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CIVIL AERONAUTICS MANUAL 42

U. S. Department of Commerce **Civil Aeronautics Administration**

Civil Aeronautics Manuals and supplements thereto are issued by the Office of Aviation Safety, Civil Aeronautics Administration, for the guidance of the public and are published in the Federal Register and the Code of Federal Regulations.

Supplement No. 2 **June 30, 1955**

SUBJECT: Miscellaneous Revisions to Civil Aeronautics Manual 42 dated August 1954

This supplement is issued to provide subscribers of CAM 42 with the following new and revised material:

(1) Section 42.23–1 is revised and sections 42.23–2 and 42.23–3 are added to establish interpretations of "approved types" of radio equipment required, and "independent means"; and policies on the use of non-approved types of radio equipment.

(2) Section 42.32–1 is changed from an interpretation to a policy and revised to provide irregular air carriers and commercial operators with more flexibility and wider option in meeting the airframe housing requirements of section 42.32 (a) when performing their own maintenance functions. This section formerly authorized work docks to be used where climatic conditions permitted; the section now authorizes the use of work docks appropriate to the climatic conditions which prevail at a particular maintenance base.

(3) Section 42.55–1 is not applicable since the amendments to Civil Air Regulation 42.55 (b) on December 10, 1954, and is therefore deleted.

(4) A new section 42.55–3 is added, which establishes the policy under which the Administrator will authorize irregular air carriers and commercial operators weather minimums down to the lowest minimums prescribed in Part 609 for IFR takeoffs and landings at regularly used airports, such as a main operations base.

(5) The speeds to which the Convair Model 28–5ACF and PBY–5A are accelerated, listed in the Takeoff Limitations Table of section 42.80–4, are corrected to coincide with the speeds indicated in figure 1 of this section.

(6) Section 42.80–6 is revised to establish en route limitations for the Beech C18S, Beech 18A, and Cessna T–50 aircraft.

(7) CAR amendments have been picked up on those pages which are revised.

Sections 42.32–1, 42.55–1, 42.55–3, and 42.80–4 appeared in 20 F. R. 4184–4185 on June 15, 1955, effective June 30, 1955. The Federal Register publication and effective dates for CAM material previously printed have been inserted at the end of each section of the manual on the revised pages.

NOTE: New or revised material is indicated by brackets **[ ]**.

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"(1) Instrument and equipment specified in paragraph (a) of this section, and one additional landing light.

["(2) After May 31, 1956, an approved anticollision light; except that in the event of failure of such light, the aircraft may continue flight to the next stop where repairs or replacements can be made."

["42.22a *Air-speed indicators, limitations, and related information for large aircraft.*

"(a) Air-speed limitations and related information contained in the Airplane Flight Manual and pertinent placards shall be expressed in the same units as used on the air-speed indicator.

"(b) When more than one air-speed indicator is required, all such indicators shall be calibrated to read in the same units.

"(c) When an air-speed indicator is calibrated in statute miles per hour, a readily usable means shall be provided for the flight crew to convert statute miles per hour to knots.

"(d) On and after April 1, 1956, all air-speed indicators shall be calibrated in knots, and all air-speed limitations and related information contained in the Airplane Flight Manual and pertinent placards shall be expressed in knots."]

"42.23 *Radio communications system and navigational equipment for large aircraft.* In lieu of the radio communications system and navigational equipment specified in section 42.21 (b) (7) and (c) (2), the following shall be required in large aircraft for the type of operations specified. The radio equipment required under paragraphs (a) and (b) of this section shall be of approved types:

"(a) For day VFR operations over routes on which navigation can be accomplished by visual reference to landmarks, each aircraft shall be equipped with such radio equipment as is necessary to accomplish the following:

"(1) Transmit to at least one appropriate ground station from any point on the route and transmit to airport traffic control towers from a distance of not less than 25 miles,

"(2) Receive communications at any point on the route,

"(3) By either of two independent means, receive meteorological information at any point on the route and receive instructions from airport traffic control towers.

"(b) For day VFR operations over routes on which navigation cannot be accomplished by visual reference to landmarks, for night VFR, or for IFR operations, each aircraft shall be equipped as specified in paragraph (a) of this section, and in addition shall be equipped with at least one marker beacon receiver and with such radio equipment as is necessary to receive satisfactorily, by either of two independent means, radio navigational signals from any other radio aid to navigation intended to be used. For operations outside the United States each aircraft operated for long distances over water or uninhabited terrain shall be equipped with two independent means of transmitting to at least one appropriate ground station from any point on the route.

"(c) If appropriate, one of the means provided for compliance with paragraph (a) (3) of this section may be employed for compliance with paragraph (a) (2) of this section, and the means provided for compliance with the requirements of paragraph (b) of this section may be employed for compliance with paragraphs (a) (1) and (3) of this section."

[42.23–1 *Approved types of radio equipment (CAA interpretations which apply to sec. 42.23).* Radio equipment is of an approved type when it is approved in accordance with the terms of a CAA type certificate or a technical standard order issued by the Administrator.

[42.23–2 *Independent means (CAA interpretations which apply to sec. 42.23).* Radio systems are independent where each such system is separate and complete, and the function of any part or the whole of one system is not dependent on the continued functioning of any component of the other, and in event of failure in one system, the other system is capable of continued independent operation: *Provided,* That where rigidly supported non-wire antenna or other antenna installations of equivalent reliability are used, only one such antenna need be provided.

[42.23–3 *Installation and use of non-approved radio communication equipment (CAA policies which apply to sec. 42.23).* All radio

communication and navigation equipment required for compliance with section 42.23 must be of approved types. However, additional non-approved radio communication equipment may be installed in aircraft for test and evaluation purposes or for the performance of a non-operational function. The non-approved equipment must be constructed and installed so that it will not interfere with the proper functioning of any approved operational equipment or create an unsafe condition aboard the aircraft.]

(Published in 20 F. R., 3067-8, May 6, 1955, effective May 31, 1955.)

"42.24 First-aid and emergency equipment.

"(a) Each aircraft shall be equipped with readily available first-aid and emergency evacuation equipment adequate for the type of operation and number of persons carried.

"(b) Each aircraft operated over uninhabited terrain shall carry such emergency equipment as the Administrator finds necessary for the preservation of life for the particular operation.

"(c) Except for takeoffs, landings, or flights for short distances over water for which the Administrator finds that any of the equipment in subparagraphs (1), (2), or (3) of this paragraph is unnecessary, each aircraft operated over water shall be equipped with:

"(1) Individual life preservers or flotation devices readily available for each person aboard the aircraft,

"(2) Life rafts of sufficient capacity to contain all persons aboard the aircraft,

"(3) A Very pistol or equivalent signal equipment,

"(4) Portable emergency radio signalling device which is not dependent upon the aircraft power supply.

