767-045
PA46-500TP Meridian
2006 & up
4697198 & 4697216 & up

Piper™

MERIDIAN

Information Manual

WARNING

This Information Manual may be used for general information purposes only.

This Information Manual is not kept current. It must not be used as a substitute for the official FAA approved Pilot's Operating Handbook required for operation of the airplane.

Piper™

MERIDIAN
PA-46-500TP

SN 4697198, 4697216 AND UP

INFORMATION MANUAL

MANUAL PART NUMBER 767-045

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APPLICABILITY

Application of this handbook is limited to the specific Piper PA-46-500TP model airplane designated by serial number and registration number on the face of the title page of this handbook.

This handbook cannot be used for operational purposes unless kept in a current status.

WARNING

EXTREME CARE MUST BE EXERCISED TO LIMIT THE USE OF THIS HANDBOOK TO APPLICABLE AIRCRAFT. THIS HANDBOOK IS VALID FOR USE WITH THE AIRPLANE IDENTIFIED ON THE FACE OF THE TITLE PAGE. SUBSEQUENT REVISIONS SUPPLIED BY PIPER MUST BE PROPERLY INSERTED.

WARNING

INSPECTION, MAINTENANCE AND PARTS REQUIREMENTS FOR ALL NON-PIPER APPROVED STC INSTALLATIONS ARE NOT INCLUDED IN THIS HANDBOOK. WHEN A NON-PIPER APPROVED STC INSTALLATION IS INCORPORATED ON THE AIRPLANE, THOSE PORTIONS OF THE AIRPLANE AFFECTED BY THE INSTALLATION MUST BE INSPECTED IN ACCORDANCE WITH THE INSPECTION PROGRAM PUBLISHED BY THE OWNER OF THE STC. SINCE NON-PIPER APPROVED STC INSTALLATIONS MAY CHANGE SYSTEMS INTERFACE, OPERATING CHARACTERISTICS AND COMPONENT LOADS OR STRESSES ON ADJACENT STRUCTURES, PIPER PROVIDED INSPECTION CRITERIA MAY NOT BE VALID FOR AIRPLANES WITH NON-PIPER APPROVED STC INSTALLATIONS.

REVISIONS

The information compiled in the Pilot's Operating Handbook, with the exception of the equipment list, will be kept current by revisions distributed to the airplane owners. The equipment list was current at the time the airplane was licensed by the manufacturer and thereafter must be maintained by the owner.

Revision material will consist of information necessary to update the text of the present handbook and/or to add information to cover added airplane equipment.

I. Revisions

Revisions will be distributed whenever necessary as complete page replacements or additions and shall be inserted into the handbook in accordance with the instructions given below:

1. Revision pages will replace only pages with the same page number.
2. Insert all additional pages in proper numerical order within each section.
3. Insert page numbers followed by a small letter in direct sequence with the same common numbered page.

II. Identification of Revised Material

Each handbook page is dated at the bottom of the page showing the date of original issue and the date of the latest revision. Revised text and illustrations are indicated by a black vertical line located along the outside margin of each revised page opposite the revised, added, or deleted information. A vertical line next to the page number indicates that an entire page has been changed or added.

Vertical black lines indicate current revisions only. Correction of typographical or grammatical errors or the physical relocation of information on a page will not be indicated by a symbol.

ORIGINAL PAGES ISSUED

The original pages issued for this handbook prior to revision are given below:

Title, ii through viii, 1-1 through 1-14, 2-1 through 2-36, 3-1 through 3-54, 4-1 through 4-54, 5-1 through 5-148, 6-1 through 6-60, 7-1 through 7-56, 8-1 through 8-30, 9-1 through 9-74, and 10-1 through 10-2.

MERIDIAN

PILOT'S OPERATING HANDBOOK LOG OF REVISIONS

Current Revisions to the PA-46-500TP Meridian Pilot's Operating Handbook, REPORT: VB-1912 issued MAY 6, 2005.

Revision Number and Code	Revised Pages	Description of Revisions	FAA Approved Signature and Date
Rev. 1 (PR050711)	v 2-9	Added Rev. 1 to L of R. Revised para. 2.25.	Linda J. Dicken July 11, 2005
Rev. 2 (PR050822)	v 2-27 2-28 3-27 4-14 5-9 5-28 5-29 7-8 7-11	Added Rev. 2 to L of R. Revised para. 2.43. Revised para. 2.43. Revised para. 3.35. Revised para. 4.5e. Revised List of Figures. Added Figure 5-11, Alternate Static System Correction. Changed Figure 5-11 to Figure 5-12. Revised para. 7.8a. Revised para. 7.8a.	Linda J. Dicken August 22, 2005
Rev. 3 (PR051031)	v 3-37 3-38 8-11	Added Rev. 3 to L of R. Revised para. 3.36j. Revised para. 3.36k. Revised para. 8.17.	Linda J. Dicken October 31, 2005
Rev. 4 (PR051219)	v 2-11 4-24 4-46	Added Rev. 4 to L of R. Revised para. 2.29. Revised para. 4.5p. Revised para. 4.37.	Linda J. Dicken December 19, 2005

PILOT'S OPERATING HANDBOOK LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revisions	FAA Approved Signature and Date
Rev. 5 (PR060111)	vi	Added Rev. 5 to L of R.	
	9-i	Revised T of C.	
	9-75 thru 9-84	Added pages and Supplement 8.	
	9-85 thru 9-88	Added pages and Supplement 9.	Linda J. Dicken January 11, 2006
Rev. 6 (PR060216)	vi	Added Rev. 6 to L of R.	Linda J. Dicken February 16, 2006
	9-65	Revised Section 2.	
	9-68	Revised Section 4.	
Rev. 7 (PR060307)	vi	Added Rev. 7 to L of R.	
	3-iii	Revised T of C.	
	3-4	Revised para. 3.1.	
	3-5	Revised para. 3.1.	
	3-6	Revised para. 3.1.	
	3-17	Revised para. 3.15.	
	3-27	Revised para. 3.35.	
	3-28	Revised para. 3.36a.	
	3-29	Revised para. 3.36b.	
	3-31	Revised para. 3.36d.	
	3-32	Revised para. 3.36e.	
	3-33	Revised para. 3.36f & 3.36g.	
	3-34	Revised para. 3.36g.	
	3-35	Revised para. 3.36h.	
	3-38	Revised para. 3.36k.	Linda J. Dicken
	3-39	Revised para. 3.36l.	March 7, 2006

PILOT'S OPERATING HANDBOOK LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revisions	FAA Approved Signature and Date
Rev. 8 (PR060403)	vi-a	Added page and Rev. 8 to L of R.	
	vi-b	Added page.	
	3-28	Revised para. 3.36a.	
	7-i	Revised T of C.	
	7-10	Revised para. 7.8a.	
	7-11	Revised para. 7.8a.	
	7-15	Revised para. 7.8b.	
	7-16	Revised para. 7.8b.	
	7-17	Revised para. 7.8b.	Linda J. Dicken
	7-23	Added para. 7.8d.	April 3, 2006
Rev. 9 (PR060612)	vi-a	Added Rev. 9 to L of R.	
	2-13	Revised para. 2.35.	
	2-15	Revised para. 2.35.	Linda J. Dicken
	4-36	Revised para. 4.13c.	June 12, 2006
Rev. 10 (PR061023)	vi-a	Added Rev. 10 to L of R.	
	4-13	Revised para. 4.5c.	Linda J. Dicken
	4-36	Revised para. 4.13c.	October 23, 2006
Rev. 11 (PR070411)	vi-a	Added Rev. 11 to L of R.	
	4-9	Revised para. 4.5b.	
	4-10	Revised para. 4.5b.	
	4-13	Revised para. 4.5c.	
	4-32	Revised para. 4.11.	Linda J. Dicken
	4-36	Revised para. 4.13c.	April 11, 2007
Rev. 12 (PR070702)	vi-a	Added Rev. 12 to L of R.	
	2-32	Revised para. 2.43.	Albert J. Mill July 2, 2007

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SECTION 1

GENERAL

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SECTION 1

GENERAL

1.1 INTRODUCTION

This Pilot's Operating Handbook is designed for maximum utilization as an operating guide for the pilot. It includes the material required to be furnished to the pilot by the Federal Aviation Regulations and additional information provided by the manufacturer and constitutes the FAA Approved Airplane Flight Manual.

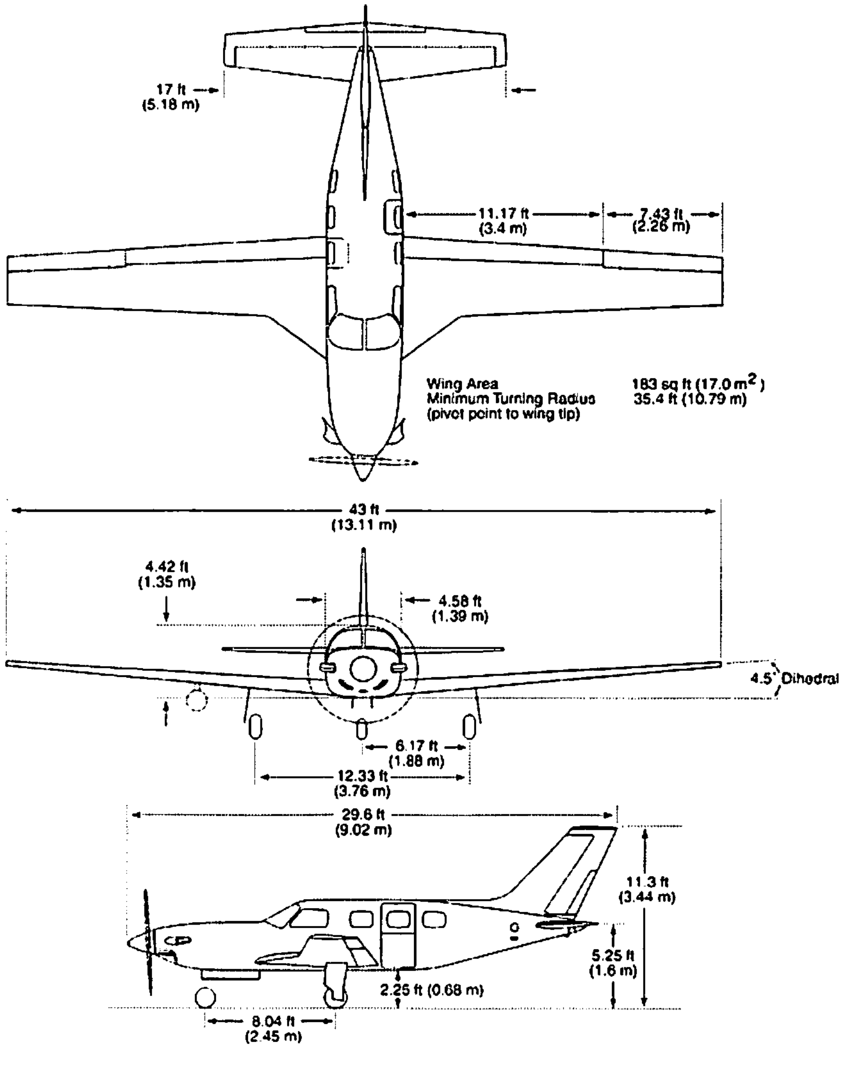
This handbook is not designed as a substitute for adequate and competent flight instruction, knowledge of current Airworthiness Directives, applicable Federal Aviation Regulations or Advisory Circulars. It is not intended to be a guide for basic flight instruction or a training manual and should not be used for operational purposes unless kept in a current status. The pilot should study the entire handbook to familiarize himself with the limitations, performance, procedures and operational handling characteristics of the airplane before flight.

Assurance that the airplane is in an airworthy condition is the responsibility of the owner. The pilot in command is responsible for determining that the airplane is safe for flight. The pilot is also responsible for remaining within the operating limitations as outlined by instrument markings, placards, and this handbook.

The handbook has been divided into numbered (arabic) sections each provided with a finger-tip tab divider for quick reference. Provisions for expansion of the handbook have been made by the deliberate omission of certain paragraph numbers, figure numbers, item numbers and pages noted as being intentionally left blank.

NOTE

In countries other than the United States of America, FAA operating rules may not apply. Operators must ensure that the aircraft is operated in accordance with national operating rules.



THREE VIEW
Figure 1-1

1.2 NOTATIONS

WARNING

Operating procedures or techniques which may result in personal injury or loss of life if not carefully followed.

CAUTION

Operating procedures or techniques which may result in damage to equipment if not carefully followed

NOTE

Supplemental information or highlights considered of sufficient significance to require emphasizing.

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1.3 ENGINE

Number of Engines	1
Engine Manufacturer	Pratt & Whitney Canada
Engine Model Number	PT6A-42A

Engine Type

This airplane incorporates a free shaft turboprop engine with 3 axial and 1 centrifugal compressor stages, an annular combustion chamber, and a 3 stage turbine where one stage drives the compressor and a dual stage powers the propeller.

Horsepower Rating and Engine Speed

Takeoff Power	500 shp
Maximum Continuous	500 shp
Compressor Turbine Speed (Ng)	38,100 rpm (101.7%)
Propeller Speed (Np)	2,000 rpm

1.5 PROPELLER

Number of Propellers	1
Propeller Manufacturer	Hartzell
Blade Model	E8501B-3.5
Number of Blades	4
Hub Model	HC-E4N-3Q
Propeller Diameter	Maximum 82.5 in. (209.5 cm) Minimum 81.5 in. (207 cm)

Propeller Type

The propeller assembly consists of a hub unit and four metal blades, and is a hydraulically actuated, constant speed, full feathering and reversible type.

1.7 FUEL

JET FUEL ONLY

Fuel Capacity	1160 lb/173 U.S. gal. (526.1 kg/654.8 liter)
Unusable Fuel	20 lb/3 U.S. gal. (9.0 kg/11.3 liter)

Fuel

Fuel, Aviation	Jet A, Jet A-1
Anti-Icing Additive	Refer to latest revision of Pratt & Whitney Service Bulletin 3044 for anti-icing additive conforming to MIL-I-27686

1.9 OIL

Oil Capacity	12 qt (11.35 liter)
Oil Specification	Refer to Section 8 for Oil Specifications

1.11 MAXIMUM WEIGHTS

Maximum Ramp Weight	5134 lb (2328.7 kg)
Maximum Takeoff Weight	5092 lb (2309.7 kg)
Maximum Landing Weight	4850 lb (2199.9 kg)
Maximum Weights in Baggage Compartment	100 lb (45.3 kg)
Maximum Zero Fuel Weight	4850 lb (2199.9 kg)

1.13 RESERVED

1.15 CABIN AND ENTRY DIMENSIONS

Cabin Width (max.)	49.5 in. (125.7 cm)
Cabin Length (Instrument panel to rear bulkhead)	148 in. (375.9 cm)
Cabin Height (max.)	47 in. (119.4 cm)
Entry Width	24 in. (60.9 cm)
Entry Height	46 in. (116.8 cm)

1.17 BAGGAGE SPACE AFT CABIN

Compartment Volume	20 cu. ft. (0.56 m^3)
Entry Dimensions	24 x 46 in. (60.9 x 116.8 cm)

1.19 SPECIFIC LOADING

Wing Loading at 5092 lb (2309.7 kg)	27.8 lb/ft^2 (135.9 kg/m^2)
Power Loading @ MCP	10.2 lb/SHP (4.62 kg/SHP)

1.21 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

The following definitions are of symbols, abbreviations and terminology used throughout the handbook and those which may be of added operational significance to the pilot.

(a) General Airspeed Terminology and Symbols

CAS	Calibrated Airspeed means the indicated speed of an aircraft, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.
KCAS	Calibrated Airspeed expressed in "Knots".
GS	Ground Speed is the speed of an airplane relative to the ground.
IAS	Indicated Airspeed is the speed of an aircraft as shown on the airspeed indicator when corrected for instrument error. IAS values published in this handbook assume zero instrument error.
KIAS	Indicated Airspeed expressed in "Knots".
M	Mach Number is the ratio of true airspeed to the speed of sound.
M_{MO}	Maximum Operating Limit Speed is the speed limit that may not be deliberately exceeded in normal flight operations. M is expressed in Mach number.
TAS	True Airspeed is the airspeed of an airplane relative to undisturbed air which is the CAS corrected for altitude, temperature and compressibility.
V_{FE}	Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.

1.21 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY (Cont)

V_{LE}	Maximum Landing Gear Extended Speed is the maximum speed at which an aircraft can be safely flown with the landing gear extended.
V_{LO}	Maximum Landing Gear Operating Speed is the maximum speed at which the landing gear can be safely extended or retracted.
V_{MO}	Maximum Operating Speed is the the speed limit that may not be exceeded at any time. V is expressed in knots.
V_O	Maximum Operating Maneuvering Speed is the maximum speed at which application of full available aerodynamic control will not overstress the airplane. NOTE V_O is defined in accordance with FAR 23 Amendment 45
V_R	Rotation Speed used for takeoff.
V_S	Stalling Speed or the minimum steady flight speed at which the airplane is controllable.
V_{SO}	Stalling Speed or the minimum steady flight speed at which the airplane is controllable in the landing configuration at maximum gross weight.
V_{S1}	Stalling Speed or the minimum steady flight speed obtained in a specific configuration.
V_X	Best Angle-of-Climb Speed is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.
V_Y	Best Rate-of-Climb Speed is the airspeed which delivers the greatest gain in altitude in the shortest possible time.

1.21 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY (Cont)

(b) Meteorological Terminology

ISA	International Standard Atmosphere in which: (1) The air is a dry perfect gas; (2) The temperature at sea level is 15° Celsius (59° Fahrenheit); (3) The pressure at sea level is 29.92 in. Hg (1013.2 mb).
IOAT	Indicated Outside Air Temperature is the temperature obtained from an indicator and not corrected for instrument error and compressibility effects.
OAT	Outside Air Temperature is the free air static temperature obtained either from inflight temperature indications or ground meteorological sources, adjusted for instrument error and compressibility effects.
Indicated Pressure Altitude	The number actually read from an altimeter when the barometric subscale has been set to 29.92 in. Hg (1013.2 mb).
Pressure Altitude (P.A.)	Altitude measured from standard sea-level pressure of 29.92 in. Hg (1013.2 mb) by a pressure or barometric altimeter. It is the indicated pressure altitude corrected for position and instrument error. In this handbook, altimeter instrument errors are assumed to be zero.
Station Pressure	Actual atmospheric pressure at field elevation.
Wind	The wind velocities recorded as variables on the charts of this handbook are to be understood as the headwind or tailwind components of the reported winds.

1.21 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY (Cont)

(c) Power Terminology

Cruise Climb Power	The power recommended to operate the airplane in a cruise climb (a continuous, gradual climb) profile.
Flight Idle Power	The power required to run an engine, in flight, at the lowest speed that will ensure satisfactory engine and systems operation and airplane handling characteristics.
Maximum Continuous Power	The maximum power approved for continuous use.
Maximum Climb Power	The maximum power approved for climb.
Maximum Cruise Power	The maximum power approved for cruise.
Reverse Thrust	The thrust of the propeller directed opposite the usual direction, thereby producing a braking action.
Takeoff Power	The maximum power permissible for takeoff (limited to 5 minutes).
Zero Thrust	The absence of appreciable thrust.

1.21 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY (Cont)

(d) Engine Controls and Instruments

Beta Range	On turbine powered aircraft using fully reversing propellers, this is the range of propeller blade angle movement not controlled by a governor and the propeller control lever. In this range, the blade pitch angle is scheduled by power lever movement and the constant propeller speed mechanism is blocked out.
Constant Speed Range	The engine operating range where the propeller is out of Beta range and operating at a constant rpm.
Gas Generator RPM (N_g)	Indicates the percent of gas generator rpm based on a figure of 101.7% at 38,100 rpm.
ITT Gauge	A temperature measuring system that senses gas temperature in the turbine section of the engine.
Manual Override (MOR)	The device that controls engine power in case of a pneumatic failure in the engine control systems. It can also control engine power in case of a power control linkage failure.
Propeller Feather	This is a propeller pitch condition which produces minimum drag in a flight condition.
Propeller Governor	The device that keeps propeller rpm constant by increasing or decreasing propeller pitch through a pitch change mechanism in the propeller hub.
Propeller RPM (N_p)	Indicates propeller speed in rpm.
Py Pressure	P_3 pressure (between the engine compressor and the combustor) This pressure is used as a reference for torque limiting and to provide smooth engine acceleration.

1.21 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY (Cont)

(d) Engine Controls and Instruments (Continued)

Tachometer — An instrument that indicates rotational speed. Gas generator tachometers measure speed as a percentage of the nominal maximum speed of the turbines (Ng), while propeller tachometers measure actual propeller rpm. (Np)

Torquemeter — An indicating system that displays the output torque available on the propeller shaft. Torque is shown in foot-pounds.

Torque Limiter — A device which monitors torque pressure and adjusts the Py air pressure to the Fuel Control Unit to prevent an overtorque condition.

(e) Airplane Performance and Flight Planning Terminology

Accelerate - Stop Distance — The distance required to accelerate an airplane to a specified speed and, experiencing failure of the engine at the instant that speed is attained, to bring the airplane to a stop.

Climb Gradient — The demonstrated ratio of the change in height during a portion of a climb, to the horizontal distance traversed in the same time interval.

Demonstrated Crosswind velocity — The demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests.

MEA — Minimum Enroute IFR Altitude.

Route Segment — A part of a route. Each end of that part is identified by: (1) a geographical location; or (2) a point at which a definite radio fix can be established.

1.21 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY (Cont)

(f) Weight and Balance Terminology

A.O.D.	Aft of Datum.
Arm	The horizontal distance from the reference datum to the center of gravity (C.G.) of an item.
Center of Gravity (C.G.)	The point at which an airplane would balance if suspended. The C.G.'s distance from the reference datum is found by dividing the total moment by the total weight of the airplane.
C.G. Arm	The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.
C.G. Limits	The extreme center of gravity locations within which the airplane must be operated at a given weight.
Datum	An imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Basic Empty Weight	Standard empty weight plus optional equipment.
Maximum Landing Weight	Maximum weight approved for touchdown when landing.
Maximum Ramp Weight	Maximum weight approved for ground maneuver. (It includes the weight of fuel for start, taxi and run up.)
Maximum Takeoff Weight	Maximum Weight approved for the start of the takeoff run.
Maximum Zero Fuel Weight	Maximum weight exclusive of usable fuel.

1.21 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY (Cont)

(f) Weight and Balance Terminology (Continued)

Moment The product of the weight of an item multiplied by its arm. (Moment divided by a constant is used to simplify balance calculations by reducing the number of digits.)

Payload Weight of occupants, cargo and baggage.

Standard Empty Weight Weight of a standard airplane including unusable fuel, full operating fluids and full oil.

Station A location along the airplane fuselage usually given in terms of distance from the reference datum.

Unusable Fuel The quantity of fuel at which the first evidence of malfunctioning occurs under the most adverse fuel feed condition occurring under each intended operation and flight maneuver involving that tank.

Usable Fuel Fuel available for flight planning.

Useful Load Difference between takeoff weight, or ramp weight if applicable, and basic empty weight.

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SECTION 2

LIMITATIONS

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SECTION 2

LIMITATIONS

SECTION 2

LIMITATIONS

2.1 GENERAL

This section provides the FAA Approved operating limitations, instrument markings, color coding and basic placards necessary for operation of the PA-46-500TP Meridian and its systems.

Limitations associated with those optional systems and equipment which require handbook supplements can be found in Section 9 (Supplements).

2.3 AIRSPEED LIMITATIONS

SPEED	KIAS	KCAS
Maximum Operating Speed (V_{MO}) Do not exceed this speed in any operation.	188	187
Maximum Operating Maneuvering Speed - (V_O) Do not make full or abrupt control movements above this speed.	127	126
Maximum Flaps Extended Speed (V_{FE}) - Do not exceed this speed at the given flap setting.		
10°	168	167
20°	135	132
36°	118	115
Maximum Landing Gear Extended Speed (V_{LE}) Do not exceed this speed with the landing gear extended.	168	167

2.3 AIRSPEED LIMITATIONS (continued)

SPEED	KIAS	KCAS
Maximum Landing Gear Operating Speed (V_{LO}) - Do not operate the landing gear above this speed.		
Extension	168	167
Retraction	129	128

2.5 AIRSPEED INDICATOR MARKINGS

(Avidyne PFD)

MARKING	KIAS	SIGNIFICANCE
Red Line	188 KTS	Maximum Operating Limit (V_{MO}).
White Arc	69 to 118 KTS	Maximum Operating Speed with full flaps extended (V_{FE}).
Green Arc	79 to 188 KTS	Normal operating speed.
Red Line	69 KTS	Stalling speed with landing gear and flaps extended (V_{SO}) at maximum weight.

(Standby Airspeed Indicator)

MARKING	KIAS	SIGNIFICANCE
Red Radial	188 KTS	Maximum Operating Limit (V_{MO})
White Arc	69 to 118 KTS	Maximum Operating Speed with full flaps extended (V_{FE}).
Green Arc	79 to 188 KTS	Normal Operating Speed

2.7 POWER PLANT LIMITATIONS

WARNING

Positioning the power lever aft of the flight idle stop in flight is prohibited. Such positioning may cause loss of airplane control or may result in an engine overspeed condition and consequent loss of engine power.

Engine

Number of Engines	1
Engine Manufacturer	Pratt & Whitney Canada
Engine Model No.	PT6A-42A

The limits presented in the Table 2-1 shall be observed. The limitations presented do not necessarily occur simultaneously. Refer to the Pratt & Whitney Engine Maintenance Manual for specific action should any of the limits be exceeded.

Table 2-1

OPERATING CONDITION (2)	SHP	TORQUE ft-lb (1)	MAX ITT °C	Ng %	Np RPM (11)	OIL PRESS PSI (7)	OIL TEMP °C
Take Off (3)	500	1313	800	101.7	2000	100 - 135	0 - 99
Max Continuous	500	1313	770	101.7	2000	100 - 135	0 - 99
Min. Idle			750 (8)	63 - 64		60 min.	-40 - 99
Starting			1000 (4)			0-200 (13)	-40 min(6)
Transient			850 (12) 880 (4)	104.1 (5)	2205 (9)	40 - 200	99 - 104 (10)
Max Reverse		310 - 360	770		1900	100 - 135	0 - 99

See Notes next page.

2.7 POWER PLANT LIMITATIONS (Continued)

NOTES:

(1) Torque limit applies within range of 1600 to 2000 rpm prop shaft, below 1600 rpm torque is limited to 1100 ft. lb.

(2) Engine inlet condition limit for engine operation: (a) temperature 46°C (115°F); (b) altitude: sea level to 30,000 ft. (temperature lapse rate of 2.0°C (3.7°F) per 1,000 ft. assumed).

(3) This value is time limited to 5 minutes.

(4) This value is time-limited to 5 seconds.

(5) This value is time-limited to 10 seconds.

(6) Limited by oil temperature.

(7) Normal oil pressure with gas generator speed above 72% speed. With engine torque below 1313 ft. lb., minimum oil pressure is 85 psig at normal oil temperature (60 to 70°C). Under emergency conditions to complete a flight, a lower oil pressure limit of 60 psig is permissible at reduced power level, not exceeding 1100 ft. lb.

(8) Applies over range 21000 to 23000 rpm.

(9) May be employed in an emergency condition, at all ratings, to complete a flight.

(10) Time limited to 10 minutes at any condition.

(11) In flight in the absence of a minimum 40 psig oil pressure, continuous steady state propeller rotation must be prevented by propeller feathering. On the ground, with the engine shutdown, continuous propeller rotation must be prevented.

(12) This value is time limited to 20 seconds.

(13) During extremely cold starts (less than 0°F / -17.7°C), oil pressure may reach 200 psig.

2.7 POWER PLANT LIMITATIONS (Continued)

Fuel Limitations

Approved Aviation Fuels .... JET A, JET A-1

Anti-Icing Additive

Anti-icing additive per MIL-I-27686 is required for use in the above fuels in the amount by volume of .15% maximum. See Section 8 for blending and handling procedures.

Total Capacity .... 1160 lb/173 U.S. gal. (526.1 kg/654.8 liter)

Unusable Fuel .... 20 lb/3 U.S. gal.(9.07 kg/11.3 liter)

The unusable fuel for this airplane has been determined as 10 lb/1.5 U.S. gal. (4.5 kg/5.6 liter) in each wing in critical flight attitudes.

Usable Fuel .... 1140 lb/170 U.S. gal. (517.1 kg/643.5 liter)

The usable fuel in this airplane has been determined as 570 lb/85 U.S. gal. (258.5 kg/321.7 liter) in each wing.

Total usable fuel may be reduced by 13 lb/2 U.S.gal. (5.89 kg/7.5 liter) if the engine driven fuel boost pump fails.

Fuel quantity indication is not accurate in uncoordinated flight.

Fuel Imbalance

The maximum allowable fuel imbalance in this airplane is 125 lb (56.6 kg).

NOTE

To insure balanced fuel condition, minimize or avoid uncoordinated flight.

2.7 POWER PLANT LIMITATIONS (Continued)

Oil Limitations

Oil Grade or Specification

Refer to the latest revision of Pratt & Whitney Canada, Service Bulletin 3001 for approved oils. (Refer to Section 8 for Oil Specifications.)

CAUTION

Do not mix brands or types of oils.

Total Oil System Capacity .... 12 U.S. qt (11.35 liter)
Oil Tank Capacity ....9.2 U.S. qt (8.7 liter)

Propeller Limitations

Propeller Manufacturer	Hartzell
Propeller Model Number	HC-E4N-3Q
Number of Propellers	1
Number of Propeller Blades	4
Propeller Diameter	
Maximum	82.5 in. (209.5 cm)
Minimum	81.5 in. (207 cm)
Propeller Operating Limits	
Maximum Normal Operation	2000 RPM
Maximum Reverse	1900 RPM
Minimum Operation During Ground Operation	1200 RPM

NOTE

Propeller operation below 1200 RPM is prohibited.

Blade Angles at Propeller Station 30 at Hydraulic Low Pitch Stop.	
Low Pitch Stop Min./Max.	18.9°/19.1°
Feather Min./Max.	84°/85°
Reverse Min./Max.	-9.5°/-10.5°

2.9 STARTER LIMITATIONS

Use of the starter is limited to 30 seconds ON, one minute OFF, 30 seconds ON, one minute OFF, 30 seconds ON, 30 minutes OFF before a fourth start may be attempted.

2.11 GENERATOR/ALTERNATOR LIMITATIONS

Generator/Alternator	Max. Continuous Load (amps)
Starter/Generator	170
Alternator Ground Operation	120
Alternator In Flight	130

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2.13 POWER CONTROL LEVER OPERATION

Power Lever Position operation aft of the flight idle detent is not permitted:

1. When the engine is shut down.
2. During flight.

WARNING

Positioning the power lever aft of the flight idle stop in flight is prohibited. Such positioning may cause loss of airplane control or may result in an engine overspeed condition and consequent loss of engine power.

2.15 CHIP DETECTOR

Takeoff is not approved with CHIP DETECT annunicator illuminated.

2.17 POWERPLANT INSTRUMENT MARKINGS

Table 2-2

Instrument	Red Line	Yellow Arc	White Arc	Yellow Arc	Red Line
Propeller Speed (N_p)	2000		0 - 2000		
Engine Speed (N_g)	101.7		0 - 101.7		
Fuel Flow - PPH Flow - KPH			0 - 600 0 - 272		
Oil Pressure - PSI	200	60 - 100 85 - 100 135 - 200	100 - 135	60 - 100 85 - 100	60 (1) 85
Oil Temp. °C	99		0 - 99	-40 - 0	-40
ITT - °C	800	770 - 800	0 - 770		
Torque Ft - Lb	1313		0 - 1313		

(1) When torque is below 1100 ft. lb.

2.19 WEIGHT LIMITS

Maximum Ramp Weight	5134 lb (2328.7 kg)
Maximum Takeoff Weight	5092 lb (2309.7 kg)
Maximum Landing Weight	4850 lb (2199.9 kg)
Maximum Zero Fuel Weight	4850 lb (2199.9 kg)
Maximum Weight in Baggage Compartment	100 lb (45.3 kg)

NOTE

It is the responsibility of the airplane owner and the pilot to ensure that the airplane is properly loaded. See Section 6 (Weight and Balance) for proper loading instructions.

2.21 CENTER OF GRAVITY LIMITS

Weight	Forward Limit Distance Aft of Datum	Rearward Limit Distance Aft of Datum
5134 lb (2328.7 kg)	141.13 in. (358.47 cm)	147.10 in. (373.63 cm)
5092 lb (2309.7 kg)	140.97 in. (358.06 cm)	147.10 in. (373.63 cm)
4100 lb (1859.7 kg)	137.23 in. (348.50 cm)	147.10 in. (373.63 cm)
3508 lb (1591.1 kg)	135.00 in. (342.90 cm)	143.67 in. (364.90 cm)
3000 lb (1360.7 kg)	135.00 in. (342.90 cm)	140.75 in. (357.49 cm)

NOTES

Straight line variation between points indicated.

The datum is located 100.0 in. (254 cm) ahead of the forward pressure bulkhead.

2.23 MANEUVER LIMITS

This is a Normal Category airplane. No acrobatic maneuvers including spins approved.

2.25 FLIGHT LOAD FACTOR LIMITS

Positive Load Factor (Maximum)	
Flaps Up	3.7 g
Flaps Down	2.0 g
Negative Load Factor (Maximum)	-1.48 g

NOTE

No inverted maneuvers approved.

2.26 RUNWAY SURFACE

Takeoff and landing operations must be conducted from paved, hard surfaces.

2.27 FLIGHT CREW LIMITS

The minimum required flight crew is one pilot in the left seat.

2.28 OUTSIDE AIR TEMPERATURE (OAT - Free Air Static Temperature) LIMITS

	Starting	In-flight
Minimum	-34°C	-54°C
Maximum	+46°C	+46°C

2.28a FUEL TEMPERATURE LIMITS

Minimum Limit

Fuel Type	Starting	In-flight
Jet A	-34°C	-34°C
Jet A-1	-34°C	-41°C

Maximum Limit

Fuel Type	Starting	In-flight
Jet A	+50°C	+50°C
Jet A-1	+50°C	+50°C

NOTE

When a mixture of Jet A and Jet A-1 is present in the fuel tanks, the Jet A minimum fuel temperature limit of -34°C must be observed.

2.29 AVIDYNE PFD LIMITATIONS

IFR flight is prohibited when the pilot's PFD or any standby instrument is inoperative (altimeter, airspeed indicator, artificial horizon, or whiskey compass).

The Avidyne FlightMax Entegra series Primary Flight Display Pilot's Guide, p/n 600-00104-000, revision 05, or appropriate revision, or p/n 600-00104-001 revision 01, or appropriate revision, must be available to the pilot during all flight operations.

2.30 AVIDYNE MFD LIMITATIONS

The Avidyne moving map displays visual advisory of the airplane's GPS position against a moving map. This information supplements CDI course deviation and information presented on the GPS navigator. The moving map display must not be used as the primary navigation instrument.

Use of MAP page during IFR flight requires an IFR approved GPS receiver and installation, operated in accordance with its applicable limitations.

The Avidyne FlightMax EX5000 Multi-Function Display Pilot's Guide, p/n 600-00121-000, revision 00 or appropriate later revision, must be available to the pilot during all flight operations.

Aircraft dispatch is prohibited when the MFD is inoperative.

2.31 RADAR LIMITATIONS

Do not operate the radar during refueling operations or within 15 feet of trucks or containers accommodating flammables or explosives. Do not allow personnel within 15 feet of area being scanned by antenna when system is transmitting.

2.32 TERRAIN AWARENESS AND WARNING SYSTEM (TAWS)

Navigation must not be predicated upon the use of the Terrain Awareness Display. The Terrain Awareness Display is intended to serve as a situational awareness tool only, and may not provide the accuracy and/or fidelity on which to solely base terrain or obstacle avoidance maneuvering decisions.

2.33 TRAFFIC INFORMATION

The pilot should not maneuver the aircraft based on the traffic display only. The traffic display is intended to assist in visually locating traffic. The traffic display lacks the resolution necessary for use in evasive maneuvering. Maneuvers should be consistent with ATC instructions.

2.34 CMAX CHART PAGE LIMITATIONS

The geographic referenced aircraft symbol must not be used for navigation.

NOTE

The aircraft symbol displayed provides supplemental aircraft situational awareness information. It is not intended as a means for navigation or flight guidance. The airplane symbol is not to be used for conducting instrument approaches or departures. Position accuracy, orientation, and related guidance must be assumed by other means or required navigation.

Operators with the optional CMax Chart Page must have back-up charts available. Do not rely upon CMax charts as your sole source of navigation information.

2.35 KINDS OF OPERATION EQUIPMENT LIST

This airplane may be operated in day or night VFR and day or night IFR when the appropriate equipment is installed and operable.

The following equipment list identifies the systems and equipment upon which type certification for each kind of operation was predicated and must be installed and operable for the particular kind of operation indicated.

NOTE

The following system and equipment list does not include specific flight instruments and communication/navigation equipment required by the FAR Part 91 operating requirements.

System	Number Required	Types of Operation and Remarks (DAY, NIGHT, VFR, IFR and ICING Conditions)
1. **Flight Instrumentation**		
Airspeed Indicator	1	DAY, NIGHT, VFR, IFR, ICING
Altimeter	1	DAY, NIGHT, VFR, IFR, ICING
Magnetic Compass	1	DAY, NIGHT, VFR, IFR, ICING
Outside Air Temperature (OAT) Indicator	1	DAY, NIGHT, VFR, IFR, ICING
Attitude Indicator	1	IFR, ICING
Heading Indicator	1	IFR, ICING
Slip/Skid Indicator	1	IFR, ICING
Vertical Speed Indicator	1	IFR, ICING
Clock	1	IFR, ICING

2.35 KINDS OF OPERATION EQUIPMENT LIST (Continued)

System	Number Required	Types of Operation and Remarks (DAY, NIGHT, VFR, IFR and ICING Conditions)
2. **Engine Instrumentation**		
Torquemeter	1	DAY, NIGHT, VFR, IFR, ICING
Propeller Tachometer (N_p)	1	DAY, NIGHT, VFR, IFR, ICING
Interstage Turbine Temperature (ITT)	1	DAY, NIGHT, VFR, IFR, ICING
Gas Generator Tachometer (N_g)	1	DAY, NIGHT, VFR, IFR, ICING
Oil Pressure	1	DAY, NIGHT, VFR, IFR, ICING
Oil Temperature	1	DAY, NIGHT, VFR, IFR, ICING
3. **Miscellaneous Instrumentation**		
Fuel Quantity Indicating System	2	DAY, NIGHT, VFR, IFR, ICING
Fuel Temperature Indicator	1	DAY, NIGHT, VFR, IFR, ICING
DC Voltmeter	1	DAY, NIGHT, VFR, IFR, ICING
DC Ammeter	1	DAY, NIGHT, VFR, IFR, ICING
4. **Equipment/ Furnishings**		
Safety Restraint Each Occupant	AR	DAY, NIGHT, VFR, IFR, ICING

2.35 KINDS OF OPERATION EQUIPMENT LIST (Continued)

System	Number Required	Types of Operation and Remarks (DAY, NIGHT, VFR, IFR and ICING Conditions)
5. Engine		
Starter Generator	1	DAY, NIGHT, VFR, IFR, ICING
Alternator	1	ICING
Fuel Press Annunciator	1	DAY, NIGHT, VFR, IFR, ICING
L Fuel and R Fuel Pump Annunciators	2	DAY, NIGHT, VFR, IFR, ICING
Firewall Fuel Shutoff Valve	1	DAY, NIGHT, VFR, IFR, ICING
6. Flight Controls		
Flap Position Indicator	1	DAY, NIGHT, VFR, IFR, ICING
Elevator Trim Position Indicator	1	DAY, NIGHT, VFR, IFR, ICING
Rudder Trim Position Indicator	1	DAY, NIGHT, VFR, IFR, ICING
7. Ice Protection		
Pneumatic Deice System (Wing and Empennage Protection)	1	ICING
Wing Ice Detection Light	1	ICING
Electrothermal Propeller Deice Boots	1 per Blade	ICING
Heated Windshield	1	DAY, NIGHT, VFR, IFR, ICING

2.35 KINDS OF OPERATION EQUIPMENT LIST (Continued)

System	Number Required	Types of Operation and Remarks (DAY, NIGHT, VFR, IFR and ICING Conditions)
7. Ice Protection (Continued)		
Heated Stall Warning Vane	1	ICING
Heated Pitot Head	1	DAY, NIGHT, VFR, IFR, ICING
Alternate Static Source	1	ICING
WNDSHLD OVR TMP Annunciator	1	ICING
Vacuum Ejector	1	DAY, NIGHT, VFR, IFR, ICING
SURF DE-ICE Annunciator	1	ICING
DE-ICE FAIL Annunciator	1	ICING
8. Landing Gear		
Hydraulic Pump	1	DAY, NIGHT, VFR, IFR, ICING
HYD PUMP Annunciator	1	DAY, NIGHT, VFR, IFR, ICING
Landing Gear Down Position Indicating Lights	3	DAY, NIGHT, VFR, IFR, ICING
Landing Gear Warning Horn	1	DAY, NIGHT, VFR, IFR, ICING
GEAR WARN Annunciator	1	DAY, NIGHT, VFR, IFR, ICING

2.35 KINDS OF OPERATION EQUIPMENT LIST (Continued)

System	Number Required	Types of Operation and Remarks (DAY, NIGHT, VFR, IFR and ICING Conditions)
9. Pneumatic/ Vacuum		
Vacuum Low Annunciator	1	IFR, ICING
10. Lights - External		
Landing Light	1	NIGHT
Position Lights a. Left Wing - Red and White	1 ea.	NIGHT
b. Right Wing - Green and White	1 ea.	NIGHT
Anti-Collision (Strobe) Lights	2	NIGHT
Taxi/Rec Lights	2	NIGHT
11. Lights - Cockpit		
Instrument Panel Switch Lights	AR	NIGHT
Instrument Lights	AR	NIGHT
Map Lights	2	NIGHT

2.35 KINDS OF OPERATION EQUIPMENT LIST (Continued)

System	Number Required	Types of Operation and Remarks (DAY, NIGHT, VFR, IFR and ICING Conditions)
12. **Pressurization**		
Cabin Altimeter	1	DAY, NIGHT, VFR, IFR, ICING
Cabin Differential Pressure Indicator	1	DAY, NIGHT, VFR, IFR, ICING
Cabin Vertical Speed Indicator	1	DAY, NIGHT, VFR, IFR, ICING
Pressure Control Valve	1	DAY, NIGHT, VFR, IFR, ICING
Pressure Relief Safety Valve	1	DAY, NIGHT, VFR, IFR, ICING
Pressurization Controller	1	DAY, NIGHT, VFR, IFR, ICING
CABIN ALT 10K Annunciator (Amber)	1	DAY, NIGHT, VFR, IFR, ICING
CAB ALT Annunciator (Red)	1	DAY, NIGHT, VFR, IFR, ICING
13. **Miscellaneous System**		
Stall Warning System	1	DAY, NIGHT, VFR, IFR, ICING
STALL WRN FAIL Annunciator	1	DAY, NIGHT, VFR, IFR, ICING
Annunciator Test System	1	DAY, NIGHT, VFR, IFR, ICING

2.36 OPERATING ALTITUDE LIMITATIONS

Flight above 30,000 feet pressure altitude is not approved. Flight up to and including 30,000 feet is approved if equipped with avionics in accordance with FAR 91.

2.37 OXYGEN

A minimum of 800 psi is required for pressurized flight above 25,000 feet.

2.38 CABIN PRESSURIZATION LIMITS

(a) Maximum cabin differential pressure of 5.5 psi.
(b) Pressurized landing not approved.

2.39 MAXIMUM SEATING CONFIGURATION

The maximum seating capacity is 6 (six) persons.

2.40 SMOKING

Smoking is not permitted in the aircraft.

2.41 ICING (Reference Section 9, Supplement 6, for Meridian Aircraft Flight Into Known Icing (FIKI)

2.42 VORTEX GENERATORS

If a total of more than 5 (five) vortex generators are damaged or missing, the aircraft is not airworthy.

2.43 PLACARDS

On the pilot's left hand side panel:

THIS AIRCRAFT MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS. NO ACROBATIC MANEUVERS (INCLUDING SPINS) APPROVED. THIS AIRCRAFT APPROVED FOR V.F.R., I.F.R., DAY AND NIGHT ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH THE AIRPLANE FLIGHT MANUAL.

WARNING
TURN OFF STROBE LIGHTS WHEN IN CLOSE PROXIMITY TO GROUND OR DURING FLIGHT THROUGH CLOUD, FOG OR HAZE.

PRESSURIZED LANDING NOT APPROVED.

Above the pilot's PFD:

V_O 127 KIAS
(SEE AFM)

V_{LE} 168 KIAS MAX

2.43 PLACARDS (Continued)

Near the yaw damper:

YAW DAMPER ◯ TRIM

Above the pilot's PFD:

ELEV. TRIM
PUSH ON/OFF

Near the standby attitude indicator:

STBY OFF ON TEST OFF GYRO

2.43 PLACARDS (Continued)

Near the fuel temperature indicator:

FUEL TEMPERATURE LIMIT
JET A -34° C TO 50° C
JET A-1 -41° C TO 50° C

On the lower pilot's instrument panel:

COUPLED
P
F
D
UNCOUPLED

Above the stall warning test button:

STALL
TEST

Above the cabin altitude mute switch:

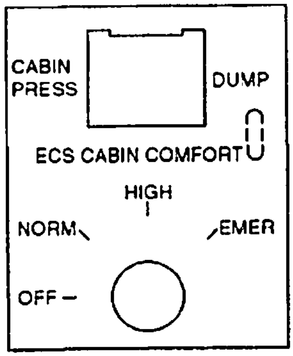
CABIN
ALTITUDE
MUTE

On the parking brake handle:

PARK
BRAKE
PULL

2.43 PLACARDS (Continued)

On the ECS control panel:



Around the landing gear handle:

LANDING
GEAR

▲
UP
129 KIAS

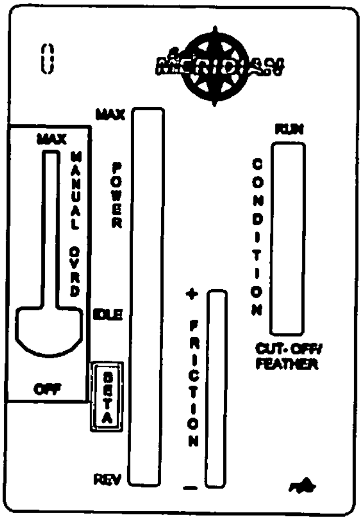
168 KIAS
DN
▼

Above the emergency gear extension handle:

EMERGENCY GEAR EXTENSION
PULL TO RELEASE. SEE A.F.M.
BEFORE RE-ENGAGEMENT

2.43 PLACARDS (Continued)

On the power control console:



Near the elevator trim wheel:

D

T/O

N

RNG

U

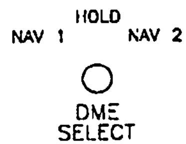
ELEV
TRIM

2.43 PLACARDS (Continued)

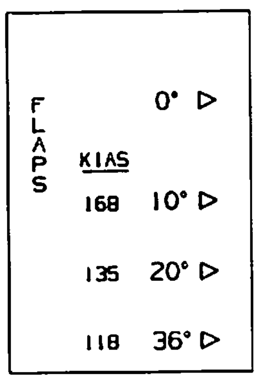
On the fuel shutoff cover:

FUEL SHUTOFF
LIFT COVER - PULL OFF

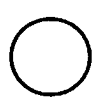
Near the DME select control:



Near the flap handle:



Near the defrost control:



DEFROST
PULL / ON

2.43 PLACARDS (Continued)

Above the copilot's PFD:

TOTAL USABLE FUEL CAPACITY 1140 LBS (517.1 KG)

Above the copilot's PFD:

STORMSCOPE NOT TO BE USED FOR
THUNDERSTORM AREA PENETRATION

Near the climate control panel:

CLIMATE CONTROL

AUTO MAN

AUTO SET

COOL WARM

MANUAL ON SET HI

Near the TAS switch on the upper copilot's panel:

TAS

ON

STBY

TEST

2.43 PLACARDS (Continued)

Near the magnetic compass:

STANDBY COMPASS
FOR CORRECT READING CHECK:
WINDSHIELD HT SWITCH OFF
PROP DE-ICE SWITCH OFF
COOLING SYSTEM OFF
COCKPIT AND CABIN HEATING OFF

2.43 PLACARDS (Continued)

On the pilot's side panel directly below the window:

ALTERNATE STATIC SOURCE
(LOCATED PILOT'S SIDE BELOW PANEL)
UP - ALTERNATE
DOWN - PRIMARY
(SEE POH SECTION 5 FOR ALTERNATE
STATIC SYSTEM CORRECTION)

On the copilot's side panel:

EMERGENCY OXYGEN
IN DRAWER UNDER SEAT
(AISLE ACCESS)
PULL MASK OUT OF DRAWER FULLY
AT FULL EXTENSION GIVE CORD A TUG
MAXIMUM DURATION ——— 15 MINS
SEE POH
NO SMOKING WHILE IN USE

On the pilot's side panel and below the right center window:

NO SMOKING

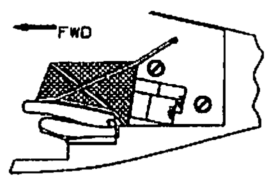
2.43 PLACARDS (Continued)

On the aft closeout panel:

STANDARD CARGO NET INSTALLED

MAX BAGGAGE THIS COMPARTMENT
100 LBS / 45.3 KG

GOLF CARGO NET INSTALLED

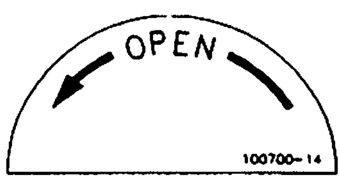


⊘ NO BAGGAGE PERMISSIBLE IN THESE AREAS WHEN THE GOLF NET IS IN USE

MAX GOLF CLUB LOAD
105 LBS / 47.6 KG

MAX ADDITIONAL BAGGAGE BEHIND LEFT SEAT
50 LBS / 22.6 KG

On the main cabin door handle:



2.43 PLACARDS (Continued)

On the upper edge of the cabin lower door:

OPEN ⟷ CLOSE   INSURE PIN
WINDOWS GREEN

Over the emergency exit handle:

EMERGENCY EXIT
REMOVE GLASS
PULL DOOR IN - LIFT UP

On inside of aft fuselage stowage door:

MAX WEIGHT THIS
COMPARTMENT 4 LBS (1.8 KG)

On the inside radar pod stowage door:

MAX WEIGHT 5 LBS (2.2 KG)

2.43 PLACARDS (Continued)

Near the wing fuel caps:

JET FUEL ONLY

JET - A - FUEL
ANTI-ICE ADDITIVE REQUIRED. SEE PILOT'S OPERATING HANDBOOK FOR OTHER APPROVED FUELS, QUANTITY AND TYPE OF ADDITIVE.

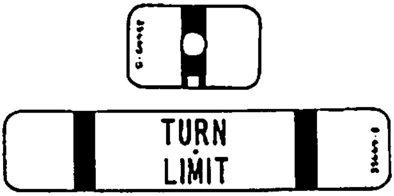
DURING FUELING AND DEFUELING OPERATIONS, ATTACH GROUNDING CABLE TO GROUND ATTACH PIN LOCATED ON MAIN STRUT.

2.43 PLACARDS (Continued)

On the inboard section of the left flap:

NO
STEP

On the nose gear strut:



On the brake fluid reservoir:

BRAKE FLUID
RESERVOIR
SERVICE USING
MIL-H-5606

Near the external power receptacle:

STARTING PROCEDURE
<u>FOR EXTERNAL POWER</u>

MASTER SWITCH AND
RADIOS MUST BE <u>OFF</u>

SEE AIRPLANE FLIGHT MANUAL
FOR
DETAILED INSTRUCTIONS

EXTERNAL POWER
28 VOLTS D.C.
TURN MASTER SWITCH
AND ALL EQUIP. OFF
BEFORE INSERTING
PLUG

2.43 PLACARDS (Continued)

Inside the main wheel well cavity:

STRUT AND TIRE
SERVICE INSTRUCTIONS

PLACE AIRCRAFT ON JACKS AND EXTEND STRUT COMPLETELY. RELEASE AIR AND REMOVE AIR VALVE. SLOWLY COMPRESS THE STRUT. SLOWLY FILL COMPRESSED STRUT WITH MIL-H-5606 HYDRAULIC FLUID THROUGH THE FILLER OPENING UNTIL IT REACHES THE TOP OF THE FILLER PLUG HOLE. MANUALLY COMPRESS AND EXTEND STRUT SEVERAL TIMES TO REMOVE TRAPPED AIR. ADD FLUID EACH TIME IF REQUIRED. REPLACE VALVE AND, WITH MAIN GEAR STILL CLEAR OF GROUND, INFLATE STRUT TO 250 PSI AIR PRESSURE. INFLATE MAIN TIRE TO 55 PSI AIR PRESSURE. REMOVE JACKS FROM AIRCRAFT (NORMAL MAIN GEAR STRUT EXTENSION IS 3.14 INCHES / 7.98 CM WITH AIRCRAFT ON A LEVEL SURFACE AND AT EMPTY WEIGHT).

On the nose wheel strut:

STRUT AND TIRE
SERVICE INSTRUCTIONS

PLACE AIRCRAFT ON JACKS AND EXTEND STRUT COMPLETELY. RELEASE AIR AND REMOVE AIR VALVE. SLOWLY COMPRESS THE STRUT. SLOWLY FILL COMPRESSED STRUT WITH MIL-H-5606 HYDRAULIC FLUID THROUGH THE FILLER OPENING UNTIL IT REACHES THE TOP OF THE FILLER PLUG HOLE. MANUALLY COMPRESS AND EXTEND STRUT SEVERAL TIMES TO REMOVE TRAPPED AIR. ADD FLUID EACH TIME IF REQUIRED. REPLACE VALVE AND, WITH NOSE GEAR STILL CLEAR OF GROUND, INFLATE STRUT TO A PRESSURE OF 160 PSI. INFLATE NOSE GEAR TIRE TO 70 PSI AIR PRESSURE. REMOVE JACKS FROM AIRCRAFT (NORMAL STRUT EXTENSION IS 2.70 INCHES / 6.86 CM WITH AIRCRAFT ON A LEVEL SURFACE AND AT EMPTY WEIGHT WITH FULL FUEL & OIL).

2.43 PLACARDS (Continued)

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2.43 PLACARDS (Continued)

On the lower edge of the upper cabin door:

ENGINE OIL SPECIFICATION

ENGINE LAST SERVICED WITH:

DATE OF LAST SERVICE:

DO NOT MIX DIFFERENT BRANDS OF OIL.
OIL TANK CAPACITY: 9.2 QTS / 8.7 L. DO NOT OVERFILL.

FILL WITH APPROVED OIL TO MAXIMUM MARK ON DIP STICK.

SEE LATEST REVISION OF PRATT & WHITNEY
CANADA ENGINE SERVICE BULLETIN SB 3001
FOR LIST OF APPROVED LUBRICATING OILS.

100700-067

On the backside of the oil filler door:

ENGINE OIL
SPECIFICATION

DO NOT MIX DIFFERENT
BRANDS OF OIL.
OIL TANK CAPACITY:
9.2 QTS / 8.7 L.
DO NOT OVERFILL.
FILL WITH APPROVED
OIL TO MAXIMUM MARK
ON DIP STICK.
SEE LATEST REVISION
OF PRATT & WHITNEY
CANADA ENGINE SERVICE
BULLETIN SB 3001 FOR
LIST OF APPROVED
LUBRICATING OILS.

100700-068

2.43 PLACARDS (Continued)

On the pyramid cabinet behind the copilot's seat:

OXYGEN ONLY
NO STOWAGE

PILOT OXYGEN
OFF ON

EMERGENCY
OXYGEN
LIGHT
SWITCH ↓

FIRE EXTINGUISHER
IN DRAWER

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EMERGENCY PROCEDURES

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SECTION 3

EMERGENCY PROCEDURES

SECTION 3

EMERGENCY PROCEDURES

3.1 GENERAL

This section provides the recommended procedures for handling various emergency or critical situations. All emergency procedures required by the FAA as well as those necessary for operation of the airplane, as determined by the operating and design features of the airplane, are presented.

Emergency procedures associated with optional systems and equipment which require handbook supplements are presented in Section 9, Supplements.

Pilots must familiarize themselves with the procedures in this section and must be prepared to take the appropriate action should an emergency situation arise. The procedures are offered as a course of action for handling the particular situation or condition described. They are not a substitute for sound judgement and common sense.

KNOW YOUR AIRCRAFT AND BE THOROUGHLY FAMILIAR WITH IMPORTANT EMERGENCY PROCEDURES

Most basic emergency procedures are a normal part of pilot training. The information presented in this section is not intended to replace this training. This information is intended to provide a source of reference for the procedures which are applicable to this airplane. The pilot should review standard emergency procedures periodically to remain proficient in them.

3.1 GENERAL (Continued)

Warning Systems

The Meridian is equipped with a comprehensive annunciator panel located on the instrument panel between the Primary Flight Display and the Multi-Function Display (see Figure 3-1).

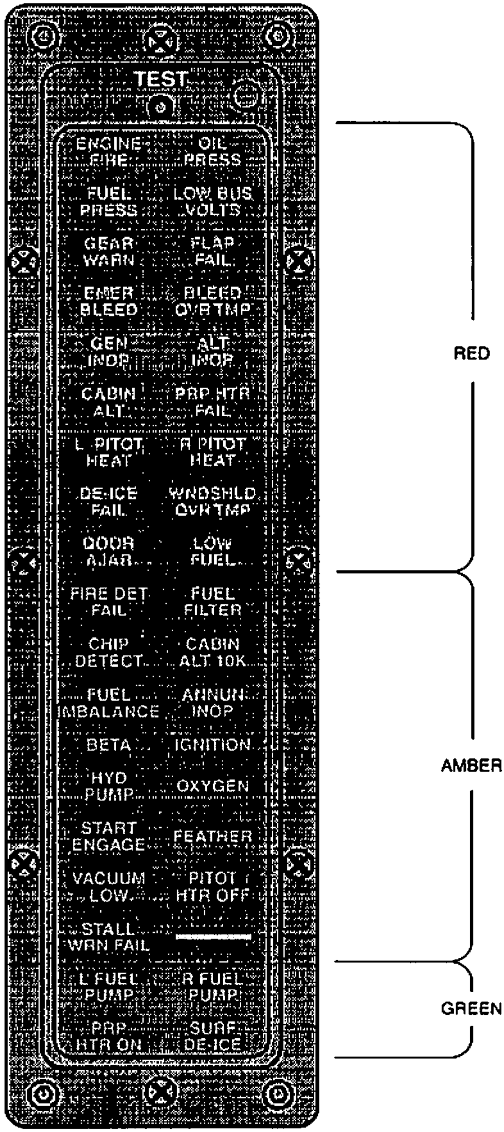
Red Warning Annunciators are those annunciators which require immediate corrective action.

Amber Caution Annunciators are those annunciators which advise of the possible need for future corrective action.

Green Advisory Annunciators are those annunciators which indicate a system is selected and is functioning.

Warning and caution annunciators will remain illuminated as long as the initiating condition exists, while advisory annunciations remain illuminated as long as a particular system is selected.

3.1 GENERAL (Continued)



Annunciator Panel
Figure 3-1

3.1 GENERAL (Continued)

Annunciator Descriptions

ENGINE FIRE - Indicates an overtemperature condition in the engine compartment, possibly due to fire.

OIL PRESSURE - Indicates engine oil pressure is below 60 psig.

FUEL PRESSURE - Indicates fuel pressure is below 10 psig.

LOW BUS VOLTS - Indicates the main bus voltage is less than 25 Vdc.

GEAR WARN - The red GEAR WARN annunciator and gear warning horn will operate simultaneously under the following conditions:

- In flight when the throttle is reduced to low power settings and the landing gear are not in the DOWN position.
- In flight when the flaps are extended more than 10° and the landing gear are not in the DOWN position.
- On the ground when the landing gear selector is in the UP position. The landing gear squat switch activates to prevent operation of the retract side of the hydraulic pump on the ground.

FLAP FAIL - Indicates a wing flap system failure due to an overcurrent condition in the flap motor/actuator circuit.

EMERGENCY BLEED - Illuminates when the emergency bleed system is activated either automatically at a cabin altitude in excess of 12,000 feet, or by pilot activation.

BLEED OVER TEMP - Indicates temperature in the bleed air ducts is 350°F or above.

GENERATOR INOP - Illuminates when the generator fails or is selected OFF.

ALTERNATOR INOP - Illuminates when the alternator fails or is selected OFF.

CABIN ALTITUDE - Indicates the cabin altitude is 12,000 feet or above.

PROP HEAT FAIL - Illuminates if a fault develops in the prop heat system or current is under 18.0 amps.

L PITOT HEAT - Indicates the left pitot heat has failed.

R PITOT HEAT - Indicates the right pitot heat has failed.

SURFACE DE-ICE FAIL - Illuminates when the surface de-ice system has failed.

3.1 GENERAL (Continued)

Annunciator Descriptions (continued)

WINDSHIELD OVER TEMP - Illuminates when the windshield temperature exceeds 170°F or the windshield temperature sensor has failed.

DOOR AJAR - Indicates the cabin door is not properly closed and latched.

LOW FUEL - Indicates the total remaining fuel quantity is below 100 pounds.

FIRE DETECT FAIL - Indicates failure of the engine fire detect system.

FUEL FILTER - Indicates the fuel filter contamination level is approaching the bypass mode and requires maintenance.

CHIP DETECTOR - Indicates the existence of ferrous metal particles in the engine oil system.

CABIN ALT HIGH - Indicates the cabin altitude is 10,000 feet or above.

FUEL IMBALANCE - Steady illumination indicates a fuel quantity imbalance has reached 25 pounds. A flashing illumination indicates an imbalance greater than 40 pounds.

ANNUN INOP - Indicates failure of the annunciator system or the annunciator press-to-test switch has been depressed when the day/night dimming switch is in the night position.

BETA - Illuminates when the power lever is selected below flight idle position and the prop blade angle is below the low pitch stop.

IGNITION - Illuminates when the ignition switch is selected to Manual and power is applied to the engine ignition unit, and when Auto mode is selected and engine torque is between 275 to 375 ft.-lbs.

HYDRAULIC PUMP - Illuminates when the landing gear hydraulic pump is operating.

OXYGEN - Illuminates if one or more of the passenger oxygen generators are activated.

STARTER ENGAGED - Indicates the starter contactor is closed and power is being applied to the starter/generator.

FEATHER - With engine operating, light illumination indicates a failure in the propeller feathering electrical system. An uncommanded propeller feathering could occur if additional electrical failures occur in the system. Illumination of the feather light is normal when the engine is not operating, the condition lever is in cutoff, and the propeller is feathered.

VACUUM LOW - Illuminates if vacuum is below approximately 2 in.Hg.

3.1 GENERAL (Continued)

Annunciator Descriptions (continued)

PITOT HEAT OFF - Indicates the pitot heat has not been selected ON.

STALL WARN FAIL - Illuminates if the lift computer and/or the lift transducer fails.

L FUEL PUMP - Indicates the left fuel pump is operating and delivering 4.5 psig minimum.

R FUEL PUMP - Indicates the right fuel pump is operating and delivering 4.5 psig minimum.

PROP HEAT ON - Cycling illumination indicates normal operation of the propeller de-ice system.

SURFACE DE-ICE - Illuminates when the de-ice boots inflate. (When the SURF DEICE switch is selected ON, the de-ice boot pressure reaches 10 psig and the pneumatic de-ice system cycles in sequence: tail, lower wing, upper wing.)

Panel Mounted Annunciator Descriptions

STBY ATT IND TEST - Illuminates if the standby attitude indicator system test mode is successfully completed.

STBY ATT IND BAT HTR FAIL - Indicates failure of the standby attitude battery heater.

Aural Warnings

Aural warnings are provided to warn:

- When an engine limitation is exceeded (2 chimes per second).
- When in a Vmo/Mmo overspeed condition (fast pulse).
- When approaching a stall (steady tone).
- When the landing gear is not extended during an approach to landing (steady tone).
- When cabin altitude Caution/Warning is exceeded (steady tone).
- Autopilot disconnect (warble tone).
- Terrain caution/warning.
- In flight when the throttle is reduced to low power settings and the landing gear are not in the DOWN position.
- In flight when the flaps are extended more than 10° and the landing gear are not in the DOWN position.
- On the ground when the landing gear selector is in the UP position.

3.1 GENERAL (Continued)

Overriding Considerations

In all emergencies, the overriding consideration must be to:

- **Maintain Airplane Control.**
- Analyze the situation.
- Take proper action.

Terminology

Many emergencies require some urgency in landing the aircraft. The degree of urgency varies with the emergency; therefore the terms "land as soon as possible" and "land as soon as practical" are employed. These terms are defined as follows:

Land as soon as possible - A landing should be accomplished at the nearest suitable airfield considering the severity of the emergency, weather conditions, field facilities, and ambient lighting.

Land as soon as practical - Emergency conditions are less urgent, and although the mission is to be terminated, the emergency is such that an immediate landing at the nearest suitable airfield may not be necessary.

3.3 AIRSPEEDS FOR EMERGENCY OPERATIONS

STALL SPEEDS

5092 lbs (Gear UP, Flaps 0°)....................79 KIAS

5092 lbs (Gear DOWN, Flaps 36°)....................69 KIAS

OPERATING MANEUVERING SPEED....................127 KIAS

BEST GLIDE (Propeller Feathered)

5092 lbs (Gear UP, Flaps 0°)....................108 KIAS

3.5 REJECTED TAKEOFF

Power Lever..IDLE
Braking...AS REQUIRED
Reverse...AS REQUIRED

If insufficient runway remains for a safe stop:

Condition Lever..CUTOFF / FEATHER
Battery Switch...OFF
Firewall Shutoff Valve...................................LIFT COVER - PULL OFF

Maneuver as necessary to avoid obstacles.

After the aircraft has stopped - EVACUATE.

3.7 ENGINE FAILURE

Engine failure before rotation:

Power Lever..IDLE
Braking...AS REQUIRED

STOP STRAIGHT AHEAD.

If insufficient runway remains for a safe stop:

Condition Lever..CUTOFF / FEATHER
Battery Switch...OFF
Firewall Shutoff Valve...................................LIFT COVER - PULL OFF

Maneuver as necessary to avoid obstacles.

After the aircraft has stopped - EVACUATE.

3.7 ENGINE FAILURE (Continued)

Engine Failure Immediately After Takeoff

If sufficient runway remains for a normal landing, land straight ahead. If area ahead is rough, or if it is necessary to clear obstructions, maintain a safe airspeed and make only a shallow turn if necessary to avoid obstructions.

Airspeed .... 100 KIAS
Landing Gear .... DOWN
Power Lever .... IDLE
Condition Lever .... CUTOFF / FEATHER
When landing gear is down and time permits:
  Flaps .... DOWN 36°
  Airspeed .... 85 KIAS
Battery Switch .... OFF
Firewall Shutoff Valve .... LIFT COVER - PULL OFF

After the aircraft has stopped - EVACUATE.

Engine Failure in Flight

Oxygen .... AS REQUIRED
Mic Select Switch .... MASK
Airspeed .... 108 KIAS
Power Lever .... IDLE
Condition Lever .... CUTOFF / FEATHER
Propeller .... VERIFY FEATHERED

CAUTION

The battery switch must be ON to [illegible]

Remaining Fuel .... CHECK

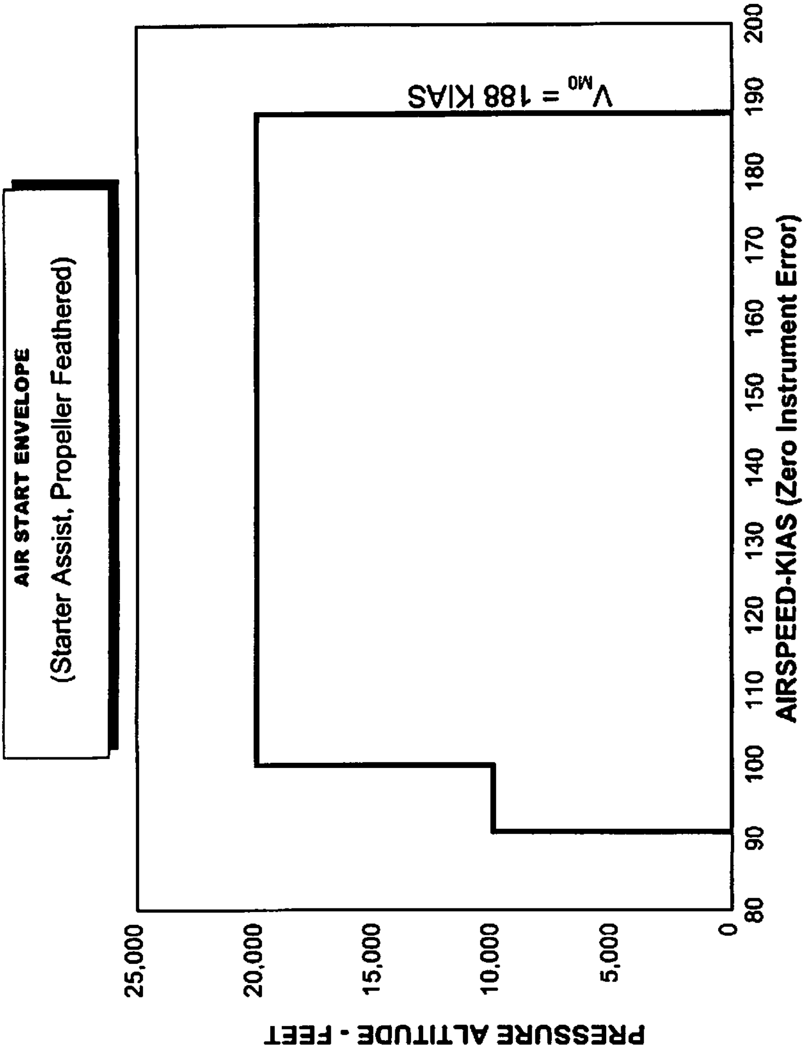
Air Start .... Refer to Air Start procedure in this section

If above the airstart envelope (Fig. 3-3), descend into the envelope and make an airstart per this section. Use oxygen as required. Perform a normal descent or emergency descent as appropriate.

If engine air start is not successful, proceed with the power off landing procedure per Section 3.21.

3.7 ENGINE FAILURE (Continued)

Air Start Envelope



Air Start Envelope
Figure 3-3

3.7 ENGINE FAILURE (Continued)

Air Start - Starter Assist

NOTE

Items indented with • may be omitted if time is short.

Oxygen .... AS REQUIRED
Mic Select Switch .... MASK
Autopilot .... DISENGAGE
Condition Lever .... CUTOFF / FEATHER
Altitude & Airspeed .... WITHIN THE AIR START ENVELOPE
Power Lever .... IDLE
Generator .... OFF
Alternator .... OFF
- Electrical Load .... REDUCE
- ECS Switch .... OFF
- Bleed Air Lever .... PULL OUT (closed)

Fuel Pump .... MANUAL
Ignition .... MANUAL

CAUTION

To obtain an AUTO air start, the MANUAL STOP/START switch must not be selected. If the switch is selected to MANUAL (switch light illuminated), the starter switch must be held ON to keep the starter engaged during the start.

Start Mode Switch .... AUTO
Starter Switch .... ENGAGE (Verify Start Annunciator Illuminated)
Condition Lever (N_g min. 13%) .... RUN
ITT and N_g .... MONITOR

After Engine Relight - Ng > 60%.

Generator .... ON
Alternator .... ON
Fuel Pump .... AUTO
Ignition .... AUTO
Bleed Air Lever .... PUSH IN (open)
ECS Switch .... NORMAL
Electrical Equipment .... AS REQUIRED

3.9 ENGINE SYSTEM

3.9a High Oil Temperature

Indication: Red "CHECK OIL TEMP" annunciator on MFD with aural warning and associated red oil temperature bar with red digital readout.

Power Lever .... REDUCE POWER

If temperature remains high, continue flight at reduced power and *land as soon as possible.*

3.9b Oil Pressure

Indication: Red "CHECK OIL PRESS" annunciator on MFD with aural warning and associated red oil pressure bar with red digital readout.

Low Oil Pressure, Below 85 PSI

Power .... REDUCE TO A MAX. OF 1100 FT - LB OF TORQUE

Land as soon as practical.

Low Oil Pressure, Below 60 PSI

Power .... REDUCE TO MINIMUM TORQUE REQUIRED TO COMPLETE FLIGHT

Land as soon as possible.

If possible, always retain glide capability to the selected landing area in case of total engine failure.

3.9c Chip Detector Light

Indication: Amber "CHIP DETECT" annunciator illuminated.

After Engine Start

Return to parking area and shutdown engine.

In Flight

Oil Temperature .... MONITOR
Oil Pressure .... MONITOR

Land as soon as practical.

Inspect Engine Before Next Flight

3.9 ENGINE SYSTEM (Continued)

3.9d Start Engage

Indication: Amber "START ENGAGE" annunciator remains illuminated after engine start.

On the Ground:

Manual/Stop Switch .... PUSH
Condition Lever .... CUTOFF/FEATHER
Battery Switch .... OFF

In Flight:

Manual/Stop Switch .... PUSH
Generator .... VERIFY ON

If generator is not on, *land as soon as possible.*

3.9e Fire Detect Fail

Indication: Amber "FIRE DET FAIL" annunciator illuminated.

Fire Detect Circuit Breaker .... CHECK IN
(Located on the pilot's forward circuit breaker panel, row C, position 8.)

Inspect and Repair Prior to Next Flight.

3.9f Feather

Indication: Amber "FEATHER" annunciator illuminated.

On Ground After Engine Start:

Shut down and investigate cause.

In Flight:

Land as soon as practical and investigate cause.

3.9g Beta

Indication: Amber "BETA" annunciator illuminated in flight.

Power Lever .... VERIFY FLIGHT IDLE POSITION OR FORWARD OF FLIGHT IDLE.

3.11 FUEL CONTROL UNIT FAILURE / POWER LEVER CONTROL LOSS (Manual Override Operation)

Indication: Power lever movement does not change Ng.

Power Lever ....FLIGHT IDLE

MOR Lever..PULL UPWARDS AND MOVE FORWARD SLOWLY TO ACHIEVE REQUIRED ENGINE POWER

Land as soon as possible.

Perform landing without reverse.

After landing
(If power cannot satisfactorily
be controlled with MOR Lever)
Condition Lever ....CUTOFF / FEATHER

CAUTION

Exercise extra care when using the MOR to avoid exceeding engine limitations. Engine response may be more rapid than when using the power lever. Avoid rapid movement.

If power control using MOR is excessive:

Reduce airspeed to below 168 KIAS by increasing pitch attitude.

Landing Gear...EXTEND BELOW 168 KIAS
Flaps 10° ....BELOW 168 KIAS

Land as soon as possible.

When landing is assured:

Condition Lever ....CUTOFF / FEATHER

3.13 PROPELLER OVERSPEED

Indication: Red "CHECK Np" annunciator on MFD and if Np remains between 2000 and 2080 RPM:

Power Lever .... REDUCE POWER
Airspeed .... REDUCE

Continue flight at reduced speed, using minimum power necessary and land as soon as practical.

Indication: Red "CHECK Np" annunciator on MFD and if Np exceeds 2080 RPM steady state:

Power Lever .... REDUCE AS NECESSARY
Airspeed .... REDUCE TO LOWEST PRACTICAL

Land as soon as possible.

If possible maintain altitude as necessary in order to retain glide capability to the selected airport in case of total engine failure.

Should heavy vibration or uncontrolled prop speed runaway occur, be prepared to shut down the engine.

Condition Lever .... CUTOFF / FEATHER

Conduct a Normal Descent, Section 4.5n, or Emergency Descent, Section 3.17, as appropriate and Power Off Landing, Section 3.21.

3.14 ENGINE FIRE

On Ground (During engine start or taxi)

Indication: Red "ENGINE FIRE" annunciator illuminated.

Power Lever .... IDLE
Condition Lever .... CUTOFF / FEATHER
Brakes .... AS REQUIRED
Firewall Shutoff Valve .... LIFT COVER - PULL OFF
Bleed Air Lever .... PULL OUT (closed)
ECS Switch .... OFF
Fuel Pump Switch .... OFF
Ignition Switch .... OFF
Radio .... EMERGENCY CALL
Battery Switch .... OFF
Aircraft .... EVACUATE
Fire .... EXTINGUISH

In Flight

Indications: Red "ENGINE FIRE" annunciator illuminated or Visual Verification

Engine Power .... REDUCE TO MINIMUM ACCEPTABLE ACCORDING TO FLIGHT SITUATION
Oxygen .... AS REQUIRED (all aircraft occupants)
Mic Select Switch .... MASK
Confirm that fire exists then:
Condition Lever .... CUTOFF / FEATHER
Firewall Shutoff Valve .... LIFT COVER - PULL OFF
ECS Switch .... OFF
Bleed Air Lever .... PULL OUT (closed)

Conduct a Normal Descent, Section 4.5n, or Emergency Descent, Section 3.17, as appropriate and Power Off Landing, Section 3.21.

CAUTION

If pressurized, this procedure will result in an immediate loss of pressurization and cabin altitude will rise at an uncontrolled rate.

3.15 ELECTRICAL FIRE, SMOKE OR FUMES

If source is known:

Oxygen.......................................CREW (100%) AND PASSENGERS DON MASKS
Mic Select Switch ....MASK
Fire (if necessary).......................................EXTINGUISH
Faulty Circuits ....ISOLATE
Smoke Evacuation (if necessary) ....EXECUTE CHECKLIST (per para. 3.16)
Land ....NEAREST SUITABLE AIRPORT

If source is unknown:

Oxygen.......................................CREW (100%) AND PASSENGERS DON MASKS
Mic Select Switch ....MASK
Fire (if necessary).......................................EXTINGUISH
Smoke Evacuation (if necessary) ....EXECUTE CHECKLIST (per para. 3.16)
Generator.......................................OFF
Alternator ....OFF
Autopilot.......................................DISENGAGE
Battery ....OFF
Cabin Altitude Select ....SELECT 500 FEET ABOVE FIELD ELEVATION
Standby Instruments.......................................VERIFY ON and FLAG IS PULLED ON GYRO
(Transition to standby instruments and maintain attitude control using standby attitude gyro)
Emergency/Ground Clearance Switch ....ON
Emergency Descent..........................ACCOMPLISH PER PARA. 3.17 TO A SAFE ALTITUDE CONSISTENT WITH TERRAIN
Land ....NEAREST SUITABLE AIRPORT
(Perform Emergency Landing Gear Extension procedure and 0° Flap Landing)

If smoke or fire still persists:

All Tie Bus Breakers ....PULL
Land ....NEAREST SUITABLE AIRPORT
(Perform Emergency Landing Gear Extension procedure and 0° Flap Landing)

CAUTION

The airplane may still be pressurized on the [illegible]
Exercise extreme caution when operating [illegible]

3.16 SMOKE EVACUATION

Cockpit / Cabin Fire

CAUTION

If pressurized, the following procedure will result in an immediate loss of pressurization and the cabin altitude will rise at an uncontrollable rate.

Oxygen Mask .... ON (100%)
Mic Select Switch .... MASK
Passengers .... DON OXYGEN MASKS
Cabin Pressure Dump/Normal Switch .... DUMP
ECS Switch .... OFF
Bleed Air Lever .... PULL OUT (closed)
Emergency Pressure Circuit Breaker .... PULL
(Located on the pilot's aft circuit breaker panel, row B, position 8.)
Air Cond and Blower Fan .... OFF
Vent Fan .... ON
Emergency Descent .... Accomplish per Paragraph 3.17 to a Safe Altitude Consistent with Terrain

Land as soon as possible.

NOTE

If fumes/smoke dissipate, land as soon as possible to investigate problem. If fumes/smoke persist, refer to Fire in Flight procedure, Paragraph 3.14.

3.17 EMERGENCY DESCENT - MAXIMUM RATE

Autopilot ....OFF
Power Lever...IDLE
Landing Gear ....Below 168 KIAS, DOWN
Windshield Defrost...PULL OUT
Windshield Heat ....DEFOG

NOTE

Windshield Heat ANTI ICE may be used for additional defrosting.

Smooth air

Airspeed after Landing Gear is Fully Extended..........................168 KIAS

Rough air

Airspeed ....127 KIAS

3.19 DESCENT -MAXIMUM RANGE AFTER ENGINE FAILURE

NOTE

Refer to Section 5, Performance, Figure 5-123 or Figure 5-257 (metric) for glide distance.

Oxygen Masks ....ON
Mic Select Switch ....MASK
Power Lever...IDLE
Condition Lever ....CUTOFF / FEATHER
Propeller ....VERIFY FEATHERED
Landing Gear / Flaps ....UP

CAUTION

If landing gear and / or flaps are extended, glide distance will be severely reduced. Retracting the landing gear and flaps will reduce battery endurance significantly.

Airspeed ....108 KIAS
Electrical Load ....REDUCE (Monitor Battery Voltage)

CAUTION

If the propeller does not feather, the glide distance will be reduced.

NOTE

It may be required to adjust the rate of descent of the aircraft in order to achieve a cabin altitude of 12,500 feet before the oxygen supply is exhausted.

3.21 POWER OFF LANDING (ENGINE CUTOFF/FEATHER)

Best Gliding Airspeed is 108 KIAS

Power Lever....................IDLE
Condition Lever....................CUTOFF / FEATHER
Propeller....................VERIFY FEATHERED
Fuel Pump Switch....................OFF
Ignition Switch....................OFF
Firewall Shutoff Valve....................LIFT COVER - PULL OFF
Electrical Load....................REDUCE
ECS Switch....................OFF
Cabin Pressure Dump/Normal Switch....................DUMP
Seats and Seat Backs....................UPRIGHT & LOCKED IN POSITION
Seat Belts and Harness....................FASTEN / TIGHT
CHECK INERTIA REEL
Passengers....................BRIEF

Locate suitable field.

Establish spiral pattern. If sufficient altitude is available, maintain 108 KIAS with flaps 10° in the pattern.

Assure 1000 feet above field at downwind position for landing approach.

NOTE

For ditching or other off-airport landings, inhibit the Terrain Awareness Alerting and Display (TAAD) and Terrain Clearance Floor (TCF) functions by selecting the TERR INHB switch (TERR INHB annunciated).

When committed to landing:

Landing Gear....................DOWN: 3 GREEN
Flaps....................AS REQUIRED

If landing site is not suitable for gear down landing:

Landing Gear....................MAINTAIN UP

NOTE

Landing gear extension requires 8 seconds minimum.

Flaps....................FULL DOWN
Final Approach Speed....................85 KIAS

After Touchdown:

Battery Switch....................OFF
After the aircraft has stopped....................EVACUATE

3.23 GEAR UP LANDING

ECS Switch .... OFF
Cabin Pressure Dump/Normal Switch .... DUMP
Passengers .... BRIEF
Seats and Seat Backs .... UPRIGHT & LOCKED IN POSITION
Seat Belts and Harness .... FASTEN / TIGHT
CHECK INERTIA REEL
Flaps .... FULL DOWN
Final Approach Speed .... 85 KIAS

When Runway is Assured:

Power Lever .... IDLE
Condition Lever .... CUTOFF / FEATHER
Firewall Shutoff Valve .... LIFT COVER - PULL OFF

After Touchdown:

Battery Switch .... OFF

After the aircraft has stopped .... EVACUATE

3.25 LANDING WITHOUT FLAPS

Proceed as for normal approach

Landing Gear .... DOWN, 3 GREEN
Final Approach Speed .... 100 KIAS
Landing .... NORMAL
Braking .... AS REQUIRED
Reverse .... AS REQUIRED

3.27 LANDING WITH PRIMARY LONGITUDINAL CONTROL FAILED

Passengers .... BRIEF
Landing Gear .... DOWN, 3 GREEN
Final Approach Speed .... TRIM TO MAINTAIN 110 KIAS

- **Select the longest runway available and make a flat, no flap approach, minimizing the use of elevator trim.**
- **Set power (approximately 300 FT-LB torque) to maintain airspeed and 300 to 500 ft./min. rate of descent.**
- **Use elevator trim to adjust pitch.**
- **When positioned over the runway, flare the airplane with elevator trim and slowly reduce power to idle, reverse and brakes as required.**

3.29 HYDRAULIC SYSTEM MALFUNCTION

Indication: Amber "HYD PUMP" annunciator illuminates continuously or cycles ON and OFF rapidly.

The illumination of the HYD PUMP annunciator while operating on the ground would require maintenance to investigate the cause prior to any flight operations.

In Flight:

Hydraulic Pump Power Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row C, position 4.)

Land as soon as practical and investigate the cause.

Prior to landing, the HYDRAULIC PUMP POWER circuit breaker must be reset to extend the landing gear. If the pump continues to run after the gear is locked down, pull the HYDRAULIC PUMP POWER circuit breaker. If the gear fails to extend, refer to the **Emergency Landing Gear Extension** procedure **3.31**.

3.31 EMERGENCY LANDING GEAR EXTENSION

Indication: One or more of the green gear extension light(s) not illuminated and or Red "GEAR WARN" annunciator illuminated.

NOTE

If emergency gear extension is required due to electrical power failure, the gear position indicator lights will not illuminate.

Prior to emergency extension procedure:

Battery Switch .... CHECK ON
Landing Gear Circuit Breakers (2) .... CHECK IN
(Located on the pilot's forward circuit breaker panel, row C, positions 1, 2.)
Day / Night Dimming Switch .... DAY MODE

If landing gear does not check down and locked:

Airspeed .... 100 KIAS
Hydraulic Pump Power Circuit Breaker (25 amp) .... PULL
(Located on the pilot's forward circuit breaker panel, row C, position 4.)
Landing Gear Handle .... DOWN
Emergency Gear Extension Control .... PULL

If 3 green lights are still not illuminated:

Yaw the aircraft left and right to lock the main landing gear.

Reduce airspeed to minimum safe speed to improve nose gear locking.

If 3 green lights are illuminated:

Land.

If not successful, refer to Gear Up Landing (Section 3.23).

3.33 FLAP SYSTEM MALFUNCTION

Indication: Red "FLAP FAIL" annunciator illuminated.

Flap Warn Circuit Breaker ....PULL AND RESET, VERIFY NORMAL FLAP OPERATION

(Located on the pilot's forward circuit breaker panel, row D, position 6.)

If Red "FLAP FAIL" annunciator remains illuminated:

Flap Motor Circuit Breaker ....PULL

(Located on the pilot's forward circuit breaker panel, row D, position 5.)

Refer to Landing Without Flaps (Section 3.25).

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3.35 ELECTRICAL SYSTEM MALFUNCTIONS

Generator Failure

Indication: Red "GEN INOP" annunciator illuminated and zero amp indication.

Electrical Load ....REDUCE UNTIL TOTAL LOAD IS BELOW 130 AMPS & LOW BUS VOLTS ANNUNCIATOR IS EXTINGUISHED
Air Conditioner ....OFF
Generator Switch ....OFF then ON

If generator fails to reset:
Generator Switch..OFF
Generator Control Circuit Breaker
(Copilot's Instrument Panel)..CHECK & RESET
Generator Switch ....ON

If circuit breaker opens again or annunciator stays illuminated with zero amps indicated:

Generator Switch..OFF
Generator Control Circuit Breaker ....DO NOT RESET

Land as soon as practical.

Alternator Failure

Indication: Red "ALT INOP" annunciator illuminated and zero amp indication.

Alternator Switch...OFF then ON

If alternator fails to reset:
Alternator Switch ....OFF
Alternator Field Circuit Breaker.................................CHECK & RESET
(Located on the pilot's forward circuit breaker panel, row C, position 7.)
Alternator Switch..ON

If circuit breaker opens again or annunciator stays illuminated with zero amps indicated:

Alternator Switch ....OFF
Alternator Field Circuit Breaker...................................DO NOT RESET

If generator has assumed the load, limit load to under 200 amps and continue. Repair alternator as soon as possible.

3.35 ELECTRICAL SYSTEM MALFUNCTIONS (Continued)

Dual Failure - Both Generator and Alternator Fail

Indication: Red "GEN INOP" and Red "ALT INOP" annunciators illuminated and zero amp indication on both ammeters.

NOTE

Any time total tie bus voltage is below 25 Vdc, the LOW BUS VOLTS annunciator will illuminate.

Electrical Load ....REDUCE TO MINIMUM
Air Conditioner ....OFF
Generator and Alternator Switches ....OFF
Generator Control Circuit Breaker..........................CHECK AND RESET
(Located on the copilot's instrument panel.)
Alternator Field Circuit Breaker ....CHECK AND RESET
(Located on the pilot's forward circuit breaker panel, row C, position 7.)
Generator Switch (after OFF at least one second)................................ON
Alternator Switch (after OFF at least one second) ....ON

If only the generator resets:

Alternator Switch ....OFF

NOTE

The generator can supply sufficient amperage to run all the required electrical systems.

If only the alternator resets:

Generator Switch...OFF
Electrical Load ....MAINTAIN LESS THAN
130 AMPS
Ammeter ....MONITOR

3.35 ELECTRICAL SYSTEM MALFUNCTIONS (Continued)

Complete Electrical Failure

NOTE

The emergency standby attitude gyro will activate automatically if the switch is in the ON position.

Standby Attitude Gyro Switch .... VERIFY ON and FLAG IS PULLED ON GYRO
Maintain attitude control using standby instruments.
Battery Switch .... OFF
Emergency / Ground Clearance Switch .... ON

NOTE

Turning ON the Emergency/Ground Clearance Switch will activate the #1 Comm/Nav/GPS, #2 Nav, Audio Panel, Landing Gear Down Lights, internal lighting for the standby instruments and illumination in the magnetic compass.

Land as soon as possible.

NOTE

With a complete electrical failure, emergency landing gear extension and landing without flaps will be required. Refer to Emergency Landing Gear Extension (Section 3.31) and Landing Without Flaps (Section 3.25).

3.36 AVIONICS SYSTEM FAILURES

3.36a Failure of Pilot's Flight Display Screen (PFD)

Indication: PFD Display goes blank.

Standby Attitude Gyro Switch ....VERIFY ON and FLAG IS PULLED ON GYRO

Maintain attitude control using standby instruments.

PFD Brightness Control (BRT/DIM)................RUN TO FULL BRIGHT

(If PFD screen cannot be reinstated)

PFD Coupled/Uncoupled Switch...Coupled

NOTE

Autopilot features are retained with the coupled/uncoupled switch selected to either position.

The following PFD features are synchronized between the pilot and copilot PFDs with the coupled/uncoupled switch selected to coupled.

- Nav Course Setting
- Heading Bug
- Altitude Bug
- BARO (Altimeter setting)

Mechanical Nav Indicator (OBS)...............................Utilize as necessary

NOTE

The mechanical nav indicator (OBS) receives nav information directly from the No. 1 (pilot's) GNS 430 nav/com/GPS.

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36b Failure of Pilot's Electronic Attitude Direction Display (PFD)

Indication: PFD Display goes blank.

Standby Attitude Gyro Switch ....VERIFY ON and FLAG IS PULLED ON GYRO

Maintain attitude control using standby instruments and establish the aircraft in straight and level unaccelerated flight.

