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CIVIL AERONAUTICS MANUAL 40

U. S. Department of Commerce — Civil Aeronautics Administration

Civil Aeronautics Manuals and supplement 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 Code of Federal Regulations.

Supplement No. 3 — **July 1, 1955**

SUBJECT: Revisions to Civil Aeronautics Manual 40 dated April 1954.

This supplement is issued to provide subscribers of CAM 40 with the following new and revised material:

(1) **Section 40.51–1** (e) (2). The date, November 1, inadvertently omitted from this section has been added to indicate the calendar period during which 165 pounds may be used as an average adult passenger weight.

(2) **Section 40.175–1.** In order to provide the air carrier industry with specific standards for compliance with the provisions of section 40.175 (c), the Administrator has determined that aircraft meeting the power supply and distribution system airworthiness requirements of sections 4b.606 (a), (b), and (c); 4b.612 (e); 4b.622 (a) and (b); 4b.623; 4b.625; and 4b.650 (b) comply with the requirements of section 40.175 (c). Accordingly, regardless of whether an airplane has been certificated under 4a, 4b, or in the case of the DC–3, Aeronautics Bulletin 7A, it must meet the applicable requirements of Part 4b as specified. However, since some airplanes certificated under Part 4a or Aeronautics Bulletin 7A use common elements in the electric power distribution system which do not meet the requirements of Part 4b, this interpretation will permit the use of these common elements if their record of reliability is such that failure is improbable.

(3) **Section 40.390–2.** A new interpretation has been added which permits lower landing minimums to be approved at alternate airports having an ILS or GCA as the only instrument approach aid.

(4) **Section 40.392–1.** In order to provide a clear understanding of what constitutes compliance with the regulation, section 40.392 (b) has been interpreted to mean that no takeoff will be made when frost, snow, or ice adhering to any part of the airplane might adversely affect its performance.

Remove and destroy the following pages:	*Insert in lieu thereof the following pages (Revised 7/1/55):*
VII through IX	VII through X
41 and 42	41 and 42
59 through 62–1	59 through 62–1

The following ink revisions should be made:

Page 22, section 40.51–1 (e) (2)—add the words "[from November 1]" between the words "period" and "through" in the second paragraph.

"Page 24.1" should be changed to read "[24–1]."

Note: New and revised material is indicated by brackets [ ].

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tank when a transfer or separate oil reserve supply is used.

"(i) *Oil-in temperature indicator* for each engine.

"(j) Tachometer for each engine.

"(k) On and after January 1, 1955, an independent fuel pressure warning device for each engine or a master warning device for all engines with means for isolating the individual warning circuits from the master warning device.

"(l) Effective September 1, 1955, a means shall be provided for each reversible propeller on airplanes equipped with reversible propellers, which will indicate to the pilots when the propeller is in reverse pitch. Such means may be actuated at any point in the reversing cycle between the normal low pitch stop position and full reverse pitch. No indication shall be given at or above the normal low pitch stop position. The source of indication shall be actuated by the propeller blade angle or be directly responsive to the propeller blade angle."

"40.173 *Emergency equipment for all operations.*

"(a) The emergency equipment specified in paragraphs (b), (c), and (d) of this section is required for all operations. Such equipment shall be readily accessible to the crew, and the method of operation shall be plainly indicated. When such equipment is carried in compartments or containers, the compartments or containers shall be so marked as to be readily identifiable.

"(b) *Hand fire extinguishers for crew, passenger, and cargo compartments.* Hand fire extinguishers of an approved type shall be provided for use in crew, passenger, and cargo compartments in accordance with the following requirements:

"(1) The type and quantity of extinguishing agent shall be suitable for the type of fires likely to occur in the compartment where the extinguisher is intended to be used.

"(2) At least one hand fire extinguisher shall be provided and conveniently located on the flight deck for use by the flight crew.