"(5) Such additional emergency equipment as the Administrator finds necessary for the preservation of life for the particular operation involved."

42.24-1 *First-aid and emergency equipment (CAA policies which apply to sec. 42.24).* First-aid kits, flotation equipment, and other emergency gear shall regularly be inspected to determine their condition and shall be provided with a means for readily determining that such equipment has not been tampered with or articles removed since last inspection. This will normally be accomplished by means of seals showing date or time of last inspection on each kit or item of emergency equipment.

The adequacy of all emergency equipment will be determined by the Administrator.

(Published in 14 F. R. 7034, November 22, 1949, effective upon publication.)

42.24-2 *First-aid kits (CAA policies which apply to sec. 42.24).* Each first-aid kit should be dust and moisture proof, should contain only materials which meet Federal Specifications GGK 391, as revised, and should include at least the following items or their equivalent:

(a) *No. 1 kit for aircraft of 1 to 5 persons capacity.*

Adhesive bandage compress, 1 inch (16 per unit)	1
Antiseptic swabs, 10 mm. (10 per unit)	1
Ammonia inhalants, 6 mm. (10 per unit)	1
Ammonia, aromatic spirits, 2 cc. with drinking cups (4 each per unit)	1
2-inch bandage compress (4 per unit)	1
4-inch bandage compress (1 per unit)	1
Triangular bandage compressed, 40-inch (1 per unit)	1
Burn compound, one-eighth oz. (6 per unit)	1
Tourniquet, forceps, and scissors (1 each per double unit container)	1

(b) *No. 2 kit for aircraft of 6 to 25 persons capacity.*[3]

Adhesive bandage compresses, 1-inch (16 per unit)	2
Antiseptic swabs, 10 mm. (10 per unit)	2
Ammonia inhalants, 6 mm. (10 per unit)	1
Ammonia, aromatic spirits, 2 cc. with drinking cups (4 each per unit)	2
2-inch bandage compresses (4 per unit)	2
4-inch bandage compresses (1 per unit)	2
Triangular bandage compressed, 40-inches (1 per unit)	1
Burn compound, one-eighth-ounce (6 per unit)	1
Tourniquet, forceps, and scissors (1 each per double unit container)	1
Eye dressing packet (3 each per unit) (ophthalmic ointment, one-eighth-ounce; eye pads; eye strips)	1

[3] Kit No. 2 in canvas may also be used on life rafts.

(c) *No. 3 kit for aircraft of more than 25 persons capacity.*

Adhesive bandage compresses, 1-inch (16 per unit)	4
Antiseptic swabs, 10 mm. (10 per unit)	2
Ammonia inhalants, 6 mm. (10 per unit)	2
Ammonia, aromatic spirits, 2 cc. with drinking cups (4 each per unit)	2
2-inch bandage compresses (4 per unit)	3
4-inch bandage compresses (1 per unit)	3
Triangular bandage compressed, 40-inches (1 per unit)	3
Burn compound, one-eighth-ounce (6 per unit)	2
Tourniquet, forceps, scissors (1 each per double unit container)	1
Eye dressing packet (3 each per unit) (ophthalmic ointment, one-eighth-ounce; eye pads; eye strips)	1

(Published in 17 F. R. 2748, March 29, 1952, effective upon publication; amended in 18 F. R. 1719, March 7, 1953, effective April 15, 1953.)

42.24-3 *Emergency evacuation equipment (CAA policies which apply to sec. 42.24 (a)).* This requirement includes under emergency evacuation equipment such items as: ropes, ladders, chutes, etc., when such equipment is necessary for safe, rapid evacuation of passengers and crew in event of emergency or crash landings; e. g., a DC-4 would require such equipment, while a DC-3 normally would not, due to differences in height from fuselage exits to ground. This equipment shall be approved

pliance with Airworthiness Directives and manufacturers' service bulletins.

(g) Small aircraft must be maintained in accordance with the provisions of the applicable regulations in this subchapter (i. e. the Civil Air Regulations) and the manufacturer's recommendations. No aircraft will be dispatched on any flight during which the aircraft may exceed any prescribed maintenance time limitations.

(Published in 14 F. R. 7035, November 22, 1949, effective upon publication.)

"42.31 *Inspections and maintenance.*

"(a) Aircraft shall be given a preflight check to determine compliance with section 42.51 (e) and, in addition, shall meet the following requirements:

"(1) Large aircraft shall be maintained and inspected in accordance with a continuous maintenance and inspection system as provided for in the maintenance manual.

"(2) Small aircraft shall either be maintained and inspected in accordance with subparagraph (1) of this paragraph or be given a periodic inspection at least every 100 hours of flight time and an annual inspection at least every 12 months. The annual inspection may be accepted as a periodic inspection.

"(b) A record shall be carried in the aircraft at all times showing that the latest inspections required by paragraph (a) of this section have been accomplished, except such record may be kept at the principal operations base when the aircraft is maintained and inspected as provided in paragraph (a) (1) of this section."

42.31–1 *Inspection and maintenance—large aircraft (CAA policies which apply to sec. 42.31 (a) (1)).* A continuous maintenance and inspection system is one in which a prescribed schedule of maintenance and inspection functions is set forth in the maintenance manual approved by Administrator. The schedules of maintenance functions shall include the overhaul time limitations and inspection program including time limitations which are considered adequate by the Administrator to maintain the aircraft in a continuously airworthy condition.

(Published in 14 F. R. 7036, November 22, 1949, effective upon publication.)

42.31–2 *Maintenance and inspection—small aircraft (CAA policies which apply to sec. 42.31 (a) (2)).* The operator may elect to establish a continuous maintenance and inspection system in his maintenance manual for the maintenance of small aircraft in the same manner as is required for the maintenance of large aircraft. Under such circumstances the maintenance manual requirements and all limitations applicable to large aircraft will also be applicable to small aircraft. Otherwise the inspections shall be conducted in accordance with the periodic and annual inspection requirements of this section and, in addition, overhauls must be conducted at or before the time limitations recommended by the manufacturers of the aircraft, aircraft engine, or other components as prescribed in part 18 of this subchapter (i. e. the Civil Air Regulations).

(Published in 14 F. R. 7036, November 22, 1949, effective upon publication.)

42.31–3 Deleted.

(Published in 19 F. R. 6829, October 23, 1954, effective upon publication.)