PFD Coupled/Uncoupled Switch ....Coupled

If time and conditions permit:

Pilot's PFD Circuit Breaker ....PULL
(Located on the pilot's forward circuit breaker panel, row B, position 1)

Pilot's PFD Circuit Breaker ....PULL
(Located on the copilot's forward circuit breaker panel, row A, position 8)

PFD/MFD Power Converter Circuit Breaker................................PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers...RESET

If PFD cannot be reinstated:

On aircraft equipped with the optional second transponder:

Transponder 1 / 2 Switch ....Select Transponder No. 2
Mechanical Nav Indicator (OBS)...........Utilize for primary navigation

NOTE

The mechanical nav indicator (OBS) receives nav information directly from the No. 1 (pilot's) nav/com/GPS. Only VLOC information is available.

NOTE

Failure of the pilot's PFD may cause the loss of Transponder No. 1 Mode C capability.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36b Failure of Pilot's Electronic Attitude Direction Display (PFD) (continued)

If PFD cannot be reinstated (continued):

Maintain attitude, airspeed and heading control using standby instruments, magnetic compass and other directional indications (such as MFD, MAP/NAV page).

CAUTION

High current loads in the vicinity of the magnetic compass can influence its accuracy. Depending on the flight conditions, the pilot must reduce these loads as much as possible to insure accuracy. Tests have shown that windshield heat, air conditioner, and pilot heat contribute to significant heading errors of the magnetic compass. These items should be turned OFF prior to cross checking the magnetic compass. Pilot judgment must be used in turning these items OFF (i.e. freezing IMC conditions). MFD MAP and GPS MAP mode may be helpful in maintaining course.

Land as soon as practical.

3.36c Yellow Airspeed Miscompare Annunciator on Pilot's and Copilot's PFD's

Indicates an airspeed difference of 4 knots.

Establish aircraft in straight and level unaccelerated flight.

Airspeed .... Verify correct airspeed by cross checking with standby airspeed indicator

ADAHRS System .... Determine system in error

- Pilot's System Error
  ADAHRS 2 .... Select
- Copilot's System Error
  ADAHRS 1 .... Select

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36d Yellow Heading Miscompare on Pilot's and Copilot's PFD's

Indicates a heading difference of 6 degrees or greater.

Establish aircraft in straight and level unaccelerated flight.

Heading .... Verify correct heading by cross checking with whiskey compass

ADAHRS System .... Determine system in error

- Pilot's System Error
  ADAHRS 2 .... Select

On aircraft equipped with the optional second transponder:

- Copilot's System Error
  ADAHRS 1 .... Select

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36e Yellow Altitude Miscompare on Pilot's and Copilot's PFD's

Indicates an altitude difference of 50 feet or greater.

NOTE

The altitude miscompare annunciator will illuminate when a miscompare of 50 feet is detected from sea level to 5,000 feet. Above 5,000 feet the miscompare value is linearly increased up to 150 feet at 30,000 feet.

Establish aircraft in straight and level unaccelerated flight.

ADAHRS System....................................Determine system in error by cross checking with standby altimeter

- Pilot's System Error
  ADAHRS 2....................................Select

On aircraft equipped with the optional second transponder:

Transponder 1 / 2 Switch....................................Select transponder No. 2

- Copilot's System Error
  ADAHRS 1....................................Select

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36f Yellow Pitch & Roll Miscompare on Pilot's and Copilot's PFD's

Indicates a pitch or roll difference of 3 degrees.

Establish aircraft in straight and level unaccelerated flight.

ADAHRS System .... Determine system in error by cross checking with standby attitude indicator

- Pilot's System Error
  ADAHRS 2 .... Select

On aircraft equipped with the optional second transponder:

- Copilot's System Error
  ADAHRS 1 .... Select

Land as soon as practical.

3.36g Invalid Air Data

Indication: Airspeed, Altimeter, and Vertical Speed Data Replaced with Red X's.

Maintain aircraft airspeed and altitude by referring to the standby airspeed and altimeter.

If time and conditions permit:

If failure is associated with the Pilot's ADAHRS:

Pilot's PFD Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row B, position 1)

Pilot's PFD Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row A, position 8)

PFD/MFD Power Converter Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers .... RESET

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36g Invalid Air Data (continued)

If air data is still invalid:

ADAHRS 1 / 2 Select Switch..Select ADAHRS 2

On aircraft equipped with the optional second transponder:

Transponder 1 / 2 Switch....................................Select Transponder No. 2

If failure is associated with the Copilot's ADAHRS:

Copilot's PFD Circuit Breaker..PULL
(Located on the pilot's forward circuit breaker panel, row B, position 2)

Copilot's PFD Circuit Breaker..PULL
(Located on the copilot's aft circuit breaker panel, row A, position 6)

PFD/MFD Power Converter Circuit Breaker................................PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers..RESET

If air data is still invalid:

ADAHRS 1 / 2 Select Switch..Select ADAHRS 1

NOTE

With the pilot's ADAHRS system selected transponder No. 2 will be inoperative.

NOTE

Certain failures of the pilot's PFD may cause a loss of Transponder No. 1 Mode C capability. Loss of Transponder No. 2 Mode C capability can be caused by failure of the copilot's PFD. Verify Mode C operation with ATC.

Cross check airspeed and altitude indications with the standby instruments.

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36h Invalid Heading Data

Indication: Heading Bug and Heading Data Removed and Replaced with Red X's.

If time and conditions permit:

If failure is associated with the Pilot's ADAHRS:

Pilot's PFD Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row B, position 1)

Pilot's PFD Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row A, position 8)

PFD/MFD Power Converter Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers .... RESET

If heading is still invalid:

ADAHRS 1 / 2 Select Switch .... Select ADAHRS 2

If failure is associated with the Copilot's ADAHRS:

Copilot's PFD Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row B, position 2)

Copilot's PFD Circuit Breaker .... PULL
(Located on the copilot's aft circuit breaker panel, row A, position 6)

PFD/MFD Power Converter Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers .... RESET

If heading is still invalid:

ADAHRS 1 / 2 Select Switch .... Select ADAHRS 1

Monitor magnetic compass.

NOTE

For accurate magnetic compass readings select the WINDSHLD HT, PROP HEAT, AIR COND and BLOWER switches OFF.

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36i Crosscheck Monitor

Indication: Yellow Crosscheck Attitude Annunciator on PFD.

Establish aircraft in straight and level unaccelerated flight.

Aircraft Attitude ....Crosscheck aircraft attitude with off side PFD and standby attitude gyro

ADAHRS 1 / 2 Switch..Select operational ADAHRS

Monitor the standby attitude indicator.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36j Invalid Attitude and Heading Data

Indication: Attitude and Heading Data Removed and Replaced with Red X's.

Standby Attitude Gyro Switch .... VERIFY ON and FLAG IS PULLED ON GYRO

Maintain attitude control using standby gyro.

If time and conditions permit:

If failure is associated with the Pilot's ADAHRS:

Pilot's PFD Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row B, position 1)

Pilot's PFD Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row A, position 8)

PFD/MFD Power Converter Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers .... RESET

If attitude and heading data is still invalid:

ADAHRS 1 / 2 Select Switch .... Select ADAHRS 2

On aircraft equipped with the optional second transponder:

Transponder 1 / 2 Switch .... Select Transponder No. 2

Monitor the standby attitude indicator.

Land as soon as practical.

If failure is associated with the Copilot's ADAHRS:

Copilot's PFD Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row B, position 2)

Copilot's PFD Circuit Breaker .... PULL
(Located on the copilot's aft circuit breaker panel, row A, position 6)

PFD/MFD Power Converter Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers .... RESET

If attitude and heading data is still invalid:

ADAHRS 1 / 2 Select Switch .... Select ADAHRS 2

Monitor the standby attitude indicator.

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36k Failure of Attitude, Airspeed and Heading Reference System (ADAHRS)

Indication: Airspeed, Attitude, Heading and Altitude Replaced with Red X's.

Standby Attitude Gyro Switch ....VERIFY ON and FLAG IS PULLED ON GYRO

Maintain attitude control using standby instruments.

If time and conditions permit:

If failure is associated with the Pilot's ADAHRS:

Pilot's PFD Circuit Breaker ....PULL
(Located on the pilot's forward circuit breaker panel, row B, position 1)

Pilot's PFD Circuit Breaker ....PULL
(Located on the copilot's forward circuit breaker panel, row A, position 8)

PFD/MFD Power Converter Circuit Breaker................................PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers ....RESET

If ADAHRS initialization does not occur:

ADAHRS 1 / 2 Select Switch ....Select ADAHRS 2

On aircraft equipped with the optional second transponder:
Transponder 1 / 2 Select Switch..............................Select transponder No. 2

If failure is associated with the Copilot's ADAHRS:

Copilot's PFD Circuit Breaker..PULL
(Located on the pilot's forward circuit breaker panel, row B, position 2)

Copilot's PFD Circuit Breaker..PULL
(Located on the copilot's aft circuit breaker panel, row A, position 6)

PFD/MFD Power Converter Circuit Breaker................................PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers ....RESET

If ADAHRS initialization does not occur:

ADAHRS 1 / 2 Select Switch ....Select ADAHRS 1

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36l Failure of Multi-Function Display (MFD)

Indication: Multi-Function Display (MFD) Goes Blank.

MFD Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row B, position 3)

PFD/MFD Power Converter Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row C, position 5)

Circuit Breakers .... RESET

If MFD initialization does not occur:

Land as soon as practical.

3.36m Loss of Standby Attitude Indicator

Indication: OFF Warning Flag in View, Tumbled or Erroneous Attitude Display.

Standby Attitude Indicator .... TEST (verify green STBY ATT IND TEST annunciator illuminated) / ON / ERECT

Establish aircraft in straight and level unaccelerated flight.

Standby Attitude Indicator .... Cage then uncage

If standby attitude indicator is not recovered:

Standby Attitude Indicator .... Cage

Land as soon as practical.

3.36 AVIONICS SYSTEM FAILURES (Continued)

3.36n Failure of Flight and Navigation Displays

Indication: All Displays Blank Out.

Standby Attitude Gyro Switch .... VERIFY ON and FLAG IS PULLED ON GYRO

Maintain aircraft control with reference to the standby airspeed, altimeter, and attitude gyro indicators.

Avionics Dimming Circuit Breaker .... PULL
(Located on the copilot's forward circuit breaker panel, row C, position 7)

NOTE

A failure of the display dimmer control can result in the two Garmin displays going blank. This is an indication of a partial failure of the dimmer control. A complete failure of this control would normally reinstate the displays to a full bright condition. However, if the displays should blank out, reinstatement of the displays to a full bright condition can be accomplished by bypassing the dimmer control (pulling the Avionics Dimming Circuit Breaker).

3.37 FUEL SYSTEM

Indication: Red "FUEL PRESS" annunciator illuminated.

Power .... REDUCE
Fuel Pumps .... MAN
Fuel Quantity and Balance .... MONITOR

If fuel pressure annunciator remains illuminated, land as soon as possible.

If fuel pressure annunciator extinguishes, land as soon as practical.

Indication: Red "LOW FUEL" annunciator illuminated.

Land as soon as practical. Remaining fuel quantity is approximately 100 pounds.

Indication: Amber "FUEL FILTER" annunciator illuminated.

Land as soon as practical. Contaminated fuel or clogged filter is possible.

Inspect filter after landing and repair prior to next flight.

3.37 FUEL SYSTEM (Continued)

Indication: Amber "FUEL IMBALANCE" annunciator illuminated.

Fuel Pumps Switch..VERIFY AUTO
Fuel Pump..VERIFY GREEN L/R FUEL PUMP
(HIGH FUEL SIDE) ANNUNCIATOR
IS ILLUMINATED
Fuel Quantity...MONITOR

NOTE

When Right and Left Fuel Quantity varies by 25 pounds or more, the amber FUEL IMBALANCE annunciator will illuminate and the fuel pump from the high fuel side will turn on. Fuel pump activation is indicated by illumination of the green R or L FUEL PUMP annunciator.

NOTE

When the FUEL PUMPS switch is in the MAN position, the green L and R FUEL PUMP annunciators are illuminated, indicating operation of the L and R fuel pumps.

CAUTION

Maximum fuel imbalance is 125 pounds.

If fuel imbalance exceeds 40 pounds: Amber "FUEL IMBALANCE" annunciator flashing.

Fuel Pump Switch ....MAN (Manual)
If either Left or Right Fuel Pump Annunciator is NOT illuminated, turn the Fuel Pump Switch to OFF.

Upon flashing "FUEL IMBALANCE" annunciation, regardless of fuel quantity indication, *land as soon as possible.*

3.37 FUEL SYSTEM (Continued)

Indication: Fuel temperature less than minimum fuel temperature limit.

Ground:

Do not start engine below -34°C Fuel Temperature.

Flight (Jet A -34°C, Jet A-1 -41°C):

Maintain fuel within fuel temperature limitations by changing altitude into warmer ambient OAT conditions.

Indication: Fuel temperature greater than maximum fuel temperature limit (+50°C).

Ground:

Do not start engine above +50°C Fuel Temperature.

Flight:

Fuel Temp Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row A, position 3.)

Fuel Pumps .... Manual

Land as soon as practical.

Indication: Fuel temperature indicator blank/malfunctions.

Fuel Temp Circuit Breaker .... PULL
(Located on the pilot's forward circuit breaker panel, row A, position 3.)

Continue flight assuming OAT is equal to fuel temperature and maintain fuel temperatures within limits using OAT.

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3.39 PRESSURIZATION / ENVIRONMENTAL SYSTEM MALFUNCTIONS

Fire / Smoke or Fumes in Cabin

If source is known:

Oxygen Mask....................ON
Mic Select Switch....................MASK

Extinguish fire using the hand held fire extinguisher located in the bottom drawer of the cabinet located behind the copilot's seat.

If source is not known:

Oxygen Mask....................ON
Mic Select Switch....................MASK
ECS Switch....................OFF
Bleed Air Lever....................PULL OUT (Closed)
Cabin Pressure Dump/Normal Switch....................DUMP
Cabin Fan Control (as required)....................LO or HI

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3.39 PRESSURIZATION / ENVIRONMENTAL SYSTEM MALFUNCTIONS (Continued)

Cabin Altitude Above 10,000 feet

Indication: Amber "CABIN ALT 10K" annunciator illuminated and Horn.

Cabin Altitude Warning Horn ....PUSH TO MUTE
Cabin Altitude ....MONITOR

Cabin Altitude Above 12,000 feet

Indication: Red "CABIN ALT" annunciator illuminated and Horn.

Oxygen Mask ....ON
Mic Select Switch ....MASK
ECS Cabin Comfort ....VERIFY NORMAL OR HIGH SELECTED
Bleed Air Lever ....VERIFY IN (open)
Cabin Altitude Warning Horn ....PUSH TO MUTE

Descend as soon as practical.

Emergency Pressurization

Indication: Red "EMER BLEED" annunciator illuminated.

Automatic Operation:

Oxygen Mask ....ON
Mic Select Switch ....MASK
ECS ....NORM or HI
Activation at 12,000 +/- 500 feet cabin altitude.

NOTE

Emergency pressurization will activate as the cabin altitude approaches 12,000 feet and will deactivate as the cabin altitude approaches 11,000 feet. This cycling can be eliminated by rotating the ECS switch to EMERGENCY PRESS.

Manual Operation:

ECS ....EMER
Cabin Altitude ....MONITOR

Descend as soon as practical.

3.39 PRESSURIZATION / ENVIRONMENTAL SYSTEM MALFUNCTIONS (Continued)

Bleed Overtemperature

Indication: Red "BLEED OVR TMP" annunciator illuminated.

Power .... REDUCE
Climate Control .... SELECT LOWER TEMP.

If annunciator remains illuminated:

Oxygen Mask .... ON
Mic Select Switch .... MASK
ECS Cabin Comfort .... OFF
Bleed Air Lever .... PULL OUT (closed)

Descend and land as soon as practical.

Overpressurization

Indication: Differential pressure above 5.5 psi or a structural failure appears imminent.

Cabin Controller .... SET TO HIGHER ALTITUDE
Cabin Rate Control .... INCREASE TO MAXIMUM

Continued increase in differential pressure above 5.5 psi:

Oxygen Mask .... ON
Mic Select Switch .... MASK
ECS Cabin Comfort .... OFF
Bleed Air Lever .... PULL OUT (closed)

If overpressurization continues:

Cabin Pressure Dump/Normal Switch .... DUMP
Emergency Descent .... ACCOMPLISH PER SECTION 3.17

3.39 PRESSURIZATION / ENVIRONMENTAL SYSTEM MALFUNCTIONS (Continued)

Rapid or Explosive Decompression

Oxygen Mask ....ON
Mic Select Switch ....MASK

If increase in cabin altitude is explosive:

Emergency Descent ....ACCOMPLISH PER SECTION 3.17

If increase in cabin altitude is rapid and cabin altitude has not exceeded 14,000 feet (time permitting):

Cabin Controller...SET TO LOWER ALTITUDE
Cabin Rate Control.......................................INCREASE TO MAXIMUM
ECS Cabin Comfort...HIGH

If cabin altitude exceeds 14,000 feet:

Emergency Descent ....ACCOMPLISH PER SECTION 3.17

3.40 EMERGENCY EXIT

Exit ....LOCATE
(second window from front on right side)

NOTE

The cabin must be depressurized before attempting to open the emergency exit.

Plexiglas Cover ....REMOVE
Handle..PULL
Emergency Exit Window ....PULL IN

3.41 VACUUM SYSTEM FAILURE

Indication: Amber "VACUUM LOW" annunciator illuminated.

Vacuum gage..CHECK - WITHIN NORMAL OPERATING RANGE

Monitor vacuum gage. Low vacuum may lead to improper operation of the wing and empennage deice boots and malfunction of the cabin pressurization. Monitor cabin altitude.

Before landing, verify cabin is depressurized. If not depressurized:

ECS Switch ....OFF
Bleed Air Lever ....PULL OUT (closed)
Pressurization..VERIFY ZERO DIFFERENTIAL PRESSURE

CAUTION

[illegible] increased by approximately 5 KIAS

3.43 ANTI-ICE / DE-ICE SYSTEM MALFUNCTIONS

3.43a Left Pitot Heat Failure

Indication: Red "L PITOT HEAT" annunciator illuminated.

Pitot Heat Switch..CHECK ON
L Pitot Heat Circuit Breaker...CHECK IN
(Located on the pilot's aft circuit breaker panel, row A, position 2.)

Failure of the L Pitot Heat could cause erroneous indications of pilot's airspeed and standby airspeed.

3.43b Right Pitot Heat Failure

Indication: Red "R PITOT HEAT" annunciator illuminated.

Pitot Heat Switch..CHECK ON
R Pitot Heat Circuit Breaker...CHECK IN
(Located on the pilot's aft circuit breaker panel, row A, position 3.)

Failure of the R Pitot Heat could cause erroneous indications of copilot's airspeed.

3.43c Pitot Heat Off

Indication: Amber "PITOT HTR OFF" annunciator illuminated.

Pitot Heat Switch ....SELECT ON

3.43d Prop Heat Failure

Indication: Red "PRP HTR FAIL" annunciator illuminated.

Prop Heat Circuit Breaker ....CHECK IN
(Located on the pilot's aft circuit breaker panel, row A, position 4.)

If Prop Heat Circuit Breaker was closed (not out):
Prop Heat Switch ....CYCLE OFF THEN ON
If Annunciator remains illuminated, Exit and Avoid icing conditions.

3.43 ANTI-ICE / DE-ICE SYSTEM MALFUNCTIONS (Continued)

3.43e Windshield Over Temp

Indication: Red "WNDSHLD OVR TMP" annunciator illuminated.

Windshield Heat Switch .... OFF
If Windshield Over Temp Annunciator extinguishes:
Windshield Heat Switch .... DEFOG
If Windshield Over Temp Annunciator remains illuminated:
Windshield Heat Switch .... OFF
Windshield Heat Circuit Breakers (2) .... PULL
(Located on the pilot's aft circuit breaker panel, row A, positions 7, 8.)

NOTE

During high ambient temperature conditions when switching windshield heat from ANTI ICE to DEFOG, the red WNDSHLD OVR TMP annunciator may illuminate and remain illuminated until the windshield surface temperature cools to the DEFOG heat temperature range.

3.43f Surface De-ice Failure

Indication: Red "DE-ICE FAIL" annunciator illuminated.

De-ice Fail Circuit Breaker .... CHECK IN
(Located on the pilot's aft circuit breaker panel, row A, position 6.)

If Annunciator remains illuminated, Exit and Avoid icing conditions.

3.43g Stall Warning Fail

Indication: Amber "STALL WRN FAIL" annunciator illuminated.

Stall Heat Circuit Breaker .... CHECK IN
(Located on the pilot's aft circuit breaker panel, row A, position 5.)

Avoid low airspeeds and monitor approach speeds closely.

3.43 ANTI-ICE / DE-ICE SYSTEM MALFUNCTIONS (Continued)

3.43h Annunciator Panel Light Failure

Indication: Amber "ANNUN INOP" annunciator illuminated.

ANNUN Circuit Breaker..CHECK IN
(Located on the pilot's forward circuit breaker panel, row B, position 5.)
ANNUN INOP Light..Extinguished

If ANNUN circuit breaker not open:

Annunciator..TEST

If annunciator lights illuminate, annunciator panel is functioning properly.

NOTE

If ANNUN circuit breaker does not remain closed or lights fail to illuminate when tested, ANNUN INOP will remain illuminated and annunciator lights will be inoperative for the remainder of the flight.

System should be repaired prior to further flight.

3.45 DOOR AJAR

Indication: Red "DOOR AJAR" annunciator illuminated.

On the Ground:

Door Latching ....CHECK AND VERIFY
4 GREEN INDICATORS

In Flight:

Ensure all occupants are seated with seat belts on.
Remain clear of the door.
Reduce cabin pressurization.
Reduce airspeed.
Land as soon as practical.

3.47 STANDBY ATTITUDE INDICATOR BATTERY HEATER FAIL

Indication: Amber "STBY ATT IND BAT HTR FAIL" annunciator illuminated.

STBY ATT IND Test Switch ....HOLD IN TEST POSITION (Minimum 5 seconds to complete self test)

If STBY ATT IND Annunciator illuminates:
Stby gyro ....MONITOR

If STBY ATT IND Annunciator does not illuminate:
Instrument Meteorological Conditions (IMC) ....EXIT AND AVOID

3.49 OXYGEN

Indication: Amber "OXYGEN" annunciator illuminated.

Indicates one or more of the passenger oxygen cannisters is in use or is expended.

If illuminated in flight:
Descend to altitude where supplemental oxygen is not required.

3.51 SPIN RECOVERY

Rudder ....FULL OPPOSITE TO DIRECTION OF ROTATION
Control Wheel..FULL FORWARD WHILE NEUTRALIZING AILERONS
Throttle...CLOSED
Rudder (when rotation stops)...NEUTRAL
Control Wheel ....AS REQUIRED TO SMOOTHLY REGAIN LEVEL FLIGHT ATTITUDE

3.53 ICING (Reference Section 9, Supplement 6, for Meridian Aircraft Flight Into Known Icing (FIKI)

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NORMAL PROCEDURES

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SECTION 4

NORMAL PROCEDURES

4.1 GENERAL

This section provides the normal operating procedures for the PA-46-500TP, Meridian airplane. All of the normal operating procedures required by the FAA are presented as well as those procedures which have been determined as necessary for the operation of the airplane, as determined by the operating and designed features of the airplane, are presented.

Normal operating procedures associated with optional systems and equipment which require handbook supplements are presented in Section 9, Supplements.

These procedures are provided to supply information on procedures which are not the same for all airplanes and as a source of reference and review. Pilots should familiarize themselves with these procedures to become proficient in the normal operation of the airplane.

This section is divided into two parts. The first part provides the Normal Procedures Checklists. These checklists supply an action - reaction sequence for normal operating procedures. Numbers in parentheses after each checklist section indicate the paragraph where the corresponding amplified procedure can be found.

The second part of this section contains the amplified normal procedures which provide additional detailed information and explanations of the procedures and how to perform them. The short form checklists should be used on the ground and in flight. Numbers in parentheses after each paragraph title indicate where the corresponding checklist can be found.

CAUTION

Pilots who fly at high altitude must be aware of the physiological problems associated with prolonged flight at such altitudes. Dehydration and the onset of hypoxia may occur in the passengers and crew.

Passenger comfort may be increased by an occasional intake of fluids. Prolonged high altitude flights require warm clothing and monitoring of the cabin temperature and the physical state of the crew and passengers.

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4.3 AIRSPEEDS FOR SAFE OPERATIONS

The following airspeeds are those which are significant to the safe operation of the airplane. These figures are for standard airplanes flown at maximum weight under standard sea level conditions.

Performance for a specific airplane may vary from published figures depending upon the equipment installed, the condition of the engine, airplane and equipment, atmospheric conditions and piloting technique.

Best Rate of Climb Speed (V_Y) .... 125 KIAS
Best Angle of Climb Speed (V_X) .... 95 KIAS
Maximum Operating Maneuvering Speed (V_O) .... 127 KIAS

Landing Final Approach Speed (Full Flaps) .... 85 KIAS
Maximum Demonstrated Crosswind Velocity .... 17 KTS
Maximum Flaps Extended Speed
10° .... 168 KIAS
20° .... 135 KIAS
Full Flaps (36°) .... 118 KIAS

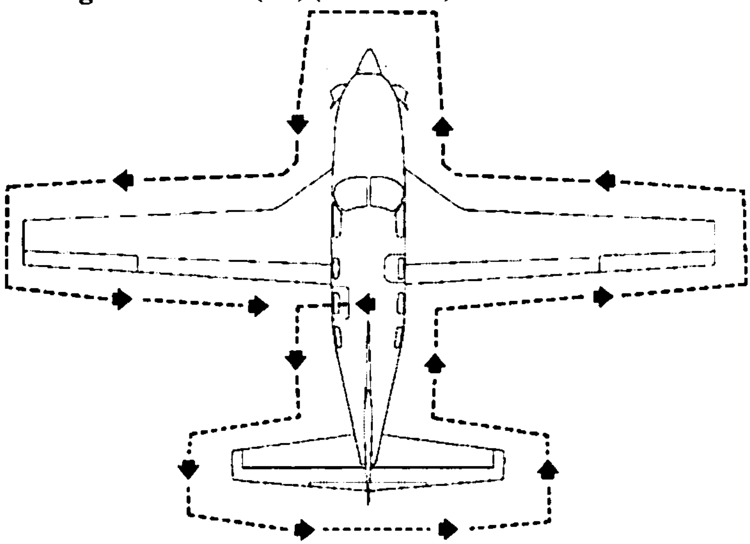
4.5 NORMAL PROCEDURES CHECKLIST

4.5a Preflight Checklist (4.9)

COCKPIT (4.9a)

Empty Seats....................................SEAT BELTS SNUGLY FASTENED
Windows....................................CHECK CLEAN
Required Papers....................................CHECK ON BOARD
All Switches....................................OFF
Control Wheel....................................RELEASE RESTRAINTS
Primary Flight Controls....................................PROPER OPERATION
Parking Brake....................................SET
Landing Gear Handle....................................DOWN
Battery Switch....................................ON
Landing Gear Indicator Lights....................................THREE GREEN
Flaps....................................EXTEND
Pilot's Emergency Oxygen System....................................ON/Verify Charge 800 psi Minimum/Check Mask and Microphone
Exterior Lighting Switches..........ON, CHECK OPERATION, THEN OFF
Battery Switch....................................OFF
Interior Cabin Lighting....................................ON and CHECK
All Lighting Switches....................................OFF
Baggage....................................STOW and SECURE

4.5a Preflight Checklist (4.9) (Continued)



WALK-AROUND
Figure 4-1

EMPENNAGE (4.9b)

Primary and Pressurization Static Ports ....CLEAR
Left Alternate Static Port ....CLEAR
Storage Compartment Door ....CLOSE / SECURE
EPU Access Door ....CLOSED
Antennas (Upper and Lower) ....CHECK
Surface Condition ....CLEAR OF ICE, FROST, SNOW
Deice Boots (Stabilizer and Rudder) ....CHECK
Elevator and Elevator Trim Tab ....CHECK
Vortex Generators ....CHECK

CAUTION

During the preflight inspection, if a total of more than 8 vortex generators are damaged or missing, the aircraft is not airworthy.

Rudder ....CHECK
Rudder Trim Tab ....CHECK
Static Wicks (11) ....CHECK
Tie Down ....REMOVE
Right Alternate Static Port ....CLEAR

4.5a Preflight Checklist (4.9) (Continued)

RIGHT WING (4.9c)

Surface Condition ....CLEAR OF ICE, FROST, SNOW
Flap and Hinges ....CHECK
Aileron and Hinges ....CHECK
Static Wicks (3) ....CHECK
Wing Tip and Lights ....CHECK
Fuel Tank Vent ....CLEAR
Fuel Tank and Filler Cap ....CHECK supply visually - SECURE CAP
Deice Boot ....CHECK
Stall Strips ....CHECK
Vortex Generators ....CHECK

CAUTION

During the preflight inspection, if a total of more than 5 vortex generators are damaged or missing, the aircraft is not airworthy.

Radar Pod and Storage Door..CHECK / SECURE
Pitot Head..REMOVE COVER and
CHECK for OBSTRUCTIONS
Tie Down and Chock...REMOVE
Main Gear Strut......................PROPER INFLATION - approx. 3 in. (8 cm)
Gear Door ....CHECK
Tire ....CHECK
Brake Block and Disc ....CHECK

4.5a Preflight Checklist (4.9) (Continued)

NOSE SECTION (4.9d)

General Condition and Cowling Fasteners....................................CHECK
Right Cowl Door..OPEN - CHECK GENERAL CONDITION - SECURE DOOR
Air Outlet and Exhaust Covers..REMOVE
Generator / Alternator Cooling Air Inlet..CLEAR
Exhaust Stacks..CHECK
Forward Upper Cowling ....HORIZONTAL LATCH SLOTS ALIGNED and PINS EXTENDED
Fuel Sumps (2)..DRAIN and CHECK for water, sediment and proper fuel
Air Inlets ....CLEAR
Propeller Spinner...CHECK
Propeller.......................................CHECK for nicks and general condition. ROTATE PROPELLER - listen for noise, check for binding
Landing Light ....CHECK
Chock ....REMOVE
Nose Gear Strut ....PROPER INFLATION - approx. 2.7 in. (6.8 cm)
Nose Tire ....CHECK
Gear Doors ....CHECK
Fuel Sumps (3)..DRAIN and CHECK for water, sediment and proper fuel
Forward Upper Cowling ....HORIZONTAL LATCH SLOTS ALIGNED and PINS EXTENDED
Left Cowl Door ....OPEN and CHECK OIL LEVEL
Oil Filler Cap..VERIFY FULLY CLOSED
Alternator and Aircond Compressor Belts ....CHECK FOR TENSION and EXCESSIVE WEAR
Brake Fluid Reservoir Cap..VERIFY CLOSED
Left Cowl Door ....CLOSED and SECURE

4.5a Preflight Checklist (4.9)(Continued)

LEFT WING (4.9e)

Surface Condition ....CLEAR OF ICE, FROST, SNOW
Main Gear Strut......................PROPER INFLATION - approx. 3 in. (8 cm)
Gear Door ....CHECK
Tire ....CHECK
Brake Block and Disc ....CHECK
Tie Down and Chock ....REMOVE
Pitot Head ....CHECK
Deice Boot ....CHECK
Stall Strips ....CHECK
Vortex Generators ....CHECK

CAUTION

During the preflight inspection, if a total of more than 5 vortex generators are damaged or missing, the aircraft is not airworthy.

Stall Warning Vane ....CHECK
Fuel Tank and Filler Cap ....CHECK supply visually - SECURE CAP
Fuel Tank Vent ....CLEAR
Wing Tip and Lights ....CHECK
Static Wicks (3) ....CHECK
Aileron and Hinges ....CHECK
Flap and Hinges ....CHECK

4.5b Before Starting Engine Checklist (4.11)

BEFORE STARTING ENGINE (4.11)

Passengers .... BOARD
Door .... CLOSE and LATCH

WARNING

Do not initiate any flight if all four door pin indicators are not green and/or the DOOR AJAR annunciator is illuminated.

Door Pins .... ALL INDICATORS GREEN
Seats .... ADJUSTED and LOCKED in position
Seat Belts and Harness .... FASTEN / ADJUST - CHECK inertia reel
All Electrical Switches .... OFF
Day/Night Switch .... Verify proper setting
Cabin Comfort Controls .... OFF
Circuit Breakers .... CHECK
Mic Select Switch .... Boom
ECS Switch .... OFF
Parking Brake .... SET
Manual Override Lever (MOR) .... FULL AFT and LOCKED IN PLACE
Power Lever .... IDLE
Condition Lever .... CUTOFF / FEATHER
Bleed Air Lever .... OUT (closed)
Firewall Shutoff Valve .... IN (open) and COVER CLOSED
Emergency Ground Clearance .... PUSH ON (Verify operation of the No. 1 Nav/Com, Audio Panel, and illumination of the Landing Gear Down Indicators, Standby Instruments and Magnetic Compass)
Emergency Ground Clearance .... OFF
External Power .... Apply as required
Battery Switch .... ON (OFF, if applying external power)
Primary Flight Display (PFD) .... Verify correct aircraft model software
Fire Detection Test .... PUSH/ANNUNCIATOR ILLUMINATED

4.5b Before Starting Engine Checklist (4.11) (Continued)

BEFORE STARTING ENGINE (4.11) (Continued)

TAS .... Standby
Annunciator Panel Lights .... TEST and HOLD

NOTE

Verify proper operation with full bright selected on annunciator panels with the auto dimming feature.

Landing Gear Warning Horn
Mute Switch (if installed) .... PRESS/
Verify horn silences and switch illuminates
ADAHRS 1 / 2 Switch .... Center position
Alternate Static System .... CHECK PRIMARY POSITION
Pitot and Static .... DRAIN
PFD Coupled/Uncoupled Switch .... VERIFY PROPER SETTING
Multi-Function Display (MFD) .... VERIFY EXCEEDANCES

NOTE

Refer to Section 2, Limitations, Paragraph 2.7, Power Plant Limitations, Table 2-1, for disposition of engine exceedances.

Initial Usable Fuel .... SET
Fuel Gauges .... CHECK QUANTITY & IMBALANCE
OAT .... CHECK
Fuel Temperature .... VERIFY WITHIN LIMITS
Proceed with appropriate Engine Start Checklist.

4.5c Engine Start Checklist (4.13)

ENGINE START - USING AIRPLANE BATTERY (4.13a)

Battery .... CHECK 24 to 26 VOLTS

NOTE

For warm weather operation engine starts may be attempted with a battery voltage of 23.5 volts minimum. Observe the engine start ITT limitation. Ng minimum speed of 13% and ensure combustion occurs within 10 seconds after moving the condition lever to run. Failure to observe these limitations can result in damage to the engine.

Fuel Pump Switch .... MANUAL
Left and Right Fuel Pump Annun. .... ILLUMINATED
Ignition Switch .... MANUAL
Ignition Annunciator .... ILLUMINATED
Prop Area .... CLEAR
Start Mode Switch .... AUTO (Light in Switch Extinguished)
Start Switch .... LIFT COVER/PUSH
Oil Pressure .... CHECK RISING
Ng (min. 13%) .... STABILIZED
Condition Lever .... RUN
ITT .... MAX. 1000°C LIMITED TO 5 SEC.

If combustion is not initiated within 10 sec. of moving Condition Lever to Run then:

a. Condition Lever .... CUTOFF / FEATHER
b. Start Mode Switch .... PUSH MAN/STOP
c. Allow minimum of 30 seconds fuel draining period, then refer to DRY MOTORING RUN (4.5 d)

Starter @ 56% .... VERIFY DISENGAGED
(If not - PUSH START MODE MAN/STOP SWITCH)
Ng .... STABLE above 60%
Np .... VERIFY 1200 RPM MINIMUM
Generator .... ON/CHECK POSITIVE AMPS/28 VOLTS/ GENERATOR INOP Annunciator Extinguished
Alternator .... ON/ALTERNATOR INOP Annunciator Extinguished
Fuel Pump Switch .... AUTO
Ignition Switch .... OFF
Oil Pressure .... CHECK (Min. 60 PSI)

4.5c Engine Start Checklist (4.13) (Continued)

ENGINE START (MANUAL MODE) - USING AIRPLANE BATTERY (4.13b)

Battery .... CHECK 24 to 26 VOLTS

NOTE

For warm weather operation engine starts may be attempted with a battery voltage of 23.5 volts minimum. Observe the engine start ITT limitation. Ng minimum speed of 13% and ensure combustion occurs within 10 seconds after moving the condition lever to run. Failure to observe these limitations can result in damage to the engine.

Fuel Pump Switch .... MANUAL
Left and Right Fuel Pump Annun. .... ILLUMINATED
Ignition Switch .... MANUAL
Ignition Annunciator .... ILLUMINATED
Prop Area .... CLEAR
Start Mode Switch .... Manual (Light in Switch Illuminated)
Start Switch .... LIFT COVER/PRESS & HOLD
Oil Pressure .... CHECK RISING
Ng (min. 13%) .... STABILIZED
Condition Lever .... RUN
ITT .... MAX. 1000°C LIMITED TO 5 SEC.

If combustion is not initiated within 10 sec. of moving Condition Lever to Run then:

a. Condition Lever .... CUTOFF / FEATHER
b. Starter .... RELEASE
c. Allow minimum of 30 seconds fuel draining period, then refer to DRY MOTORING RUN (4.5 d)

Starter @ 56% .... RELEASE & VERIFY STARTER ANNUNCIATOR EXTINGUISHED
Ng .... STABLE above 60%
Np .... VERIFY 1200 RPM MINIMUM
Generator .... ON/CHECK POSITIVE AMPS/28 VOLTS/ GENERATOR INOP Annunciator Extinguished
Alternator .... ON/ALTERNATOR INOP Annunciator Extinguished
Fuel Pump Switch .... AUTO
Ignition Switch .... OFF
Oil Pressure .... CHECK (Min. 60 PSI)

4.5c Engine Start Checklist (4.13) (Continued)

ENGINE START - USING EXTERNAL POWER (4.13c)

Battery Switch .... Verify OFF
External Power Unit .... CONNECT

NOTE

For engine starting, the external power source must be capable of providing 24 to 29 Volts and 1200 Amps.

Voltmeter .... CHECK STABLE 24 to 29 VOLTS
Fuel Pump Switch .... MANUAL
Left and Right Fuel Pump Annun. .... ILLUMINATED
Ignition Switch .... MANUAL
Ignition Annunciator .... ILLUMINATED
Prop Area .... CLEAR
Start Mode Switch .... AUTO (Light in Switch Extinguished)
Start Switch .... LIFT COVER/PUSH
Oil Pressure .... CHECK RISING
Ng (min. 13%) .... STABILIZED
Condition Lever .... RUN
ITT .... MAX. 1000°C LIMITED TO 5 SEC.

If combustion is not initiated within 10 sec. of moving Condition Lever to Run then:

a. Condition Lever .... CUTOFF / FEATHER
b. Start Mode Switch .... PUSH MAN/STOP
c. Allow minimum of 30 seconds fuel draining period, then refer to DRY MOTORING RUN (4.5 d)

Starter @ 56% .... VERIFY DISENGAGED
(If not - PUSH START MODE MAN/STOP SWITCH)
Ng .... STABLE above 60%
Np .... VERIFY 1200 RPM MINIMUM
Fuel Pump Switch .... AUTO
Ignition Switch .... OFF
Oil Pressure .... CHECK (Min. 60 PSI)
Battery Switch .... ON
External Power Unit .... DISCONNECT
Generator .... ON/CHECK POSITIVE AMPS/28 VOLTS/ GENERATOR INOP Annunciator Extinguished
Alternator .... ON/ALTERNATOR INOP Annunciator Extinguished

4.5d ENGINE DRY MOTORING RUN (4.15)

Allow minimum of 30 seconds fuel draining period, then:

Power Lever .... IDLE
Condition Lever .... CUTOFF / FEATHER
Fuel Pump Switch .... OFF
Ignition Switch .... OFF
Battery Switch .... ON
Start Mode .... MANUAL (Switch Light Illuminated)
Starter .... PUSH and HOLD (15 SEC.)
Starter .... RELEASE

NOTE

Observe starter cooling limits (Section 2.9).

4.5e BEFORE TAXIING (4.17)

Avionics Switch .... ON

NOTE

Movement of the aircraft prior to or during ADAHRS initialization may extend the time required for initialization. The initialization process is normally completed in 3 minutes.

Pitot Heat .... ON, CHECK OPERATION
(Amber pitot heat annunciator extinguished. Monitor volt/ammeter.)
Pitot Heat .... OFF
Taxi/Rec Lights .... AS REQUIRED
Nav & Strobe Lights .... AS REQUIRED
Cabin Comfort Controls .... AS REQUIRED
Radios / Avionics .... CHECK
Select Aux Page on MFD .... Verify set to proper GPS
Flaps .... RETRACT
Manual Electric Trim Preflight Check .... Perform per procedure defined in S-TEC MAGIC 1500 Autopilot Airplane Flight Manual Supplement (Ref. Section 9)

4.5e BEFORE TAXIING (4.17) (Continued)

Bleed Air Lever .... IN (open)
Cabin Pressure Dump Switch .... VERIFY POSITION
ECS Switch .... NORMAL
Autopilot Master Switch .... SELECT ON / Verify Self Test Completed
Stall Warning System .... TEST
Pressurization Control .... SET

NOTE

Maximum cooling on the ground may be achieved by operating with the Bleed Air lever in the OUT (closed) position and the ECS control selected OFF.

Standby Attitude Indicator .... TEST (verify green STBY ATT IND TEST annunciator illuminated) / ON
Altimeter/Standby Altimeter .... SET
TAWS .... TEST (if installed)
Pilot / Copilot ADAHRS .... VERIFY INITIALIZED
Parking Brake .... RELEASE

4.5f TAXIING (4.19)

Taxi Area .... CLEAR
Power Lever .... ADVANCE SLOWLY
Brakes .... CHECK
Steering .... CHECK
Flight Instruments .... CHECK

CAUTION

Propeller operation below 1200 rpm is prohibited.

NOTE

Beta range (aft of idle detent) may be used during taxi to control taxi speed and reduce wear on brakes.

4.5g ENGINE RUN UP (4.21)

Parking Brake .... SET
Power Lever .... 1900 RPM
Overspeed Governor Test Switch .... LIFT COVER / PUSH and HOLD
NP .... OBSERVE APPROX. 60 RPM DROP
Overspeed Governor Test Switch .... RELEASE
Np .... RETURN TO 1900 RPM
Power Lever .... IDLE
Reverse Lockout Switch .... PUSH and HOLD (Min. 5 sec.)
Power Lever .... LIFT and RETARD TOWARDS REVERSE
Beta and Prop Reverse .... NOT ATTAINABLE
Reverse Lockout Switch .... RELEASE, POWER LEVER CAN BE MOVED TOWARDS REVERSE
Power Lever .... IDLE
Generator .... OFF (verify alternator picks up load and red GEN INOP annunciator is illuminated)
Generator .... ON (red GEN INOP annunciator extinguished)
Alternator .... OFF (red ALT INOP annunciator illuminated)
Alternator .... ON (red ALT INOP annunciator extinguished)
Quadrant Friction Lock .... SET

NOTE

Refer to Section 9, Supplement 6, for Meridian Aircraft Flight Into Known Icing (FIKI), prior to any flight operations (takeoff, cruise, landing, etc.).

4.5h BEFORE TAKEOFF (4.23)

Seat Backs .... ERECT
Seats .... ADJUSTED & LOCKED IN POSITION
Armrests .... STOWED
Belts/Harness .... FASTENED / ADJUSTED
Generator .... ON
Alternator .... ON
Bleed Air Lever .... IN (open)
ECS Switch .... NORMAL
Pressurization System .... SET
Fuel Temperature .... CHECK WITHIN LIMITS
Fuel Pump Switch .... MANUAL
Ignition Switch .... MANUAL
Windshield Heat .... AS REQUIRED
Pitot Heat .... ON
Taxi/Rec Light .... AS REQUIRED
Landing Light .... AS REQUIRED
Nav & Strobe Lights .... ON
Flight Instruments .... CHECK (Primary and Standby)
Annunciator Lights .... CONSIDER ANY LIGHTS ILLUMINATED
Engine Instruments .... CHECK
Radios / Avionics .... AS REQUIRED
Flaps .... SET (0° - 20°)
Elevator and Rudder Trim .... SET
Flight Controls .... FREE & PROPER TRAVEL

NOTE

Refer to Section 9, Supplement 6, for Meridian Aircraft Flight Into Known Icing (FIKI), prior to any flight operations (takeoff, cruise, landing, etc.).

4.5i TAKEOFF (4.25)

WARNING

Positioning the Power Lever aft of the flight idle stop in flight is prohibited. Such positioning may cause loss of airplane control or may result in an engine overspeed condition and consequent loss of engine power.

NOTE

Increasing airspeed will cause torque to increase.

NOTE

Demonstrated crosswind component is 17 knots.

NORMAL TAKEOFF (0° FLAPS) (4.25a)

Brakes .... APPLY
Power Lever .... SET TO TAKEOFF
Brakes .... RELEASE
Engine Instruments .... MONITOR
Rotation and Liftoff (V_R) .... 85 KIAS
Obstacle Clearance Speed .... 100 KIAS

After liftoff and positive rate of climb:

Landing Gear .... UP
Fuel Pump .... AUTO
Ignition .... AUTO
Landing Light .... OFF
Taxi/Rec Lights .... AS REQUIRED
TAS .... ON

4.5i TAKEOFF (4.25) (Continued)

SHORT FIELD TAKEOFF PERFORMANCE (20° FLAPS) (4.25b)

Flaps ....20°
Brakes ....APPLY
Power Lever ....SET TO TAKEOFF (MCP)
Brakes ....RELEASE
Engine Instruments...MONITOR
Rotation and Liftoff (V_R)..85 KIAS
Obstacle Clearance Speed ....95 KIAS

After liftoff and positive rate of climb:

Flaps...RETRACT
Landing Gear ....UP
Fuel Pump ....AUTO
Ignition ....AUTO
Landing Light ....OFF
Taxi/Rec Lights...AS REQUIRED
TAS...ON

NOTE

The Ignition may be operated continuously and can be used for takeoff, landing, or flight into precipitation. There is no time limitation, although continuous operation will reduce component life.

4.5j MAXIMUM CONTINUOUS POWER CLIMB (4.27a)

Power Lever ....MCP
Ice Protection Equipment ....AS REQUIRED
Engine Instruments
a. Torque..MONITOR (1313 FT-LB MAX.)
b. ITT ....MONITOR (770°C MAX.)
c. Ng ....MONITOR (101.7% MAX.)
Climb Speed (best rate) ....125 KIAS
Pressurization System ....SET& MONITOR

4.5k CRUISE CLIMB (4.27b)

Climb Power .... SET MCP
Ice Protection Equipment .... AS REQUIRED
Engine Instruments
a. Torque .... MONITOR (1313 FT-LB MAX.)
b. ITT .... MONITOR (770°C MAX.)
c. Ng .... MONITOR (101.7% MAX.)

Cruise Climb Speed .... 145 KIAS (to 20,000 FT)
135 KIAS (20,000 FT to 30,000 FT)
Pressurization System .... SET& MONITOR
Altimeters .... CHECK

4.5l CRUISE (4.29)

Cruise Power .... SET PER POWER TABLES IN SECTION 5
Engine / Fuel Instruments .... MONITOR
Pressurization System .... SET & MONITOR
Fuel Temperature / OAT .... MONITOR
Cabin Comfort Controls .... AS DESIRED

4.5m FLIGHT IN ICING CONDITIONS

Reference Section 9, Supplement 6, for Meridian Aircraft Flight Into Known Icing (FIKI).

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4.5n DESCENT (4.33)

Windshield Defrost ....PULL ON
Windshield Heat ....DEFOG
Ice Protection Equipment..AS REQUIRED
Power Lever ....SET TO DESIRED TORQUE
Altimeter & Standby Altimeter..CHECK
Cabin Pressure Controller ....SET (field elev. +500 ft)
Cabin Rate Control ....SET for comfort
(approx. 9 o'clock position)
Cabin Comfort Controls ....AS REQUIRED

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4.5o BEFORE LANDING (4.35)

APPROACH CHECK (4.35a)

Altimeter & Standby Altimeter.......................................SET
Pressurization.......................................SET
Fuel Pump.......................................MANUAL
Ignition.......................................MANUAL
Fuel Quantity.......................................CHECK
Seats.......................................ADJUSTED & LOCKED IN POSITION
Armrests.......................................STOWED
Belts/Harness.......................................FASTEN & ADJUSTED
Landing Gear.......................................DOWN (below 168 KIAS)
Flaps.......................................SET (10° @ 168 KIAS max.)

NOTE

During landing gear operation it is normal for the HYDRAULIC PUMP annunciator light to illuminate until full system pressure is restored.

LANDING CHECK (4.35b)

Landing Gear.......................................3 GREEN LIGHTS
Brakes.......................................CHECK

WARNING

After pumping several times, if one or both toe brakes are inoperative, DO NOT attempt landing on a short field.

Flaps.......................................SET (36° @ 118 KIAS max.)
Airspeed.......................................85 KIAS

NOTE

Landing distance performance was established by maintaining a power on (280 ft. lb. torque), stabilized 3° approach at 85 KIAS, and reducing power to idle during the flare.

Autopilot.......................................DISENGAGE
Yaw Damper (prior to landing).......................................DISENGAGE
TAS.......................................AS REQUIRED

4.5p LANDING (4.37)

NOTE

In crosswind conditions, the nosewheel may not be aligned with the runway as the wheel touches down because of opposite rudder input. To prevent swerving in the direction the nosewheel is offset, the rudder must be promptly centered just as the nosewheel touches down.

NORMAL TECHNIQUE (4.37a)

Power Lever .... IDLE

Touch Down Main Wheels First

Brakes .... MODERATE or AS REQUIRED
Power Lever .... BETA or AS REQUIRED

NOTE

Landing distance was determined by selecting beta immediately after touchdown (all three landing gear) and applying moderate braking.

SHORT FIELD TECHNIQUE (4.37b)

Power Lever .... IDLE

Touch Down Main Wheels First

Reverse (After Touchdown) .... MAXIMUM
Brakes .... MODERATE
Power Lever .... IDLE (before aircraft stops)

4.5q BALKED LANDING (Go-Around) (4.39)

Power Lever .... SET TAKEOFF TORQUE
Climb Airspeed .... 85 KIAS
Flaps (after climb established .... RETRACT TO 20°
and obstacle has been cleared)
Climb Airspeed .... ACCELERATE TO 100 KIAS
Flaps .... RETRACT TO 0°
Landing Gear .... RETRACT

4.5r AFTER LANDING (4.41)

Fuel Pumps....AUTO
Ignition ....OFF
Ice Protection Equipment ....OFF
Landing / Taxi Lights....AS REQUIRED
Strobe Lights....OFF
WX Radar ....STBY
Flaps ....RETRACT
Transponder ....AS REQUIRED

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4.5s SHUTDOWN (4.43)

WARNING

If there is evidence of fire within the engine after shutdown, proceed immediately with the Dry Motoring Run Procedure, Section 4.5d.

CAUTION

When the condition lever is selected to CUTOFF/FEATHER, the propeller should quickly stop (20 to 30 seconds) in the feather position. If the propeller continues to windmill for an extended period, a feathering system failure has occurred. Investigate and correct the problem prior to the next flight.

Parking Brake .... SET
ECS Switch .... OFF
Power Lever .... IDLE
Cabin Comfort Controls .... OFF
Exterior Lighting Switches .... OFF
Fuel Pump .... OFF
Avionics Switch .... OFF
Generator .... OFF
Alternator .... OFF

NOTE

Allow ITT to stabilize at least two minutes at idle.

Condition Lever .... CUTOFF / FEATHER
Feather Annunciator .... CHECK ON
Bleed Air Lever .... OUT (closed)
Battery Switch .... OFF
Standby Attitude Indicator .... OFF
Flight Controls .... SECURED
Oxygen System .... OFF
Wheel Chocks .... AS REQUIRED
Tie Downs .... AS REQUIRED
Air Inlets, Exhaust and Pitot Covers .... INSTALL

4.7 AMPLIFIED NORMAL PROCEDURES (GENERAL)

The following paragraphs are provided to supply detailed information and the explanation of the normal procedures for operation of the airplane.

4.9 PREFLIGHT CHECK (4.5a)

The airplane should be given a thorough preflight and walk-around check. The preflight should include a check of the airplane's operational status, computation of weight and C.G. limits, takeoff distance, and in-flight performance. A weather briefing should be obtained for the intended flight path, and any other factors relating to a safe flight should be checked before takeoff.

4.9a Cockpit (4.5a)

Upon entering the cockpit, check seat belts on empty seats are snugly fastened and check the windows for cleanliness. Verify that all required papers, flight manuals, flight manual supplements, and pilot operating handbooks are on board. Ensure that all electrical switches are OFF. Release the seatbelts securing the control wheel.

Check the primary flight controls for proper operation.

Set the parking brake by first depressing and holding the toe brake pedals and then pulling the parking brake knob. Then verify the landing gear handle is in the DOWN position.

Turn ON the battery switch. Verify three green landing gear indicator lights are illuminated. Extend the flaps to the full deflection position.

Check the charge and operation of the pilot's emergency oxygen system. Verify the charge is above the yellow arc (800 psi minimum). Verify proper mask and microphone operation as follows: Depress and hold the reset test button on the mask, while depressing the press-to-test button on the stowage box. Visually verify that the test indicator located on the stowage box and auditory cues signify oxygen flow. Also verify the mask microphone operation by monitoring the ship speaker system during the oxygen system test. The mask microphone, intercom, and ship speaker must be activated prior to testing. The mask does not have to be removed from the stowage box for preflight testing.

Turn ON and check operation of exterior lights (taxi/rec lights, landing lights, nav lights, strobe lights and ice lights).

Turn the battery switch OFF.

Check operation of interior lighting, then turn OFF interior lighting.

Stow and secure any baggage.

4.9 PREFLIGHT CHECK (4.5a) (Continued)

4.9b Empennage (4.5a)

Begin the walk-around at the left side of the aft fuselage. Ensure that the primary and pressurization static ports on the underside of the aft fuselage and the alternate static port on the left side of the aft fuselage are clear of obstructions. Verify the contents of the tail storage compartment are secured properly, then close and verify that the compartment door is secured. Verify the EPU access door is closed or the EPU is connected. Check the condition of antennas located on the fuselage and the vertical tail. All surfaces of the empennage must be clear of ice, frost, snow or other extraneous substances. Check the condition of the stabilizer and rudder de-ice boots for any nicks, tears or delamination. Check the condition of the elevator trim tab and ensure that all hinges and pushrods are sound and operational. Check that all vortex generators on the underside of the horizontal stabilizer are installed and in good condition.

CAUTION

During the preflight inspection, if a total of more than 5 vortex generators are damaged or missing, the aircraft is not airworthy.

The elevator and rudder should be operational and free from damage or interference of any type, and the static wicks (total of 11) should be firmly attached and in good condition. Check the rudder trim tab for neutral position and excessive free play. If the tail has been tied down, remove the tie-down rope. Verify the alternate static port on the right side of the aft fuselage is clear of obstructions.

4.9 PREFLIGHT CHECK (4.5a) (Continued)

4.9c Right Wing (4.5a)

Check that the wing surface and control surfaces are clear of ice, frost, snow or other extraneous substances. Check the flap, aileron and hinges for damage and operational interference. Static wicks (total of 3) should be firmly attached and in good condition. Check the wing tip and lights for damage.

Check and verify that the fuel tank vent is clear of any obstructions. Open the fuel cap and visually check the fuel quantity. Replace the cap securely. Check the condition of the deice boot for any nicks, tears or delamination, and verify that the stall strips are securely attached. Check that all vortex generators are installed and in good condition.

CAUTION

During the preflight inspection, if a total of more than 5 vortex generators are damaged or missing, the aircraft is not airworthy.

Check the radar pod for any damage, that all attachment points are secure, and the storage door is closed and latched. If installed, remove the cover from the pitot head and verify that it is clear of obstructions.

Remove the tiedown and chock.

Next, complete a check of the landing gear and general area. Check the gear strut for proper inflation. There should be approximately 3 in. (8 cm) of strut exposure under a normal static load. Also, check for hydraulic leaks. Check the integrity of the gear door, and check the tire for cuts, wear, and proper inflation. Make a visual check of the brake block and disc.

4.9 PREFLIGHT CHECK (4.5a) (Continued)

4.9d Nose Section (4.5a)

Check the general condition of the nose section; look for oil or fluid leakage and that the cowling fasteners are secure. The upper forward cowling latches consist of three slot type latches on the right and three on the left side of the cowling. Prior to flight, visually verify that each latch fastener is properly fastened. When the latch is properly fastened, the slot will be in the horizontal position and aligned with indicator marks on the cowling, and the indicator pin in the center of the slot will be extended into the slot. Open the right side cowling door and check general condition of the linkage, hoses, and wiring, then close and secure the door. Remove the outlet and exhaust covers, and verify the generator/alternator cooling air inlet is clear of obstructions. Check the exhaust stacks for cracks and that they are securely attached. Verify that the engine and oil cooler air inlets and outlets are clear of obstructions. The propeller spinner and propeller should be checked for detrimental nicks, cracks, or other defects. Rotate the propeller and listen for noises and check for binding. Verify that the landing light is clean and intact.

Remove the chock and check the nose gear strut for proper inflation. There should be approximately 2.7 in. (6.8 cm) of strut exposure under a normal static load. Check the tire for cuts, wear, and proper inflation. Check the integrity of the gear doors. Drain the fuel sumps through the quick drains located under the aft nose section, making sure that enough fuel has been drained to ensure that all water and sediment is removed and to verify proper fuel type. The fuel system should be drained daily prior to the first flight and after each refueling.

Open the left cowl door and visually check the oil level. If low, refer to Section 8 for servicing.

Oil quantity may be checked either by the sight gage or the dipstick (refer to Section 8 for procedures). Verify the oil filler cap is closed and the locking tab is down. Check the alternator and air conditioner drive belts for tension and excessive wear. Verify no leaks and that the brake fluid reservoir cap is secure. Close and secure the cowl door.

4.9 PREFLIGHT CHECK (4.5a) (Continued)

4.9e Left Wing (4.5a)

Check that the wing surface and control surfaces are clear of ice, frost, snow or other extraneous substances. Next, make a check of the landing gear area. Check the gear strut for proper inflation. There should be approximately 3 in. (8 cm) of strut exposure under a normal static load. Also, check for hydraulic leaks. Check the integrity of the gear door and check the tire for cuts, wear, and proper inflation. Make a visual check of the brake block and disc. Remove the tiedown and chock.

If installed, remove the cover from the pitot head and verify that it is clear of obstructions. Check the condition of the deice boot for any nicks or tears and verify that the stall strips are securely fastened. Check the stall warning vane for obstructions and freedom of movement. Check that all vortex generators are installed and in good condition.

CAUTION

During the preflight inspection, if a total of more than 5 vortex generators are damaged or missing, the aircraft is not airworthy.

Open the fuel cap and visually check the fuel quantity. Replace the cap securely. Check and verify that the fuel tank vent is clear of any obstructions.

Check the wing tip and lights for damage. Static wicks should be firmly attached and in good condition. Check the aileron, hinges, and flap for damage and operational interference.

4.11 BEFORE STARTING ENGINE (4.5b)

When all passengers are on board, the pilot should check that the cabin door is properly closed and latched, and visually check that all four door pin indicators are green.

WARNING

Do not initiate any flight if all four door pin indicators are not green and/or the "DOOR AJAR" annunciator is illuminated.

Seats should be adjusted and locked in position. Seat belts on empty seats should be snugly fastened. All passengers should fasten their seat belts and shoulder harnesses. A pull test of the inertia reel locking restraint feature should be performed.

Before starting the engine, verify the parking brake is set and the area around the airplane is clear of personnel and equipment. Verify the Mic Select switch is in the BOOM position.

Verify the firewall shutoff valve is open (IN position) and the cover is closed. The bleed air lever should be closed (OUT position). The power lever should be in the IDLE position and the condition lever should be in CUTOFF/FEATHER. Check that the manual override lever (MOR) is FULL AFT and locked in place. Verify the ECS switch, cabin comfort controls, and electrical switches are in the OFF positions. Check the circuit breaker panels and verify circuit breakers are in. The avionics switch should be OFF.

Push ON the emergency ground clearance switch and verify activation of the No. 1 Nav/GPS, the audio panel, and illumination of the landing gear down indicators, standby airspeed, altitude and attitude indicators, and the magnetic compass.

If required, connect the external power unit to the aircraft.

Turn the battery switch ON unless external power is being applied, in which case the battery switch should be OFF.

Press the fire detection switch and verify the red "ENGINE FIRE" annunciator is illuminated. Move TAS toggle switch to STANDBY.

Verify that all the annunciators illuminate by selecting TEST on the annunciator. In addition, the landing gear warning horn should sound. (The landing gear warning horn can be silenced by pressing the landing gear warning horn mute switch, if installed, and verifying the switch illuminates.)

NOTE

If equipped with the auto dimming feature on the annunciator panel, verify operation in the full bright mode.

4.11 BEFORE STARTING ENGINE (4.5b) (Continued)

Move ADAHRS 1 / 2 switch to the center position. Verify that the PFD displays the correct aircraft model in the center of the display.

Verify that the alternate static system valve is in the normal (DOWN) position. Drain the pitot and static systems using drain valves located on both the right and left cockpit lower side panels next to the crew seats (two valves on the pilot's side and four on the copilot's side).

Set the PFD Coupled/Uncoupled switch to the proper position for the flight.

Check and verify exceedances displayed on the MFD.

NOTE

Refer to Section 2, Limitations, Paragraph 2.7, Power Plant Limitations, Table 2-1, for disposition of engine exceedances.

Set the fuel totalizer for the current fuel load. Verify the fuel imbalance falls within the maximum allowed per Section 2.7.

4.13 ENGINE START (4.5c)

4.13a Engine Start - Using Airplane Battery (4.5c)

Check the voltmeter for output of 24 to 26 Volts.

NOTE

For warm weather operation engine starts may be attempted with a battery voltage of 23.5 volts minimum. Observe the engine start ITT limitation, Ng minimum speed of 13% and ensure combustion occurs within 10 seconds after moving the condition lever to run. Failure to observe these limitations can result in damage to the engine.

Select MAN on the fuel pump switch and verify the left and right fuel pump annunciators illuminate. Select the ignition switch to MAN and verify the ignition annunciator illuminates.

Verify area around propeller is clear. Verify the start mode switch is in the AUTO position (light in the switch is extinguished).

Lift cover and push start switch to ENGAGE the starter. Check that oil pressure rises, and Ng stabilizes above 13%.

Move the condition lever to RUN.

Monitor ITT to make sure the temperature does not exceed the maximum of 1000°C for more than 5 seconds.

If combustion is not initiated within 10 seconds of moving the Condition Lever to Run then:

Move the condition lever to CUTOFF/FEATHER and push the start mode switch to MAN/STOP. Allow a minimum of 30 seconds for fuel draining, then refer to Dry Motoring Run, Section 4.5d.

Verify that the starter automatically disengages at 56% Ng. If the starter does not automatically disengage at 56% Ng, push the start mode MAN/STOP switch. Verify Ng is stable above 60% and prop rpm (Np) is 1200 rpm or above.

Select the generator ON and check for an indication of positive amps, 28 Volts, and GENERATOR INOP annunciator extinguished. Select the alternator ON and verify the ALTERNATOR INOP annunciator has extinguished and in it's standby state is indicating zero(s) on the display. Select the fuel pump switch to AUTO and the ignition switch to OFF. Monitor oil pressure to verify a minimum of 60 psi.

4.13 ENGINE START (4.5c) (Continued)

4.13b Engine Start (Manual Mode) - Using Airplane Battery (4.5c)

Check the voltmeter for output of 24 to 26 Volts.

NOTE

For warm weather operation engine starts may be attempted with a battery voltage of 23.5 volts minimum. Observe the engine start ITT limitation, Ng minimum speed of 13% and ensure combustion occurs within 10 seconds after moving the condition lever to run. Failure to observe these limitations can result in damage to the engine.

Select MAN on the fuel pump switch and verify the left and right fuel pump annunciators illuminate. Select the ignition switch to MAN and verify the ignition annunciator illuminates. Select manual mode by depressing the start mode switch and verify the switch light is illuminated.

Verify area around propeller is clear. Lift the starter guard cover and press and ***hold*** the start switch to ENGAGE the starter. Check that oil pressure rises, and Ng increases and stabilizes above 13%. Once Ng stabilizes, move the condition lever to RUN. Monitor ITT to make sure the temperature does not exceed the maximum of 1000°C for more than 5 seconds.

If combustion is not initiated within 10 seconds of moving the Condition Lever to Run then:

First move the condition lever to CUTOFF/FEATHER then release the starter. Allow a minimum of 30 seconds for fuel draining, then refer to Dry Motoring Run, Section 4.5d.

If the start is proceeding normally, release the starter switch at 56% Ng and verify the starter annunciator is extinguished. Verify Ng is stable above 60% and prop rpm (Np) is 1200 rpm or above.

Select the generator ON and check for an indication of positive amps, 28 Volts, and GENERATOR INOP annunciator extinguished. Select the alternator ON and verify the ALTERNATOR INOP annunciator has extinguished and in it's standby state is indicating zero(s) on the display. Select the fuel pump switch to AUTO and the ignition switch to OFF. Monitor oil pressure to verify a minimum of 60 psi.

4.13 ENGINE START (4.5c) (Continued)

4.13c Engine Start - Using External Power (4.5c)

Verify the battery switch is OFF.

Connect the external power unit to the aircraft and check that the voltmeter remains stable at 24 to 29 Volts.

NOTE

For engine starting, the external power source must be capable of providing 24 to 29 Volts and 1200 Amps.

Select MAN on the fuel pump switch and verify the left and right fuel pump annunciators illuminate. Select MAN on the ignition switch and verify the ignition annunciator illuminates.

Verify area around propeller is clear. Verify the start mode switch is in the AUTO position (light in the switch is extinguished).

Lift cover and push start switch to ENGAGE the starter. Check that oil pressure rises, and Ng stabilizes above 13%. Move the condition lever to RUN.

Monitor ITT to make sure the temperature does not exceed the maximum of 1000°C for more than 5 seconds.

If combustion is not initiated within 10 seconds of moving the Condition Lever to Run then:

Move the condition lever to CUTOFF/FEATHER and push the start mode switch to MAN/STOP. Allow a minimum of 30 seconds for fuel draining, then refer to Dry Motoring Run, Section 4.5d.

Verify that the starter automatically disengages at 56% Ng. If the starter does not automatically disengage at 56% Ng, push the start mode MAN/STOP switch. Verify Ng is stable above 60% and prop rpm (Np) is 1200 rpm or above.

Select the fuel pump switch to AUTO and the ignition switch to OFF. Monitor oil pressure to verify a minimum of 60 psi.

Turn the battery switch ON then disconnect the external power unit from the aircraft.

Select the generator ON and check for an indication of positive amps, 28 Volts, and GENERATOR INOP annunciator extinguished. Select the alternator ON and verify the ALTERNATOR INOP annunciator has extinguished and in it's standby state is indicating zero(s) on the display.

4.15 DRY MOTORING RUN (4.5d)

After allowing a minimum of 30 seconds for fuel to drain, move the power lever to IDLE and the condition lever to CUTOFF/FEATHER. The fuel pump switch and the ignition switch should be selected OFF. Turn the battery switch ON and select MANUAL on the start mode switch. The light in the start mode switch should be illuminated. Select and hold the starter switch to ENGAGE for 15 seconds, then release the starter switch to OFF.

NOTE

Observe starter cooling limits (Section 2.9).

4.17 BEFORE TAXIING (4.5e)

Select the avionics switch to ON.

Select pitot heat switch ON, check operation then select OFF. Note proper operation of pitot heat by verifying amber pitot heat annunciator extinguished and monitoring the volt/ammeter for a corresponding voltage drop and amperage rise.

The navigation and strobe lights and the taxi/rec lights should be utilized as required. The cabin comfort controls can be set as desired.

Check that the radios and avionics are set and functioning as required. (Utilize the avionics self test operations where applicable.) Select the Aux page on the MFD and verify the correct GPS is selected. Retract the flaps. Turn the autopilot master switch to FD/AP and verify the autopilot self test is completed per procedures in the S-TEC Airplane Flight Manual Supplement located in Section 9. Perform the Manual Electric Trim Preflight Check per procedures defined in the MAGIC 1500 Autopilot Airplane Flight Manual Supplement located in Section 9. Set the electric elevator trim in takeoff range. Verify the yaw damp switch is OFF.

Position the bleed air lever to the open position (IN). Verify the cabin pressure dump switch is in the pressurize position (light in switch extinguished and switch in the out position). Select NORMAL on the ECS switch and set the pressurization control to field elevation plus 500 feet and the rate control knob to the 9 o'clock position.

NOTE

Maximum cooling on the ground may be achieved by operating with the bleed air lever in the OUT (closed) position and the ECS control selected OFF.

4.17 BEFORE TAXIING (4.5e) (Continued)

Select TEST on the standby attitude indicator switch and verify the standby attitude indicator annunciator illuminates, then select ON. Pull the ERECT knob to erect the gyro. Set the altimeter/standby altimeters as required. Press the stall warning press-to-test button and verify activation of the stall aural warning horn.

If installed, conduct TAWS self-test. Verify pilot and copilot ADAHRS have initialized prior to taxi.

Release the parking brake.

4.19 TAXIING (4.5f)

After making sure the taxi area is clear, slowly advance the power lever. Taxi a few feet forward and apply the brakes to determine their effectiveness. While taxiing, make slight turns to check the effectiveness of the steering. Check the flight instruments for proper operation.

CAUTION

Propeller operation below 1200 rpm is prohibited.

NOTE

Beta range (aft of idle detent) may be used during taxi to control taxi speed and reduce wear on brakes.

4.21 ENGINE RUN UP (4.5g)

Make sure the parking brake is set. Apply brakes with rudder pedals, then pull out the parking brake control. Advance the power lever to attain 1900 RPM. Move the friction lever forward to apply throttle friction so that the throttle will maintain a set position.

Lift the cover, push and hold the overspeed governor test switch and observe approximate 60 RPM drop in Np. Release the overspeed governor test switch and check that Np returns and stabilizes at 1900 RPM.

Move the power lever to IDLE and depress and hold the reverse lockout switch for a minimum of 5 seconds. Keeping the reverse lockout switch depressed, lift and retard the power lever toward beta and reverse. Beta and reverse should not be attainable. Release the reverse lockout switch and repeat lifting and retarding the power lever aft to beta and reverse. Beta and reverse should now be attainable.

Return the power lever to IDLE. Select the generator OFF, verify the alternator picks up the load. Verify the red GEN INOP annunciator is illuminated. Select the generator ON. Verify the red GEN INOP annunciator is extinguished. Select the alternator OFF, verify the generator picks up the load and the red ALT INOP annunciator is illuminated. Select the alternator ON, verify the red ALT INOP annunciator is extinguished.

NOTE

Refer to Section 9, Supplement 6, for Meridian Aircraft Flight Into Known Icing (FIKI), prior to any flight operations (takeoff, cruise, landing, etc.).

4.23 BEFORE TAKEOFF (4.5h)

Make sure seat backs are erect and seats are adjusted and locked in position. Armrests should be stowed and seat belts and harnesses should be fastened and adjusted. Verify the generator and alternator are ON with a positive indication of amps.

The bleed air lever should be IN (open), the ECS switch should be set to NORMAL, the pressurization controller should be set to 500 feet above the airport pressure altitude, the rate control should be set to the approximate 9 o'clock position, and the DUMP/NORM switch should be set to NORM and the cover closed. Verify fuel temperature is within specified limitations.

Select the fuel pump switch and the ignition switch to the manual position. Select windshield heat as required. Select pitot heat ON. Select nav lights and strobe lights ON and the landing light and taxi/rec lights as required. The landing light is only usable when the landing gear is extended. For maximum aircraft visibility by other aircraft in flight, select pulse mode taxi/rec lights.

Check all the flight instruments and set as required. Check the annunciator panel lights and consider any lights that are illuminated. Check all the engine instruments to verify the engine indications are within the normal operating range. Radios and avionics should be set as required. Verify elevator trim and rudder trim are in the takeoff range, and flaps are up. Check the flight controls for free and proper travel.

NOTE

Refer to Section 9, Supplement 6, for Meridian Aircraft Flight Into Known Icing (FIKI), prior to any flight operations (takeoff, cruise, landing, etc.).

4.25 TAKEOFF (4.5i)

WARNING

Positioning the power lever aft of the flight idle stop in flight is prohibited. Such positioning may cause loss of airplane control or may result in an engine overspeed condition and consequent loss of engine power.

NOTE

Increasing airspeed will cause torque to increase.

NOTE

Demonstrated crosswind component is 17 knots.

4.25a Normal Takeoff (0° Flaps) (4.5i)

Align the airplane with the runway and apply the brakes. Move the power lever to takeoff power and release the brakes. Scan the engine instruments to verify all indications are within the normal operating range. Accelerate to attain rotation speed (V_R) of 85 KIAS. After liftoff, adjust the airplane attitude as required to attain the obstacle clearance speed of 100 KIAS.

After liftoff and a positive rate of climb is established, retract the landing gear. Select the fuel pump and ignition switch to the AUTO position and turn OFF the landing light. The taxi/rec lights may be utilized as required. Turn TAS ON.

NOTE

The Ignition may be operated continuously and can be used for takeoff, landing, or flight into precipitation. There is no time limitation, although continuous operation will reduce component life.

4.25 TAKEOFF (4.5i) (Continued)

4.25b Short Field Takeoff Performance (20° Flaps) (4.5i)

Set the flaps to the 20° position. Align the airplane with the runway and apply the brakes. Set the power lever to takeoff power (MCP) and release the brakes. Monitor the engine instruments to verify all indications are within the normal operating range. Accelerate to attain rotation speed of 85 KIAS. After liftoff, adjust the airplane attitude as required to attain the obstacle clearance speed of 95 KIAS.

After liftoff and a positive rate of climb is established, retract the flaps and the landing gear. Select the fuel pump and ignition switch to the AUTO position and turn the landing light OFF. The taxi/rec lights may be utilized as required. Turn TAS ON.

NOTE

The Ignition may be operated continuously and can be used for takeoff, landing, or flight into precipitation. There is no time limitation, although continuous operation will reduce component life.

4.27 CLIMB (4.5j)

4.27a Maximum Continuous Power Climb (4.5j)

Position the power control lever to maintain maximum continuous power climb. Use ice protection equipment as required. Monitor the engine instruments: torque 1313 ft. lb. max, ITT (770°C max.), and Ng (101.7% max.). Adjust the airplane attitude to obtain the best rate of climb speed of 125 KIAS. Check that the pressurization system controls are properly set, and continuously monitor.

4.27b Cruise Climb (4.5k)

Position the power lever to maintain maximum continuous power. Use ice protection equipment as required. Monitor the engine instruments: torque 1313 ft. lb. max, ITT (770°C max.), and Ng (101.7% max.). Adjust the airplane attitude to obtain the best cruise climb speed of 145 KIAS (to 20,000 feet) or 135 KIAS (20,000 to 30,000 feet). Check that the pressurization system controls are properly set, and continuously monitor. Check the altimeters.

4.29 CRUISE (4.51)

The cruising speed is determined by many factors including power setting, altitude, temperature, loading, and equipment installed on the airplane. Also, weather conditions should be continuously monitored, with special attention to conditions which could lead to icing.

When leveling off at cruise altitude, determine the cruise power setting by referring to the power tables located in Section 5, Performance. Continuously monitor the engine and fuel instruments to verify all indications are within the normal operating range and that fuel is being properly managed. Check that the pressurization system controls are properly set, and continuously monitor. Verify fuel temperature/OAT are within specified limitations. Adjust the cabin comfort controls as desired.

4.31 FLIGHT IN ICING CONDITIONS

Reference Section 9, Supplement 6, for Meridian Aircraft Flight Into Known Icing (FIKI).

4.33 DESCENT (4.5n)

Pull the windshield defrost control on and turn the windshield heat to DEFOG. Position the power lever to obtain the desired torque required for the descent. Check the altimeter and standby altimeter. The cabin pressure controller should be set to field elevation +500 feet. The cabin rate control should be set to approximately the 9 o'clock position and the cabin comfort controls should be set as desired to obtain comfortable conditions.

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4.35 BEFORE LANDING (4.5o)

4.35a Approach Check (4.5o)

Set the altimeter and standby altimeter. Verify that the cabin pressurization is set. Select the fuel pump and ignition switches to MANUAL. Verify fuel quantity and balance. Make sure seat backs are erect and seats are adjusted and locked in position. Armrests should be stowed and seat belts and harnesses should be fastened and adjusted. The landing gear may be extended and the flaps may be set to 10° at airspeeds up to 168 KIAS maximum.

NOTE

During landing gear operation it is normal for the HYDRAULIC PUMP annunciator light to illuminate until full system pressure is restored.

4.35b Landing Check (4.5o)

Verify 3 green lights indicating that the landing gear are down and locked. Pump the toe brakes to ensure that the system is capable of uniform braking during landing rollout.

WARNING

After pumping several times, if one or both toe brakes are inoperative, DO NOT attempt landing on a short field.

As the airspeed is reduced to 118 KIAS or lower, the flaps can be set to 36°. Set power (approximately 280 ft. lb. torque for a 3° approach) to maintain an airspeed of 85 KIAS.

NOTE

Landing distance performance was established by maintaining a power on (280 ft. lb. torque), stabilized 3° approach at 85 KIAS, and reducing power to idle during the flare.

The autopilot and the yaw damper must be disengaged for landing. Use TAS as required.

4.37 LANDING (4.5p)

NOTE

In crosswind conditions, the nosewheel may not be aligned with the runway as the wheel touches down because of opposite rudder input. To prevent swerving in the direction the nosewheel is offset, the rudder must be promptly centered just as the nosewheel touches down.

4.37a Normal Technique (4.5p)

When performing a normal landing, reduce the power to IDLE during the flare. *Touchdown should be made with the main wheels first.* After touchdown (all three landing gear), apply moderate braking, and lift and retard the power lever to the beta position.

NOTE

Landing distance was determined by selecting beta immediately after touchdown (all three landing gear) and applying moderate braking.

4.37b Short Field Technique (4.5p)

When performing a short field landing, reduce the power to IDLE during the flare. *Touchdown should be made with the main wheels first.* After touchdown (all three landing gear), apply moderate braking, and lift and retard the power lever to maximum reverse. Move the power lever to IDLE before the airplane comes to a stop.

4.39 BALKED LANDING (Go-around) (4.5q)

To initiate a go-around from a landing approach, apply takeoff torque and adjust the airplane attitude to obtain a climb airspeed of 85 KIAS. After a positive climb is established and obstacle has been cleared, retract the flaps to 20° and accelerate to a climb airspeed of 100 KIAS. Retract the flaps to 0° and then retract the landing gear. Verify aircraft heading against the correction card.

4.41 AFTER LANDING (4.5r)

When clear of the active runway, retract the flaps. Turn OFF the strobe lights and the ice protection equipment. The landing and taxi lights may be used as required. Turn the fuel pump to AUTO, and the ignition and ECS to OFF. Turn the weather radar to STBY and the transponder to STBY or ALT, as required.

4.43 SHUTDOWN (4.5s)

WARNING

If there is evidence of fire within the engine after shutdown, proceed immediately with the Dry Motoring Run Procedure, Section 4.5d.

CAUTION

When the condition lever is selected to CUTOFF/FEATHER, the propeller should [illegible] (20 to 30 seconds) in the feather position. If the [illegible] continues to windmill for an extended period, a [illegible] system failure has occurred. Investigate and correct the problem prior to the next flight.

With the power lever in IDLE and the airplane at a complete stop, set the parking brake. Turn the cabin comfort controls and the exterior lighting switches to OFF. The fuel pump, ignition, and avionics switches should all be set to OFF. Also, turn the generator and alternator switches to OFF.

NOTE

Allow ITT to stabilize at least two minutes at idle.

The condition lever can now be moved to CUTOFF/FEATHER and the battery switch can be turned to OFF. The bleed air lever should be closed (OUT position). Turn the standby attitude indicator OFF.

The aileron and elevator controls should be secured by looping the safety belt through the control wheel and pulling it snug. Turn the pilot's emergency oxygen system OFF. Wheel chocks should be positioned in place and tiedowns should be secured to the main landing gear and to the tail skid. The rudder is held in position by its connections to the nose wheel steering and normally does not have to be secured.

Place protective covers on all air inlets, exhaust openings and pitot heads.

4.45 STALLS

The stall characteristics of the Meridian are conventional. An approaching stall is indicated by a stall warning horn which is activated at least 5 knots above the actual stall. Mild airframe buffeting and pitching may also precede the stall.

The stalling speed at maximum gross weight with power off, landing gear extended, and full flaps is 69 KIAS. With the landing gear retracted and flaps up, stall speed is increased to 79 KIAS. Loss of altitude during stalls can be as great as 900 feet, depending on configuration and power.

NOTE

The stall warning system is inoperative with the battery and generator/alternator switches OFF.

During preflight, the stall warning system should be checked by turning the battery switch ON and pressing the stall warning test switch to determine if the horn is actuated.

4.47 TURBULENT AIR OPERATION

In keeping with good operating practice, it is recommended that when turbulent air is encountered or expected, the airspeed be reduced to maneuvering speed to reduce the structural loads caused by gusts and to allow for inadvertent speed build-ups which may occur as a result of the turbulence or of distractions caused by the conditions (refer to paragraph 2.3 for maneuvering speeds).

4.49 CABIN PRESSURIZATION

Cabin pressurization system controls, gauges and switches are located on the lower left instrument panel. (Refer to Section 7, Figure 7-9.)

The cabin pressurization system controls, gauges and switches are as follows:

(a) Cabin Altitude Controller with Rate of Change Control
(b) Cabin Pressure Altitude/Differential Pressure/Rate of Climb Gauge
(c) Cabin Pressure Dump/Normal Switch
(d) Cabin Pressurization Control

4.49 CABIN PRESSURIZATION (continued)

Set ***cabin*** altitude (outer scale) on the cabin altitude controller to 500 feet above the field pressure altitude before takeoff. (Cabin pressurization will begin as the cabin passes through the altitude selected.) If no further adjustments are made, cabin altitude will remain at the selected altitude until maximum cabin differential (5.5 PSI) is reached, at which time the cabin altitude will begin to climb until at 30,000 feet aircraft pressure altitude the cabin pressure altitude will be approximately 10,630 feet.

For flight below an airplane altitude of 12,500 feet, the cabin altitude control should be left at the takeoff setting. For flight above 12,500 feet, at which point maximum differential will be achieved, smoother operation will result by setting the ***cabin*** altitude (outer scale) on the cabin altitude controller to 500 feet above field elevation for takeoff. Once the cabin has begun to pressurize and the controller has captured isobaric control, reset the ***aircraft*** altitude (inner scale) on the cabin altitude controller to 500 feet above the cruise altitude and adjust the cabin rate of climb as desired. The normal 9 o'clock position should provide a cabin rate of climb of approximately 500 feet per minute. No additional adjustment should be required prior to descent unless cruise altitude is changed, at which point the ***aircraft*** altitude (inner scale) should be reset to 500 feet above the new cruise altitude.

To descend for landing be certain that the selected ***cabin*** altitude (outer scale) is higher than the pressure altitude of the landing field. Shortly after letdown is initiated, set the ***cabin*** altitude (outer scale) to 500 feet above the pressure altitude of the landing field and adjust the rate of control high enough to allow the cabin to descend to the landing setting before the aircraft descends to that altitude. For normal letdown the rate knob should be at the 9 o'clock position. A higher setting should be selected for rapid descents so that the aircraft altitude does not catch up with the cabin altitude.

WARNING

Do not land with aircraft pressurized.

4.51 CABIN COMFORT CONTROL PANEL OPERATION

4.51a Cabin Comfort Control Panel Controls and Switches

Cabin comfort controls and switches are located at the bottom of the center instrument panel below the radar display in the cabin comfort control panel. (Refer to Section 7, Figure 7-9.)

The cabin comfort system controls and switches from left to right on the panel are:

- Airconditioner (AIR COND) ON switch
- BLOWER HI/LOW and OFF switch
- VENT ON switch
- CLIMATE CONTROL - Auto Rotary switch
- Mode switch (AUTO - MANUAL)
- MANUAL WARM/COOL switch

4.51b Auto Temp Operation

Set the ECS selector on the ECS CABIN COMFORT panel to the NORM position.

Under normal conditions, temperature will be maintained automatically. For automatic operation, set the mode switch to AUTO. Set the temperature control to the desired temperature. Set the blower fan switch to either HI or LOW as desired.

4.51 CABIN COMFORT CONTROL PANEL OPERATION (continued)

4.51c Manual Temp Operation

NOTE

Maximum heat can be obtained in the manual mode by positioning the ECS selector to HIGH. This position should only be used on the ground with ambient temperature less than 20°F (-7°C). Should the bleed overtemperature annunciator light illuminate, manually decrease the temperature by pulsing the WARM/COOL switch to the cool position.

For maximum airconditioning, hold the manual WARM/COOL switch to the cool position for 45 seconds. The switch may be pulsed to the WARM position to control the cabin temperature desired.

To meet POH performance, the ECS selector must be in the NORM position.

4.51d Maximum Cabin Cooling

On Ground

On the ground, maximum cabin cooling may be obtained by placing the bleed air lever OUT (closed) position, the ECS selector OFF, Air Conditioner ON and the blower fan to HI.

In Flight

Unpressurized flights can be conducted with the bleed air lever pulled OUT (closed) and the ECS selector OFF. This will provide maximum ventilation. Set the blower fan to HI or LO as desired and turn the vent fan ON.

4.53 NOISE LEVEL

The corrected noise level of this aircraft is 76.8 dB(A) as measured per ICAO Annex to Volume 1, Chapter 10 and FAR 36 Appendix G, Amendment 22.

No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

The above statement notwithstanding, the noise level stated above has been verified by and approved by the Federal Aviation Administration in noise level test flights conducted in accordance with F.A.R. 36, Noise Standards - Aircraft Type and Airworthiness Certification. This aircraft model is in compliance with all F.A.R. 36 noise standards applicable to this type.

4.55 RESERVED

4.57 HIGH ALTITUDE OPERATION

During high altitude operations above approximately 28,500 ft. MSL, the cabin altitude will exceed 10,000 ft. MSL and an amber "CABIN ALT 10K" annunciator light will illuminate continuously accompanied by a warning horn that the pilot can mute. This is an indication for the pilot to:

- Be vigilant about monitoring the cabin altitude.
- Check the bleed air selector is ON.
- Check the cabin dump switch is OFF.
- Check the cabin altitude selector is properly set to 500 ft. above the destination airport altitude.
- Check the pilot's emergency oxygen system charge (1850 psig).

If the cabin altitude rises above 12,000 ft. MSL, a red "CABIN ALT" annunciator light will illuminate, a warning horn that the pilot can mute will sound and the emergency pressurization system will activate, indicating the pilot should:

- Don the pilot's emergency oxygen mask and insure that oxygen is flowing.
- Descend to an altitude where the red "CABIN ALT" annunciator light extinguishes.

  AND

- Make an emergency descent if required.

CAUTION

A fully charged (1850 psig) pilot supplemental demand flow oxygen system contains a supply (approximately 30 minutes) of oxygen for the pilot to breath in the "normal" setting for a duration in excess of that required for an emergency descent. The minimum duration of oxygen required for an emergency descent to an appropriate altitude for unpressurized flight is indicated on the oxygen gauge by a yellow arc.

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SECTION 5

PERFORMANCE

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SECTION 5

PERFORMANCE

5.1 GENERAL

All of the required (FAA regulations) and complementary performance information is provided by this section.

True airspeed may vary ±1% due to tolerances in power, airspeed and temperature indications.

Performance information associated with those optional systems and equipment which require handbook supplements is provided by Section 9 (Supplements).

Performance is predicated on NORMAL ECS setting. Setting ECS to HI, while maintaining a constant power, will increase fuel flow by approximately 9 pph, or, if ITT is maintained at the temperature limit, power will be reduced by 8%.

While some performance charts show information below -54°C, performance information presented in this chapter is valid for the range from +50°C (122°F) to -54°C (-65°F) only.

5.2 AIRCRAFT CONFIGURATION

Performance depicted in Section 5 is applicable to aircraft equipped with a weather radar pod, main landing gear fairings, 2 communications antennas, 2 GPS antennas, 1 dual purpose navigation antenna, 1 radar altitude antenna, 2 transponder antennas, 1 marker beacon antenna, 1 stormscope antenna, 1 ADF antenna, 1 DME antenna and 1 AM/FM radio antenna.

5.3 INTRODUCTION - PERFORMANCE AND FLIGHT PLANNING

The performance information presented in this section is based on measured Flight Test Data corrected to I.C.A.O. standard day conditions, or non parametric coefficients, and analytically expanded for the various parameters of weight, altitude, temperature, etc.

The performance charts are unfactored and do not make any allowance for varying degrees of pilot proficiency or mechanical deterioration of the aircraft. This performance, however, can be duplicated by following the stated procedures in a properly maintained airplane.

5.3 INTRODUCTION - PERFORMANCE AND FLIGHT PLANNING (continued)

Effects of conditions not considered on the charts must be evaluated by the pilot, such as the effect of winds aloft on cruise and range performance.

REMEMBER! To get chart performance, follow the chart procedures.

The information provided by paragraph 5.5 (Flight Planning Example) outlines a detailed flight plan using performance charts in this section. Each chart includes its own example to show how it is used.

WARNING

Performance information derived by extrapolation beyond the limits shown on the charts should not be used for flight planning purposes.

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5.5 FLIGHT PLANNING EXAMPLE

(a) Aircraft Loading

The first step in planning the flight is to calculate the airplane weight and center of gravity by utilizing the information provided by Section 6 (Weight and Balance) of this handbook.

The basic empty weight for the airplane as licensed at the factory has been entered in Figure 6-5. If any alterations to the airplane have been made affecting weight and balance, reference to the aircraft logbook and Weight and Balance Record (Figure 6-7) should be made to determine the current basic empty weight of the airplane.

Make use of the Weight and Balance Loading Forms (Section 6) and the C.G. Range and Weight graph (Figure 6-33) to determine the total weight of the airplane and the center of gravity position.

After proper utilization of the information provided, the following weights have been determined for consideration in the flight planning example.

The landing weight cannot be determined until the weight of the fuel to be used has been established. Refer to item (g) (1).

(1)	Basic Empty Weight	3380 lb
(2)	Occupants	520 lb
(3)	Baggage and Cargo	80 lb
	Total Zero Fuel Weight [(1) + (2) + (3)]	3980 lb
(4)	Fuel (6.7 lb/gal. x 135)	904.5 lb
(5)	Ramp Weight	4884.5 lb
(6)	Start, Taxi and Runup Weight	-43.0 lb
(7)	Takeoff Weight	4841.5 lb
(8)	Landing Weight (a)(5) minus (g)(1), (4884.5 lb minus 220 lb)	4664.5 lb

The total zero fuel weight is below the maximum of 4850 lbs.

The takeoff weight is below the maximum of 5092 lbs and the weight and balance calculations have determined the C.G. position within the approved limits. Refer to Figure 6-9.

5.5 FLIGHT PLANNING EXAMPLE (continued)

(b) Takeoff and Landing

Now that the aircraft loading has been determined, all aspects of the takeoff and landing must be considered.

All of the existing conditions at the departure and destination airport must be acquired, evaluated and maintained throughout the flight.