"(3) On and after November 1, 1954, at least one hand fire extinguisher shall be conveniently located in the passenger compartment of airplanes accommodating more than six but less than 31 passengers. On airplanes accommodating more than 30 passengers, at least two fire extinguishers shall be provided. None need be provided in passenger compartments of airplanes accommodating six or less persons.

"(c) *First-aid equipment.* First-aid equipment suitable for treatment of injuries likely to occur in flight or in minor accidents shall be provided in a quantity appropriate to the number of passengers and crew accommodated in the airplane.

"(d) *Crash ax.* On and after [April] 1, 1955, all airplanes shall be equipped with at least one crash ax, and if accommodations are provided for more than 30 persons including the crew, airplanes shall be equipped with at least two crash axes. This equipment shall be stowed in readily accessible locations."

40.173–1 *Hand fire extinguishers for crew, passenger, and cargo compartments (CAA interpretations which apply to sec. 40.173 (b)).* Approved extinguishers are extinguishers which have been approved by the Administrator or by the Underwriters Laboratories (UL), the Factory Mutual Laboratories (FML), or any other agency which may be deemed qualified by the Administrator in accordance with section 4b.18.

(Published in 18 F. R. 8612 on December 22, 1953, effective January 1, 1954.)

"40.174 *Seats and safety belts for all occupants.* A seat and an individual safety belt are required for each passenger and crew member, excluding infants, who are in other than a recumbent position during take off and landing. One safety belt only is required in a berth for one or two persons in a recumbent position during takeoff and landing. During flight between takeoff and landing, one safety belt is sufficient for two persons occupying a multiple lounge or divan seat."

"40.175 *Miscellaneous equipment for all operations.* All airplanes shall have installed the following equipment:

"(a) If protective fuses are used, spare fuses of a number approved for the particular

airplane and appropriately described in the air carrier manual,

"(b) Windshield wiper or equivalent for each pilot,

"(c) A power supply and distribution system capable of producing and distributing the load for all required instruments and equipment using an external power supply in the event of failure of any one power source or component of the power distribution system: *Provided*, That the Administrator may authorize the use of common elements in the power distribution system when he finds that such elements are so designed as to be reasonable protected against malfunction. Engine-driven sources of energy, when used, shall be on separate engines: *And provided further*, That the provisions of this paragraph with respect to required instruments and equipment other than flight instruments shall not be mandatory prior to July 1, 1955.

"(d) On and after December 1, 1954, means for indicating the adequacy of the power being supplied to required flight instruments.

"(e) Two independent static pressure systems, so vented to the outside atmospheric pressure that they will be least affected by air flow variation, moisture, or other foreign matter, and so installed as to be airtight except for the vent. When a means is provided for transferring an instrument from its primary operating system to an alternate system, such means shall include a positive positioning control and shall be marked to indicate clearly which system is being used.

"(f) Means for locking all companionway doors which separate passenger compartments from flight crew compartments. Keys for all doors which separate passenger compartments from other compartments having emergency exit provisions shall be readily available to all crew members. Any door which is the means of access to a required passenger emergency exit shall be placarded to indicate that it must be open during takeoff and landing. All doors which lead to compartments normally accessible to passengers and which are capable of being locked by passengers shall be provided with means for unlocking by the crew in the event of any emergency.

"(g) For seaplanes only, an anchor light or lights, a warning bell for signaling when not under way during fog conditions, and an anchor adequate for the size of the seaplane."

[40.175–1 *Power supply and distribution systems (CAA interpretations which apply to sec. 40.175(c))*.

[(a) Aircraft having a power supply and distribution system which meets the requirements of sections 4b.606 (a), (b), and (c); 4b.612 (e); 4b.622 (a) and (b); 4b.623; 4b.625; 4b.650 (b) of this subchapter are deemed to have met the requirements of section 40.175 (c).

[(b) The use of common elements in the electrical power distribution system which do not meet the requirements of paragraph (a) of this section will be approved under the provisions of section 40.175 (c) if their record of reliability is such that failure is improbable.[5a]

[(Published in 20 F. R. 4291—2 on June 18, 1955, effective July 1, 1955.)]