42.31–4 *Maintenance and inspection records (CAA policies which apply to sec. 42.31 (b)).* The record required in this paragraph may consist of the aircraft log book if it is so arranged as to provide full information on the maintenance work performed on the aircraft. In case the aircraft is maintained under a continuous maintenance and inspection system, the maintenance records which are utilized in such system may be considered as complying with this requirement; however, all such records shall be complete and shall properly identify the aircraft, aircraft time, and the extent of maintenance work or inspections performed. When maintenance or inspection functions are performed away from their principal maintenance base, a copy of the record of maintenance or inspections performed shall be retained in the aircraft and a copy promptly mailed to the principal maintenance base.

(Published in 14 F. R. 7036, November 22, 1949, effective upon publication; amended in 15 F. R. 3151, May 25, 1950, effective upon publication.)

"42.32 *Additional maintenance requirements for large aircraft.* The following re-

quirements are applicable to operations conducted in large aircraft:

"(a) *Facilities.* Facilities for the proper inspection, maintenance, overhaul, and repair of the types of aircraft used shall be maintained by the air carrier, unless arrangements acceptable to the Administrator are made with other persons possessing such facilities.

"(b) *Maintenance personnel.* A staff of qualified mechanics, inspectors, and appropriate supervisory personnel shall be employed by the air carrier and kept available for performing the functions specified in section 42.30, except where the air carrier has obtained the approval of the Administrator for the performance of such functions by some other person. The air carrier shall permit maintenance to be performed only by an individual competent therefor.

"(c) *Reporting of mechanical irregularities occurring in operation.* Each air carrier shall prescribe in its operations manual a procedure for the submission of written reports by the members of the flight crew for all mechanical irregularities occurring during the operation of the aircraft. The members of the flight crew designated by the air carrier shall submit a written report in accordance with such system to the person responsible for the maintenance of the aircraft. This report shall be submitted at the end of each through flight or sooner if the seriousness of the irregularity so warrants. Such report or copy thereof indicating the action taken shall be retained in the aircraft for the information of the next flight crew.[6]

"(d) *Maintenance manual.*

"(1) The air carrier shall prepare and maintain for the use and guidance of maintenance personnel a maintenance manual which contains full information pertaining to the maintenance, repair, and inspection of aircraft and equipment and clearly outlines the duties and the responsibilities of maintenance personnel. The form and content shall be acceptable to the Administrator. It shall contain a copy of the approved time limitations for inspection and overhauling of aircraft, aircraft engines, propellers, and appliances. Copies and revisions shall be furnished to all persons designated by the Administrator. All copies in the hands of company personnel shall be kept up to date.

"(2) A copy of those portions pertaining to the aircraft shall be carried therein.

"(3) Any changes prescribed by the Administrator in the interest of safety shall be promptly incorporated in the manual. Other changes not inconsistent with any Federal regulation, the air carrier operating certificate, or safe operating practices may be made without prior approval of the Administrator.

"(4) No maintenance, repair, or inspection of aircraft or equipment shall be made by the air carrier contrary to the provisions of the maintenance manual."

[42.32–1 *Facilities for the proper inspection, maintenance, overhaul, and repair (CAA policies which apply to sec. 42.32).* (a) The facilities required in section 42.32 (a) of this subchapter include housing, work space, equipment, supplies, materials, tools, parts, and aircraft components in sufficient quantity and quality to assure that the needed inspection, maintenance, overhaul, and repair of the air carrier's or commercial operator's aircraft (including airframes, powerplants, propellers, and appliances) can be satisfactorily performed at all times by either the air carrier, or commercial operator, or persons with whom arrangements have been made for the performance of such functions.

(b) Sections 52.21–1 through 52.21–3 and sections 52.30–1 through 52.36–1 of this subchapter, outline housing, facilities, equipment and materials which constitute criteria that may be used to determine the minimum facilities required by section 42.32 (a) insofar as applicable and appropriate to the air carrier's aircraft and maintenance system: Provided, That a work dock is used for the performance of airframe maintenance in lieu of a permanent hangar, if such work dock is appropriate for the proper performance of such maintenance under the climatic conditions which prevail at the particular maintenance location. When necessary, the entire airframe or portion thereof on which work is being performed should be enclosed so as to exclude rain, snow, dust, and provide reasonable protection to workers from the extremes of temperature which might impair the work being performed.

[6] See section 42.96 for the requirements for reporting aircraft or component malfunctioning and defects.

(c) When an air carrier contracts to perform inspection, maintenance, overhaul and repair on aircraft of other air carriers, the minimum facilities required by section 42.32 (a) are considered to be the same as required for a certificated repair station performing identical functions.]

42.32–2 *Arrangements acceptable to the Administrator (CAA policies which apply to sec. 42.32 (a)).* The Administrator will determine the acceptability of arrangements made by the air carrier with other persons for the inspection, maintenance, overhaul, and repair of the types of aircraft used by the air carrier on the basis of the following criteria:

(a) Such arrangements conform to the approved continuous airworthiness, maintenance, and inspection program which the air carrier must perform in accordance with its maintenance manual.

(b) The inspection, maintenance, overhaul, and repair of the air carrier's aircraft, including airframes, powerplants, propellers, and appliances, is performed, inspected, and/or approved, by a certificated repair station, appropriately certificated air carrier, or manufacturer, in accordance with section 18.10 (b), (d), or (e); section 18.11 (a) (2), (3), or (4); and section 18.11 (b) (2), (3), or (4); provided

other parts of the aircraft referred to in this section include, but are not limited to, carburetors, windshields, pitot-static tubes, and empennage surfaces.

(Published in 14 F. R. 7040, November 22, 1949, effective upon publication.)

"42.55 *Weather minimums.* No flight shall be started unless the takeoff, en route operation, and landing at destination can be conducted in accordance with the weather requirements of Part 60 of this subchapter (i. e., the Civil Air Regulations),[3] but in no case less than the minimums specified below:

"(a) For VFR takeoff, en route operation, or landing, the weather minimums shall be a ceiling of 1,000 feet and visibility of 1 mile for day and 2 miles for night, unless otherwise authorized by an air traffic clearance obtained from air traffic control.

["(b) For IFR operations the weather minimums, including alternate airport requirements, shall not be less than those specified in Parts 609 and 610 of the Regulations of the Administrator, or as otherwise specified or authorized by the Administrator. These weather minimums, including alternate airport requirements, also may be found in the Approach and Landing Charts and Radio Facility Charts of the Coast and Geodetic Survey and in the Airman's Guide.]

[42.55–1 Deleted.]

42.55–2 *Air traffic clearance (CAA interpretations which apply to sec. 42.55 (a)).* An air traffic clearance obtained from air traffic control is an approval for the flight, or portion thereof, only with regard to known traffic conditions and does not authorize a pilot to violate the Civil Air Regulations pertaining to weather minimums. Regardless of any air traffic clearance obtained from air traffic control, the minimum visibility shall be not less than 1 mile for day and 2 miles for night in control zones, and 3 miles in control areas.