Apply the departure airport conditions and takeoff weight to the appropriate Takeoff Ground Roll and Takeoff Distance (Figures 5-41, 5-43, 5-45 and 5-47) to determine the length of runway necessary for the takeoff and/or obstacle clearance.

The landing distance calculations are performed in the same manner using the existing conditions at the destination airport and, when established, the landing weight.

The conditions and calculations for the example flight are listed below. The takeoff and landing distances required for the flight have fallen well below the available runway lengths.

	Departure Airport	Destination Airport
(1) Pressure Altitude	1000 ft	3500 ft
(2) Temperature	29°C	25°C
(3) Wind Component (Headwind)	10 KTS	5 KTS
(4) Runway Length Available	3400 ft	5000 ft
(5) Runway Gradient	2% up	2% up
(6) Takeoff and Landing Distance Required	2488 ft*	2205 ft**

* reference Figure 5-47
** reference Figure 5-131

5.5 FLIGHT PLANNING EXAMPLE (continued)

NOTE

The remainder of the performance charts used in this flight plan example assume a no wind condition. The effect of winds aloft must be considered by the pilot when computing climb, cruise and descent performance.

(c) Climb

The next step in the flight plan is to determine the necessary climb segment components.

The desired cruise pressure altitude and corresponding cruise outside air temperature values are the first variables to be considered in determining the climb components from the Fuel, Time, and Distance to Climb graph (Figures 5-55, 5-57, 5-59). After the fuel, time, and distance for the cruise pressure altitude and outside air temperature values have been established, apply the existing conditions at the departure field to graph (Figures 5-55, 5-57, 5-59). Now, subtract the values obtained from the graph for the field of departure conditions from those for the cruise pressure altitude.

The remaining values are the true fuel, time, and distance components for the climb segment of the flight plan corrected for field pressure altitude and temperature.

The following values were determined from the above instructions in the flight planning example.

(1)	Cruise Pressure Altitude	25000 ft
(2)	Cruise OAT	-20° C
(3)	Fuel to Climb (includes Start, Taxi and Takeoff) (152 lb. minus 48 lb.)	104 lb.*
(4)	Time to Climb (20 min. minus 0.7 min.)	19.3 min.**
(5)	Distance to Climb (54 nautical miles minus 1.3 nautical miles)	52.7 nautical miles***

* reference Figure 5-57
** reference Figure 5-55
***reference Figure 5-59

5.5 FLIGHT PLANNING EXAMPLE (continued)

(d) Descent

The descent data will be determined prior to the cruise data to provide the descent distance for establishing the total cruise distance.

Utilizing the cruise pressure altitude and OAT, determine the basic fuel, time, and distance for descent (Figures 5-115, 5-117, 5-119). These figures must be adjusted for the field pressure altitude and temperature at the destination airport. To find the necessary adjustment values, use the existing pressure altitude and temperature conditions at the destination airport as variables to find the fuel, time, and distance values from the graph (Figures 5-115, 5-117, 5-119). Now, subtract the values obtained from the field conditions from the values obtained from the cruise conditions to find the true fuel, time and distance values needed for the descent segment of the flight plan.

The values obtained by proper utilization of the graphs for the descent segment of the example are shown below.

(1) Fuel to Descend (50.1 lb. minus 10.7 lb.)	39.4 lb.*
(2) Time to Descend (16.6 min. minus 2.6 min.)	14 min.**
(3) Distance to Descend (60.2 nautical miles minus 8.2 nautical miles)	52 nautical miles***

(e) Cruise

Using the total distance to be traveled during the flight, subtract the previously calculated distance to climb and distance to descend to establish the total cruise distance. Refer to the appropriate Power Setting Table (refer to Figure 5-69) when selecting the cruise power setting. The established pressure altitude and temperature values and the selected cruise power should now be used to determine the true airspeed from the Power Setting tables (Figure 5-69). Interpolation may be required if altitude and/or temperature falls between cardinal values on power tables.

* reference Figure 5-117
** reference Figure 5-115
***reference Figure 5-119

5.5 FLIGHT PLANNING EXAMPLE (continued)

Calculate the cruise fuel consumption for the cruise power setting from the information provided by the Power Setting Table (refer to Figure 5-69).

The cruise time is found by dividing the cruise distance by the cruise speed and the cruise fuel is found by multiplying the cruise fuel consumption by the cruise time.

The cruise calculations established for the cruise segment of the flight planning example are as follows:

(1)	Total Distance	188 nautical miles
(2)	Cruise Distance (e)(1) minus (e)(5) minus (d)(3), (188 nautical miles minus 52.6 nautical miles minus 52 nautical miles)	83.4 nautical miles
(3)	Cruise Torque	1174 FT.-LB. maximum speed cruise
(4)	Cruise Speed	259 KTS TAS*
(5)	Cruise Fuel Consumption	255 pph*
(6)	Cruise Time (e)(2) divided by (e)(4). (83.4 nautical miles divided by 259 KTS)	0.32 hrs
(7)	Cruise Fuel (e)(5) multiplied by (e)(6) (255 pph multiplied by 0.32 hrs)	81.6 lb.

(f) Total Flight Time

The total flight time is determined by adding the time to climb, the time to descend and the cruise time. Remember! The time values taken from the climb and descent graphs are in minutes and must be converted to hours before adding them to the cruise time.

*reference Figure 5-69

5.5 FLIGHT PLANNING EXAMPLE (continued)

The flight time required for the flight planning example is shown below:

(1) Total Flight Time
(c)(4) plus (d)(2) plus (e)(6),
(0.32 hrs plus 0.23 hrs plus 0.32 hrs)
(19.3 min. plus 14 min. plus 19.2 min.) 0.87 hrs

(g) Total Fuel Required

Determine the total fuel required by adding the fuel to climb (includes fuel to start, taxi and runup), the fuel to descend, and the cruise fuel. When the total fuel (in pounds) is determined, divide this value by 6.7 lb/gal. to determine the total fuel in gallons used for the flight.

The total fuel calculations for the example flight plan are shown below.

(1) Total Fuel Required
(c)(3) plus (d)(1) plus (e)(7),
(15.5 gal. plus 5.9 gal. plus 12.2 gal.) 33.6 gal./225.1 lb.

5.7 PERFORMANCE GRAPHS

LIST OF FIGURES

5.7 PERFORMANCE GRAPHS (continued)

LIST OF FIGURES (continued)

5.7 PERFORMANCE GRAPHS (continued)

LIST OF FIGURES (continued)

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5.7 PERFORMANCE GRAPHS (continued)

LIST OF FIGURES (continued)

METRIC

5.7 PERFORMANCE GRAPHS (continued)

LIST OF FIGURES (continued)

METRIC (continued)

5.7 PERFORMANCE GRAPHS (continued)

LIST OF FIGURES (continued)

METRIC (continued)

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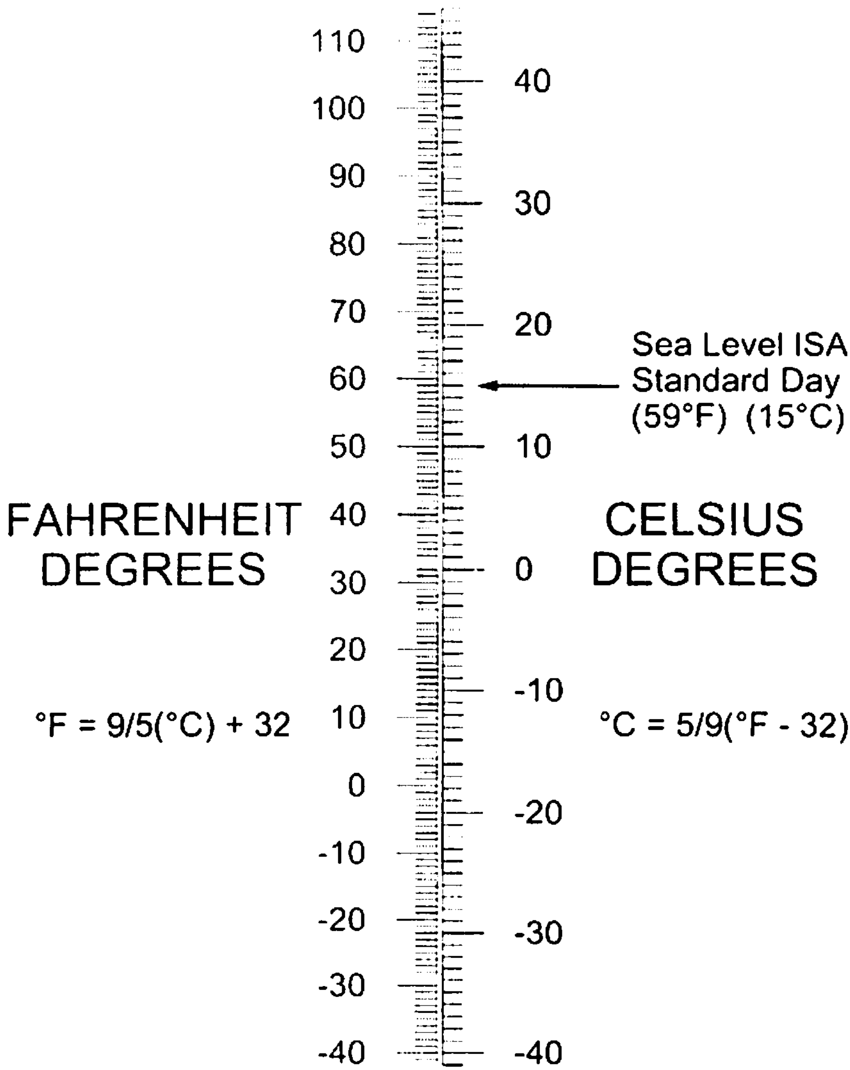
CONVERSION TABLE

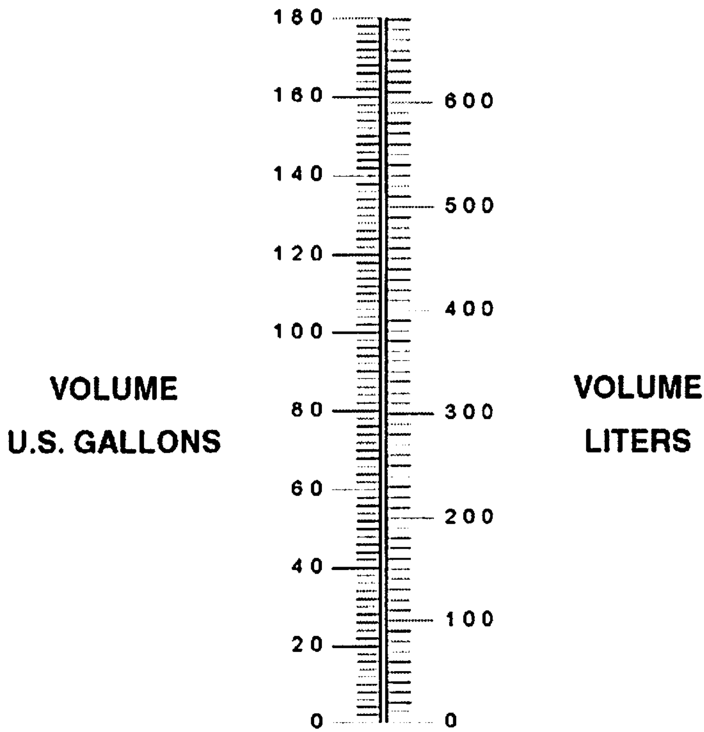
MULTIPLY	BY	TO OBTAIN
Feet	0.3048	Meters
Meters	3.2808	Feet
Gallons	3.7854	Liters
Liters	0.2642	Gallons
Pounds	0.4536	Kilograms
Kilograms	2.2046	Pounds
Inches of Mercury	33.8639	Millibars
Millibars	0.02953	Inches of Mercury

Example: 50 feet = 50 x 0.3048 meters = 15.24 meters
100 liters = 100 x 0.2642 gallons = 26.42 gallons

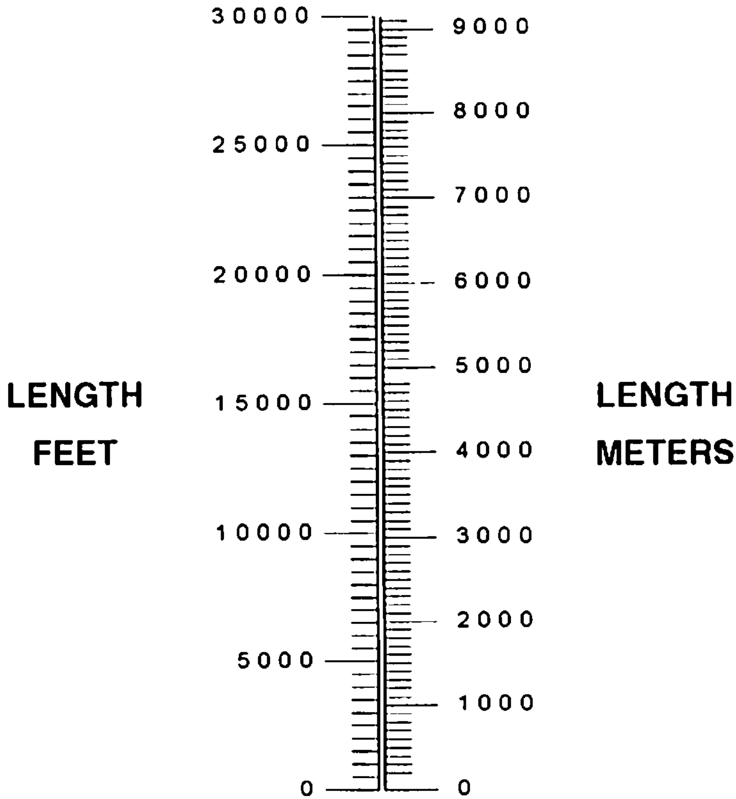
Conversion Table
Figure 5-1



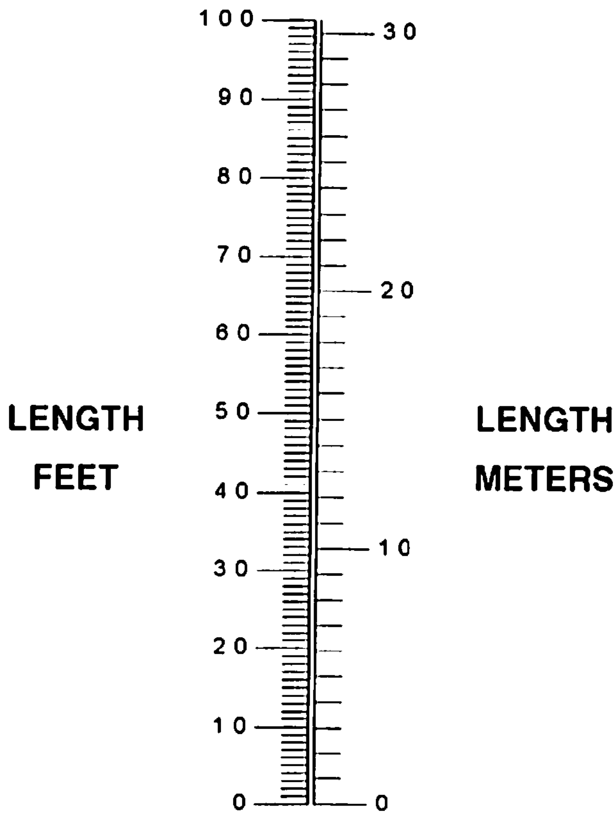
Temperature Conversion
Figure 5-2



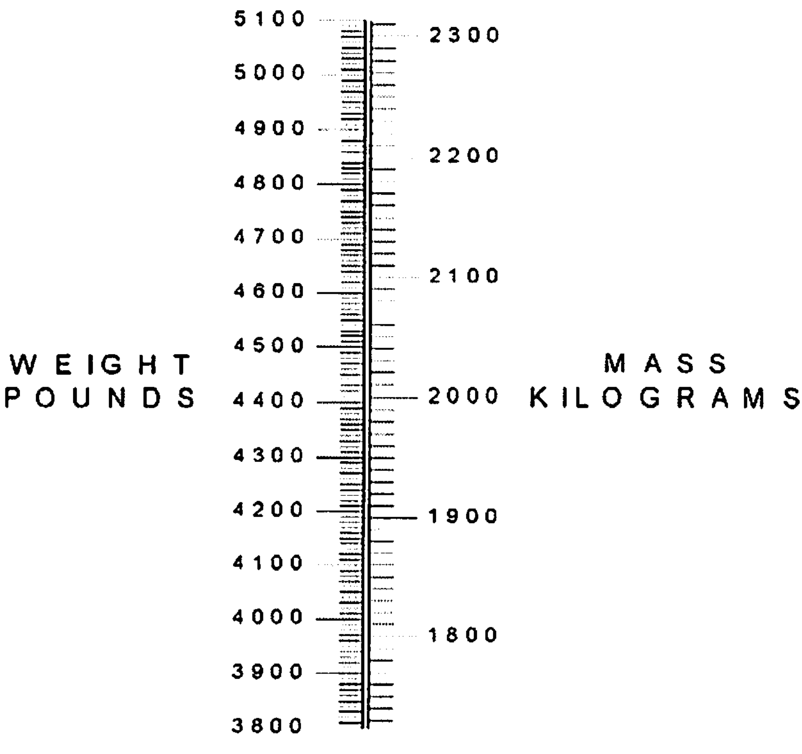
Volume Conversion
Figure 5-3



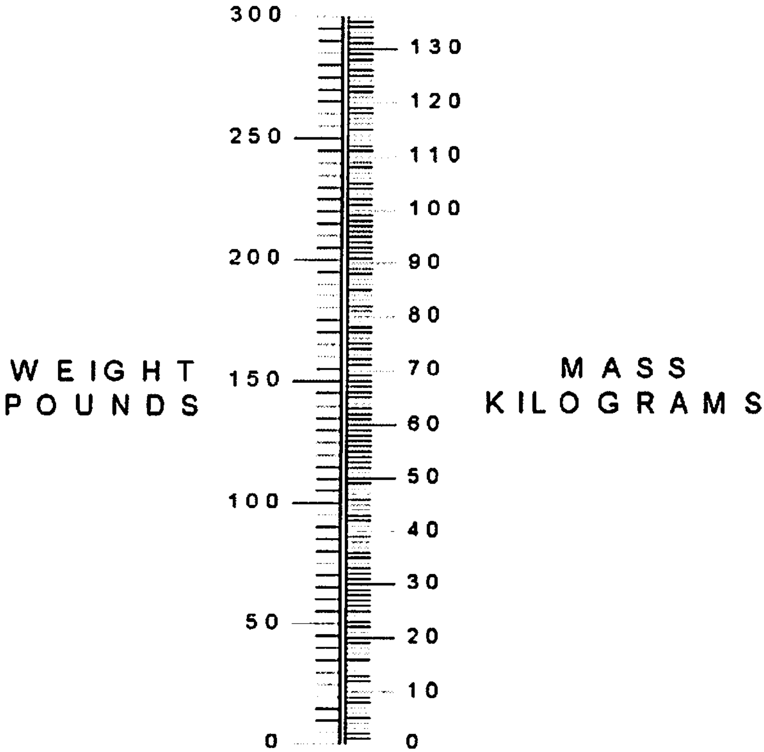
Feet to Meters Conversion (0 to 30,000 feet)
Figure 5-4



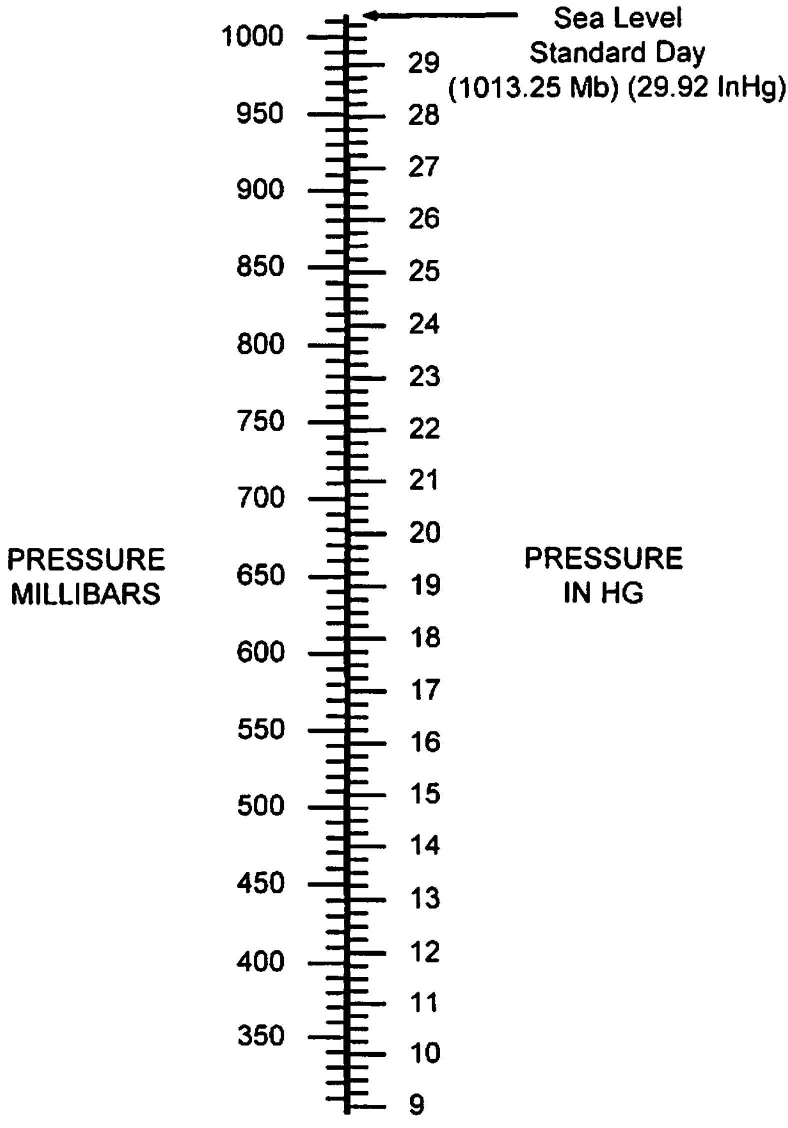
Feet to Meters Conversion (0 to 100 feet)
Figure 5-5



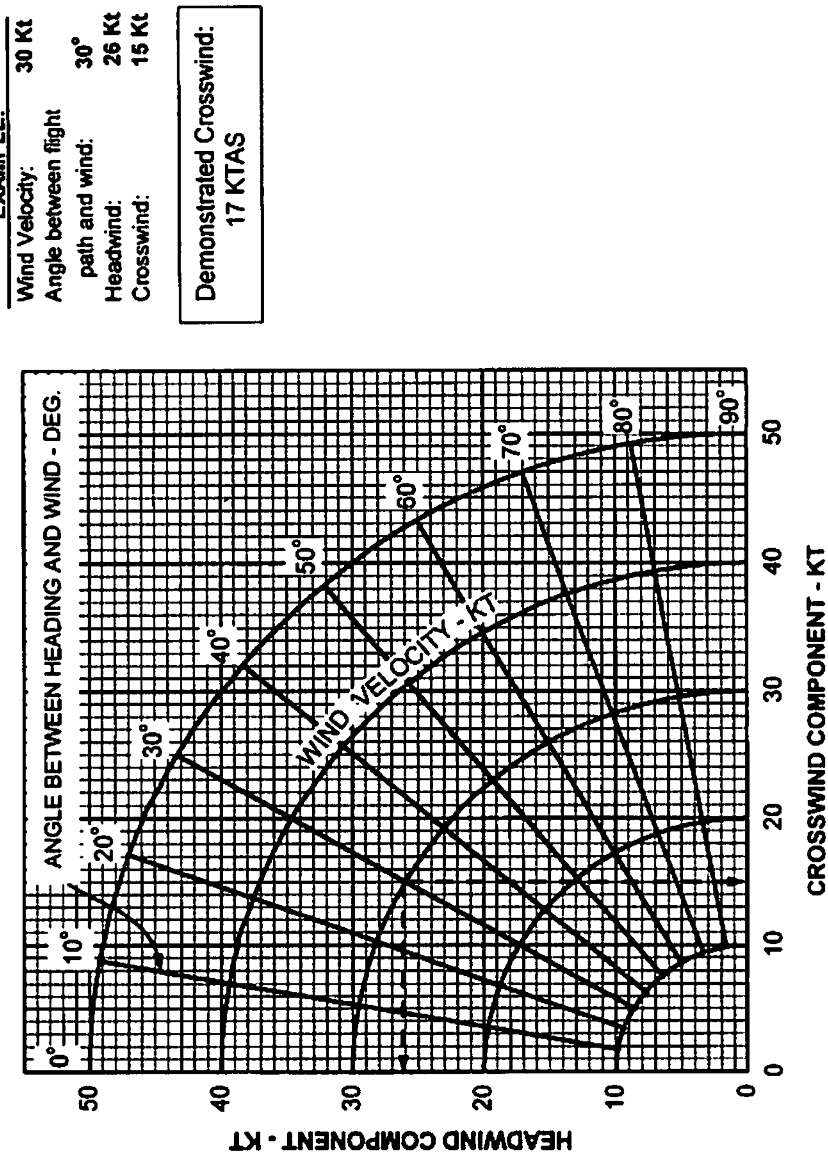
Pounds to Kilograms Conversion (3,800 to 5,100 pounds)
Figure 5-6



Pounds to Kilograms Conversion (0 to 300 pounds)
Figure 5-7



Inches of Mercury to Millibars Conversion
Figure 5-8



Wind Components
Figure 5-10

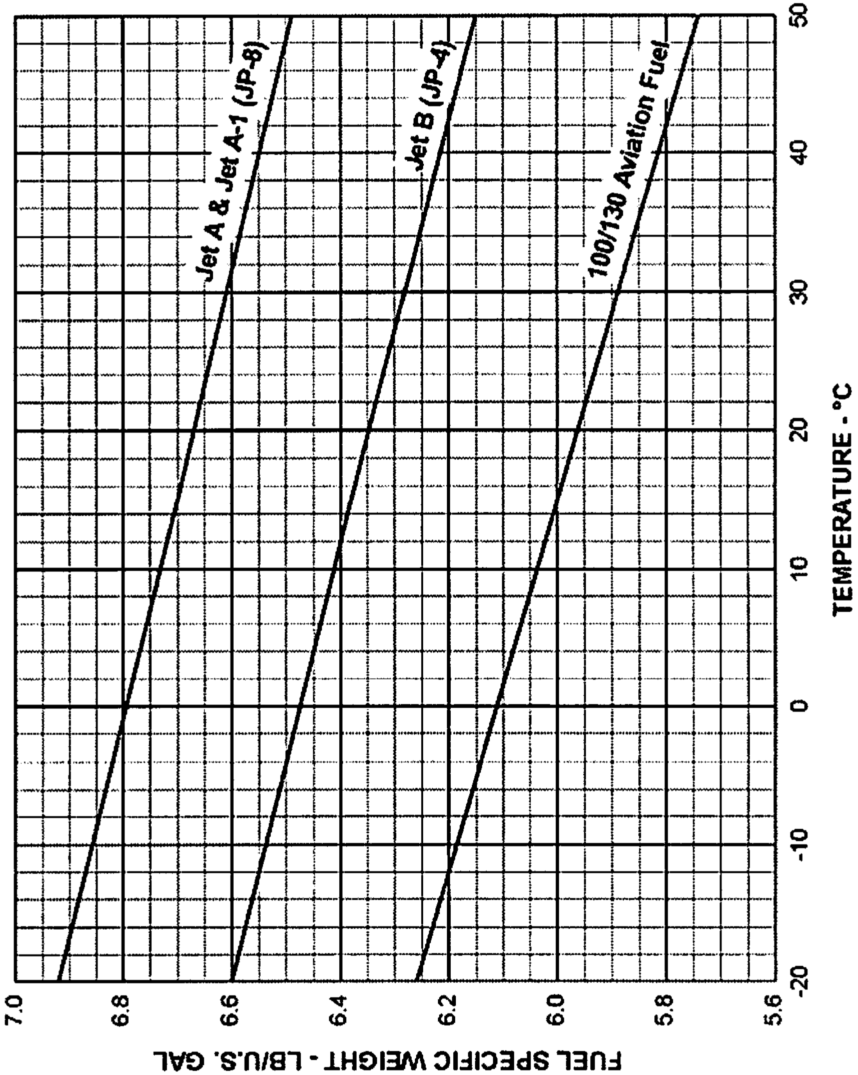
CORRECTION CARD
ALTERNATE
STATIC SOURCE

PRIMARY	ALTERNATE
ALTITUDE	
1,000	930
2,000	1,930
3,000	2,930
4,000	3,930
5,000	4,930
6,000	5,930
7,000	6,930
8,000	7,930
9,000	8,930
10,000	9,930
11,000	10,930
12,000	11,930
13,000	12,930

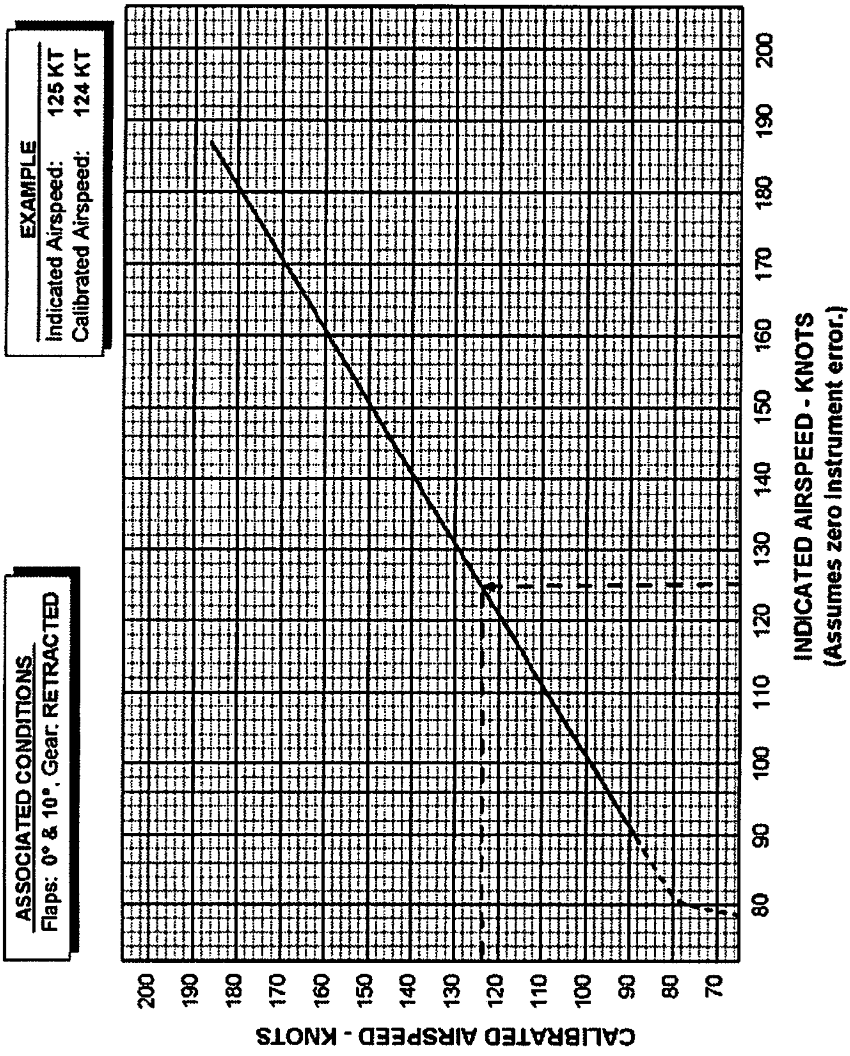
AIRSPEED

125	CLIMB	122
175	CRUISE	172
85	APPROACH	83

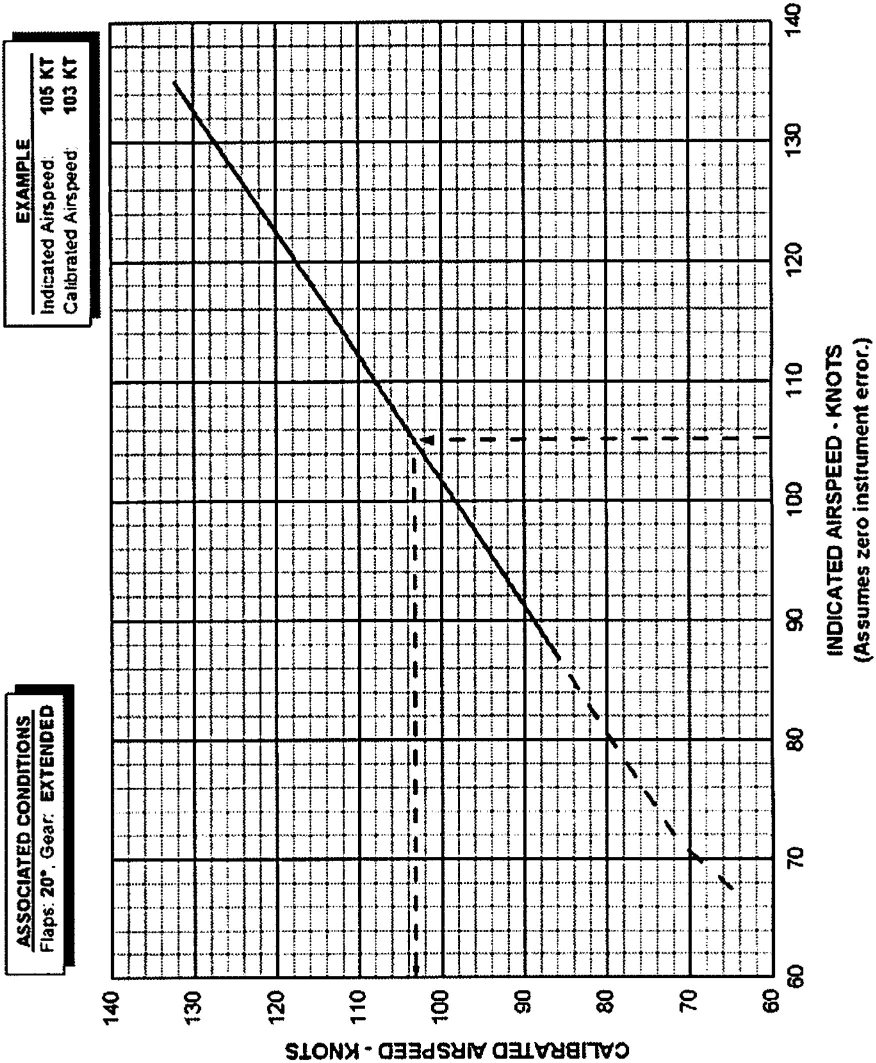
Alternate Static System Correction
Figure 5-11



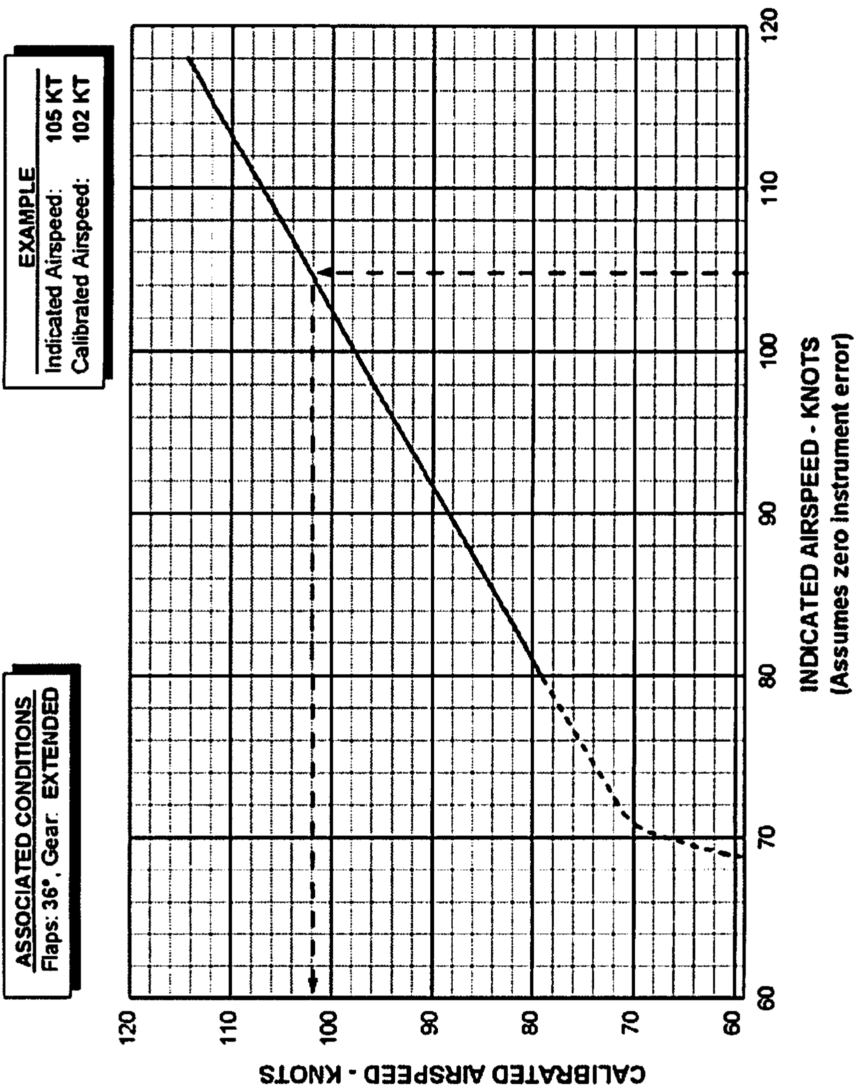
Aviation Fuel Specific Weight
Figure 5-12



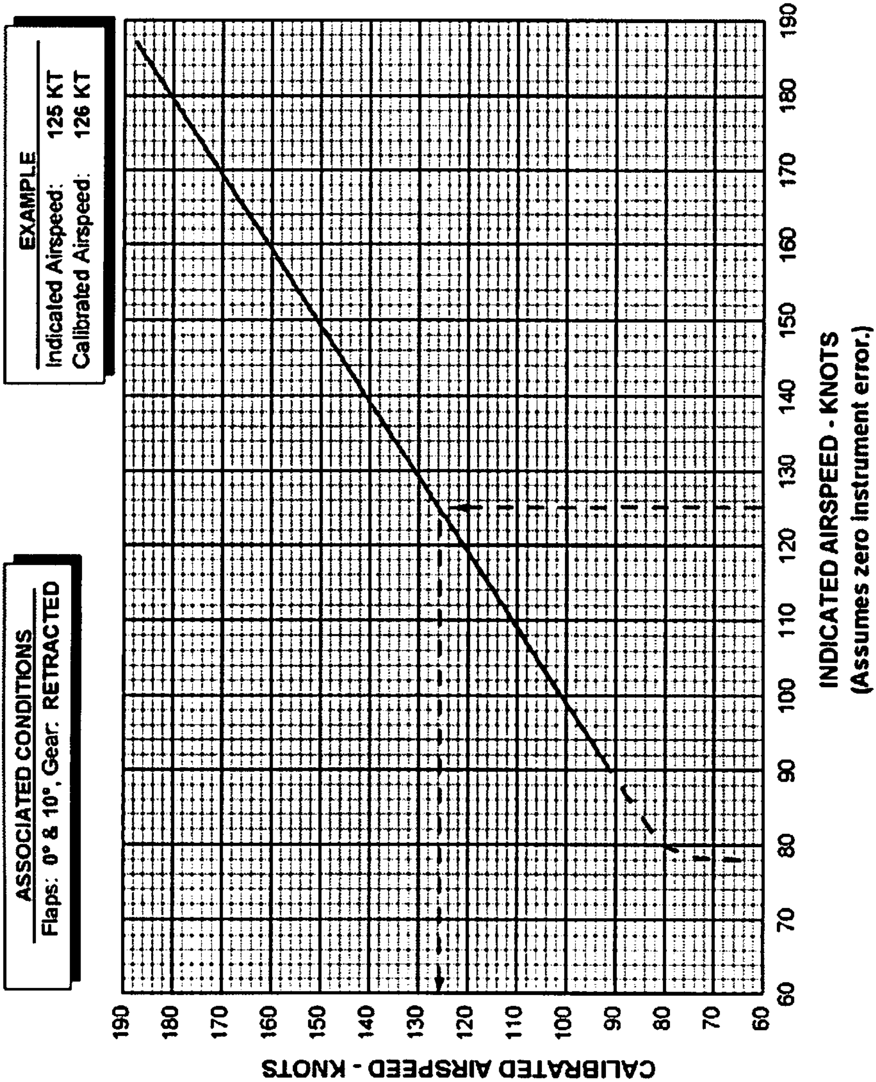
Airspeed Calibration
Primary Static (Flaps 0° and 10°)
Figure 5-13



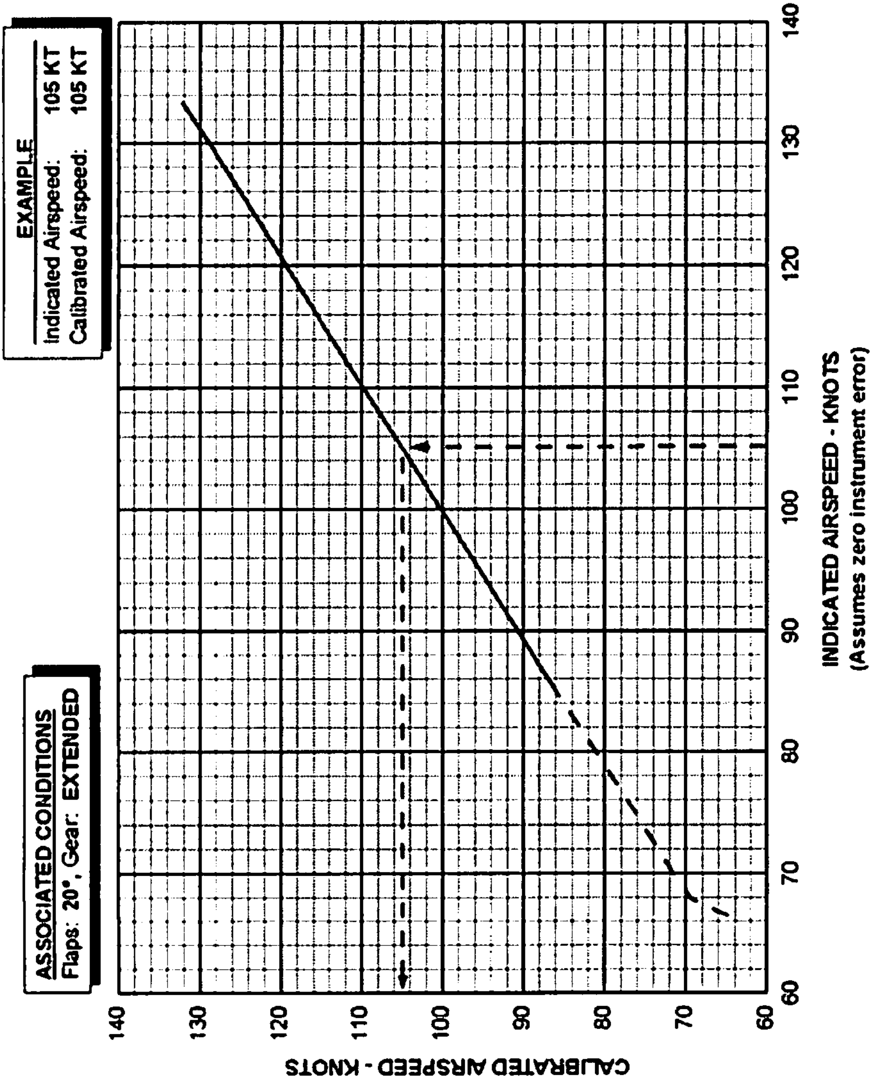
Airspeed Calibration
Primary Static (Flaps 20°, Gear DOWN)
Figure 5-15



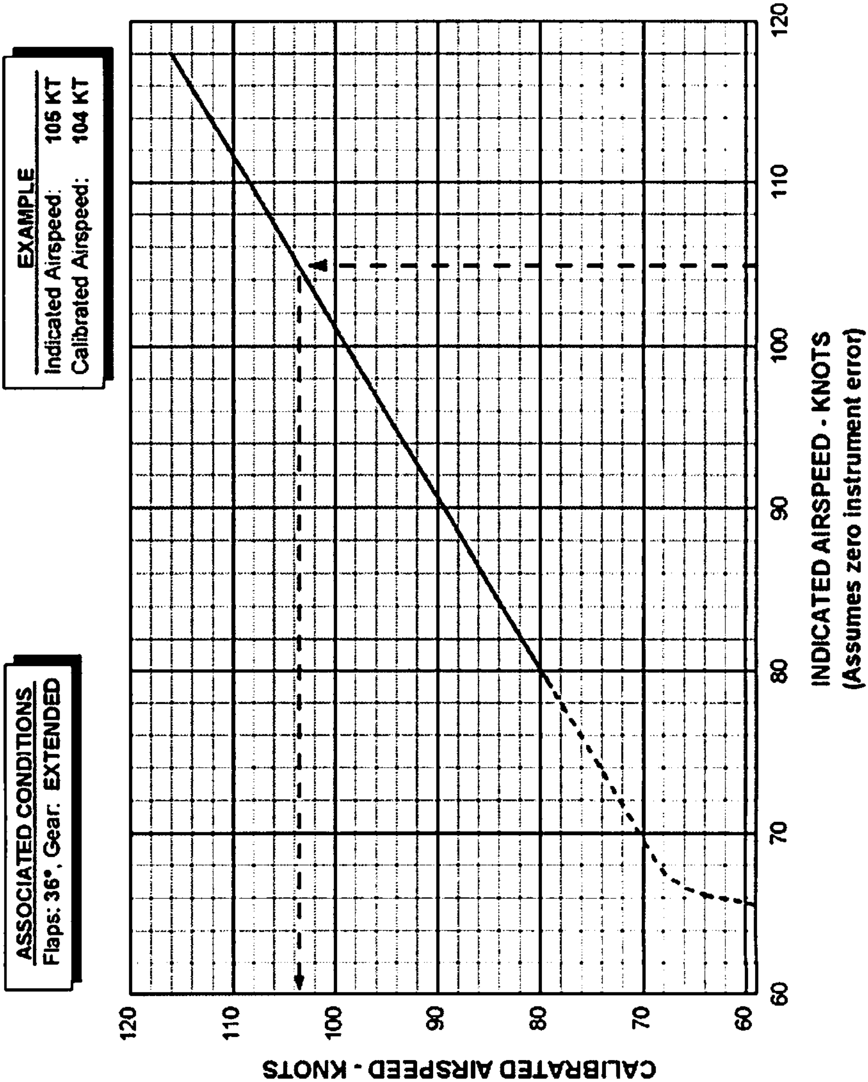
Airspeed Calibration
Primary Static (Flaps 36°, Gear DOWN)
Figure 5-17



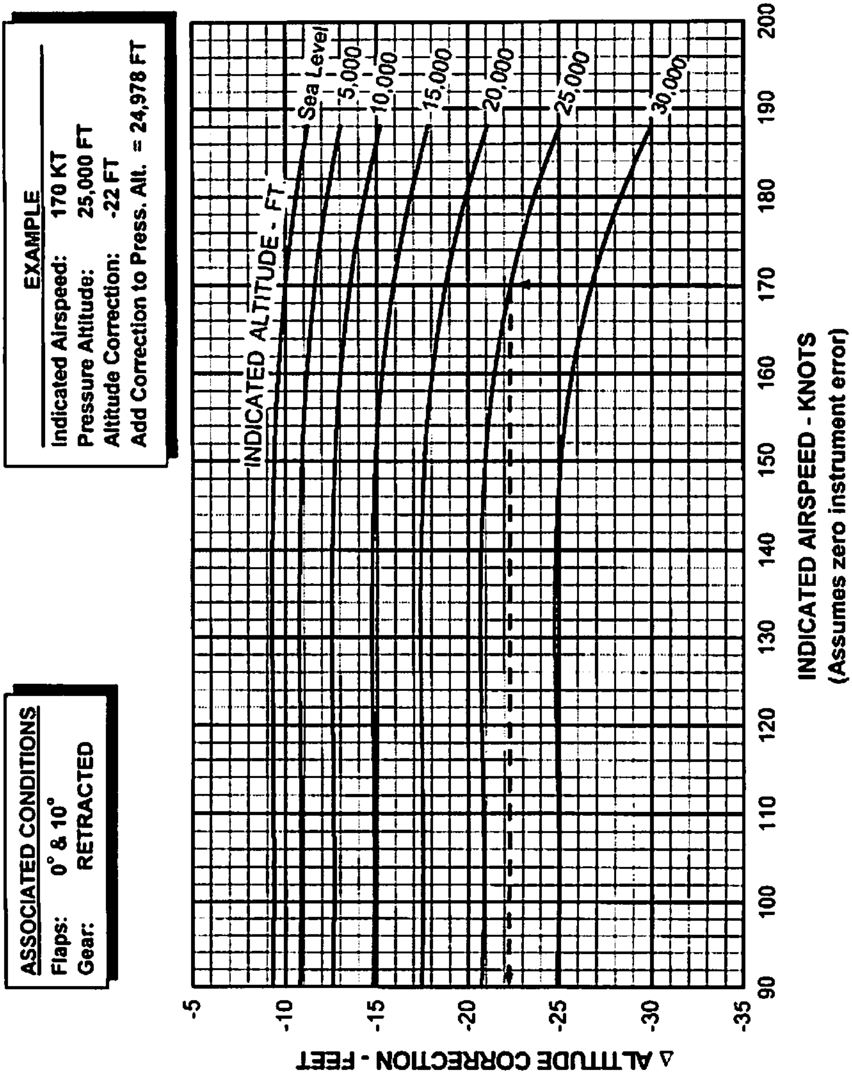
Airspeed Calibration
Alternate Static (Flaps 0° and 10°)
Figure 5-19



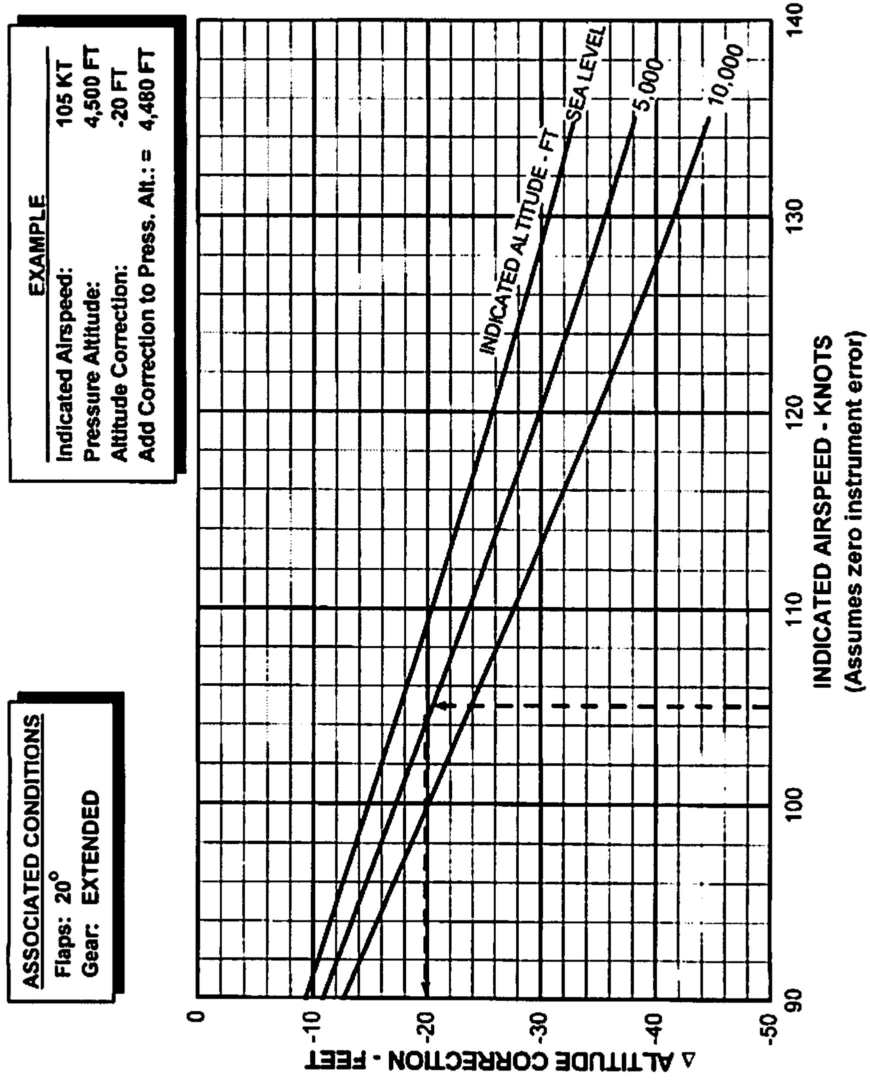
Airspeed Calibration
Alternate Static (Flaps 20°, Gear DOWN)
Figure 5-21



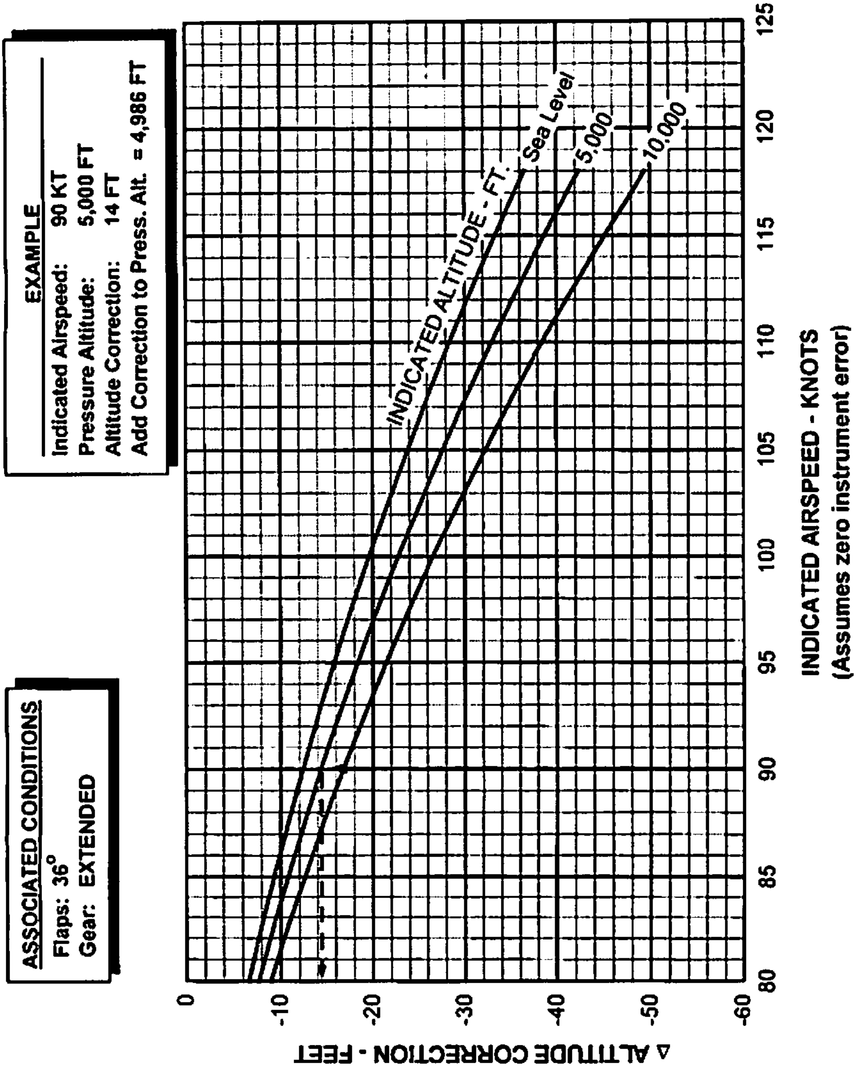
Airspeed Calibration
Alternate Static (Flaps 36°, Gear DOWN)
Figure 5-23



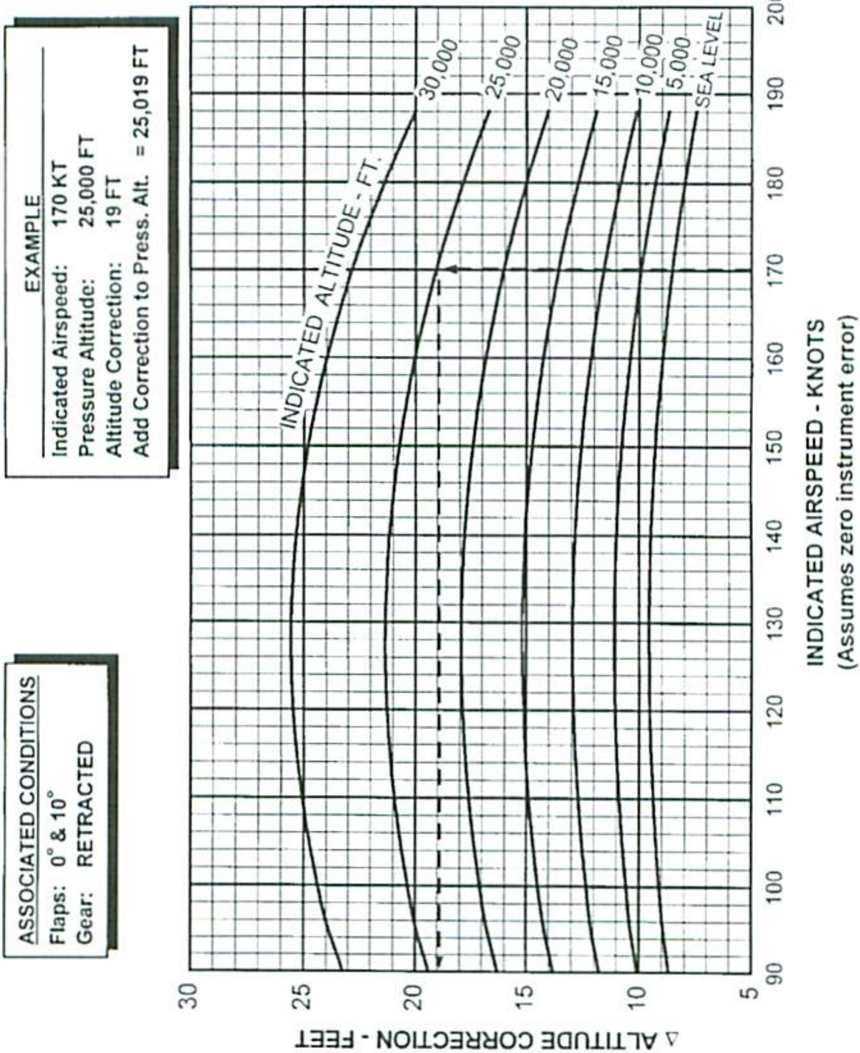
Altitude Calibration
Primary Static (Flaps 0° and 10°)
Figure 5-25



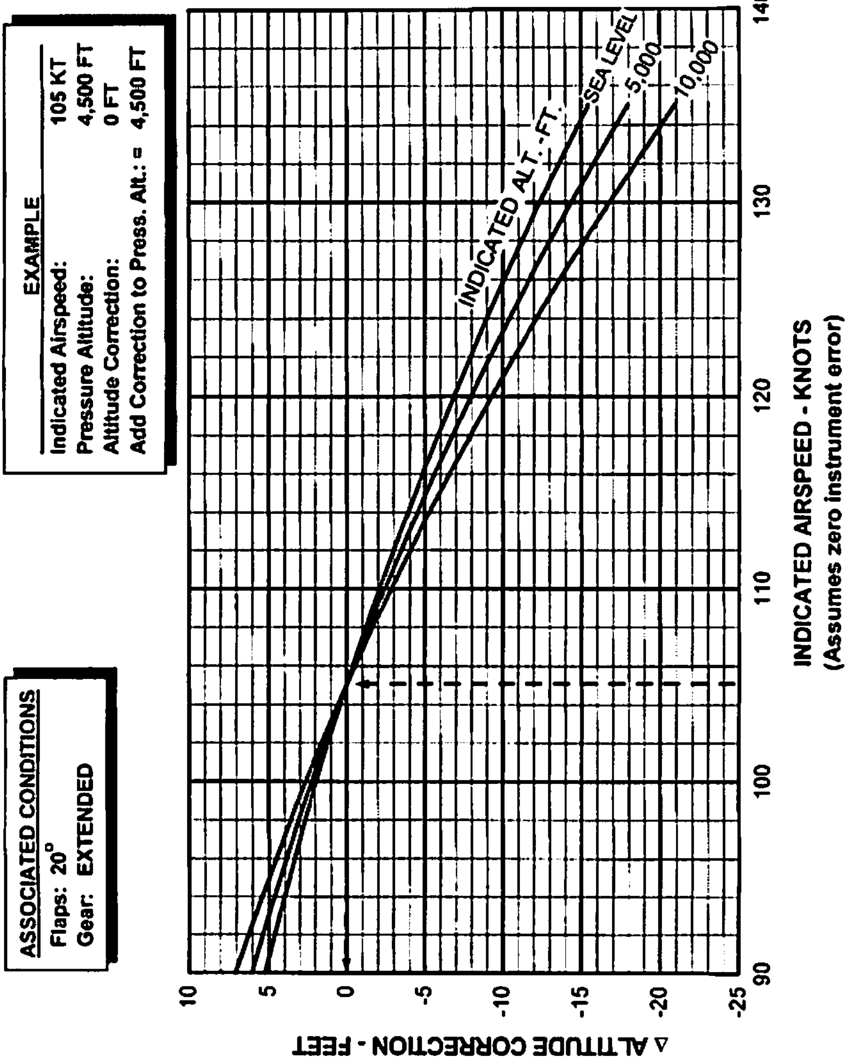
Altitude Calibration
Primary Static (Flaps 20°, Gear DOWN)
Figure 5-27



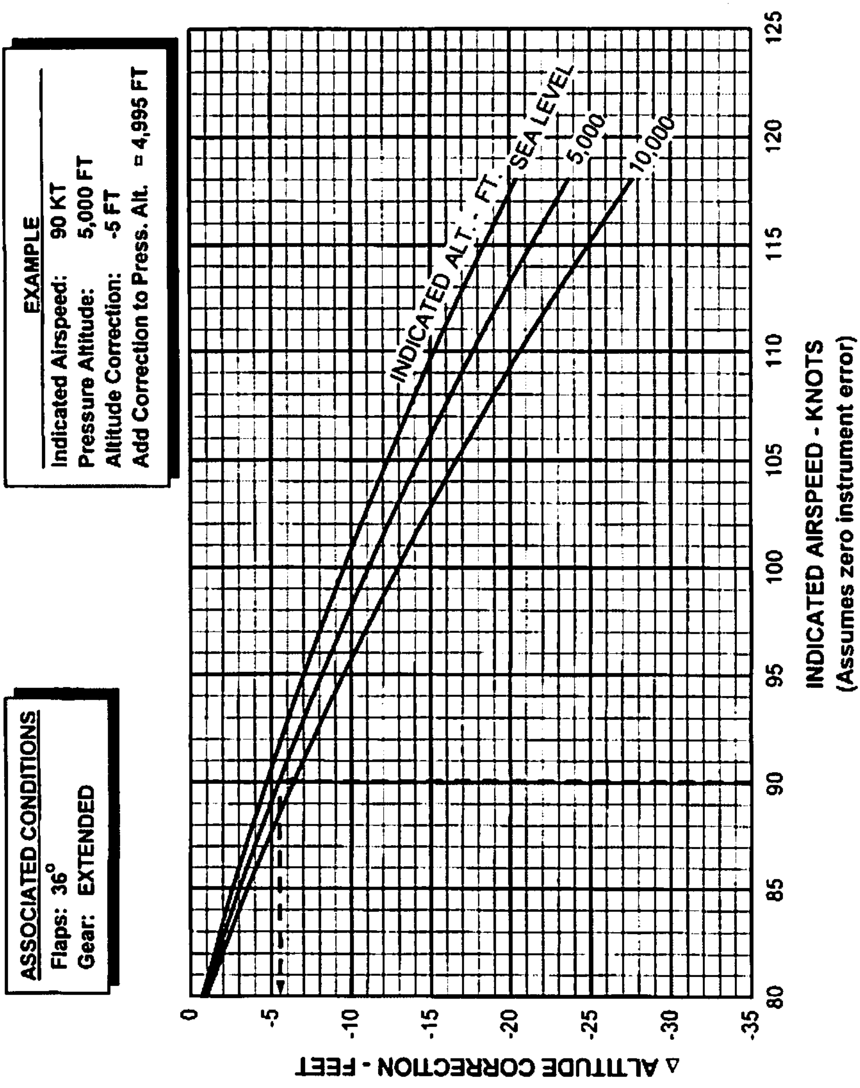
Altitude Calibration
Primary Static (Flaps 36°, Gear DOWN)
Figure 5-29



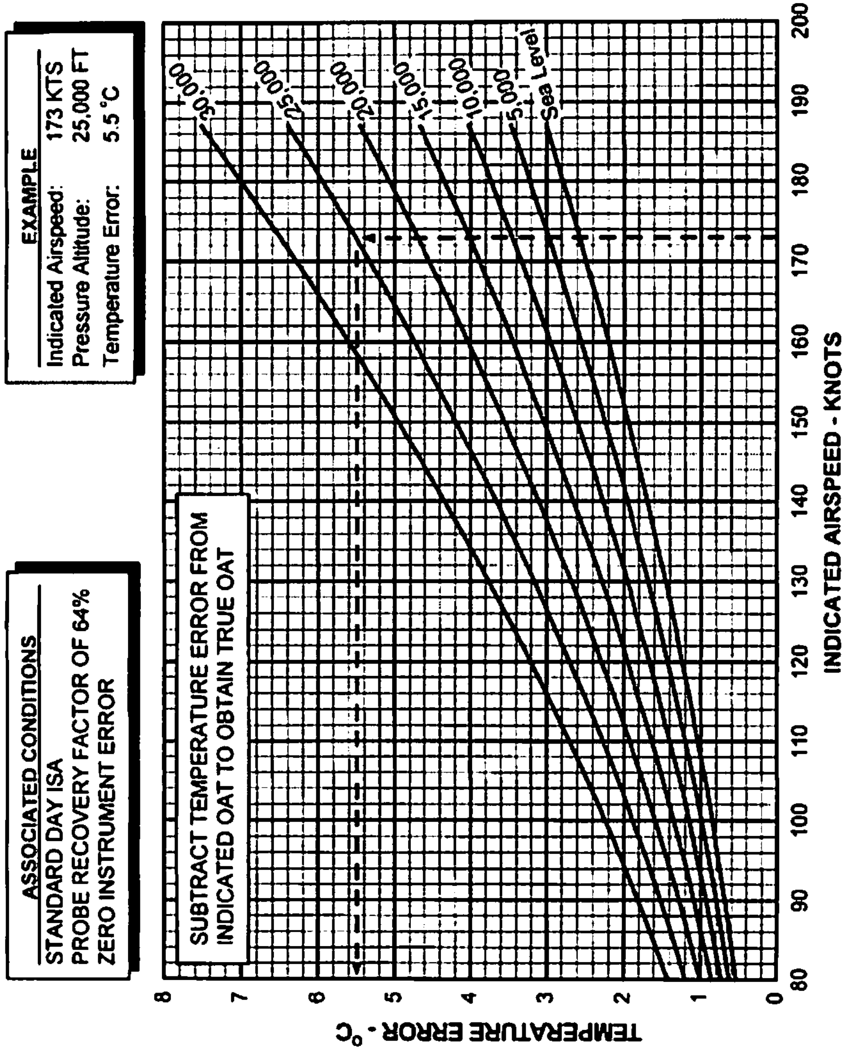
Altitude Calibration
Alternate Static (Flaps 0° and 10°)
Figure 5-31



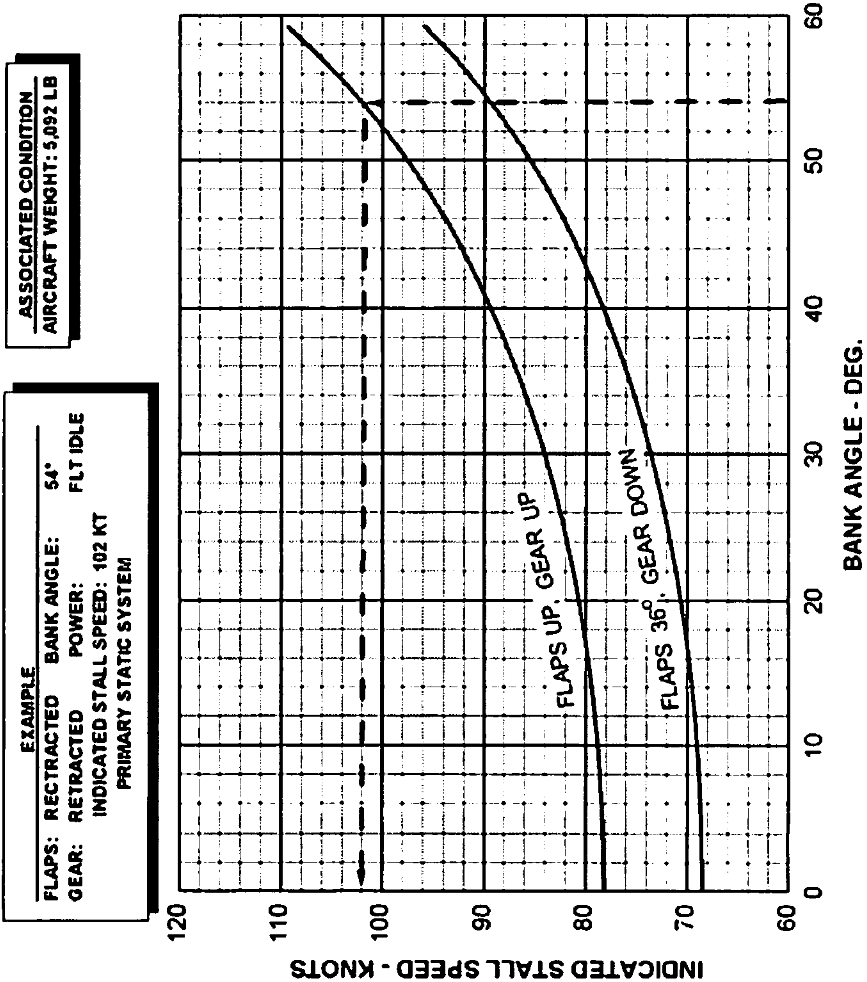
Altitude Calibration
Alternate Static (Flaps 20°, Gear DOWN)
Figure 5-33



Altitude Calibration
Alternate Static (Flaps 36°, Gear DOWN)
Figure 5-35



Temperature Probe Calibration
Figure 5-37



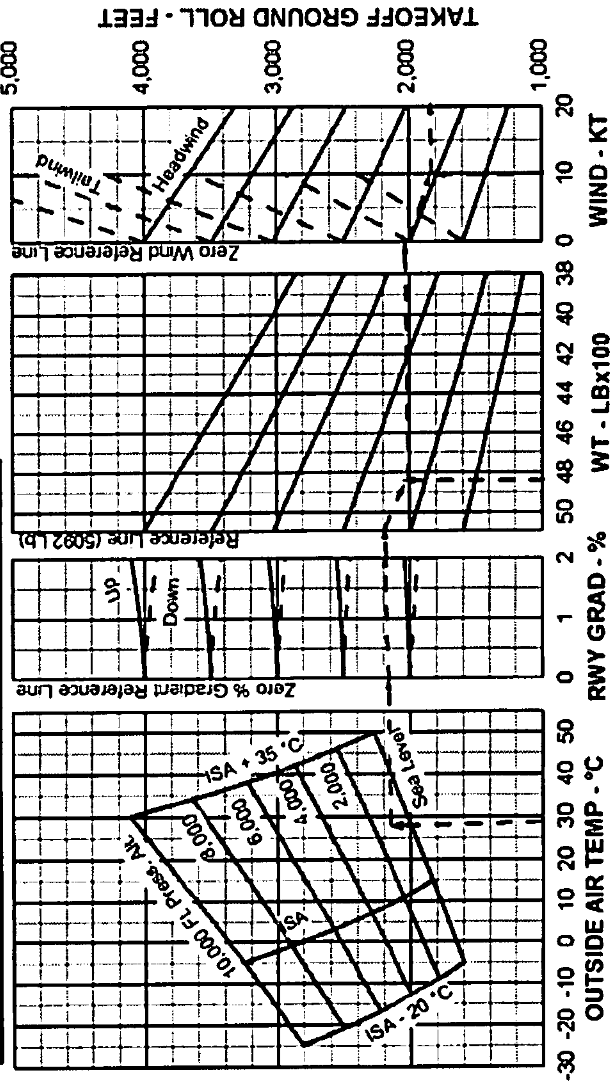
Angle of Bank vs. Stall Speed
Figure 5-39

ASSOCIATED CONDITIONS

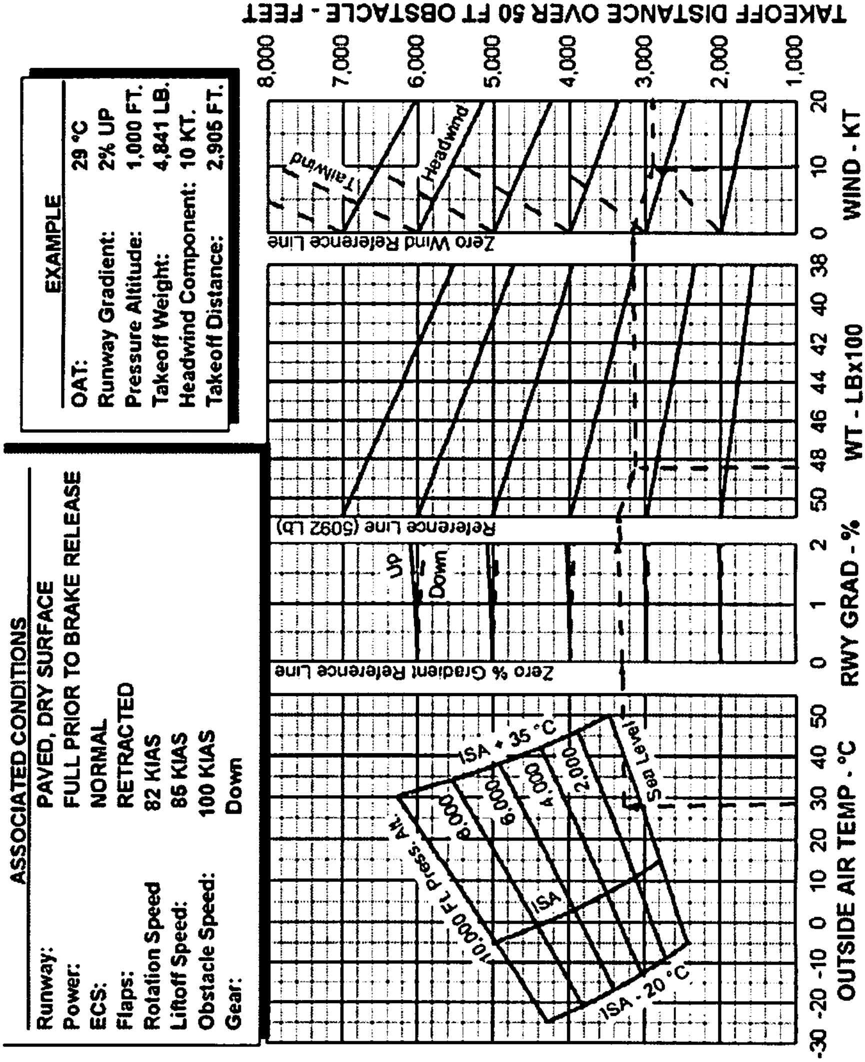
Runway:	PAVED, DRY SURFACE
Power:	FULL PRIOR TO BRAKE RELEASE
ECS:	NORMAL
Flaps:	RETRACTED
Rotation Speed:	82 KIAS
Liftoff Speed:	85 KIAS

EXAMPLE

OAT:	29 °C
Runway Gradient:	2% UP
Pressure Altitude:	1,000 FT.
Takeoff Weight:	4,841 LB.
Headwind Component:	10 KT.
Ground Roll Distance:	1851 FT.



Normal Takeoff Ground Roll, 0° Flaps
Figure 5-41



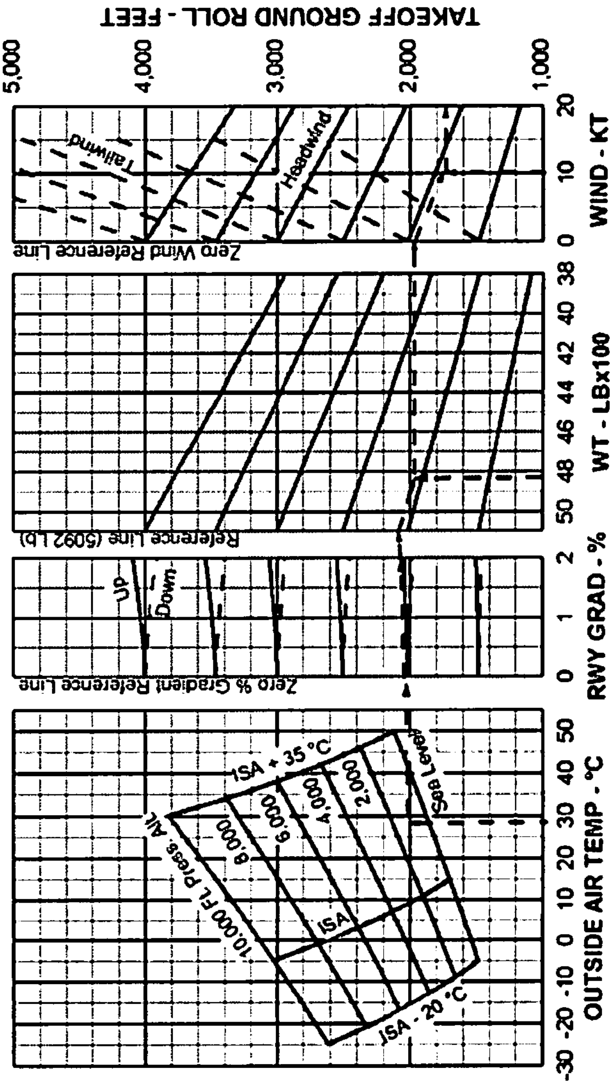
Normal Takeoff Performance over 50 ft. Obstacle, 0° Flaps
Figure 5-43

EXAMPLE

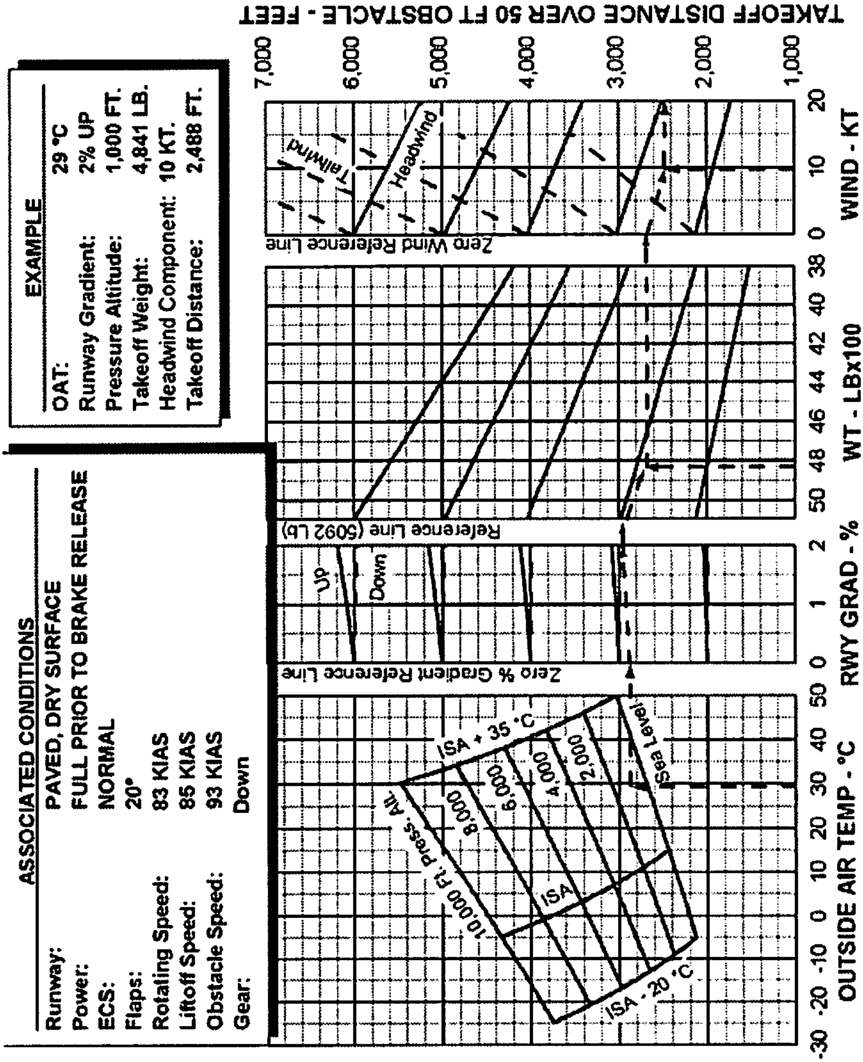
OAT:	29 °C
Runway Gradient:	2% UP
Pressure Altitude:	1,000 FT.
Takeoff Weight:	4,841 LB.
Headwind Component:	10 KT.
Ground Roll Distance:	1,727FT.

