the written or practical examination conducted by the school.

CAR 50.30 *Inspection.* Upon reasonable request, an applicant for an airman agency certificate, or the holder of such a certificate, shall permit any authorized representative of the Administrator or the Board to inspect its personnel, facilities, equipment, and records.

§ 50.30–1 *Inspection (CAA policies which apply to § 50.30).* At varying intervals it will be necessary for the local Aviation Safety Agent to spot check, reinspect, or examine each operation, including the students, instructors, facilities, equipment, etc. It is anticipated that the arrangements for these inspections will be made on a mutually cooperative basis and that the examining agent will minimize the interruption to normal training schedules.

CAR 50.31 *Curriculum changes.* Changes in an approved curriculum shall not be made without filing immediate notification of such changes with the Administrator. Unless the school is notified to the contrary within 45 days after filing the proposed changes with the Administrator, they will be considered approved.

§ 50.31–1 *Curriculum changes (CAA interpretations which apply to § 50.31).* An approved airman agency must notify the local Aviation Safety Agent of any proposed changes in any approved curriculums and should the agent request it, forward the altered curriculum in duplicate. Until rejection or approval is received, the altered curriculum cannot be utilized. This action must be completed within the 45 days prescribed above.

CAR 50.32 *Maintenance of facilities, equipment, and material.* A certificated airman agency shall maintain personnel, facilities, and equipment at least equal in quality and quantity to those required for the issuance of such a certificate.

CAR 50.33 *Advertising.* No certificated airman agency shall make any statement pertaining to the school which is false, or which is designed to mislead any person contemplating enrollment in the school. Any advertising which indicates that the school is approved by the Administrator shall clearly differentiate between those courses which have been approved by the Administrator and those which have not.

§ 50.33–1 *Advertising (CAA policies which apply to § 50.33).* It is necessary that any airman agency accompany the use of their airman agency number with their pertinent ratings on any form, correspondence, or advertising.

CAR 50.34 *Change of location.* No change in a location of an approved airman agency shall be made without the prior written approval of the Administrator.

§ 50.34–1 *Change of location (CAA policies which apply to § 50.34).* A change in location of an airman agency, without a change of ownership, does not invalidate the air agency certificate. However, the intent to make such a change will be reported on Application for Airmen Agency Certificate and Rating, and Inspection Report (Form ACA–387) by the owner to the local Aviation Safety Agent. Upon receipt of such notification the local Aviation Safety Agent will signify approval or disapproval in the space provided on this form. As soon thereafter as is practical, an inspection of the facilities at the new location will be made and the remainder of the form completed. If the results of this inspection are satisfactory, a new airman agency certificate will be issued containing the old certificate number, the new location, the ratings issued, and the date of reinspection. In the event that the results of this inspection are not satisfactory, immediate action should be taken to eliminate the deficiencies or steps will be taken to revoke the certificate.

FORMS

Forms to which reference has been made throughout Civil Aeronautics Manual 50 are reproduced in Appendix A.

A group of sample forms have been included in Appendix B. These forms are offered as a suggested guide for the use of airman agencies in keeping student records. These forms are not obtainable from the Civil Aeronautics Administration.

†FORM ACA-387
(4-17-47)

DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION

FORM APPROVED
BUDGET BUREAU NO. 41-R067.4

APPLICATION FOR AIRMAN AGENCY CERTIFICATE AND RATING, AND INSPECTION REPORT

APPLICATION IS MADE FOR AN AIRMAN AGENCY CERTIFICATE WITH THE FOLLOWING RATINGS

☐ BASIC GROUND SCHOOL ☐ PRIMARY FLYING SCHOOL ☐ INSTRUMENT FLYING SCHOOL

☐ ADVANCED GROUND SCHOOL ☐ COMMERCIAL FLYING SCHOOL ☐ FLIGHT INSTRUCTOR SCHOOL

I CERTIFY THAT I AM FAMILIAR WITH PART 50 OF THE CIVIL AIR REGULATIONS AND ITS ACCOMPANYING MANUAL 50 AND, TO THE BEST OF MY KNOWLEDGE, BELIEVE THAT MY SCHOOL MEETS THE REQUIREMENTS FOR CERTIFICATION AS PRESCRIBED THEREIN.