(Published in 14 F. R. 7040, November 22, 1949, effective upon publication.)

[42.55–3 *IFR takeoff and landing minimums (CAA policies which apply to section 42.55).*

(a) The basic IFR takeoff minimums and landing minimums for each type of instrument approach procedure are prescribed in the operations specifications issued to an air carrier or commercial operator under the authority of this part. Frequently, these minimums are higher than those published in Part 609 of the Regulations of the Administrator. However, by application to the local CAA Aviation Safety Agent having certificate responsibility, minimums down to the lowest minimums prescribed in Part 609 for a particular airport may be authorized if such airport is regularly used by an air carrier or commercial operator (e. g., main operations base). To obtain such authorization, the air carrier or commercial operator will be required to demonstrate that its pilot training program and overall operating proficiency is adequate for the use of lower minimums. Such lower minimums, when approved, will be applicable only to those pilots-in-command who (1) have served as a pilot or as an observer member of the crew on the flight deck during operations conducted into the particular airport within the previous twelve months, (2) have been checked in accordance with section 42.44–2 of his subchapter on the type of facility for which the lower minimums are authorized, and (3) have been so certified by a company check pilot as being qualified to operate at the lower minimums.]

"42.56 *Instrument approach.* No instrument approach procedure shall be executed or landing made at an airport when the latest United States Weather Bureau report for that airport indicates the ceiling or visibility to be less than that prescribed by the Administrator for landing at such airport. *Provided,* That, if an instrument approach procedure is initiated when the current U. S. Weather Bureau report indicates that the prescribed ceiling and visibility minimums exist and a later weather report indicating below minimum conditions is received after the aircraft (a) is on an ILS final approach and has passed the outer marker, or (b) is on a final approach using a radio range station or comparable facility and has passed the appropriate facility and has reached the authorized landing minimum altitude, or (c) is on GCA final approach

[[3] See Parts 609 and 610 of the Regulations of the Administrator, or refer to the Approach and Landing Charts and Radio Facility Charts of the Coast and Geodetic Survey, and to the Airman's Guide for specific en route, take-off, and landing minimums for particular routes and airports."]

and has been turned over to the final approach controller, such approach may be continued and a landing may be made in the event weather conditions equal to or better than the prescribed minimums for the airport are found to exist by the pilot in command of the flight upon reaching the authorized landing minimum altitude."

42.56–1 *Standard instrument approach procedures (CAA rules which apply to sec. 42.56).* Standard instrument approach procedures prescribed by the Administrator are published in part 609 of this title (i. e. Regulations of the Administrator).

(Published in 16 F. R. 7351, July 27, 1951, effective upon publication.)

42.56–2 *Takeoff and landing weather minimums (CAA rules which apply to sec. 42.55 and sec. 42.56).*

(a) Whenever the latest weather report, furnished by the United States Weather Bureau or a source approved by the Weather Bureau contains a visibility value specified as a runway visibility for a particular runway of an airport, such visibility shall be used for straight-in instrument approach and landing or takeoff for that runway only. The terminal visibility as reported in the main body of such weather report shall be used for instrument approach and landing or takeoff, for all other runways.

(b) The ceiling value reported in the main body of such weather report shall constitute the ceiling for both circling and straight-in instrument approach and landing or takeoff for all runways.

(Published in 19 F. R. 1536, March 20, 1954, effective April 1, 1954.)

***"42.57 Airport lighting for night operations.* No air carrier shall use an airport for the take-off or landing of an aircraft at night unless such airport is adequately lighted."**

42.57–1 *Minimum facilities (CAA policies which apply to sec. 42.57).* The minimum facilities and equipment for airport lighting where night operations are authorized and conducted shall include at least the following:

(a) Adequate boundary lights defining the boundaries of the usable area and/or adequate contact (runway marker) lights identifying the outer limits of the runways. Lights of the open-flame type (flare pots) are not considered adequate contact lights, except in an emergency. Range lights (aviation green) shall be installed and operating in conjunction with the boundary or contact (runway marker) lights.

(b) Floodlights, either of a permanent or portable type, shall be provided and operated to illuminate the ramp, apron, and passenger-loading area.

(c) Obstructions on and in the vicinity of the landing area should be obstruction lighted. The criteria for determining obstructions to air navigation and for the lighting of obstructions to air navigation are contained in Technical Standard Orders available from the Aviation Information Office, Civil Aeronautics Administration, Washington 25, D. C.

(d) An illuminated wind direction indicator shall be provided and located so as to be clearly visible from the ground and the air.

(Published in 18 F. R. 1719, March 27, 1953, effective April 15, 1953.)

***"42.58 Navigational aids for IFR flight.* IFR operations shall be conducted only over civil airways and at airports equipped with radio ranges or equivalent facilities, unless the Administrator has found that instrument navigation can be conducted by the use of radio direction finding equipment installed in the aircraft or by other specialized means and has approved or otherwise authorized such operation in the air carrier operating certificate."**

42.58–1 *Off-airway instrument operation (CAA rules which apply to sec. 42.58).*

(a) Off-airway instrument operation may be authorized provided the aircraft is properly equipped, and the flight crew demonstrates they are capable of navigating along a predetermined flight path over a proposed route without deviating more than 5 miles or 5° on either side (whichever is the lesser) from a straight line drawn between the point of departure and the next point of arrival.

(b) This term "off-airways," as used in this manual and in the printed Standard Operations Specifications (form ACA–1014), does not apply where a projected course of a radio range extends along the route to be flown. Therefore, no special authorization will be required where complete coverage by radio range projected courses is provided and radio facilities for authorized instrument approach and let-

down are available at the point of destination.

(Published in 14 F. R. 7040, November 22, 1949, effective upon publication.)

"42.59 *Passenger use of emergency equipment.* The air carrier shall establish procedures for familiarizing passengers with the location and use of emergency equipment."

42.59–1 *Placement of established procedures (CAA policies which apply to sec. 42.59).* The procedures required by this section shall be contained in the air carrier's operations manual.

(Published in 14 F. R. 7040, November 22, 1949, effective upon publication.)

"42.60" Operations manual for large aircraft.

"(a) When operations are conducted in large aircraft the air carrier shall prepare and maintain for the use and guidance of operations personnel an operations manual which contains full information necessary to guide flight and ground personnel in the conduct of safe flight operations and to inform such personnel regarding their duties and responsibilities. The manual shall also contain a copy of the air carrier operating certificate. The form and content shall be acceptable to the Administrator. Copies and revisions shall be furnished to all persons designated by the Administrator. All copies in the hands of company personnel shall be kept up to date.