ASSOCIATED CONDITIONS

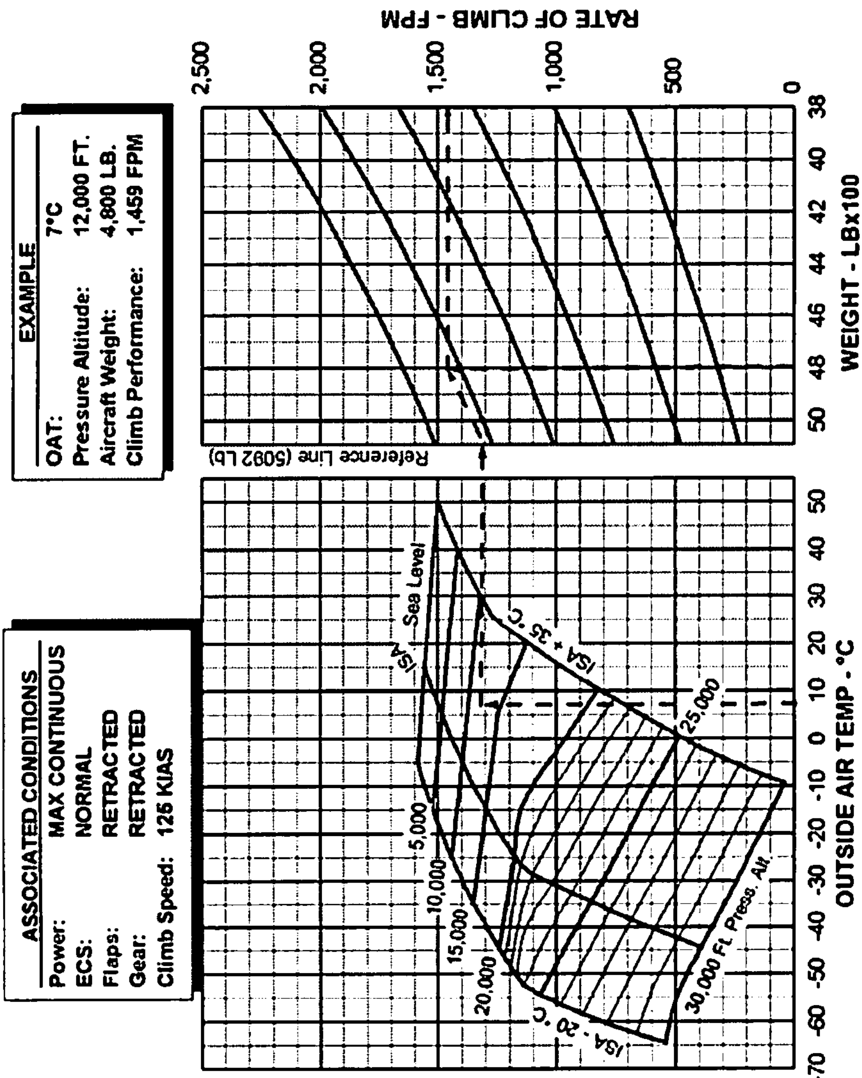
Runway:	PAVED, DRY SURFACE
Power:	FULL PRIOR TO BRAKE RELEASE
ECS:	NORMAL
Flaps:	20°
Rotation Speed:	83 KIAS
Liftoff Speed:	85 KIAS



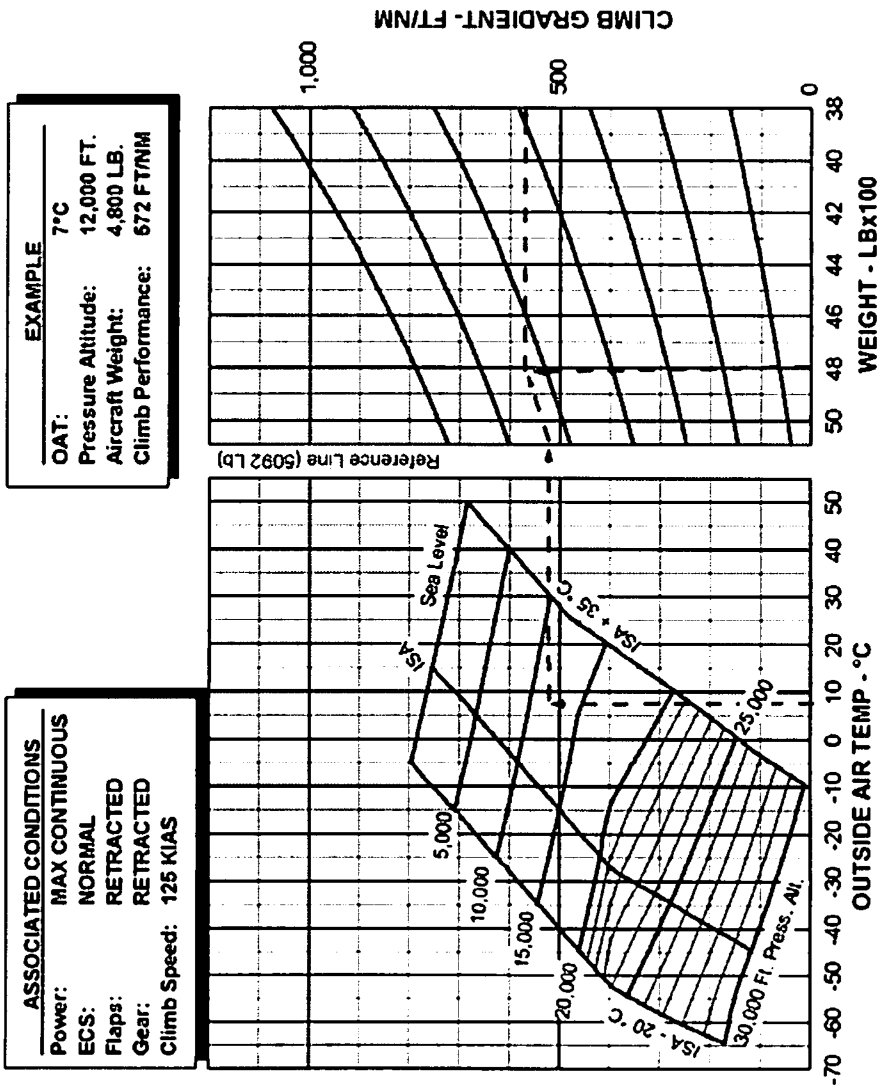
Maximum Effort Takeoff Ground Roll, 20° Flaps
Figure 5-45



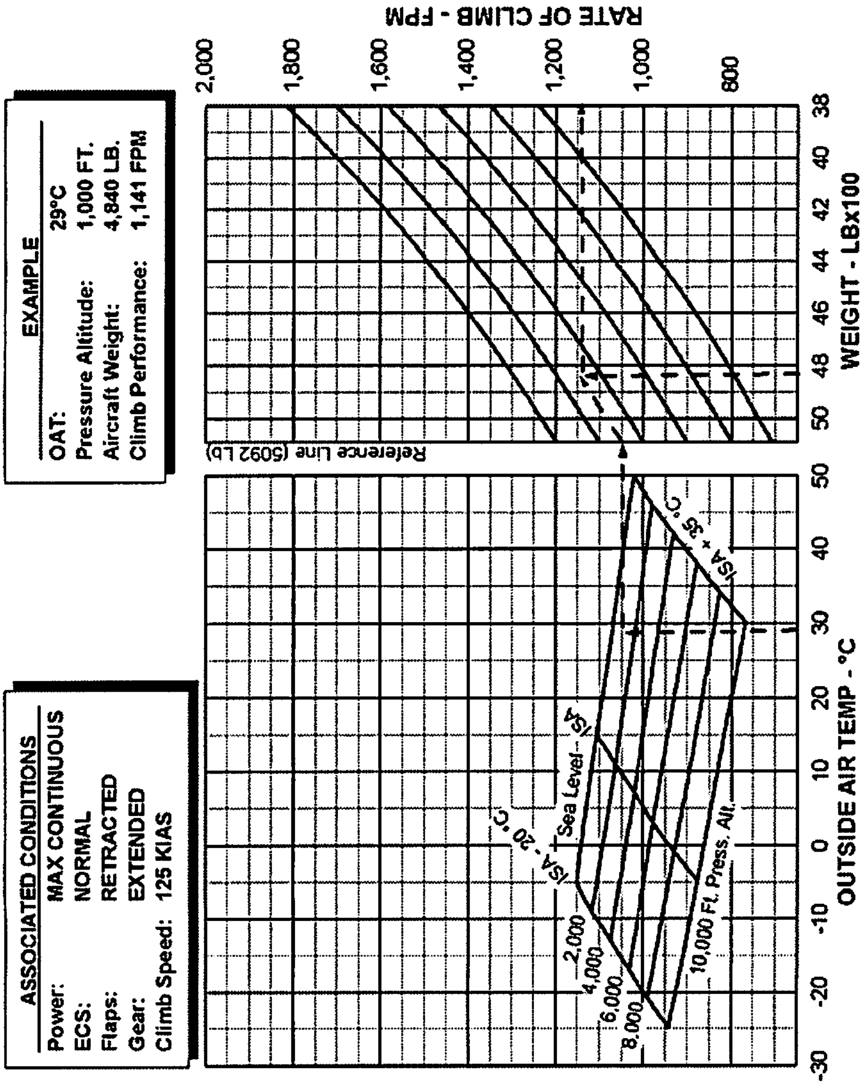
Maximum Effort Takeoff Performance over 50 ft. Obstacle, 20° Flaps
Figure 5-47



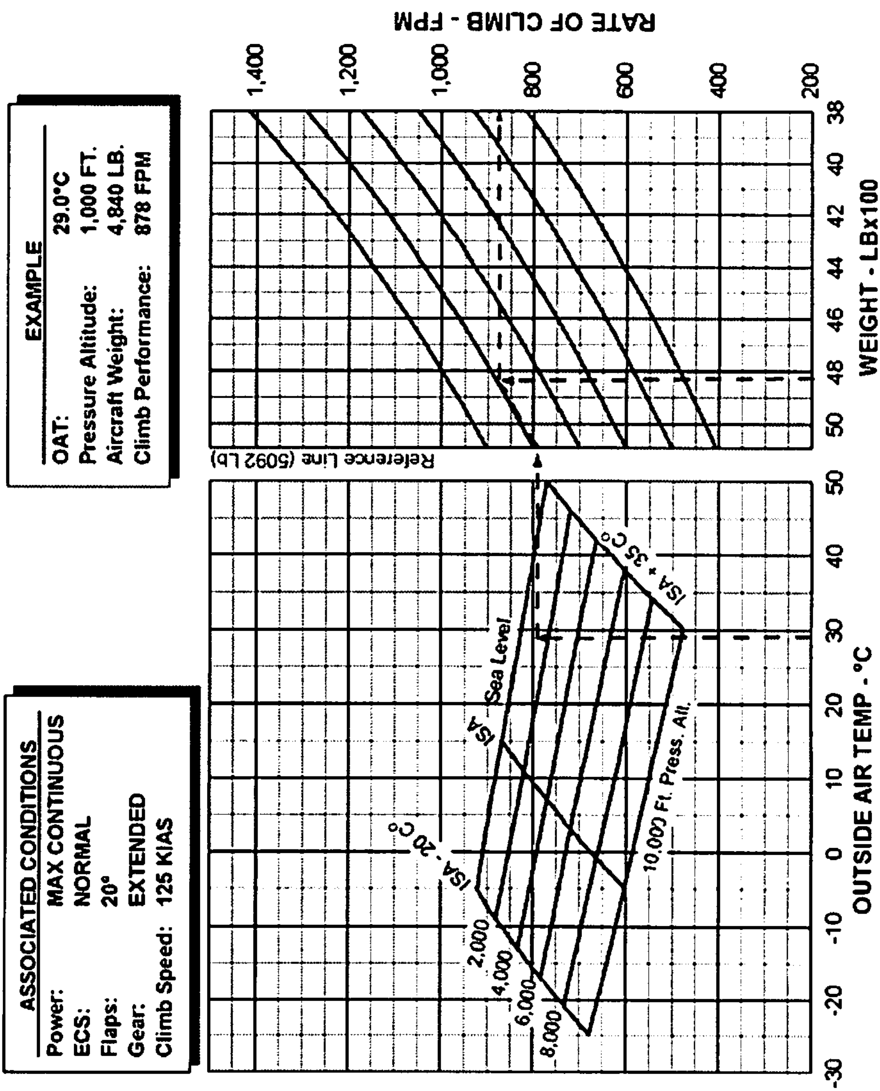
Enroute Climb Performance
Figure 5-49



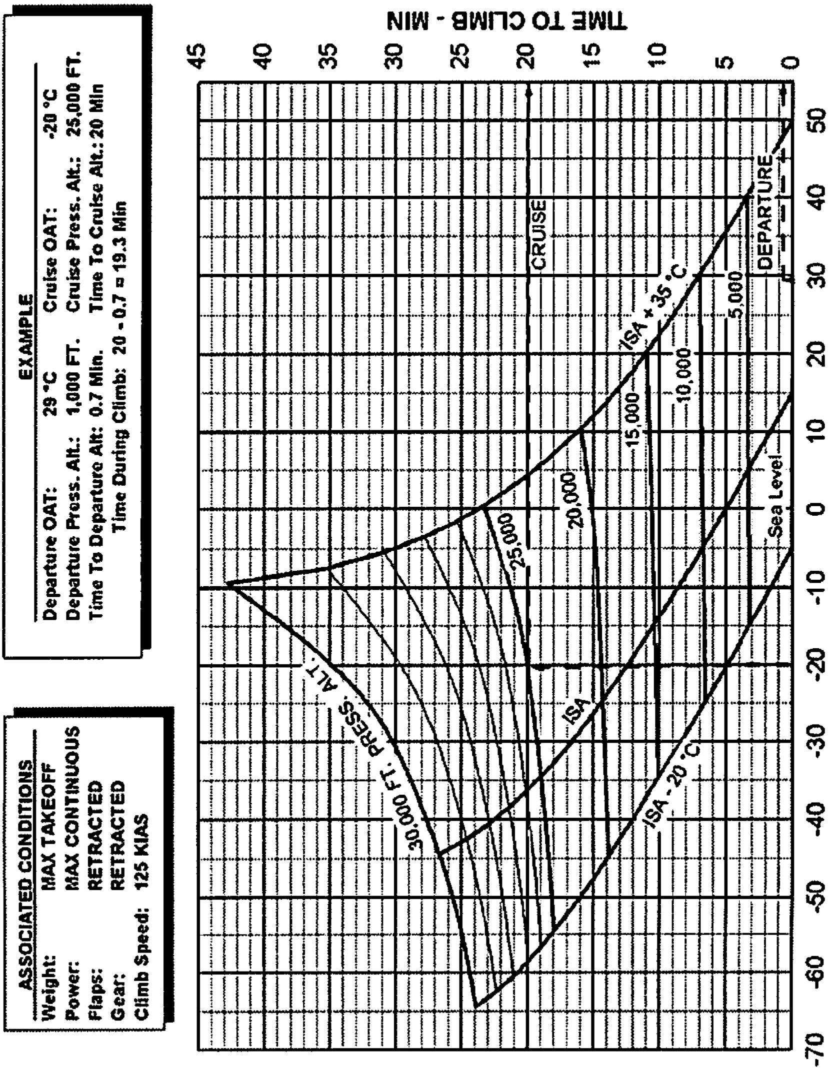
Enroute Climb Gradient
Figure 5-51



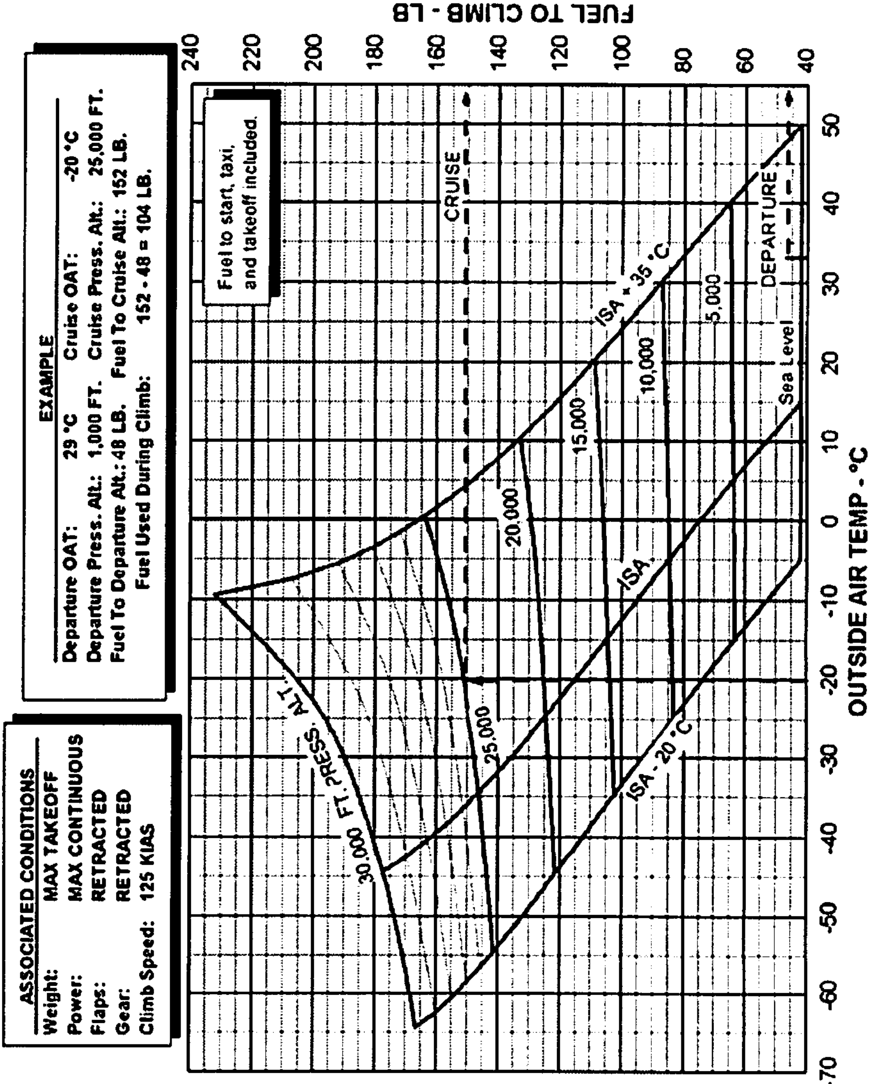
Takeoff Climb Performance, 0° Flaps
Figure 5-53



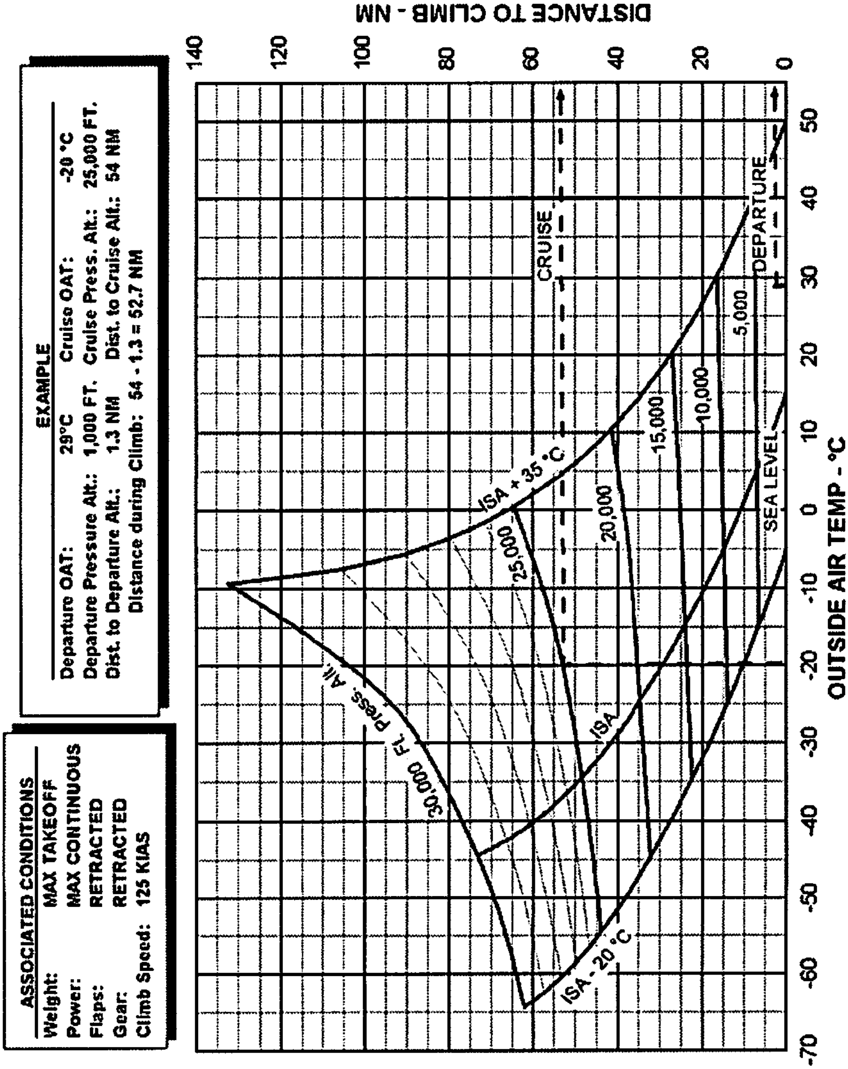
Takeoff Climb Performance, 20° Flaps
Figure 5-54



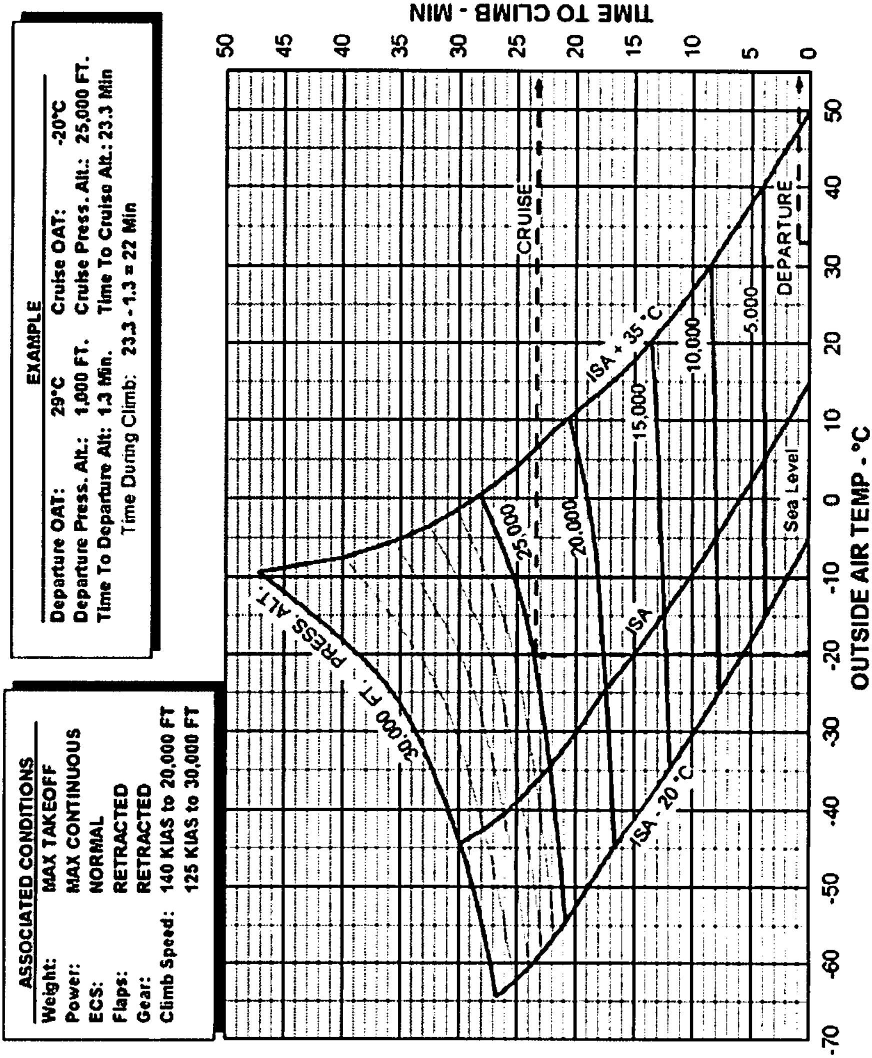
Maximum Climb Time
Figure 5-55



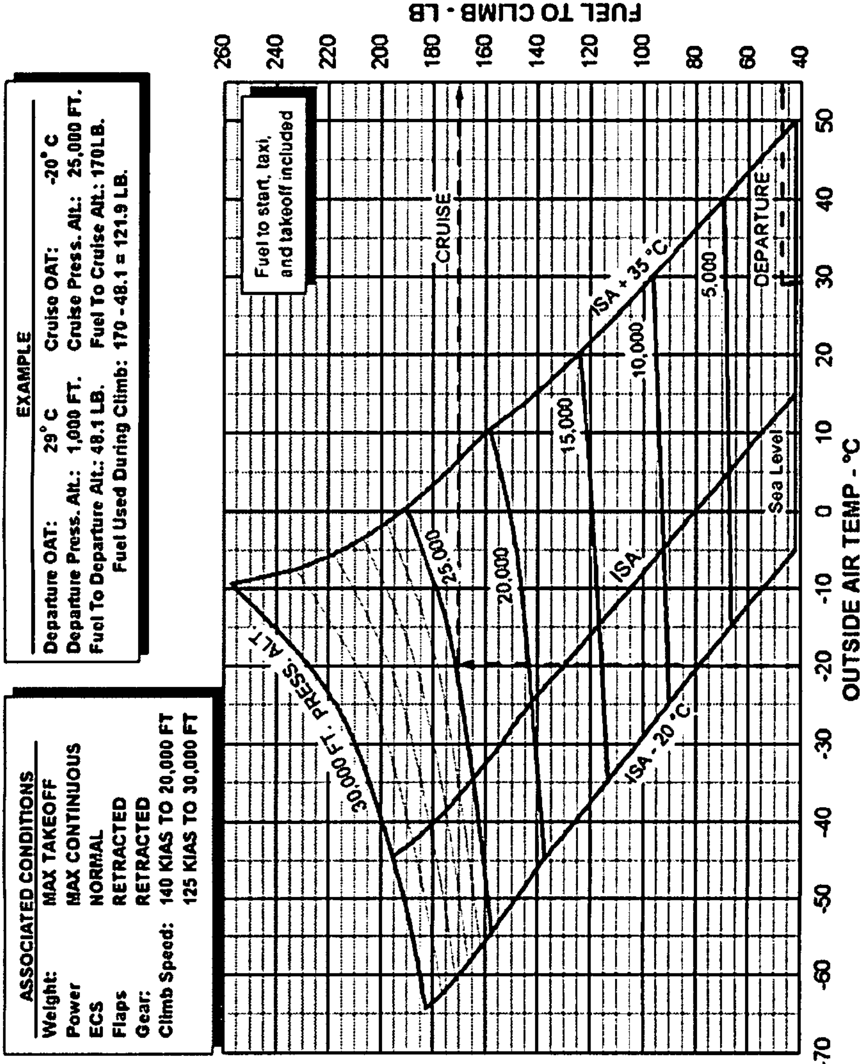
Maximum Climb Fuel
Figure 5-57



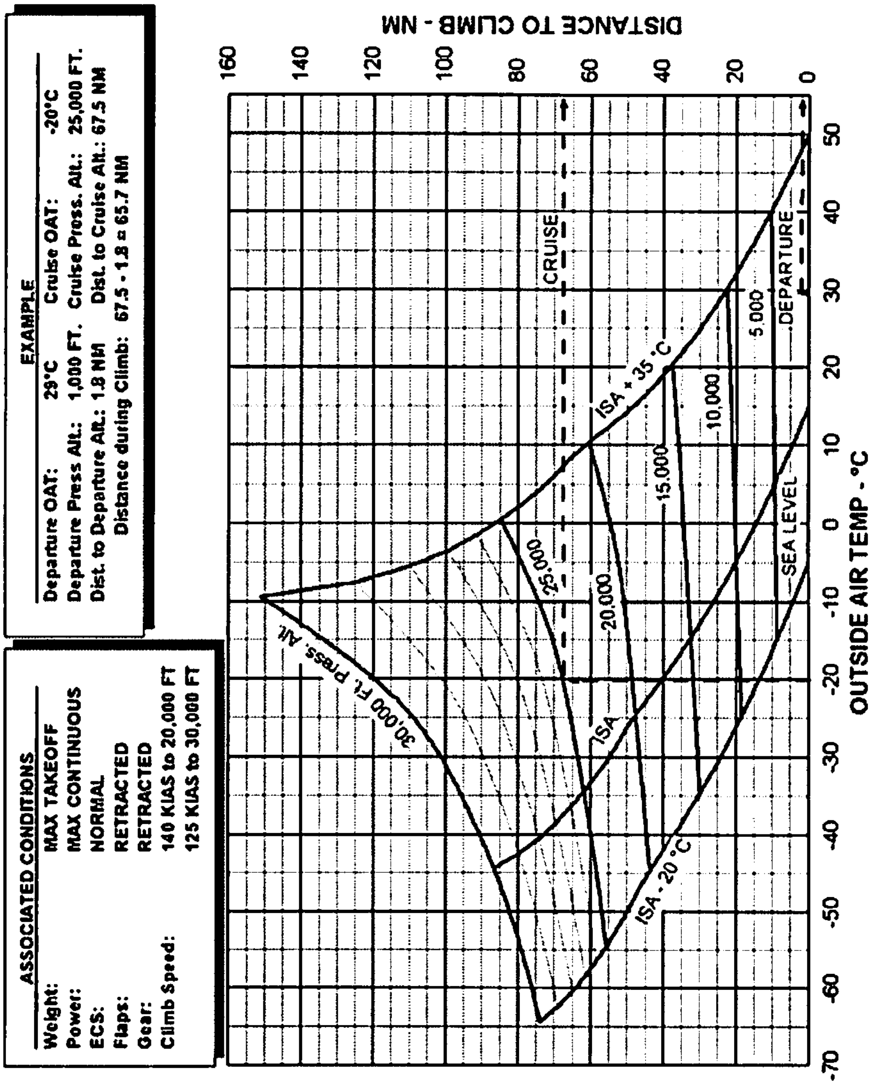
Maximum Climb Distance
Figure 5-59



Cruise Climb Time
Figure 5-61



Cruise Climb Fuel
Figure 5-63



Cruise Climb Distance
Figure 5-65

ISA - 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-3	-5	943	350	177
5000	-12	-15	998	318	190
10000	-22	-25	1066	293	205
15000	-31	-35	1153	280	222
20000	-40	-45	1255	281	241
25000	-49	-55	1313	282	257
30000	-59	-64	1112	237	255
ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	8	5	956	353	180
5000	-2	-5	1014	322	194
10000	-11	-15	1088	297	209
15000	-21	-25	1177	285	226
20000	-30	-35	1285	286	246
25000	-39	-45	1298	278	260
30000	-49	-54	1077	230	256
ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	18	15	969	355	183
5000	8	5	1030	325	197
10000	-1	-5	1106	301	213
15000	-10	-15	1201	290	231
20000	-19	-25	1313	291	251
25000	-29	-35	1250	269	260
30000	-39	-44	1040	222	255

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Maximum Speed Cruise
(ISA, ISA -10, ISA -20)
Figure 5-67

ISA + 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	28	25	983	360	186
5000	19	15	1048	330	201
10000	9	5	1127	305	217
15000	0	-5	1224	295	235
20000	-9	-15	1313	292	254
25000	-18	-25	1200	260	259
30000	-29	-34	997	214	254
ISA + 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	38	35	996	363	189
5000	29	25	1064	334	204
10000	20	15	1148	310	221
15000	10	5	1248	299	240
20000	1	-5	1310	292	257
25000	-9	-15	1147	250	258
30000	-19	-24	955	207	253
ISA + 35 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	54	50	1017	368	194
5000	44	40	1088	339	209
10000	35	30	1177	317	227
15000	26	20	1285	307	246
20000	16	10	1201	274	253
25000	7	0	1071	237	255
30000	-3	-9	890	195	250

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Maximum Speed Cruise
(ISA +10, ISA +20, ISA +35)
Figure 5-69

ISA - 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-4	-5		292	129
5000	-13	-15		252	138
10000	-23	-25		213	147
15000	-33	-35	500	185	155
20000	-43	-45		161	164
25000	-52	-55		143	171
30000	-62	-64		129	178
ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	6	5		292	131
5000	-3	-5		252	140
10000	-13	-15		214	149
15000	-23	-25	500	185	157
20000	-32	-35		161	166
25000	-42	-45		143	173
30000	-52	-54		129	180
ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	16	15		292	133
5000	7	5		253	142
10000	-3	-5		215	151
15000	-12	-15	500	185	159
20000	-22	-25		162	167
25000	-32	-35		143	175
30000	-42	-44		129	182

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Low Power Cruise, 500 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-75

ISA + 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	27	25		293	136
5000	17	15		254	144
10000	7	5		215	153
15000	-2	-5	500	185	161
20000	-12	-15		162	169
25000	-22	-25		143	177
30000	-32	-34		130	183
ISA + 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	37	35		293	137
5000	27	25		254	146
10000	18	15		216	155
15000	8	5	500	186	163
20000	-2	-5		162	171
25000	-12	-15		143	178
30000	-21	-24		130	184
ISA + 35 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	52	50		294	141
5000	42	40		255	149
10000	33	30		217	157
15000	23	20	500	187	165
20000	13	10		164	173
25000	4	0		145	180
30000	-6	-9		131	185

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
* ECS: NORMAL

Low Power Cruise, 500 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-77

ISA -20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-3	-5	600	306	144
5000	-13	-15		264	153
10000	-23	-25		227	162
15000	-32	-35		197	170
20000	-42	-45		175	179
25000	-52	-55		157	188
30000	-61	-64		145	197
ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	7	5	600	306	146
5000	-3	-5		265	155
10000	-13	-15		227	164
15000	-22	-25		198	173
20000	-32	-35		175	182
25000	-42	-45		157	191
30000	-51	-54		145	199
ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	17	15	600	307	148
5000	7	5		266	157
10000	-3	-5		227	166
15000	-12	-15		199	175
20000	-22	-25		176	184
25000	-31	-35		158	193
30000	-41	-44		145	202

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 600 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-79

ISA + 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	27	25		308	150
5000	17	15		267	159
10000	8	5		228	168
15000	-2	-5	600	199	177
20000	-12	-15		176	186
25000	-21	-25		158	195
30000	-31	-34		145	204
ISA + 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	37	35		308	152
5000	28	25		268	161
10000	18	15		228	170
15000	8	5	600	200	179
20000	-1	-5		177	188
25000	-11	-15		159	197
30000	-21	-24		146	205
ISA + 35 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	52	50		309	156
5000	43	40		269	164
10000	33	30		230	173
15000	23	20	600	201	182
20000	14	10		178	191
25000	4	0		159	200
30000	-5	-9		146	208

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 600 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-81

ISA - 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-3	-5		318	156
5000	-13	-15		277	165
10000	-22	-25		240	174
15000	-32	-35	700	211	183
20000	-42	-45		189	192
25000	-51	-55		172	202
30000	-61	-64		161	212

ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	7	5		319	158
5000	-3	-5		278	167
10000	-12	-15		240	176
15000	-22	-25	700	212	185
20000	-32	-35		190	195
25000	-41	-45		172	205
30000	-51	-54		161	215

ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	17	15		320	160
5000	7	5		278	169
10000	-2	-5		241	178
15000	-12	-15	700	212	187
20000	-21	-25		190	197
25000	-31	-35		172	207
30000	-40	-44		161	217

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 700 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-83

ISA + 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	27	25		321	162
5000	18	15		279	171
10000	8	5		242	180
15000	-2	-5	700	213	190
20000	-11	-15		191	199
25000	-21	-25		173	210
30000	-30	-34		162	220
ISA + 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	37	35		322	164
5000	28	25		280	173
10000	18	15		243	182
15000	9	5	700	214	192
20000	-1	-5		191	202
25000	-10	-15		174	212
30000	-20	-24		162	222
ISA + 35 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	53	50		324	167
5000	43	40		282	176
10000	33	30		244	185
15000	24	20	700	215	195
20000	14	10		192	205
25000	5	0		175	215
30000	-5	-9		163	225

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 700 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-85

ISA - 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-3	-5		331	165
5000	-13	-15		291	174
10000	-22	-25		254	184
15000	-32	-35	800	225	193
20000	-41	-45		204	203
25000	-51	-55		188	214
30000	-61	-64		178	225
ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	7	5		332	168
5000	-2	-5		292	177
10000	-12	-15		255	186
15000	-22	-25	800	226	196
20000	-31	-35		204	206
25000	-41	-45		188	217
30000	-50	-54		178	228
ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	17	15		333	170
5000	8	5		293	179
10000	-2	-5		255	188
15000	-11	-15	800	227	198
20000	-21	-25		205	209
25000	-31	-35		189	219
30000	-40	-44		178	230

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 800 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-87

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	28	25		334	172
5000	18	15		294	181
10000	8	5		256	191
15000	-1	-5	800	228	201
20000	-11	-15		205	211
25000	-20	-25		189	222
30000	-30	-34		178	233

ISA (°C)	ISA + 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	38	35		335	174
5000	28	25		295	183
10000	19	15		257	193
15000	9	5	800	228	203
20000	-1	-5		206	213
25000	-10	-15		190	224
30000	-19	-24		179	235

ISA (°C)	ISA + 35 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	53	50		337	177
5000	43	40		296	186
10000	34	30		259	196
15000	24	20	800	230	206
20000	15	10		208	217
25000	5	0		191	228
30000	-4	-9		179	239

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 800 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-89

ISA (°C)	ISA - 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-3	-5		344	174
5000	-12	-15		305	183
10000	-22	-25		268	193
15000	-32	-35	900	241	203
20000	-41	-45		220	213
25000	-51	-55		205	224
30000	-60	-64		196	236
ISA (°C)	ISA - 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	8	5		345	176
5000	-2	-5		306	185
10000	-12	-15		269	195
15000	-21	-25	900	241	205
20000	-31	-35		220	216
25000	-40	-45		205	227
30000	-50	-54		196	239
ISA (°C)	ISA (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	18	15		346	178
5000	8	5		307	188
10000	-1	-5		270	198
15000	-12	-15	900	242	208
20000	-21	-25		220	219
25000	-30	-35		206	230
30000	-40	-44		196	242

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 900 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-91

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	28	25		348	180
5000	18	15		308	190
10000	9	5		271	200
15000	-1	-5	900	243	210
20000	-10	-15		221	221
25000	-20	-25		206	233
30000	-29	-34		196	245
ISA (°C)	ISA + 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	38	35		349	182
5000	29	25		309	192
10000	19	15		272	202
15000	9	5	900	243	213
20000	0	-5		222	224
25000	-10	-15		207	235
30000	-19	-24		196	247
ISA (°C)	ISA + 35 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	53	50		351	185
5000	44	40		311	195
10000	34	30		274	205
15000	25	20	900	245	216
20000	15	10		223	227
25000	6	0		207	239
30000	-3	-		197	251

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 900 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-93

ISA (°C)	ISA - 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	-5		-	-
5000	-12	-15		319	191
10000	-22	-25		283	201
15000	-31	-35	1000	255	211
20000	-41	-45		236	222
25000	-50	-55		222	233
30000	-60	-64		215	246

ISA (°C)	ISA - 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	8	5		360	184
5000	-2	-5		320	193
10000	-11	-15		284	203
15000	-21	-25	1000	256	214
20000	-31	-35		237	225
25000	-40	-45		222	237
30000	-49	-54		215	249

ISA (°C)	ISA (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	18	15		361	186
5000	8	5		321	196
10000	-1	-5		285	206
15000	-11	-15	1000	257	216
20000	-20	-25		237	228
25000	-30	-35		223	240
30000	-39	-44		214	252

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1000 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-95

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	28	25		362	188
5000	18	15		323	198
10000	9	5		286	208
15000	-1	-5	1000	258	219
20000	-10	-15		238	230
25000	-19	-25		223	242
30000	-29	-34		215	255
ISA (°C)	**ISA + 20 (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	38	35		364	190
5000	29	25		324	200
10000	19	15		287	210
15000	10	5	1000	259	221
20000	0	-5		239	233
25000	-9	-15		223	245
30000	-18	-24		212	258
ISA (°C)	**ISA + 35 (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	53	50		366	193
5000	44	40		327	203
10000	35	30		288	214
15000	25	20	1000	261	225
20000	16	10		239	237
25000	6	0		224	249
30000	-3	-9		199	262

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1000 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-97

ISA (°C)	ISA - 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	-5		-	-
5000	-	-15		-	-
10000	-21	-25		298	208
15000	-31	-35	1100	271	219
20000	-41	-45		253	230
25000	-50	-55		241	242
30000	-59	-64		234	255

ISA (°C)	ISA - 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	5		-	-
5000	-	-5		-	-
10000	-11	-15		299	211
15000	-21	-25	1100	271	221
20000	-30	-35		254	233
25000	-40	-45		241	245
30000	-49	-54		234	258

ISA (°C)	ISA (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	15		-	-
5000	-	5		-	-
10000	-1	-5		300	213
15000	-11	-15	1100	273	224
20000	-20	-25		254	236
25000	-29	-35		241	248
30000	-39	-44		229	261

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1100 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-99

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	25		-	-
5000	-	15		-	-
10000	9	5		301	216
15000	0	-5	1100	274	227
20000	-10	-15		255	239
25000	-19	-25		241	251
30000	-28	-34		221	264

ISA (°C)	ISA + 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	35		-	-
5000	29	25		339	207
10000	19	15		302	218
15000	10	5	1100	275	229
20000	1	-5		256	241
25000	-9	-15		241	254
30000	-	-24		-	-

ISA (°C)	ISA + 35 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	50		-	-
5000	44	40		341	211
10000	35	30		304	222
15000	25	20	1100	276	233
20000	16	10		256	245
25000	7	0		238	258
30000	-	-9		-	-

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
* ECS: NORMAL

Intermediate Cruise Power, 1100 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-101

ISA (°C)	ISA - 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	-5		-	-
5000	-	-15		-	-
10000	-	-25		-	-
15000	-	-35	1200	-	-
20000	-40	-45		270	237
25000	-50	-55		259	250
30000	-	-64		-	-
ISA (°C)	**ISA - 10 (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	5		-	-
5000	-	-5		-	-
10000	-	-15		-	-
15000	-21	-25	1200	289	229
20000	-30	-35		271	240
25000	-39	-45		259	253
30000	-49	-54		239	266
ISA (°C)	**ISA (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	15		-	-
5000	-	5		-	-
10000	-	-5		-	-
15000	-10	-15	1200	290	231
20000	-20	-25		271	243
25000	-29	-35		259	256
30000	-	-44		-	-

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
* ECS: NORMAL

Intermediate Cruise Power, 1200 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-103

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	25		-	-
5000	-	15		-	-
10000	-	5		-	-
15000	0	-5	1200	290	234
20000	-9	-15		272	246
25000	-19	-25		260	259
30000	-	-34		-	-

ISA (°C)	ISA + 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	35		-	-
5000	-	25		-	-
10000	-	15		-	-
15000	10	5	1200	291	237
20000	1	-5		272	249
25000	8	-15		254	262
30000	-	-24		-	-

ISA (°C)	ISA + 35 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)
0	-	50		-	-
5000	-	40		-	-
10000	35	30		321	229
15000	26	20	1200	292	241
20000	16	10		273	253
25000	7	0		238	267
30000	-	-9		-	-

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1200 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-105

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MAXIMUM SPEED CRUISE

Altitude	Cruise Nautical Miles / 100 Lbs. Fuel					
FT	ISA - 20° C	ISA - 10° C	ISA	ISA + 10° C	ISA + 20° C	ISA + 35° C
0	50.6	51.0	51.5	51.7	52.1	52.7
5000	59.7	60.2	60.6	60.9	61.1	61.7
10000	70.0	70.4	70.8	71.1	71.3	71.6
15000	79.4	79.3	79.7	79.7	80.3	80.1
20000	85.8	86.0	86.3	87.0	88.0	92.3
25000	91.1	93.5	96.7	99.6	103.2	107.6
30000	107.8	111.3	114.9	118.7	122.2	128.2

INTERMEDIATE POWER CRUISE - 1000 FT-LB

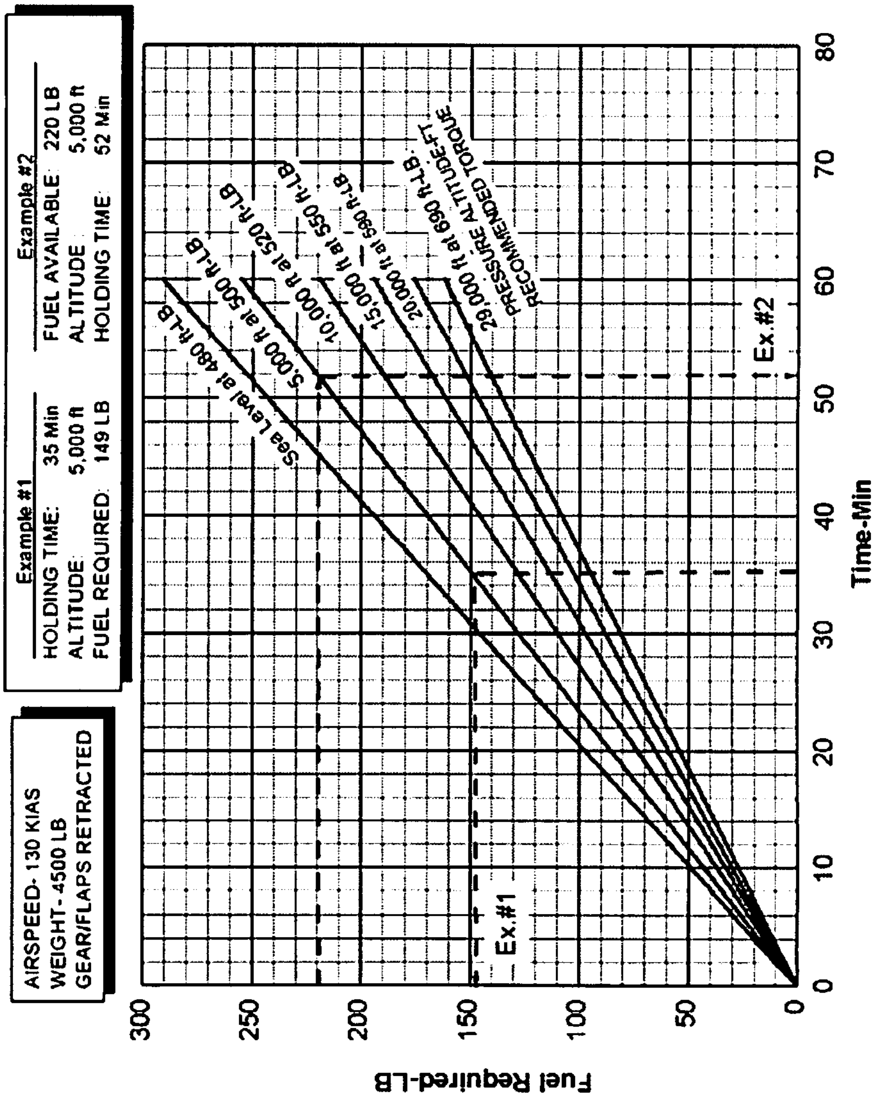
Altitude	Cruise Nautical Miles / 100 Lbs. Fuel					
FT	ISA - 20° C	ISA - 10° C	ISA	ISA + 10° C	ISA + 20° C	ISA + 35° C
0	-	51.1	51.5	51.9	52.3	52.9
5000	59.8	60.4	60.9	61.3	61.7	62.3
10000	70.9	71.6	72.2	72.8	73.4	74.2
15000	82.6	83.5	84.3	84.9	85.5	86.3
20000	93.9	94.9	95.9	96.9	97.7	98.9
25000	104.9	106.4	107.6	108.6	109.7	111.1
30000	114.4	116.1	117.6	118.9	121.9	131.8

LOW POWER CRUISE-500 FT-LB

Altitude	Cruise Nautical Miles / 100 Lbs. Fuel					
FT	ISA - 20° C	ISA - 10° C	ISA	ISA + 10° C	ISA + 20° C	ISA + 35° C
0	44.3	44.9	45.6	46.4	46.9	47.9
5000	54.9	55.6	56.3	56.8	57.4	58.3
10000	68.9	69.7	70.4	71.0	71.6	72.5
15000	84.1	85.1	86.1	87.0	87.7	88.5
20000	101.8	102.8	103.6	104.3	105.4	105.9
25000	119.9	121.2	122.3	123.1	124.2	124.5
30000	138.5	139.4	140.3	140.9	141.2	141.6

Note:
ECS: NORMAL
Shaded areas are beyond aircraft OAT limit. See paragraph 2.28.
Does not include 45 minute reserve, 26 gal. (174.2 Lb).
To obtain 45 minute reserve endurance set power to Low Power Cruise @ 5,000'.

Specific Air Range
Figure 5-111



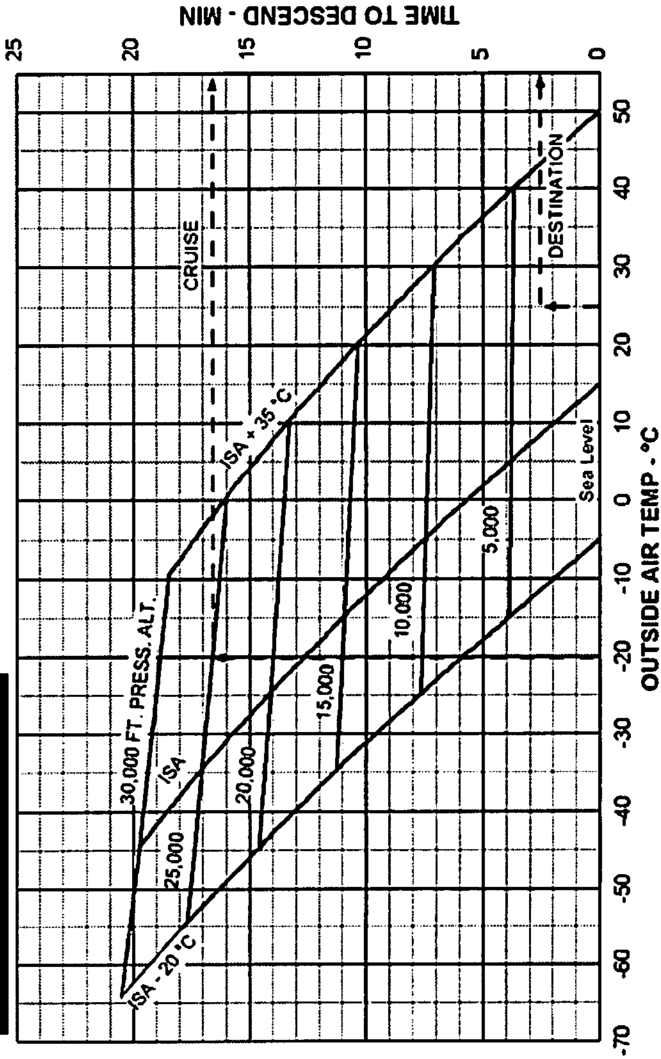
Holding Time vs. Fuel On Board
Figure 5-113

EXAMPLE

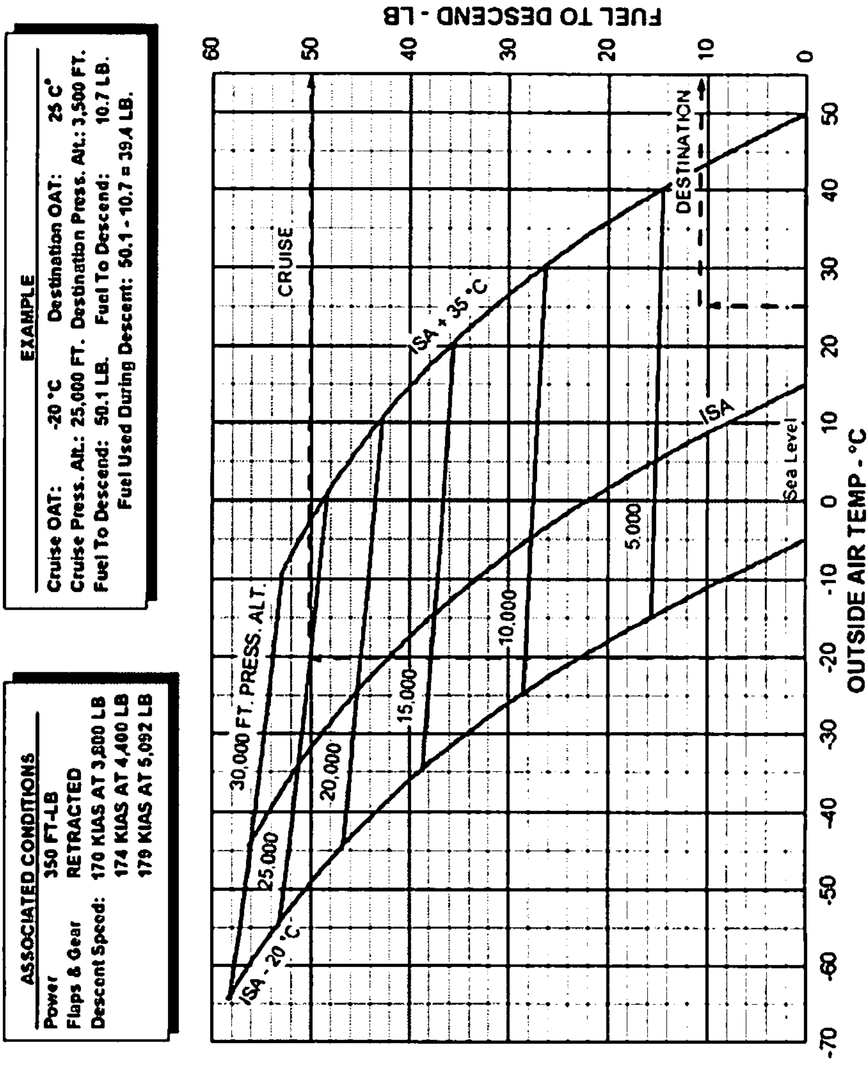
Cruise OAT:	-20 °C	Destination OAT:	25 °C
Cruise Press. Alt.:	25,000 FT.	Destination Press. Alt.:	3,500 FT.
Time To Descend.:	16.6 Min	Time To Descend:	2.6 Min.
Time During Descent:	16.6 - 2.6 = 14.0 Min		

ASSOCIATED CONDITIONS

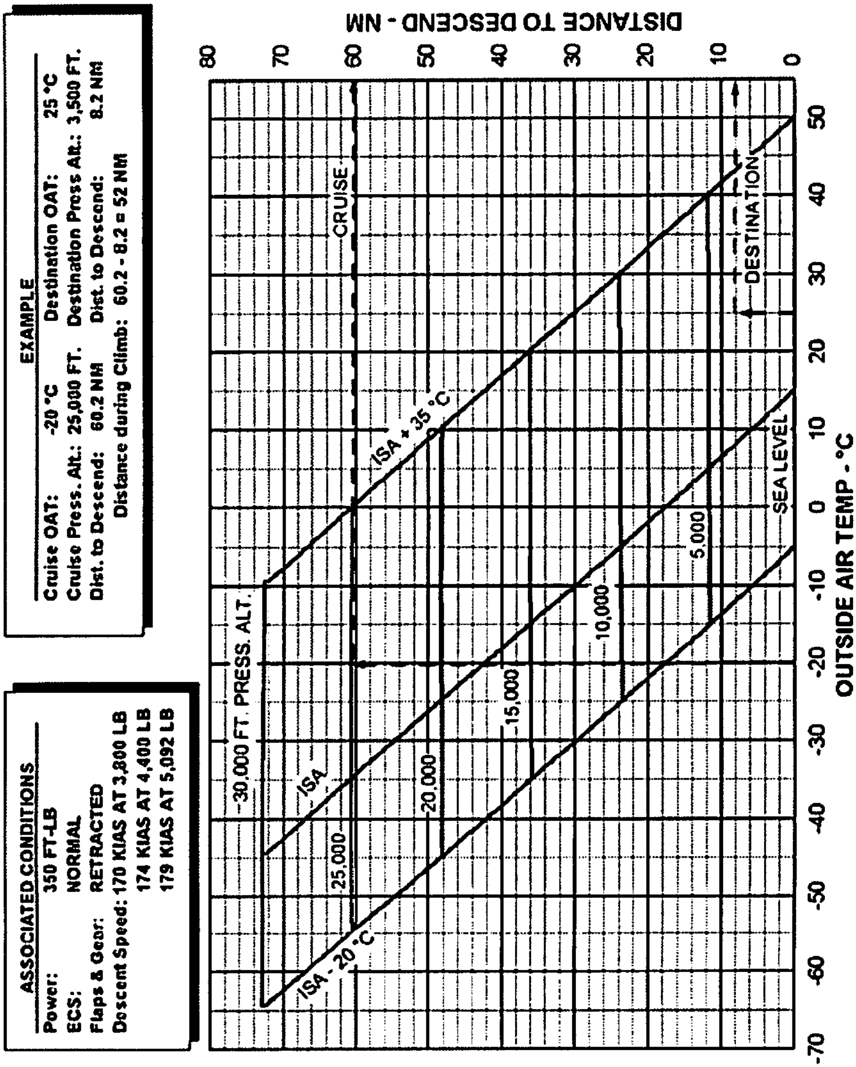
Power:	350 FT-LB
ECS:	NORMAL
Flaps & Gear:	RETRACTED
Descent Speed:	170 KIAS at 3,800 LB 174 KIAS at 4,400 LB 179 KIAS at 5,092 LB



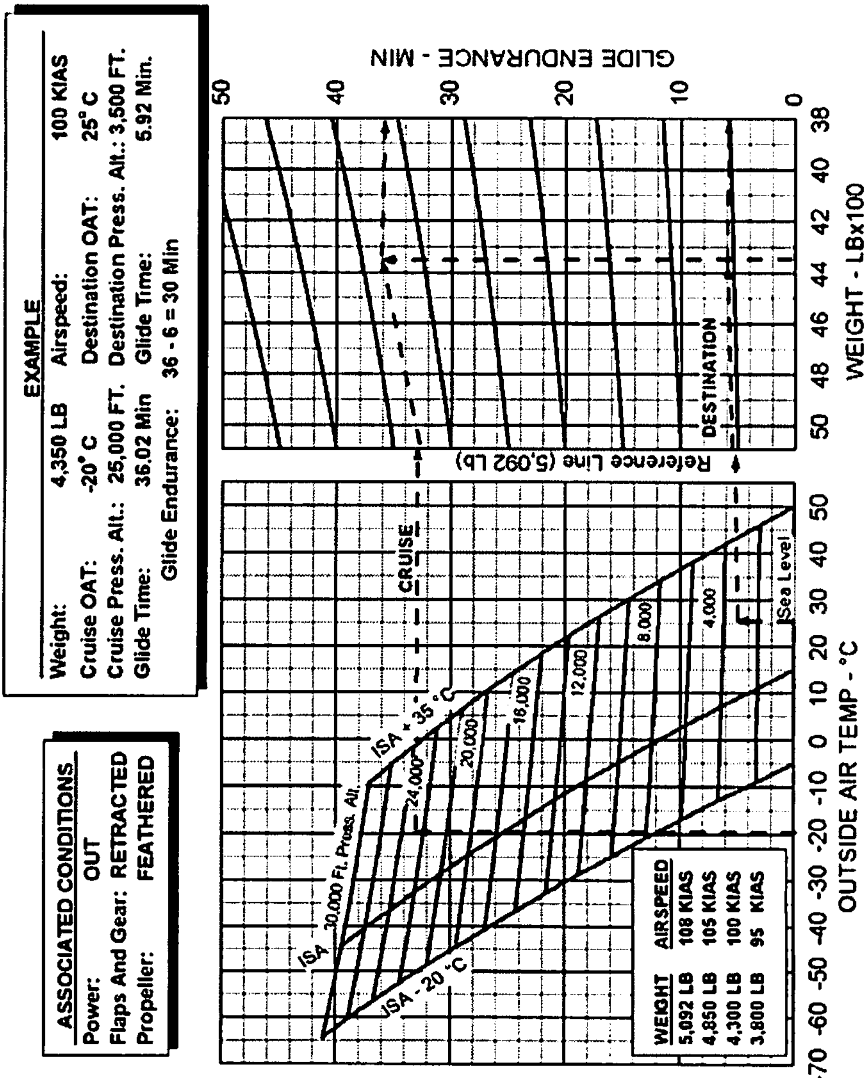
Time to Descend
Figure 5-115



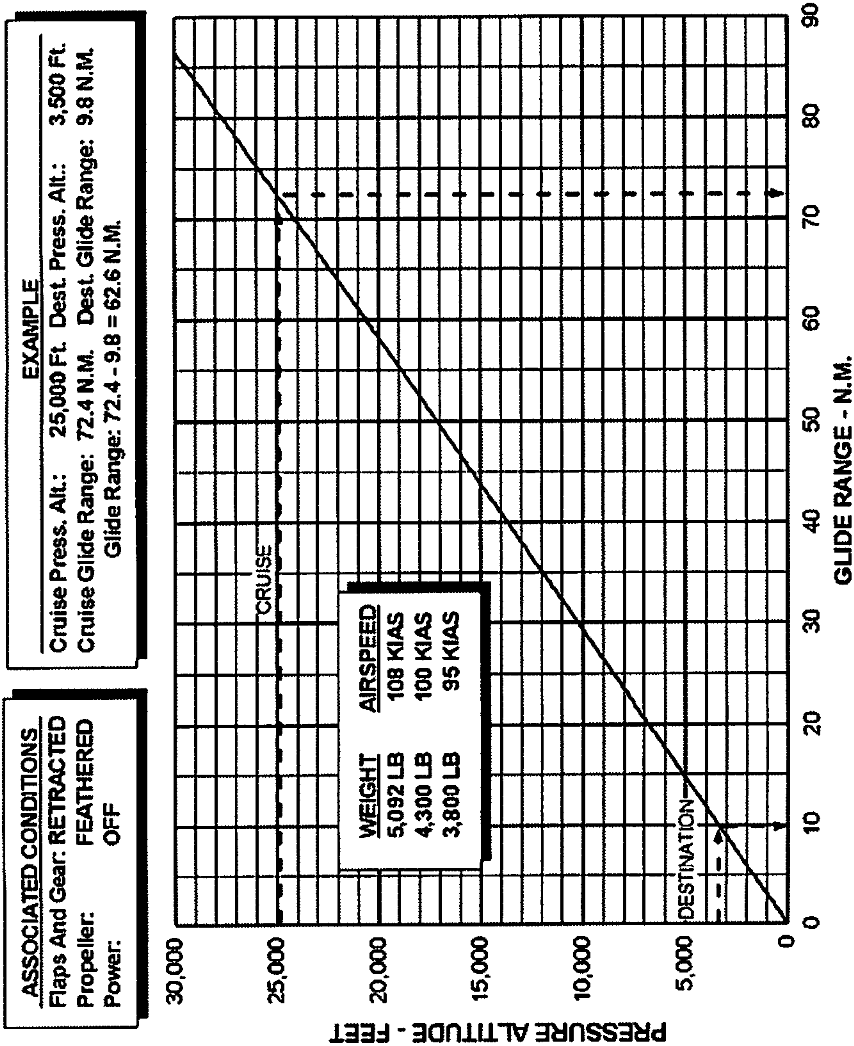
Fuel to Descend
Figure 5-117



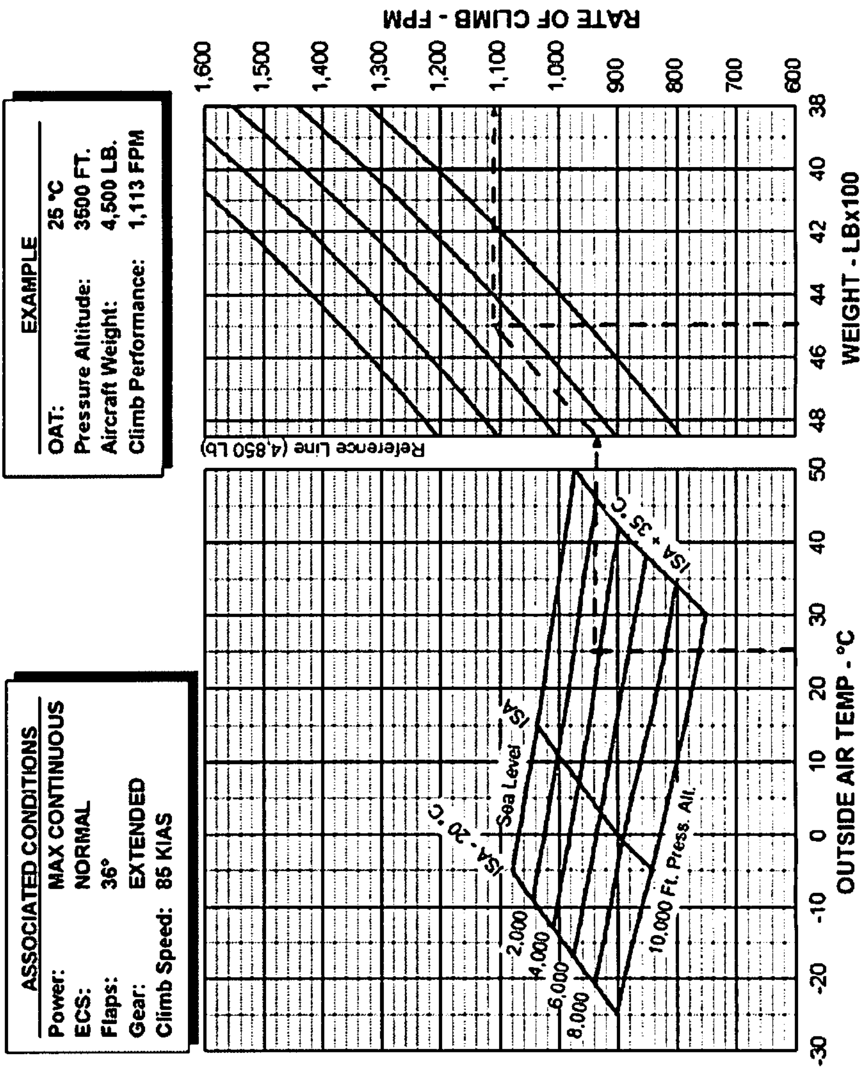
Distance to Descend
Figure 5-119



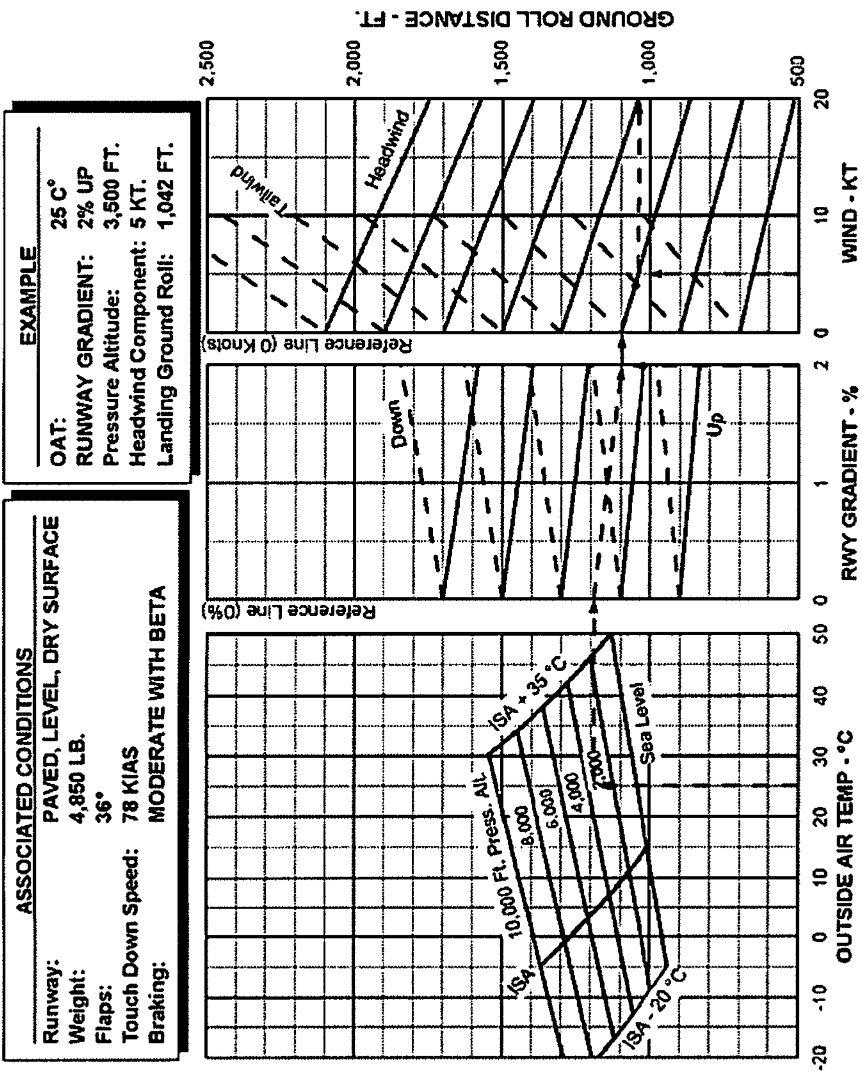
Glide Endurance
Figure 5-121



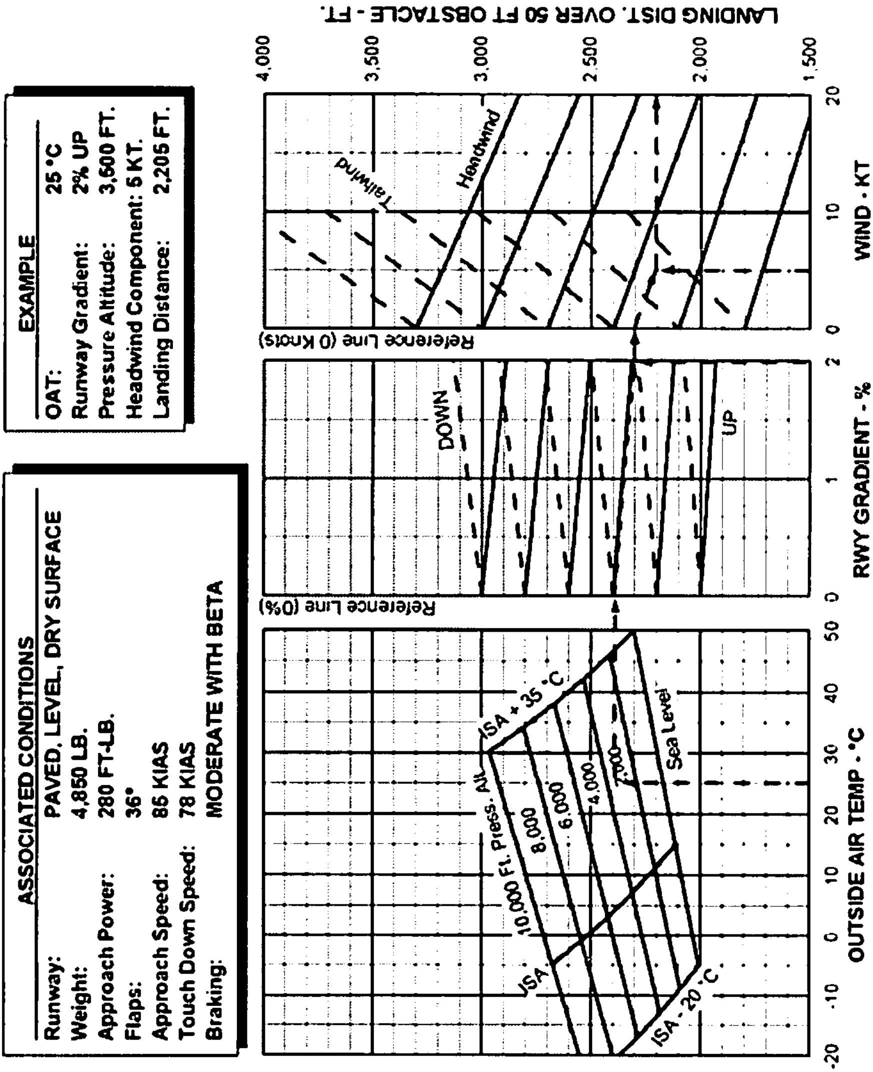
Glide Distance
Figure 5-123



Balked Landing Climb Performance
Figure 5-125



Landing Ground Roll, Flaps 36°, without Reverse
Figure 5-129



Landing Distance, Flaps 36°, without Reverse
Figure 5-131

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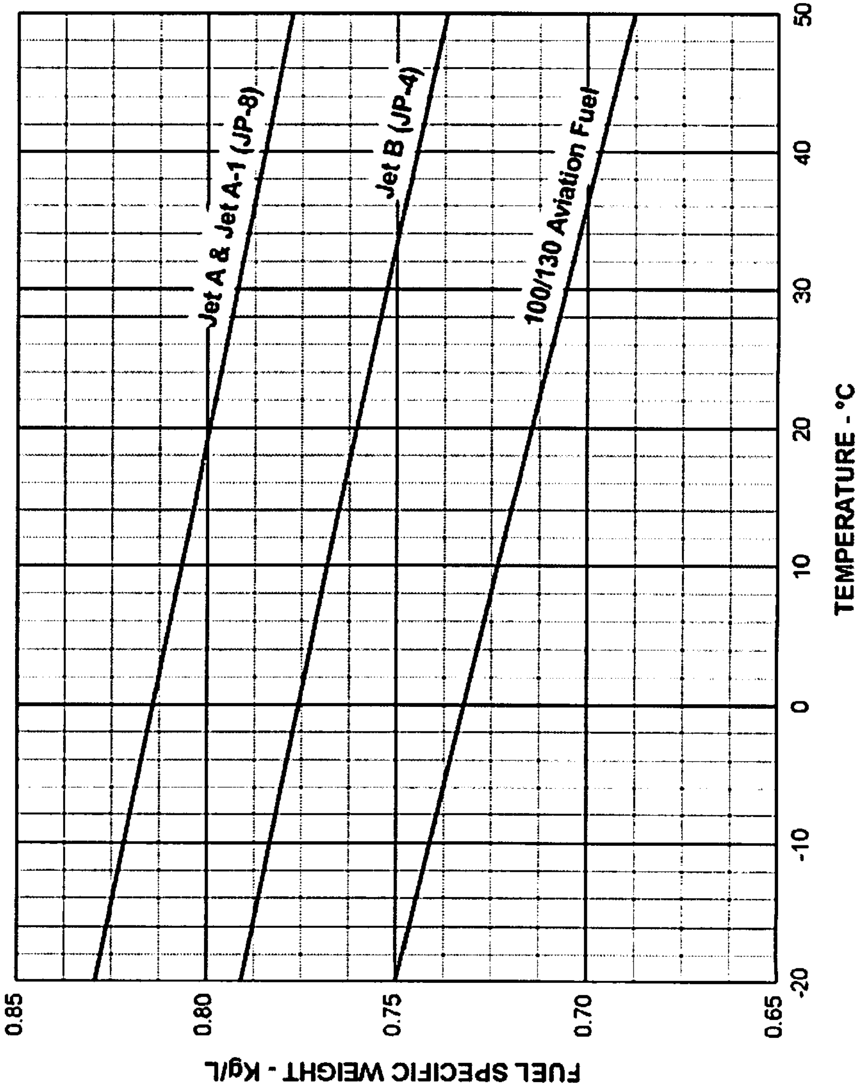
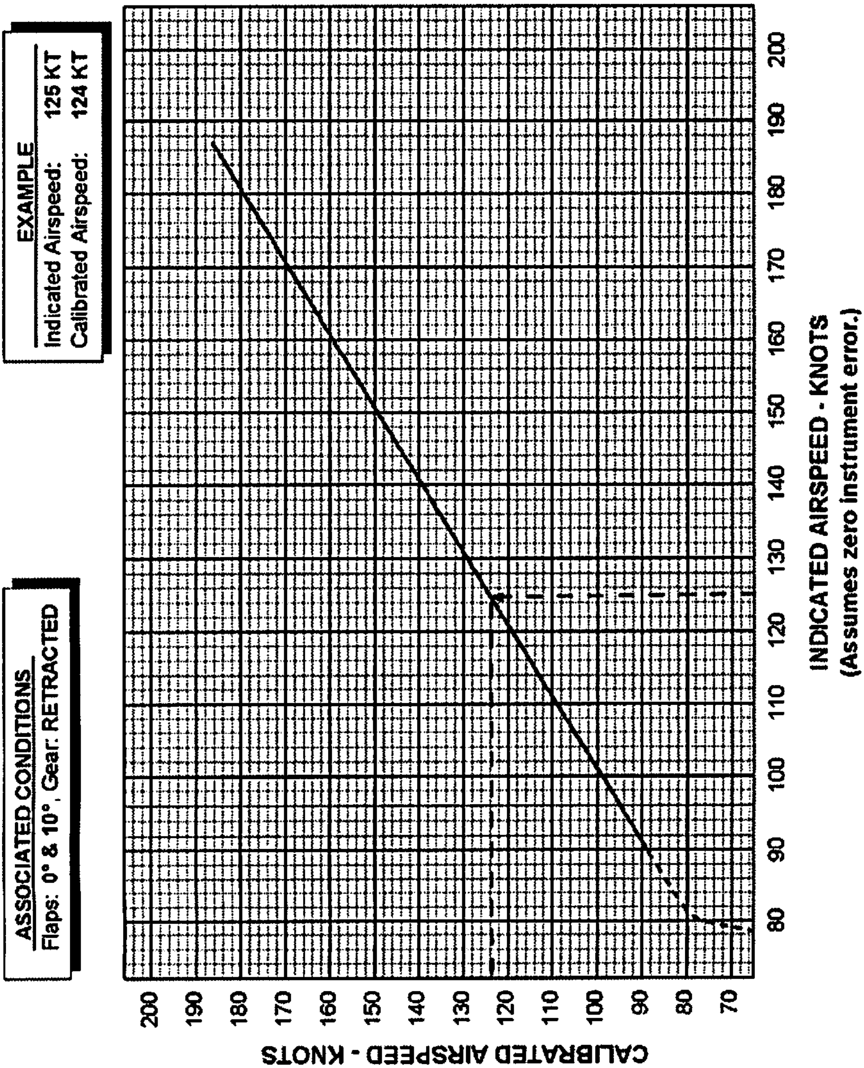
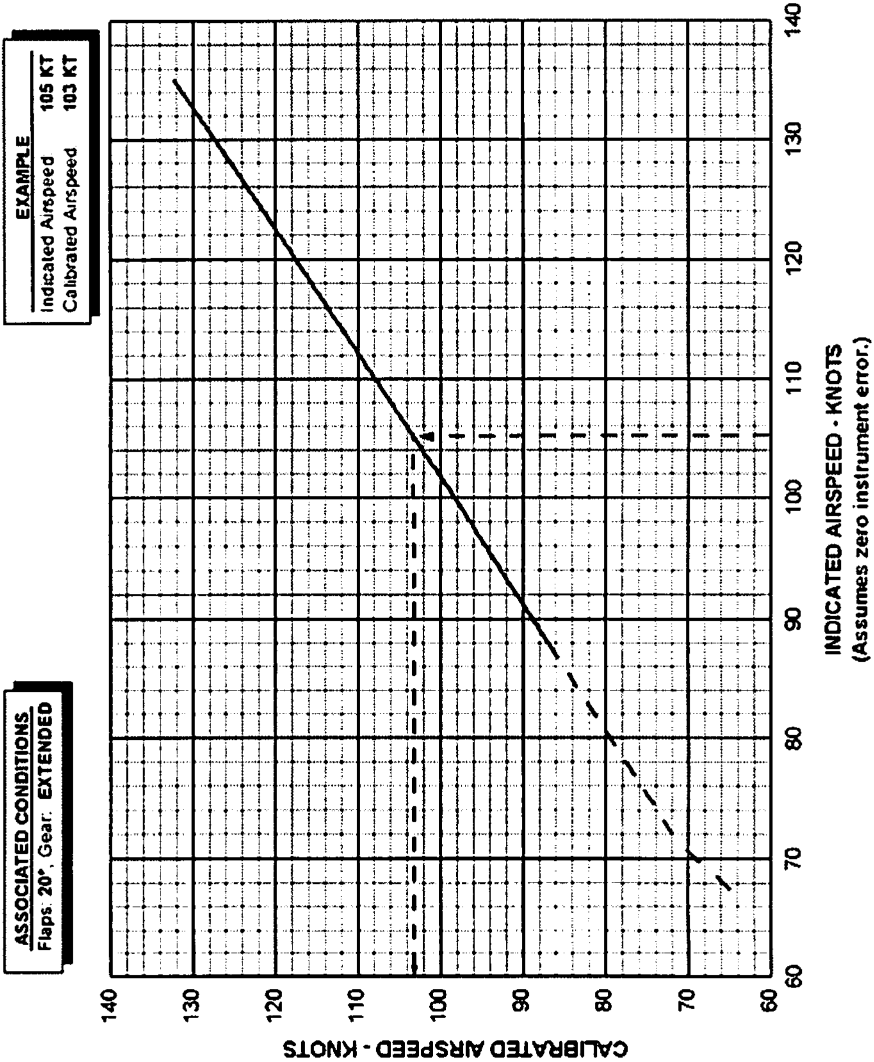


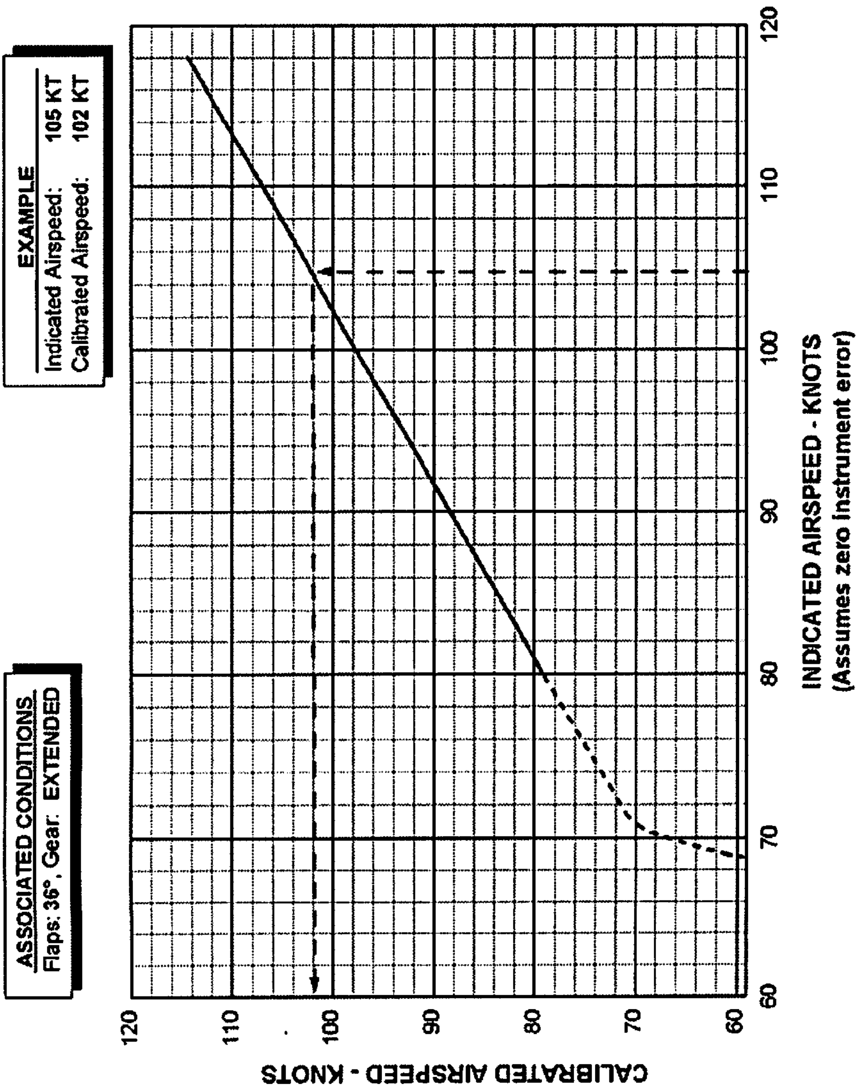
Aviation Fuel Specific Weight
Figure 5-145



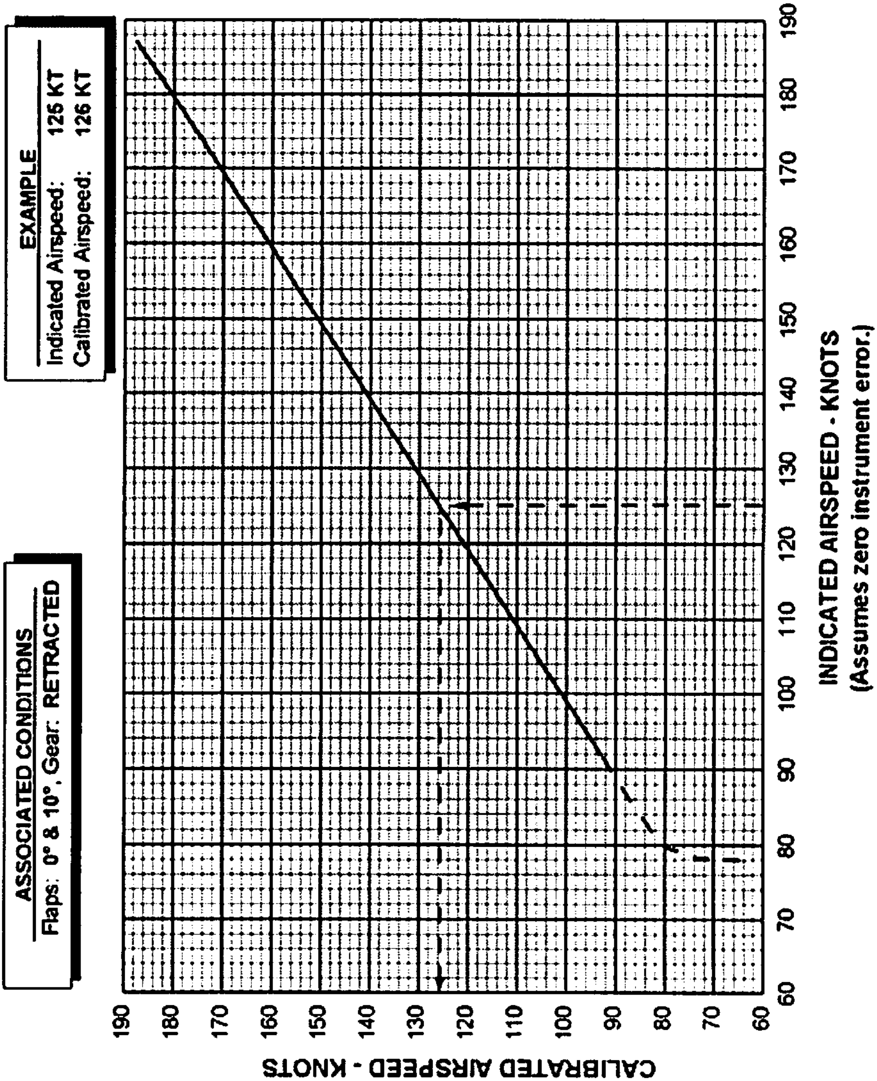
Airspeed Calibration
Primary Static (Flaps 0° and 10°)
Figure 5-147



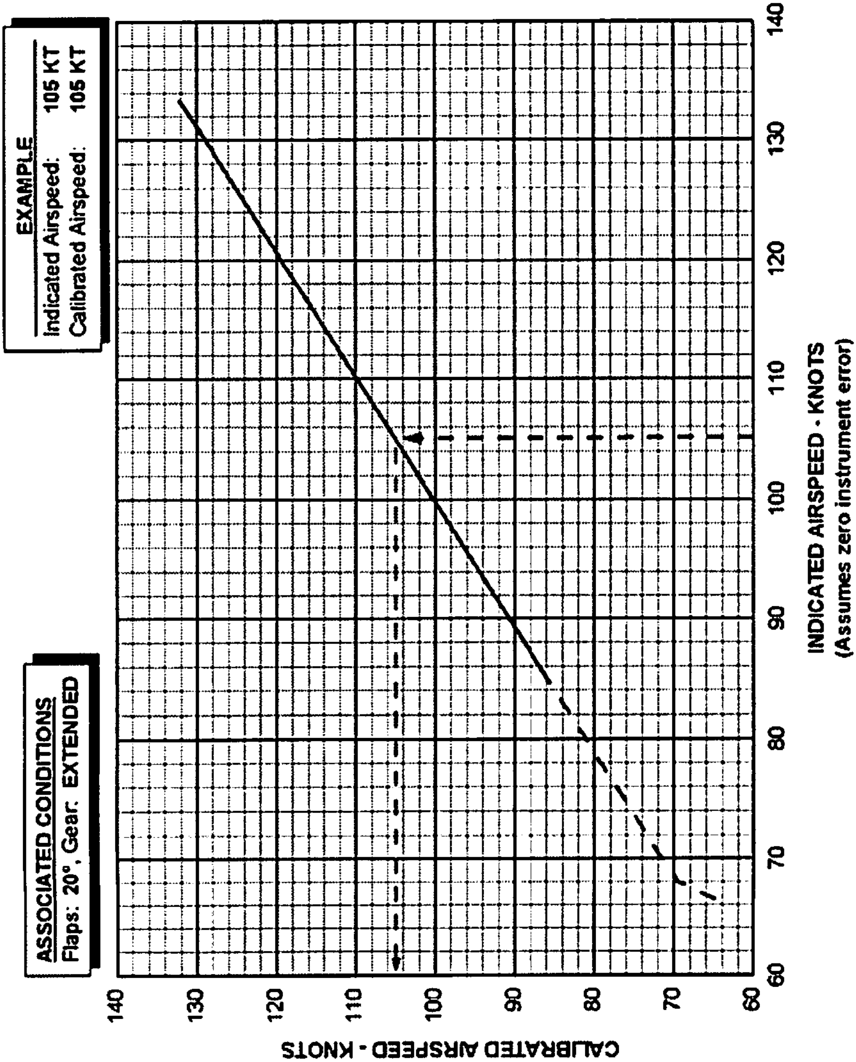
Airspeed Calibration
Primary Static (Flaps 20°, Gear DOWN)
Figure 5-149



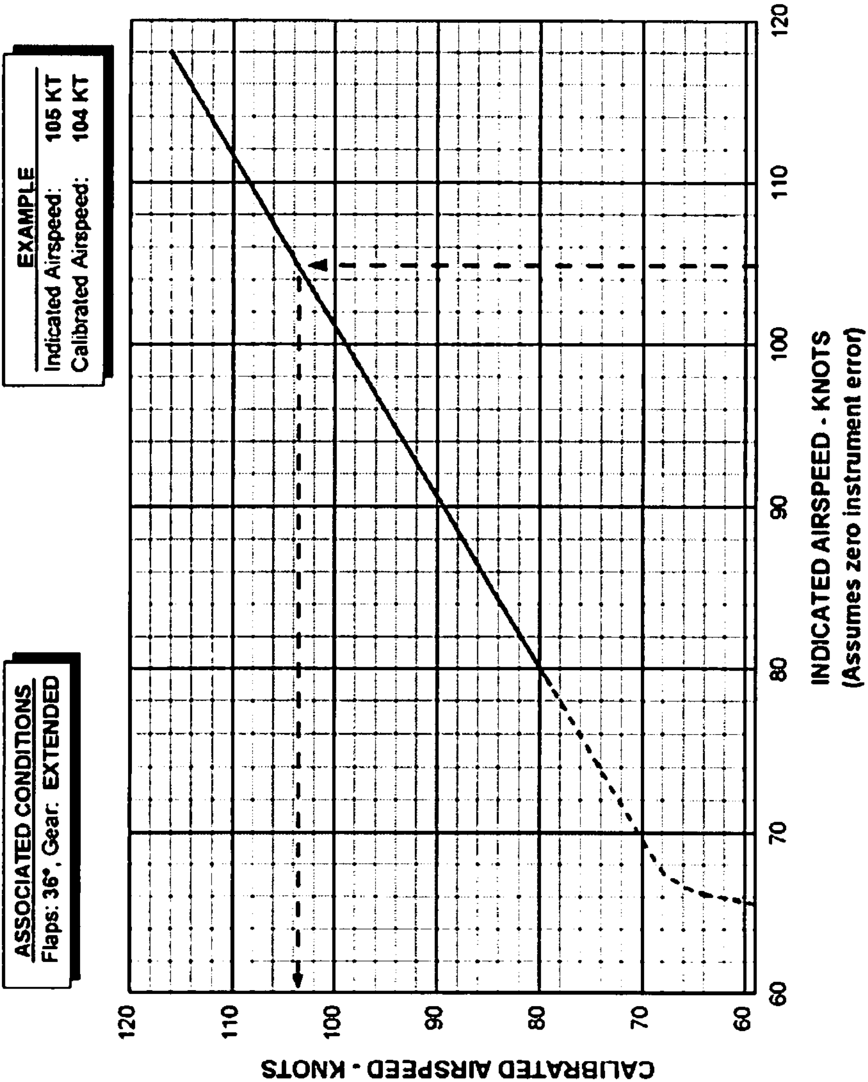
Airspeed Calibration
Primary Static (Flaps 36°, Gear DOWN)
Figure 5-151



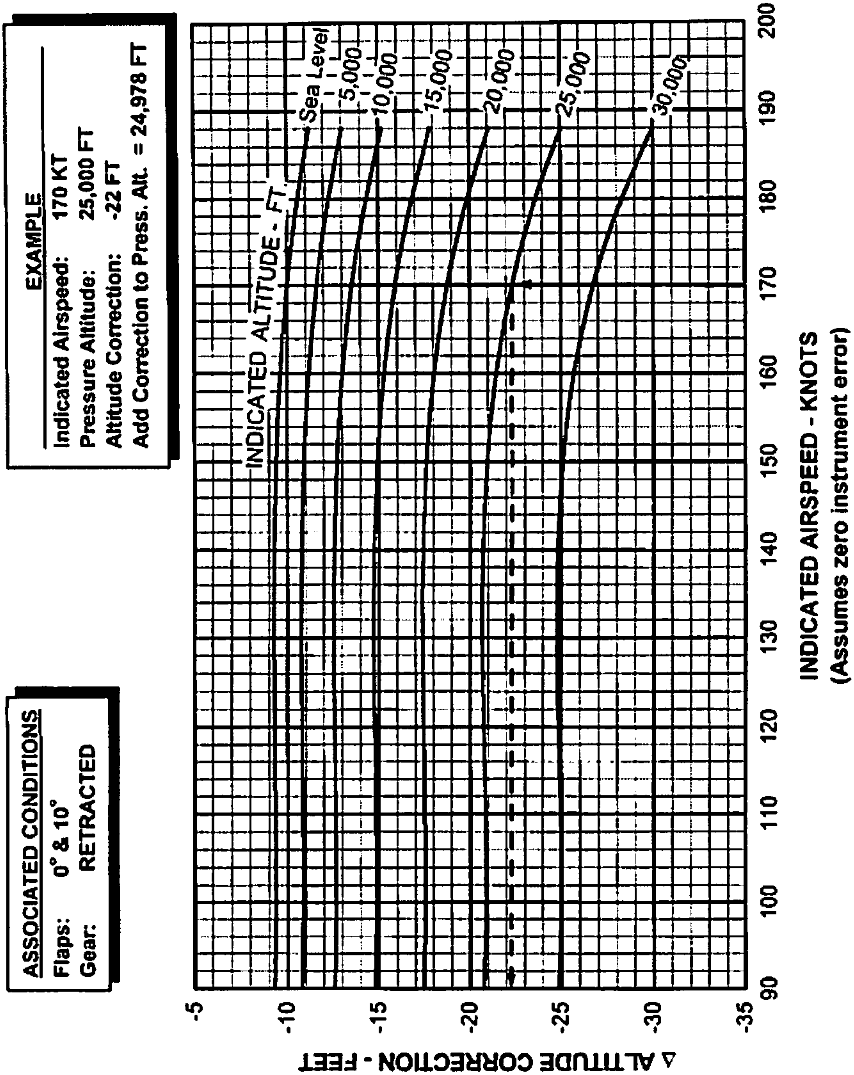
Airspeed Calibration
Alternate Static (Flaps 0° and 10°)
Figure 5-153



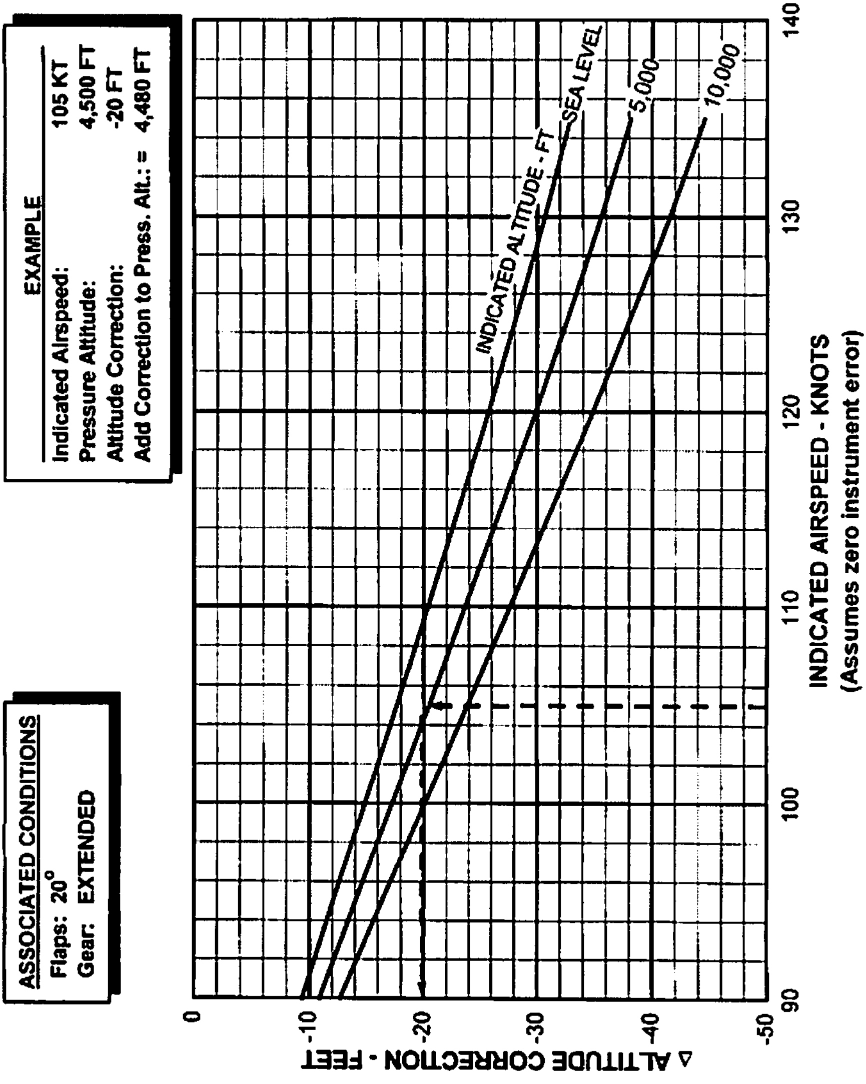
Airspeed Calibration
Alternate Static (Flaps 20°, Gear DOWN)
Figure 5-155



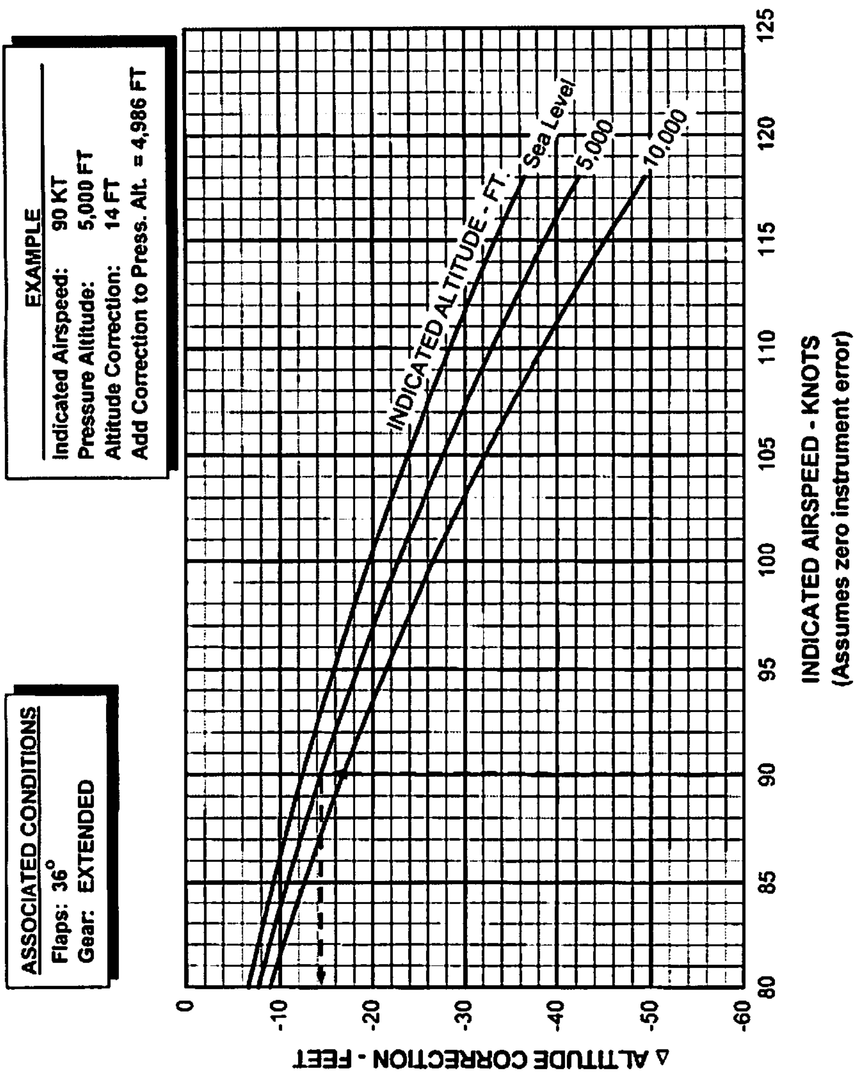
Airspeed Calibration
Alternate Static (Flaps 36°, Gear DOWN)
Figure 5-157