(Check applicable item)

☐ THE APPROPRIATE CURRICULUM OUTLINED IN MANUAL 50 WILL BE FOLLOWED

☐ THE CURRICULUM ATTACHED HERETO IN DUPLICATE WILL BE FOLLOWED

NAME OF SCHOOL	ADDRESS OF SCHOOL

DATE _____ SIGNATURE OF APPLICANT _____ TITLE _____

THE FOLLOWING IS FOR THE USE OF CAA PERSONNEL ONLY

INSPECTION REPORT

AIR AGENCY CERTIFICATE NO.

INSTRUCTIONS

The inspector will indicate in appropriate spaces below the results of his inspection of the applicant's facilities. *Explain any deficiencies found under Item III, "Remarks".*

☐ APPROVED ☐ DISAPPROVED

SIGNATURE OF INSPECTOR

DATE OF INSPECTION

	YES	NO
I-GROUND SCHOOL (NOT APPLICABLE TO PRIMARY AND COMMERCIAL FLYING SCHOOLS)		
A. ARE CLASSROOMS ADEQUATELY HEATED AND LIGHTED AND OF SUITABLE SIZE FOR NUMBER OF STUDENTS ENROLLED?		
B. ARE ADEQUATE TOILET AND WASHROOM FACILITIES PROVIDED?		
C. IS CLASSROOM EQUIPMENT SUFFICIENT FOR INSTRUCTION IN REQUIRED SUBJECTS?		
D. ARE CERTIFICATED GROUND INSTRUCTORS AVAILABLE FOR ALL SUBJECTS FOR WHICH RATINGS ARE PROVIDED IN CIVIL AIR REGULATIONS?		
II-FLYING SCHOOLS		
A. FACILITIES		
1. ARE SUITABLE OFFICE FACILITIES PROVIDED?		
2. IS SUITABLE STUDENT READY ROOM PROVIDED?		
3. ARE ADEQUATE TOILET AND WASHROOM FACILITIES PROVIDED?		
4. IS HANGAR OF SUFFICIENT SIZE TO HOUSE ALL AIRCRAFT USED FOR FLIGHT INSTRUCTION AND TO MEET THE REQUIREMENTS OF MANUAL 50?		
5. ARE SUITABLE SHOP AND MAINTENANCE FACILITIES PROVIDED?		
a. ARE THESE OWNED BY APPLICANT? OR		
b. UNDER SATISFACTORY AND PRACTICAL LEASE TO APPLICANT?		
6. LOCATION OF MAINTENANCE FACILITIES *(Describe)*	XXX	XXX
7. DOES AIRPORT MEET THE MINIMUM REQUIREMENTS OF MANUAL 50 FOR TYPE OF SCHOOL RATING SOUGHT?		
8. ARE ADEQUATE NIGHT FLYING FACILITIES PROVIDED?		
9. WHERE APPLICABLE, GIVE DATE OF STATE APPROVAL FOR COMMERCIAL OPERATION OF THIS FIELD.		

FORM ACA-387 (4-17-47)