"(b) A copy of the operations manual shall be kept at the principal operations base. Those portions of the manual pertinent to safe operation of the aircraft, including the copy of the air carrier operating certificate, shall be carried therein.

"(c) Any changes prescribed by the Administrator in the interest of safety shall be promptly incorporated in the manual. Other changes not inconsistent with any Federal regulation, the air carrier operating certificate, or a safe operating practice may be made without the prior approval of the Administrator.

"(d) No operation shall be conducted by the air carrier contrary to the safety provisions of the operations manual."

42.60–1 *Form of operations manual (CAA rules which apply to sec. 42.60).* *The opera-*

42.80–4 *Convair Model 28–5ACF and PBY–5A landplane aircraft (CAA rules which apply to sec. 42.80).* The following performance limitations data, applicable to Convair Model 28–5ACF and PBY–5A landplane aircraft shall be used in determining compliance with section 42.80. These data are presented in tables 1 through 4 and figures 1 and 2.

TABLE 1.—*Takeoff limitations*

[(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12). (Distance to accelerate to 95 miles per hour TIAS (28–5ACF), 91 miles per hour TIAS (PBY–5A), and stop, with zero wind and zero gradient.)]

Standard altitude in feet	Airplane weight in pounds					
	23,000	24,000	25,000	26,000	[1]27,000	[2]28,000
	Distance in feet					
S. L.	3,240	3,400	3,565	3,725	3,880	4,050
1,000	3,370	3,540	3,720	3,885	4,055	4,225
2,000	3,500	3,680	3,875	4,045	4,230	4,400
3,000	3,635	3,830	4,025	4,200	4,400	4,580
4,000	3,860	4,070	4,280	4,485	4,700	4,900
5,000	4,095	4,315	4,540	4,770	5,000	5,215
6,000	4,330	4,565	4,810	5,060	5,305	5,545
7,000	4,580	4,830	5,090	5,360	5,610	5,880
8,000	4,830	5,095	5,380	5,660	5,940	6,240

[1] Maximum weight for PBY–5A landplane.
[2] Maximum weight for 28–5ACF.

[(b) Actual length of runway required when "effective length," considering obstacles, is not determined. (Distance to accelerate to 95 miles per hour TIAS (28–5ACF), 91 miles per hour TIAS (PBY–5A), and stop, divided by the factor 0.85.)]

Standard altitude in feet	Airplane weight in pounds					
	23,000	24,000	25,000	26,000	[1]27,000	[2]28,000
	Distance in feet					
S. L.	3,810	4,000	4,190	4,380	4,560	4,760
1,000	3,965	4,165	4,375	4,570	4,770	4,970
2,000	4,115	4,330	4,557	4,755	4,975	5,175
3,000	4,275	4,505	4,735	4,940	5,175	5,385
4,000	4,540	4,785	5,035	5,275	5,525	5,760
5,000	4,815	5,075	5,340	5,610	5,880	6,130
6,000	5,090	5,370	5,655	5,950	6,240	6,520
7,000	5,385	5,680	5,985	6,305	6,600	6,915
8,000	5,680	5,990	6,325	6,655	6,985	7,340

[1] Maximum weight for PBY–5A landplane.
[2] Maximum weight for 28–5ACF.

TABLE 2.—*En route limitations*

Weight in pounds	Terrain clearance [1] in feet and climb speed in miles per hour TIAS			
	Model PBY–5A		Model 28–5ACF	
	Feet	Miles per hour	Feet	Miles per hour
28,000			7,500	104.0
27,500			8,000	103.0
27,000	7,200	93.5	8,500	102.0
26,500	7,700	92.5	9,050	101.0
26,000	8,200	91.5	9,600	100.0
25,500	8,700	90.5	10,100	99.0
25,000	9,200	89.0	10,650	97.5
24,500	9,700	88.0	11,150	96.5
24,000	10,200	87.0	11,700	95.0

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

TABLE 3.—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in miles per hour TIAS					
	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet					
S. L.	3,420	86	3,570	88	3,690	90
1,000	3,515	86	3,665	88	3,800	90
2,000	3,605	86	3,765	88	3,900	90
3,000	3,700	86	3,860	88	4,010	90
4,000	3,790	86	3,955	88	4,110	90
5,000	3,885	86	4,055	88	4,215	90
6,000	3,975	86	4,150	88	4,320	90
7,000	4,070	86	4,245	88	4,425	90
8,000	4,160	86	4,340	88	4,525	90

[1] Steady approach speed through 50 feet height in miles per hour. TIAS denoted by symbol V_{50}.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in miles per hour TIAS					
	23,000	V_{50}	24,000	V_{50}	25,000	V_{50}
	Distance in feet					
S. L.	4,350	86	4,544	88	4,696	90
1,000	4,475	86	4,664	88	4,836	90
2,000	4,588	86	4,792	88	4,964	90
3,000	4,709	86	4,913	88	5,104	90
4,000	4,824	86	5,034	88	5,231	90
5,000	4,944	86	5,161	88	5,364	90
6,000	5,059	86	5,282	88	5,498	90
7,000	5,180	86	5,403	88	5,632	90
8,000	5,294	86	5,524	88	5,759	90

[1] Steady approach speed through 50 feet height in miles per hour. TIAS denoted by symbol V_{50}.

TABLE 4.—*Landing limitations*

(a) "Effective length" of runway required when effective length is determined in accordance with section 42.1 (a) (12) with zero wind and zero gradient.

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in miles per hour TIAS					
	26,000	V_{50}	[2]27,000	V_{50}	[3]28,000	V_{50}
	Distance in feet					
S. L.	3,830	92	3,965	93	4,100	95
1,000	3,940	92	4,080	93	4,220	95
2,000	4,050	92	4,200	93	4,345	95
3,000	4,160	92	4,315	93	4,470	95
4,000	4,275	92	4,430	93	4,595	95
5,000	4,385	92	4,550	93	4,720	95
6,000	4,495	92	4,665	93	4,840	95
7,000	4,610	92	4,785	93	4,970	95
8,000	4,720	92	4,900	93	5,090	95

[1] Steady approach speed through 50 feet height in miles per hour TIAS denoted by symbol V_{50}.
[2] Maximum weight for PBY-5A landplane.
[3] Maximum weight for 28-5ACF.

(b) Actual length of runway required when effective length, considering obstacles, is not determined in accordance with section 42.1 (a) (12).