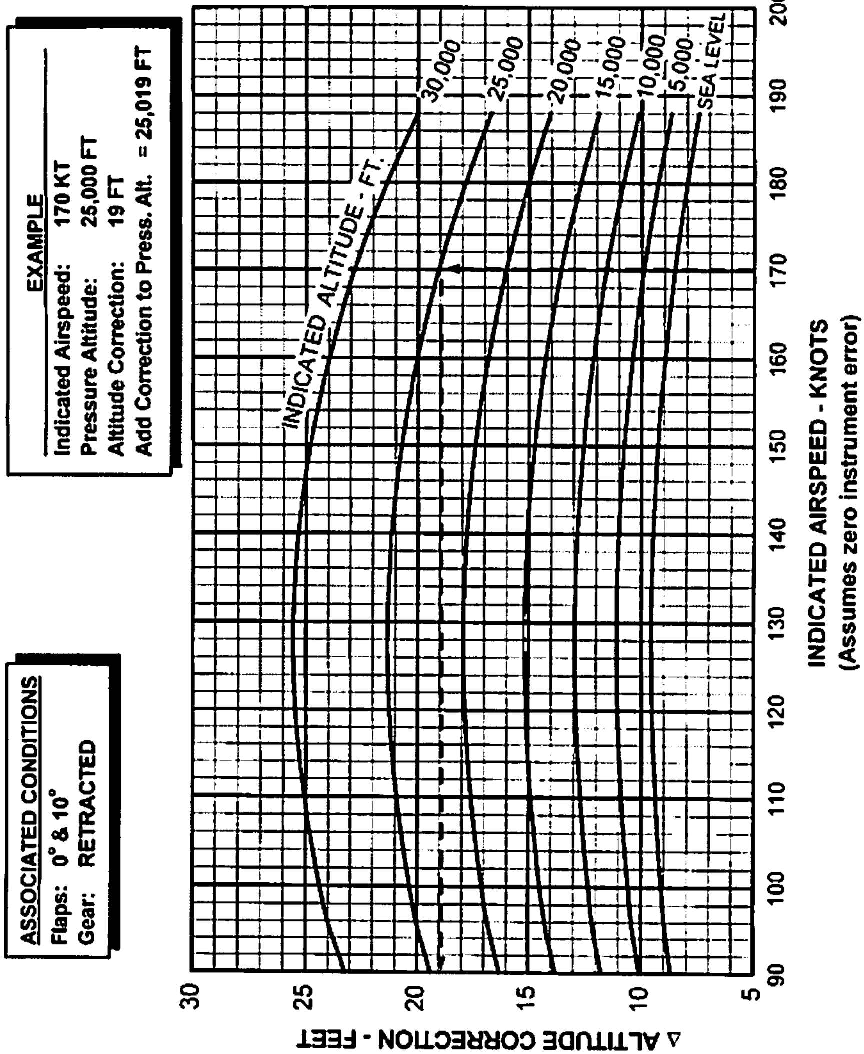
Altitude Calibration
Primary Static (Flaps 0° and 10°)
Figure 5-159



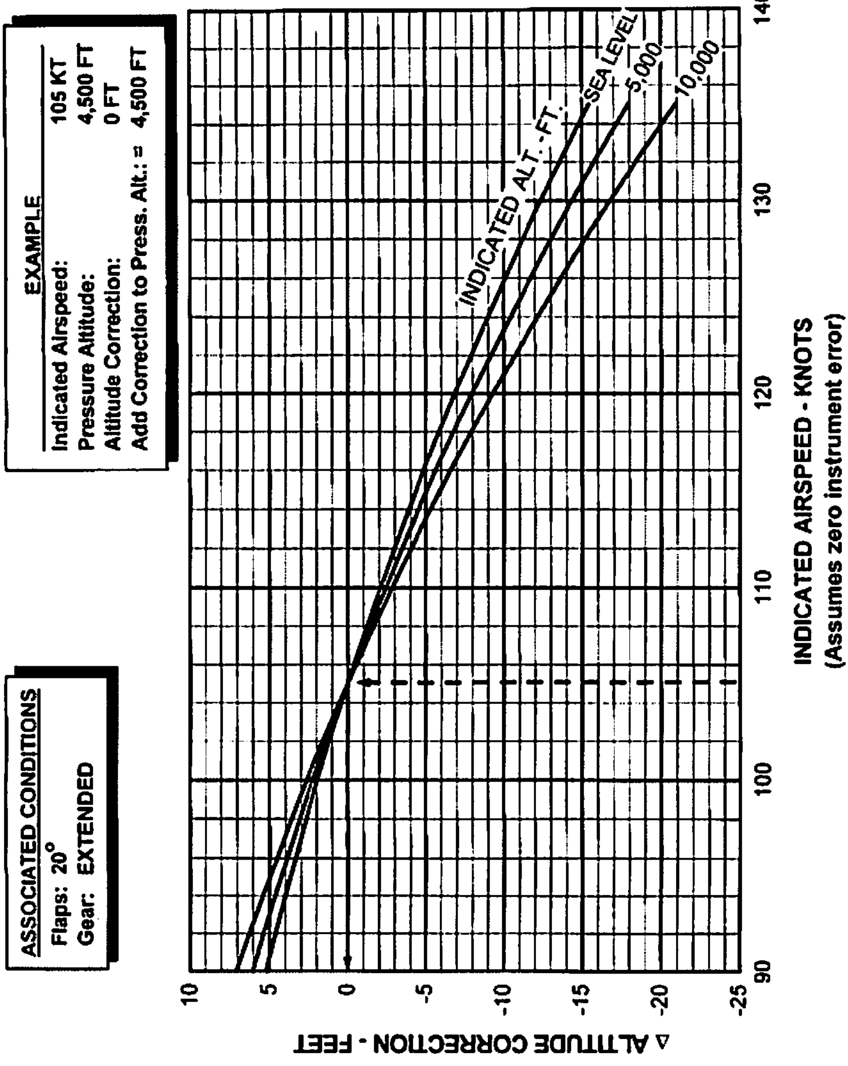
Altitude Calibration
Primary Static (Flaps 20°, Gear DOWN)
Figure 5-161



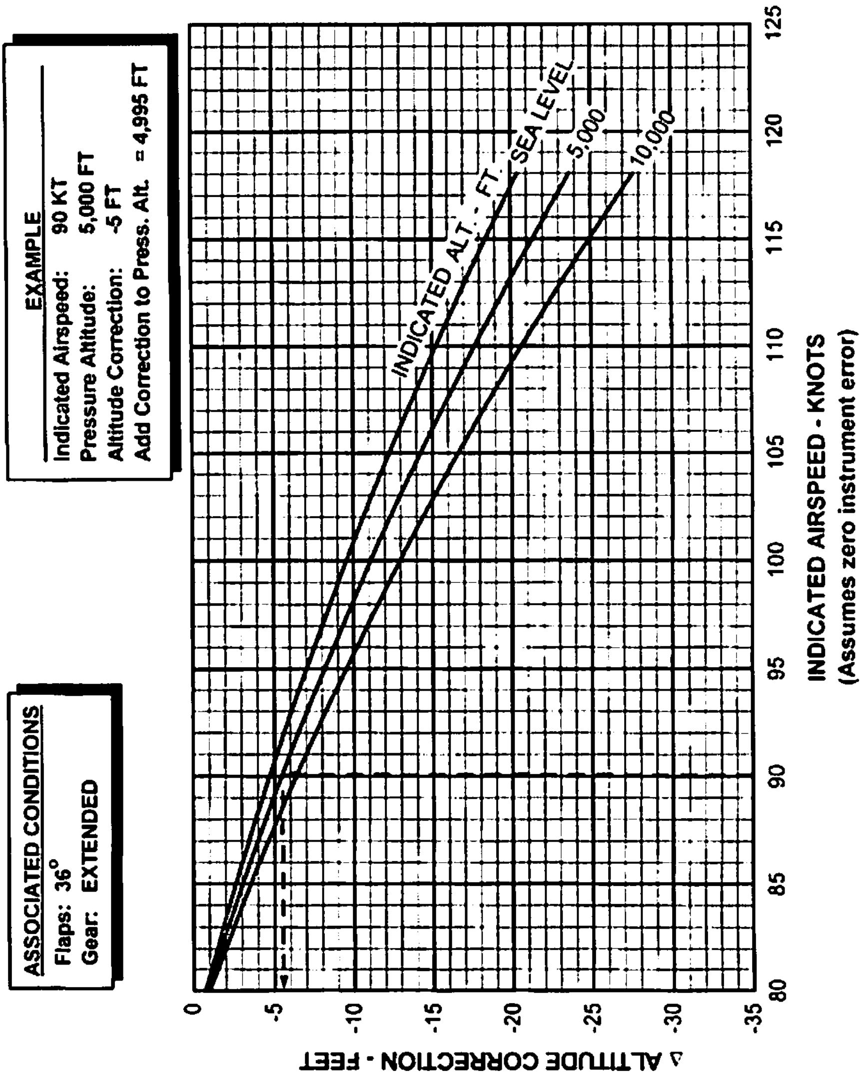
Altitude Calibration
Primary Static (Flaps 36°, Gear DOWN)
Figure 5-163



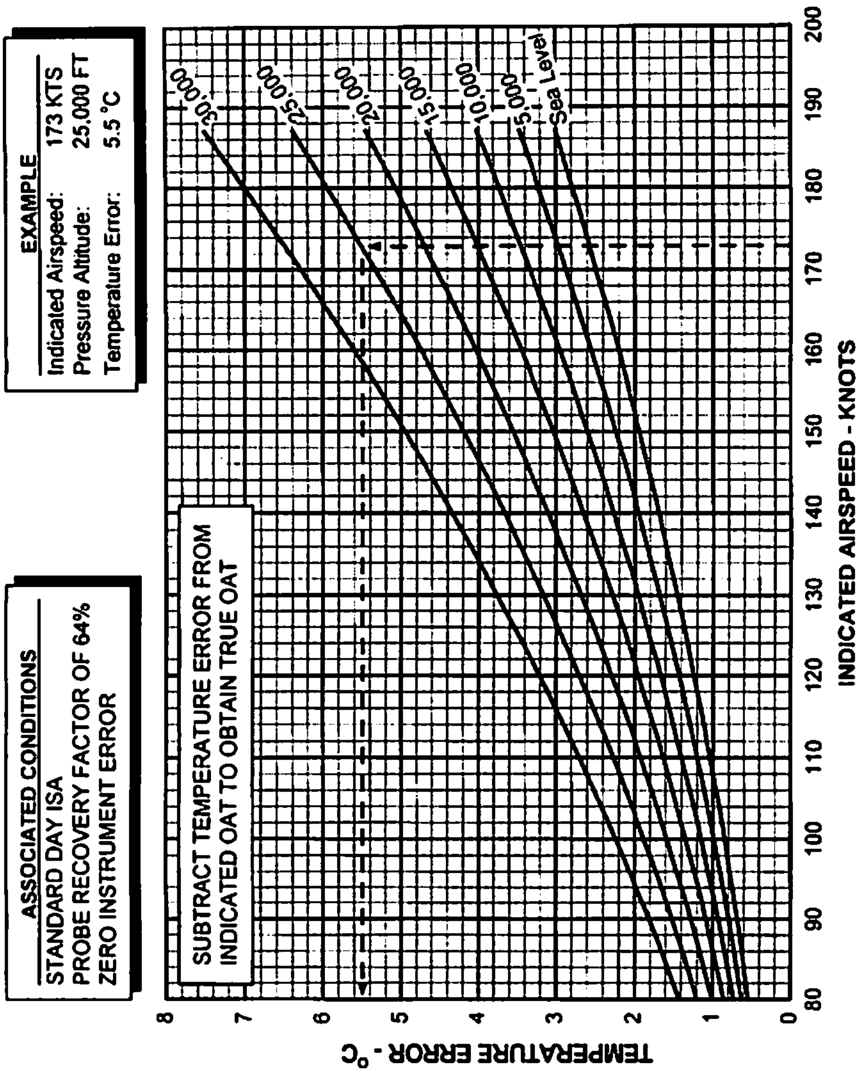
Altitude Calibration
Alternate Static (Flaps 0° and 10°)
Figure 5-165



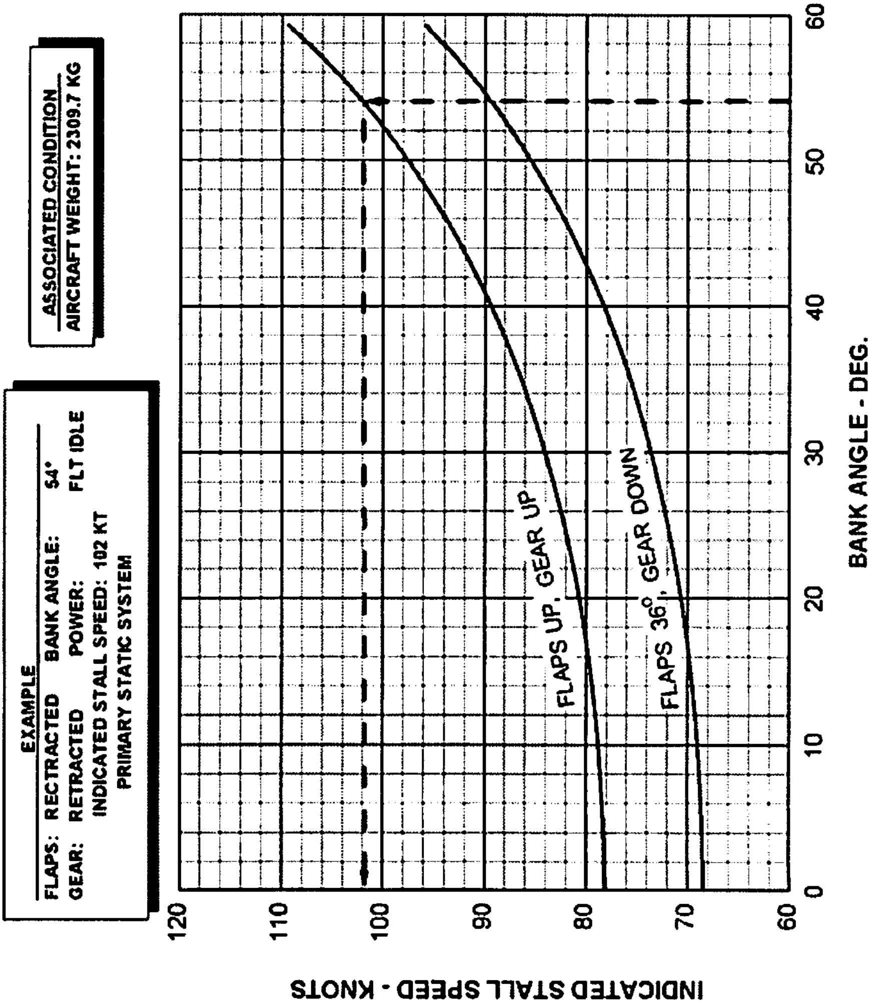
Altitude Calibration
Alternate Static (Flaps 20°, Gear DOWN)
Figure 5-167



Altitude Calibration
Alternate Static (Flaps 36°, Gear DOWN)
Figure 5-169



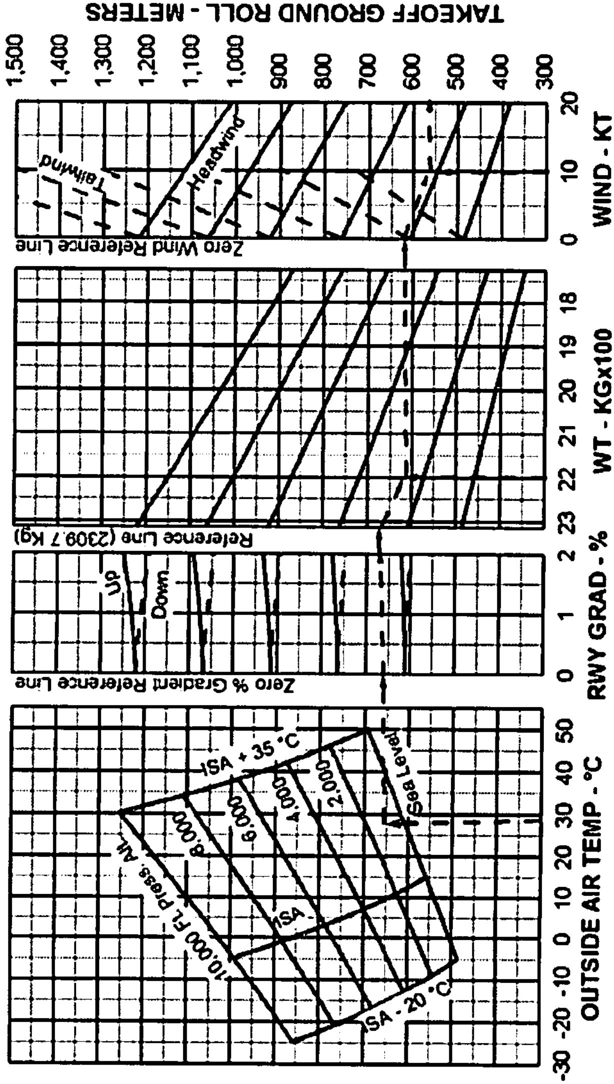
Temperature Probe Calibration
Figure 5-171



Angle of Bank vs. Stall Speed
Figure 5-173

ASSOCIATED CONDITIONS	
Runway:	PAVED, DRY SURFACE
Power:	FULL PRIOR TO BRAKE RELEASE
ECS:	NORMAL
Flaps:	RETRACTED
Rotation Speed :	82 KIAS
Liftoff Speed:	85 KIAS

EXAMPLE	
OAT:	29 °C
Runway Gradient:	2% UP
Pressure Altitude:	1,000 FT.
Takeoff Weight:	2,196 Kg.
Headwind Component:	10 KT.
Ground Roll Distance:	564 M.



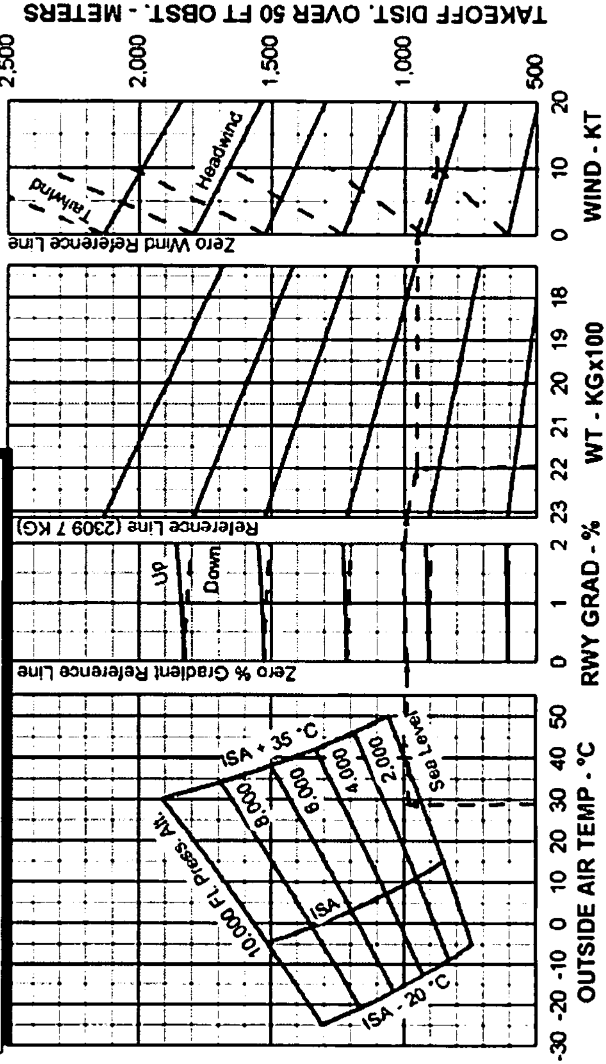
Normal Takeoff Ground Roll, 0° Flaps
Figure 5-175

ASSOCIATED CONDITIONS

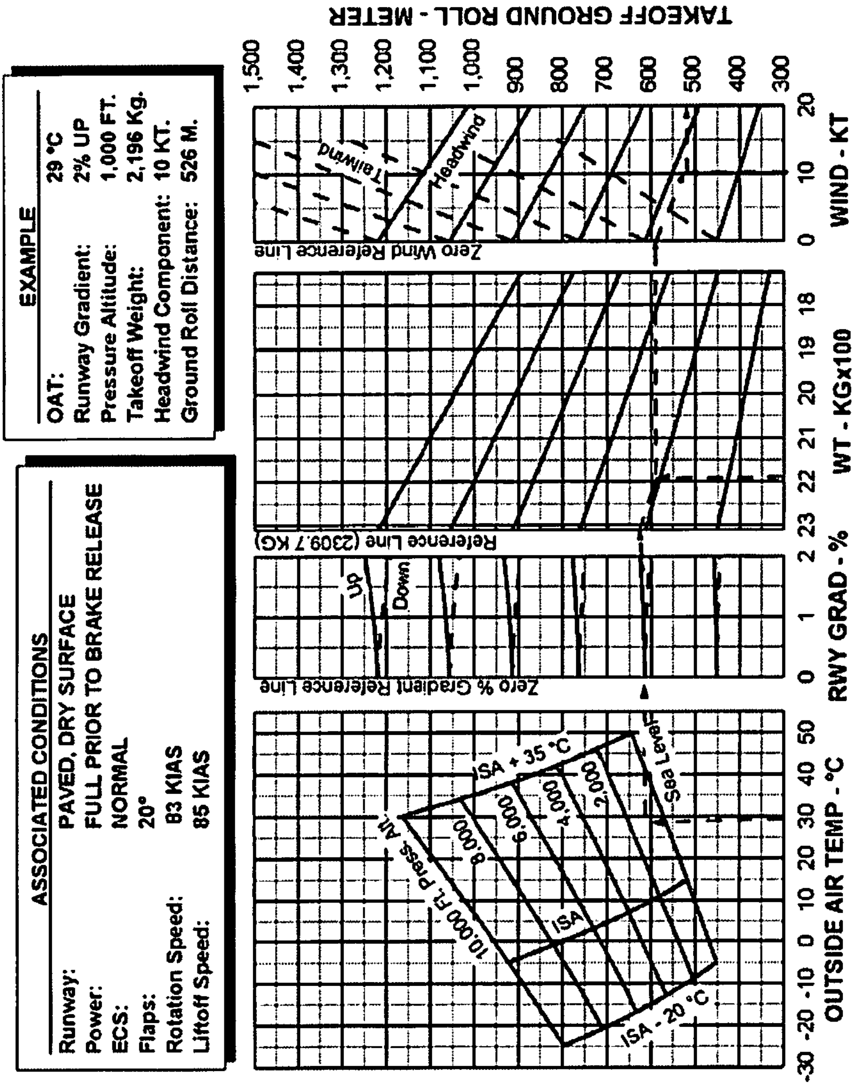
Runway:	PAVED, DRY SURFACE
Power:	FULL PRIOR TO BRAKE RELEASE
ECS:	NORMAL
Flaps:	RETRACTED
Rotation Speed:	82 KIAS
Liftoff Speed:	85 KIAS
Obstacle Speed:	100 KIAS
Gear:	Down

EXAMPLE

OAT:	29 °C
Runway Gradient:	2% UP
Pressure Altitude:	1,000 FT.
Takeoff Weight:	2,196 Kg.
Headwind Component:	10 KT
Takeoff Distance:	885 FT.



Normal Takeoff Performance over 50 ft. Obstacle, 0° Flaps
Figure 5-177



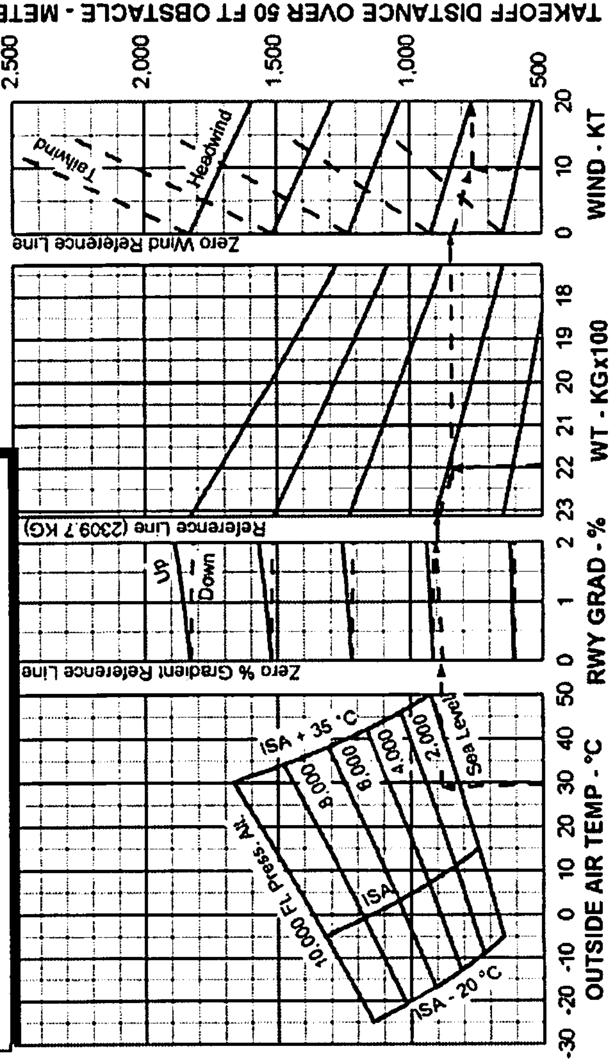
Maximum Effort Takeoff Ground Roll, 20° Flaps
Figure 5-179

ASSOCIATED CONDITIONS

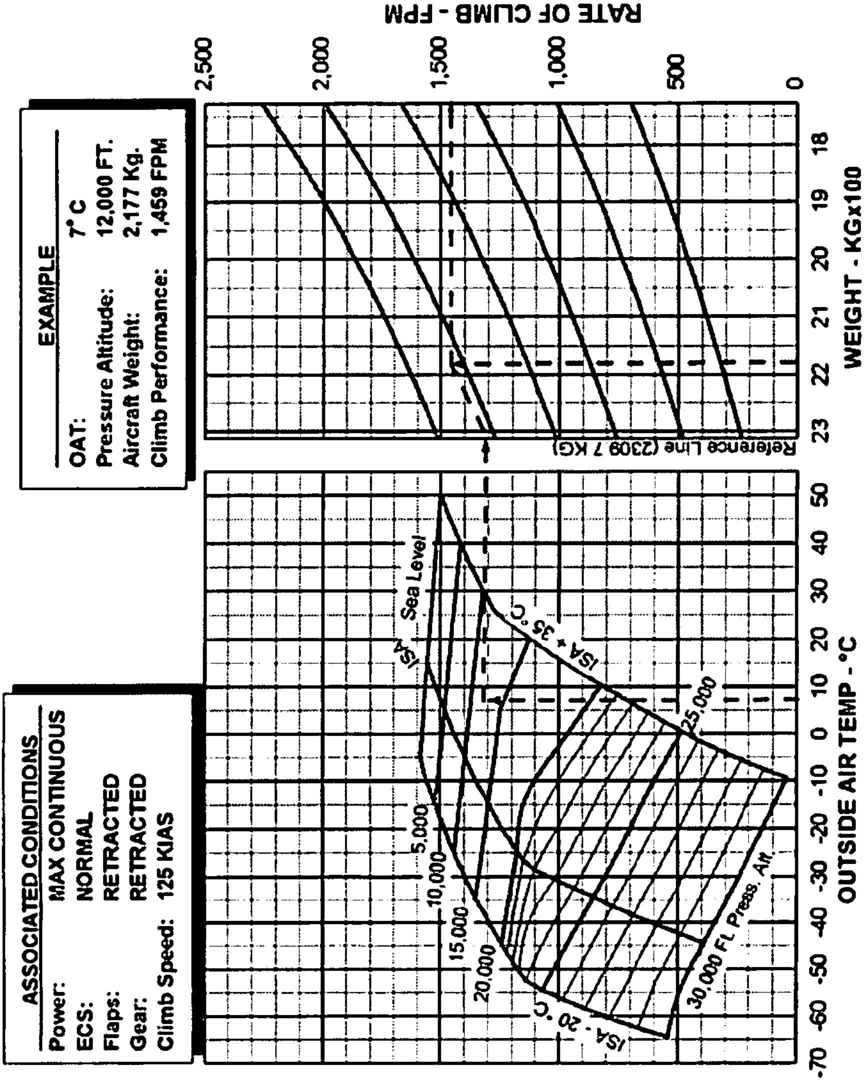
Runway:	PAVED, DRY SURFACE
Power:	FULL PRIOR TO BRAKE RELEASE
ECS:	NORMAL
Flaps:	20°
Rotating Speed:	83 KIAS
Liftoff Speed:	85 KIAS
Obstacle Speed:	93 KIAS
Gear:	Down

EXAMPLE

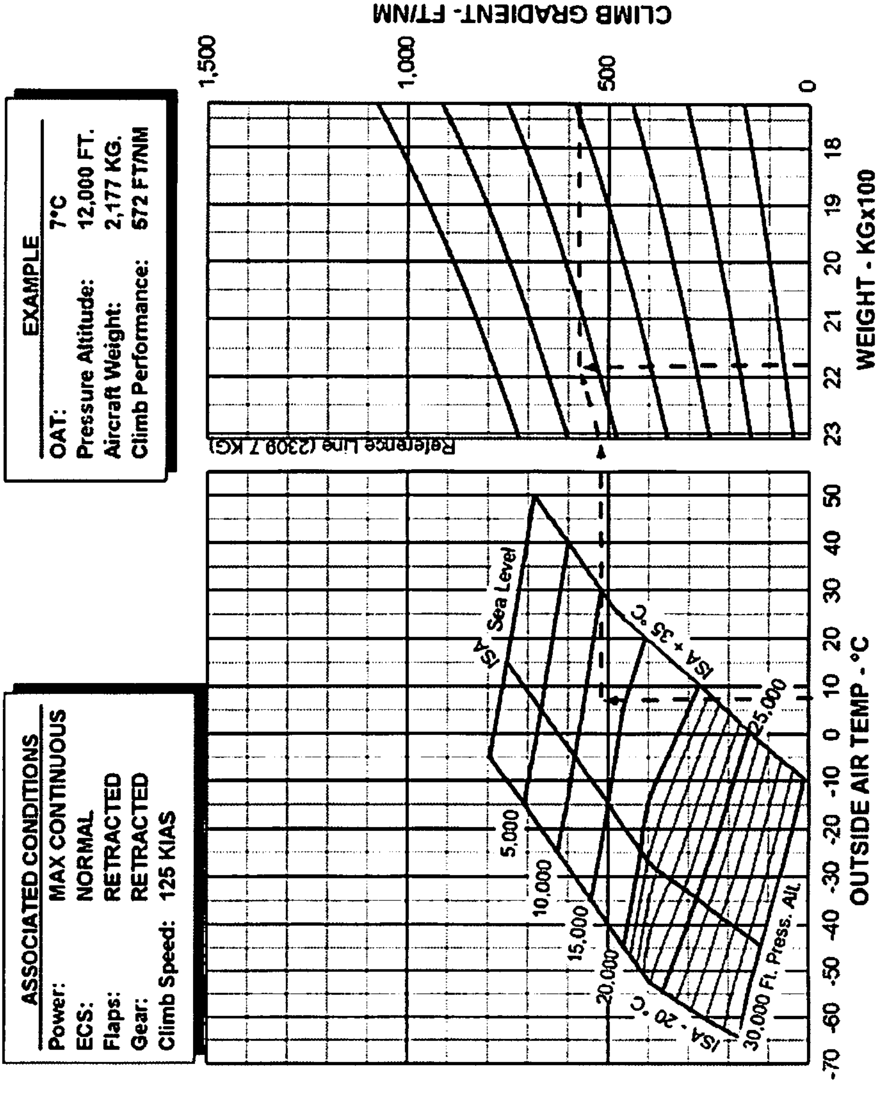
OAT:	29 °C
Runway Gradient:	2% UP
Pressure Altitude:	1,000 FT.
Takeoff Weight:	2,196 Kg.
Headwind Component:	10 KT.
Takeoff Distance:	758 M.



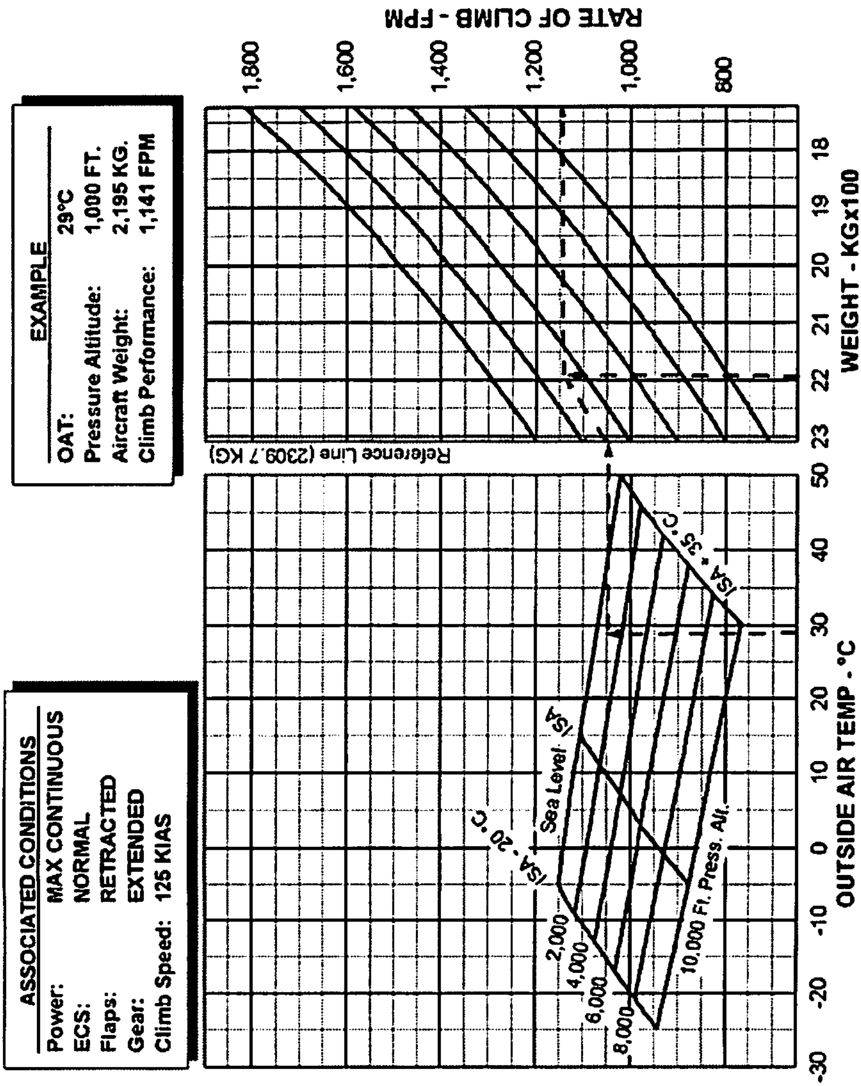
Maximum Effort Takeoff Performance over 50 ft. Obstacle, 20° Flaps
Figure 5-181



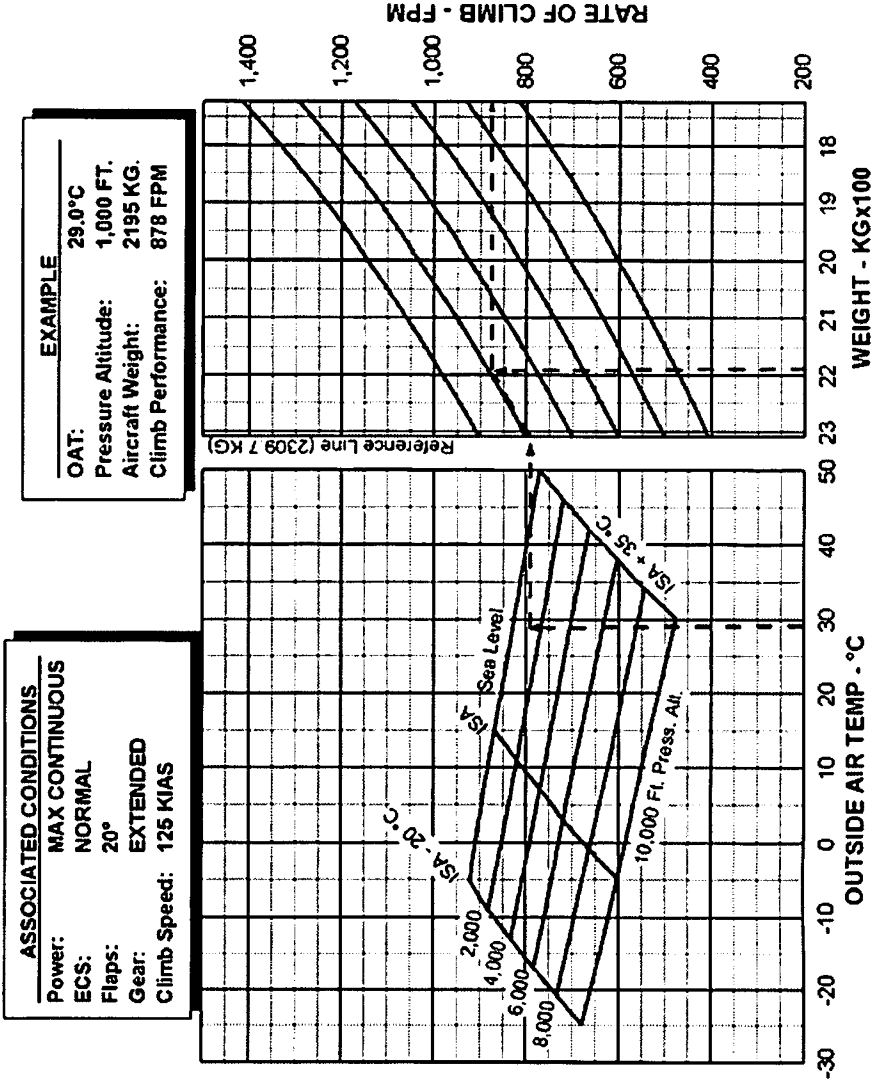
Enroute Climb Performance
Figure 5-183



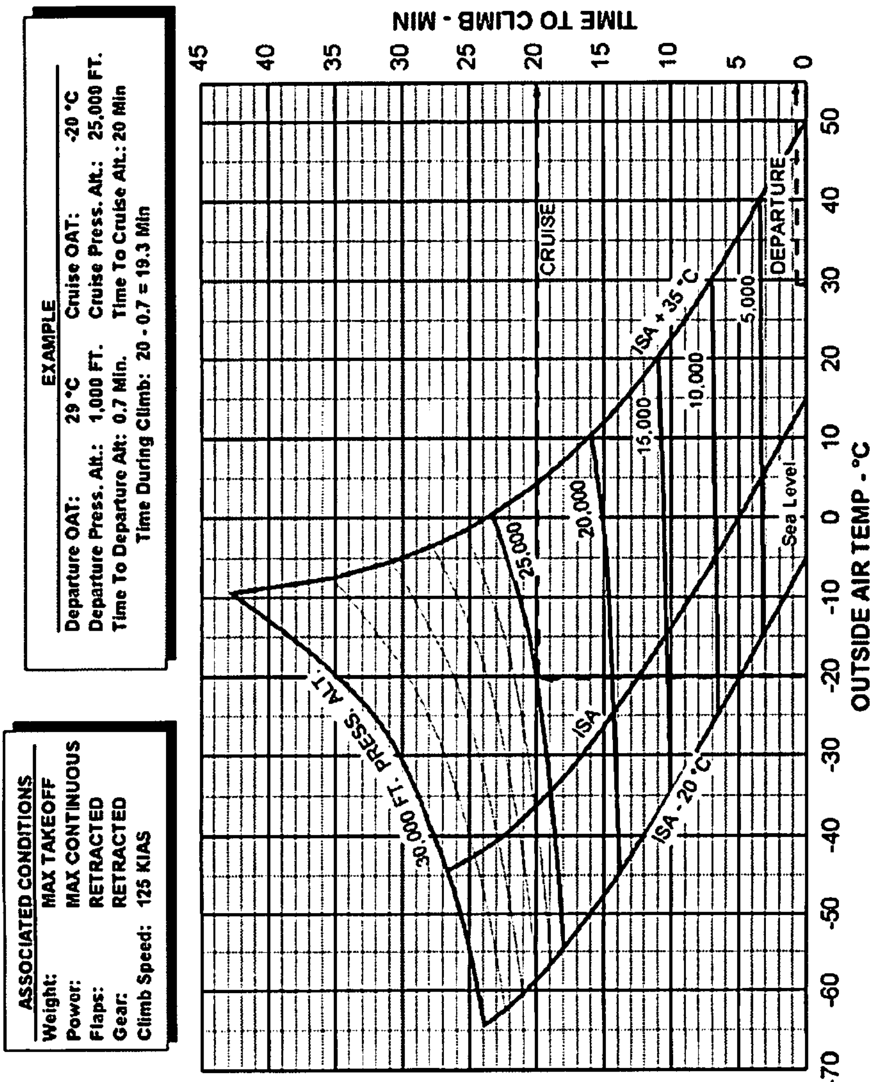
Enroute Climb Gradient
Figure 5-185



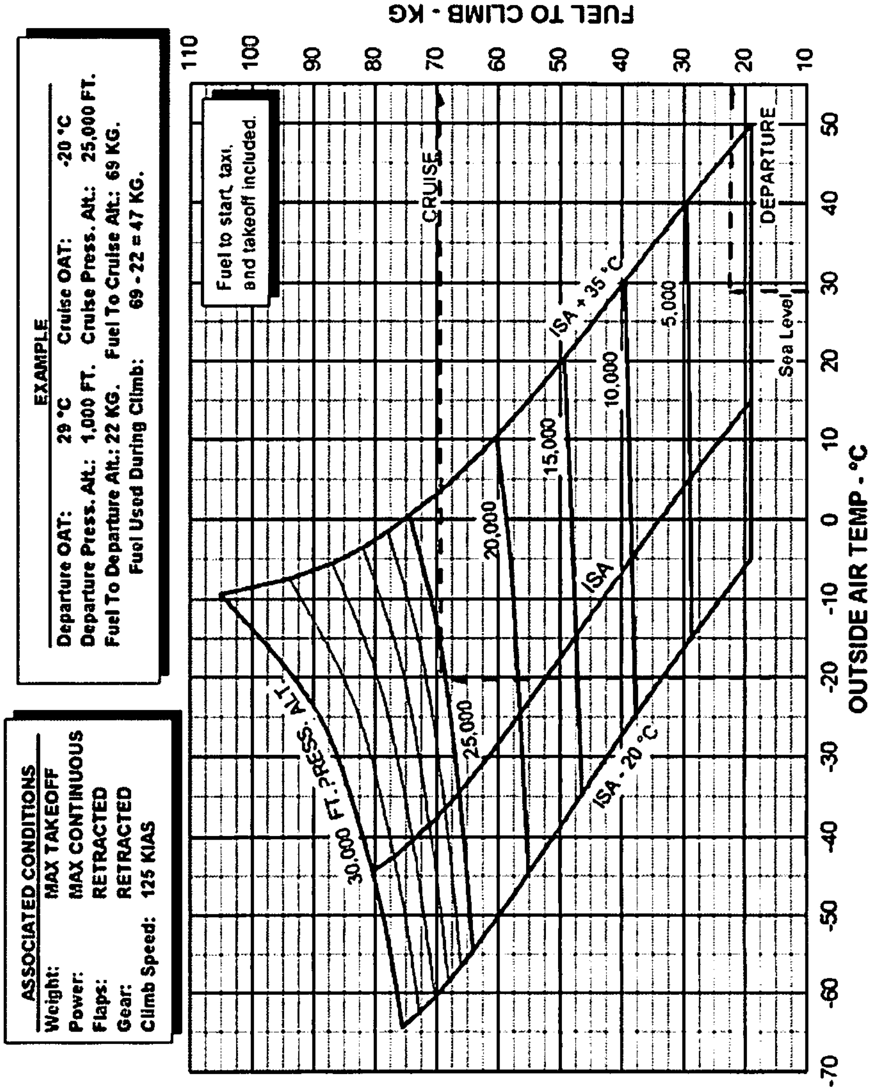
Takeoff Climb Performance, 0° Flaps
Figure 5-187



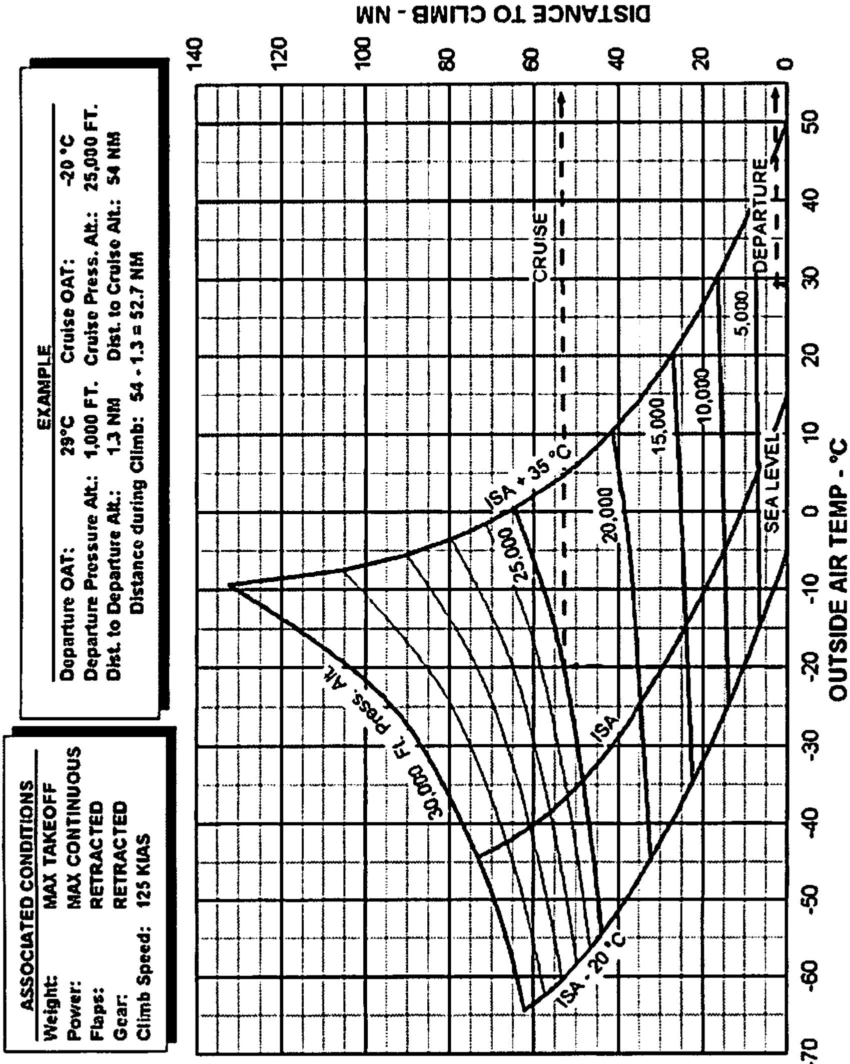
Takeoff Climb Performance, 20° Flaps
Figure 5-188



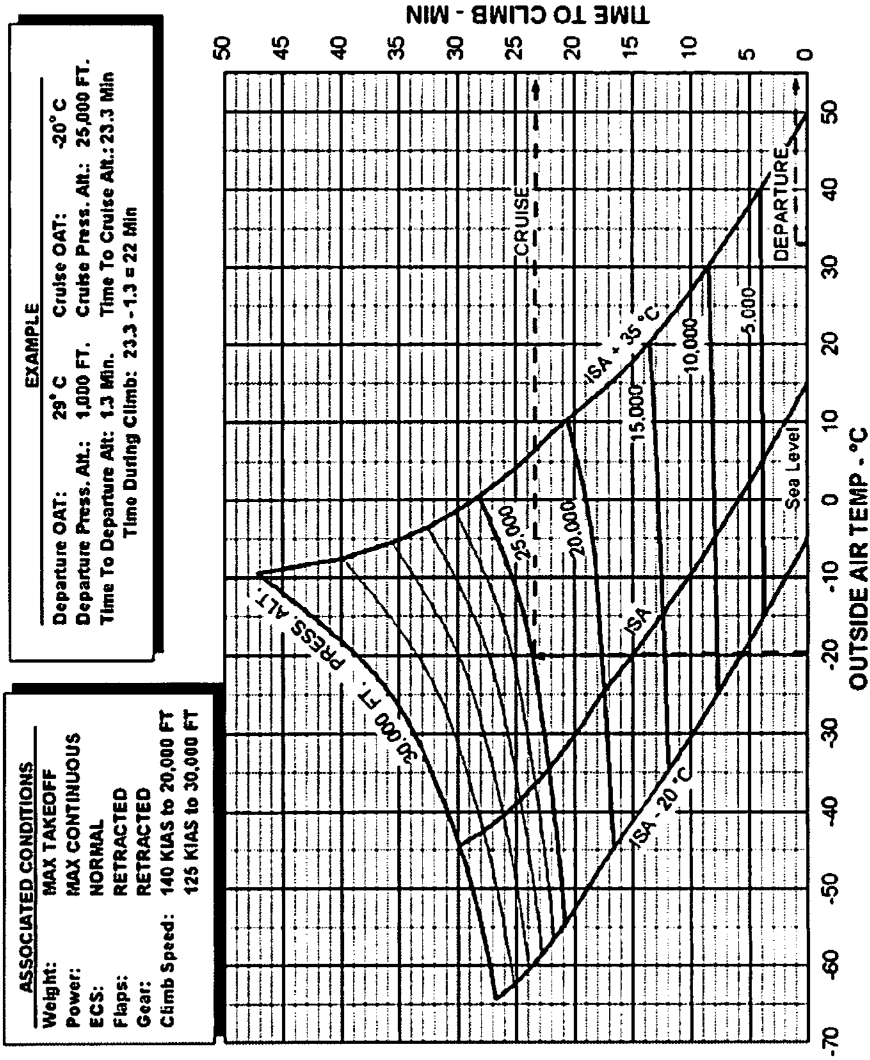
Maximum Climb Time
Figure 5-189



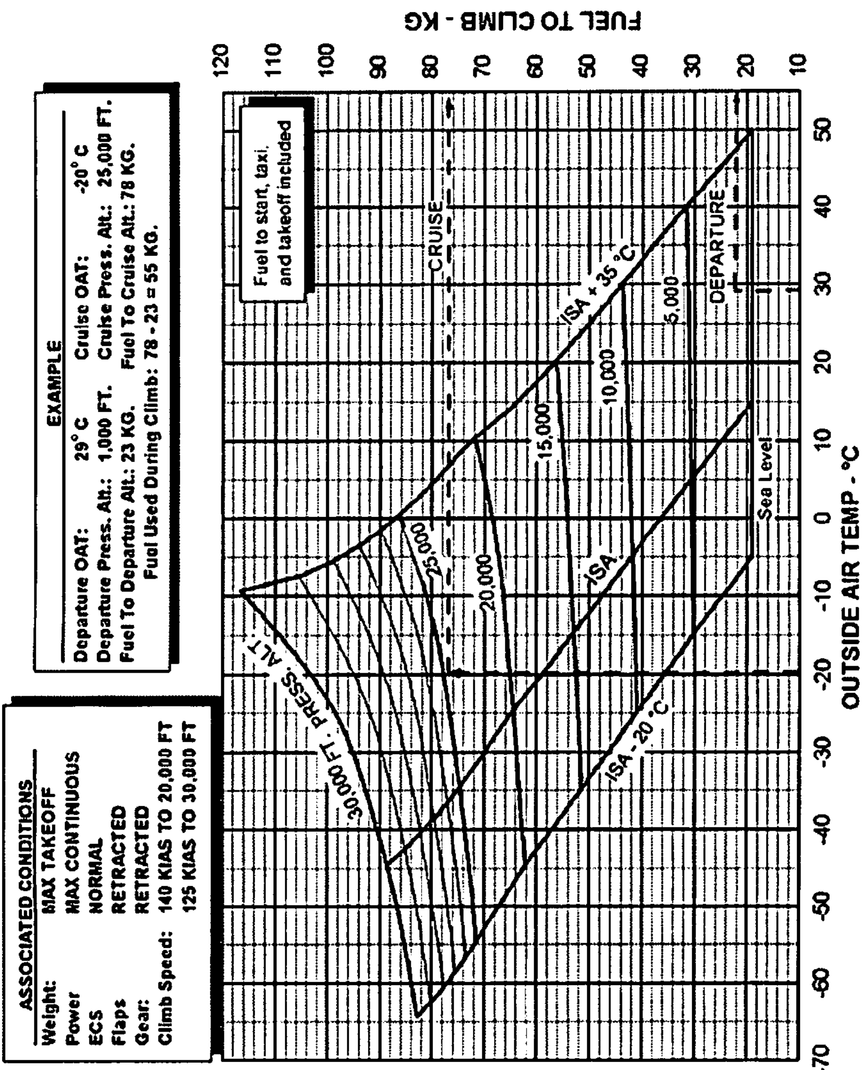
Maximum Climb Fuel
Figure 5-191



Maximum Climb Distance
Figure 5-193



Cruise Climb Time
Figure 5-195



Cruise Climb Fuel
Figure 5-197

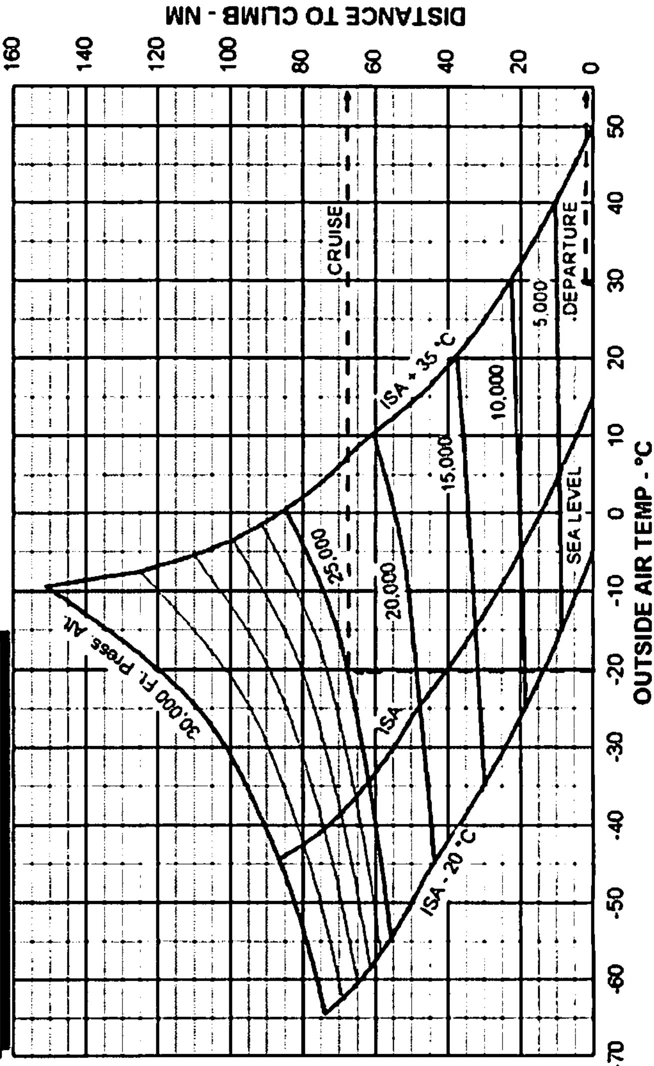
ASSOCIATED CONDITIONS

Weight:	MAX TAKEOFF
Power:	MAX CONTINUOUS
ECS:	NORMAL
Flaps:	RETRACTED
Gear:	RETRACTED
Climb Speed:	140 KIAS to 20,000 FT 125 KIAS to 30,000 FT

EXAMPLE

Departure OAT:	29°C	Cruise OAT:	-20°C
Departure Press Alt.:	1,000 FT.	Cruise Press. Alt.:	25,000 FT.
Dist. to Departure Alt.:	1.8 NM	Dist. to Cruise Alt.:	67.5 NM

Distance during Climb: 67.5 - 1.8 = 65.7 NM



Cruise Climb Distance
Figure 5-199

ISA - 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-3	-5	943	158.6	177
5000	-12	-15	998	144.2	190
10000	-22	-25	1066	132.9	205
15000	-31	-35	1153	126.8	222
20000	-40	-45	1255	127.5	241
25000	-49	-55	1313	127.9	257
30000	-59	-64	1112	107.3	255
ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	8	5	956	160.1	180
5000	-2	-5	1014	146.1	194
10000	-11	-15	1088	134.7	209
15000	-21	-25	1177	129.3	226
20000	-30	-35	1285	129.7	246
25000	-39	-45	1298	126.1	260
30000	-49	-54	1077	104.3	256
ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	18	15	969	161.0	183
5000	8	5	1030	147.4	197
10000	-1	-5	1106	136.5	213
15000	-10	-15	1201	131.5	231
20000	-19	-25	1313	132.0	251
25000	-29	-35	1250	122.0	260
30000	-39	-44	1040	100.7	255

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Maximum Speed Cruise
(ISA, ISA -10, ISA -20)
Figure 5-201

ISA + 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	28	25	983	163.3	186
5000	19	15	1048	149.7	201
10000	9	5	1127	138.3	217
15000	0	-5	1224	133.8	235
20000	-9	-15	1313	132.4	254
25000	-18	-25	1200	117.9	259
30000	-29	-34	997	97.1	254
ISA + 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	38	35	996	164.7	189
5000	29	25	1064	151.5	204
10000	20	15	1148	140.6	221
15000	10	5	1248	135.6	240
20000	1	-5	1310	132.4	257
25000	-9	-15	1147	113.4	258
30000	-19	-24	955	93.9	253
ISA + 35 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	54	50	1017	166.9	194
5000	44	40	1088	153.8	209
10000	35	30	1177	143.8	227
15000	26	20	1285	139.3	246
20000	16	10	1201	124.3	253
25000	7	0	1071	107.5	255
30000	-3	-9	890	88.5	250

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Maximum Speed Cruise
(ISA +10, ISA +20, ISA +35)
Figure 5-203

ISA - 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-4	-5		132.2	129
5000	-13	-15		114.2	138
10000	-23	-25		96.8	147
15000	-33	-35	500	83.8	155
20000	-43	-45		72.8	164
25000	-52	-55		64.8	171
30000	-62	-64		58.4	178
ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	6	5		132.4	131
5000	-3	-5		114.5	140
10000	-13	-15		97.0	149
15000	-23	-25	500	83.8	157
20000	-32	-35		73.0	166
25000	-42	-45		64.8	173
30000	-52	-54		58.6	180
ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	16	15		132.6	133
5000	7	5		114.8	142
10000	-3	-5		97.3	151
15000	-12	-15	500	83.9	159
20000	-22	-25		73.3	167
25000	-32	-35		64.9	175
30000	-42	-44		58.7	182

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
* ECS: NORMAL

Low Power Cruise, 500 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-209

ISA + 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	27	25		132.8	136
5000	17	15		115.2	144
10000	7	5		97.6	153
15000	-2	-5	500	84.0	161
20000	-12	-15		73.5	169
25000	-22	-25		65.1	177
30000	-32	-34		58.9	183
ISA + 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	37	35		133.1	137
5000	27	25		115.4	146
10000	18	15		97.9	155
15000	8	5	500	84.3	163
20000	-2	-5		73.5	171
25000	-12	-15		65.1	178
30000	-21	-24		59.1	184
ISA + 35 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	52	50		133.5	141
5000	42	40		115.7	149
10000	33	30		98.4	157
15000	23	20	500	84.7	165
20000	13	10		74.2	173
25000	4	0		65.7	180
30000	-6	-9		59.4	185

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Low Power Cruise, 500 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-211

ISA -20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-3	-5		138.6	144
5000	-13	-15		119.9	153
10000	-23	-25		102.8	162
15000	-32	-35	600	89.5	170
20000	-42	-45		79.4	179
25000	-52	-55		71.1	188
30000	-61	-64		65.6	197
ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	7	5		139.0	146
5000	-3	-5		120.2	155
10000	-13	-15		102.9	164
15000	-22	-25	600	89.7	173
20000	-32	-35		79.5	182
25000	-42	-45		71.3	191
30000	-51	-54		65.6	199
ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	17	15		139.4	148
5000	7	5		120.6	157
10000	-3	-5		103.0	166
15000	-12	-15	600	90.1	175
20000	-22	-25		79.6	184
25000	-31	-35		71.5	193
30000	-41	-44		65.6	202

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 600 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-213

ISA + 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	27	25		139.7	150
5000	17	15		121.0	159
10000	8	5		103.2	168
15000	-2	-5	600	90.4	177
20000	-12	-15		79.8	186
25000	-21	-25		71.7	195
30000	-31	-34		65.8	204
ISA + 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	37	35		139.9	152
5000	28	25		121.4	161
10000	18	15		103.6	170
15000	8	5	600	90.7	179
20000	-1	-5		80.1	188
25000	-11	-15		71.9	197
30000	-21	-24		66.0	205
ISA + 35 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	52	50		140.3	156
5000	43	40		122.0	164
10000	33	30		104.3	173
15000	23	20	600	91.2	182
20000	14	10		80.6	191
25000	4	0		72.3	200
30000	-5	-9		66.3	208

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
* ECS: NORMAL

Intermediate Cruise Power, 600 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-215

ISA - 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-3	-5		144.4	156
5000	-13	-15		125.8	165
10000	-22	-25		108.7	174
15000	-32	-35	700	95.9	183
20000	-42	-45		85.8	192
25000	-51	-55		78.1	202
30000	-61	-64		72.8	212
ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	7	5		144.9	158
5000	-3	-5		125.9	167
10000	-12	-15		109.1	176
15000	-22	-25	700	96.0	185
20000	-32	-35		86.0	195
25000	-41	-45		78.1	205
30000	-51	-54		73.0	215
ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	17	15		145.3	160
5000	7	5		126.2	169
10000	-2	-5		109.5	178
15000	-12	-15	700	96.3	187
20000	-21	-25		86.3	197
25000	-31	-35		78.1	207
30000	-40	-44		73.1	217

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 700 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-217

ISA + 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	27	25	700	145.8	162
5000	18	15		126.5	171
10000	8	5		109.9	180
15000	-2	-5		96.6	190
20000	-11	-15		86.6	199
25000	-21	-25		78.4	210
30000	-30	-34		73.3	220
ISA + 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	37	35	700	146.3	164
5000	28	25		127.1	173
10000	18	15		110.3	182
15000	9	5		97.0	192
20000	-1	-5		86.8	202
25000	-10	-15		78.7	212
30000	-20	-24		73.5	222
ISA + 35 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	53	50	700	147.0	167
5000	43	40		128.0	176
10000	33	30		110.9	185
15000	24	20		97.7	195
20000	14	10		87.2	205
25000	5	0		79.2	215
30000	-5	-9		73.8	225

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 700 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-219

ISA - 20 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-3	-5		150.0	165
5000	-13	-15		131.8	174
10000	-22	-25		115.1	184
15000	-32	-35	800	102.2	193
20000	-41	-45		92.5	203
25000	-51	-55		85.3	214
30000	-61	-64		80.7	225

ISA - 10 (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	7	5		150.4	168
5000	-2	-5		132.3	177
10000	-12	-15		115.4	186
15000	-22	-25	800	102.6	196
20000	-31	-35		92.7	206
25000	-41	-45		85.5	217
30000	-50	-54		80.8	228

ISA (°C)					
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	17	15		150.8	170
5000	8	5		132.7	179
10000	-2	-5		115.8	188
15000	-11	-15	800	103.0	198
20000	-21	-25		92.9	209
25000	-31	-35		85.7	219
30000	-40	-44		80.8	230

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
* ECS: NORMAL

Intermediate Cruise Power, 800 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-221

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	28	25	800	151.4	172
5000	18	15		133.3	181
10000	8	5		116.2	191
15000	-1	-5		103.3	201
20000	-11	-15		93.1	211
25000	-20	-25		85.9	222
30000	-30	-34		80.9	233
ISA (°C)	**ISA + 20 (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	38	35	800	151.9	174
5000	28	25		133.7	183
10000	19	15		116.7	193
15000	9	5		103.6	203
20000	-1	-5		93.6	213
25000	-10	-15		86.1	224
30000	-19	-24		81.0	235
ISA (°C)	**ISA + 35 (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	53	50	800	153.1	177
5000	43	40		134.4	186
10000	34	30		117.5	196
15000	24	20		104.2	206
20000	15	10		94.2	217
25000	5	0		86.5	228
30000	-4	-9		81.2	239

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
* ECS: NORMAL

Intermediate Cruise Power, 800 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-223

ISA (°C)	ISA - 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-3	-5		156.0	174
5000	-12	-15		138.3	183
10000	-22	-25		121.5	193
15000	-32	-35	900	109.1	203
20000	-41	-45		99.6	213
25000	-51	-55		92.9	224
30000	-60	-64		89.1	236

ISA (°C)	ISA - 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	8	5		156.4	176
5000	-2	-5		138.8	185
10000	-12	-15		121.8	195
15000	-21	-25	900	109.4	205
20000	-31	-35		99.6	216
25000	-40	-45		93.1	227
30000	-50	-54		89.1	239

ISA (°C)	ISA (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	18	15		157.0	178
5000	8	5		139.3	188
10000	-1	-5		122.3	198
15000	-12	-15	900	109.7	208
20000	-21	-25		99.9	219
25000	-30	-35		93.3	230
30000	-40	-44		89.0	242

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 900 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-225

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	28	25	900	157.7	180
5000	18	15		139.8	190
10000	9	5		122.7	200
15000	-1	-5		110.0	210
20000	-10	-15		100.3	221
25000	-20	-25		93.5	233
30000	-29	-34		89.1	245

ISA (°C)	ISA + 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	38	35	900	158.3	182
5000	29	25		140.3	192
10000	19	15		123.3	202
15000	9	5		110.4	213
20000	0	-5		100.7	224
25000	-10	-15		93.8	235
30000	-19	-24		89.1	247

ISA (°C)	ISA + 35 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	53	50	900	159.4	185
5000	44	40		141.3	195
10000	34	30		124.2	205
15000	25	20		111.1	216
20000	15	10		101.2	227
25000	6	0		94.1	239
30000	-3	-		89.2	251

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 900 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-227

ISA (°C)		ISA - 20 (°C)			
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	-5		-	-
5000	-12	-15		144.6	191
10000	-22	-25		128.4	201
15000	-31	-35	1000	115.8	211
20000	-41	-45		107.1	222
25000	-50	-55		100.9	233
30000	-60	-64		97.4	246
ISA (°C)		**ISA - 10 (°C)**			
Altitude (FT)	**IOAT (°C)**	**OAT (°C)**	**Torque (FT-LB)**	**Fuel Flow (Kg/Hr)***	**TAS (KT)**
0	8	5		163.2	184
5000	-2	-5		145.1	193
10000	-11	-15		128.8	203
15000	-21	-25	1000	116.1	214
20000	-31	-35		107.4	225
25000	-40	-45		100.9	237
30000	-49	-54		97.3	249
ISA (°C)		**ISA (°C)**			
Altitude (FT)	**IOAT (°C)**	**OAT (°C)**	**Torque (FT-LB)**	**Fuel Flow (Kg/Hr)***	**TAS (KT)**
0	18	15		163.8	186
5000	8	5		145.7	196
10000	-1	-5		129.2	206
15000	-11	-15	1000	116.4	216
20000	-20	-25		107.7	228
25000	-30	-35		101.0	240
30000	-39	-44		97.2	252

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
* ECS: NORMAL

Intermediate Cruise Power, 1000 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-229

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	28	25		164.3	188
5000	18	15		146.4	198
10000	9	5		129.7	208
15000	-1	-5	1000	116.9	219
20000	-10	-15		107.8	230
25000	-19	-25		101.2	242
30000	-29	-34		97.3	255
ISA (°C)	**ISA + 20 (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	38	35		165.0	190
5000	29	25		147.1	200
10000	19	15		130.1	210
15000	10	5	1000	117.5	221
20000	0	-5		108.2	233
25000	-9	-15		101.3	245
30000	-18	-24		96.0	258
ISA (°C)	**ISA + 35 (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	53	50		165.9	193
5000	44	40		148.1	203
10000	35	30		130.8	214
15000	25	20	1000	118.2	225
20000	16	10		108.6	237
25000	6	0		101.7	249
30000	-3	-9		90.2	262

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1000 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-231

ISA (°C)	ISA - 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	-5		-	-
5000	-	-15		-	-
10000	-21	-25		135.4	208
15000	-31	-35	1100	122.9	219
20000	-41	-45		114.9	230
25000	-50	-55		109.3	242
30000	-59	-64		106.3	255
ISA (°C)	ISA - 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	5		-	-
5000	-	-5		-	-
10000	-11	-15		135.7	211
15000	-21	-25	1100	123.1	221
20000	-30	-35		115.2	233
25000	-40	-45		109.3	245
30000	-49	-54		106.3	258
ISA (°C)	ISA (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	15		-	-
5000	-	5		-	-
10000	-1	-5		136.1	213
15000	-11	-15	1100	123.6	224
20000	-20	-25		115.4	236
25000	-29	-35		109.3	248
30000	-39	-44		103.8	261

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1100 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-233

ISA (°C)		ISA + 10 (°C)			
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	25		-	-
5000	-	15		-	-
10000	9	5		136.5	216
15000	0	-5	1100	124.1	227
20000	-10	-15		115.7	239
25000	-19	-25		109.2	251
30000	-28	-34		100.0	264
ISA (°C)		**ISA + 20 (°C)**			
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	35		-	-
5000	29	25		153.7	207
10000	19	15		137.1	218
15000	10	5	1100	124.6	229
20000	1	-5		115.9	241
25000	-9	-15		109.3	254
30000	-	-24		-	-
ISA (°C)		**ISA + 35 (°C)**			
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	50		-	-
5000	44	40		154.8	211
10000	35	30		138.0	222
15000	25	20	1100	125.3	233
20000	16	10		116.3	245
25000	7	0		107.9	258
30000	-	-9		-	-

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1100 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-235

ISA (°C)	ISA - 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	-5	1200	-	-
5000	-	-15		-	-
10000	-	-25		-	-
15000	-	-35		-	-
20000	-40	-45		122.7	237
25000	-50	-55		117.6	250
30000	-	-64		-	-
ISA (°C)	**ISA - 10 (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	5	1200	-	-
5000	-	-5		-	-
10000	-	-15		-	-
15000	-21	-25		131.0	229
20000	-30	-35		122.9	240
25000	-39	-45		117.5	253
30000	-49	-54		108.2	266
ISA (°C)	**ISA (°C)**				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	15	1200	-	-
5000	-	5		-	-
10000	-	-5		-	-
15000	-10	-15		131.3	231
20000	-20	-25		123.1	243
25000	-29	-35		117.6	256
30000	-	-44		-	-

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1200 FT-LB
(ISA, ISA -10, ISA -20)
Figure 5-237

ISA (°C)	ISA + 10 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	25		-	-
5000	-	15		-	-
10000	-	5		-	-
15000	0	-5	1200	131.6	234
20000	-9	-15		123.3	246
25000	-19	-25		117.7	259
30000	-	-34		-	-
ISA (°C)	ISA + 20 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	35		-	-
5000	-	25		-	-
10000	-	15		-	-
15000	10	5	1200	132.0	237
20000	1	-5		123.5	249
25000	8	-15		115.3	262
30000	-	-24		-	-
ISA (°C)	ISA + 35 (°C)				
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (Kg/Hr)*	TAS (KT)
0	-	50		-	-
5000	-	40		-	-
10000	35	30		145.4	229
15000	26	20	1200	132.5	241
20000	16	10		123.9	253
25000	7	0		108.1	267
30000	-	-9		-	-

NOTE: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28

* ECS: NORMAL

Intermediate Cruise Power, 1200 FT-LB
(ISA +10, ISA +20, ISA +35)
Figure 5-239

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MAXIMUM SPEED CRUISE

Altitude	Cruise Nautical Miles / 100 Kg. Fuel					
FT	ISA - 20° C	ISA - 10° C	ISA	ISA + 10° C	ISA + 20° C	ISA + 35° C
0	111.6	112.4	113.6	113.9	114.8	116.2
5000	131.7	132.8	133.6	134.3	134.7	135.9
10000	154.2	155.1	156.0	156.9	157.2	157.9
15000	175.0	174.8	175.6	175.6	177.0	176.7
20000	189.1	189.6	190.2	191.8	194.0	203.6
25000	200.9	206.2	213.1	219.6	227.5	237.2
30000	237.6	245.4	253.2	261.7	269.5	282.6

INTERMEDIATE POWER CRUISE - 1000 FT-LB

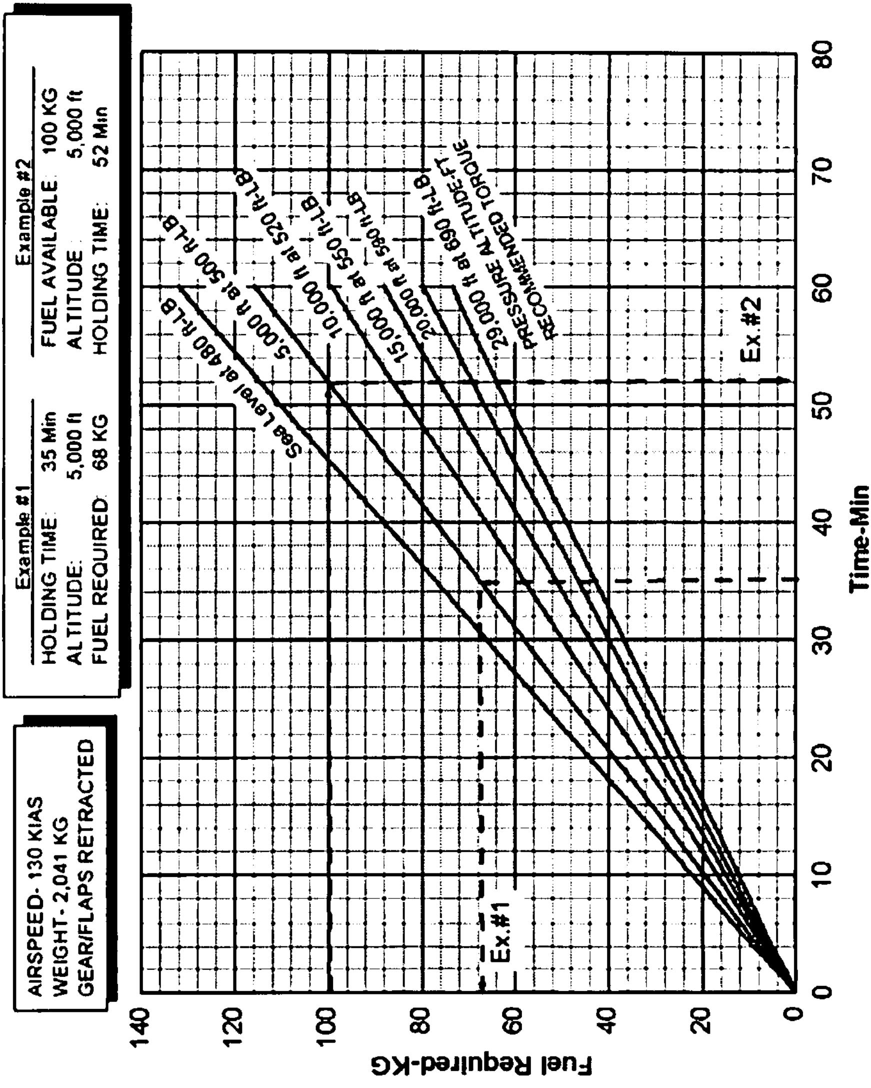
Altitude	Cruise Nautical Miles / 100 Kg. Fuel					
FT	ISA - 20° C	ISA - 10° C	ISA	ISA + 10° C	ISA + 20° C	ISA + 35° C
0	-	112.6	113.5	114.5	115.3	116.6
5000	131.9	133.2	134.3	135.1	136.0	137.2
10000	156.2	157.8	159.2	160.5	161.7	163.5
15000	182.1	184.1	185.9	187.2	188.4	190.3
20000	207.0	209.3	211.5	213.5	215.3	218.0
25000	231.3	234.5	237.2	239.5	241.9	245.0
30000	252.2	255.8	259.2	262.1	268.7	290.6

LOW POWER CRUISE - 500 FT-LB

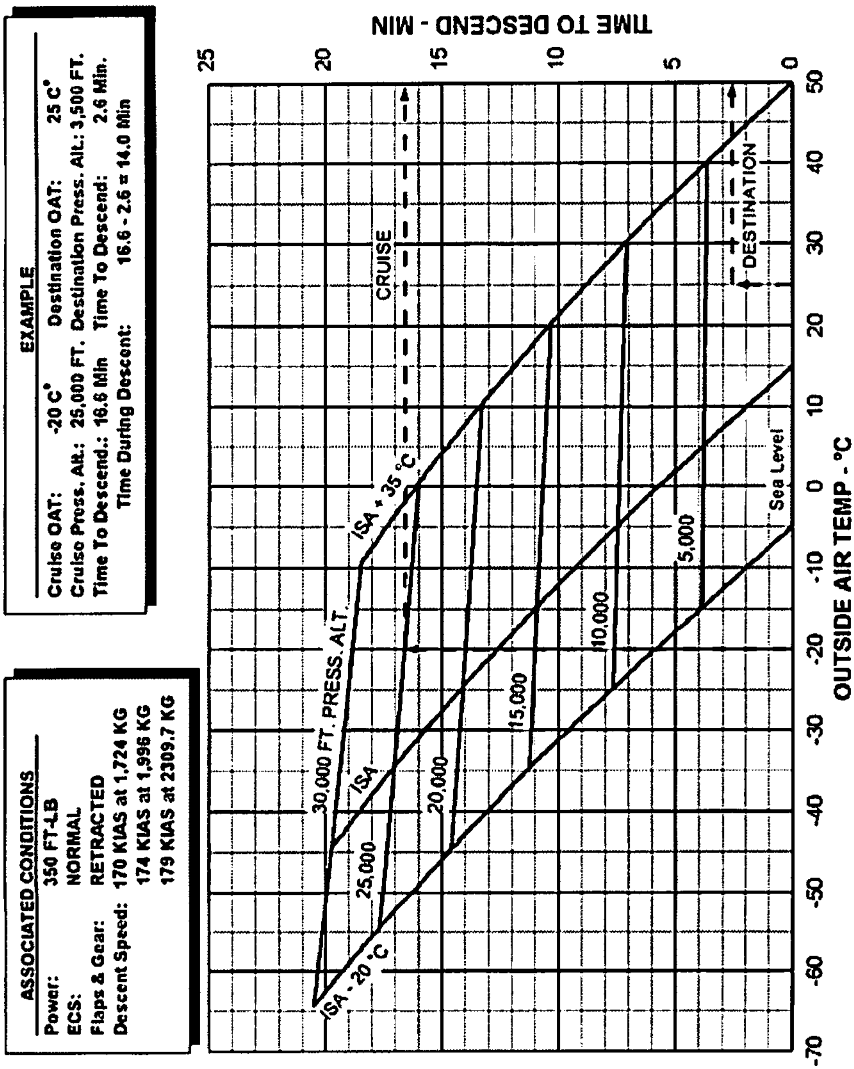
Altitude	Cruise Nautical Miles / 100 Kg. Fuel					
FT	ISA - 20° C	ISA - 10° C	ISA	ISA + 10° C	ISA + 20° C	ISA + 35° C
0	97.6	99.1	100.6	102.2	103.3	105.7
5000	121.1	122.6	124.1	125.3	126.6	128.6
10000	151.8	153.6	155.2	156.6	158.0	159.8
15000	185.5	187.7	189.9	191.9	193.4	195.2
20000	224.5	226.6	228.3	229.9	232.4	233.4
25000	264.4	267.3	269.7	271.4	273.8	274.4
30000	305.2	307.4	309.3	310.7	311.4	312.3

Note:
ECS: NORMAL
Shaded areas are beyond aircraft OAT limit. See paragraph 2.28.
Does not include 45 minute reserve, 26 gal. (174.2 Lb).
To obtain 45 minute reserve endurance set power to Low Power Cruise @ 5,000'.