"40.176 *Cockpit check procedure for all operations.* The air carrier shall provide for each type of airplane a cockpit check procedure. This procedure shall include all items necessary for flight crew members to check for safety prior to starting engines, prior to taking off, prior to landing, and in engine emergencies. It shall be so designed as to obviate the necessity for a flight crew member to rely upon his memory for items to be checked and shall be readily usable in the cockpit of each airplane."

"40.177 *Passenger information for all operations.* All airplanes shall be equipped with signs visible to passengers and cabin

[5a As a result of surveys conducted by the CAA during March and July of 1954, it was found that by employing the standards in section 40.175–1, all aircraft in service which were subject to the provisions of this part, with the exception of a limited number of DC-3 aircraft, were acceptable from a compliance viewpoint. The DC-3 aircraft mentioned were not considered to meet the provisions of this section because a common circuit breaker is incorporated in the electric power distribution system to both ADF inverters and did not provide a means, such as individual fuses or circuit breakers, to assure continued operation in the event the common circuit breaker opened as a result of fault in either inverter or ADF system.

minimums, and the regulations of this subchapter.

"(b) If an emergency situation arises during the course of a flight which requires immediate decision and action on the part of the aircraft dispatcher, and which is known to him, he shall advise the pilot in command of such situation. The aircraft dispatcher shall ascertain the decision of the pilot in command and shall cause the same to be made a matter of record. If unable to communicate with the pilot, the dispatcher shall declare an emergency and follow any course of action which he considers necessary under the circumstances.

"(c) When emergency authority is exercised by the pilot in command or by the dispatcher, the appropriate dispatch center shall be kept fully informed regarding the progress of the flight, and within 10 days after the completion of the particular flight a written report of any deviation shall be submitted by the individual declaring the emergency to the Administrator through the air carrier operations manager.

"40.361 *Reporting potentially hazardous meteorological conditions and irregularities of ground and navigational facilities.* When any meteorological condition or irregularity of ground or navigational facilities is encountered in flight, the knowledge of which the pilot in command considers essential to the safety of other flights, he shall notify an appropriate ground radio station as soon as practicable. Such information shall thereupon be relayed by that station to the appropriate governmental agency."

"40.362 *Reporting mechanical irregularities.* The pilot in command shall enter or cause to be entered in the maintenance log of the airplane all mechanical irregularities encountered during flight. He shall, prior to each flight, inspect the log to ascertain the status of any irregularities entered in the log at the end of the last preceding flight."

"40.363 *Engine failure or precautionary stoppage.*

"(a) Except as provided in paragraph (b) of this section, when one engine of an airplane fails or where the rotation of an engine of an airplane is stopped in flight as a precautionary measure to prevent possible damage, a landing shall be made at the nearest suitable airport in point of time where a safe landing can be effected.

"(b) The pilot in command of an airplane having 4 or more engines may, if not more than 1 engine fails or the rotation thereof is stopped, proceed to an airport of his selection, if, upon consideration of the following factors, he determines such action to be as safe a course of action as landing at the nearest suitable airport:

"(1) The nature of the malfunctioning and the possible mechanical difficulties which may be encountered if flight is continued,

"(2) The availability of the inoperative engine for use,

"(3) The altitude, airplane weight, and usable fuel at the time of engine stoppage,

"(4) The weather conditions en route and at possible landing points,

"(5) The air traffic congestion,

"(6) The type of terrain, and

"(7) The familiarity of the pilot with the airport to be used.

"(c) When engine rotation is stopped in flight, the pilot in command shall immediately notify the proper ground station and shall keep such station fully informed regarding the progress of the flight.

"(d) In cases where the pilot in command selects an airport other than the nearest suitable airport in point of time, he shall, upon completion of the trip, submit a written report, in duplicate, to his operations manager setting forth his reasons for determining that the selection of an airport other than the nearest was as safe a course of action as landing at the nearest suitable airport. The operations manager shall, within 7 days after completion of the trip, furnish a copy of this report with his own comments thereon to the Administrator."