Standard altitude in feet	Airplane weight in pounds and approach speeds [1] in miles per hour TIAS					
	26,000	V_{50}	[2]27,000	V_{50}	[3]28,000	V_{50}
	Distance in feet					
S. L.	4,874	92	5,046	93	5,218	95
1,000	5,014	92	5,193	93	5,371	95
2,000	5,154	92	5,345	93	5,530	95
3,000	5,294	92	5,492	93	5,689	95
4,000	5,441	92	5,638	93	5,848	95
5,000	5,581	92	5,791	93	6,007	95
6,000	5,721	92	5,937	93	6,160	95
7,000	5,867	92	6,090	93	6,325	95
8,000	6,007	92	6,236	93	6,478	95

[1] Steady approach speed through 50 feet height in miles per hour TIAS denoted by symbol V_{50}.
[2] Maximum weight for PBY-5A landplane.
[3] Maximum weight for 28-5ACF.

[42.80–6 *En route limitations on multi-engine aircraft with maximum allowable takeoff weights below 12,500 pounds (CAA rules which apply to sec. 42.80).* The following en route limitations data, applicable to Aero Commander 520, Beech 18A, Beech AT–11, Beech C18S, Beech D18C, Beech D18S, Beech 50, Cessna T–50, Grumman G–21, Lockheed 10A, Lockheed 10E, and Lockheed 12A aircraft, shall be used in determining compliance with section 42.80. These data are presented in Table 1 and Figures 1 through 9. En route performance data on other aircraft weighing less than 12,500 pounds and operated under section 42.16 will be made available upon application to the Administrator.]

(Published in 19 F. R. 5660, September 8, 1954, effective October 1, 1954.)

TABLE 1.—*En route limitations*

AERO COMMANDER 520

Weight in pounds [1]	Terrain clearance [2] in feet and climb speed in miles per hour (TIAS)	
	Feet [3]	Miles per hour
5,500	(3, 480)	94. 8
5,000	6, 820	93. 5
4,500	10, 130	92. 4

[1] The maximum permissible weight under secs. 42.16 and 42.82 is 5,420 pounds.
[2] Highest altitude of terrain over which airplane may be operated in compliance with SEC. 42.82.
[3] The "terrain clearance" in parenthesis is not usable under secs. 42.16 and 42.82 because the minimum terrain altitude is 4,000 feet under sec. 42.82.

NOTE.—Inoperative propeller windmilling.

[BEECH C–18S AND BEECH 18A

Airplane	Weight in pounds	Terrain clearance [1] in feet and climb speed in miles per hour (TIAS)	
		Feet	Miles per hour
Beech C–18S	7, 850	6, 200	102. 5
	7, 500	7, 620	98. 7
	7, 000	9, 630	93. 3
Beech 18A	7, 200	4, 760	91. 7
	7, 000	5, 540	90. 8
	6, 500	7, 460	88. 9
	6, 000	9, 400	86. 9

[1] Highest altitude of terrain over which airplane may be operated in compliance with Sec. 42.82]

BEECH AT–11

Weight in pounds	Terrain clearance [1] in feet and climb speed in miles per hour (TIAS)	
	Feet	Miles per hour
7,850	6, 200	102. 1
7,500	7, 800	100. 9
7,000	10, 170	99. 2
6,500	12, 500	97. 5

[1] Highest altitude of terrain over which airplane may be operated in compliance with Sec. 42.82.

NOTE.—Inoperative propeller idling in high pitch. Cowl flaps are closed on inoperative engine. De-icers are not operating.

BEECH D–18C

Weight in pounds	Terrain clearance [1] in feet and climb speed in miles per hour (TIAS)	
	Feet	Miles per hour
9,000	6, 200	121. 0
8,500	7, 300	120. 0
8,000	8, 450	119. 5
7,500	9, 600	119. 0

[1] Highest altitude of terrain over which airplane may be operated in compliance with Sec. 42.82.

NOTE.—Inoperative propeller feathered.

TABLE 1.—*En route limitations*

BEECH D–18S

Weight in pounds	Terrain clearance [1] in feet and climb speed in miles per hour (TIAS)			
	Propeller feathered		Propeller idling	
	Feet	Miles per hour	Feet	Miles per hour
8,750	7,100	103.5		
8,500	7,600	103.5	5,600	104.5
8,000	8,800	102.5	6,700	104.0
7,500	9,900	102.0	7,900	103.0

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

BEECH 50

Weight in pounds	Terrain clearance [1] in feet and climb speed in miles per hour (TIAS)	
	Feet	Miles per hour
5,500	4,140	96.4
5,000	7,710	94.6
4,500	11,340	92.7

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

NOTE.—Inoperative propeller windmilling.

[*Cessna T–50*
(WITH LYCOMING R–680–E3 ENGINES AND MAXIMUM GROSS WEIGHT OF 5,700 POUNDS)

Weight [3] in pounds	Terrain clearance [1] in feet and climb speed in miles per hour (TIAS)			
	6135A–15 propeller		6135A–9 propeller	
	Feet [2]	Miles per hour	Feet [2]	Miles per hour
5,700			(450)	87.4
5,500	(920)	87.2	(1,540)	87.0
5,250	(2,280)	86.6	(2,890)	86.4
5,000	(3,740)	86.0	4,320	85.7
4,750	5,120	85.3	5,730	85.2

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.
[2] The "terrain clearances" in parentheses are not usable under sec. 42.16 and sec. 42.82 because minimum terrain altitude is 4,000 feet under sec. 42.82.
[3] Maximum permissible weights under sec. 42.16 and sec. 42.82 are 4,950 pounds with 6135A–15 propeller; 5,050 pounds with 6135A–9 propeller.]

NOTE.—Inoperative propeller windmilling. No leading edge de-icers installed.

GRUMMAN G–21

Weight in pounds [1]	Terrain clearance [2] in feet and climb speed in miles per hour (TIAS)	
	Feet [3]	Miles per hour
7,500	[3] (3,620)	111.5
7,000	4,610	111.1
6,500	5,590	110.6
6,000	6,550	110.1
5,500	7,530	109.6

[1] The maximum permissible weight under secs. 42.16 and 42.82 is 7,310 pounds.
[2] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.
[3] The "terrain clearance" in parenthesis is not usable under secs. 42.16 and 42.82 because the minimum terrain altitude is 4,000 feet under sec. 42.82.

NOTE.—Propeller idling in high pitch. Airplane is equipped with de-icers.