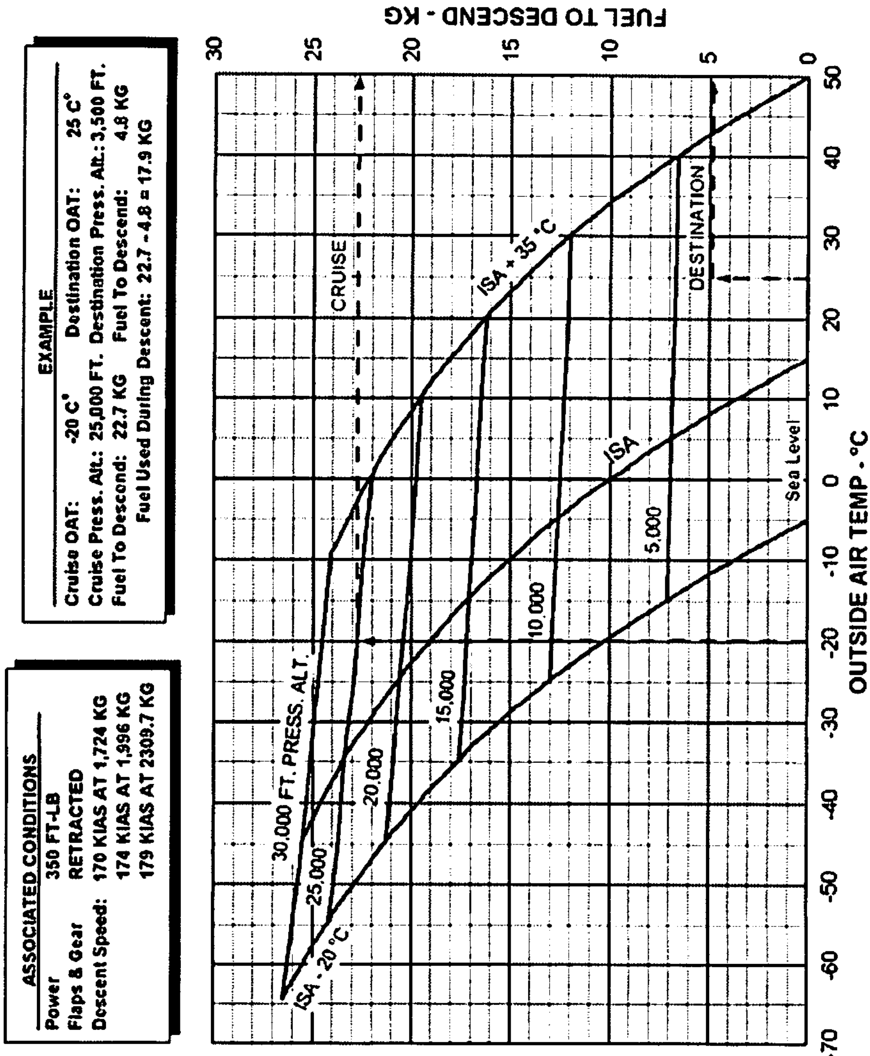
Specific Air Range
Figure 5-245



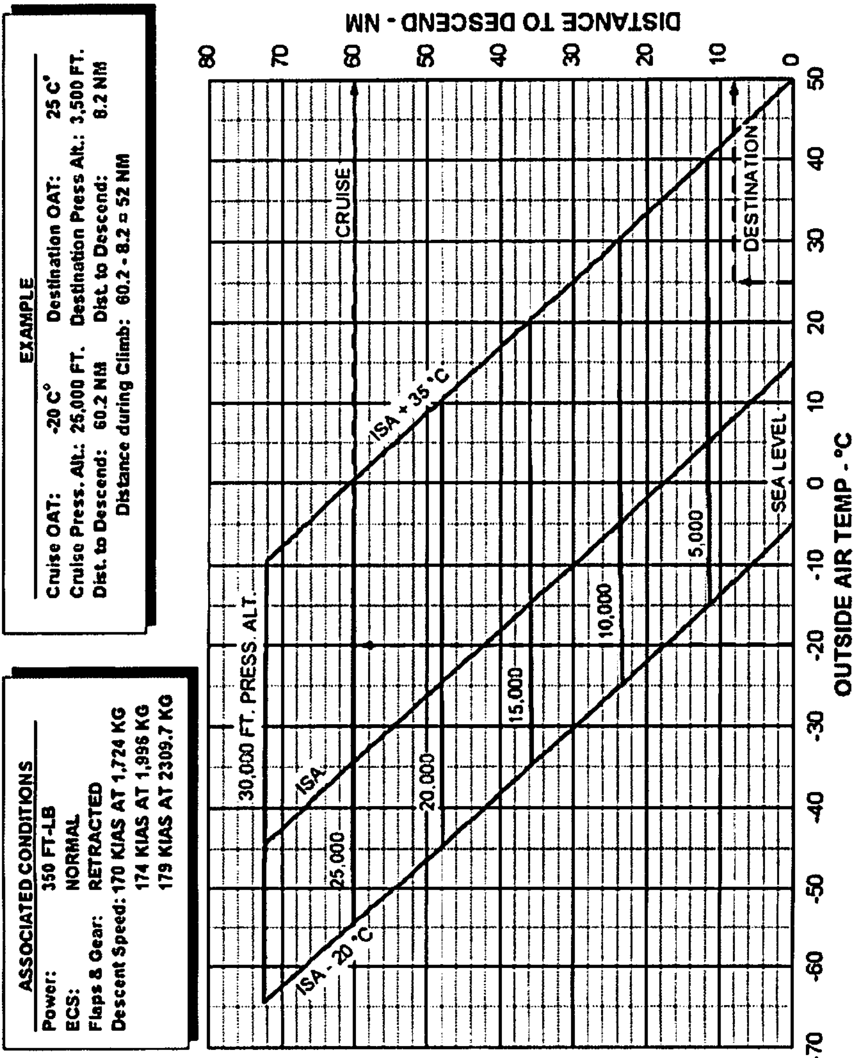
Holding Time vs. Fuel On Board
Figure 5-247



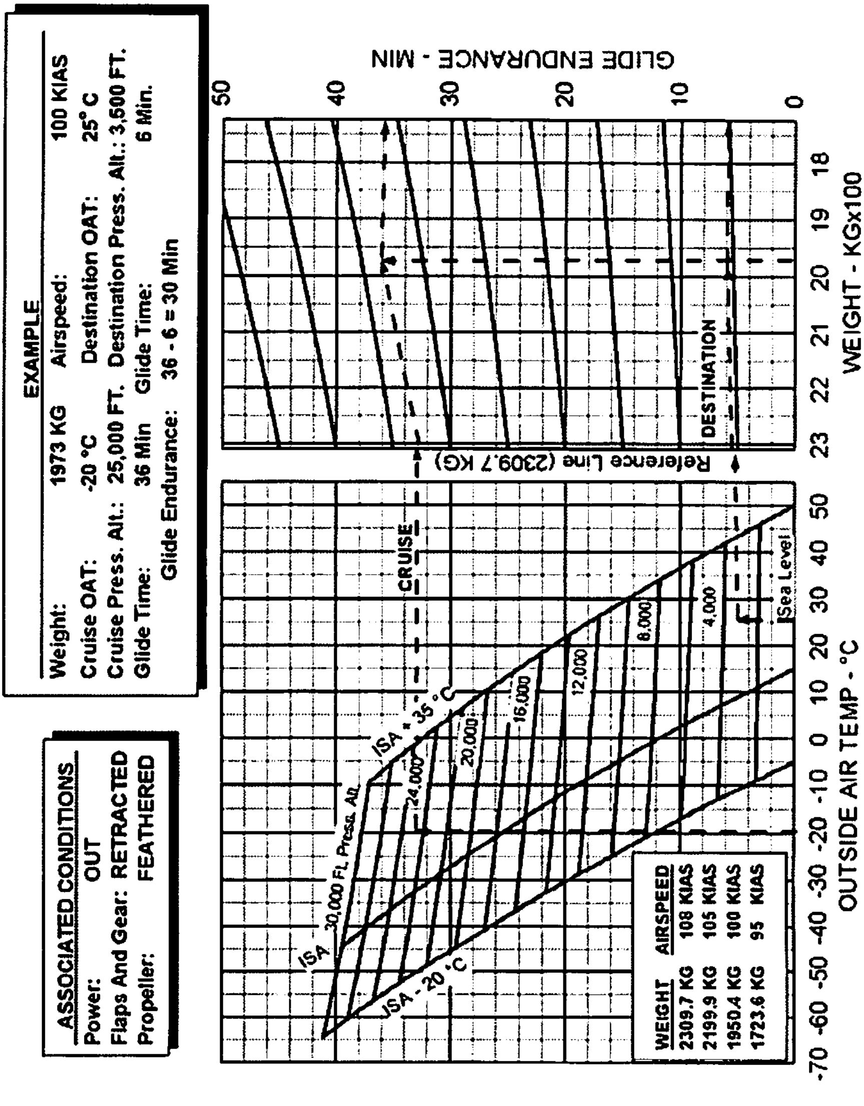
Time to Descend
Figure 5-249



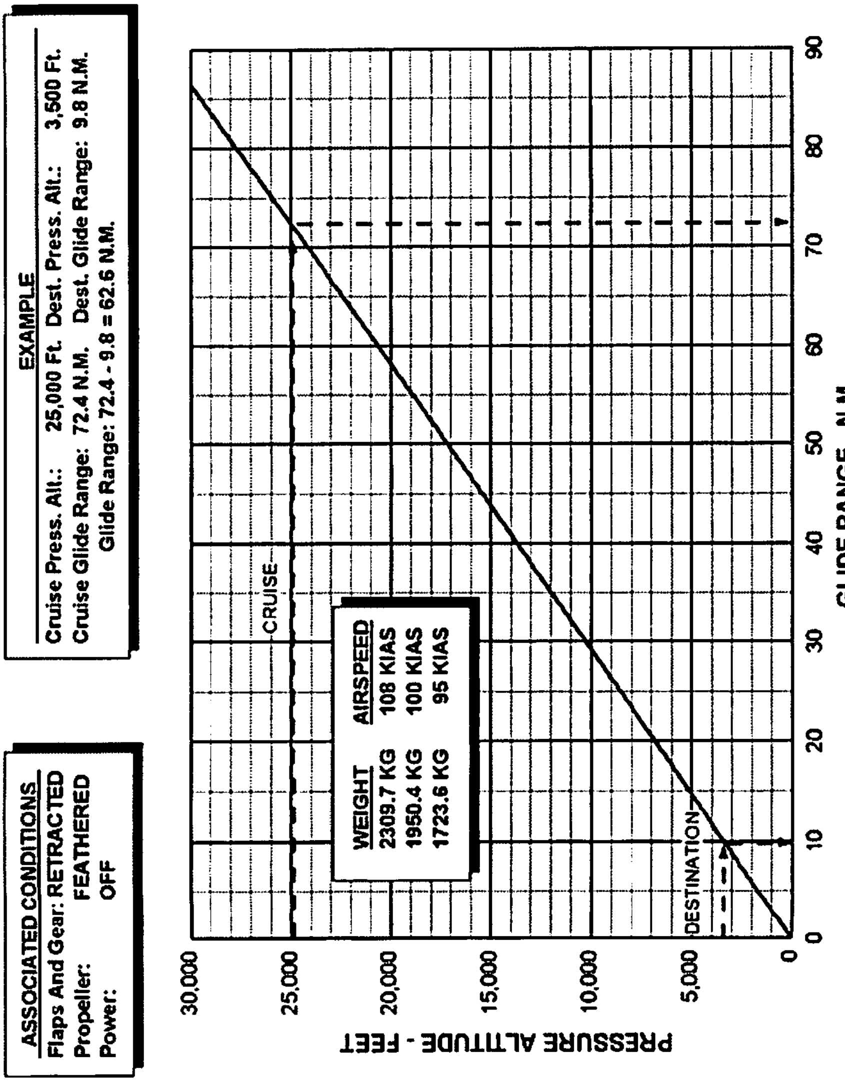
Fuel to Descend
Figure 5-251



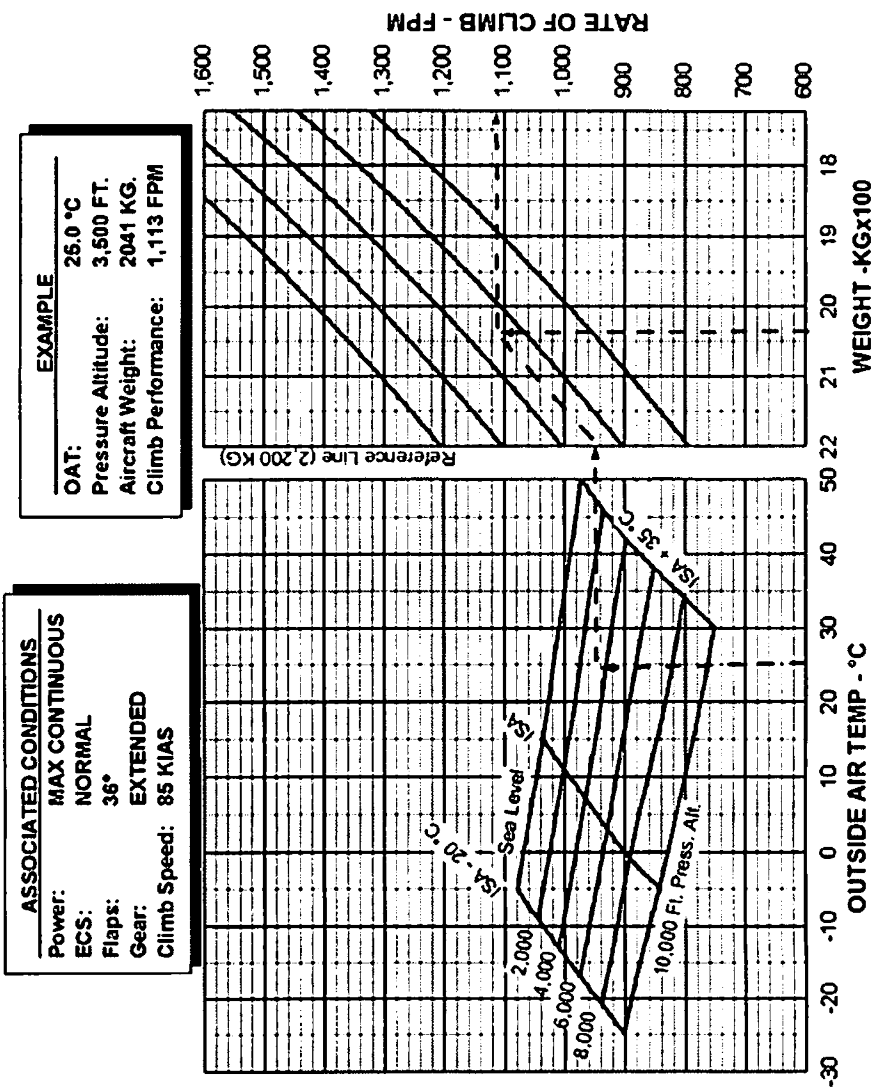
Distance to Descend
Figure 5-253



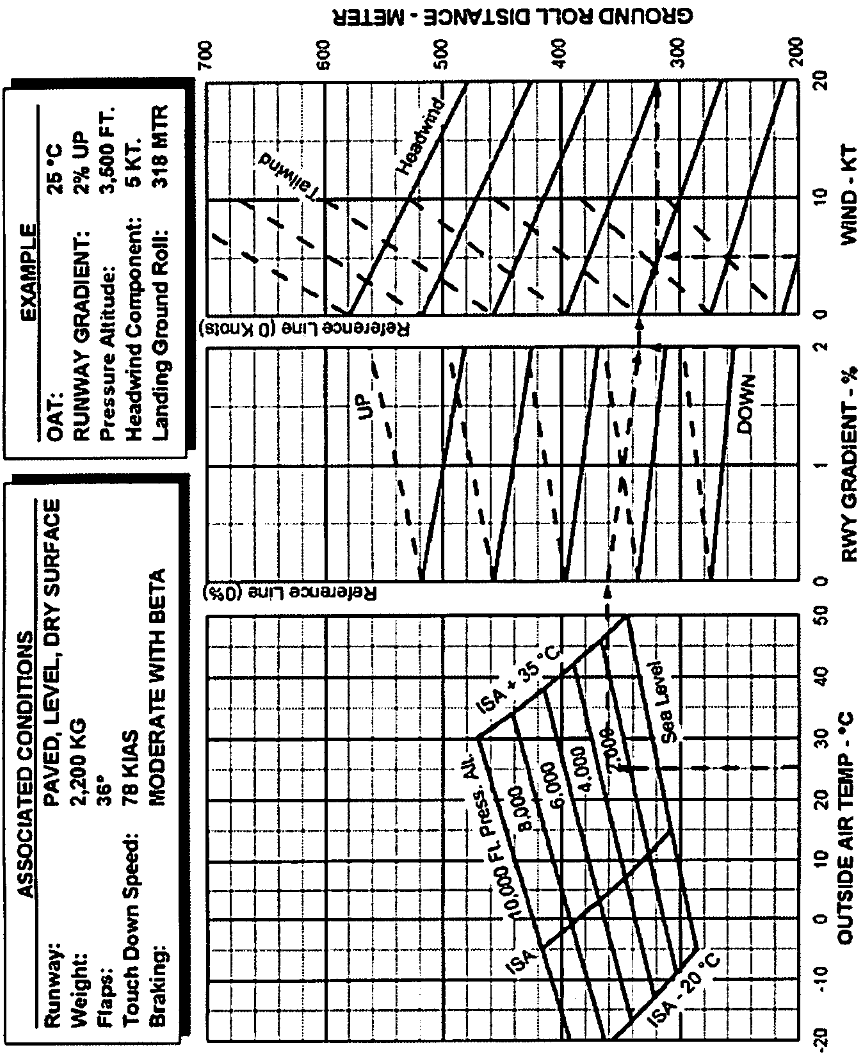
Glide Endurance
Figure 5-255



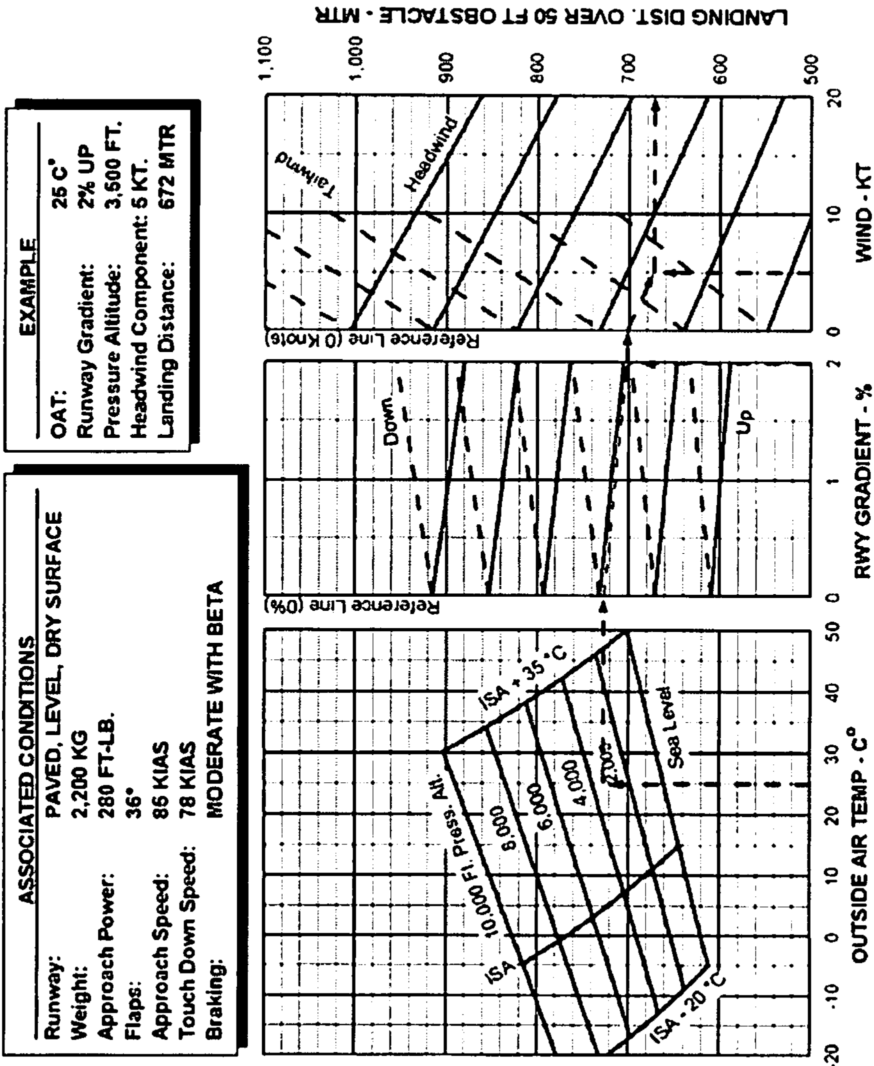
Glide Distance
Figure 5-257



Balked Landing Climb Performance
Figure 5-259



Landing Ground Roll, Flaps 36°, without Reverse
Figure 5-263



Landing Distance, Flaps 36°, without Reverse
Figure 5-265

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TABLE OF CONTENTS

SECTION 6

WEIGHT AND BALANCE

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SECTION 6

WEIGHT AND BALANCE

6.1 GENERAL

In order to achieve design performance and flying characteristics, the airplane must be operated and flown within the approved weight vs. center of gravity (C.G.) envelope. (Refer to Figure 6-33.) The airplane offers flexibility of loading, however, it cannot be flown with the maximum number of passengers, full fuel tanks and maximum baggage.

Before the airplane is licensed, a basic empty weight and C.G. location is computed (basic empty weight consists of the standard empty weight of the airplane plus the optional equipment). Using the basic empty weight and C.G. location, the pilot can determine the weight and C.G. position for the loaded airplane. It is the responsibility of the pilot in command to ensure that the airplane is loaded within approved weight vs. C.G. envelope limits prior to each flight.

6.1 GENERAL (Continued)

The basic empty weight and C.G. location is recorded in the Weight and Balance Data Form (Figure 6-5) and the Weight and Balance Record (Figure 6-7). If modification work is performed or new equipment is added to the airplane, a revised basic empty weight and C.G. must be computed and recorded in the Weight and Balance Data Form and the Weight and Balance Record. The current values for weight and C.G. should be used to calculate the quantity of fuel, baggage, and passengers that can be boarded so as to remain within the approved weight and C.G. limitations.

The following pages contain procedures and forms used when weighing an airplane and computing basic empty weight, C.G. position, and useful load. Note that the useful load includes usable fuel, baggage, cargo and passengers.

6.3 AIRPLANE WEIGHING PROCEDURE

At the time of licensing, Piper provides each airplane with the basic empty weight and center of gravity location. This data is supplied in the Weight and Balance Data Form (Figure 6-5).

The removal or addition of equipment or airplane modifications can affect the basic empty weight and center of gravity. The following is a weighing procedure to determine this basic empty weight and center of gravity location:

(a) Preparation

(1) Verify that all items checked in the airplane equipment list are installed in the proper location in the airplane.

(2) Remove excessive dirt, grease, moisture, and foreign items such as rags and tools, from the airplane before weighing.

(3) Defuel airplane. Then open all fuel drains until all remaining fuel is drained. Then add the unusable fuel, 20 pounds (3 gallons total, 1.5 gallons each wing).

(4) Fill oil to full capacity.

6.3 AIRPLANE WEIGHING PROCEDURE (Continued)

(a) Preparation (continued)

(5) Place pilot and copilot seats in fifth (5th) notch, aft of forward position. Put flaps in the fully retracted position and all control surfaces in the neutral position. All entrance and baggage doors should be closed.

(6) Weigh the airplane inside a closed building to prevent errors in scale readings due to wind.

(b) Leveling

(1) With the airplane on scales, insert a 3.4 inch spacer on each of the main gear struts and a 3.0 inch spacer on the nose gear strut.

(2) Level airplane (refer to Figure 6-3) deflating (or inflating as required) nose wheel tire, to center bubble on level.

(c) Weighing - Airplane Basic Empty Weight

(1) With the airplane level and brakes released, record the weight shown on each scale. Deduct the tare, if any, from each reading. (Refer to Figure 6-1.)

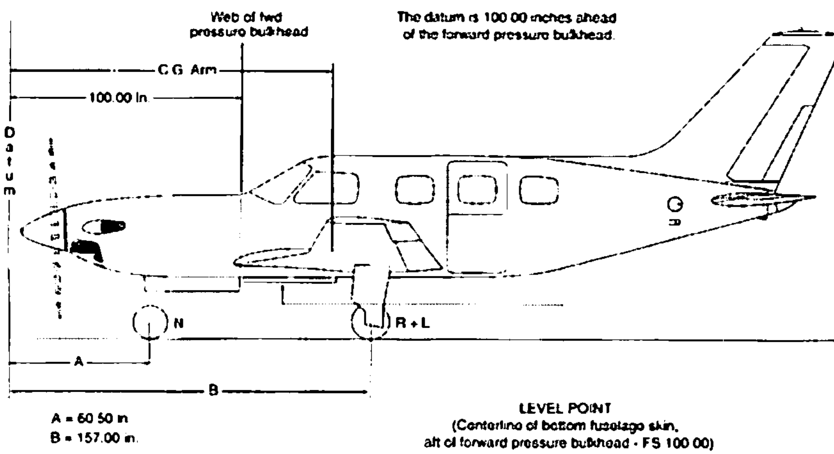
6.3 AIRPLANE WEIGHING PROCEDURE (Continued)

Scale Position and Symbol		Scale Reading	Tare	Net Weight
Nose Wheel	(N)			
Right Main Wheel	(R)			
Left Main Wheel	(L)			
Basic Empty Weight, as Weighed	(T)			

WEIGHING FORM
Figure 6-1

(d) Basic Empty Weight Center of Gravity

(1) The following geometry applies to the airplane when it is level. Refer to Leveling paragraph 6.3 (b).



LEVELING DIAGRAM
Figure 6-3

6.3 AIRPLANE WEIGHING PROCEDURE (Continued)

(2) The basic empty weight center of gravity (as weighed including optional equipment, full oil and unusable fuel) can be determined by the following formula:

$$\text{C.G. Arm} = \frac{(N)(A) + (R + L)(B)}{T} \text{ inches}$$

$$\text{Where: } T = N + R + L$$

6.5 WEIGHT AND BALANCE DATA AND RECORD

The Basic Empty Weight, Center of Gravity Location and Useful Load listed in Figure 6-5 are for the airplane as licensed at the factory. These figures apply only to the specific airplane serial number and registration number shown.

The basic empty weight of the airplane as licensed at the factory has been entered in the Weight and Balance Record (Figure 6-7). This form is provided to present the current status of the airplane basic empty weight and a complete history of previous modifications. Any change to the permanently installed equipment or modification which affects weight or moment must be entered in the Weight and Balance Record.

6.5 WEIGHT AND BALANCE DATA AND RECORD (Continued)

MODEL PA-46-500TP MERIDIAN

Airplane Serial Number ____________________

Registration Number____________________

Date____________________

AIRPLANE BASIC EMPTY WEIGHT

Item	Weight x (Lbs)	C.G. Arm (Inches Aft of Datum)	= Moment (In-Lbs)
Standard Empty Weight* Actual / Computed			
Optional Equipment			
Basic Empty Weight			

*The standard empty weight includes full oil capacity and 3.0 gallons of unusable fuel.

AIRPLANE USEFUL LOAD - NORMAL CATEGORY OPERATION

(Ramp Weight) - (Basic Empty Weight) = Useful Load

(5134 lbs) - (lbs) = lbs.

THIS BASIC EMPTY WEIGHT, C.G. AND USEFUL LOAD ARE FOR THE AIRPLANE AS LICENSED AT THE FACTORY. REFER TO APPROPRIATE AIRCRAFT RECORD WHEN ALTERATIONS HAVE BEEN MADE.

WEIGHT AND BALANCE DATA FORM
Figure 6-5

PA-46-500TP		Serial Number		Registration Number			Page Number	
Date	Item No.	Description of Article or Modification	Added (+) Removed (-)	Weight Change			Running Basic Empty Weight	
				Wt. (Lb.)	Arm (In.)	Moment /100	Wt. (Lb.)	Moment /100
		As licensed						

WEIGHT AND BALANCE RECORD
Figure 6-7

PA-46-500TP		Serial Number		Registration Number			Page Number	
Date	Item No.	Description of Article or Modification	Added (+) Removed (-)	Weight Change			Running Basic Empty Weight	
				Wt. (Lb.)	Arm (In.)	Moment /100	Wt. (Lb.)	Moment /100

WEIGHT AND BALANCE RECORD (continued)
Figure 6-7 (continued)

6.7 GENERAL LOADING RECOMMENDATIONS

For all airplane configurations, it is the responsibility of the pilot in command to make sure that the airplane always remains within the allowable weight vs. center of gravity limits while in flight.

The following general loading recommendation is intended only as a guide. The charts, graphs, tables and instructions should be checked to assure that the airplane is within the allowable weight vs. center of gravity envelope.

(a) Pilot Only
Load rear baggage compartment first. Investigation is required to determine the amount of fuel. Fuel load may be limited by forward envelope.

(b) 2 Occupants - Pilot and Passenger in Front
Load rear baggage compartment first. Investigation is required to determine the amount of fuel. Fuel load may be limited by forward envelope.

(c) 3 Occupants - 2 in front, 1 in rear
Investigation is required to determine the amount of fuel. Fuel load may be limited by forward envelope.

(d) 4 Occupants - 2 in front, 2 in rear
With 4 occupants, aft passengers' weight, fuel and baggage may be limited by envelope. Investigation is required to determine optimum fuel and baggage load.

(e) 5 Occupants - 2 in front, 1 in middle, 2 in rear
With 5 occupants, aft passengers' weight, fuel and baggage may be limited by envelope.Investigation is required to determine optimum fuel and baggage load.

(f) 6 Occupants - 2 in front, 2 in middle, 2 in rear
With 6 occupants, aft passengers weight, fuel and baggage may be limited by envelope. Investigation is required to determine optimum fuel and baggage load.

WARNING

Do not attempt to fly this airplane under any conditions when it is loaded outside the limits of the approved weight and center of gravity envelope.

6.7 GENERAL LOADING RECOMMENDATIONS (continued)

NOTE

With configuration loadings falling near the envelope limits, it is important to check anticipated landing loadings since fuel burn could result in a final loading outside of the approved weight vs. C.G. envelope.

NOTE

For all airplane configurations, it is the responsibility of the pilot in command to make sure that the airplane always remains within the allowable weight vs. center of gravity envelope while in flight.

NOTE

Always load the fuel equally between the right and left tanks.

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT

(a) Record the airplane basic empty weight and moment from the Weight and Balance Data form or from the latest superseding form (Weight and Balance Record) onto the Weight and Balance computation form (figure 6-13).

(b) Record the weight and corresponding moment of each item using the loading tables (figures 6-19 through 6-29).

(c) Add the weight and moment of all items to the basic empty weight and moment to determine the zero fuel weight and moment.

(d) Divide the zero fuel weight moment by the zero fuel weight to determine the zero fuel weight arm (C.G.).

(e) Check the zero fuel weight and C.G. by locating the weight and arm on the Center of Gravity Limits graph (figure 6-33). Approved points are located within the C.G. envelope. This then meets the weight and balance requirements.

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

(f) Use the loading table for fuel (figure 6-27) to determine the moment for the fuel being loaded. Record the weight and moment of the fuel in the Weight and Balance Computation Form.

(g) Total the zero fuel weight and moment with the fuel loading weight and moment to obtain ramp weight.

(h) Divide the ramp weight moment by the ramp weight to determine the ramp weight arm (C.G.). Check the ramp weight and C.G. by locating the weight and arm on the Center of Gravity Limits graph (figure 6-33). Approved points are located within the C.G envelope. This then meets the weight and balance requirements.

(i) Subtract the weight and moment of the fuel allowance for engine start, taxi, and runup to determine takeoff weight and moment. A standard 42.61 pound fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup. Enter the fuel allowance weight and moment in the Weight and Balance Computation form.

(j) Divide the takeoff weight moment by the takeoff weight to determine the takeoff weight arm (C.G.). Check the takeoff weight and C.G. by locating the weight and arm on the Center of Gravity Limits graph (figure 6-33). Approved points are located within the C.G. envelope. This then meets the weight and balance requirements.

(k) Determine the estimated weight of the fuel to be used during the flight to the appropriate destination. The weight and moment for this fuel is determined by the difference of the total fuel remaining after the fuel allowance is removed and the fuel remaining after reaching destination. Use the loading table for fuel (figure 6-27) to determine the moments. Enter the weight and moment of the fuel used during the flight in the Weight and Balance Computation form.

(l) Subtract the weight and moment of the fuel used during the flight to determine landing weight and moment. Divide the landing weight moment by the landing weight to determine the landing weight arm (C.G.). Check the landing weight and C.G. by locating the weight and arm on the Center of Gravity Limits graph (figure 6-33). Approved points are located within the C.G. envelope. This then meets the weight and balance requirements.

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

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6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

	Weight (pounds)	Arm Aft of Datum (inches)	Moment (inch-pounds)
Basic Empty Weight	3380.0	136.01	459713.8
Pilot (Seat 1)	170.0	135.50	23035.0
Copilot (Seat 2)	170.0	135.50	23035.0
Center Passenger L/H (Seat 3)	180.0	177.00	31860.0
Center Passenger R/H (Seat 4)		177.00	
Rear Passenger L/H (Seat 5)		218.75	
Rear Passenger R/H (Seat 6)		218.75	
Radar pod stowage compartment-Standard (maximum 5 pounds-soft items only)		152.85	
Radar pod stowage compartment- EFIS equipped (maximum 5 pounds-soft items only)		157.475	
Aft Golf Baggage net (105 lbs. maximum -3 bags)-optional		222.31	
Aft Baggage (100 lbs. max.) (50 lbs. maximum with golf bag net option)	80.0	248.23	19858.4
Aft oil stowage compartment (maximum – 5 pounds)		286.50	
Zero Fuel Weight (maximum – 4850 pounds)	3980.0	140.08	557502.2
Fuel (170 gals. maximum)[1] @ 6.70 pounds per gallon	904.5	148.36	134188.7
Maximum Ramp Weight (5134 pounds)	4884.5	141.61	691690.9
Fuel allowance for Engine Start, Taxi and Run up[2]	-42.61	149.89	-6386.63
Maximum Takeoff Weight (5092 pounds)	4841.89	141.54	685304.23

Locate the arm (Center of Gravity, C.G.) of the takeoff weight on the Center of Gravity Limits graph (figure 6-33). If this point falls within the Weight/C.G. envelope, the loading is acceptable for takeoff.

Example of Weight and Balance Computation Form
Standard Configuration (Sample Loading)
Figure 6-9

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT(cont)

Weight Calculation	Weight (pounds)
Total Fuel	904.50
Fuel allowance for Engine Start, Taxi and Run up	-42.61
Fuel Remaining on board	861.89
Moment Calculation	Moment (inch-pounds)
Total Fuel	134188.66
Fuel Remaining on board	-127802.03
Fuel allowance for Engine Start, Taxi and Run up	6386.63

Notes:

1. Use the fuel loading table (figure 6-27) to determine the moment for the amount of fuel being loaded for the flight. If fuel is to be added to existing fuel, determine the total fuel weight and use the fuel loading table to determine the fuel moment. (Arm = Moment/Weight).
2. A standard 42.61 pound fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup. See example, figure 6-11.

Example of Moment Calculation for Fuel Allowance
Standard Configuration (Sample Loading)
Figure 6-11

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

The moment for the fuel burned during the mission is determined by the difference in moments of the takeoff fuel loaded and the fuel remaining on board after landing. See example below.

Weight Calculation	Weight (pounds)
Takeoff Fuel	861.89
Mission Fuel used (Fuel burned during Climb, Cruise and Descent)	-633.3
Post Mission Fuel (Fuel remaining at Landing)	228.64
Moment Calculation	**Moment (inch-pounds)**
Takeoff Fuel	127802.03
Mission Fuel used (Fuel burned during Climb, Cruise and Descent)	-33122.14
Post Mission Fuel (Fuel remaining at Landing)	94679.89

Item	Weight (pounds)	Arm Aft of Datum (inches)	Moment (inch-pounds)
Maximum Takeoff Weight (5092 pounds)	4841.89	141.54	685304.23
Minus Estimated Fuel Burn-off (Climb & Cruise) @ 6.70 pounds per gallon	-633.3	149.51	-94679.89
Maximum Landing Weight (4850 pounds)	4208.59	140.34	590624.34

Locate the arm (Center of Gravity, C.G.) of the landing weight on the Center of Gravity Limits graph (figure 6-33). If this point falls within the Weight/C.G. envelope, the loading is acceptable for landing.

IT IS THE SOLE RESPONSIBILITY OF THE PILOT IN COMMAND TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY AT ALL TIMES.

Example of Moment Calculation for Fuel Burned During the Mission
Figure 6-12

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

	Weight (pounds)	Arm Aft of Datum (inches)	Moment (inch-pounds)
Basic Empty Weight			
Pilot (Seat 1)		135.50	
Copilot (Seat 2)		135.50	
Center Passenger L/H (Seat 3)		177.00	
Center Passenger R/H (Seat 4)		177.00	
Rear Passenger L/H (Seat 5)		218.75	
Rear Passenger R/H (Seat 6)		218.75	
Radar pod stowage compartment-Standard (maximum 5 pounds-soft items only)		152.85	
Radar pod stowage compartment- EFIS equipped (maximum 5 pounds-soft items only)		157.475	
Aft Golf Baggage net (105 lbs. maximum -3 bags)-optional		222.31	
Aft Baggage (100 lbs. max. (50 lbs. maximum with golf bag net option))		248.23	
Aft oil stowage compartment (maximum – 5 pounds)		286.50	
Zero Fuel Weight (maximum – 4850 pounds)			
Fuel (170 gals. maximum)[1] @ 6.70 pounds per gallon			
Maximum Ramp Weight (5134 pounds)			
Fuel allowance for Engine Start, Taxi and Run up[2]	-42.61		
Maximum Takeoff Weight (5092 pounds)			

Notes:

1. Use the fuel loading table (figure 6-27) to determine the moment for the amount of fuel being loaded for the flight. If fuel is to be added to existing fuel, determine the total fuel weight and use the fuel loading table to determine the fuel moment. (Arm = Moment/Weight).
2. A standard 42.61 pound fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup.

Locate the arm (Center of Gravity, C.G.) of the takeoff weight on the Center of Gravity Limits graph (figure 6-33). If this point falls within the Weight/C.G. envelope, the loading is acceptable for takeoff.

Weight and Balance Computation Form
Standard Configuration (Normal Category)
Figure 6-13A

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

	Weight (pounds)	Arm Aft of Datum (inches)	Moment (inch-pounds)
Basic Empty Weight			
Pilot (Seat 1)		135.50	
Copilot (Seat 2)		135.50	
Stowage Area #1 (Maximum 5 pounds) (see Figure 6-31)		158.45	
Stowage Area #2 (Maximum 5 pounds) (see Figure 6-31)		158.45	
Stowage Area #3 (Maximum 5 pounds) (see Figure 6-31)		158.45	
Stowage Area #4 (Maximum 5 pounds) (see Figure 6-31)		171.25	
Ice Chest drawer (Maximum 20 pounds) (see Figure 6-31)		183.85	
Center Passenger R/H (Seat 4)		177.00	
Rear Passenger L/H (Seat 5)		218.75	
Rear Passenger R/H (Seat 6)		218.75	
Radar pod stowage compartment-Standard (maximum 5 pounds-soft items only)		152.85	
Radar pod stowage compartment- EFIS equipped (maximum 5 pounds-soft items only)		157.475	
Aft Golf Baggage net (105 lbs. maximum -3 bags)-optional		222.31	
Aft Baggage (100 lbs. max. (50 lbs. maximum with golf bag net option))		248.23	
Aft oil stowage compartment (maximum – 5 pounds)		286.50	
Zero Fuel Weight (maximum – 4850 pounds)			
Fuel (170 gals. maximum)[1] @ 6.70 pounds per gallon			
Maximum Ramp Weight (5134 pounds)			
Fuel allowance for Engine Start, Taxi and Run up[2]	-42.61		
Maximum Takeoff Weight (5092 pounds)			

Notes:

1. Use the fuel loading table (figure 6-27) to determine the moment for the amount of fuel being loaded for the flight. If fuel is to be added to existing fuel, determine the total fuel weight and use the fuel loading table to determine the fuel moment. (Arm = Moment/Weight).
2. A standard 42.61 pound fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup.

Locate the arm (Center of Gravity, C.G.) of the takeoff weight on the Center of Gravity Limits graph (figure 6-33). If this point falls within the Weight/C.G. envelope, the loading is acceptable for takeoff.

Weight and Balance Computation Form
Executive/Entertainment Configuration (Normal Category)
Figure 6-13B

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

Weight Calculation	Weight (pounds)
Total Fuel	
Fuel allowance for Engine Start, Taxi and Run up*	
Fuel Remaining on board	
Moment Calculation	**Moment (inch-pounds)**
Total Fuel	
Fuel Remaining on board	
Fuel allowance for Engine Start, Taxi and Run up	

Notes:
1. Use the fuel loading table (figure 6-27) to determine the moment for the amount of fuel being loaded for the flight. If fuel is to be added to existing fuel, determine the total fuel weight and use the fuel loading table to determine the fuel moment. (Arm = Moment/Weight).
2. A standard 42.61 pound fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup. See example, figure 6-11.

Moment Calculation for Fuel Allowance
Figure 6-14

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

The moment for the fuel burned during the mission is determined by the difference in moments of the takeoff fuel loaded and the fuel remaining on board after landing. See example below.

Weight Calculation	Weight (pounds)
Takeoff Fuel	
Mission Fuel used (Fuel burned during Climb, Cruise and Descent)	
Post Mission Fuel (Fuel remaining at Landing)	
Moment Calculation	**Moment (inch-pounds)**
Takeoff Fuel	
Mission Fuel used (Fuel burned during Climb, Cruise and Descent)	
Post Mission Fuel (Fuel remaining at Landing)	

Item	Weight (pounds)	Arm Aft of Datum (inches)	Moment (inch-pounds)
Maximum Takeoff Weight (5092 pounds)			
Minus Estimated Fuel Burn-off (Climb & Cruise) @ 6.70 pounds per gallon			
Maximum Landing Weight (4850 pounds)			

Locate the arm (Center of Gravity, C.G.) of the landing weight on the Center of Gravity Limits graph (figure 6-33). If this point falls within the Weight/C.G. envelope, the loading is acceptable for landing.

IT IS THE SOLE RESPONSIBILITY OF THE PILOT IN COMMAND TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY AT ALL TIMES.

Moment Calculation for Fuel Burned During the Mission
Figure 6-15

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

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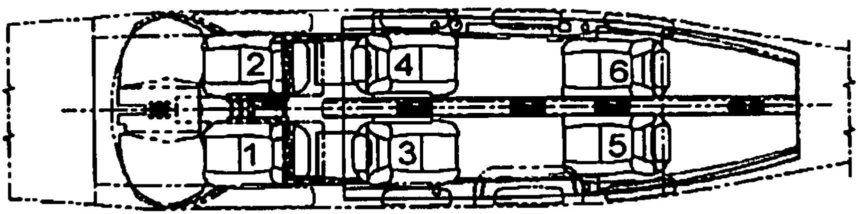
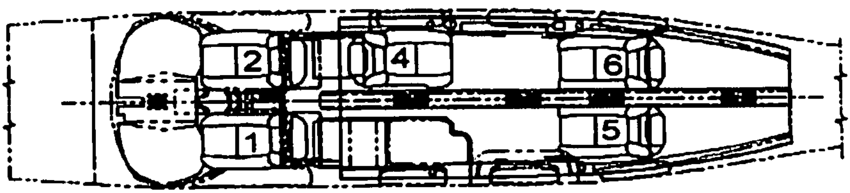
6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

Standard Configuration



Executive/Entertainment Configuration



Seating Configurations
Figure 6-17

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

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6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

Weight (pounds)	Pilot Arm FS 135.5	Copilot (Seat 2) Arm FS 135.5	Seat 3 Arm FS 177.0	Seat 4 Arm FS 177.0	Seat 5 Arm FS 218.75	Seat 6 Arm FS 218.75
	Moment (inch - Pounds)					
20	2710.0	2710.0	3540.0	3540.0	4375.0	4375.0
30	4065.0	4065.0	5310.0	5310.0	6562.5	6562.5
40	5420.0	5420.0	7080.0	7080.0	8750.0	8750.0
50	6775.0	6775.0	8850.0	8850.0	10937.5	10937.5
60	8130.0	8130.0	10620.0	10620.0	13125.0	13125.0
70	9485.0	9485.0	12390.0	12390.0	15312.5	15312.5
80	10840.0	10840.0	14160.0	14160.0	17500.0	17500.0
90	12195.0	12195.0	15930.0	15930.0	19687.5	19687.5
100	13550.0	13550.0	17700.0	17700.0	21875.0	21875.0
110	14905.0	14905.0	19470.0	19470.0	24062.5	24062.5
120	16260.0	16260.0	21240.0	21240.0	26250.0	26250.0
130	17615.0	17615.0	23010.0	23010.0	28437.5	28437.5
140	18970.0	18970.0	24780.0	24780.0	30625.0	30625.0
150	20325.0	20325.0	26550.0	26550.0	32812.5	32812.5
160	21680.0	21680.0	28320.0	28320.0	35000.0	35000.0
170	23035.0	23035.0	30090.0	30090.0	37187.5	37187.5

Loading Table
Occupants (Standard Configuration)
Figure 6-19

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

Weight (pounds)	Pilot Arm FS 135.5	Copilot (Seat 2) Arm FS 135.5	Seat 4 Arm FS 177.0	Seat 5 Arm FS 218.75	Seat 6 Arm FS 218.75
	Moment (inch - pounds)				
20	2710.0	2710.0	3540.0	4375.0	4375.0
30	4065.0	4065.0	5310.0	6562.5	6562.5
40	5420.0	5420.0	7080.0	8750.0	8750.0
50	6775.0	6775.0	8850.0	10937.5	10937.5
60	8130.0	8130.0	10620.0	13125.0	13125.0
70	9485.0	9485.0	12390.0	15312.5	15312.5
80	10840.0	10840.0	14160.0	17500.0	17500.0
90	12195.0	12195.0	15930.0	19687.5	19687.5
100	13550.0	13550.0	17700.0	21875.0	21875.0
110	14905.0	14905.0	19470.0	24062.5	24062.5
120	16260.0	16260.0	21240.0	26250.0	26250.0
130	17615.0	17615.0	23010.0	28437.5	28437.5
140	18970.0	18970.0	24780.0	30625.0	30625.0
150	20325.0	20325.0	26550.0	32812.5	32812.5
160	21680.0	21680.0	28320.0	35000.0	35000.0
170	23035.0	23035.0	30090.0	37187.5	37187.5

Loading Table
Occupants (Executive/Entertainment Configuration)
Figure 6-21

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

Standard Baggage net configuration	
Weight	**Standard baggage**
(pounds)	**Arm FS 248.23**
	Moment (inch -pounds)
10	2482.3
20	4964.6
30	7446.9
40	9929.2
50	12411.5
60	14893.8
70	17376.1
80	19858.4
90	22340.7
100	24823.0

Loading Table
Standard Baggage
Figure 6-23

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

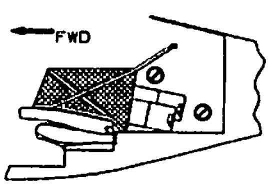
Golf baggage net configuration		
Weight	Golf baggage location	Aft location
(pounds)	Arm FS 222.31	Arm FS 248.23
	Moment (inch -pounds)	Moment (inch -pounds)
10.0	2223.1	2482.3
20.0	4446.2	4964.6
30.0	6669.3	7446.9
40.0	8892.4	9929.2
50.0	11115.5	12411.5
60.0	13338.6	
70.0	15561.7	
80.0	17784.8	
90.0	20007.9	
100.0	22231.0	
105.0	23342.6	

Loading Table
Golf Baggage - Optional
Figure 6-25

STANDARD CARGO NET INSTALLED

MAX BAGGAGE THIS COMPARTMENT
100 LBS / 45.3 KG

GOLF CARGO NET INSTALLED



⊘ NO BAGGAGE PERMISSIBLE IN THESE AREAS WHEN THE GOLF NET IS IN USE

MAX GOLF CLUB LOAD
105 LBS / 47.6 KG

MAX ADDITIONAL BAGGAGE BEHIND LEFT SEAT
50 LBS / 22.6 KG

Golf Baggage Loading Configuration
Figure 6-26

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

Gallons (unusable fuel not included)	Fuel Weight (pounds)	Fuel Moment Arm Varies (inch pounds)
20	134.00	19144.68
25	167.50	24079.93
30	201.00	29030.69
35	234.50	33990.65
40	268.00	38957.46
45	301.50	43930.87
50	335.00	48911.41
55	368.50	53899.63
60	402.00	58895.65
65	435.50	63899.05
70	469.00	68908.87
75	502.50	73923.83
80	536.00	78942.46
85	569.50	83963.42
90	603.00	88985.58
95	636.50	94008.15
100	670.00	99030.76
105	703.50	104053.34
110	737.00	109076.01
115	770.50	114098.96
120	804.00	119122.17
125	837.50	124145.36
130	871.00	129167.84
135	904.50	134188.66
140	938.00	139206.95
145	971.50	144222.62
150	1005.00	149237.50
155	1038.50	154257.05
160	1072.00	159292.80
165	1105.50	164365.64
170	1139.00	169510.07

Three (3) gallons of unusable fuel (20.10 pounds, 2901.84 inch pounds) included in basic empty weight. The above weights are based on a fuel specific gravity of 0.02899 pounds per cubic inch at 59 degrees F for Jet A and Jet A-1, which yields a fuel density of 6.7 pounds per gallon.

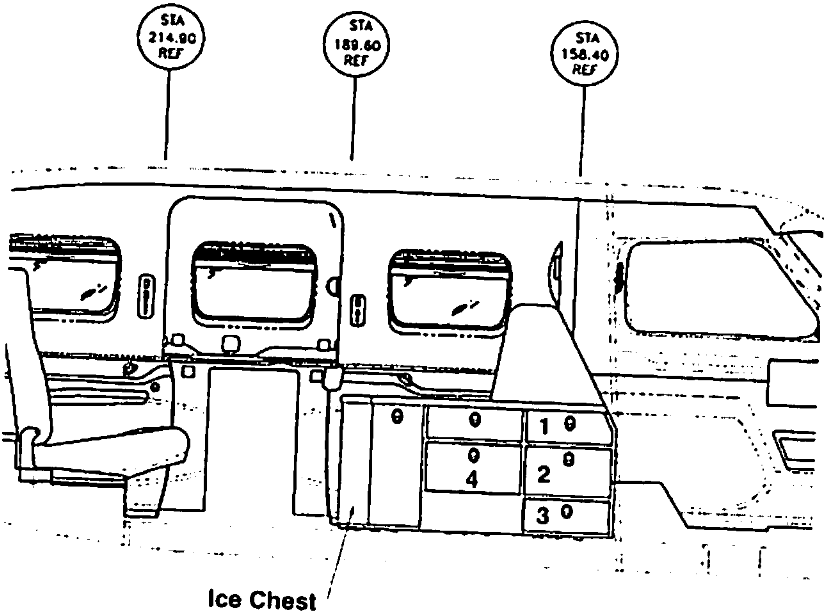
Loading Table
Fuel
Figure 6-27

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)

Weight (pounds)	Stowage area 1-3 Arm FS 158.45 Moment (inch - pounds)	Stowage area 4 Arm FS 171.25 Moment (inch - pounds)	Ice chest Arm FS 183.85 Moment (inch - pounds)
1	158.5	171.3	183.9
2	316.9	342.5	367.7
3	475.4	513.8	551.6
4	633.8	685.0	735.4
5	792.3	856.3	919.3
6			1103.1
7			1287.0
8			1470.8
9			1654.7
10			1838.5
11			2022.4
12			2206.2
13			2390.1
14			2573.9
15			2757.8
16			2941.6
17			3125.5
18			3309.3
19			3493.2
20			3677.0

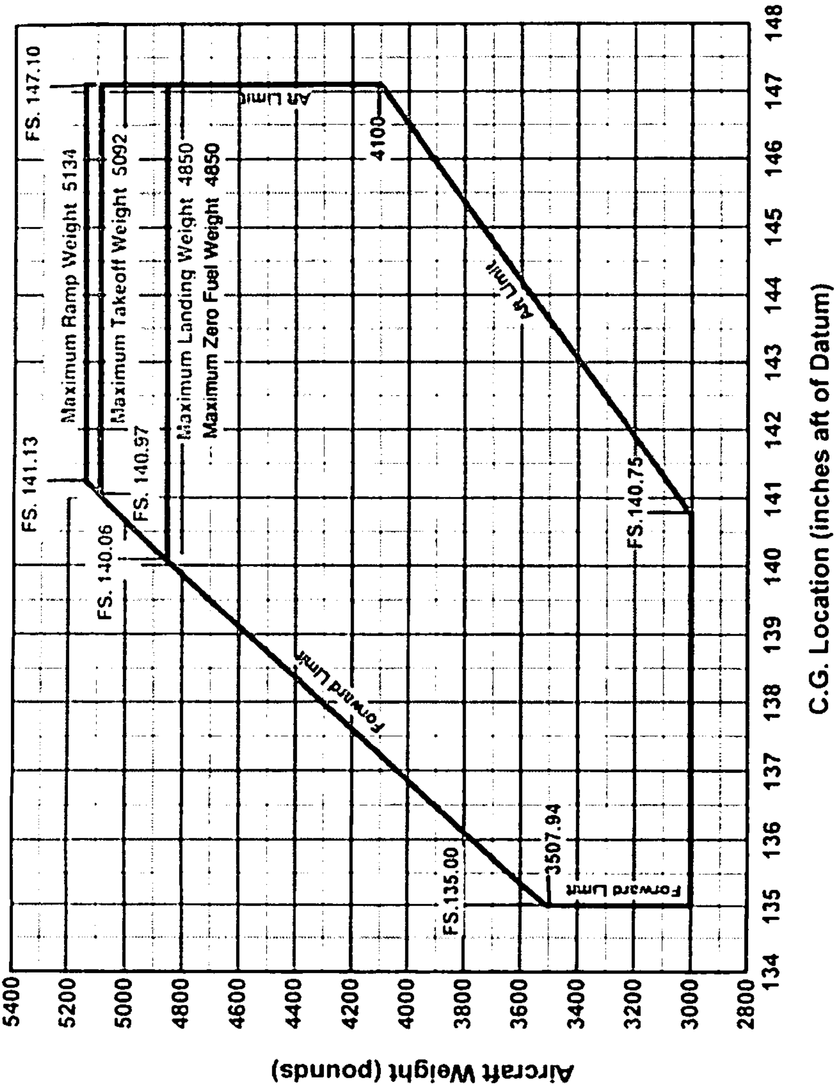
Loading Table
Executive/Entertainment Stowage Compartment
Figure 6-29

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)



Stowage Configuration
Figure 6-31

6.9 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT (cont)



Center of Gravity Limits Graph
Figure 6-33

SECTION 6 - METRIC
WEIGHT AND BALANCE

6.1 General - Metric

In order to achieve design performance and flying characteristics, the airplane must be operated and flown within the approved weight vs. center of gravity (C.G.) envelope. (Refer to Figure 6-69.) The airplane offers flexibility of loading, however, it cannot be flown with the maximum number of passengers, full fuel tanks and maximum baggage.

Before the airplane is licensed, a basic empty weight and C.G. location is computed (basic empty weight consists of the standard empty weight of the airplane plus the optional equipment). Using the basic empty weight and C.G. location, the pilot can determine the weight and C.G. position for the loaded airplane. It is the responsibility of the pilot in command to ensure that the airplane is loaded within approved weight vs. C.G. envelope limits prior to each flight.

The basic empty weight and C.G. location is recorded in the Weight and Balance Data Form (Figure 6-39) and the Weight and Balance Record (Figure 6-41). If modification work is performed or new equipment is added to the airplane, a revised basic empty weight and C.G. must be computed and recorded in the Weight and Balance Data Form and the Weight and Balance Record. The current values for weight and C.G. should be used to calculate the quantity of fuel, baggage, and passengers that can be boarded so as to remain within the approved weight and C.G. limitations.

The following pages contain procedures and forms used when weighing an airplane and computing basic empty weight, C.G. position, and useful load. Note that the useful load includes usable fuel, baggage, cargo and passengers.

6.3 Airplane Weighing Procedure - Metric

At the time of licensing, Piper provides each airplane with the basic empty weight and center of gravity location. This data is supplied in the Weight and Balance Data Form (Figure 6-39).

The removal or addition of equipment or airplane modifications can affect the basic empty weight and center of gravity. The following is a weighing procedure to determine this basic empty weight and center of gravity location:

(a) Preparation

(1) Verify that all items checked in the airplane equipment list are installed in the proper location in the airplane.

(2) Remove excessive dirt, grease, moisture, and foreign items such as rags and tools, from the airplane before weighing.

(3) Defuel airplane. Then open all fuel drains until all remaining fuel is drained. Then add the unusable fuel, 5.6 liters in each wing.

(4) Fill oil to full capacity.

(5) Place pilot and copilot seats in fifth (5th) notch, aft of forward position. Put flaps in the fully retracted position and all control surfaces in the neutral position. All entrance and baggage doors should be closed.

(6) Weigh the airplane inside a closed building to prevent errors in scale readings due to wind.

6.3 Airplane Weighing Procedure - Metric (continued)

(b) Leveling

(1) With the airplane on scales, insert an 8.6 centimeter spacer on each of the main gear struts and a 7.6 centimeter spacer on the nose gear strut.

(2) Level airplane (refer to Figure 6-37) deflating (or inflating as required) nose wheel tire, to center bubble on level.

(c) Weighing - Airplane Basic Empty Weight

With the airplane level and brakes released, record the weight shown on each scale. Deduct the tare, if any, from each reading. (Refer to Figure 6-35.)

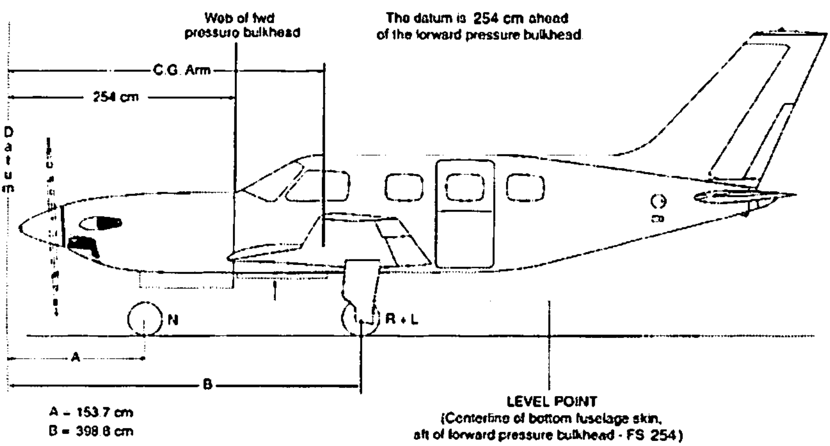
Scale Position and Symbol		Scale Reading	Tare	Net Weight
Nose Wheel	(N)			
Right Main Wheel	(R)			
Left Main Wheel	(L)			
Basic Empty Weight, as Weighed	(T)			

Weighing Form
Figure 6-35

6.3 Airplane Weighing Procedure - Metric (continued)

(d) Basic Empty Weight Center of Gravity

(1) The following geometry applies to the airplane when it is le
Leveling, paragraph 6.3 (b).



Leveling Diagram
Figure 6-37

6.3 Airplane Weighing Procedure - Metric (continued)

(d) Basic Empty Weight Center of Gravity

(2) The basic empty weight center of gravity (as weighed including optional equipment, full oil and unusable fuel) can be determined by the following formula:

$$\text{C.G. Arm} = \frac{(N)(A) + (R + L)(B)}{T} \text{ centimeters}$$

$$\text{Where: } T = N + R + L$$

6.5 Weight and Balance Data and Record - Metric

The Basic Empty Weight, Center of Gravity Location and Useful Load listed in Figure 6-39 are for the airplane as licensed at the factory. These figures apply only to the specific airplane serial number and registration number shown.

The basic empty weight of the airplane as licensed at the factory has been entered in the Weight and Balance Record (Figure 6-41). This form is provided to present the current status of the airplane basic empty weight and a complete history of previous modifications. Any change to the permanently installed equipment or modification which affects weight or moment must be entered in the Weight and Balance Record.

6.5 Weight and Balance Data and Record - Metric (Continued)

MODEL PA-46-500TP MERIDIAN

Airplane Serial Number ____________________

Registration Number____________________

Date____________________

AIRPLANE BASIC EMPTY WEIGHT

Item	Weight x (kg)	C.G. Arm (cm Aft of Datum)	= Moment (cm-kg)
Standard Empty Weight* Actual / Computed			
Optional Equipment			
Basic Empty Weight			

*The standard empty weight includes full oil capacity and 11.4 liters of unusable fuel.

AIRPLANE USEFUL LOAD - NORMAL CATEGORY OPERATION

(Ramp Weight) - (Basic Empty Weight) = Useful Load

(2328.7 kg) - (kg) =   kg

THIS BASIC EMPTY WEIGHT, C.G. AND USEFUL LOAD ARE FOR THE AIRPLANE AS LICENSED AT THE FACTORY. REFER TO APPROPRIATE AIRCRAFT RECORD WHEN ALTERATIONS HAVE BEEN MADE.

Weight and Balance Data Form
Figure 6-39

6.5 Weight and Balance Data and Record - Metric (Continued)

PA-46-500TP	Serial Number		Registration Number			Page Number	
Date	Item No.	Description of Article or Modification	Added (+) Removed (-)	Weight Change			Running Basic Empty Weight	
				Wt. (kg)	Arm (cm)	Moment /100	Wt. (kg)	Moment /100
		As licensed						

Weight and Balance Record
Figure 6-41

6.5 Weight and Balance Data and Record - Metric (Continued)

PA-46-500TP		Serial Number		Registration Number			Page Number	
Date	Item No.	Description of Article or Modification	Added (+) Removed (-)	Weight Change			Running Basic Empty Weight	
				Wt. (kg)	Arm (cm)	Moment /100	Wt. (kg)	Moment /100

Weight and Balance Record
Figure 6-41 (continued)

6.7 General Loading Recommendations - Metric

For all airplane configurations, it is the responsibility of the pilot in command to make sure that the airplane always remains within the allowable weight vs. center of gravity limits while in flight.

The following general loading recommendation is intended only as a guide. The charts, graphs, tables and instructions should be checked to assure that the airplane is within the allowable weight vs. center of gravity envelope.

(a) Pilot Only
Load rear baggage compartment first. Investigation is required to determine the amount of fuel. Fuel load may be limited by forward envelope.

(b) 2 Occupants - Pilot and Passenger in Front
Load rear baggage compartment first. Investigation is required to determine the amount of fuel. Fuel load may be limited by forward envelope.

(c) 3 Occupants - 2 in front, 1 in rear
Investigation is required to determine the amount of fuel. Fuel load may be limited by forward envelope.

(d) 4 Occupants - 2 in front, 2 in rear
With 4 occupants, aft passengers' weight, fuel and baggage may be limited by envelope. Investigation is required to determine optimum fuel and baggage load.

(e) 5 Occupants - 2 in front, 1 in middle, 2 in rear
With 5 occupants, aft passengers' weight, fuel and baggage may be limited by envelope.Investigation is required to determine optimum fuel and baggage load.

(f) 6 Occupants - 2 in front, 2 in middle, 2 in rear
With 6 occupants, aft passengers weight, fuel and baggage may be limited by envelope. Investigation is required to determine optimum fuel and baggage load.

WARNING

Do not attempt to fly this airplane under any conditions when it is loaded outside the limits of the approved weight and center of gravity envelope.

6.7 General Loading Recommendations - Metric (continued)

NOTE

With configuration loadings falling near the envelope limits, it is important to check anticipated landing loadings since fuel burn could result in a final loading outside of the approved weight vs. C.G. envelope.

NOTE

For all airplane configurations, it is the responsibility of the pilot in command to make sure that the airplane always remains within the allowable weight vs. center of gravity envelope while in flight.

NOTE

Always load the fuel equally between the right and left tanks.

6.9 Weight and Balance Determination for Flight - Metric

(a) Record the airplane basic empty weight and moment from the Weight and Balance Data form or from the latest superseding form (Weight and Balance Record) onto the Weight and Balance computation form (figure 6-47).

(b) Record the weight and corresponding moment of each item using the loading tables (figures 6-53 through 6-65).

(c) Add the weight and moment of all items to the basic empty weight and moment to determine the zero fuel weight and moment.

(d) Divide the zero fuel weight moment by the zero fuel weight to determine the zero fuel weight arm (C.G.).

(e) Check the zero fuel weight and C.G. by locating the weight and arm on the Center of Gravity Limits graph (figure 6-69). Approved points are located within the C.G. envelope. This then meets the weight and balance requirements.

6.9 Weight and Balance Determination for Flight - Metric (cont)

(f) Use the loading table for fuel (figure 6-63) to determine the moment for the fuel being loaded. Record the weight and moment of the fuel in the Weight and Balance Computation Form.

(g) Total the zero fuel weight and moment with the fuel loading weight and moment to obtain ramp weight.

(h) Divide the ramp weight moment by the ramp weight to determine the ramp weight arm (C.G.). Check the ramp weight and C.G. by locating the weight and arm on the Center of Gravity Limits graph (figure 6-69). Approved points are located within the C.G envelope. This then meets the weight and balance requirements.

(i) Subtract the weight and moment of the fuel allowance for engine start, taxi, and runup to determine takeoff weight and moment. A standard 19.33 kilogram fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup. Enter the fuel allowance weight and moment in the Weight and Balance Computation form.

(j) Divide the takeoff weight moment by the takeoff weight to determine the takeoff weight arm (C.G.). Check the takeoff weight and C.G. by locating the weight and arm on the Center of Gravity Limits graph (figure 6-69). Approved points are located within the C.G. envelope. This then meets the weight and balance requirements.

(k) Determine the estimated weight of the fuel to be used during the flight to the appropriate destination. The weight and moment for this fuel is determined by the difference of the total fuel remaining after the fuel allowance is removed and the fuel remaining after reaching destination. Use the loading table for fuel (figure 6-63) to determine the moments. Enter the weight and moment of the fuel used during the flight in the Weight and Balance Computation form.

(l) Subtract the weight and moment of the fuel used during the flight to determine landing weight and moment. Divide the landing weight moment by the landing weight to determine the landing weight arm (C.G.). Check the landing weight and C.G. by locating the weight and arm on the Center of Gravity Limits graph (figure 6-69). Approved points are located within the C.G. envelope. This then meets the weight and balance requirements.

6.9 Weight and Balance Determination for Flight - Metric (cont)

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6.9 Weight and Balance Determination for Flight - Metric (cont)

Item	Weight (kilograms)	Arm Aft of Datum (centimeter)	Moment (centimeter-kilograms)
Basic Empty Weight	1533.1	345.47	529644.8
Pilot (Seat 1)	77.1	344.17	26539.1
Copilot (Seat 2)	77.1	344.17	26539.1
Center Passenger L/H (Seat 3)	81.6	449.58	36706.5
Center Passenger R/H (Seat 4)		449.58	
Rear Passenger L/H (Seat 5)		555.63	
Rear Passenger R/H (Seat 6)		555.63	
Radar pod stowage compartment-Standard (maximum 2.2 kilograms-soft items only)		388.24	
Radar pod stowage compartment- EFIS equipped (maximum 2.2 kilograms-soft items only)		399.99	
Aft Golf Baggage net (47.6 kilograms max. -3 bags)-optional		564.67	
Aft Baggage (45.3 kilograms max.) (22.6 kilograms max with golf bag)	36.3	630.50	22879.2
Aft oil stowage compartment (maximum – 2.2 kilograms)		727.71	
Zero fuel Weight (maximum – 2199.9 kilograms)	1805.3	355.79	642308.65
Fuel (643.45 litres maximum)[1] @ 0.80 kilograms per litre	410.3	376.83	154601.3
Maximum Ramp Weight (2328.7 kilograms)	2215.6	359.69	796909.9
Fuel allowance for Engine Start, Taxi and Run up[2]	-19.33	380.71	-7358.2
Maximum Takeoff Weight (2309.7 kilograms)	2196.2	359.50	789551.75

Locate the arm (Center of Gravity, C.G.) of the takeoff weight on the Center of Gravity Limits graph (figure 6-69). If this point falls within the Weight/C.G. envelope, the loading is acceptable for takeoff.

Example of Weight and Balance Computation
Standard Configuration (Sample Loading)
Figure 6-43

6.9 Weight and Balance Determination for Flight - Metric (cont)

Weight Calculation	Weight (kilograms)
Total Fuel	410.27
Fuel allowance for Engine Start, Taxi and Run up*	-19.33
Fuel Remaining on board	390.94
Moment Calculation	Moment (centimeter-kilograms)
Total Fuel	154601.3
Fuel Remaining on board	-147243.1
Fuel allowance for Engine Start, Taxi and Run up	7358.2

Notes:

1. Use the fuel loading table (figure 6-63) to determine the moment for the amount of fuel being loaded for the flight. If fuel is to be added to existing fuel, determine the total fuel weight and use the fuel loading table to determine the fuel moment. (Arm = Moment/Weight).
2. A standard 19.33 kilograms fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup. See example, figure 6-45.

Example of Moment Calculation for Fuel Allowance
Standard Configuration (Sample Loading)
Figure 6-45

6.9 Weight and Balance Determination for Flight - Metric (cont)

The moment for the fuel burned during the mission is determined by the difference in moments of the takeoff fuel loaded and the fuel remaining on board after landing. See example below.

Weight Calculation	Weight (kilograms)
Takeoff Fuel	390.94
Mission Fuel used (Fuel burned during Climb, Cruise and Descent)	-287.2
Post Mission Fuel (Fuel remaining at Landing)	103.74
Moment Calculation	**Moment (centimeter-kilograms)**
Takeoff Fuel	147243.10
Mission Fuel used (Fuel burned during Climb, Cruise and Descent)	-38160.6
Post Mission Fuel (Fuel remaining at Landing)	109082.5

Maximum Takeoff Weight (2309.7 kilograms)	2196.23	359.50	789551.75
Minus Estimated Fuel Burn-off (Climb & Cruise) @ 0.80 kilograms per litre	-287.2	379.76	-109082.5
Maximum Landing Weight (2199.91 kilograms)	1909.00	356.45	680469.28

Locate the arm (Center of Gravity, C.G.) of the landing weight on the Center of Gravity Limits graph (figure 6-69). If this point falls within the Weight/C.G. envelope, the loading is acceptable for landing.

IT IS THE SOLE RESPONSIBILITY OF THE PILOT IN COMMAND TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY AT ALL TIMES.

Example of Moment Calculation for Fuel Burned During the Mission
Figure 6-46

6.9 Weight and Balance Determination for Flight - Metric (cont)

Item	Weight (kilograms)	Arm Aft of Datum (centimeter)	Moment (centimeter-kilograms)
Basic Empty Weight		345.47	
Pilot (Seat 1)		344.17	
Copilot (Seat 2)		344.17	
Center Passenger L/H (Seat 3)		449.58	
Center Passenger R/H (Seat 4)		449.58	
Rear Passenger L/H (Seat 5)		555.63	
Rear Passenger R/H (Seat 6)		555.63	
Radar pod stowage compartment-Standard (maximum 2.27 kilograms-soft items only)		388.24	
Radar pod stowage compartment- EFIS equipped (maximum 2.27 kilograms-soft items only)		399.99	
Aft Golf Baggage net (47.63 kilograms max. -3 bags)-optional		564.67	
Aft Baggage (45.36 kilograms max. (22.68 kilograms max with golf bag)		630.50	
Aft oil stowage compartment (maximum – 2.27 kilograms)			
Zero fuel Weight (maximum – 2199.9 kilograms)			
Fuel (643.45 litres maximum)[1] @ 0.80 kilograms per litre			
Maximum Ramp Weight (2328.7 kilograms)			
Fuel allowance for Engine Start, Taxi and Run up[2]	-19.33		
Maximum Takeoff Weight (2309.7 kilograms)			

Notes:

1. Use the fuel loading table (figure 6-63) to determine the moment for the amount of fuel being loaded for the flight. If fuel is to be added to existing fuel, determine the total fuel weight and use the fuel loading table to determine the fuel moment. (Arm = Moment/Weight).
2. A standard 19.33 kilograms fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup.

Locate the arm (Center of Gravity, C.G.) of the takeoff weight on the Center of Gravity Limits graph (figure 6-69). If this point falls within the Weight/C.G. envelope, the loading is acceptable for takeoff.

Weight and Balance Computation Form
Standard Configuration (Normal Category)
Figure 6-47A

6.9 Weight and Balance Determination for Flight - Metric (cont)

Item	Weight (kilograms)	Arm Aft of Datum (centimeter)	Moment (centimeter-kilograms)
Basic Empty Weight			
Pilot (Seat 1)		344.17	
Copilot (Seat 2)		344.17	
Stowage Area #1 (Maximum 2.27 kilograms) (See Figure 6-67)		402.46	
Stowage Area #2 ((Maximum 2.27 kilograms)(See Figure 6-67)		402.46	
Stowage Area #3 (Maximum 2.27 kilograms) (See Figure 6-67)		402.46	
Stowage Area #4 (Maximum 2.27 kilograms) (See Figure 6-67)		434.98	
Ice Chest drawer (Maximum 9.07 kilograms) (See Figure 6-67)		466.98	
Center Passenger R/H (Seat 4)		449.58	
Rear Passenger L/H (Seat 5)		555.63	
Rear Passenger R/H (Seat 6)		555.63	
Radar pod stowage compartment-Standard (maximum 2.2 kilograms-soft items only)		388.24	
Radar pod stowage compartment- EFIS equipped (maximum 2.2 kilograms-soft items only)		399.99	
Aft Golf Baggage net (47.6 kilograms max. -3 bags)-optional		564.67	
Aft Baggage (45.3 kilograms max) (22.6 kilograms max with golf bag)		630.50	
Aft oil stowage compartment (maximum - 2.2 kilograms)		727.71	
Zero fuel Weight (maximum - 2199.9 kilograms)			
Fuel (643.45 litres maximum)[1] @ 0.80 kilograms per litre			
Maximum Ramp Weight (2328.7 kilograms)			
Fuel allowance for Engine Start, Taxi and Run up[2]	-19.33		
Maximum Takeoff Weight (2309.7 kilograms)			

Notes:

1. Use the fuel loading table (figure 6-63) to determine the moment for the amount of fuel being loaded for the flight. If fuel is to be added to existing fuel, determine the total fuel weight and use the fuel loading table to determine the fuel moment. (Arm = Moment/Weight).
2. A standard 19.33 kilograms fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup.

Locate the arm (Center of Gravity, C.G.) of the takeoff weight on the Center of Gravity Limits graph (figure 6-69). If this point falls within the Weight/C.G. envelope, the loading is acceptable for takeoff.

Weight and Balance Computation Form
Executive/Entertainment Configuration (Normal Category)
Figure 6-47B

6.9 Weight and Balance Determination for Flight - Metric (cont)

Locate the arm (Center of Gravity, C.G.) of the landing weight on the Center of Gravity Limits graph (figure 6-69). If this point falls within the Weight/C.G. envelope, the loading is acceptable for landing.

Weight Calculation	Weight (kilograms)
Total Fuel	
Fuel allowance for Engine Start, Taxi and Run up*	
Fuel Remaining on board	
Moment Calculation	**Moment (centimeter-kilograms)**
Total Fuel	
Fuel Remaining on board	
Fuel allowance for Engine Start, Taxi and Run up	

Notes:

1. Use the fuel loading table (figure 6-63) to determine the moment for the amount of fuel being loaded for the flight. If fuel is to be added to existing fuel, determine the total fuel weight and use the fuel loading table to determine the fuel moment. (Arm = Moment/Weight).
2. A standard 19.33 kilograms fuel allowance for taxi and runup is assumed. The moment for the fuel allowance is determined by the difference in moments of the total fuel loaded and the fuel remaining on board after taxi and runup. See example, figure 6-45.

Moment Calculation for Fuel Allowance
Figure 6-48

6.9 Weight and Balance Determination for Flight - Metric (cont)

Weight Calculation	Weight (kilograms)
Takeoff Fuel	
Mission Fuel used (Fuel burned during Climb, Cruise and Descent)	
Post Mission Fuel (Fuel remaining at Landing)	
Moment Calculation	**Moment (centimeter-kilograms)**
Takeoff Fuel	
Mission Fuel used (Fuel burned during Climb, Cruise and Descent)	
Post Mission Fuel (Fuel remaining at Landing)	

Maximum Takeoff Weight (2309.7 kilograms)		
Minus Estimated Fuel Burn-off (Climb & Cruise) @ 0.80 kilograms per litre		
Maximum Landing Weight (2199.91 kilograms)		

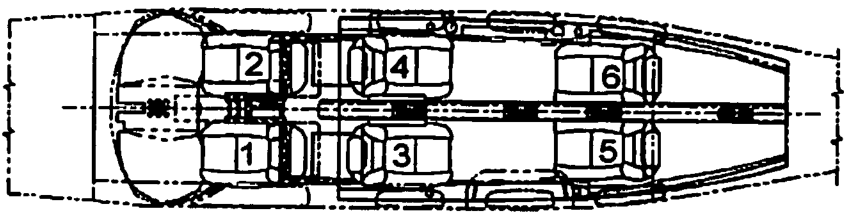
Locate the arm (Center of Gravity, C.G.) of the landing weight on the Center of Gravity Limits graph (figure 6-69). If this point falls within the Weight/C.G. envelope, the loading is acceptable for landing.

IT IS THE SOLE RESPONSIBILITY OF THE PILOT IN COMMAND TO ENSURE THAT THE AIRPLANE IS LOADED PROPERLY AT ALL TIMES.

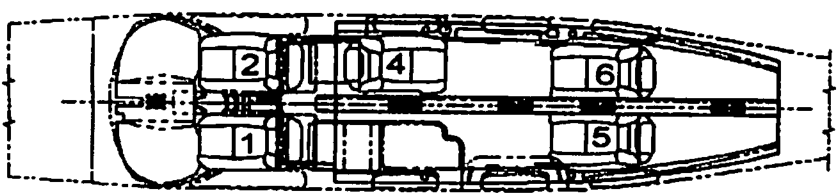
Moment Calculation for Fuel Burned During the Mission
Figure 6-49

6.9 Weight and Balance Determination for Flight - Metric (cont)

Standard Configuration



Executive/Entertainment Configuration



Seating Configurations
Figure 6-51

6.9 Weight and Balance Determination for Flight - Metric (cont)

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6.9 Weight and Balance Determination for Flight - Metric (cont)

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6.9 Weight and Balance Determination for Flight - Metric (cont)

Weight (kilograms)	Pilot Arm FS 344.17	Copilot (Seat 2) Arm FS 344.17	Seat 3 Arm FS 449.48	Seat 4 Arm FS 449.48	Seat 5 Arm FS 555.63	Seat 6 Arm FS 555.63
			Moment (centimeters-kilograms)			
9.1	3122.2	3122.2	4078.5	4078.5	5040.5	5040.5
13.6	4683.4	4683.4	6117.7	6117.7	7560.8	7560.8
18.1	6244.5	6244.5	8157.0	8157.0	10081.0	10081.0
22.7	7805.6	7805.6	10196.2	10196.2	12601.3	12601.3
27.2	9366.7	9366.7	12235.5	12235.5	15121.6	15121.6
31.8	10927.8	10927.8	14274.7	14274.7	17641.8	17641.8
36.3	12489.0	12489.0	16314.0	16314.0	20162.1	20162.1
40.8	14050.1	14050.1	18353.2	18353.2	22682.3	22682.3
45.4	15611.2	15611.2	20392.5	20392.5	25202.6	25202.6
49.9	17172.3	17172.3	22431.7	22431.7	27722.9	27722.9
54.4	18733.4	18733.4	24471.0	24471.0	30243.1	30243.1
59.0	20294.6	20294.6	26510.2	26510.2	32763.4	32763.4
63.5	21855.7	21855.7	28549.5	28549.5	35283.6	35283.6
68.0	23416.8	23416.8	30588.7	30588.7	37803.9	37803.9
72.6	24977.9	24977.9	32628.0	32628.0	40324.2	40324.2
77.1	26539.1	26539.1	34667.2	34667.2	42844.4	42844.4

Loading Table
Occupants (Standard Configuration)
Figure 6-53

6.9 Weight and Balance Determination for Flight - Metric (cont)

Weight (kilograms)	Pilot Arm FS 344.17	Copilot (Seat 2) Arm FS 344.17	Seat 4 Arm FS 449.48	Seat 5 Arm FS 555.63	Seat 6 Arm FS 555.63
	Moment (centimeters - kilograms)				
9.1	3122.2	3122.2	4078.5	5040.5	5040.5
13.6	4683.4	4683.4	6117.7	7560.8	7560.8
18.1	6244.5	6244.5	8157.0	10081.0	10081.0
22.7	7805.6	7805.6	10196.2	12601.3	12601.3
27.2	9366.7	9366.7	12235.5	15121.6	15121.6
31.8	10927.8	10927.8	14274.7	17641.8	17641.8
36.3	12489.0	12489.0	16314.0	20162.1	20162.1
40.8	14050.1	14050.1	18353.2	22682.3	22682.3
45.4	15611.2	15611.2	20392.5	25202.6	25202.6
49.9	17172.3	17172.3	22431.7	27722.9	27722.9
54.4	18733.4	18733.4	24471.0	30243.1	30243.1
59.0	20294.6	20294.6	26510.2	32763.4	32763.4
63.5	21855.7	21855.7	28549.5	35283.6	35283.6
68.0	23416.8	23416.8	30588.7	37803.9	37803.9
72.6	24977.9	24977.9	32628.0	40324.2	40324.2
77.1	26539.1	26539.1	34667.2	42844.4	42844.4

Loading Table
Occupants (Executive/Entertainment Configuration)
Figure 6-55

6.9 Weight and Balance Determination for Flight - Metric (cont)

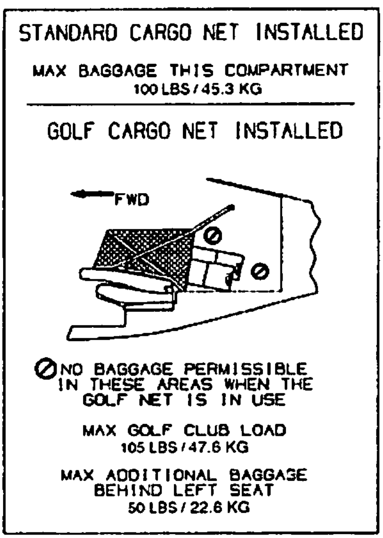
Weight (kilograms)	Standard baggage Arm FS 630.50 Moment (centimeter-kilograms)
4.5	2859.9
9.1	5719.8
13.6	8579.7
18.1	11439.6
22.7	14299.5
27.2	17159.4
31.8	20019.3
36.3	22879.2
40.8	25739.1
45.4	28599.0

Loading Table
Standard Baggage
Figure 6-57

6.9 Weight and Balance Determination for Flight - Metric (cont)

Weight (kilograms)	Golf baggage location Arm FS 564.67 Moment (centimeter-kilograms)	Aft location Arm FS 630.50 Moment (centimeter-kilograms)
4.5	2561.3	2859.9
9.1	5122.5	5719.8
13.6	7683.8	8579.7
18.1	10245.1	11439.6
22.7	12806.4	14299.5
27.2	15367.6	
31.8	17928.9	
36.3	20490.2	
40.8	23051.5	
45.4	25612.7	
47.6	26893.4	

Loading Table
Golf Baggage - Optional
Figure 6-59



Golf Baggage Loading Configuration
Figure 6-61

6.9 Weight and Balance Determination for Flight - Metric (cont)

Litres (unusable fuel not included)	Fuel Weight (kilograms)	Fuel Moment Arm Varies (centimeter - kilograms)
75.7	60.8	22056.9
94.6	76.0	27742.9
113.6	91.2	33446.8
132.5	106.4	39161.3
151.4	121.6	44883.6
170.3	136.8	50613.6
189.3	152.0	56351.7
208.2	167.1	62098.8
227.1	182.3	67854.8
246.0	197.5	73619.3
265.0	212.7	79391.2
283.9	227.9	85169.0
302.8	243.1	90951.1
321.7	258.3	96735.8
340.7	273.5	102521.9
359.6	288.7	108308.5
378.5	303.9	114095.2
397.4	319.1	119881.8
416.4	334.3	125668.5
435.3	349.5	131455.5
454.2	364.7	137242.9
473.1	379.9	143030.2
492.1	395.1	148816.7
511.0	410.3	154601.3
529.9	425.5	160382.9
548.8	440.7	166161.6
567.8	455.9	171939.3
586.7	471.1	177722.4
605.6	486.2	183524.2
624.5	501.4	189368.7
643.45	516.6	195295.7

11.3 litres of unusable fuel (9.12 kilograms, 3343.26 centimeters-kilograms) included in basic empty weight. The above weights are based on a fuel specific gravity of 802.6732 kilograms per cubic meters at 15 degrees C for Jet A and Jet A-1, which yields a fuel density of 0.8027 kilograms per litre.

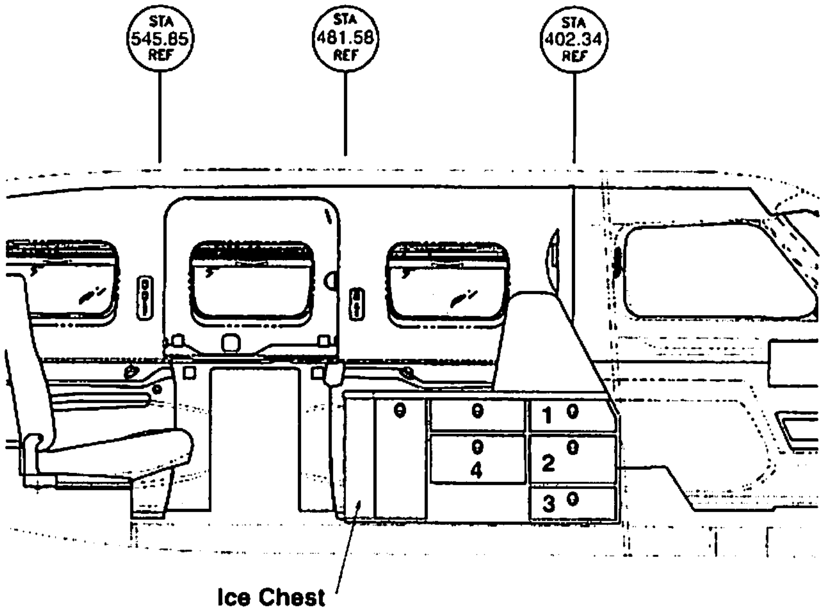
Loading Table
Fuel
Figure 6-63

6.9 Weight and Balance Determination for Flight - Metric (cont)

Weight (kilograms)	Stowage area 1-3 Arm FS 402.463	Stowage area 4 Arm FS 434.975	Ice chest Arm FS 466.979
	Moment (centimeters - kilograms)		
0.5	182.6	197.3	211.8
0.9	365.1	394.6	423.6
1.4	547.7	591.9	635.5
1.8	730.2	789.2	847.3
2.3	912.8	986.5	1059.1
2.7			1270.9
3.2			1482.7
3.6			1694.5
4.1			1906.4
4.5			2118.2
5.0			2330.0
5.4			2541.8
5.9			2753.6
6.4			2965.4
6.8			3177.3
7.3			3389.1
7.7			3600.9
8.2			3812.7
8.6			4024.5
9.1			4236.3

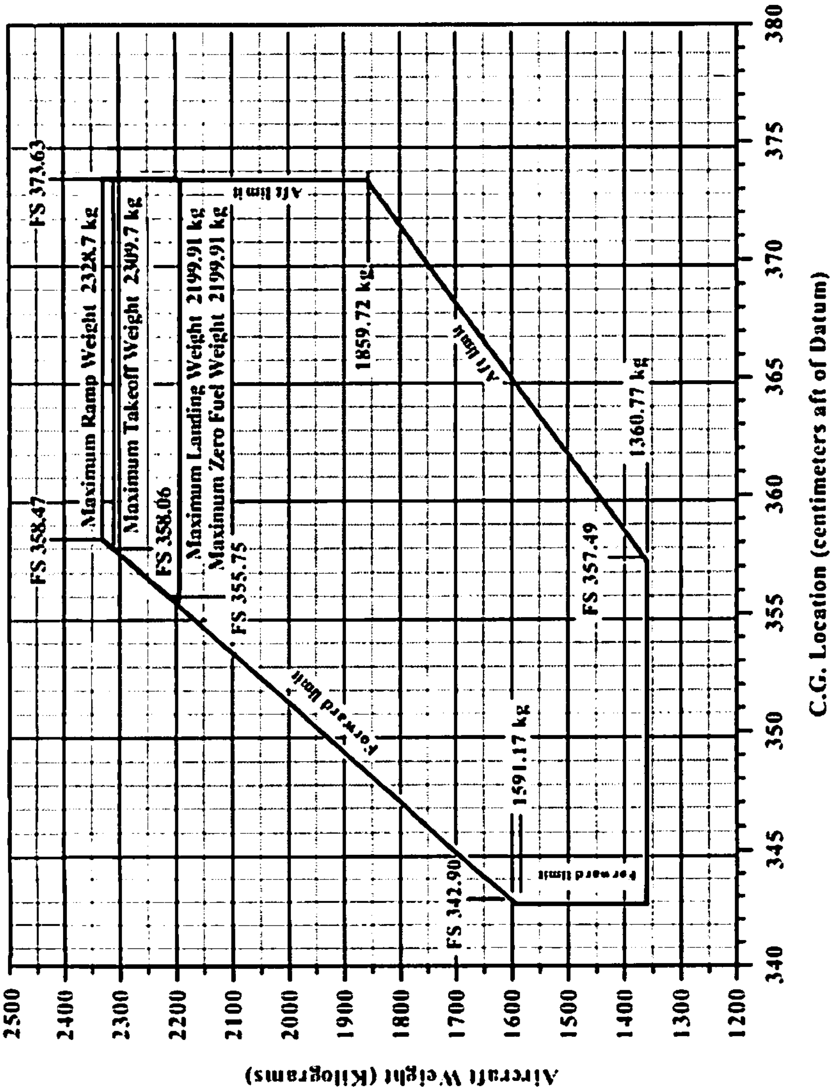
Loading Table
Executive/Entertainment Stowage Compartment
Figure 6-65

6.9 Weight and Balance Determination for Flight - Metric (cont)



Stowage Configuration
Figure 6-67

6.9 Weight and Balance Determination for Flight - Metric (cont)



Center of Gravity Limits Graph
Figure 6-69

TABLE OF CONTENTS

SECTION 7

DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS

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SECTION 7

DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS

7.1 THE AIRPLANE

The PA-46-500TP Meridian is a single engine, all metal, retractable landing gear, low wing, turbo-propeller airplane. It has a pressurized cabin with seating for six occupants and a luggage compartment located behind the aft cabin seats.

7.3 THE AIRFRAME

The primary airframe is of aluminum alloy construction, with a steel combination engine mount - nose gear support structure. The nose cowl is made of aluminum and fiberglass.

The fuselage is an all metal, semi-monocoque structure with flush riveted skin. The skin has internally bonded doublers and is butt jointed at all seams not in the airflow direction. There are two basic fuselage sections: the pressurized cabin section and the tail cone section. The cabin section is sealed to maintain pressurization.

The seating arrangement includes two crew seats and four passenger seats. The forward passenger seats face aft, and all passenger seats have adjustable backs with built-in headrests. An inside baggage area is provided aft of the rear passenger seats.

Cabin access is through the main cabin door, located on the left side, aft of the wing. The main door is a horizontally split door with retractable steps in the lower half. The upper half is held open by a gas spring. A plug type, inward releasing, emergency egress door is located on the right side adjacent to the aft facing seat.

Windows include a two-piece windshield, pilot and copilot windows, a storm window in the pilot's window, and three passenger windows on each side.

7.3 THE AIRFRAME (Continued)

The wing is a three section structure. The center section built-up main spar extends through the lower fuselage and outboard of each main landing gear. This section has two forward spars and a rear spar which are pin jointed at the fuselage sides. The main landing gear retracts inward into recesses located aft of the main spar. The outboard section of each wing, to within approximately 18 in. (46 cm) of the tip, is a sealed integral fuel cell. Portions of the wing structure are adhesively bonded, and skins are butt jointed and flush riveted for a smooth airfoil surface.

The all-metal flaps are electrically actuated through a mechanical linkage. The flaps extend aft and down on three tracks and have four preselect positions (up, 10°, 20°, and 36°).

The all-metal ailerons are mass balanced and operated by a cable system mounted on the aft wing spar.

The empennage is of conventional fin and rudder, stabilizer and elevator design with aerodynamic and mass balanced control surfaces. Surfaces are all-metal construction. The single-piece elevator assembly incorporates a center-mounted anti-servo trim tab. The rudder trim tab is operated by an electrically driven actuator.

Various access panels on the fuselage, wings and empennage are removable for service or inspection purposes.

Electrical bonding is provided to ensure good electrical continuity between components. Lightning strike protection is provided in accordance with presently accepted practices. Anti-static wicks are provided on trailing edges of ailerons, elevator and rudder to discharge static electricity that might cause avionics interference.

7.5 ENGINE AND PROPELLER

Engine

The Meridian is powered by a Pratt & Whitney PT6A-42A turbo-propeller engine, with a flat rated power of 500 shp and maximum propeller speed of 2000 RPM. This engine is a reverse flow, free turbine arrangement. Accessories include a starter/generator and a belt driven alternator and air conditioning compressor.

Engine intake air is provided through dual, symmetric air inlets located on the forward portion of the cowling at the four and eight o'clock positions. The inlets are of fixed geometry such that no moving ice vanes or doors are utilized. The inlets are designed such that the dynamics of icing conditions do not allow the inlet to ice closed. Both inlets supply air to an inertial separator, which in turn supplies a common engine inlet plenum and intake screen.

The inertial separator functions by preventing foreign objects from making an abrupt turn into the plenum and instead exit through the bypass outlet. As air enters through the intake screen, it is ducted into a three-stage axial and single-stage centrifugal compressor driven by a single-stage reaction turbine. A dual turbine, counter-rotating with the first, drives the propeller through a two-stage reduction gear box. Exhaust is provided through dual exhaust stacks located on either side of the engine just behind the propeller.

A single annular combustion chamber, containing 14 removable fuel nozzles and two igniter plugs, comprises the combustion system. Seven of the fuel nozzles are used for starting; the remaining nozzles activate as the engine accelerates. A hydropneumatic fuel control schedules fuel flow to maintain engine power.

The ignition system consists of one exciter box, two ignition leads and two spark igniters. Both igniters are engaged simultaneously. DC power is delivered to the exciter box from the essential bus through an ignition mode selector switch in the overhead switch panel and a torque pressure switch. When in the automatic ignition mode, the ignition system will activate when the torque is less than or equal to approximately 275 ft. lbs., and deactivate when the torque is greater than or equal to approximately 375 ft. lbs. Continuous ignition, at any torque setting, is provided in the manual ignition mode.

7.5 ENGINE AND PROPELLER (continued)

Engine (continued)

The engine incorporates an integral oil lubrication system with an oil tank of approximately 12 quarts (11.35 liters) total capacity including propeller, integral engine oil system, and oil cooler. The oil tank is an integral part of the compressor inlet case in front of the accessory gearbox and contains a filler neck with calibrated dipstick. The filler neck incorporates a ball check valve to ensure oil does not migrate out of the filler neck in the event the dipstick is not properly secured. In addition, an oil level sight glass is provided to indicate the oil level in the gearbox without having to remove the dipstick. Adequate oil level for engine operation is indicated by an oil level within the green area of the sight glass.

Engine instruments are displayed on the PFD and MFD. The Primary Display (PFD) displays Torque, ITT (Interstage Turbine Temperature), and Fuel Flow. Temporary engine parameters to supplement engine starting include Propeller Speed (Np), Gas Turbine Speed (Ng), and Oil Pressure (OP).

The Multi-Function Display (MFD) Engine page displays Torque, ITT, Np, Ng, Oil Temperature, and Oil Pressure in both vertical tapes and digital formats. In addition, Vacuum, Fuel Flow, Outside Air Temperature, and Fuel Quantity are presented.

Fire detection is provided by a heat sensitive fire cable, which passes a current at approximately 540° F (282.2° C). This current alerts the fire detection computer, which then actuates the ENGINE FIRE warning light on the annunciator panel. When switched to test mode, an electrical current is passed to the fire detection computer, which should sense the current and illuminate the ENGINE FIRE warning light in the annunciator panel.

7.5 ENGINE AND PROPELLER (continued)

Propeller

The propeller is a Hartzell model number HC-E4N-3Q/E8501K-3.5. 82.5 inch diameter, four blade, metal, constant speed unit with reversing and full feathering capabilities. Each propeller blade incorporates an electric deice boot.

The propeller governor pressurizes and regulates the flow of the propeller gearbox oil to a piston in the propeller dome. The piston is linked by a sliding rod and fork arrangement to the propeller blades. Governor oil pressure against the piston works to decrease propeller blade pitch. Centrifugal twisting moments on the propeller blades work to decrease propeller blade pitch and increase rpm. Governing of the interaction of these and other forces to maintain a constant rpm is provided by the propeller governor.

The propeller governor maintains a constant propeller speed and is not pilot controlled, but rather fixed at a maximum propeller speed of 2000 RPM. Propeller feather is selected by moving the condition lever to the cutoff position. Beta and reverse blade angles are controlled by power lever movement. Movement of the power lever into the beta and reverse range of operation is only possible on the ground via a squat switch controlled solenoid. An additional overspeed governor is also provided to protect against propeller and power turbine overspeed.

Propeller feathering is controlled electrically by switches in the throttle quadrant and a torque sensing switch. The battery switch must be ON to feather the propeller.

7.7 ENGINE CONTROLS

The engine is controlled by power, condition, and manual override (MOR) levers, located on the control quadrant of the lower central instrument panel. The power lever is used to actuate the engine fuel control unit as well as propeller beta and reverse settings. The power lever is connected through linkage to the fuel control unit at the rear of the engine, and controls engine power through the full range from maximum takeoff power back to idle and further aft to the beta detent and the reverse detent. When the power lever is at the idle stop, the gas generator (Ng) is at idle and the propeller (Np) is at minimum pitch. A lifting action is required to raise the power lever over the idle detent to the beta and reverse detents. When the power lever is selected to the beta position, the gas generator is at idle and the propeller blade pitch is controlled by the power lever from idle thrust back through a zero or a no thrust condition. The beta position may be used after landing during ground roll and to control taxi speed. Further lifting and aft movement of the power lever to the reverse detent increases engine power and provides negative thrust (reverse).

WARNING

To prevent damage to the control linkage, do not move the power lever aft of the idle stop when the engine is not operating.

WARNING

Positioning the power lever aft of the flight idle stop in flight is prohibited. Such positioning may cause loss of airplane control or may result in an engine overspeed condition and consequent loss of engine power.

The landing gear warning horn is activated by an idle power setting or flap extension beyond 10 degrees combined with the landing gear not in a down and locked position. The horn will continue to sound until the gear is down and locked, the power setting is increased, or the flaps are retracted to less than 10 degrees. This is a safety feature to warn the pilot of an inadvertent gear-up landing.

The condition lever controls the run and cut-off function of the fuel control unit as well as propeller feather. The full forward position sets the run fuel flow, and full aft position cuts off fuel flow and feathers the propeller.

7.7 ENGINE CONTROLS (continued)

The manual override (MOR) lever is located in the center console to the left of the power lever. The MOR is used to directly control fuel flow to the engine if a pneumatic malfunction occurs in the engine fuel control unit. When the engine is operating, a failure of any pneumatic signal input to the fuel control unit will result in the fuel flow decreasing to minimum idle (approximately 48% Ng at sea level and increasing with altitude). Power may be regained by using the manual override (MOR) lever. The normal position for the MOR is the OFF position. The normal position is used for all normal engine operation when the fuel control unit is operating normally and engine power is selected by the power lever. Rapid movement of the MOR lever could cause compressor surges and excessive ITT overtemperature.

To operate the MOR, lift up on the lever and slowly move it forward toward the MAX position. Monitor gas generator speed (Ng) and ITT.

The friction adjustment lever, located in the middle of the control quadrant, may be adjusted to increase or decrease the friction holding the power lever.

7.8 AVIDYNE FLIGHTMAX ENTEGRA PRIMARY FLIGHT / MULTI-FUNCTION DISPLAYS

Due to the design of the Avidyne FlightMax Entegra Avionics System utilized on the Meridian, the various avionics systems are very integrated.

This section provides a general description of the Avidyne FlightMax Entegra Series 700-00006-0XX-( ) PFD, its operation, and aircraft systems interfaces. For a detailed description of PFD operation, refer to the Avidyne FlightMax Entegra Series Primary Flight Display Pilot's Guide, p/n 600-00104-000, revision 05-A or later.

7.8a PFD SYSTEMS DESCRIPTION

The Entegra PFD start-up is automatic once power is applied. The display presents the Initialization Display immediately after power is applied. Power-on default is 75% brightness. Typical alignment times are 3 minutes.