"40.364 *Instrument approach procedures.* When an instrument approach is necessary, the instrument approach procedures and weather minimums authorized in the operations specifications shall be adhered to."

"40.365 *Requirements for air carrier equipment interchange.*

"(a) Prior to conducting any operations pursuant to an interchange agreement authorized by the Civil Aeronautics Board, the air carrier shall show that:

"(1) The procedures proposed for the conduct of such operations by the carriers involved conform with the provisions of this subchapter and with safe operating practices;

"(2) All operations personnel involved are familiar with the airplanes and equipment of the air carrier with whom interchange is to be effected, and with the communications and dispatching procedures to be used;

"(3) All maintenance personnel involved are familiar with the airplanes and equipment, and the maintenance procedures of the air carrier with whom interchange is to be effected;

"(4) The flight crew and the dispatchers involved meet the appropriate route and airport qualifications; and

"(5) All airplanes operated are essentially similar to those airplanes of the carrier with whom interchange is to be effected with respect to flight instruments and their arrangement and with respect to the arrangement and motion of controls critical to safety, unless the Administrator determines that adequate training programs have been established to insure that any dissimilarities which might be a potential hazard will be safely overcome by flight crew familiarization.

"(b) The pertinent provisions and procedures affecting the carriers involved shall be included in their manuals.

Dispatching Rules

"40.381 *Necessity for dispatching authority.* No flight shall be started without specific authority from an aircraft dispatcher, except when an airplane has landed at an intermediate airport specified in the original dispatch release and has remained there for one hour or less."

"40.382 *Familiarity with weather conditions.* No aircraft dispatcher shall release a flight unless he is thoroughly familiar with existing and anticipated weather conditions along the route to be flown."

"40.383 *Facilities and services.* The dispatcher shall furnish to the pilot in command all available current reports or information pertaining to irregularities of navigational facilities and airport conditions which may affect the safety of the flight. He shall also furnish the pilot, while en route, any additional available information concerning meteorological conditions and irregularities of facilities and services which may affect the safety of the flight."

"40.384 *Airplane equipment required for dispatch.* All airplanes dispatched shall be airworthy and shall be equipped in accordance with the provisions of section 40.170."

"40.385 *Communications and navigational facilities required for dispatch.* No airplane shall be dispatched over any route or route segment unless the communications and navigational facilities required by sections 40.34 and 40.36 are in satisfactory operating condition."

"40.386 *Dispatching under VFR.* Airplanes shall be dispatched for operation under VFR only if the appropriate weather reports and forecasts, or a combination thereof, indicate that the ceilings and visibilities along the route to be flown are, and will remain, at or above the minimums required for flight under VFR until the flight arrives at the airport or airports of intended landing specified in the dispatch release."

"40.387 *Dispatching under IFR or over-the-top.* Airplanes shall dispatched for operation under IFR or over-the-top only if the appropriate weather reports and forecasts, or a combination thereof, pertaining to the airport or airports to which dispatched indicate that the ceilings and visibilities will be at or above the minimums approved by the Administrator at the estimated time of arrival thereat."

"40.388 *Alternate airport for departure.*

"(a) If the weather conditions at the airport of take-off are below the approved landing minimums for that airport, no airplane shall be dispatched from that airport unless an alternate airport located with respect to the airport of takeoff as follows is specified in the dispatch release: Provided, That such alternate need not be selected if the ceiling and visibility respectively at the takeoff airport are at least

300 feet and 1 mile, 400 feet and three-quarters mile, or 500 feet and one-half mile.

"(1) *Airplanes having 2 or 3 engines.* Alternate airport located at a distance no greater than 1 hour of flying time in still air at normal cruising speed with 1 engine inoperative.

"(2) *Airplanes having 4 or more engines.* Alternate airport located at a distance no greater than 2 hours of flying time in still air at normal cruising speed with 1 engine inoperative.