II-FLYING SCHOOLS (Continued)	YES	NO
B. FLIGHT EQUIPMENT		
1. ARE AIRCRAFT PROVIDED IN SUFFICIENT NUMBER AND OF A TYPE REQUIRED BY MANUAL 50 FOR THE TYPE OF SCHOOL RATING SOUGHT?		
2. DO THE AIRCRAFT TO BE USED PROVIDE THE NECESSARY EQUIPMENT AND DEVICES REQUIRED BY MANUAL 50 FOR THE TYPE OF SCHOOL RATING SOUGHT?		
3. ARE AIRCRAFT OWNED BY APPLICANT?		
4. IF AIRCRAFT IS LEASED, IS LEASE ARRANGEMENT PRACTICAL AND SATISFACTORY?		
5. ARE SUFFICIENT NUMBER OF PARACHUTES AS REQUIRED BY MANUAL 50 PROVIDED?		
C. PERSONNEL		
1. IF SHOP AND MAINTENANCE FACILITIES ARE OWNED BY APPLICANT, ARE SUFFICIENT CERTIFICATED PERSONNEL AVAILABLE TO MAINTAIN AIRCRAFT?		
a. ARE CERTIFICATED PERSONNEL REGULARLY EMPLOYED? OR		
b. ARE CERTIFICATED PERSONNEL UNDER CONTRACT?		
c. IF CERTIFICATED PERSONNEL ARE UNDER CONTRACT, IS THE ARRANGEMENT PRACTICAL AND SATISFACTORY?		
2. ARE SUFFICIENT NUMBER OF CERTIFICATED FLIGHT INSTRUCTORS REGULARLY AVAILABLE?		
3. NAME AND CERTIFICATE NUMBER OF CHIEF FLIGHT INSTRUCTOR		

NAME	CERTIFICATE NO.

III-REMARKS

23344

The United States of America

Department of Commerce
Civil Aeronautics Administration

Air Agency Certificate

Number 46785

This certificate is issued to

Miller Flying Service

whose business address is

Municipal Airport
Fort Worth, Texas

upon finding that its organization complies in all respects with the requirements of the Civil Air Regulations relating to the establishment of an Air Agency, and is empowered to operate an approved Airman Agency

with the following ratings:

Primary Flying School
- Airplanes
- Helicopters
- Gliders

Commercial Flying School
- Airplanes
- Helicopters
- Gliders

This certificate, unless canceled, suspended, or revoked, shall continue in effect until May 31, 1952

Date issued:

May 15, 1950

By direction of the Administrator

Chief, Airman Standards Branch

This Certificate is not Transferable, AND ANY MAJOR CHANGE IN THE BASIC FACILITIES, OR IN THE LOCATION THEREOF, SHALL BE IMMEDIATELY REPORTED TO THE APPROPRIATE REGIONAL OFFICE OF THE CIVIL AERONAUTICS ADMINISTRATION.

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both

U. S. GOVERNMENT PRINTING OFFICE: 1949—O-818984

Form ACA-390
(12-48)

RATINGS HELD

DATE OF THIS REPORT

Form ACA-1784
(3-14-47)

DEPT. OF COM.
CIV. AERO. ADMIN.

APPROVED AIR AGENCY ACTIVITY REPORT

INSTRUCTIONS: Submit two (2) copies of this report to Director, Airman Service, Civil Aeronautics Administration, Washington 25, D. C., as soon as you have reports on 32 students, or at least once every 6 months.

FORM APPROVED
BUDGET BUREAU NO. 41-R066.

NAME OF SCHOOL

ADDRESS

CERTIFICATE NO.

LINE NO.	NAME OF STUDENT	DATES OF		(Check whether)		WRITTEN EXAMINATIONS[1]								FLIGHT TESTS[1]							
						CERTIFICATE				RATING				CERTIFICATE				RATING			
		GRADUATION	EXAMINATION	INITIAL EXAMINATION	REEXAMINATION	PRIVATE PILOT		COMMERCIAL PILOT		FLIGHT INSTRUCTOR		INSTRUMENT		PRIVATE PILOT		COMMERCIAL PILOT		FLIGHT INSTRUCTOR		INSTRUMENT	
						P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
1																					
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12																					
13																					
14																					

[1]CODE: P=PASSED, F=FAILED (*Check whichever applies*)

16—54552-1

Form ACA-1784 (3-14-47)

LINE NO.	NAME OF STUDENT	DATES OF		(Check whether)		WRITTEN EXAMINATIONS[1]								FLIGHT TESTS[1]							
						CERTIFICATE				RATING				CERTIFICATE				RATING			
		GRADUATION	EXAMINATION	INITIAL EXAMINATION	REEXAMINATION	PRIVATE PILOT		COMMERCIAL PILOT		FLIGHT INSTRUCTOR		INSTRUMENT		PRIVATE PILOT		COMMERCIAL PILOT		FLIGHT INSTRUCTOR		INSTRUMENT	
						P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F
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[1] CODE: P=PASSED, F=FAILED (*Check whichever applies*)