Attitude Direction Indicator (ADI)

Air Data

The airspeed tape to the left of the PFD begins indicating at 20 Knots Indicated Airspeed (IAS) and is color coded in accordance with the model POH airspeeds for V_{SO}, V_{FE}, V_S, and V_{MO}. An altitude tape is provided to the right of the PFD which also displays a symbol for the Altitude Preselect (Altitude Bug). The Vertical Speed Indicator (VSI) is displayed to the right of the altitude tape. For vertical speed rates greater than the PFD displayed VSI scale, the indicator needle will peg just outside the scale and a digital readout of actual VSI up to 4000 FPM is then displayed. An additional data block is provided for display of Outside Air Temperature (OAT), True Airspeed (TAS), and Ground Speed (GS). Controls for selecting bug and barometric correction values are along the right side of the PFD. A wind indicator is also provided beneath the altitude tape.

Attitude Data

Attitude is depicted on the PFD using a combination of an aircraft reference symbol ("flying-delta") against a background of labeled pitch ladders for pitch and a bank angle pointer in the form of an arced scale along the top of the PFD for bank. A skid/slip indicator is attached to the bottom edge of the bank angle pointer.

7.8a PFD SYSTEMS DESCRIPTION (continued)

Horizontal Situation Indicator (HSI) (continued)

Heading Data

Magnetic heading is represented in a boxed digital form at the top of the compass rose. Heading rate (Rate of Turn Indicator) takes the form of a blue arcing arrow that begins behind the magnetic heading indicator and moves left or right accordingly. Graduations are provided on the rate of turn indicator scale to indicate ½ and full standard rate turns. A heading bug is also provided on the compass rose.

Navigation Data

Navigation data on the PFD takes several forms. A Course Deviation Indicator (CDI) is always provided on the HSI and a bearing pointer can be optionally selected for display on the HSI by the pilot. Controls for selecting the source of navigation data, selecting the display format of the navigation data, and for selecting the type of compass rose and moving map to be displayed are along the left side of the PFD. The active flight plan contained in the GPS Nav/Comm unit selected as the primary navigation source (Nav) can be optionally selected for display on the HSI as well as the desired range of the optionally selectable moving map display. If a localizer or ILS frequency is tuned and captured in the GPS Nav/Comm selected as the Nav source, a Vertical Deviation Indicator (VDI) and Horizontal Deviation Indicator (HDI) are automatically displayed on the ADI.

NOTE

In the event glide slope or localizer signals are lost, the HDI and/or VDI will be displayed as red X's to indicate loss of signal. The red X'd indicator will only be removed if the signal is regained. In this case, the PFD Nav source will set to GPS, or if the GPS Nav/Comm is retuned, to another frequency. Appropriate action must be taken by the pilot if on an approach.

7.8a PFD SYSTEMS DESCRIPTION (continued)

Autopilot Integration

The Entegra PFD is fully integrated with the S-TEC MAGIC 1500 Autopilot. Reference bugs for Heading and Altitude are provided on the PFD to control the autopilot and aid pilot situational awareness. These bugs are displayed with solid or hollow symbology depending on the autopilot status. If the autopilot is engaged in that mode, the bug is solid to indicate the autopilot is coupled to that bug. A hollow bug indicates the autopilot is not engaged in that mode.

Autopilot mode annunciations are shown on the S-TEC MAGIC 1500 computer.

Flight director command bars on the PFD attitude indicator can be enabled by the pilot. When the flight director is enabled and the autopilot is engaged in both lateral and vertical modes, the flight director displays the goals of the autopilot.

A lateral autopilot mode must be engaged on the S-TEC MAGIC 1500 Autopilot before a vertical mode can be engaged.

The flight director command bars will only be displayed on the PFD when enabled by the pilot and when both lateral and vertical autopilot modes are engaged.

The following autopilot modes are supported by the PFD:

1. HDG (Heading, using the heading bug)
2. NAV (Nav, using the course pointer and course deviation indicator)
3. GPSS (GPS Steering, using GPS course guidance)
4. APR (Approach, using the HDI and VDI, including automatic glide slope capture)
5. REV (Reverse sensing HDI approach)

NOTE

When HDG mode is engaged, rotation of the heading bug greater than 180° will result in a reversal of turn direction.

CAUTION

If a VLOC is selected in NAV on the PFD and GPSS mode is engaged on the autopilot, the autopilot will track the active flight plan in GPS1 if VLOC1 is selected or GPS2 if VLOC2 is selected and not track VLOC1 or VLOC2 as the selected source in NAV on the PFD. Therefore, the course deviation on the PFD CDI and the course deviation flown by the autopilot can be different. This situation may be confusing and should be avoided.

7.8a PFD SYSTEMS DESCRIPTION (continued)

Engine Instruments

Torque Gauge -

Displays current engine torque in foot-pounds. A numeric display below the torque analog indicator displays the torque value to the nearest 10 foot-pound. If the torque enters the warning (red) area, the analog indicator bar and the numeric readout will be displayed in the corresponding color.

Inter-Turbine Temperature (ITT) Gauge -

Displays the current engine ITT in °C. A numeric display below the ITT analog indicator displays the ITT value to the nearest 5°C. If the ITT enters the caution (yellow) or warning (red) area, if one exists, the analog indicator bar and the numeric readout will be displayed in the corresponding color.

Fuel Flow -

Displays the current engine fuel flow as a numeric display, to the nearest 1 pound per hour (or 1 kilogram per hour if metric units are selected).

Fuel Quantity -

Displays the total (left plus right) fuel quantity to the nearest 5 pounds (or 5 kilograms if metric units are selected).

Engine Start Parameters -

During engine start or parameter exceedance, numeric displays of the following parameters are provided:

a. Propeller Speed (Np) - units of RPM
b. Gas Turbine Speed (Ng) - units of %
c. Oil Pressure (OP) - units of PSI

Coupled/Uncoupled Switch -

A coupled/uncoupled switch is included as part of the avionics suite. This switch allows the pilot to remove several features from the copilot's PFD. The features which are isolated from the copilot's display include:

- Nav Course Setting
- Heading Bug
- Altitude Bug
- BARO (Altimeter setting)

7.8b MFD SYSTEMS DESCRIPTION

NOTE

For a detailed description of the MFD, refer to the Avidyne FlightMax EX5000 Series Pilot's Guide and Reference, p/n 600-00121-000, revision 00 or later.

Navigation

Data associated with the moving map is found on four pages: Map, Nearest, Trip, and Info pages. The MFD contains a Jeppesen NavData database that is available for display on the Map page. In conjunction with GPS-supplied position information, an own-ship symbol is superimposed on the moving map and positioned relative to the NavData information. GPS can also supply the active flight plan for display on the moving map. Terrain data is provided by a USGS terrain database stored within the MFD and updated only on an as needed basis.

The Jeppesen Navigation Database provides data on airports, approaches, VOR's, NDB's, intersections, airspace definitions, and frequencies. North American and international databases are available. Database information can be updated via the USB port on the front face of the bezel.

The navigation data on the moving map display are based on databases that are updated periodically. Database updates are available on 28-day cycle subscriptions. Expired databases are clearly stated to the pilot via messages during system startup and on the System Setup page. The warning can only be removed by updating the data.

NOAA man-made obstruction database information provides data on man-made obstacles over 200 feet AGL. This data is only available for North America and can be updated via the USB port on the front face of the bezel.

The obstacle data on the moving map display are based on databases that are updated periodically. Database updates are available from Avidyne on 56-day cycle subscriptions. Expired databases are clearly stated to the pilot via messages during system startup and on the System Setup page. The warning can only be removed by updating the data.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Navigation (continued)

Using the Jeppesen NavData data and the GPS-supplied present position, the MFD can provide the pilot with the nearest 25 airports or navaids, depending on pilot selection, within 100 nm. This information is presented on the Nearest page.

More detailed information on a particular airport is also generated from the Jeppesen NavData data and is available for pilot viewing on the Info page.

Flight plan data supplied by the GPS system provide the pilot with a tabular form of the remaining legs in the active GPS flight plan. This information is viewed on the Trip page and includes a CDI for added enroute navigation aiding.

Flight plan data is transmitted to the MFD from an external GPS navigator. Some installations do not support depictions of curved flight paths. In these cases, curved flight path segments will be depicted as straight lines. The GPS navigator and HSI are to be used during approach procedures. Reference the Avidyne FlightMax EX5000 Series Pilot's Guide, p/n 600-00121-000, for more information.

Datalink

Datalink information is received by the MFD based upon installation provisions and a subscription service available through Avidyne (www.myavidyne.com). Data is presented on the Map, Trip, and Nearest pages. Datalink information is provided for strategic planning purposes only. Data aging and transport considerations make it unsuitable for tactical use. Reference the Avidyne FlightMax EX5000 Series Pilot's Guide, p/n 600-00121-000, for more information.

Setup

The various System Setup pages allow the pilot to set user preferences for system operation. In addition to listing the software version identification information and database validity dates, the System Setup page allows access to several pages for preference selection and provides a means to initiate self-tests of the traffic and lightning sensors.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Setup (continued)

Airport Settings page provides selections for displaying airport type, runway surface type and minimum runway lengths on the moving map. **Declutter Settings** page allows the pilot to select settings for defining the base map detail when changing display range. **System Time** page provides an opportunity to select system time zone and Map page menu timeout options. **DataBlock Edit** page allows the pilot to select the data to be displayed in the datablock windows on the Map page. **Datalink Setup** page allows the pilot to select parameters for the datalink system, including update rate and range of weather data request.

Engine Instruments

The Engine page provides the pilot with engine parameters depicted on simulated gauges and electrical system parameters located in dedicated regions within the MFD display. An Engine Sensor Unit interfaces with engine-mounted sensors and provides data to the MFD for display.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Traffic Mode - (option)

Traffic Information Service (TIS) provides a graphic display of traffic advisory information overlaid on the MFD Map page. TIS is a ground based service providing relative location of all ATCRBS Mode A and Mode C transponder equipped aircraft within a specified service volume. Aircraft without an operating transponder are invisible to TIS.

If an aircraft has a transponder, but does not have altitude reporting, the TIS will depict it without the altitude information tag. If the depicted traffic is reporting altitude and is climbing or descending at a rate of at least 500 feet per minute, a trend arrow is displayed near the traffic symbol indicating that the aircraft is climbing or descending. If the intruder is not reporting altitude, the traffic symbol appears without an altitude tag or trend arrow. Traffic ground track is indicated by a "target track vector", a short line displayed in 45 degree increments.

The symbology displayed is as follows:

(1) Other Aircraft - An open cyan diamond indicates that an intruder's relative aircraft is greater than +/- 3000 feet, or its distance is beyond 7 nm range. It is not considered a threat.

(2) Proximity Intruder Traffic - A filled cyan diamond indicates that the intruder aircraft is within +/- 1200 feet, and within 7 nm range, but is still not considered a threat.

(3) Traffic Alert (TA) - A symbol changed to a filled amber circle indicates that the intruder aircraft is considered to be potentially hazardous. The condition which causes a traffic alert is defined on a course that will intercept a 0.5 nm radius and a relative altitude of +/- 500 feet within 34 seconds.

When a hazardous intruder aircraft is detected an annunciator will be displayed on the MFD with relative bearing, range and relative altitude along with the advisory voice message "TRAFFIC, TRAFFIC" heard through the audio system.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Terrain Awareness and Warning System (TAWS) Mode - (option)

Rotating the MFD Page knob will allow you to view the TAWS display page. The TERRAIN function is active when the amber TERR N/A annunciator is extinguished and the following systems are operational:

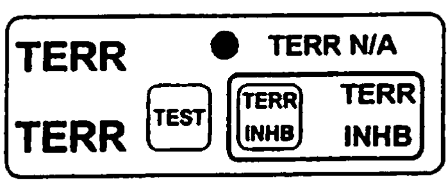
- Multi Hazard Warning Processor
- Encoding Altimeter

NOTE

Horizontal position is derived from the Number 1 GNS 430 receiver. Should the Number 1 GNS 430 become inoperative TAWS will not be available.

Perform a system self test on the ground prior to every flight to verify proper operation.

The remote Terrain Awareness Control Unit (see Figure 7-1) incorporates all of the terrain annunciations and control functions into a single panel mounted unit. All annunciation colors are as described in Table 7-1. The two push buttons are black legends on white switches.



Terrain Awareness Control Unit
Figure 7-1

7.8b MFD SYSTEMS DESCRIPTION (continued)

Terrain Awareness and Warning System (TAWS) Mode - (option) (continued)

INDICATOR/CONTROL	COLOR	FUNCTION
TERR lamp	RED	Terrain Warnings.
TERR lamp	AMBER	Terrain Cautions.
TERR N/A lamp	AMBER	Indicates terrain function INOP.
TEST switch		Provides press-to-test function for the terrain function.
TERR INHB lamp/switch	WHITE	Push-on to inhibit all terrain alerting functions.

TAWS Annunciation Legend
Table 7-1

Proper operation of the TAWS can be verified when the aircraft is on the ground as follows:

Select the TERR display mode on the MFD.

Ensure the TERR INHB switch is NOT ENGAGED, and momentarily push the TEST switch.

The amber TERR N/A light illuminates.

The red TERR light illuminates.

An aural "EGPWS SYSTEM OK" message is enunciated over the cockpit speaker.

The red TERR light extinguishes.

The amber TERR light illuminates.

A terrain self test pattern appears on the MFD.

The terrain self test pattern disappears after several sweeps of the terrain display.

The amber TERR light extinguishes.

The amber TERR N/A light extinguishes.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Response to Ground Proximity Warnings

When an aural "PULL UP" warning occurs, the following procedure should be followed:

1. Level the wings, simultaneously adding maximum power.
2. Smoothly pitch up at a rate of 2 to 3 degrees per second towards an initial target pitch attitude of 15 degrees nose up.
3. Adjust pitch attitude to ensure terrain clearance, while respecting stall warning. If flaps are extended, retract flaps to the up position.
4. Continue climb at best angle of climb speed (Vx) until terrain clearance is assured.
    - Only vertical maneuvers are recommended unless operating in VMC or the pilot determines, using all available information and instruments, that a turn, in addition to the vertical escape maneuver, is the safest course of action.
    - Pilots are authorized to deviate from their current air traffic control (ATC) clearance to the extent necessary to comply with an EGPWS warning.

When an aural warning other than "PULL UP" occurs, initiate corrective action to remove the cause of the warning. The following aural warnings can occur:

"SINK RATE"
"DON'T SINK"

NOTE

During operations at certain locations, warning thresholds may be exceeded due to specific terrain or operating procedures. During day, VFR, these expected warnings may be considered as cautionary and the approach continued.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Advisory Callouts

"FIVE HUNDRED" - occurs at 500 feet AGL.

Response to Terrain / Obstacle Awareness Alerts

CAUTION ALERT

When an aural "CAUTION TERRAIN" or a "CAUTION OBSTACLE" alert occurs, take positive corrective action until the alert ceases. Stop descending, or initiate a climb and/or turn as necessary, based on analysis of all available instruments and information.

If the GPWS issues a caution when the terrain display is not selected, a pop up message will appear on the active display page of the MFD. The pilot must acknowledge the pop up message.

WARNING ALERT

When an aural "TERRAIN TERRAIN, PULL UP" or an "OBSTACLE OBSTACLE, PULL UP" warning occurs, follow the procedure described for a "PULL UP" warning.

If the GPWS issues a warning when the terrain display is not selected, a pop up message will appear on the active display page of the MFD. The pilot must acknowledge the pop up message.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Use of Terrain Awareness Display

The Terrain Awareness Display is selected by rotating the page control knob to the TAWS legend located on the bottom of the MFD. The display is intended to enhance situational awareness with respect to separation from terrain or obstacles.

The TERR display is not intended to be used for navigation purposes.

Color and intensity variations are used to show terrain/obstacle heights relative to the airplane - refer to Avidyne FlightMax EX5000 Multi-Function Display Pilot's Guide, p/n 600-00121-000.

The 500/250-foot GREEN to YELLOW boundary is BELOW the airplane in order to account for altimetry and/or terrain/obstacle height errors. For situational awareness with respect to terrain/obstacle shown on the display, the pilot should assume that the YELLOW or RED terrain or obstacle is at or above the airplane. GREEN terrain is below the airplane. These boundary levels are biased upwards by half of the aircraft's descent rate greater than 1000 feet per minute.

If there is no terrain data in the database for a particular area, that portion of the display is colored a MAGENTA dot pattern. Terrain is not shown (black) if it is below the lowest band and/or is within 400 feet of the runway elevation nearest the aircraft.

Two elevation numbers indicate the highest and lowest terrain currently displayed on the screen. The elevation numbers indicate terrain in hundreds of feet above sea level (e.g., "125" is 12,500 feet MSL) and are color matched to the display. In the event that there is no appreciable difference between the highest and lowest elevations (flat terrain or over water), only the highest numeric value is displayed.

Geometric Altitude, which is displayed on the upper left of the TERR display, is an additional feature incorporated into the GA-EGPWS. Based on GPS Altitude, Geometric Altitude is a computed pseudo-barometric altitude designed to reduce or eliminate errors potentially induced in Corrected Barometric Altitude by temperature extremes, non-standard pressure altitude conditions, and altimeter miss-sets. This ensures an optimal EGPWS Terrain display and alerting capability. Geometric Altitude also allows continuous EGPWS operations in QFE environments without custom inputs or special operational procedures.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Use of Terrain Awareness Display (continued)

Geometric Altitude requires a GPS Altitude input with its associated Vertical Figure of Merit (VFOM) and RAIM failure indication, standard (uncorrected) altitude, Radio Altitude, Ground Speed, Roll Angle, and aircraft position (latitude and longitude). Additionally, corrected Barometric Altitude, Static Air Temperature (SAT), GPS mode, and the number of satellites tracked are used if available.

The Geometric Altitude is computed by blending a calculated Non-Standard Altitude, Runway Calibrated Altitude (determined during takeoff), GPS Calibrated Altitude, Radio Altitude Calibrated Altitude (determined during approach), and Barometric Altitude (if available). Estimates of the VFOM for each of these are determined and applied in order to determine its weight in the final altitude. The blending algorithm gives the most weight to altitudes with a higher estimated accuracy, reducing the effect of less accurate altitudes. Each component altitude is also checked for reasonableness using a window monitor computed from GPS Altitude and its VFOM. Altitudes that are invalid, not available, or fall outside the reasonableness window are not included in the final Geometric Altitude value.

The Geometric Altitude algorithm is designed to allow continued operation when one or more of the altitude components are not available. If all component altitudes are invalid or unreasonable, the GPS Altitude is used directly. If GPS Altitude fails or is not present, then the EGPWS reverts to using Corrected Barometric Altitude on the Altimeter alone.

The Geometric Altitude function is fully automatic and requires no pilot action other than the proper setting of Corrected Barometric Altitude on the Altimeter.

System Constraints

1. If there is no terrain data in the database for a particular area, then Terrain/Obstacle Awareness alerting is not available for that area. The affected display area is colored with a MAGENTA dot pattern.
2. If the Terrain/Obstacle Awareness features have been inhibited (e.g., selected OFF due to excessive navigation system position error), the GA-EGPWS will not give aural alerts. A WARNINGS INHIBITED message will be annunciated on the MFD.
3. The Geometric Altitude is intended only as a reference against which the Barometric Altitude is checked. It is not intended to be the primary altitude reference for the aircraft.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Radar Mode

The Weather Radar installation consists of a Receiver/Transmitter unit in a teardrop shaped pod mounted beneath the right wing just outboard of the wing jack point.

The Bendix/King RDR Vertical Profile Weather Radar System is an X-band radar designed for weather location and analysis and for ground mapping. All features for the weather radar are presented by selecting the "RADAR" feature of the MFD. Weather patterns can be displayed on both the radar page of the MFD or overlayed on the Map page. The radar generates high level RF pulses and should be operated with caution while on the ground. When operating on the ground, position the nose of the airplane so that the antenna scan sector is free of large metallic objects such as hangars or other aircraft for a distance of at least 100 feet.

The system detects storms along the flight path and gives the pilot a visual indication, in color, of storm intensity. Storm intensity is displayed at five color levels with black representing weak or no returns, and green, yellow, red, and magenta showing progressively stronger returns. In ground mapping mode, levels of increasing reflectivity are displayed as black, cyan, yellow, and magenta.

Located on the radar page of the MFD are soft keys for operating the different radar modes. They are "Radar On" - applies electrical power to the system and turns the radar on in normal operation. "Radar Test" - when this mode is selected the weather depiction will be a special colored test pattern to allow verification of system operation. "Radar Standby" - in this position the radar is powered up but does not radiate any RF energy nor does the antenna scan. "Radar Off" - removes electrical power from the system. "Knob" - switches the left outer knob function from "Bearing" to "Gain" in order to allow adjustment of the gain setting. "Mode" - allows to select between Weather (WX), Weather Alert (WxA), and Ground (GND) modes. "Scan" - allows selection of either "Normal" or "Sector" scan. "VP" - places the radar in "Vertical Profile" operation. "Control" - changes the bottom left button, and top right three buttons to: "Traffic", "View", "Declutter", "Base Map", and "Weather Overlay (WxOvly)".

For additional description of the radar page modes of operation refer to the Avidyne FlightMax EX5000 Multi-Function Display Pilot's Guide, p/n 600-00121-000.

7.8b MFD SYSTEMS DESCRIPTION (continued)

Engine Page

All engine instruments are of the vertical tape readout design except for fuel flow which is digital readout only.

The FUEL FLOW indication displays fuel flow in pounds per hour. Readings are accurate at stabilized power settings.

The FUEL QUANTITY indicator is calibrated in pounds of fuel and accurately displays fuel remaining in the left and right tanks.

For additional description of the engine page features refer to the Avidyne FlightMax EX5000 Multi-Function Display Pilot's Guide, p/n 600-00121-000.

7.8c ADAHRS REVERSION

Failure of an ADAHRS will be apparent when the on-side air data parameters are replaced with red X's and a red (ATTITUDE FAIL) "Refer to Backup Gauges" annunciator is displayed in the top center of the PFD. If either ADAHRS should fail, the ADAHRS revision switch located on the pilot's upper panel will allow the pilot to select the remaining ADAHRS to provide the air data parameters to both displays. The three position switch is labeled ADAHRS 1 / ADAHRS 2.

7.8d ENGINE START ITT MODE CHANGE

During engine start with the Ng below 56% and increasing the ITT, full scale range will be shown from 0°C to 1200°C. In addition, the following range markings will be displayed:

Green range	0°C to 770°C
Yellow range	771°C to 999°C
Red range	1000°C to 1200°C

Once the engine start sequence has been completed, the total ITT range scale will change and be displayed from 400°C to 1000°C with the following range markings:

Green range	400°C to 770°C
Yellow range	771°C to 799°C
Red range	800°C to 1000°C

7.9 STANDBY INSTRUMENTS

The standby instrument group includes an electric attitude indicator, an airspeed indicator, and a barometric altimeter mounted to the left of the pilot's PFD. The standby airspeed and altimeter are plumbed to the left side pitot static system, and are of the traditional mechanical design. The standby electric attitude indicator is powered by an emergency battery mounted in the underwing radar pod, and is controlled by a three position toggle switch placarded STBY GYRO, ON, OFF, and TEST. If a fault occurs which causes one of the ADAHRS to output misleading information to the PFD, the standby instruments act as a useful comparison to indicate which out of the three displays are correct.

Standby Attitude Indicator

The Standby Attitude Indicator provides backup display of aircraft attitude. It is located at the top of the standby instrument group where it can be viewed easily by the pilot. It is powered from an emergency battery so that it will remain powered for at least 45 minutes after the loss of the aircraft electrical system. The attitude indicator is a DC powered electromechanical unit. A power warning flag is rotated out of sight by a flag motor which allows the flag to reappear if power is interrupted. The standby attitude indicator switch must be selected ON for the standby gyro system to operate.

Depressing the test switch applies a ground for the ON/OFF control circuit. If the self test does not complete within 5 seconds, one or more of the following may be true:

- Batteries are less than 50% charged.
- The TEST/FAIL annunciator is burned out.
- The attitude indicator power supply itself is defective.

The illumination of the amber "INSTR OVRHT" annunciator means the temperature in the area of the standby attitude indicator has exceeded 55°C. This possibly indicates the failure of the avionics cooling fan. The standby attitude indicator should be considered to be unreliable and every effort should be made to exit IMC conditions.

7.10 HYDRAULIC SYSTEM

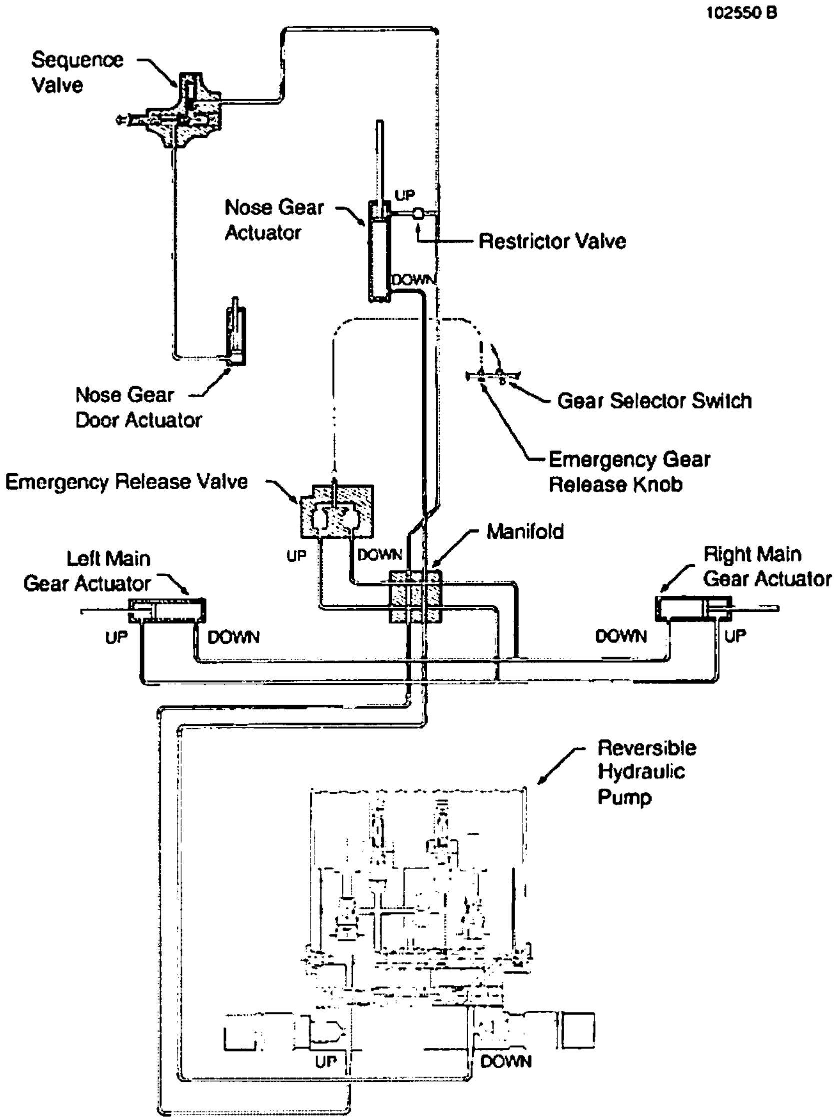
The hydraulic system provides the power to retract and extend the landing gear. (See Figure 7-2.)

The electric motor driven hydraulic pump assembly is located aft of the rear baggage compartment and is accessible through the baggage compartment aft close-out panel. The pump assembly has an integral reservoir with filler plug, sight gauge and vent. The pump assembly incorporates pressure switches, bypass relief valves, and thermal relief valves in both the UP and DOWN sides. A shuttle valve is also incorporated to allow for unequal volumes of hydraulic fluid displaced during UP and DOWN gear actuation. Normal system operating pressure is controlled by the pressure switches. Maximum system operating pressure is limited by the bypass relief valves, and maximum system holding or trapped pressure is limited by the thermal relief valves.

The motor which drives the hydraulic pump is reversible and runs in one direction to supply gear UP pressure and in the opposite direction to supply gear DOWN pressure. The direction in which the pump runs is controlled electrically by the position of the gear selector switch on the instrument panel.

Other major components of the hydraulic system are the three gear actuators and the emergency gear extension valve. Operation of these components is covered in the landing gear section.

7.10 HYDRAULIC SYSTEM (continued)



Hydraulic System
Figure 7-2

7.11 LANDING GEAR

The aircraft is equipped with hydraulically operated, fully retractable, tricycle landing gear.

Locking-type actuators are used for main and nose gears. The actuator assembly provides mechanical gear-down locking at the fully extended position and is hydraulically unlocked. The actuator also acts as the gear brace in the extended position.

The main gear retracts inboard into the wing root area. A mechanically linked door covers the strut assembly.

Hydraulic pressure for gear operation is furnished by an electrically driven hydraulic pump. Landing gear operation is controlled by a two position landing gear selector switch with a wheel shaped knob located to the left of the engine power control quadrant. Three green lights, which are individually activated as each gear mechanically locks into the DOWN position, are located above the landing gear selector.

NOTE

Day/night dimmer switch must be in the DAY position to obtain full intensity of the landing gear position indicator lights. When the aircraft is operated at night, the switch should be in the NIGHT position to dim the gear lights.

The landing gear selector switch must be pulled outward to release it from a detent in the DOWN position prior to moving it to the UP position. In addition, there is a squat switch on the left main gear which prevents operation of the gear UP electrical circuit when the aircraft weight is on the gear. If the landing gear selector is placed in the UP position with the aircraft weight on the gear, the gear warning horn will sound, and the red GEAR WARN annunciator will illuminate.

The landing gear is held in the UP position by hydraulic pressure which is trapped in the system UP lines by a check valve in the pump assembly. When normal pump operation is stopped by the pressure switch, a check valve in the pump assembly closes to trap fluid pressure in the UP side of the system. Emergency gear extension is accomplished by a manually actuated valve which relieves the pressure in the UP side and bypasses fluid to the DOWN side of the system. The additional fluid required for DOWN operation comes directly from the reservoir.

7.11 LANDING GEAR (continued)

The landing gear is held in the DOWN position by spring loaded mechanical locking mechanisms built into each of the three actuating cylinders. The individual gear safe light switches are also mechanically operated when each mechanism is in the LOCKED position. With the hydraulic pump and system operating normally, hydraulic pressure is also trapped in the DOWN side of the system. This DOWN pressure is not required to mechanically lock the cylinders and is not available if the hydraulic pump is inoperative.

The EMERGENCY GEAR extension system allows the landing gear to free fall, with spring assist on the nose gear, into the extended position where the mechanical locks engage. If a gear system malfunction has been indicated and the EMERGENCY GEAR extension system used, it is recommended that the EMERGENCY GEAR extension control and the HYDRAULIC PUMP circuit breaker be left in the pulled position until the aircraft is safely on jacks. See the Maintenance Manual for proper landing gear system check-out procedures. If the aircraft is being used for training purposes or a pilot check-out flight the EMERGENCY GEAR extension control and HYDRAULIC PUMP circuit breaker must be reset in order for hydraulic pressure to be generated in the UP side of the system and the gear retracted.

CAUTION

When flying in extreme cold where the aircraft has been cold soaked for an extended period of time, the gear may not indicate down and locked for 10 to 15 seconds after normal gear extension.

CAUTION

When flying in extreme cold where the aircraft has been cold soaked, it may take several minutes for all three gear to indicate down and locked following an EMERGENCY EXTENSION "FREE FALL".

7.11 LANDING GEAR (continued)

The annunciator panel contains two lights pertaining to landing gear operation. A red GEAR WARN annunciator is activated whenever all three gears are not fully down and locked, or not fully up with the gear doors closed. This annunciator will illuminate during normal gear operation to indicate that the gear is in transit. If it does not go out within approximately 10 seconds during normal gear operation or illuminates steadily during flight with the landing gear selector in the UP position, a system malfunction is indicated. There is also an amber HYD PUMP annunciator which indicates that the hydraulic pump motor is being supplied with electrical power. The annunciator is illuminated during normal landing gear operation for approximately the same duration as the GEAR WARN annunciator. If the light remains on or begins cycling intermittently after gear operation, a system malfunction is indicated.

The red GEAR WARN annunciator and gear warning horn will operate simultaneously under the following conditions:

(a) In flight when the throttle is reduced to low power settings and the landing gear is not in the DOWN position.

(b) In flight when the flaps are extended beyond 10° and the landing gear is not in the DOWN position.

(c) On the ground when the landing gear selector is in the UP position. The landing gear squat switch activates to prevent operation of the retract side of the hydraulic pump on the ground.

A landing gear warning horn mute switch is located above the pilot's PFD. Activating the landing gear warning horn mute switch temporarily silences the landing gear warning horn only if the horn is triggered. When activated, the landing gear warning horn mute switch will illuminate. The horn can be cancelled by extending the landing gear or advancing the power lever.

7.13 BRAKE SYSTEM

The brake system is designed to meet all normal braking needs. Two single-disc, double puck brake assemblies, one on each main gear, are actuated by toe brake pedals mounted on both the pilot's and copilot's rudder pedals. A brake system reservoir, independent of the hydraulic system reservoir, is located on the firewall. Brake fluid should be maintained at the level marked on the reservoir. For further information see BRAKE SERVICE in Section 8 of this handbook.

The parking brake knob is located below the pilot's control column. To set the parking brake, first depress and hold the toe brake pedals and then pull the parking brake knob. To release the parking brake, first depress and hold the toe brake pedals and then push in on the parking brake knob.

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7.15 FLIGHT CONTROL SYSTEM

The primary flight controls are conventional and are operated by dual control wheels and rudder pedals. The control wheel operates the ailerons and elevator. The rudder pedals actuate the rudder and nose wheel steering. The toe brakes, which are an integral part of the pedals, operate the wheel brakes. The ailerons and rudder are interconnected through a rudder/aileron spring system, which is activated only when controls are out of harmony. In normal coordinated flight, the system is inactive. All flight control systems are operated by closed circuit cable systems.

Elevator and rudder trim controls are located on the pedestal. Aileron trim is provided by a fixed, ground-adjustable tab on the right aileron. The elevator trim control wheel is located on the right side of the pedestal. The trim wheel is rotated forward for nose-down trim and aft for nose-up trim. Rudder trim is achieved by a trim tab driven by an electro-mechanical linear actuator. The rudder trim is activated by depressing a rocker switch, located on the aft face of the pedestal below the throttle lever. The switch is marked with L and R, corresponding to nose left or nose right. Trim indications, in degrees, are located on the MFD.

The wing flaps are electrically controlled by a flap selector lever mounted on the instrument panel immediately to the right of the control pedestal. The flap position indicator is located to the left of the selector lever. The flaps may be set to one of four positions; up (0°), 10°, 20°, and full down (36°). Each position is detented on the flap selector panel. The flaps will automatically move to the selected position, which can be confirmed by referring to the position indicator. The flaps may be extended to 10° at airspeeds below 168 KIAS, 20° below 135 KIAS, and 36° flap extension is limited to airspeeds below 118 KIAS. When extending the flaps with the landing gear retracted, prior to the flaps reaching the 20° position, the landing gear warning horn will sound, and the red GEAR WARN annunciator will illuminate. A red FLAP FAIL annunciator light is provided as part of the annunciator panel located in the upper center section of the instrument panel. If the annunciator light illuminates, it is indicative of a system malfunction in which case the flap protection circuit automatically removes power from the electric flap motor. Resetting the FLAP WARN circuit breaker will restore normal operating power to the flap motor. If, after resetting, and operation of the flaps, the annunciator illuminates again then a system malfunction is indicated and the flap motor circuit breaker should be pulled.

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7.17 FUEL

The fuel system consists of two main, inboard, and header wing tanks, two header tank boost pumps, supply and vapor return fuel lines, and four sump drains. Fuel is drawn from both wings simultaneously, with float valves and switches employed to prevent air ingestion. The two header tank and two fuel return sump drains are located on the lower aft left and right sides of the cowling. The filter sump drain is located adjacent to the left header sump drain. Upon engine shutdown, the fuel remaining in the fuel manifold drains into an EPA fuel purge system. This system utilizes accumulated engine bleed air to force the residual fuel into the burner upon shutdown. A slight and momentary increase in ITT and the possible presence of smoke in the exhaust is normal as the residual fuel is consumed. The fuel shut-off valve is located on the center pedestal and is pulled for the closed position. A fuel temperature indicator, located on the lower left corner of the instrument panel, displays the fuel temperature sensed by a fuel temperature probe, located in the right inboard fuel tank. During operations where the fuel temperature indicator is below -23°C (-10°F), the fuel return solenoid valve downstream of the high pressure gear driven pump opens and returns unused fuel from the fuel control unit to the outboard left and right fuel tanks. This returning of warmed fuel to the fuel tanks slows the cooling process of the fuel, which allows the aircraft to operate at temperatures as cold as -54°C (-65°F) for a longer period of time.

NOTE

Fuel pump activation is more likely to occur while warm fuel is being returned to the tanks due to the increased likelihood of fuel tank imbalance.

The return fuel solenoid valve will be energized open when the following conditions are met:

- The valve will always be open during an engine start, regardless of the other conditions.
- When the fuel temperature indicator is below -23°C (-10°F) **AND** the total fuel quantity is more than 100 lbs.

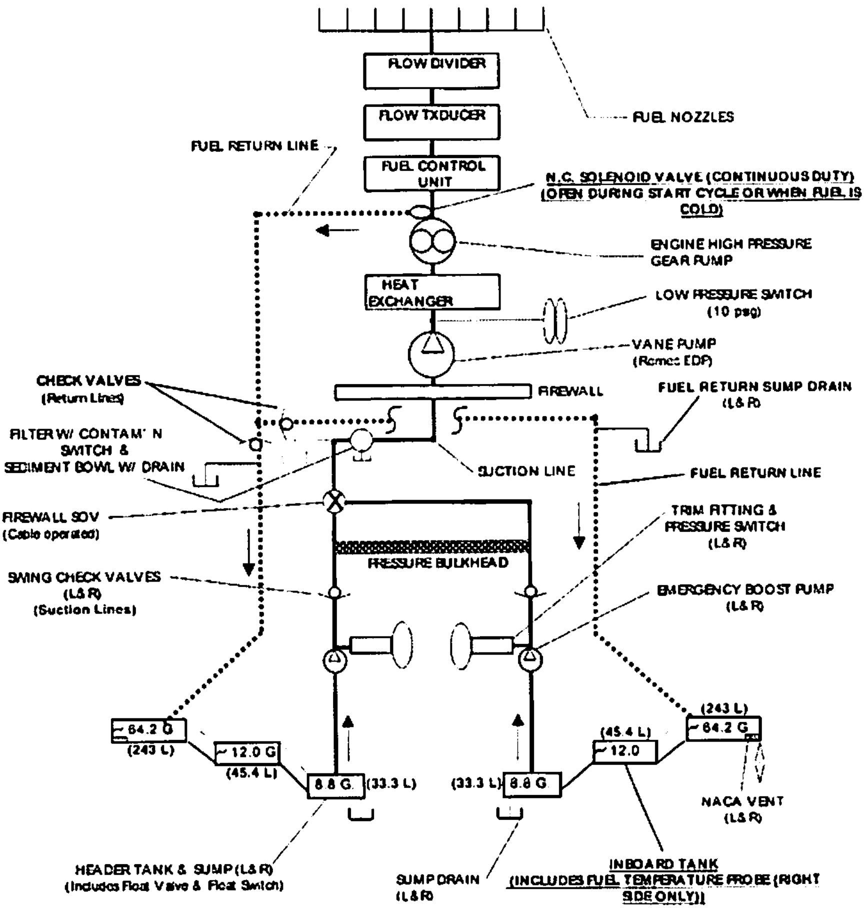
The return fuel solenoid valve will be de-energized (closed) when the following conditions are met:

- Fuel temperature indicator is above -23°C (-10°F) and the engine is not in a start cycle.
- Total fuel quantity is less than 100 lbs. and the engine is not in a start cycle.

7.17 FUEL (continued)

An inline electric boost pump is located in each wing root just forward of the header tanks. Control of these pumps is through a three-position switch located on the left overhead panel with selections: MAN, OFF, and AUTO. The pumps operate in unison to provide emergency back up for the engine driven pump, boost pressure for starting, and vapor suppression at high altitudes. In the AUTO position, a pressure switch activates both pumps automatically when the fuel pressure from the engine driven pump drops below 9 psig, and remains activated until the pressure increases to 12 psig. During this period, the red FUEL PRESS, green L FUEL PUMP, and green R FUEL PUMP annunciators will illuminate. As pressure increases to 12 psig the pumps are turned off and all three annunciators extinguish. This boost pump cycling prompts the pilot to select the MAN mode to provide continuous fuel pressure. In the AUTO mode the pumps are also controlled automatically, but separately, by the Avidyne Primary Flight Display (PFD). The Avidyne system provides a secondary means to control fuel balance. To provide proper fuel balance, a discrete signal from the PFD activates the boost pump on the "heavy" side once a 25-pound imbalance is reached, illuminates the amber FUEL IMBALANCE annunciator, and remains on until fuel is in balance. If the imbalance worsens (to 40 pounds), a second discrete output from the PFD causes the amber FUEL IMBALANCE light to flash indicating fuel system malfunction which may require pilot action.

7.17 FUEL (continued)



Fuel System Schematic
Figure 7-3

7.19 ELECTRICAL

Power for the 28 Vdc negative ground dual fed split bus electrical system is supplied by a direct driven 200 ampere generator and a belt driven 135 ampere alternator. The generator and the alternator are located on the aft end of the engine. Although the units do not operate in true parallel fashion, both units are kept running at the same time. The generator is considered the primary current source and the alternator is the back-up. The units that control the generator and the alternator are adjusted such that the generator furnishes all of the load and the alternator is the backup. In the event that the generator should fail or be turned off for any reason, the alternator picks up the entire load. A single 24 Vdc lead acid battery of 38 ampere hour capacity, is located in the battery compartment in the right side of the nose of the aircraft just forward of the wing leading edge. The battery provides power for engine starting and also acts as an emergency source of electrical power in the event the generator and the alternator should both fail.

Electrical switches are located as follows.

- An overhead switch panel (Figure 7-6) located above the upper edge of the wind shield.
- Avionics and systems switches located on the instrument panel. (Figure 7-9)
- Environmental control panel installed in the instrument panel. (Figure 7-9)

A battery bus, located in the engine compartment, provides a source of power for the courtesy lights. Because the battery bus is connected directly to the battery, power is available for these functions even when the Battery switch is OFF. The battery bus contains fuses to protect these circuits.

The EMERGENCY/GROUND CLEARANCE BUS can be activated by depressing the EMER/GND CLEAR switch on the overhead switch panel.

NOTE

The battery switch must be off prior to activating the EMER/GND CLEAR switch.

The bus is tied directly to the battery via a relay. The EMER/GND CLEAR bus provides power to #1 Comm/Nav/GPS, #2 VOR Indicator, Audio Panel, Landing Gear Down Lights, Internal Lighting for the Standby Instruments, and Illumination in the Magnetic Compass. It is intended to be used for filing flight plans prior to turning the battery on or providing emergency power to systems required to land the aircraft in the event of a total electrical failure.

7.19 ELECTRICAL (continued)

When the Battery switch, located on the overhead switch panel, is turned ON, the battery contactor closes, enabling current to flow from the battery to both the start contactor and the tie bus located on the lower right section of the Co-Pilots instrument panel (Figures 7-4 and 7-9). Should the airplane's battery be depleted, a receptacle (located behind a small access door on the left side of the aft fuselage) permits using an external 24 Vdc power source for engine start. With the Battery switch OFF, connecting an appropriate external source completes a circuit that closes the external power contactor, permitting current to flow to the starter generator and the tie bus. Whether using the airplanes battery, or external power, tie bus overcurrent protection is provided by the 150 ampere Battery circuit breaker.

NOTE

When using only the airplane's battery or a 24 volt external power source, the "LOW BUS VOLTS" annunciator will be illuminated. Check the voltmeter for correct voltage.

7.19 ELECTRICAL (continued)

The generator and the alternator each have their own independent ON-OFF switch located on the overhead switch panel. Each system also has it's own solid state voltage regulator which regulates field voltage to their respective device. When selected ON, the output of the generator and the alternator is fed through individual shunts to the tie bus. The alternator is tied to the bus by a 150 ampere circuit breaker. The generator is tied to the bus by a line contactor which is controlled by the generator control unit (GCU). Should an overvoltage or field ground fault condition occur in the alternator system, it's voltage regulator will turn off the output to the alternator field. Once the fault has been cleared the alternator system may be turned back on by turning the alternator switch on the overhead switch panel OFF and then back ON. Should an overvoltage or ground fault condition occur in the generator system the GCU will open the line contactor and place itself in the tripped mode. Once the fault has been cleared the generator can be put back on line by resetting the Generator control circuit breaker (on the lower right hand instrument panel, Figures 7-4 and 7-9) and turning the generator switch on the overhead switch panel OFF and then back ON. Any time the alernator or the generator is turned OFF an "ALT. INOP" or "GEN INOP" light will be illuminated on the annunciator panel.

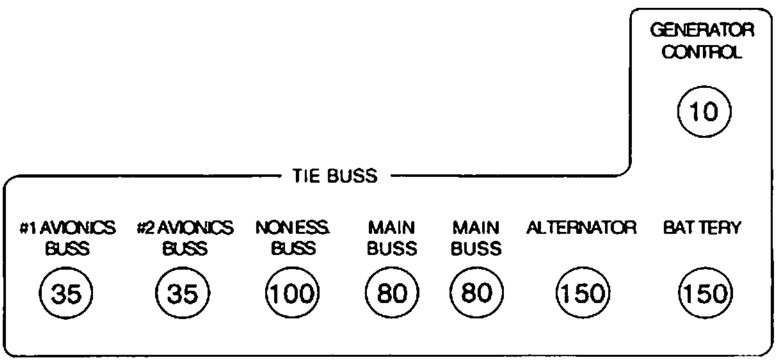
The engine start system has an Auto and a Manual mode. Auto mode is considered the normal mode. In Auto mode, momentarily depressing the PUSH START switch will engage the starter. The starter will automatically disengage at 56% Ng. To disengage the starter or to abort a start in AUTO mode, place the MAN/STOP switch (green indicator light in switch illuminated) to the manual position. When in manual mode, the starter will engage only while the PUSH START switch is depressed.

A main electrical bus with associated circuit breakers is located on the pilots forward and aft side panels (Figure 7-7). The non-essential bus, AVIONICS NO.1 and AVIONICS NO.2 busses are located on the co-pilot's instrument panel (Figures 7-4 and 7-9). The two avionics busses are interconnected via a 25 ampere bus tie circuit breaker.

7.19 ELECTRICAL (continued)

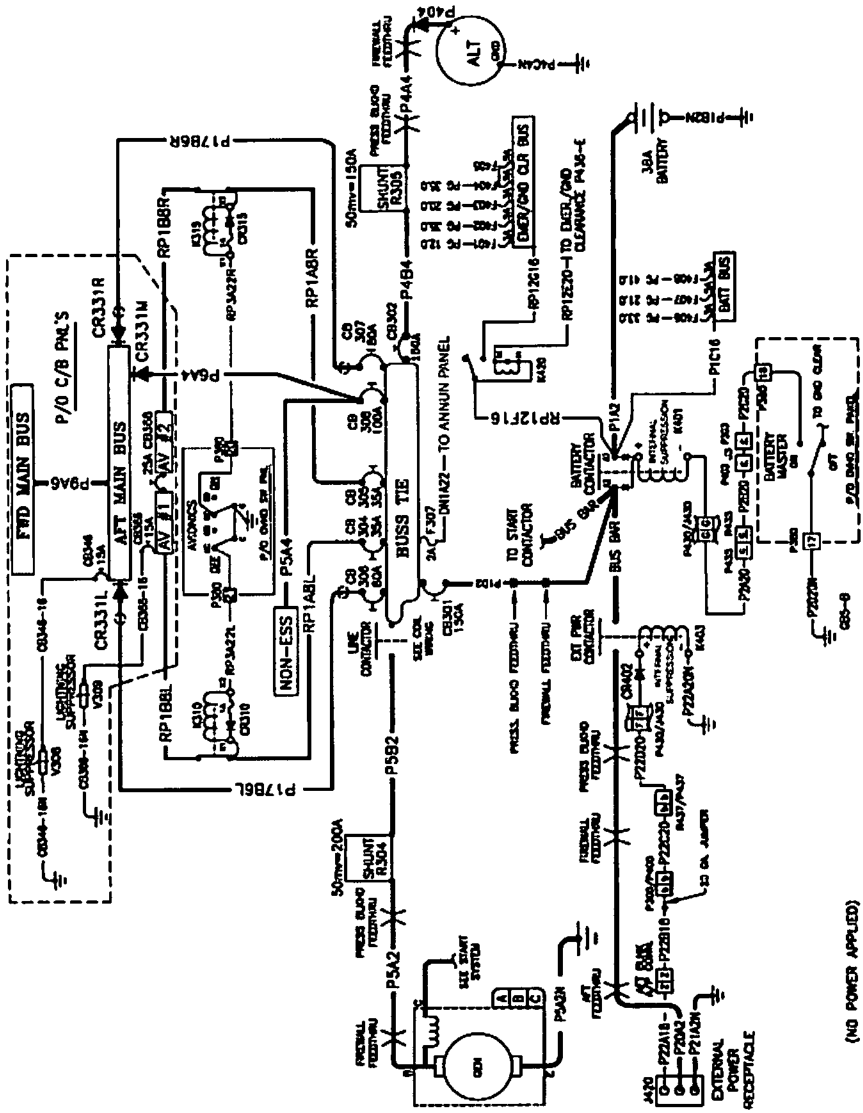
Current is fed to the main bus by three conductors. Three in line diodes provide isolation in the event of a ground fault in one of the feeder lines. The three feeders are protected by two 80 amp and one 100 amp circuit breakers. (Figure 7-4) The non-essential bus is also fed by the 100 amp circuit breaker.

The two avionics busses are fed through independent contactors. (Figure 7-4) The feeders to the contactors are protected by 35 ampere circuit breakers. When the AVIONICS switch on the overhead switch panel is depressed, both avionics contactors close allowing current to flow to both avionics busses. Should the need arise, either avionics bus can be isolated by pulling the avionics bus BUS TIE circuit breaker and the appropiate tie bus avionics circuit breaker.



Tie Buss Circuit Breakers
Figure 7-4

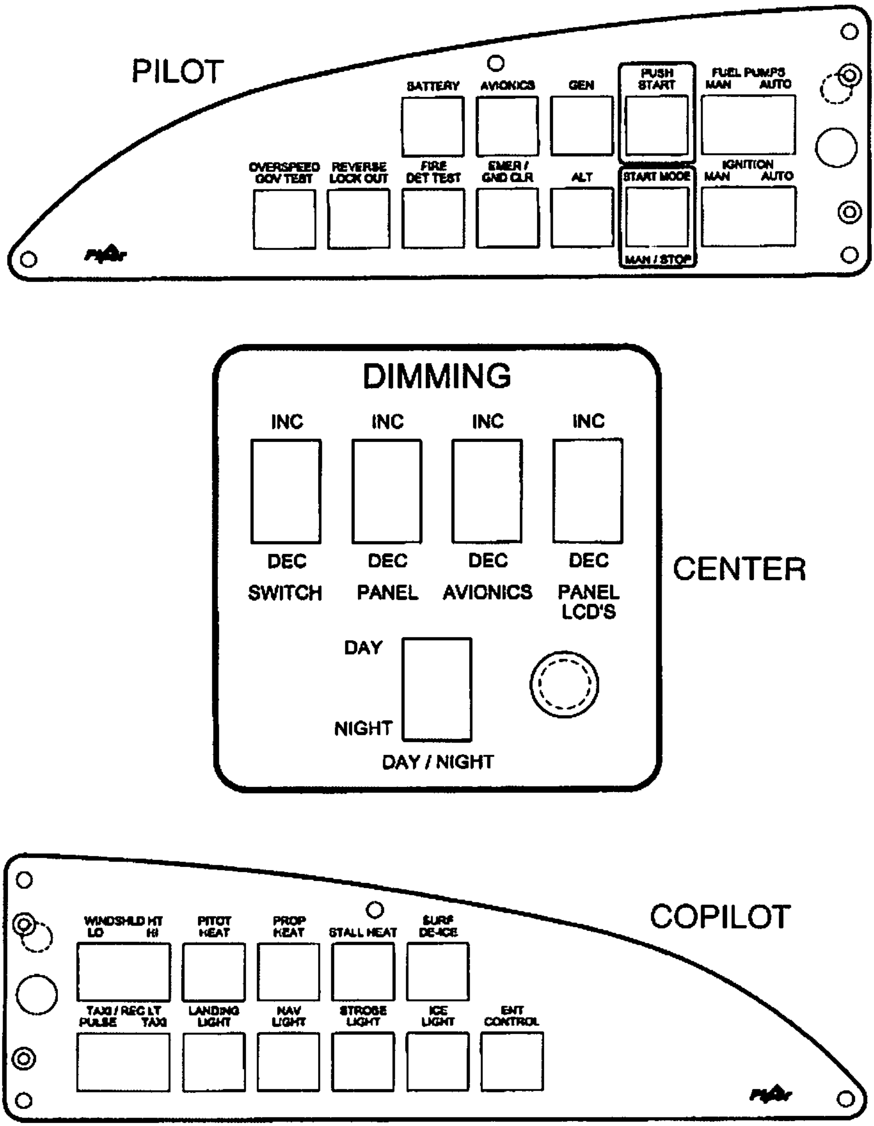
7.19 ELECTRICAL (continued)



Electrical Power Distribution System

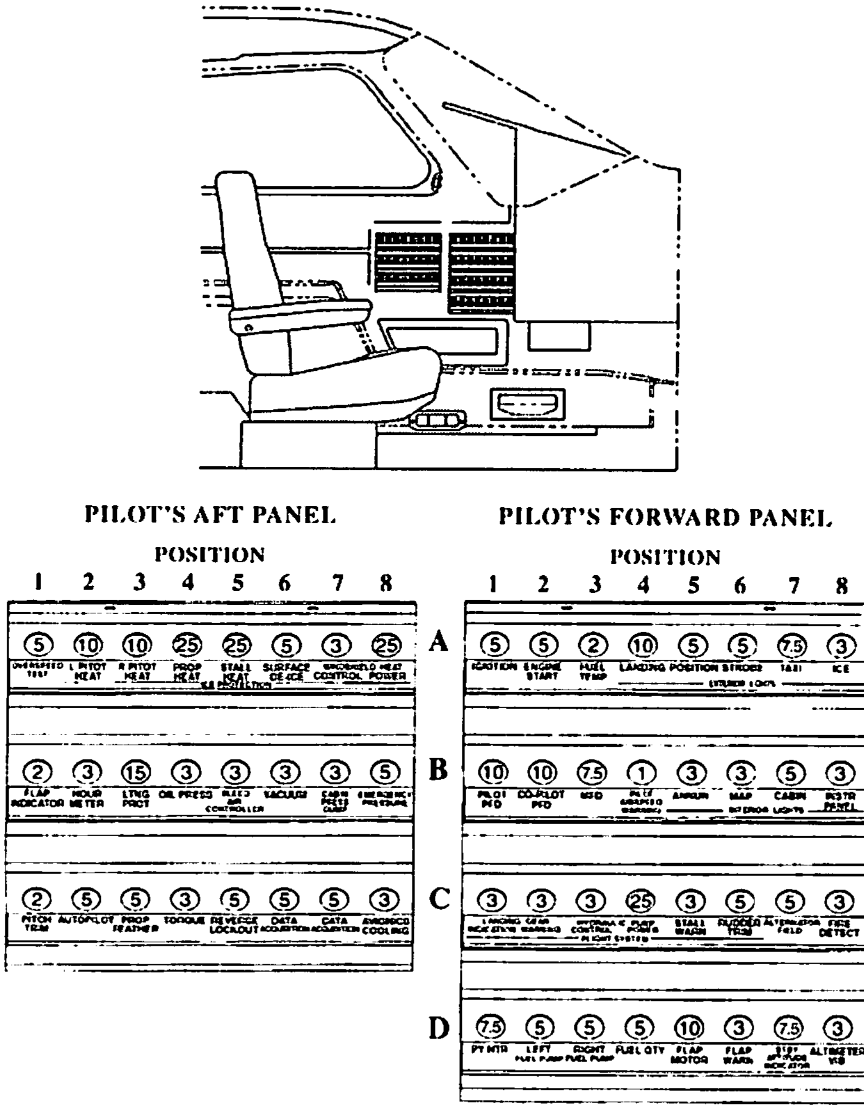
Figure 7-5

7.19 ELECTRICAL (continued)



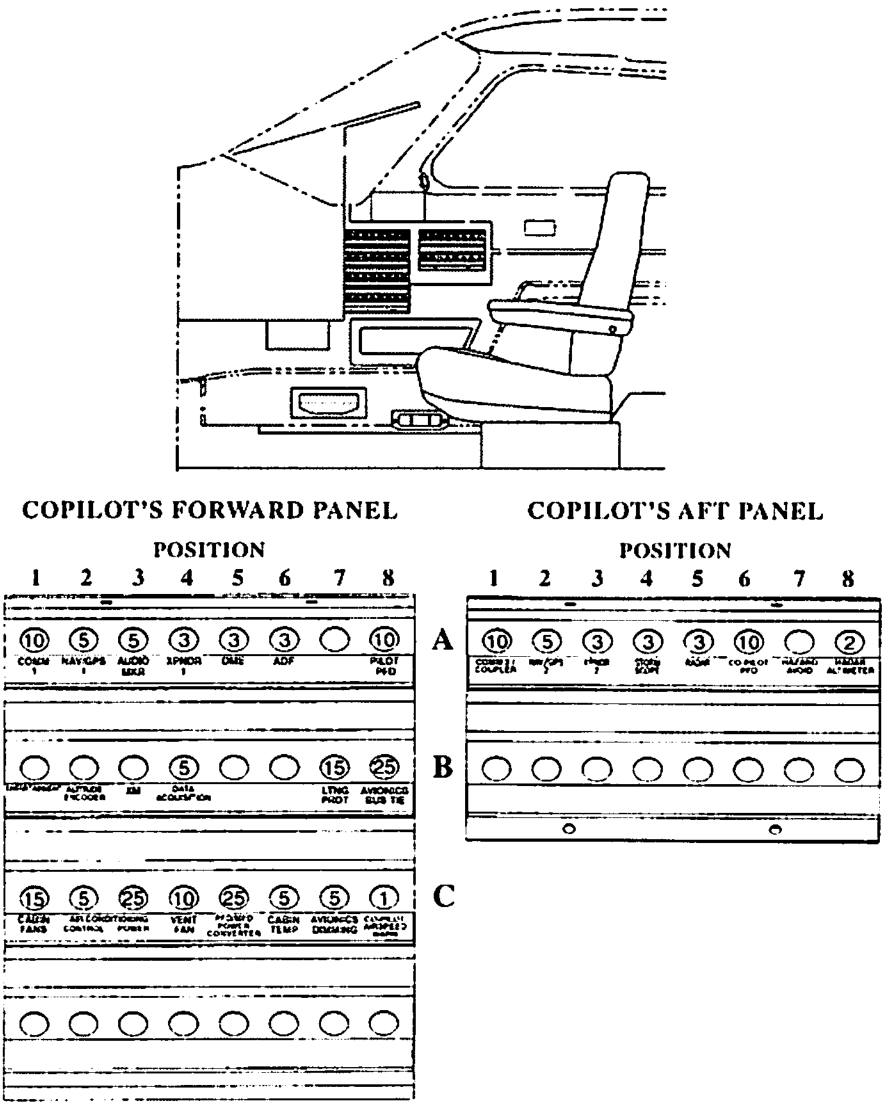
Overhead Switch Panel
Figure 7-6

7.19 ELECTRICAL (continued)



Circuit Breaker Panel - Pilot's Side, Typical
Figure 7-7

7.19 ELECTRICAL (continued)



Circuit Breaker Panel - Copilot's Side, Typical
Figure 7-8

7.21 INSTRUMENT PANEL

The instrument panel is designed to accommodate the flight instruments and the required power plant instruments.

All the high current tie bus input and feeder circuit breakers are located on the lower right section of the instrument panel.

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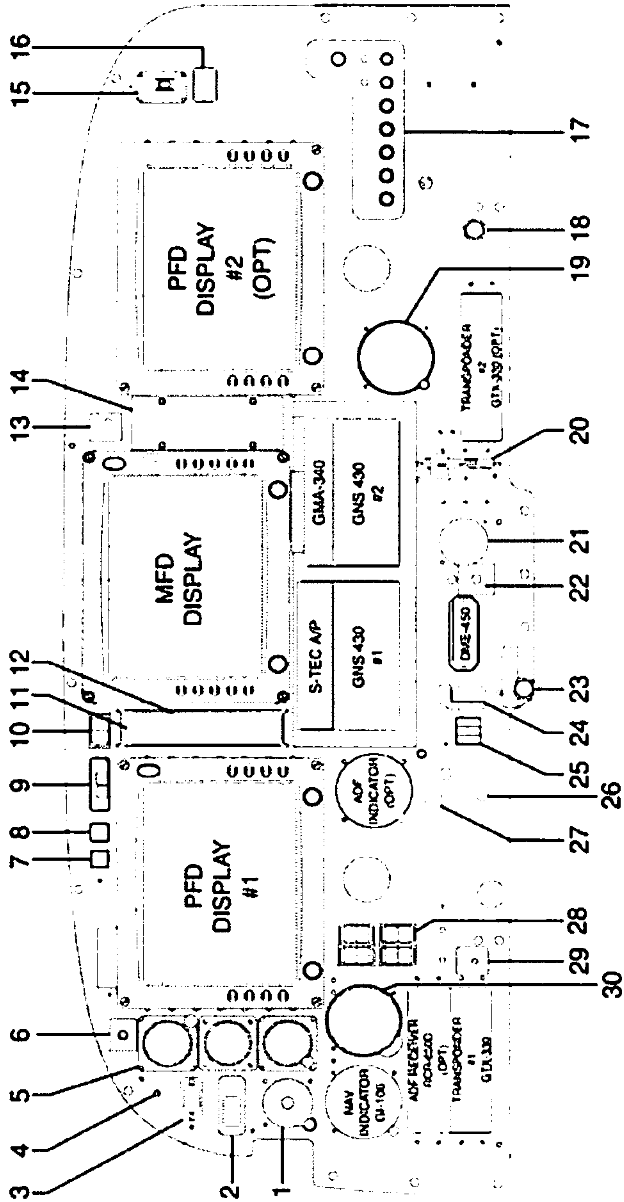


Instrument Panel, Typical
Figure 7-9

7.21 INSTRUMENT PANEL (continued)

1. Cabin Altitude Selector
2. Fuel Temperature Indicator
3. Standby Attitude Indicator Battery Status Annunciator
4. Standby Gyro Test Switch
5. Standby Instruments (Attitude, Airspeed, Altitude)
6. Yaw Damper/Trim Switch
7. Elevator Trim Switch
8. Landing Gear Warning Horn Mute Switch
9. ADAHRS Selector Switches
10. ADAHRS 1 / 2 Switch
11. Annunciator Test
12. Annunciator Panel
13. TAS Selector
14. Climate Control Switch Panel
15. ELT Switch
16. Hobbs Meter
17. Tie Buss Circuit Breakers
18. Defrost Control
19. Radar Altitude Indicator
20. Flap Position Selector
21. Flap Position Indicator
22. DME Selector
23. Emergency Gear Extension
24. Landing Gear Selector
25. Landing Gear Indicator Lights
26. ECS Cabin Comfort Control Panel
27. Cabin Pressure Dump Switch
28. Avionics Selector Switches
29. PFD Coupled/Uncoupled Selector
30. Cabin Altitude Indicator

Typical Instrument Panel
Figure 7-9 (continued)

7.23 PITOT STATIC SYSTEM

Pitot pressure for the airspeed indicators is sensed by heated pitot heads installed on the bottom of the left and right wings and is carried through lines within the wing and fuselage to the two ADAHRS units on the PFD's. Static pressure for the two ADAHRS units and standby altimeter and airspeed indicators is sensed by static source ports on the underside of the fuselage. Static pressure for the pressurization system outflow valve is sensed by a separate static port located on the aft bottom of the aircraft in close proximity to the static ports.

An alternate static source control valve is located below the instrument panel to the left of the pilot. For normal operation, the lever remains down. To select alternate static source, place the lever in the up position. When the alternate static source is selected the airspeed and altimeter and vertical speed indicator are vented to alternate static ports on the aft sides of the fuselage. During alternate static source operation, these instruments may give slightly different readings. The pilot can determine the effects of the alternate static source on instrument readings by switching from standard to alternate sources at different airspeeds. Corrections for each operating mode are shown in Section 5, Performance.

If one or more of the pitot static instruments malfunction, the system should be checked for dirt, leaks or moisture.

The holes in the sensors for pitot and static pressure must be fully open and free from blockage. Blocked sensor holes will give erratic or zero readings on the instruments.

Both the pitot and static can be drained through separate drain valves located on both the right and left lower side panel next to the crew seats. Two drains exist on the pilot side. The forward valve is the pilot static drain and the aft valve is the pilot pitot drain. Four drains exist on the copilot side. The forward valve is the pilot pitot drain, next is the pilot static drain, the third is the pilot alt-static drain and the furthest aft valve is the copilot pitot drain.

The heated pitot heads, which alleviate problems with icing and heavy rain, are standard equipment. The switch for pitot heat is located on the right overhead switch panel. Static source ports have been demonstrated to be non-icing; however, in the event that icing does occur, selecting the alternate static source will alleviate the problem.

7.25 ENVIRONMENTAL SYSTEM

The environmental system consists of:

(a) An engine bleed air and conditioning system.

(b) The ventilating air system.

(c) An air conditioning system.

(d) The cabin air distribution system.

(e) The pressurization and control system.

Compressor bleed air from the P3 engine port supplies air for heating the cabin during flight and ground operations and for pressurization. The bleed air is first routed through a mass flow controller that mixes ambient and bleed air, then the air flow is split between a heat exchanger and muffler. The amount of air flowing through each component is dependent on the cabin air temperature setting. The air then flows into the cabin through the lower left and right cabin side panel ducts, and through the windshield defroster, when selected by pulling the defoster knob located below the right control column. Conditioned bleed air entering the cabin will always be warmer than the outside air and typically warmer than the cabin air.

Cabin ventilating air during ground or unpressurized flight operation is provided by a blower through the lower left and right cabin side panel ducts. The blower is activated by the VENT/FAN switch.

Cabin air conditioning is provided by a vapor cycle system. The freon compressor is belt driven by the engine dual drive.

The condenser and its cooling air fan are located in the tailcone immediately aft of the rear pressure bulkhead. Cooling air from outside the tailcone is drawn into the cooling air duct through a flush opening in the skin, routed across the condenser coil, and discharged overboard through the tailcone exit opening.

Two recirculation blowers and evaporator assemblies are located aft of each rear seat below the rear baggage compartment floor. The recirculation blowers draw air into each evaporator coil through grills in the floor structure behind the rear seats and discharges it into the upper left and right cabin side panel ducts. Adjustable eyeball outlets are located at each seat location in the airplane.

7.25 ENVIRONMENTAL SYSTEM (continued)

The AIR COND and BLOWER LO & HI switches, located as part of the environmental switch panel in the center of the instrument panel, are used to control the air conditioning system.

When the AIR COND switch is selected ON, the compressor belt drive is electrically clutched, the condenser blower motor relay is closed, and both recirculation blowers are activated. The recirculation blowers can be operated independently of the air conditioner by selecting the BLOWER HI or LO on. In either situation, the BLOWER switches are used only to select a HI or LO recirculation blower motor speed. Overcurrent protection is provided by the 15 amp CABIN BLOWERS, 5 amp AIR CONDITIONER CONTROL, and 25 amp AIR CONDITIONER POWER circuit breakers in the nonessential bus section of the pilot's forward circuit breaker panel.

The HFC-134A portion of the system incorporates a receiver dryer, a sight gauge, suction and discharge service valves, and 265 psi high pressure and 40 psi low pressure switches. Should the compressor discharge pressure increases above 265 psi, or decrease below 40 psi, the applicable pressure switch will open, disengaging the freon compressor clutch.

Refer to paragraph 7.27, BLEED AIR, CONDITIONING AND PRESSURIZATION SYSTEM, for a more complete description of the pressurization system and use of related controls and switches.

7.27 BLEED AIR, CONDITIONING AND PRESSURIZATION SYSTEM

Air for cabin pressure is obtained from the P3 engine bleed port. Bleed air is routed through the mass flow and temperature controllers. The mass flow controller meters the amount of mass flow to the cabin through an actuator controlled, ambient and bleed air, mixing ejector. The amount of mass flow is controlled by a four position switch located below and to the right of the left control column. The available settings are off, normal, high, and emergency.

The temperature controller sets what percentage of bleed air will flow through the cooling heat exchanger and what percentage will flow through the acoustic muffler. The amount of air through each device determines the mixed cabin supply air temperature. The temperature controls are located in the middle of the instrument panel and have two modes of operation, automatic and manual. Cabin temperature is controlled by a relative temperature knob when in automatic mode and an increase/decrease rocker switch when in manual mode. The automatic temperature mode relies on the cabin temperature sensor, located behind the pilot in a side close out panel, for temperature regulation. The manual temperature mode directly controls the amount of air flowing through the cooling heat exchanger and acoustic muffler.

The cabin pressurization control system consists of an isobaric outflow valve, a safety outflow valve, absolute pressure regulator, cabin altitude and rate selector, electrically operated vacuum solenoid valve, and surge tank.

Cabin altitude, differential pressure, and rate of change are displayed on a single three inch diameter indicator. Cabin pressure is automatically regulated to a maximum of 5.5 psi pressure differential. Should the cabin outflow valve malfunction, the cabin safety valve will maintain a maximum of 5.6 cabin differential pressure. The landing gear squat switch and vacuum pressure prevents the cabin from being pressurized while the airplane is on the ground.

7.27 BLEED AIR, CONDITIONING AND PRESSURIZATION SYSTEM (continued)

Should cabin pressure altitude exceed 10,000 feet, an amber CABIN ALTITUDE annunciator combined with audible alarm will warn the pilot. The audible alarm can be muted by depressing the cabin altitude mute switch located to the right of the annunciator panel. If the cabin altitude exceeds 12,000 feet, the emergency bleed air solenoid is opened and a red CABIN ALT annunciator combined with audible alarm will warn the pilot. If the cabin altitude exceeds 13,500 feet, the absolute pressure regulator will close the isobaric outflow valve. The cabin pressurization system isobaric outflow valve provides the means by which smoke and impurities are vented from the cabin.

For pressurized flight, set the cabin pressure controller at 500 feet above the airport pressure altitude, CABIN PRESS control set to normal and the DUMP/NORM switch to NORM. The rate of cabin ascent and descent change is controlled with the rate knob (left lower corner of the cabin pressure controller), and may be adjusted between approximately 200 and 2000 feet per minute, as desired. Setting the rate knob arrow to the 9 o'clock position provides a cabin rate of change of approximately 500 feet per minute. This position gives a comfortable rate for normal operations.

For complete instructions on the operation of the cabin pressurization system, refer to Section 4, Normal Procedures.

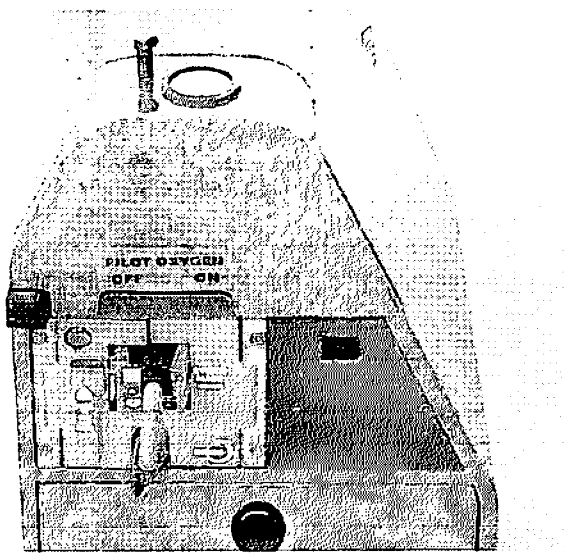
The CABIN PRESS DUMP/NORM switch, when set to DUMP, electrically opens a solenoid valve allowing vacuum suction pressure to open the safety valve and rapidly dump cabin pressure to ambient pressure.

For unpressurized flight the CABIN PRESS control should be set to OFF and the pressurization bleed air shut off valve pulled closed. Setting the CABIN PRESS/DUMP/NORM switch to DUMP will provide maximum airflow through the cabin.

For complete instructions on pressurization malfunctions, refer to Section 3 - Emergency Procedures.

7.28 EMERGENCY OXYGEN SYSTEM

The pilot diluter demand emergency oxygen system consists of a quick donning mask, stowage box, pressure gauge, and oxygen bottle with pressure regulator and shutoff valve assembly. The complete system is contained within a cabinet located behind the copilot seat. Figure 7-10 shows the pilot emergency oxygen system as installed within the cabin.



Emergency Oxygen System Installation
Figure 7-10

The oxygen system is activated by a lever located above the stowage box and slightly recessed within the cabinet. A placard on the cabinet clearly marks the ON and OFF positions. The system pressure gauge is located on top of the cabinet and is illuminated by a post light. The pressure gauge incorporates a yellow arc from 0 to 800 psi. The minimum safe charge for pressurized operation above 25,000 feet is 800 psi or above. The quick donning mask stowage box incorporates a test indicator and is located in the upper left corner of the stowage box face. A press-to-test button is also located in the lower left corner of the stowage box face. The controls on the mask itself consist of a switch to select between diluted/normal (N) flow and non-diluted flow (100%), as well as an additional emergency pressure breather switch. Integral to the mask supply line and adjacent to the mask is a secondary flow indicator.

7.28 EMERGENCY OXYGEN SYSTEM (Continued)

To remove the mask from the stowage box, pull on the inflation control valve (red handles) protruding from the face of the stowage box. Once removed, depressing the inflation control valve inflates the harness and allows it to be placed over the head. After the harness is completely over the head, releasing the inflation control valve will firmly hold the mask in place. To achieve optimum fit, simply reinflate the harness by depressing the inflation control valve and adjusting the mask as needed. The MIC SELECT switch located on the lower left (pilot's) instrument panel when in the mask position activates the mask microphone. Continued oxygen system operation can be verified by the pressure gauge, located on top of the cabinet, and two flow indicators, one located on the face of the stowage box and the other integral to the oxygen mask supply line.

With the system charged to 800 psi or higher and the mask set to normal (N), the pilot oxygen system will provide adequate oxygen for an emergency descent from 30,000 feet to 10,000 feet. The 15 minute descent profile used to define the minimum safe oxygen charge includes a one-minute dwell time at 30,000 feet, a 5,000 fpm descent to 10,000 feet, followed by a 10 minute hold at 10,000 feet. With the system fully charged to 1800 psi and the mask set to normal (N), the oxygen system will provide oxygen to the pilot for approximately 25 minutes at 30,000 feet.

NOTE

Pilot oxygen system pressure must be above the yellow arc, or greater than 800 psi, during pressurized flight above 25,000 feet.

The passenger emergency oxygen system consists of three "two man" oxygen generators and six masks. The system consists of two major assemblies, the copilot and passenger assemblies. The oxygen generators provide sufficient oxygen flow for six people for a 15 minute period. Once an oxygen generator is activated, it will continue to produce oxygen until depleted, as no shutoff provisions are provided. Each generator has two oxygen masks connected, either of which is capable of activating the generator.

7.28 EMERGENCY OXYGEN SYSTEM (Continued)

The copilot assembly is located under the copilot seat and contains two masks and one, two man oxygen generator mounted on a sliding tray. The tray slides out into the aisle, between the pilot and copilot seat, exposing the two masks. Each mask is connected to the oxygen generator via a clear plastic oxygen delivery tube and lanyard. Pulling either of the masks, and thus the lanyard, activates the oxygen generator and delivers oxygen to both masks simultaneously. The additional mask can be used by the pilot in the event of a failed pilot demand oxygen system. The generator has two over-pressure relief valves to prevent excessive pressure should a malfunction in the system occur.

The passenger assembly is located in a drawer beneath the right rear facing passenger seat. Four masks and two, two-man oxygen generators are accessed by sliding the drawer out in the aft direction. The two inboard masks are connected to the first oxygen generator, while the two outboard masks are connected to the second generator. Any of the four masks will reach any of the four passengers. Activation and operation of the passenger oxygen generators is identical to the copilot assembly.

Placards are provided on the side panels outboard of the copilot's seat and the right aft facing seat, which state the location and operation of the copilot and passenger emergency oxygen system, and that smoking is prohibited.

An amber OXYGEN annunciator, on the pilot's annunciator panel, is provided to inform the crew whenever either of the three oxygen generators has been activated. The annunciator light is activated by a microswitch on each generator. The light will continue to illuminate until the used generator is replaced with a full one.

7.29 VACUUM SYSTEM

Vacuum for the system is provided by an ejector, driven by pressure regulated precooled engine bleed air. Also, included is a vacuum regulator and a low vacuum switch.

Vacuum is used for pneumatic deice boot hold down and as a source of control pressure for the cabin pressure control system. Vacuum level indication on the copilot's (secondary) EDU is for general vacuum system health monitoring, and is for reference only. Transient decreases in vacuum during pneumatic boot operation can be expected. Any sustained decrease in system vacuum may indicate a sticking or maladjusted vacuum regulator, a leak in the system, or a failure of the ejector. The VACUUM LOW annunciator indicates excessively low vacuum level.

7.31 STALL WARNING SYSTEM

The stall warning system consists of a lift transducer located in the leading edge of the left wing and a lift computer to power regulators, a signal processor, control circuitry and a push-to-test switch. The lift transducer protrudes into the air stream and during flight is positioned by local airflow velocity and direction. A continuous stall warning tone will sound prior to the actual stall.

Activation of the stall warning push-to-test switch during ground operation will produce an aural stall warning tone, verifying proper stall warning operation.

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AIRPLANE HANDLING, SERVICING, AND MAINTENANCE

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SECTION 8

AIRPLANE HANDLING, SERVICING, AND MAINTENANCE

8.1 GENERAL

This section provides guidelines relating to the handling, servicing, and maintenance of the Meridian. For complete maintenance instructions, refer to the PA-46-500TP Maintenance Manual.

WARNING

Inspection, maintenance and parts requirements for all non-PIPER approved STC installations are not included in this handbook. When a non-PIPER approved STC installation is incorporated on the airplane, those portions of the airplane affected by the installation must be inspected in accordance with the inspection program published by the owner of the STC. Since non-PIPER approved STC installations may change systems interface, operating characteristics and component loads or stresses on adjacent structures, PIPER provided inspection criteria may not be valid for airplanes with non-PIPER approved STC installations.

WARNING

Modifications must be approved in writing by PIPER prior to installation. Any and all other installations, whatsoever, of any kind will void this warranty in it's entirety.

8.1 GENERAL (Continued)

WARNING

Use only genuine PIPER parts or PIPER approved parts obtained from PIPER approved sources, in connection with the maintenance and repair of PIPER airplanes.

Genuine PIPER parts are produced and inspected under rigorous procedures to insure airworthiness and suitability for use in PIPER airplane applications. Parts purchased from sources other than PIPER, even though identical in appearance, may not have had the required tests and inspections performed, may be different in fabrication techniques and materials, and may be dangerous when installed in an airplane.

Additionally, reworked or salvaged parts or those parts obtained from non-PIPER approved sources, may have service histories which are unknown or cannot be authenticated, may have been subjected to unacceptable stresses or temperatures or may have other hidden damage not discernible through routine visual or nondestructive testing. This may render the part, component or structural assembly, even though originally manufactured by PIPER, unsuitable and unsafe for airplane use.

PIPER expressly disclaims any responsibility for malfunctions, failures, damage or injury caused by use of non-PIPER approved parts.

8.1 GENERAL (Continued)

Every owner should stay in close contact with an authorized Piper Service Center or Piper's Customer Services Department to obtain the latest information pertaining to their airplane, and to avail themselves of Piper's support systems.

Piper takes a continuing interest in having owners get the most efficient use from their airplane and keeping it in the best mechanical condition. Consequently, Piper, from time to time, issues service releases including Service Bulletins, Service Letters, Service Spares Letters, and others relating to the airplane.

Piper Service Bulletins are of special importance and Piper considers compliance mandatory. These are sent directly to the latest FAA-registered owners in the United States (U.S.) and Piper Service Centers worldwide. Depending on the nature of the release, material and labor allowances may apply. This information is provided to all authorized Piper Service Centers.

Service Letters deal with product improvements and servicing techniques pertaining to the airplane. They are sent to Piper Service Centers and, if necessary, to the latest FAA-registered owners in the U.S. Owners should give careful attention to Service Letter information.

Service Spares Letters offer improved parts, kits, and optional equipment which were not available originally, and which may be of interest to the owner.

Piper offers a subscription service for Service Bulletins, Service Letters, and Service Spares Letters. This service is available to interested persons such as owners, pilots, and mechanics at a nominal fee, and may be obtained through an authorized Piper Service Center or Piper's Customer Services Department.

Maintenance manuals, parts catalogs, and revisions to both, are available from Piper Service Centers or Piper's Customer Services Department.

Any correspondence regarding the airplane should include the airplane model and serial number to ensure proper response.

8.3 AIRPLANE INSPECTION PERIODS

WARNING

All inspection intervals, replacement time limits, overhaul time limits, the method of inspection, life limits, cycle limits, etc., recommended by PIPER are solely based on the use of new, remanufactured or overhauled PIPER approved parts. If parts are designed, manufactured, remanufactured, overhauled and/or approved by entities other than PIPER, then the data in PIPER'S maintenance/service manuals and parts catalogs are no longer applicable and the purchaser is warned not to rely on such data for non-PIPER parts. All inspection intervals, replacement time limits, overhaul time limits, the method of inspection, life limits, cycle limits, etc., for such non-PIPER parts must be obtained from the manufacturer and/or seller of such non-PIPER parts.

Piper has developed inspection items and required inspection intervals for the PA-46-500TP. The PA-46-500TP Progressive Inspection Manual contains appropriate forms, and all inspection procedures should be complied with by a properly trained, knowledgeable, and qualified mechanic at an authorized Piper Service Center or a reputable repair shop. Piper cannot accept responsibility for the continued airworthiness of any aircraft not maintained to these standards, and/or not brought into compliance with applicable Service Bulletins issued by Piper, instructions issued by the engine, propeller, or accessory manufacturers, or Airworthiness Directives issued by the FAA.

In addition, but in conjunction with the above, the FAA requires periodic inspections on all aircraft to keep the Airworthiness Certificate in effect. The owner is responsible for assuring compliance with these inspection requirements and for maintaining proper documentation in logbooks and/or maintenance records.

8.5 PREVENTIVE MAINTENANCE

The holder of a pilot certificate issued under Federal Aviation Regulations (FAR) Part 61 may perform certain preventive maintenance as defined in the FARs. This maintenance may be performed only on an aircraft which the pilot owns and operates, and which is not used in air carrier or air taxi/commercial operations service.

All other aircraft maintenance must be accomplished by a person or facility appropriately certificated by the Federal Aviation Administration (FAA) to perform that work.

Anytime maintenance is accomplished, an entry must be made in the appropriate aircraft maintenance records. The entry shall include:

(a) The date the work was accomplished.
(b) Description of the work.
(c) Number of hours on the aircraft.
(d) The certificate number of pilot performing the work.
(e) Signature of the individual doing the work.

8.7 AIRPLANE ALTERATIONS

If the owner desires to have his aircraft modified, he must obtain FAA approval for the alteration. Major alterations accomplished in accordance with Advisory Circular 43.13-2, when performed by an A & P mechanic, may be approved by the local FAA office. Major alterations to the basic airframe or systems not covered by AC 43.13-2 may require a Supplemental Type Certificate.

8.8 AIRPLANE FILE

The owner or pilot is required to ascertain that the following aircraft papers are in order and in the aircraft.

(a) To be displayed in the aircraft at all times:
  (1) Aircraft Airworthiness Certificate Form FAA-8100-2.
  (2) Aircraft Registration Certificate Form FAA-8050-3.
  (3) Aircraft Radio Station License if transmitters are installed.

(b) To be carried in the aircraft at all times:
  (1) Pilot's Operating Handbook and FAA approved Airplane Flight Manual.
  (2) Weight and Balance data plus a copy of the latest Repair and Alteration FAA Form -337, if applicable.
  (3) Aircraft equipment list.

Although the aircraft and engine logbooks are not required to be in the aircraft, they should be made available upon request. Logbooks should be complete and up to date. Good records will reduce maintenance cost by giving the mechanic information about what has or has not been accomplished.

8.9 GROUND HANDLING

(a) Towing

The airplane may be moved on the ground by power equipment that will not damage or excessively strain the nose gear steering assembly.

CAUTION

When towing with power equipment, do not turn the nose gear beyond its steering limit in either direction, as this will result in damage to the nose gear and steering mechanism.

CAUTION

Do not tow the airplane when the controls are secured.

In the event towing lines are necessary, ropes should be attached to both main gear struts as high up on the tubes as possible. Lines should be long enough to clear the nose and/or tail by not less than fifteen feet, and a qualified person should ride in the pilot's seat to maintain control by use of the brakes.

8.9 GROUND HANDLING (Continued)

(b) Taxiing

CAUTION

Do not operate engine above ground idle with cabin doors open.

Before attempting to taxi the airplane, ground personnel should be instructed and approved by a qualified person authorized by the owner. Engine starting and shut-down procedures as well as taxi techniques should be covered. When it is ascertained that the propeller blast and taxi areas are clear, power should be applied to start the taxi roll, and the following checks should be performed:

(1) Taxi a few feet forward and apply the brakes to determine their effectiveness.

(2) Propeller thrust may be modulated from full forward to full reverse by selection of the reversing range. A lock-out feature allows reverse pitch to function only during ground operations.

(3) While taxiing, make slight turns to ascertain the effectiveness of the steering.

(4) Observe wing clearance when taxiing near buildings or other stationary objects. If possible, station an observer outside the airplane.

(5) When taxiing over uneven ground, avoid holes and ruts.

(6) Do not operate the engine at high rpm when running up or taxiing over ground containing loose stones, gravel, or any loose material that may cause damage to the propeller blades.

(7) When the airplane is stopped on the taxiway or runway and brake freeze-up occurs, actuate the brakes several times using maximum pressure. To reduce the possibility of brake freeze-up during taxi operation in severe weather conditions, one or two taxi slow downs (from 25 to 5 knots) may be made using light brake pressure, which will assist moisture evaporation within the brake.

(8) Minimize ground operation in Beta/Reverse and monitor engine oil temperature.

8.9 GROUND HANDLING (Continued)

(c) Parking

When parking the airplane, be sure that it is sufficiently protected from adverse weather conditions and that it presents no danger to other aircraft. When parking the airplane for any length of time or overnight, it is suggested that it be moored securely.

(1) To park the airplane, head it into the wind if possible.

(2) The parking brake knob is located just below the left control column. To set the parking brake, first depress and hold the toe brakes and then pull out on the parking brake knob. To release the parking brake, first depress the brake pedals and then push in on the parking brake knob.

CAUTION

Care should be taken when setting brakes that are overheated or during cold weather when accumulated moisture may freeze a brake.

(3) Aileron and elevator controls should be secured with the front seat belt and chocks should be used to properly block the wheels.

(d) Mooring

The airplane should be moored for immovability, security and protection. The following procedures should be used for the proper mooring of the airplane:

(1) Head the airplane into the wind if possible.

(2) Retract the flaps.

(3) Immobilize the ailerons and elevator by looping the seat belt through the control wheel and pulling it snug.

(4) Place chocks both fore and aft of the main wheels.

8.9 GROUND HANDLING (Continued)

(d) Mooring (continued)

(5) Secure tiedown ropes to main landing gear and tail tiedown at approximately 45 degree angles to the ground. When using rope of non-synthetic material. leave sufficient slack to avoid damage to the airplane should the ropes contract.

CAUTION

[illegible]

NOTE

Additional preparations for high winds include using tiedown ropes from the nose landing gear and securing the rudder.

(6) Install pitot head covers if available. Be sure to remove the pitot head covers before flight.

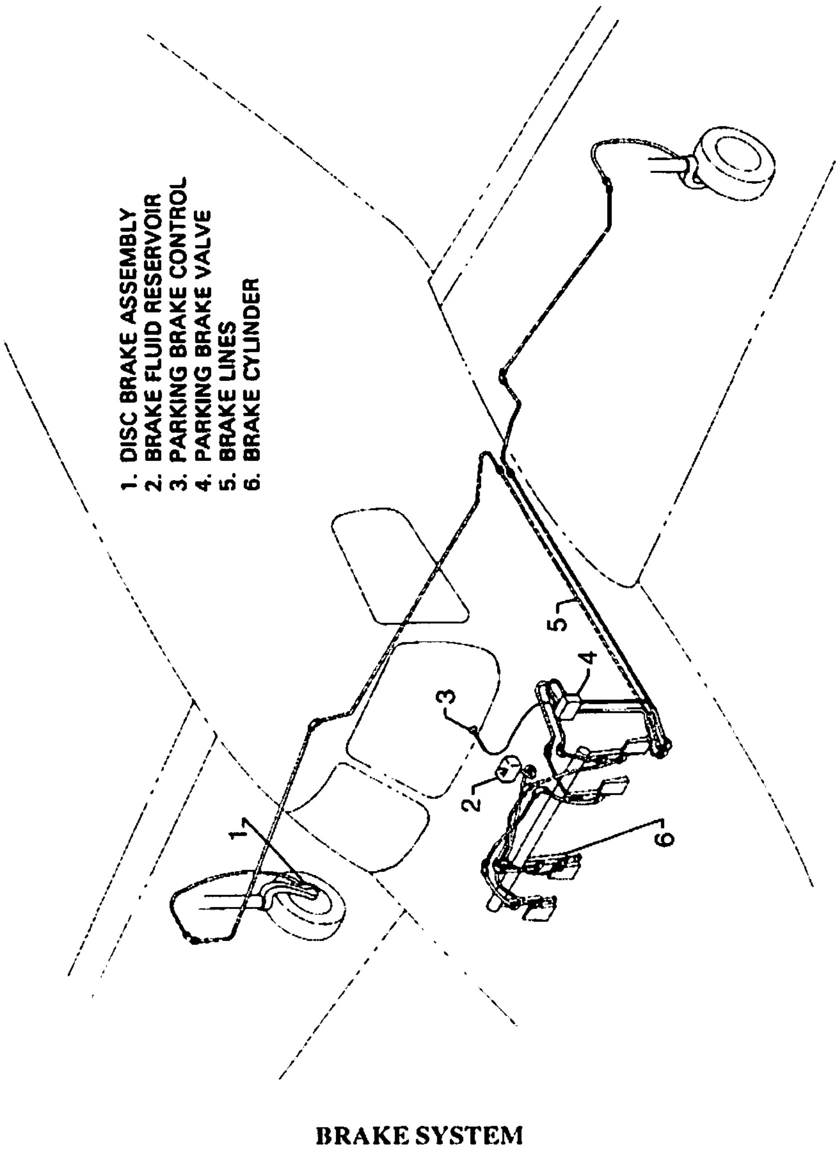
(7) The cabin door should be locked when the airplane is unattended.

(8) For overnight or in blowing snow or dust, install engine inlet covers and dust covers on the air inlet cooling duct on top of the cowling and on the exhaust stacks. Attach propeller restrainers to prevent windmilling.

8.13 BRAKE SERVICE

The brake system is filled with MIL-H-5606 (petroleum base) hydraulic fluid. The fluid level should be checked periodically (at least every 90 days) or at every 100 hour inspection, and replenished when necessary. The brake fluid reservoir is located on the left side of the firewall. If the entire system must be refilled, fill with fluid under pressure from the brake end of the system. This will eliminate air from the system.

No adjustment of the brake clearances is necessary. If, after extended service, brake blocks become excessively worn they should be replaced with new segments.