"(b) The alternate airport weather requirements shall be those specified in section 40.390.

"(c) All required alternate airports shall be listed in the dispatch release."

"40.389 *Alternate airport for destination; IFR or over-the-top.*

"(a) *For all IFR or over-the-top operations* there shall be at least one alternate airport designated for each airport of destination and, when the weather conditions forecast for the destination and first alternate are marginal, at least one additional alternate airport: *Provided,* That no alternate need be designated when, for the period 2 hours before to 2 hours after the estimated time of arrival, the ceiling at the airport to which the flight is dispatched is forecast to be at least 1,000 feet above the minimum initial approach altitude applicable to such airport and the visibility at such airport is forecast to be at least 3 miles.

"(b) The alternate airport weather requirements shall be those specified in section 40.390.

"(c) All required alternate airports shall be listed in the dispatch release."

"40.390 *Alternate airport weather minimums.* An airport shall not be specified in the dispatch release as an alternate airport unless the weather conditions existing there at the time of dispatch are equal to or above the ceiling and visibility minimums approved for such airport when using it as an alternate, and the appropriate weather reports and forecasts, or a combination thereof, indicate that the weather conditions will be at or above such minimums until the flight shall arrive thereat. The weather minimums at such alternate airport shall not be less than one of the following and in no event less than the corresponding minimums specified for the airport when used as a regular airport: *Provided,* That the Administrator may approve higher or lower minimums at particular airports where the safe conduct of flight requires or permits, considering the character of the terrain being traversed, the meteorological service and navigational facilities available, and other conditions affecting flight.

"(a) An airport served by an approved radio navigational facility and either an instrument landing system or a ground control approach system which the carrier has been authorized to use: Ceiling 800 feet and visibility of 1 mile; or ceiling 700 feet and visibility of 1½ miles; or ceiling 600 feet and visibility of 2 miles;

"(b) An airport served by an approved radio navigational facility: Ceiling 1,000 feet and visibility of 1 mile; or ceiling 900 feet and visibility of 1½ miles; or ceiling 800 feet and visibility of 2 miles;

"(c) An airport not served by an approved radio navigational facility: If overcast, ceiling 1,000 feet above the minimum en route instrument altitude applicable to the route to such alternate airport and visibility of 2 miles; if broken clouds, ceiling 1,000 feet above the elevation of the airport and visibility of 2 miles."

40.390–1 *Alternate airport landing minimums for airports not served by a radio navigation facility (CAA policies which apply to sec. 40.390 (c)).* When there is no minimum en route instrument altitude associated with an alternate airport, the approval of alternate airport landing minimums under overcast conditions will be contingent upon (a) the incorporation of appropriate minimum en route altitudes in the air carriers operations manual in order to provide a basis for establishing weather minimums in accordance with section 40.390 (c) and (b) the availability of radio navigation facilities of sufficient adequacy to permit safe navigation *over* such alternate airport. The latter may be accomplished by using any of the following or a combination thereof.

(1) Radio bearings from the airport of intended destination,

(2) Radio range course from the airport of intended destination,

(3) Radio range course projected over

the alternate airport on a line with the intended course to be flown,

(4) Radio bearing from a radio facility located beyond the alternate airport on a line with the intended course to be flown, or

(5) Radio bearing from a radio facility located along the intended course to be flown.

(Published in 19 F. R. November 19, 1954, effective November 30, 1954.)

[40.390-2. *Establishment of alternate airport landing minimums at airports where ILS or GCA only available instrument approach aids (CAA interpretations which apply to sec. 40.390(a)).* Alternate airport landing minimums as low as 600–2, 700–1½, or 800–1 may be approved at airports where an ILS or GCA is the only instrument approach aid serving such airport: Provided, That adequate radio facilities are available to accomplish transition to the ILS or GCA.

[(Published in 20 F. R. 3559 on May 21, 1955, effective June 15, 1955.)]