LOCKHEED 10A

Weight in pounds [1]	Terrain clearance [2] in feet and climb speed in miles per hour (TIAS)			
	Propeller feathered		Propeller idling	
	Feet [3]	Miles per hour	Feet [3]	Miles per hour
10,500	(3,600)	93.8		
10,100	4,580	93.6	(3,120)	92.9
10,000	4,820	93.5	(3,350)	92.8
9,500	6,020	93.1	4,660	92.5
9,000	7,200	92.8	5,900	92.1
8,500	8,350	92.4	7,180	91.7
8,000	9,550	92.0	8,420	91.4

[1] The maximum permissible weights under sec. 42.16 and 42.82 are 9,750 pounds with propeller idling, 10,340 pounds with propeller feathered.
[2] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.
[3] The "terrain clearances" in parenthesis are not usable under secs. 42.16 and 42.82 because the minimum terrain altitude is 4,000 feet under sec. 42.82.

LOCKHEED 10E

Weight in pounds	Terrain clearance [1] in feet and climb speed in miles per hour (TIAS)			
	Propeller feathered		Propeller idling	
	Feet	Miles per hour	Feet	Miles per hour
10,500	9,000	96	7,500	96.5
10,000	9,600	96	8,100	96.5
9,500	10,200	96	8,600	96.5
9,000	10,700	96	9,200	96.5
8,500	11,300	96	9,750	96.5
8,000	11,900	96	10,350	96.5

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

LOCKHEED 12A

Weight in pounds	Terrain clearance [1] in feet and climb speed in miles per hour (TIAS)	
	Feet	Miles per hour
8,600	6,700	98.5
8,000	7,400	98.5
7,500	7,950	98.5
7,000	8,500	98.5
6,500	9,000	98.5

[1] Highest altitude of terrain over which airplane may be operated in compliance with sec. 42.82.

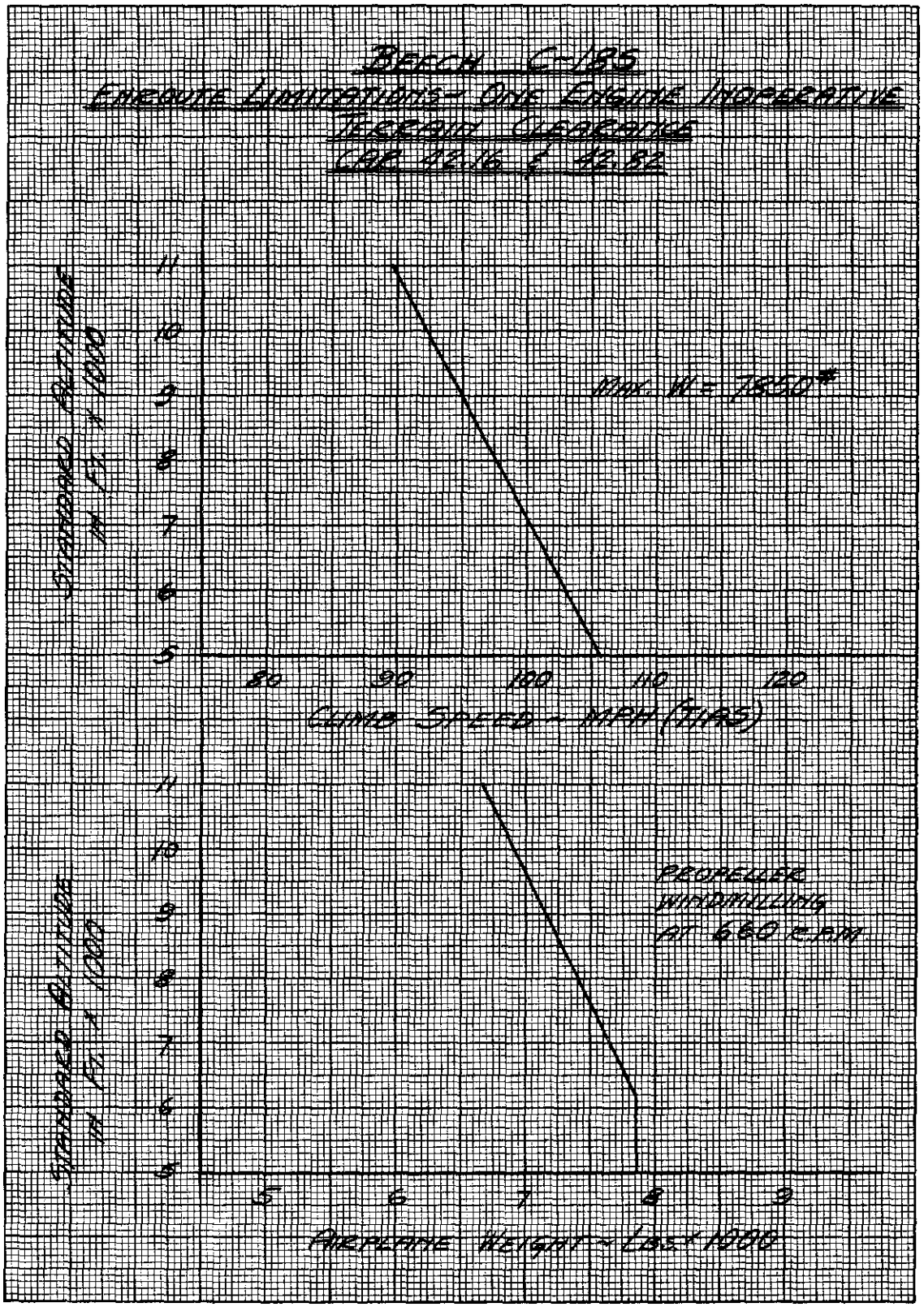

Figure 7

(Rev. 6/30/55)