16—54553-1 U. S. GOVERNMENT PRINTING OFFICE

Form ACA 391
(Rev. 6-15-41)

UNITED STATES OF AMERICA
DEPARTMENT OF COMMERCE
CIVIL AERONAUTICS ADMINISTRATION
WASHINGTON

School Graduation Certificate

This is to certify that _____ (Name)

_____ (Address) was graduated from the

_____ curriculum of the

_____ (School)

_____ (Address) Air Agency Certificate No. _____

on _____ (Date); that he has successfully completed the instruction required by the Civil Air Regulations and is eligible to apply for a _____

Certificate and _____ Rating as issued by the Administrator of Civil Aeronautics.

The record of this graduate is as follows:

Flying time:

Dual _____

Solo _____

Total _____

Final flying grade _____ _____

COURSES SATISFACTORILY COMPLETED	GRADE

I certify that the above statements are true.

_____ (School)

By _____ (Signature)

_____ (Title)

Date issued _____

16—6127-1 U. S. GOVERNMENT PRINTING OFFICE

DAILY FLIGHT SHEET

COURSE AIRCRAFT NO. H.P.

WEATHER WIND DIRECTION WIND VELOCITY

FLIGHT	DUAL TIME Hrs. Mins.	SOLO TIME Hrs. Mins.	GROUND INSTRUCTION Hrs. Mins.
Time This Period			
Previous Time			
TOTAL TIME TO DATE			

Marks will be awarded on a relative basis by comparing the student's performance and attributes at this stage and period of training with the performances and attributes of all other students which the instructor has observed in this same stage and period of training.

MANEUVERS PERFORMED	Well Above Average 90-100 1	Above Average 85-89 2	Average 80-84 3	Below Average 70-79 4	Unsatis-factory 0-69 5

HEADWORK
Does : Know ( ) Think ( ) Plan ( ) Remember ( ) Use Judgment ( ) Pay Attention ( )
Doesn't: Know ( ) Think ( ) Plan ( ) Remember ( ) Use Judgment ( ) Pay Attention ( )

MENTAL ATTITUDE
Is : Lazy ( ) Uncooperative ( ) Careless ( ) Cocky ( ) Impatient ( )
Is Not: Lazy ( ) Uncooperative ( ) Careless ( ) Cocky ( ) Impatient ( )

AIR DISCIPLINE
Does Observe : Check-off List ( ) Other Craft ( ) Safety ( )
Ground Rules ( ) Course Rules ( ) Area Rules ( )
Doesn't Observe: Check-off List ( ) Other Craft ( ) Safety ( )
Ground Rules ( ) Course Rules ( ) Area Rules ( )

Use Back, if necessary, for additional remarks.

Instructor's Signature

Recommendation, if any:

STUDENT _____ Date _____

FLIGHT PROFICIENCY REPORT

STUDENT: DATE ENROLLED:

COURSE AIRCRAFT NO. H.P.

WEATHER WIND DIRECTION WIND VELOCITY

FLIGHT	DUAL TIME Hrs. Mins.	SOLO TIME Hrs. Mins.	GROUND INSTRUCTION Hrs. Mins.
Time This Period			
Previous Time			
TOTAL TIME TO DATE			

Marks will be awarded on a relative basis by comparing the student's proficiency at this stage and period of training with the proficiency of all other students which the check pilot has observed in this same stage and period of training.