"40.391 *Continuance of flight; flight hazards.*

"(a) No airplane shall be continued in flight toward any airport to which it has been dispatched when, in the opinion of the pilot in command or the aircraft dispatcher, the flight cannot be completed with safety, unless in the opinion of the pilot in command there is no safer procedure. In the latter event, continuation shall constitute an emergency situation as set forth in section 40.360.

"(b) If any item of equipment required pursuant to the regulations of this subchapter for the particular operation being conducted becomes unserviceable en route, the pilot in command shall comply with the procedures specified in the manual for such occurrence: *Provided,* That the Administrator may authorize the incorporation in the air carrier manual of procedures for the continued operation of an airplane beyond a scheduled terminal where he finds that, in the particular circumstances of the case, literal compliance with this requirement is not necessary in the interest of safety."

"40.392 *Operation in icing conditions.*

"(a) An airplane shall not be dispatched, en route operations continued, or landing made when, in the opinion of the pilot in command or aircraft dispatcher, icing conditions are expected or encountered which might adversely affect the safety of the flight.

"(b) No airplane shall take off when frost, snow, or ice is adhering to the wings, control surfaces, or propellers of the airplane."

[40.392-1 *Operation in icing conditions (CAA interpretations which apply to sec. 40.392 (b)).* No takeoff will be made when frost, snow, or ice adhering to any part of the airplane might adversely affect its performance.

[(Published in 20 F. R. 4002 on June 9, 1955, effective June 30, 1955.)]

"40.393 *Redispatch and continuance of flight.*

"(a) Any regular, provisional, or refueling airport, the use of which is authorized for the type of airplane to be operated may be specified as a destination for the purpose of original dispatch.

"(b) An airport specified as a destination or alternate for the purpose of original dispatch may be changed en route to another airport which is authorized for the type of airplane to be operated, provided that the appropriate requirements of sections 40.381 through 40.409 and section 40.70 or section 40.90 are met at the time of redispatch.

"(c) No flight shall be continued to any airport to which it has been dispatched unless the weather conditions at an alternate airport specified in the dispatch release remain at or above the minimums specified for such airport when used as an alternate: *Provided,* That the dispatch release may be amended en route to include any approved alternate airport lying within the fuel range of the airplane as specified in sections 40.396 and 40.397.

"(d) When the dispatch release is amended while the airplane is en route, such amendments shall be made a matter of record."

"40.394 *Dispatch to and from provisional airport.*

"(a) No aircraft dispatcher shall dispatch an airplane to a provisional airport unless such airport complies with all of the requirements of this part pertinent to regular airports.

(Revised 7/1/55)

"(b) Dispatch from a provisional airport shall be accomplished in accordance with the same regulations governing dispatch from a regular airport."

"40.395 *Takeoffs from alternate airports or from airports not listed in the operations specifications.* No airplane shall take off from an alternate airport or from an airport which is not listed in the air carrier operations specifications unless:

"(a) Such airport and related facilities are adequate for the operation of the airplane,

"(b) In taking off it is possible to comply with the applicable airplane operating limitations,

"(c) The weather conditions at that airport are equal to or better than those prescribed for such airport, and

"(d) The airplane is dispatched in accordance with all dispatching rules applicable to operation from an approved airport."

"40.396 *Fuel supply for all operations.* No airplane shall be dispatched unless it carries sufficient fuel:

"(a) To fly to the airport to which dispatched, and thereafter,

"(b) To fly to and land at the most distant alternate for the airport to which dispatched where such alternate is required and thereafter,

"(c) To fly for a period of at least 45 minutes at normal cruising consumption."

"40.397 *Factors involved in computing fuel required.* In computing the fuel required, consideration shall be given to the wind and other weather conditions forecast, traffic delays anticipated, and any other conditions which might delay the landing of the airplane. Required fuel shall be additional to unusable fuel."

"40.405 *Takeoff and landing weather minimum; VFR.* Irrespective of any clearance which may be obtained from air traffic control, no airplane shall take off or land under VFR when the reported ceiling or ground