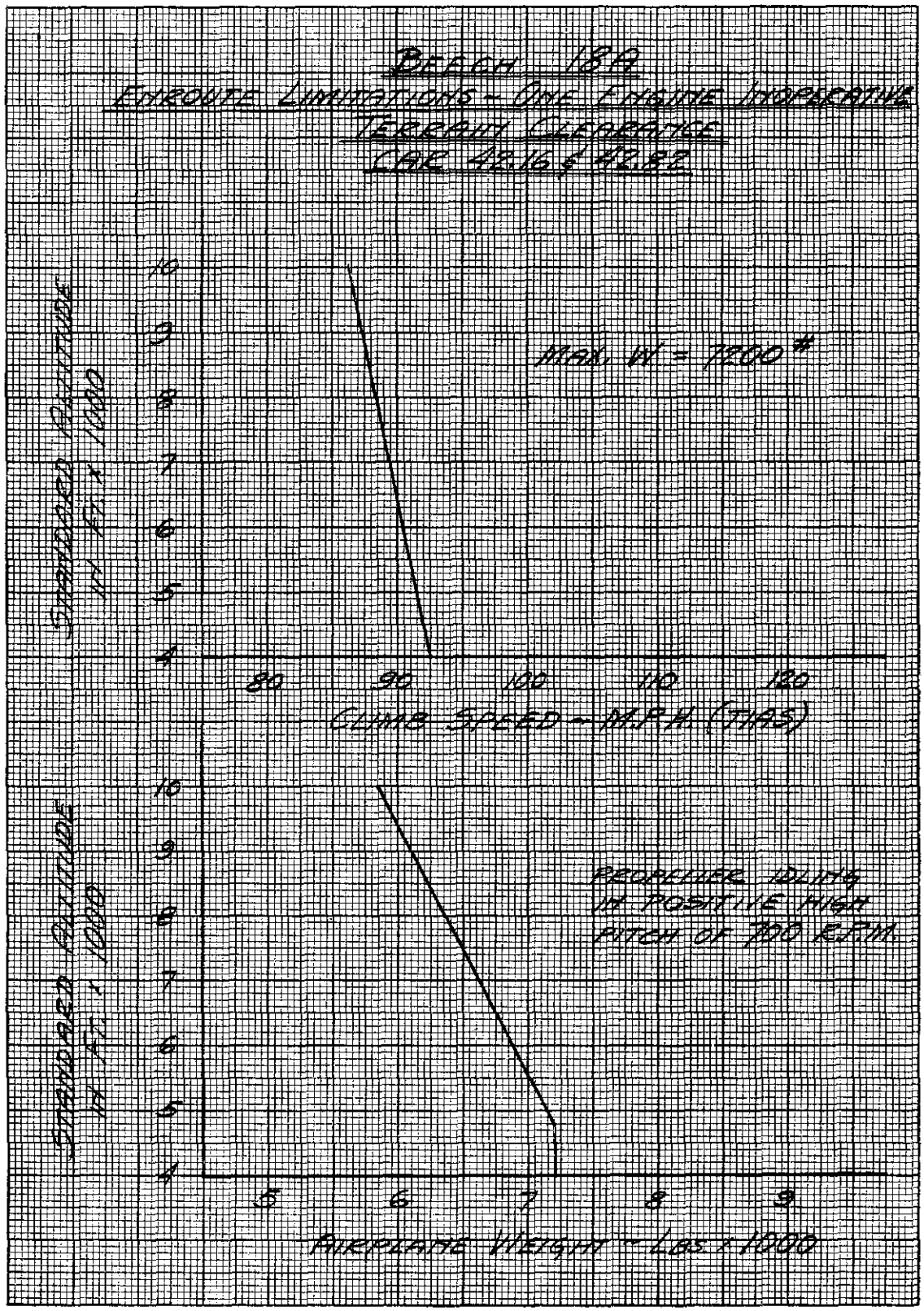

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Figure 8

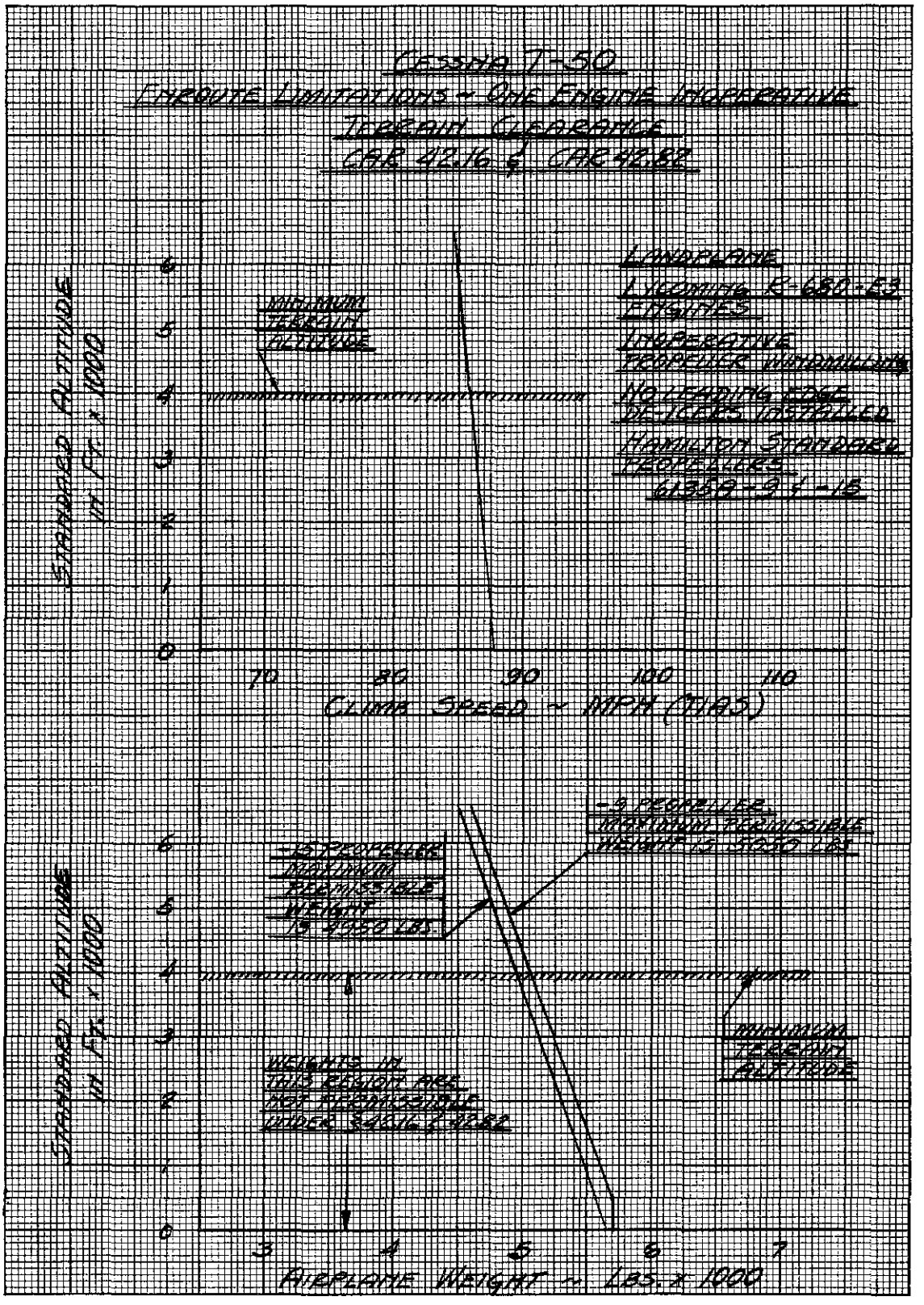

Figure 9

(Rev. 6/30/55)