MANEUVERS PERFORMED	Well Above Average 90-100 1	Above Average 85-89 2	Average 80-84 3	Below Average 70-79 4	Unsatisfactory 0-69 5	

Summary and Recommendation:

Check Pilot Signature

Date:

INDIVIDUAL FLIGHT PROGRESS RECORD

NAME: DATE ENROLLED:

TRAINING COURSE: Private - Airplane ( ) Commercial - Airplane ( ) Instrument ( )
Glider ( ) Glider ( ) Flight Instructor ( )
Helicopter ( ) Helicopter ( )

DATE	MANEUVERS	GRADE	DAILY TIME Hrs. Mins.	TOTAL TIME Hrs. Mins.	AIRCRAFT	INSTRUCTOR

Civil Air Regulations:

Part 1: Certification, Identification, and Marking of Aircraft and Related Products	$0.05
Part 20: Pilot Certificates	0.05
Part 43: General Operation Rules	0.05
Part 60: Air Traffic Rules	0.10
Part 62: Notices and Reports of Aircraft Accidents and Missing Aircraft	0.05
Aircraft Powerplant Handbook (CAA Technical Manual No. 107)	1.25
Air Force-Navy-CAA Procedures for the Control of Air Traffic	0.40
Airman's Guide	0.25
Commercial Pilot Examination Kit	0.30
Facts of Flight	0.50
Flight Information Manual	1.00
Flight Instruction Manual	1.50
Flight Instructor Oral Examination Guidebook	0.05
Meteorology for Pilots (Civil Aeronautics Bulletin No. 25)	1.00
Path of Flight	0.40
Personal Aircraft Inspection Manual	0.55
Pilots' Airplane Manual (Civil Aeronautics Bulletin No. 27)	0.30
Pilots' Radio Manual (Civil Aeronautics Bulletin No. 29)	0.30
Practical Air Navigation (Civil Aeronautics Bulletin No. 24)	1.50
Realm of Flight	0.60
Student Pilot Guide	0.10

MINIMUM LIGHTING REQUIREMENTS

(a) GENERAL REQUIREMENTS—ARRANGEMENT

(1) Airports

The lights or reflectors shall mark both edges of the strip or runway. Longitudinal spacing shall be 200 feet and the units shall be placed opposite each other in rows not over 200 feet apart laterally. Single units may be omitted to allow for runway intersections. The lights or reflectors shall show clear (white) light, except that the units on the end of each row shall be green lights (not reflectors) to mark the threshold of the runway or strip. When used, the portable floodlights shall be located so that they do not extend above a 20:1 approach clearance angle, measured from the green threshold lights at the same end of the runway. Each floodlight location shall be marked by a red obstruction light. Other obstructions shall be lighted in accordance with CAA Technical Standard Order TSO-N2; however, airports lighted by the portable lighting equipment described below may calculate approach clearances from the green threshold lights. A lighted wind indicator shall be provided and located so that it is visible from all directions from the air.

(2) Seadromes

The lights shall be spaced in a single row 500 feet apart. All lights marking the landing path shall be clear except the one light on the approach end which shall be green. Obstructions shall be marked by red lights as required.

(b) FIXTURES. Portable fixtures shall meet the following minimum requirements:

(1) Portable Handlanterns

The fixture shall consist of a steady burning incandescent or gaseous discharge source. Minimum candlepower with a clear lens shall be not less than 5 candles in any direction above the horizontal. Handlanterns shall be supplied by rechargeable storage batteries of not less than 20 ampere-hour capacity. Green filters or globes shall have a transmission factor not less than 17 percent of clear. Red filters or globes shall have a transmission factor not less than 13 percent of clear.

(2) Portable Floodlights and Reflectors

(i) The floodlighting system shall consist of not less than two commercial floodlights, rated not less than 200 watts, located in the approach to the lighted runway or strip, as described in Appendix D, paragraph (a) (1). The beam spread of any floodlight used should not be more than 60 degrees. The system shall include an obstruction light mounted on or above each floodlight or floodlight location. The green threshold lights and obstruction lights shall use a lamp providing not less than 5 candlepower, bare lamp distribution.

(ii) The reflectors shall be a "wicket," stake, or cone mounted type and shall include a clear retroreflective surface consisting of:

(a) A "button" not less than 3 inches in diameter or

(b) A treated cloth, fabric, or coating of not less than 60 square inches.

Reflecting materials shall be equal to "Scotchlite Type F" or AGA Stinsonite #1753-A1.

(3) Semi-Portable Cable Fed System

The fixture shall consist of a steady burning incandescent or