BRAKE SYSTEM
Figure 8-1

8.15 HYDRAULIC SYSTEM SERVICE

The hydraulic system reservoir is an integral part of the electric hydraulic pump assembly. It is located aft of the aft cabin baggage compartment and is accessible through the baggage compartment aft closeout panel. Fill the reservoir with MIL-H-5606 hydraulic fluid. The fluid level should be checked periodically (at least every 90 days) or at every 100 hour inspection, and replenished when necessary. With the landing gear down and the system up to pressure, fill to the FULL line on the sight gauge.

8.17 LANDING GEAR SERVICE

The main landing gear uses 6.00 x 6 wheels with 6.00 x 6, eight-ply rating tires and tubes. (Refer to paragraph 8.25.)

The nose wheel uses a 5.00 x 5 wheel with a 5.00 x 5 eight-ply rating, type III tire and tube. (Refer to paragraph 8.25.)

Wheels are removed by taking off the hub cap, cotter pin, axle nut, and bolts holding the brake segment in place. Mark tire and wheel for reinstallation; then dismount by deflating the tire, removing the through-bolts from the wheel and separating the wheel halves.

Landing gear oleos should be serviced according to the instructions on the units. The main oleos should be extended under normal static load until 3.14 +/- 0.25 inches of oleo piston tube is exposed, and the nose gear should show 2.7 +/- 0.25 inches. To add air to the oleo struts, attach a strut pump to the valve assembly near the top of the oleo strut housing and pump the oleo to the desired position. To add oil, jack the aircraft, release the air pressure in the strut, remove the valve core and add oil through this opening with the strut extended. After the strut is full, compress it slowly and fully to allow excess air and oil to escape. With the strut still compressed reinsert the valve core and pump up the strut as above.

8.17 LANDING GEAR SERVICE (Continued)

In jacking the aircraft for landing gear or other service, two hydraulic jacks and a tail stand should be used. At least 400 pounds of ballast should be placed on the base of the tail stand before the airplane is jacked up. The hydraulic jacks should be placed under the jack points on the bottom of the wing and the airplane jacked up until the tail skid is at the right height to attach the tail stand. After the tail stand is attached and the ballast added, jacking may be continued until the airplane is at the height desired.

The steering rods from the rudder pedals to the transverse bellcrank in the nose wheel tunnel are factory adjusted and should be readjusted only in accordance with the applicable rigging specification. Nose wheel alignment is accomplished by adjusting the rod end(s) on the steering bungee assembly in such a way that the nose wheel is in line with the fore and aft axis of the plane when the rudder pedals are centered. Alignment of the nose wheel can be checked by pushing the airplane back and forth with the rudder two degrees to the right to determine that the plane follows a straight line. The turning arc of the nose wheel is 30° +/- 1° in either direction and is limited by stops at the trunnion forging or the forward steering contact arm mounted on the engine mount.

NOTE

The rudder is set to neutral with the rudder pedals neutralized and the nose wheel centered.

8.19 PROPELLER SERVICE

The spinner and backing plate should be cleaned and inspected for cracks frequently. Before each flight the propeller should be inspected for nicks, scratches, and corrosion. Significant damage must be repaired by a qualified mechanic prior to flight. Nicks or scratches cause an area of increased stress which can lead to serious cracks or the loss of a propeller tip. The back face of the blades should be painted when necessary with flat black paint to retard glare. To prevent corrosion, the surface should be cleaned and waxed periodically.

8.21 OIL REQUIREMENTS

Oil conforming to Pratt & Whitney Canada Service Bulletin 3001 and all revisions or supplements thereto, must be used. The oils listed below comply with the engine manufacturers specification PWA521 and have a viscosity Type II rating. These oils are fully approved for use in Pratt & Whitney Canada, Inc. commercially operated engines. When adding oil, service the engine with the type and brand which is currently being used in the engine. Refer to the airplane and engine maintenance records for this information. Should oils of different viscosities or brands be inadvertently mixed, the oil system servicing instructions in the Pratt & Whitney Maintenance Manual, p/n 3013242, shall be carried out.

Exxon Turbo Oil 2380
Aero Shell Turbine Oil 500
Aero Shell Turbine Oil 560 (Third generation lubricant)
Royco Turbine Oil 500
Royco Turbine Oil 560 (Third generation lubricant)
Mobil Jet Oil II
Mobil Jet Oil 254 (Third generation lubricant)
Castrol 5000
Turbonycoil 525-2A

CAUTION

Do not mix brands or types of oils.

When changing from an existing lubricant formulation [illegible] third generation lubricant formulation [illegible] the engine manufacturer strongly recommends that [illegible] change should only be made when an engine is new or freshly overhauled. For additional information on the use of third generation oils, refer to the engine manufacturer [illegible] pertinent oil service bulletins.

8.21 OIL REQUIREMENTS (Continued)

TOTAL OIL CAPACITY

12 U.S quarts (including oil in filter, cooler and hoses)

DRAIN AND REFILL QUANTITY

Approximately 9.2 U.S. quarts

OIL QUANTITY OPERATING RANGE

NOTE

Oil quantity operating range may be verified either by the dipstick method or by the visual sight glass method. Either method is acceptable for oil quantity preflight operations.

Dipstick Method

Fill to within 1½ quarts of MAX HOT or MAX COLD (as appropriate) on dipstick. Quart markings indicate U.S. quarts low if oil is hot. For example, a dipstick reading of 3 indicates the system is within 2 quarts of MAX, if the oil is cold, and within 3 quarts of MAX if the oil hot. It is recommended the oil level be checked either within 10 minutes after engine shutdown while the oil is hot (MAX HOT marking) or prior to the first flight of the day while the oil is cold (MAX COLD marking). If more than 10 minutes has elapsed since engine shutdown, and engine oil is still warm, perform an engine dry motoring run (Section 4.15) before checking oil level.

WARNING

Ensure oil dipstick cap is securely latched down. Operating the engine with less than the recommended oil level and with the dipstick cap unlatched will result in excessive oil loss and eventual engine stoppage.

8.21 OIL REQUIREMENTS (Continued)

OIL QUANTITY OPERATING RANGE (continued)

Sight Glass Method

Engine oil quantity may be determined by using the visual sight glass located on the aft, left corner of the engine. Oil quantity (whether hot or cold) indicated in the green area of the sight glass is adequate for flight operations.

OIL DRAIN PERIOD

Pratt & Whitney Canada experience, over an extended period of time, has indicated that regular oil changes are no longer necessary for the PT6A-42 engine. However, operators should be aware of the danger of oil contamination from extraneous matter such as hydraulic fluid, sand, etc. which would require the oil system to be drained, flushed and replenished with new oil of an approved brand.

8.23 FUEL SYSTEM

(a) Servicing Fuel System

At every 100 hour inspection or after an extended downtime, the fuel filter strainer must be cleaned. The fuel filter strainer is located under the aft nose section on the left side.

(b) Fuel Requirements (Jet A, Jet A-1)

NOTE

For approved additives, refer to Pratt & Whitney Service Bulletin 3044.

The operation of the aircraft is approved only with an anti-icing additive in the fuel. If pre-blended fuel is not used, then an anti-icing additive must be added to the fuel when refueling. The anti-icing additive must meet the specification MIL-I-27686, must be uniformly blended with the fuel while refueling, and must not exceed 0.15% by volume. *One and one half liquid* ounces per ten gallons of fuel would fall within this range. A blender supplied by the additive manufacturer should be used. Except for the information contained in this section, the manufacturer's mixing or blending instructions should be carefully followed.

CAUTION

Assure that the additive is directed into the flowing fuel stream. The additive flow should start after and stop before the fuel flow. Do not permit the concentrated additive to come in contact with the aircraft painted surfaces or the interior surfaces of the fuel tanks.

Some fuels have anti-icing additives pre-blended in the fuel at the refinery, so no further blending should be performed.

Fuel additive can not be used as a substitute for preflight draining of the fuel system drains.

8.23 FUEL SYSTEM (Continued)

(c) Filling Fuel Tanks

WARNING

Do not operate any avionics or aircraft electrical equipment during refueling. Do not allow open flame or smoking in the vicinity of the airplane while refueling.

During all refueling operations, fire fighting equipment must be available. Two ground wires from different points on the airplane to separate approved grounding stakes shall be used.

Observe all safety precautions required when handling fuel. Fill the fuel tanks through the filler located on the forward slope of the wing. Each wing holds 570 pounds (85 U.S gallons) of usable fuel. When using less than the standard 570 pounds capacity, fuel should be distributed equally between each side.

CAUTION

Fuel imbalance must not exceed 125 pound prior to takeoff.

NOTE

Aircraft should be refueled in a wing level condition. At times this will require alternate filling of left and right tanks until the full condition is reached.

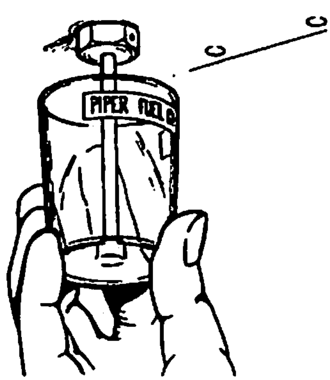
8.23 FUEL SYSTEM (Continued)

(d) Draining Fuel Strainer, Sumps and Lines

The fuel tank sumps, fuel return sumps, and fuel filter should be drained before the first flight of the day and after refueling. The fuel tank sumps and fuel return sumps, which represent the lowest points in the system, are located in the left/right header tanks and behind the firewall at the left/right wing roots respectively. Each fuel system sump drains via flush mounted valves located on the left and right aft bottom portion of the engine cowling. (Refer to Figure 8-4.) The fuel filter drain is located on the lower left side of the cowling a few inches forward of the left sump drain. Sumps and filter should be drained until sufficient fuel has flowed to ensure the removal of any contaminants. (The first fuel sample cup full will only drain fuel from the lines; more than one cup sampling must be taken to assure fuel sample is from the fuel tanks). When draining filter and sumps, use the end of the rod to push in the valve, catching fuel in the cup. (Refer to Figure 8-3.) Always inspect fuel for contaminants, water and fuel grade (color). Assure that valves have sealed after draining.

NOTE

Sump drains will lock open if valve is pushed in and turned. Continue turning to release lock.



FUEL TANK DRAIN
Figure 8-3

8.23 FUEL SYSTEM (Continued)

(e) Emptying Fuel System (See Figure 8-4.)

CAUTION

When draining any amount of fuel, care should be taken to ensure that no fire hazard exists before starting the engine.

CAUTION

Whenever the fuel system is completely drained and fuel is replenished, it will be necessary to purge the fuel system and the fuel control, per the Pratt & Whitney Engine Maintenance Manual, to insure that no air exists in the fuel supply lines.

For draining a large volume of fuel, a quick evacuation outlet is incorporated into the fuel system and is located adjacent to the fuel filter. Fuel can be drained from this outlet by gravity or by using the airplane's boost pumps. Using the airplane's boost pumps provides a means of draining the left and right sides separately.

Draining fuel using gravity is accomplished as follows:

(1) Remove the filter access door.
(2) Close the firewall shutoff valve.
(3) Remove the cap and connect a 1/2 inch hose to the quick evacuation outlet.
(4) Place the other end of the hose in a suitable container. (Be sure the container is large enough to hold the amount of fuel to be drained.)
(5) Open the firewall shutoff valve and allow the fuel to flow into the container.
(6) To stop the fuel flow, close the firewall shutoff valve.
(7) Install the cap on the quick evacuation outlet, and safety wire.

8.23 FUEL SYSTEM (Continued)

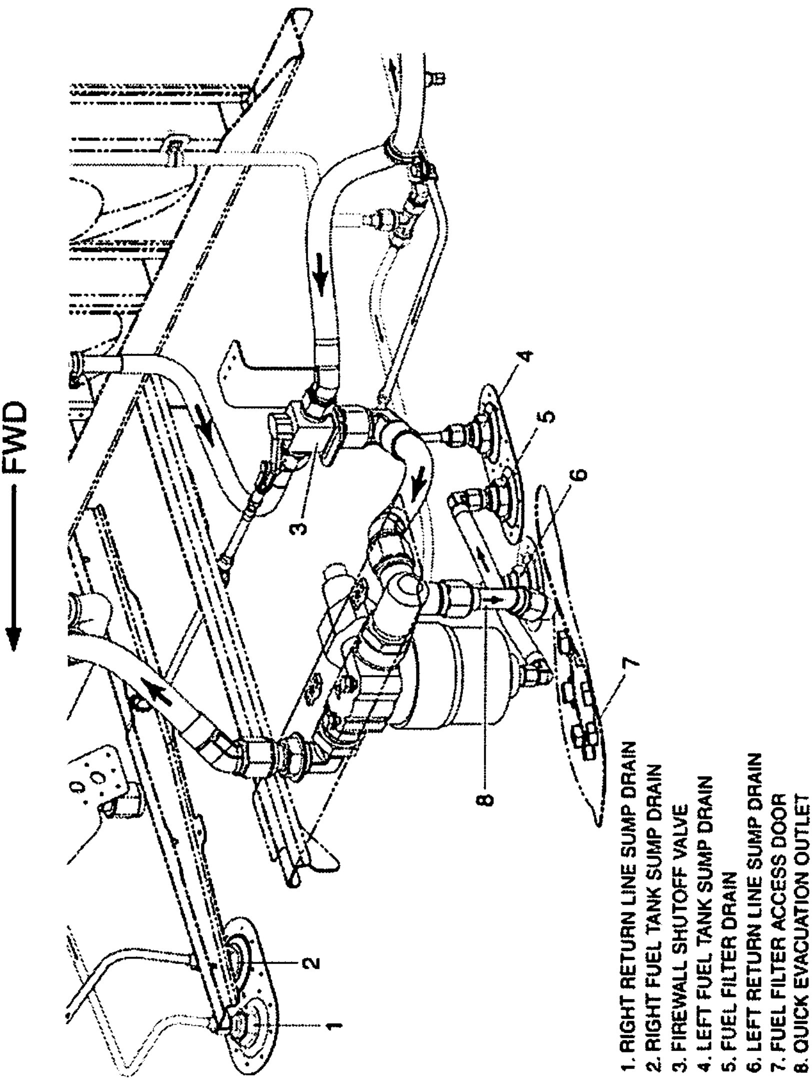
(e) Emptying Fuel System (continued)

Draining fuel using the airplane's boost pumps is accomplished as follows:

(1) Remove the filter access door.
(2) Close the firewall shutoff valve.
(3) Remove the cap and connect a 1/2 inch hose to the quick evacuation outlet.
(4) Place the other end of the hose in a suitable container. (Be sure the container is large enough to hold the amount of fuel to be drained.)
(5) Open the firewall shutoff valve.
(6) Turn the boost pump switch to MAN. (To stop fuel flow, move the switch to OFF and close the firewall shutoff valve.)
(7) If fuel is to be drained from only one side, follow the procedure above except pull the circuit breaker for the pump that is not required.
(8) Install the cap on the quick evacuation outlet, and safety wire.

NOTE

The boost pumps are disabled at approximately 2.5 gallons per side. Most of the remaining fuel can be drained by gravity from the quick evacuation outlet, but the final small amount must be drained from the sump drains.



FUEL QUICK EVACUATION SYSTEM
Figure 8-4

8.25 TIRE INFLATION

For maximum service, keep tires inflated to the proper pressure: nose tire should be 70 psi or 50 psi, depending on type of tire installed (see placard on nose wheel strut to verify correct psi) and main tires should be 55 psi. All wheels and tires are balanced before original installation, and the relationship of tire, tube, and wheel should be maintained upon reinstallation. Unbalanced wheels can cause extreme vibration in the landing gear; therefore, in the installation of new components, it may be necessary to rebalance the wheels with the tires mounted. When checking tire pressure, examine the tires for wear, cuts, bruises, and slippage.

8.27 BATTERY SERVICE

Access to the 24-volt battery is through the battery access panel located on the aft right side of the engine compartment. Remove the access panel by removing the screws securing the panel to the fuselage. Release the retainers (one on each side near the bottom of the battery) by loosening the top screw on each retainer enough to pivot the retainer out of the way and allow the battery to be pulled out.

The battery is maintenance free and requires no maintenance of the liquid level and recombines the gases formed on charge within the battery to reform water. The battery may be used in any attitude without danger of leakage or spilling of electrolyte.

Inspect the battery for general condition (at least every 30 days). If evidence of leakage is present, the battery must be replaced.

8.29 EMERGENCY OXYGEN SYSTEM

The emergency oxygen system must be serviced if used. The canister generators must be replaced with new units to restore the emergency system to a useable condition. The pilot's quick-donning oxygen mask system also must be serviced if used or if it shows indications of low pressure. Refer to the PA-46-500TP Maintenance Manual for oxygen system maintenance and inspection requirements.

8.31 PRESSURIZATION SYSTEM

The system should be given an operational check before each flight. Should the operational check show any malfunction of the pressurization system, refer to the PA-46-500TP Maintenance Manual.

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8.33 LUBRICATION

For lubricating instructions, a chart showing lubrication points and types of lubricants to be used, and lubrication methods, refer to the PA-46-500TP Maintenance Manual.

8.35 CLEANING

(a) Cleaning Engine Compartment

(1) Place a large pan under the engine to catch waste.
(2) See engine maintenance manual for engine external cleaning requirements.
(3) Lubricate the controls, bearing surfaces, etc., in accordance with the Lubrication Chart in the PA-46-500TP Maintenance Manual.
(4) Assure that all engine exhaust deposits and stains are removed frequently from bottom of aircraft around exhaust outlets. *Accumulation of exhaust deposits left even over short periods of time will cause corrosion.*

8.35 CLEANING (Continued)

(b) Cleaning Landing Gear

Before cleaning the landing gear, place a plastic cover or similar material over the wheel and brake assembly.

CAUTION

Do not brush the micro switches.

(1) Place a pan under the gear to catch waste.
(2) Spray or brush the gear area with solvent or a mixture of solvent and degreaser, as desired. Where heavy grease and dirt deposits have collected, it may be necessary to brush areas that were sprayed, in order to clean them.
(3) Allow the solvent to remain on the gear from five to ten minutes. Then rinse the gear with additional solvent and allow to dry.
(4) Remove the cover from the wheel and remove the catch pan.
(5) Lubricate the gear in accordance with the Lubrication Chart.

(c) Cleaning Exterior Surfaces

The airplane should be washed with a mild soap and water. Harsh abrasives or alkaline soaps or detergents could make scratches on painted or plastic surfaces or could cause corrosion of metal. Cover areas where cleaning solutions could cause damage. To wash the airplane, use the following procedure:

CAUTION

Do not direct any stream of water or cleaning solutions at the openings in the pitot head, static ports, alternate static ports or fuselage belly drains.

(1) Flush away loose dirt with water.
(2) Apply cleaning solution with a soft cloth, a sponge or a soft bristle brush.
(3) To remove exhaust stains, allow the solution to remain on the surface longer.
(4) To remove stubborn oil and grease, use a cloth dampened with naphtha.
(5) Rinse all surfaces thoroughly.
(6) Any good automative wax may be used to preserve painted surfaces. Soft cleaning cloths or a chamois should be used to prevent scratches when cleaning or polishing. A heavier coating of wax on the leading surfaces will reduce the abrasion problems in these areas.

8.35 CLEANING (Continued)

(d) Cleaning Windshield and Windows

CAUTION

Use only mild soap and water when cleaning the heated windshield. Use of ANY other clearing agent or material may cause distortion or damage to windshield coatings.

(1) Remove dirt, mud and other loose particles from exterior surfaces with clean water.
(2) Wash with mild soap and warm water or with aircraft plastic cleaner. Use a soft cloth or sponge in a straight back and forth motion. Do not rub harshly.
(3) Remove oil and grease with a cloth moistened with kerosene.

CAUTION

Do not use gasoline, alcohol, benzene, carbon tetrachloride, thinner, acetone, or window cleaning sprays.

(4) After cleaning plastic surfaces, apply a thin coat of hard polishing wax. Rub lightly with a soft cloth. Do not use a circular motion.
(5) A minor scratch or mar in plastic can be removed by rubbing out the scratch with jeweler's rouge. Smooth both sides and apply wax. Deep scratches may lead to failure when pressurized.
(6) If a deep scratch or crack is found in any of the windshields or windows, do not pressurize cabin until serviced at authorized repair station.

(e) Cleaning Headliner, Side Panels and Seats

(1) For normal soiling and smudges, simply use the dry cleaning pad provided. This pad contains an exclusive grit-free powder with unusual power to absorb dirt.

Squeeze and twist the pad so the powder sifts through the meshes and adheres to the cloth. Then rub the soiled part in any direction, as hard as necessary to clean.

Even though the pad eventually becomes soiled, this soil will not transfer back to the headliner.

8.35 CLEANING (Continued)

(2) For simple stains (e.g. coffee, cola) clean headliner with a sponge and a common household suds detergent (e.g. Tide). Dirty grease stains should be first spot cleaned with a lighter fluid containing Naphtha to remove the solvent soluble matter. Any stain residue should then be shampooed with a household upholstery cleaner (e.g. Carbona upholstery and rug shampoo).

With proper care, your Meridian headliner will provide years of excellent appearance and durability.

CAUTION

Solvent cleaners require adequate ventilation.

(3) Leather should be cleaned with saddle soap or a mild hand soap and water.

(f) Cleaning Carpets

To clean carpets, first remove loose dirt with a whisk broom or vacuum. For soiled spots and stubborn stains use a noninflammable dry cleaning fluid. Floor carpets may be cleaned like any household carpet.

(g) Cleaning Oxygen Equipment

(1) Clean the mask assemblies with a suitable oil-free disinfectant.
(2) Wipe dirt and foreign particles from the unit with a clean, dry, lint-free cloth.

(h) Cleaning Surface Deicing Equipment

The deicers should be cleaned when the aircraft is washed using a mild soap and water solution.

In cold weather, wash the boots with the airplane inside a warm hangar if possible. If the cleaning is to be done outdoors, heat the soap and water solution before taking it out to the

8.35 CLEANING (Continued)

airplane. If difficulty is encountered with the water freezing on boots, direct a blast of warm air along the region being cleaned using a portable ground heater.

Petroleum products are injurious to rubber and their use as cleaning agents should be avoided. Limited use of Mineral Spirits or non-leaded (NOT LOW LEAD) gasoline is not harmful in cleaning the deicers, if the cloth is dampened (not dripping) with solvent, and a dry cloth is used to wipe the deicer before the solvent has time to soak into the rubber.

With the deicer boots properly cleaned, a coating of Agemaster No. 1 should be applied to the boots, as described in the PA-46-500TP Maintenance Manual. This treatment helps protect the neoprene deice boots from ozone attack, aging and weathering.

Icex may be applied to all of the boots if icing conditions are anticipated. Any boots treated with Agemaster should be allowed to dry before application of Icex. For specific instructions refer to the PA-46-500TP Maintenance Manual.

8.36 CLEANING AND MAINTENANCE OF RELIEF TUBE SYSTEM

When the aircraft is equipped with a relief tube system, the corrosive effects of urine or other liquids poured through the system are extreme and require much attention to the cleanliness of this system both inside and outside of the aircraft. From the interior standpoint, the funnel tube assembly, rubber hose and surrounding sheet metal should be cleaned at termination of flight when the system has been used. Likewise, attention to the exterior of the aircraft is equally as important and must be cleaned as described below.

NOTE

The corrosive affects of urine on painted and unpainted surfaces cannot be understated. Corrosion may appear in surrounding areas if allowed to go uncleaned for one day.

(a) Interior

After each use of the relief tube, the area surrounding the relief tube should be examined for spillage and cleaned according to the cleaning procedures listed in paragraphs 8.35(e) and (f) above. Clean area inside the box and access door, funnel and tube using mild soap and water. After cleaning, assure that no soapy residue remains by flushing with clean water. Dry system thoroughly.

CAUTION

Should spillage extending into the fuselage be evident, maintenance actions must occur which include removing panels to access the floor structure to neutralize urine spillage in the aircraft structure.

Prepare to flush the relief tube assembly by placing a container underneath the relief tube outlet. Flush tube by pouring a solution of baking soda (10%) and water through the tube, flushing out the entire system. Flush again with at least 1/2 gallon of clear water. (Shop air, at low pressure, may be blown through the relief tube system to dry the system.)

8.36 CLEANING AND MAINTENANCE OF RELIEF TUBE SYSTEM (Continued)

(b) Exterior

Exterior bottom painted surfaces of the aircraft must be cleaned from the firewall to the tip of the tail including the bottom of the tail surfaces, at termination of each flight when the relief tube system has been used. Cleaning should occur in accordance with paragraph 8.35(c) with the following exception: After completion of washing, a solution of baking soda (10%) and water should be applied to the entire area and allowed to remain for a few minutes. The area then must be thoroughly rinsed with clean water. The area should be thoroughly dried and observed for paint chips and corrosion, with touch up as necessary.

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SECTION 9

SUPPLEMENTS

9.1 GENERAL

This section provides information in the form of supplements which are necessary for efficient operation of the airplane when it is equipped with one or more of the various optional systems and equipment not approved with the standard airplane.

All of the supplements provided in this section are FAA Approved and consecutively numbered as a permanent part of this handbook. The information contained in each supplement applies only when the related equipment is installed in the airplane.

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PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 1
FOR
GARMIN GNS 430 VHF COMMUNICATION TRANSCEIVER/VOR/ILS RECEIVER/GPS RECEIVER

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the Garmin GNS 430 VHF Communication Transceiver/VOR/ILS Receiver/GPS Receiver is installed per the Equipment List. The information contained herein supplements or supersedes the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

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VERO BEACH, FLORIDA

DATE OF APPROVAL: May 6, 2005

SECTION 1 - GENERAL

The GNS 430 System is a fully integrated, panel mounted instrument, which contains a VHF Communications Transceiver, a VOR/ILS Receiver, and a Global Positioning System (GPS) Navigation computer. The system consists of a GPS Antenna, GPS Receiver, VHF VOR/LOC/GS Antenna, VOR/ILS Receiver, VHF COMM Antenna and a VHF Communications Transceiver. The primary function of the VHF Communication portion of the equipment is to facilitate communication with Air Traffic Control. The primary function of the VOR/ILS Receiver portion of the equipment is to receive and demodulate VOR, Localizer, and Glide Slope signals. The primary function of the GPS portion of the system is to acquire signals from the GPS system satellites, recover orbital data, make range and Doppler measurements, and process this information in real- time to obtain the user's position, velocity, and time.

Provided the GARMIN GNS 430's GPS receiver is receiving adequate usable signals, it has been demonstrated capable of and has been shown to meet the accuracy specifications for:

- VFR/IFR enroute, terminal, and non-precision instrument approach (GPS, Loran-C, VOR, VOR-DME, TACAN, NDB, NDB- DME, RNAV) operation within the U.S. National Airspace System in accordance with AC 20-138.

- One of the approved sensors, for a single or dual GNS 430 installation, for North Atlantic Minimum Navigation Performance Specification (MNPS) Airspace in accordance with AC 91-49 and AC 120- 33.

- The system meets RNP5 airspace (BRNAV) requirements of AC 90-96 and in accordance with AC 20-138, and JAA AMJ 20X2 Leaflet 2 Revision 1, provided it is receiving usable navigation information from the GPS receiver.

NOTE

Navigation is accomplished using the WGS-84 (NAD-83) coordinate reference datum. Navigation data is based upon use of only the Global Positioning System (GPS) operated by the United States of America.

SECTION 2 - LIMITATIONS

A. The GARMIN GNS 430 Pilot's Guide, p/n 190-00140-00, Rev. A, dated October 1998, or later appropriate revision, must be immediately available to the flight crew whenever navigation is predicated on the use of the system.

B. The GNS 430 must utilize the following or later FAA approved software versions:

Sub-System	Software Version
Main	2.00
GPS	2.00
Comm	1.22
VOR/LOC	1.25
G/S	2.00

The main software version is displayed on the GNS 430 self test page immediately after turn-on for 5 seconds. The remaining system software versions can be verified on the AUX group sub-page 2, "SOFTWARE/DATABASE VER".

SECTION 2 - LIMITATIONS (continued)

C. IFR enroute and terminal navigation predicated upon the GNS 430's GPS Receiver is prohibited unless the pilot verifies the currency of the data base or verifies each selected waypoint for accuracy by reference to current approved data.

D. Instrument approach navigation predicated upon the GNS 430's GPS Receiver must be accomplished in accordance with approved instrument approach procedures that are retrieved from the GPS equipment data base. The GPS equipment data base must incorporate the current update cycle.

E. Instrument approaches utilizing the GPS receiver must be conducted in the approach mode and Receiver Autonomous Integrity Monitoring (RAIM) must be available at the Final Approach Fix.

F. Accomplishment of ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for GPS overlay with the GNS 430's GPS receiver is not authorized.

G. Use of the GNS 430 VOR/ILS receiver to fly approaches not approved for GPS require VOR/ILS navigation data to be present on the external indicator.

H. When an alternate airport is required by the applicable operating rules, it must be served by an approach based on other than GPS or Loran-C navigation, the aircraft must have the operational equipment capable of using that navigation aid, and the required navigation aid must be operational.

I. VNAV information may be utilized for advisory information only. Use of VNAV information for Instrument Approach Procedures does not guarantee Step-Down Fix altitude protection, or arrival at approach minimums in normal position to land.

SECTION 2 - LIMITATIONS (continued)

J. If not previously defined, the following default settings must be made in the "SETUP 1" menu of the GNS 430 prior to operation (refer to Pilot's Guide for procedure if necessary):

n k
1. dis, spd.........m t (sets navigation units to "nautical miles" and "knots")
2. alt, vs...........ft fpm (sets altitude units to "feet" and "feet per minute")
3. map datum...WGS 84 (sets map datum to WGS-84, see note below)
4. posn.............deg-min (sets navigation grid units to decimal minutes)

NOTE

In some areas outside the United States, datums other than WGS-84 or NAD-83 may be used. If the GNS 430 is authorized for use by the appropriate Airworthiness authority, the required geodetic datum must be set in the GNS 430 prior to its use for navigation.

SECTION 3 - EMERGENCY PROCEDURES

ABNORMAL PROCEDURES

A. If GARMIN GNS 430 navigation information is not available or invalid, utilize remaining operational navigation equipment as required.

B. If "RAIM POSITION WARNING" message is displayed the system will flag and no longer provide GPS based navigational guidance. The crew should revert to the GNS 430 VOR/ILS receiver or an alternate means of navigation other than the GNS 430's GPS receiver.

C. If "RAIM IS NOT AVAILABLE" message is displayed in the enroute, terminal, or initial approach phase of flight, continue to navigate using the GPS equipment or revert to an alternate means of navigation other than the GNS 430's GPS receiver appropriate to the route and phase of flight. When continuing to use GPS navigation, position must be verified every 15 minutes using the GNS 430's VOR/ILS receiver or another IFR-approved navigation system.

D. If "RAIM IS NOT AVAILABLE" message is displayed while on the final approach segment, GPS based navigation will continue for up to 5 minutes with approach CDI sensitivity (0.3 nautical mile). After 5 minutes the system will flag and no longer provide course guidance with approach sensitivity. Missed approach course guidance may still be available with 1 nautical mile CDI sensitivity by executing the missed approach.

E. In an in-flight emergency, depressing and holding the Comm transfer button for 2 seconds will select the emergency frequency of 121.500 Mhz into the "Active" frequency window.

SECTION 4 - NORMAL PROCEDURES

CAUTION

Familiarity with the enroute operation of the GNS 430 does not constitute proficiency in approach operations. Do not attempt approach operations in IMC prior to attaining proficiency in the use of the GNS 430 approach feature.

A. DETAILED OPERATING PROCEDURES

Normal operating procedures are described in the GARMIN GNS 430 Pilot's Guide, p/n 190-00140-00, Rev. A, dated October 1998, or later appropriate revision.

B. CROSSFILL OPERATIONS

Crossfill capabilities exist between the GNS 430 systems. Refer to the Garmin GNS 430 Pilot's Guide for detailed crossfill operating instructions.

C. AUTOMATIC LOCALIZER COURSE CAPTURE

By default, the GNS 430 automatic localizer course capture feature is enabled. This feature provides a method for system navigation data present on the external indicator to be switched automatically from GPS guidance to localizer/glide slope guidance at the point of course intercept on a localizer at which GPS derived course deviation equals localizer derived course deviation. If an offset from the final approach course is being flown, it is possible that the automatic switch from GPS course guidance to localizer/glide slope course guidance will not occur. It is the pilot's responsibility to ensure correct system navigation data is present on the external indicator before continuing a localizer based approach beyond the final approach fix.

SECTION 5 - PERFORMANCE

No Change.

SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in the Equipment List attached to the Pilot's Operating Handbook.

SECTION 7 - DESCRIPTION AND OPERATION

See the GNS 430 Pilot's Guide for a complete description of the GNS 430 system.

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 2
FOR
S-TEC DME-450

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the S-TEC DME-450 is installed per the Equipment List. The information contained herein supplements or supersedes the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

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SECTION 1 - GENERAL

The S-TEC DME-450 system is a full feature, solid state, remote mounted system with full 200 channel capability. For long distance operation, it provides a full 100 watts maximum pulse power transmitter output.

The IND-450 indicator (see figure 1) provides selectable read-out of distance to/from the station, ground speed, and time to/from the station. Features also include automatic display dimming and waypoint annunciation.

SECTION 2 - LIMITATIONS

No change.

SECTION 3 - EMERGENCY PROCEDURES

No change.

SECTION 4 - NORMAL PROCEDURES

DME OPERATION

- DME Mode Selector Switch - Set to DME 1 or DME 2
- NAV 1 and NAV 2 VHF Navigation Receivers - ON; SET FREQUENCY to VOR/DME station frequencies, as required.

NOTE

When the VOR frequency is selected, the appropriate DME Frequency is automatically channeled.

- DME audio selector button (on audio selector panel) - SET to desired mode.

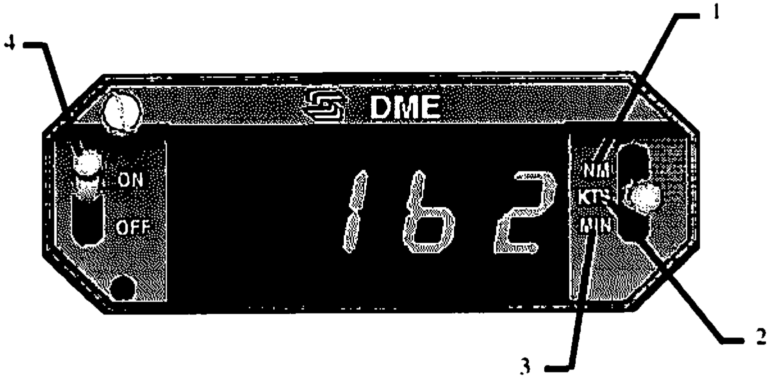
SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in Section 6 of the Pilot's Operating Handbook and Airplane Flight Manual.

SECTION 7 - DESCRIPTION AND OPERATION



IND-450
Figure 1

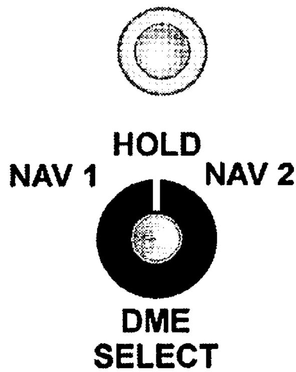
1. DISTANCE DISPLAY (NM) - DME distance to VORTAC/WAYPOINT displayed in .1 nautical mile increments up to 99.9 NM, then in increments of one nautical mile.

2. GROUND SPEED DISPLAY (KTS) - Displays ground speed in knots to or from VORTAC/WAYPOINT up to 999 knots (aircraft must be flying directly to or from the VORTAC/WAYPOINT for true ground speed indication.

3. TIME TO STATION DISPLAY (MIN) - Displays time to station (VORTAC/WAYPOINT) in minutes up to 99 minutes (aircraft must be flying directly to or from the VORTAC/WAYPOINT for true time to the station indication.

7 - DESCRIPTION AND OPERATION (continued)

4. DME ON/OFF SWITCH - Turns DME power on or off.



Mode Selector Switch
Figure 2

5. DME MODE SELECTOR SWITCH (NAV 1, HOLD, NAV 2) - Selects DME operating mode as follows:

   NAV 1 - Selects DME operation with NO. 1 VHF navigation set; enables channel selection by NAV 1 frequency selector controls.

   HOLD - Selects DME memory circuit; DME remains channeled to station to which it was last channeled when HOLD was selected and will continue to display information relative to this channel. Allows both the NAV 1 and NAV 2 navigation receivers to be set to new operational frequencies without affecting the previously selected DME operation.

   NOTE

   In the HOLD mode there is no annunciation of the VOR/DME station frequency. However, an annunciator light located above the HOLD position of the selector illuminates to inform the pilot that the DME is in the HOLD mode.

   NAV 2 - Selects DME operation with NO. 2 VHF navigation set; enables channel selection by NAV 2 frequency selector controls.

PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 3 FOR GARMIN GMA 340 AUDIO PANEL

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the Garmin GMA 340 is installed per the Equipment List. The information contained herein supplements or supersedes the information in the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures, and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

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SECTION 1 - GENERAL

This supplement supplies information necessary for the operation of the airplane when the Garmin GMA 340 audio panel is installed in accordance with FAA approved Piper data.

SECTION 2 - LIMITATIONS

No change.

SECTION 3 - EMERGENCY PROCEDURES

No change.

SECTION 4 - NORMAL PROCEDURES

AUDIO CONTROL SYSTEM OPERATION:

- Select the desired transmitter audio selector button (COM1, COM2, OR COM3) and verify that the buttons LED is illuminated.
- INTERCOM VOL Control (ICS) - Adjust to desired listening level.
- INTERCOM VOX (voice) Sensitivity Control - ROTATE CONTROL knob clockwise to the middle range and then adjust as required for desired voice activation or hot mic intercom.
- If desired, select the speaker function button. Selecting this button allows radio transmissions to be received over the cabin speaker.

NOTE

Audio level is controlled by the selected NAV radio volume control.

MARKER BEACON RECEIVER OPERATION:

- TEST Button - PRESS to verify all marker lights are operational.
- SENS Button - SELECT HI for airway flying for LO for ILS/LOC approaches.

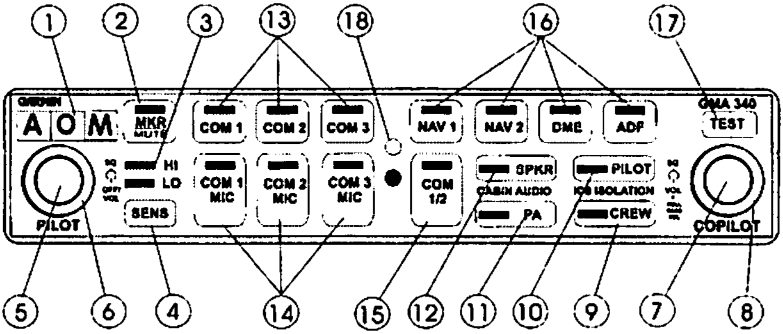
SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in section 6 of the Airplane Flight Manual.

SECTION 7 - DESCRIPTION AND OPERATION



1. Marker Beacon Lamps
2. Marker Beacon Receiver Audio Select/Mute Button
3. Marker Beacon Receiver Sensitivity Selection Indicator LED
4. Marker Beacon Receiver Sensitivity Selection Button
5. Unit On/Off, Pilot Intercom System (ICS) Volume
6. Pilot ICS Voice Activated (VOX) Intercom Squelch Level
7. Copilot and Passenger ICS Volume Control (Pull out for Passenger Volume)
8. Copilot/Passenger VOX Intercom Squelch Level
9. Crew Isolation Intercom Mode Button
10. Pilot Isolation Intercom Mode Button
11. Passenger Address (PA) Function Button
12. Speaker Function Button
13. Transceiver Audio Selector Buttons (COM1, COM2, COM3)
14. Transmitter (Audio/Mic) Selection Buttons
15. Split COM Button
16. Aircraft Radio Audio Selection Buttons (NAV1, NAV2, DME, ADF)
17. Annunciator Test Button
18. Photocell - Automatic Annunciator Dimming

SECTION 7 - DESCRIPTION AND OPERATION (continued)

ON/OFF, Pilot Intercom System (ICS) Volume Control

The GMA 340 is powered OFF when the left small knob (5) is rotated fully CCW into the detent. To turn the unit ON, rotate the knob clockwise past the click. The knob then functions as the pilot ICS volume control. A fail safe circuit connects the pilot's headset and microphone directly to COM1 in case power is interrupted or the unit is turned OFF.

Transceivers

Selection of either COM1, COM2, or COM3 for both MIC and audio source is accomplished by pressing either COM1, MIC, COM2 MIC, COM3 MIC (14). The activeCOM audio is always heard on the headphones.

Additionally, each audio source can be selected independently by pressing COM1, COM2, or COM3 (13). When selected this way, they remain active as audio sources regardless of which transceiver has been selected for microphone use.

When a microphone is keyed, the active transceiver's MIC button LED blinks approximately one per second to indicate that the radio is transmitting.

NOTE

Audio level is controlled by the selected COM radio volume controls.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Split COM

Pressing the COM 1/2 button (15) activates the split COM function. When this mode is active, COM1 is dedicated solely to the pilot for MIC/Audio while COM2 is dedicated to the copilot for MIC/Audio. The pilot and copilot can simultaneously transmit in this mode over separate radios. Both pilots can still listen to COM3, NAV1, NAV2, DME, ADF, and MRK as selected. The split COM mode is cancelled by pressing the COM 1/2 button a second time.

When in the split COM mode the copilot may make PA announcements while the pilot continues using COM1 independently. When the PA button is pressed after the split com mode is activated the copilot's mic is output over the cabin speaker when keyed. A second press of the PA button returns the copilot to normal split COM operation.

NOTE

It is possible that radio interference may occur in the split COM mode when the frequencies of the two communications radios are close together (normally less than one MHz). The extent of the interference is a function of the specific frequencies selected, transmitted power, antenna spacing, etc. No guarantee is made to the performance of the split COM feature on small aircraft.

Aircraft Radios and Navigation

Pressing NAV1, NAV2, DME, ADF (16) or MRK (2) selects each audio source. A second button press deselects the audio.

Speaker Output

Pressing the SPKR button (12) selects the aircraft radios over the cabin speaker. The speaker output is muted when a COM microphone is keyed.

PA Function

The PA mode is activated by pressing the PA button (11). Then, when either the pilot's or copilot's microphone is keyed, the corresponding mic audio is heard over the cabin speaker. If the SKR button is also active, then any selected speaker audio is muted while the microphone is keyed. The SPKR button does not have to be previously active in order to use the PA function.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Intercom System (ICS)

Intercom volume and squelch (VOX) are adjusted using the following front panel knobs:

- **Left Small Knob** - Unit ON/OFF power control and pilot's ICS volume. Full CCW detent position is OFF.
- **Left Large Knob** - Pilot ICS mic VOX squelch level. CW rotation increases the amount of mic audio (VOX level) required to break squelch. Full CCW is the "HOT MIC" position (no squelch).
- **Right Small Knob** - IN position: Copilot ICS volume. OUT position: Passenger ICS volume.
- **Right Large Knob** - Copilot and passenger mic VOX squelch level. CW rotation increases the amount of mic audio (VOX level) required to break squelch. Full CCW is the "HOT MIC" position.
- **PILOT Mode** - This mode isolates the pilot from everyone else and dedicates the aircraft radios to the pilot exclusively. The copilot and passengers share communications between themselves but cannot communicate with the pilot or hear the aircraft radios.
- **CREW Mode** - This mode places the pilot and copilot on a common ICS communication channel with the aircraft radios. The passengers are on their own intercom channel and can communicate with each other, but cannot communicate with the crew or hear the aircraft radios.

Marker Beacon Receiver

The GMA 340's marker beacon receiver controls are located on the left side of the front panel (1 - 4). The SENS button selects either high or low sensitivity as indicated by the HI or LO LED being lit. Low sensitivity is used on ILS approaches while high sensitivity allows operation over airway markers or to get an earlier indication of nearing the outer marker during an approach.

The marker audio is initially selected by pressing the MKR/Mute button (2). If no beacon signal is received, then a second button press will deselect the marker audio. This operation is similar to selecting any other audio source on the GMA 340. However, if the second button press occurs while a marker beacon signal is received, then the marker audio is muted but not deselected. The buttons LED will remain lit to indicate that the source is still selected. When the current marker signal is no longer received, the audio is automatically un-muted. While in the muted state, pressing the MKR/Mute button deselects the marker audio. The button's LED will extinguish to indicate that the marker audio is no longer selected.

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 4
FOR
S-TEC ADF-650D SYSTEM

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the S-TEC ADF-650D System is installed per the equipment list. The information contained herein supplements or supersedes the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures, performance and loading information not contained in this supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

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VERO BEACH, FLORIDA

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SECTION 1 - GENERAL

This supplement supplies information necessary for the operation of the airplane when the S-TEC ADF-650D System is installed in accordance with FAA approved Piper data.

SECTION 2 - LIMITATIONS

No change.

SECTION 3 - EMERGENCY PROCEDURES

No change.

SECTION 4 - NORMAL PROCEDURES

To turn on the ADF-650D System:

- Depress the PWR button momentarily and release.

NOTE

If the PWR button is pressed for longer than 3 seconds, the receiver will immediately shut off.

- After successful self test, input desired station frequency and select ANT mode.
- Positively identify selected station or beacon.
- Adjust volume control as required.
- If ADF-650D System is used for navigation, select ADF or BFO mode immediately after the station has been positively identified.

To turn off the ADF-650D System:

- Depress the PWR button for at least 3 seconds.

NOTE

If the PWR button is released within 3 seconds, normal operations will resume.

SECTION 4 - NORMAL PROCEDURES (continued)

To perform the preflight checklist and self test:

- After successful self test, press the mode control until ANT is displayed and input a predetermined frequency to select a station in the immediate area. Adjust the volume control as necessary to provide a comfortable listening level.
- Press the ID button and observe that the station identification code becomes louder (if the station is voice-identified, it is not necessary to press the ID button).
- Press the ID button again to cancel the IDENT function and press the mode control until ADF is displayed.
- Observe the IND-650A Indicator and note that the bearing pointer indicates the relative bearing to the station.
- Push the TEST button while observing the indicator bearing pointer. The bearing pointer will rotate 90° and stop.
- Push the TEST button again (to turn off test function). The bearing pointer returns to the original relative bearing position.
- Switch to BFO mode, if appropriate, and verify a tone is present. Select the appropriate operating mode when all checks have been completed.

SECTION 5 - PERFORMANCE

No change.

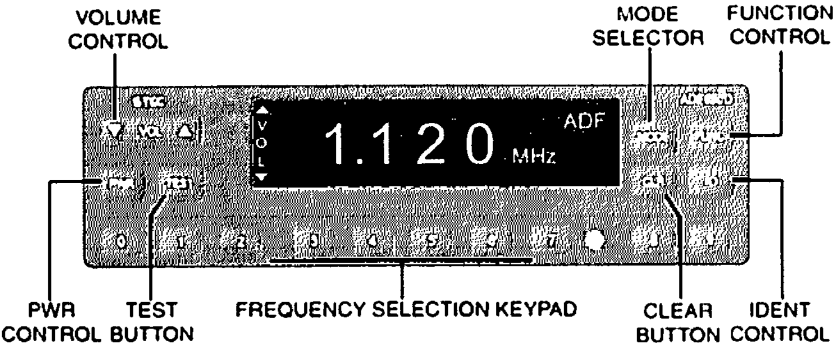
SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in Section 6 of the Pilot's Operating Handbook and Airplane Flight Manual.

SECTION 7 - DESCRIPTION AND OPERATION

The S-TEC ADF-650D System operates over a frequency range of 200 through 1799 kHz in 1-kHz increments. Three operating modes are included as part of the ADF-650D System.

- BFO
- ADF
- ANT



RCR-650D Receiver Controls

Beat Frequency Oscillator (BFO) Mode

The BFO (beat frequency oscillator) mode is used to aurally identify stations that employ keyed CW (Carrier Wave) rather than amplitude modulation techniques. This mode activates the bearing pointer. The bearing pointer will point in the direction of the station relative to the aircraft heading.

NOTE

CW signals (Morse Code) are unmodulated and no audio will be heard without use of BFO. This type of signal is not used in the United States air navigation. It is used in some foreign countries and marine beacons.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Automatic Direction Finder (ADF) Mode

The Automatic Direction Finder (ADF) mode uses conventional nondirectional beacons and AM broadcast stations for navigation. This mode activates the bearing pointer. The bearing pointer will point in the direction of the station relative to the aircraft heading.

Antenna (ANT) Mode

The ANT (antenna) mode cannot be used for navigation; this mode enhances audio reception clarity and is normally used for station identification.

Frequency Selection Keypad

The Frequency Selection Keypad is used to select the system operating frequency. The keypad consists of a row of numbered buttons from 0 to 9, located along the bottom of the RCR-650D Receiver. Frequencies in the megahertz and kilohertz range may be selected.

Power (PWR) Control

The power control is used to turn the receiver on and off. Momentarily depressing the PWR button will turn the receiver on and also initiate a self test.

NOTE

If the PWR button is pressed for longer than 3 seconds the receiver will immediately shut off.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Clear (CLR)

The clear function offers several options for the operator.

- If the entire frequency is entered and the CLR button is pushed, all the numbers will become dashes. An additional push on the CLR button will restore and display the prior frequency entry.
- If an entry is in progress and a number is entered in error, pressing the CLR button will erase the last number entry.
- Pressing the CLR button while in the contrast function reverses the display image and also places the receiver in manual mode.

NOTE

It is not necessary to push CLR to enter a new frequency number. Simply complete the entry and then enter the new numbers and they will replace the old frequency.

Volume (VOL) Control

The audio volume control is used to adjust the settings and levels for all function selector and setup modes and is controlled by pressing the ^ and v buttons on the VOL control.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Function (FUNC) Selector

The function selector enables the user to select between contrast and volume display functions (on power-up, the RCR-650D will be in the volume display function). The first time the function selector is pressed, the receiver enters the contrast function. Subsequent presses of the function selector button toggles the unit between contrast and volume. Additionally, pressing the clear button while in the contrast function places the receiver in manual mode. In manual mode, subsequent pushes of the function selector will cycle the receiver through four functions: volume, contrast, display and keypad.

- **Volume**

The volume control function is available on power-up and is accessed immediately by pressing the ^ and v buttons on the VOL control. Upon activation, the kHz and mode annunciations are temporarily replaced by the text "VOLUME" with a horizontal fill bar. The filled portion of the bar indicates the current volume setting.

- **Contrast**

The contrast function is activated by pressing the FUNC selector. Upon activation, the kHz and mode annunciation are temporarily replaced by the text "CONTRAST" with a horizontal fill bar on the right side of the annunciator panel. The filled portion of the bar indicates the current contrast setting. The contrast is adjusted by pressing the appropriate ^ and v indicators on the volume control.

- **Display**

When the display is setup in the manual mode, press the FUNC selector until the display function is selected. The display function is then activated and the kHz and mode annunciations are temporarily replaced by the text "DISPLAY" with a horizontal fill bar on the right side of the annunciator panel. The filled portion of the bar indicates the current display setting. The display is adjusted by pressing the appropriate ^ and v indicators on the volume control.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Function (FUNC) Selector - continued

- **Keypad Light Brightness**

The keypad light brightness setting is used to adjust the brightness of all legends on the display face. When the display is setup in the manual mode, press the FUNC selector until the keypad function is selected. The keypad function is then displayed with the text "KEYPAD" and a horizontal fill bar on the right side of the annunciator panel. The filled portion of the bar indicates the current keypad brightness setting. The brightness is adjusted by pressing the appropriate ^ and v indicators on the volume control.

Mode Selector

The mode selector is used to select one of the three operating states: BFO, ADF, or ANT. Pressing the MODE selector button will step the receiver through the three modes. The current mode will be displayed in the upper right corner of the display. On system power-up, the mode selector will be in the ADF mode.

Ident (ID)

The receiver utilizes an Ident Filter for audio output which aids in receiving weak signals. Pressing the ID button toggles the Ident Filter on and off. When the Ident Filter is active, the text "IDENT" is displayed in the bottom right corner of the display.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Test Mode

Press the TEST button to start the test mode. The text "TEST" will be displayed in the bottom right corner of the display for approximately 15 seconds. During this time, the IND-650A Indicator pointer will incrementally rotate 90°. Press the TEST button again to cancel the test while in this mode. The pointer will immediately return to its starting point.

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 5
FOR
GARMIN GTX 330/330D TRANSPONDER

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the Garmin GTX 330/330D Transponder is installed per the Equipment List. The information contained herein supplements or supersedes the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

FAA APPROVED: LINDA J. DICKEN
DOA-510620-CE
THE NEW PIPER AIRCRAFT, INC.
VERO BEACH, FLORIDA

DATE OF APPROVAL: May 6, 2005

SECTION 1 - GENERAL

This supplement supplies information necessary for the operation of the airplane when the Garmin GTX 330/330D Transponder is installed in accordance with FAA approved Piper data.

SECTION 2 - LIMITATIONS

A. Display of TIS traffic information is advisory only and does not relieve the pilot responsibility to "see and avoid" other aircraft. Aircraft maneuvers shall not be predicated on the TIS displayed information.

B. Display of TIS traffic information does not constitute a TCAS I or TCAS II collision avoidance system as required by 14 CFR Part 121 or Part 135.

C. Title 14 of the Code of Federal Regulations (14 CFR) states that "When an Air Traffic Control (ATC) clearance has been obtained, no pilot-in-command (PIC) may deviate from that clearance, except in an emergency, unless he obtains an amended clearance." Traffic information provided by the TIS up-link does not relieve the PIC of this responsibility.

D. The 400/500 Series Garmin Display Interfaces (Pilot's Guide Addendum) P/N 190-00140-13 Rev. A or later revision must be accessible to the flight crew during flight.

E. 400/500 Series Main Software 4.00 or later FAA approved software is required to operate the TIS interface and provide TIS functionality.

SECTION 3 - EMERGENCY PROCEDURES

To transmit an emergency signal:

- Mode Selection Key - ALT
- Code Selection - SELECT 7700

To transmit a signal representing loss of all communications:

- Mode Selection Key - ALT
- Code Selection - SELECT 7600

SECTION 4 - NORMAL PROCEDURES

BEFORE TAKEOFF:

To transmit Mode C (Altitude Reporting) code in flight:

- Mode Selection Key - ALT
- Code Selector Keys - SELECT assigned code.

To transmit Mode A (Aircraft Identification) code in flight:

- Mode Selector Key - ON
- Code Selector Keys - SELECT assigned code.

NOTE

During normal operation with the ON mode selected, the reply indicator "R" flashes, indicating transponder replies to interrogations.

NOTE

Mode A reply codes are transmitted in ALT also; however, Mode C codes only are suppressed when the Function Selector ON key is selected.

NOTE

GTX 330D Diversity Option is operational only with the No. 1 Transponder.

1. DETAILED TRANSPONDER OPERATING PROCEDURES

   Normal transponder operating procedures are described in the GARMIN GTX 330 Pilot's Guide, P/N 190-00207-00, Rev. A, or later appropriate revision.

2. DISPLAY OF TRAFFIC INFORMATION SERVICE (TIS) DATA

   TIS surveillance data uplinked by Air Traffic Control (ATC) radar through the GTX 330 Mode S Transponder will appear on the interfaced display device (Garmin 400 or 500 series products). For detailed operating instructions and information regarding the TIS interface, refer to the 400/500 Series Garmin Display Interfaces (Pilot's Guide Addendum) P/N 190-00140-13 Rev. A or later appropriate revision.

SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in section 6 of the Airplane Flight Manual.

SECTION 7 - DESCRIPTION AND OPERATION

See the 400/500 Series Garmin Display Interfaces (Pilot's Guide Addendum), P/N 190-00140-13, and GTX 330 Pilot's Guide, P/N 190-00207-00, for a complete description of the GTX 330 system.

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 6
FOR
MERIDIAN AIRCRAFT
FLIGHT INTO KNOWN ICING (FIKI)

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when operating the Piper PA-46-500TP Meridian airplane into known icing conditions. The information contained in this document supplements or supersedes the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures, performance and loading information not contained in this supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

FAA APPROVED: [signature]
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VERO BEACH, FLORIDA

DATE OF APPROVAL: May 6, 2005

SECTION 1 - GENERAL

This supplement provides information necessary for the operation of the Piper Meridian aircraft for flight into known icing conditions.

Icing conditions can exist when:

- The outside air temperature (OAT) is 10°C or colder, and visible moisture in any form such as clouds, fog or mist, rain, snow, sleet and ice crystals are present.
- During ground operations when operating on contaminated ramps, taxiways or runways where surface snow, ice, standing water or slush are present.
- There are visible signs of ice accretion on the aircraft.

The Meridian ice protection system was designed and tested for operation in light to moderate meteorological conditions defined in FAR 25, Appendix C, for continuous maximum and intermittent maximum icing conditions. The ice protection system was not designed or tested for flight in freezing rain, freezing drizzle or supercooled liquid water and ice crystals, or conditions defined as severe. Flight in these conditions is prohibited and must be avoided.

The ice protection system was not designed to remove ice, snow or frost accumulations from a parked airplane. Ice, snow or frost must be completely removed during preflight to ensure a safe takeoff and subsequent flight. Procedures for ice, snow or frost removal, such as a heated hangar and/or approved deicing fluids, must be used to ensure that **ALL** ice, snow, or frost is **COMPLETELY** removed from the wings, tail, control surfaces, windshield, propeller, engine intakes, fuel vents and pitot-static ports, prior to flight.

Some icing conditions not defined in FAR Part 25, Appendix C have the potential of producing hazardous ice accumulations, which may exceed the capabilities of the airplane's ice protection equipment.

Flight into icing conditions which are outside the FAR defined conditions is prohibited, and pilots are advised to be prepared to divert the flight promptly, by changing course or altitude, if hazardous ice accumulations occur.

SECTION 1 - GENERAL (continued)

ICING DEFINITIONS

Residual Ice - Ice that remains attached to the de-ice boot at the conclusion of that boot inflation cycle.

Intercycle Ice - The quantity of ice that accumulates on the wing horizontal stabilizer and vertical tail de-ice boots between de-ice boot cycles.

Failure Ice - The quantity of ice accumulated on the wing horizontal stabilizer and vertical tail de-ice boots if the pneumatic surface de-ice system fails.

SECTION 2 - LIMITATIONS

REQUIRED EQUIPMENT

The Piper Meridian airplane is approved for flight into light to moderate icing conditions as defined by FAR Part 25, Appendix C, only if the following required ice protection systems and equipment are installed and functioning properly.

1. Surface De-ice System
2. Propeller Anti-ice System
3. Windshield Heat Anti-ice System
4. Pitot Heat Anti-ice System
5. Stall Heat Anti-ice System
6. Wing Inspection Light

NOTE

The Generator and Alternator must be installed and functioning properly for flight into known icing conditions.

ENVIRONMENTAL CONDITIONS

Inadvertent operation in freezing rain, freezing drizzle, or conditions defined as severe may be detected by heavy ice accumulation on the airframe and windshield, ice accumulation in areas not normally observed to collect ice, or when ice forms on the upper surface of the wing, aft of the surface de-ice boot. If these conditions are encountered, the pilot should take immediate action to exit these conditions by changing altitude or course.

SECTION 2 - LIMITATIONS (continued)

MINIMUM SPEED IN ICING CONDITIONS

Minimum speed during flight in icing conditions with the flaps up is 130 KIAS.

FLAP SETTINGS FOR OPERATION IN ICING CONDITIONS

Flaps must be up when holding in icing conditions. Maximum flap extension with **ANY** ice accumulation on the airframe is limited to **20°**.

MINIMUM TORQUE REQUIRED FOR PROPER SURFACE DE-ICE SYSTEM OPERATION

During flight, engine torque must be maintained at the following settings to assure proper surface de-ice system operation.

- Above 25,000 feet - engine torque must be 350 ft. lb. or greater
- At or below 25,000 feet - engine torque must be 250 ft. lb. or greater

WINDSHIELD HEAT

Ground operation with windshield heat selected to **ANTI ICE** or **DEFOG** is limited to 20 seconds duration.

MAGNETIC COMPASS

Accuracy of the magnetic compass is unreliable with windshield heat, air conditioner and blower fan on.

SECTION 2 - LIMITATIONS (continued)

AUTOPILOT

Autopilot operation during icing conditions may mask cues that indicate adverse changes in aircraft handling characteristics. Autopilot operation is prohibited if any of the following conditions in icing flight are experienced:

- Severe icing conditions (reference Section 1. General)
- Unusual aileron roll forces noted
- Elevator bridging is encountered
- Frequent autopilot trim annunciations during straight and level flight

NOTE

The autopilot must be disconnected periodically to evaluate the above mentioned conditions.

CAUTION

During flight in icing conditions, ice will form on the unprotected leading edge of the elevator, and possibly form a bridge of ice, or ice cap, between the stabilizer and the elevator. This condition may be detected and verified by visual observation, by increased elevator pitch control forces, or frequent autopilot trim annunciations during straight and level flight. If ice bridging is detected or suspected, disconnect the autopilot and cycle the aircraft elevator pitch control to dislodge the ice bridge. [illegible]

SECTION 2 - LIMITATIONS (continued)

SURFACE DE-ICE SYSTEM

Operation of the surface de-ice system is prohibited in temperatures below -40°C. Such operation may result in damage to the surface de-ice boots.

PLACARDS

On the pilot's left side panel:

THIS AIRCRAFT MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS. NO ACROBATIC MANEUVERS (INCLUDING SPINS) APPROVED. THIS AIRCRAFT APPROVED FOR V.F.R., I.F.R., DAY AND NIGHT ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH THE AIRPLANE FLIGHT MANUAL.

WARNING
TURN OFF STROBE LIGHTS WHEN IN CLOSE PROXIMITY TO GROUND OR DURING FLIGHT THROUGH CLOUD, FOG OR HAZE.

PRESSURIZED LANDING NOT APPROVED.

SECTION 3 - EMERGENCY PROCEDURES

ICE PROTECTION SYSTEM ANNUNCIATORS

Green - Surface De-ice (SURF DE-ICE) - Illuminates when the de-ice boots inflate. (When the SURF DE-ICE switch is selected ON, the de-ice boot pressure reaches 10 psig and the pneumatic de-ice system cycles in sequence: tail, lower wing, upper wing.)

Green - Propeller Heat On (PRP HTR ON) - Cycling illumination indicates normal operation of the propeller de-ice system.

Red - Propeller Heat Fail (PRP HTR FAIL) - Illuminates if a fault develops in the prop heat system or current is under 18.0 amps.

Red - Windshield Overtemperature (WNDSHLD OVR TMP) - Illuminates when the windshield temperature exceeds 170°F (77°C) or the windshield temperature sensor has failed.

NOTE

During high ambient temperature conditions when switching windshield heat from ANTI ICE to DEFOG, the red WNDSHLD OVR TMP annunciator may illuminate and remain illuminated until the windshield surface temperature cools to the DEFOG heat temperature range.

Red - Surface De-ice Fail (DE-ICE FAIL) - Illuminates when the surface de-ice system has failed.

Amber - Stall Warning Fail (STALL WRN FAIL) - Illuminates if the lift computer fails and/or the STALL WARN circuit breaker trips.

Red - Generator Inoperative (GEN INOP) - Illuminates when the generator fails or is selected OFF.

Amber - Pitot Heat Off (PITOT HTR OFF) - Indicates the pitot heat has not been selected ON.

Red - Left Pitot Heat (L PITOT HEAT) - Indicates the left pitot heat has failed.

Red - Right Pitot Heat (R PITOT HEAT) - Indicates the right pitot heat has failed.

Red - Alternator Inoperative (ALT INOP) - Illuminates when the alternator fails or is selected OFF.

SECTION 3 - EMERGENCY PROCEDURES (continued)

ICE PROTECTION SYSTEM ANNUNCIATORS (continued)

Left Pitot Heat Failure

Indication: Red "L PITOT HEAT" annunciator illuminated.

Pitot Heat Switch..CHECK ON
Left Pitot Heat Circuit Breaker..CHECK IN
(Located on the pilot's aft circuit breaker panel, row A, position 2.)

Failure of the Left Pitot Heat could cause erroneous indications of pilot's airspeed and standby airspeed.

Right Pitot Heat Failure

Indication: Red "R PITOT HEAT" annunciator illuminated.

Pitot Heat Switch..CHECK ON
Right Pitot Heat Circuit Breaker..CHECK IN
(Located on the pilot's aft circuit breaker panel, row A, position 3.)

Failure of the Right Pitot Heat could cause erroneous indications of copilot's airspeed.

Pitot Heat Off

Indication: Amber "PITOT HTR OFF" annunciator illuminated.

Pitot Heat Switch ....SELECT ON

Prop Heat Failure

Indication: Red "PRP HTR FAIL" annunciator illuminated.

Prop Heat Circuit Breaker...CHECK IN
(Located on the pilot's aft circuit breaker panel, row A, position 4.)

If Prop Heat Circuit Breaker was closed (not out):
Prop Heat Switch ....SELECT OFF THEN ON

If Annunciator remains illuminated, Exit and Avoid icing conditions.

If uneven anti-icing of the propeller blades is indicated by excessive vibration:

1. Power Lever - Momentarily retard, then return to MCP
2. Prop Heat Circuit Breaker - CHECK IN

If excessive vibration persists - exit icing conditions as soon as possible and avoid further icing conditions.

SECTION 3 - EMERGENCY PROCEDURES (continued)

ICE PROTECTION SYSTEM ANNUNCIATORS (continued)

Surface De-ice Failure

Indication: Red "DE-ICE FAIL" annunciator illuminated.

Surface De-ice Circuit Breaker..CHECK IN

(Located on the pilot's aft circuit breaker panel, row A, position 6.)

If red "DE-ICE FAIL" annunciator remains illuminated:

1. Exit and avoid icing conditions.
2. Approach speed with failed surface de-ice boots is 110 KIAS with landing gear down and flaps set to 20° maximum.

CAUTION

Expect longer than published landing distance due to increased approach speeds with failed surface de-ice system.

3. During approach in icing conditions with failed surface de-ice system, consider a delayed landing gear and flap extension as a final landing check.

Stall Warning Fail

Indication: Amber "STALL WRN FAIL" annunciator illuminated.

Stall Heat Circuit Breaker..CHECK IN

(Located on the pilot's aft circuit breaker panel, row A, position 5.)

Avoid low airspeeds and monitor approach speeds closely.

CAUTION

The landing gear warning system may not sound an aural warning alarm with airframe icing when the landing gear is not down and locked and when flaps are set to 0° to 10°.

Landing Without Flaps

Proceed as for normal approach. Landing distance may be calculated by increasing the flap 20° landing distance by 16%. Landing ground roll may be calculated by increasing the flap 20° landing ground roll by 13%.

Landing Gear..DOWN, 3 GREEN
Final Approach Speed ....110 KIAS
Landing..NORMAL
Braking ....AS REQUIRED
Reverse ....AS REQUIRED

SECTION 4 - NORMAL PROCEDURES

ENGINE RUNUP

1. WINDSHLD HT Switch .... Select ANTI ICE position, Verify increased amps/ Select DEFOG position, Verify increased amps
2. WINDSHLD HT Switch .... OFF

CAUTION

To avoid possible windshield distortion or overheat during ground operations or during testing, DO NOT position the WINDSHLD HT switch to ANTI ICE or DEFOG for more than 20 seconds.

3. PITOT HEAT .... Select ON - Verify increased amps and amber PITOT HTR OFF annunciator extinguished
4. PITOT HEAT .... OFF
5. PROP HEAT .... Verify green PRP HTR ON annunciator illuminates steady for 30 seconds, then flashing for 30 seconds, accompanied with increased amps. After 1 minute, PRP HTR ON annunciator extinguished and prop heat is de-energized.
6. PROP HEAT .... OFF
7. STALL HEAT .... Activate switch and verify increased amps.
8. STALL HEAT .... OFF

SECTION 4 - NORMAL PROCEDURES (continued)

ENGINE RUNUP (continued)

9. SURFACE DE-ICE ....CHECK
   a) POWER LEVER - Increase to 250 ft. lb. torque
   b) SURF DE-ICE Switch - Select ON (Verify green SURF DE ICE annunciator illuminated during each de-ice boot inflation cycle. Visually verify wings and horizontal stabilizer de-ice boot inflation and deflation.)
   c) POWER LEVER - IDLE
   d) SURF DE-ICE Switch - OFF

BEFORE LANDING

APPROACH CHECK

Altimeter and Standby Altimeter ....SET
Pressurization ....SET
Fuel Pump...MANUAL
Ignition ....MANUAL
Fuel Quantity ....CHECK
Seats.......................................ADJUSTED & LOCKED IN POSITION
Armrests..STOWED
Belts/Harness ....FASTENED & ADJUSTED
Landing Gear ....DOWN (below 168 KIAS)
Flaps ....SET (10° @ 168 KIAS max.)

NOTE

During landing gear operation it is normal for the HYDRAULIC PUMP annunciator light to illuminate until full system pressure is restored.

SECTION 4 - NORMAL PROCEDURES (continued)

BEFORE LANDING (continued)

LANDING CHECK

Landing Gear ....3 GREEN LIGHTS
Brakes ....CHECK
Flaps ....SET (20° @ 135 KIAS max.)
Airspeed ....100 KIAS

NOTE

Landing distance performance was established by maintaining a power on (370 ft. lb. torque), stabilized 3° approach at 100 KIAS, and reducing power to idle during the flare.

Autopilot..DISENGAGE
Yaw Damper (prior to landing) ....DISENGAGE

BALKED LANDING (Go-Around)

Power Lever...SET TAKEOFF TORQUE
Climb Airspeed ....100 KIAS

After climb established:

Climb Airspeed ....ACCELERATE TO 110 KIAS
Flaps ....RETRACT TO 0°
Landing Gear ....RETRACT
Airspeed ....ACCELERATE TO 125 KIAS (Vy)

SECTION 4 - NORMAL PROCEDURES (continued)

FLIGHT INTO KNOWN ICING CONDITIONS

The Piper Meridian is approved for flight into known icing conditions as defined in **SECTION 1, GENERAL.**

NOTE

Flight in known icing conditions is approved only if the required ice protection systems and equipment are installed and functioning properly. They are:

SURFACE DE-ICE SYSTEM
PROPELLER HEAT ANTI-ICE SYSTEM
WINDSHIELD HEAT ANTI-ICE SYSTEM
PITOT HEAT ANTI-ICE SYSTEM
STALL HEAT ANTI-ICE SYSTEM
WING INSPECTION LIGHT

WARNING

Flight in icing conditions is prohibited if there is known failure of any of the ice protection systems or if the generator or alternator are failed or are inoperative.

WARNING

Maximum flap extension with ANY ice accumulation on the airframe is limited to 20°.

SECTION 4 - NORMAL PROCEDURES (continued)

FLIGHT INTO KNOWN ICING CONDITIONS (continued)

PRIOR to entering icing conditions, the following ice protection systems **MUST** be activated.

1. Surface De-ice ....SELECT ON
2. Stall Heat ....SELECT ON
3. Pitot Heat ....VERIFY ON
4. Prop Heat ....SELECT ON
5. Windshield Heat ....SELECT ANTI ICE
6. Wing Inspection Light ....AS REQUIRED
7. Ignition ....MANUAL
8. Windshield Defog ....PULL ON
9. Environmental Control System (ECS) ....HIGH

During Icing Conditions:

10. Wing Leading Edge ....MONITOR for continual shedding of ice
11. Annunciator Panel ....MONITOR for correct function of ice protection systems.

WARNING

If any of the aircraft ice protection systems fail during flight in icing conditions, exit and avoid icing conditions.

SECTION 4 - NORMAL PROCEDURES (continued)

FLIGHT INTO KNOWN ICING CONDITIONS (continued)

After departure from icing conditions with remaining residual and intercycle airframe ice:

1. Surface De-ice ....MAINTAIN ON
2. Stall Heat ....MAINTAIN ON
3. Prop Heat ....MAINTAIN ON
4. Pitot Heat ....MAINTAIN ON
5. Windshield Heat ....DE-FOG or ANTI ICE as required
6. Ignition ....AUTO
7. Flaps ....DO NOT EXTEND BEYOND 20°

After removal of residual and intercycle airframe ice:

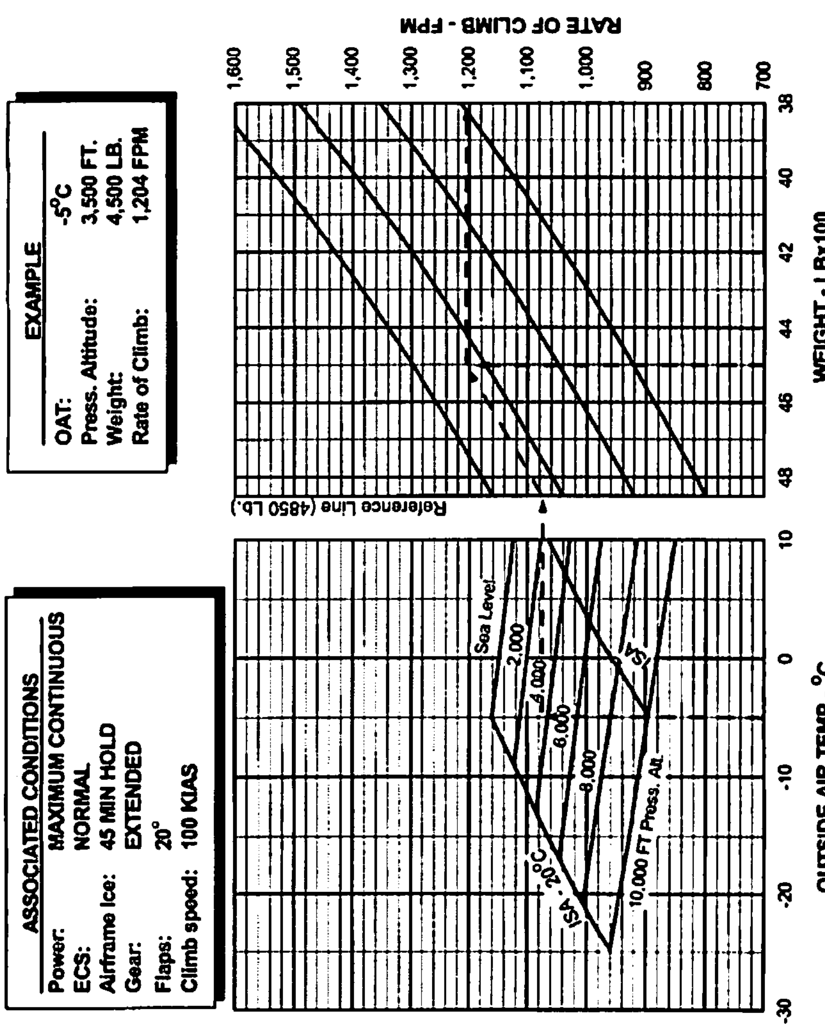
1. Surface De-ice ....OFF
2. Stall Heat ....OFF
3. Prop Heat ....OFF
4. Pitot Heat ....MAINTAIN ON
5. Windshield Heat ....DE-FOG or ANTI ICE as required

SECTION 5 - PERFORMANCE

The performance charts in this supplement are based on an airplane with ice on the unprotected surfaces that would have accumulated during a 45 minute hold in icing conditions, in addition to, intercycle ice on the de-ice boots while they are operating in the 60 second cycle mode. It is assumed that the flaps and landing gear are retracted while executing the 45 minute hold. Intercycle ice is the ice on the de-ice boots just prior to de-ice boot inflation.

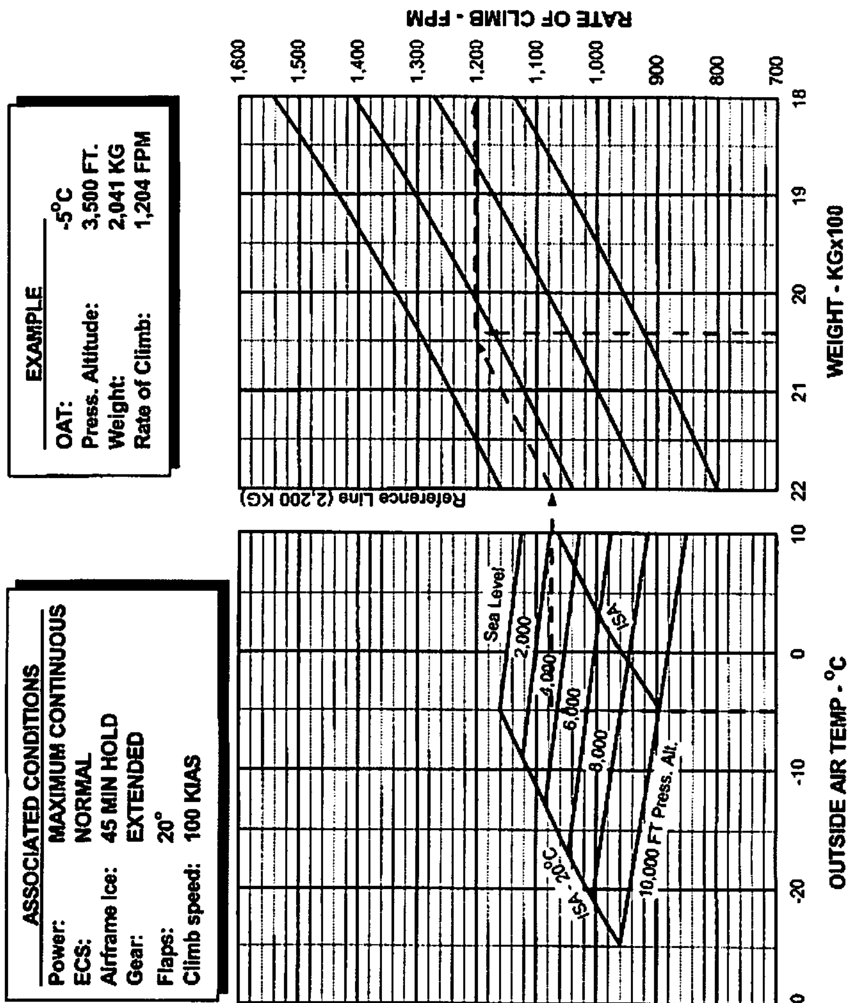
Be sure to review flap extension and airspeed limitations in **SECTION 2, LIMITATIONS** and de-ice equipment operation in **SECTION 4, NORMAL PROCEDURES** of this supplement when ice is on the airframe.

SECTION 5 - PERFORMANCE (continued)



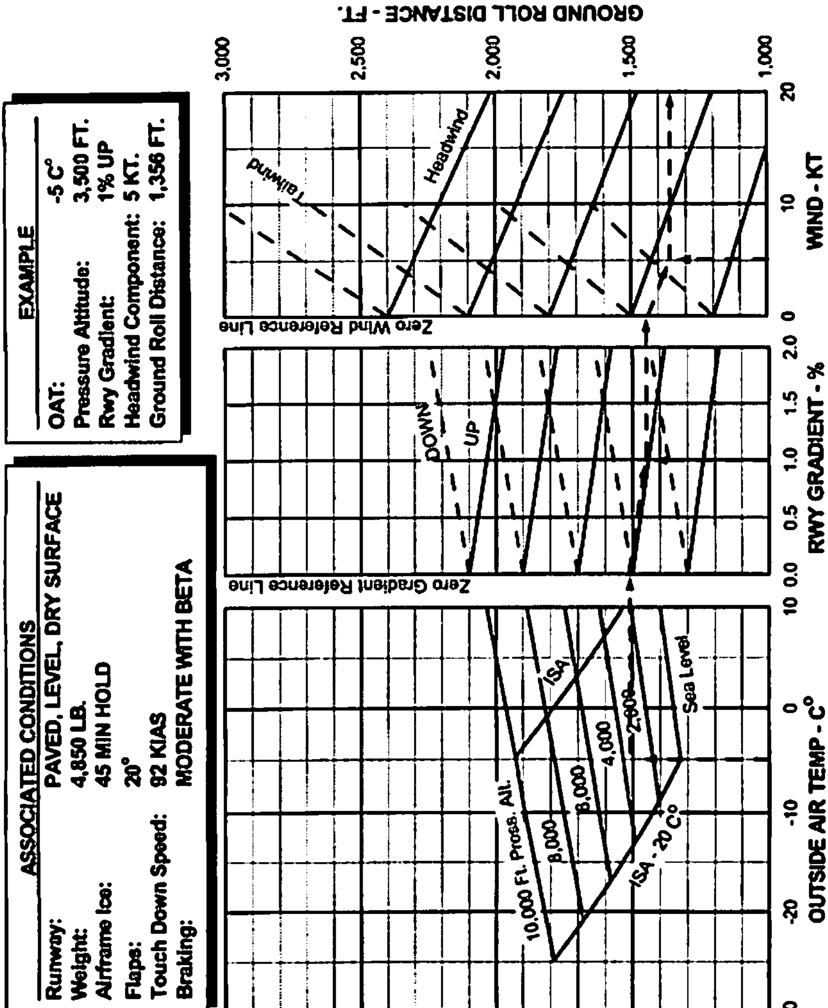
Balked Landing Climb Performance
Figure 1

SECTION 5 - PERFORMANCE (continued)



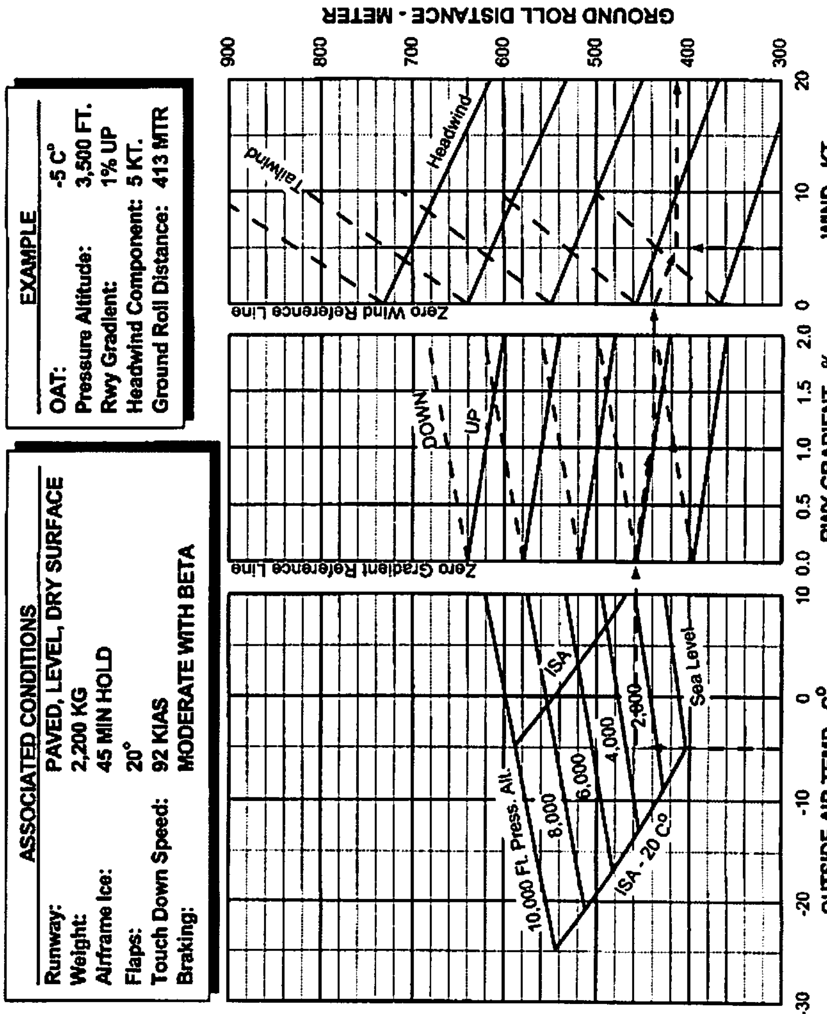
Balked Landing Climb Performance (Metric)
Figure 2

SECTION 5 - PERFORMANCE (continued)



Landing Ground Roll, Flaps 20°, without Reverse
Figure 3

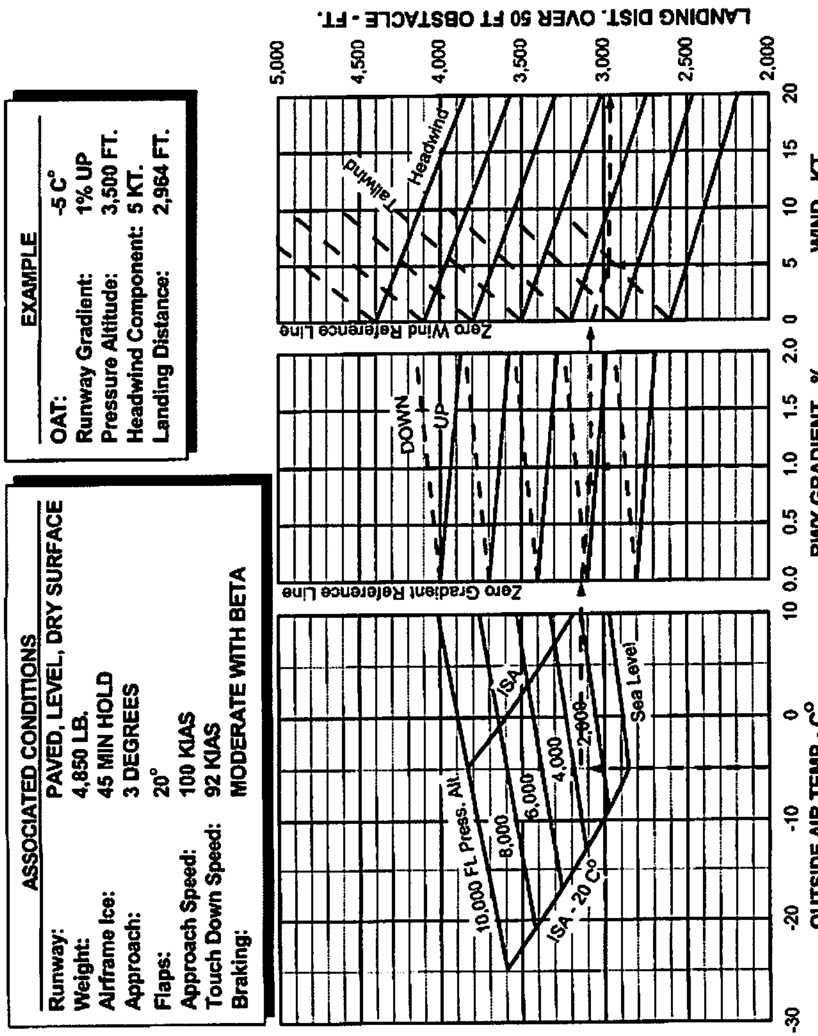
SECTION 5 - PERFORMANCE (continued)



Landing Ground Roll, Flaps 20°, without Reverse (Metric)

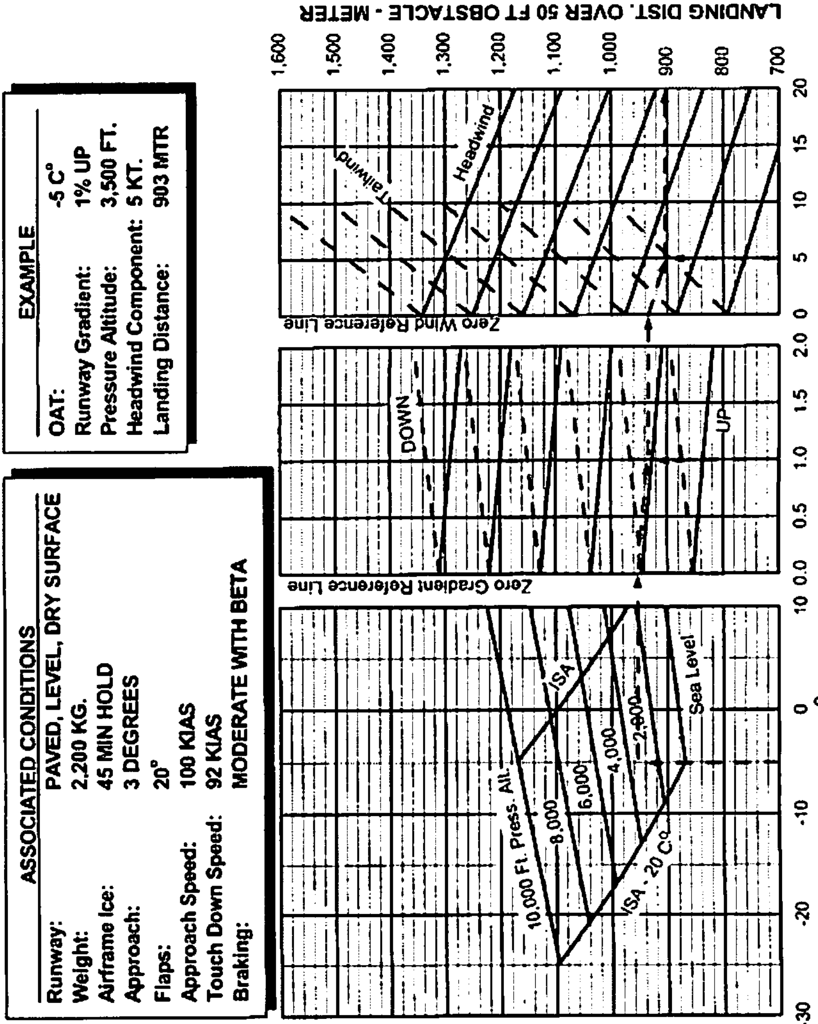
Figure 4

SECTION 5 - PERFORMANCE (continued)



Landing Distance, Flaps 20°, without Reverse
Figure 5

SECTION 5 - PERFORMANCE (continued)



Landing Distance, Flaps 20°, without Reverse (Metric)
Figure 6

SECTION 6 - WEIGHT AND BALANCE

No change.

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SECTION 7 - DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS

PNEUMATIC DE-ICE SYSTEM

The Piper Meridian utilizes BF Goodrich pneumatic de-ice boots to displace ice from the leading edges of the wing, vertical and horizontal stabilizer. The de-ice boots are fabricated from neoprene containing built in span wise inflation tubes. The system consists of the wing, vertical and horizontal stabilizer de-ice boots, pressure regulator, ejector, pressure switches, de-icer flow valves, vacuum regulator, timer, check valve and a water separator. The timer allows continuous operation of the pneumatic de-ice system without additional input from the pilot once the system is selected on. The de-ice boots are inflated by engine bleed air and held down during flight by vacuum supplied by a single fixed orifice ejector.

Operation of the pneumatic de-ice system is controlled by a locking, single throw switch on the overhead switch panel. When the switch is engaged, power is supplied to the de-ice timer which then shuttles the empennage de-icer flow valve to supply precooled bleed air pressure to the empennage boots for 6 seconds. As pressure in the boots is increased above 10 psig, the tail pressure switch is engaged and the green SURF DE-ICE annunciator is illuminated. At the end of six seconds the empennage de-icer flow valve returns to the vacuum (normal) position and the bottom wing de-icer flow valve is shuttled to the pressure side. After a second 6 seconds the bottom wing deicer flow valve is shuttled back to the vacuum side and the process is repeated for the upper wing boots. This complete cycle is repeated every 60 seconds or until the surface deice switch is disengaged. The timer monitors system voltage, increasing and decreasing boot pressure, and cycle advance. Should any failure in operation be detected, the red DE-ICE FAIL annunciator will illuminate.

Circuit protection for the surface de-ice system is provided by a SURFACE DE-ICE circuit breaker (located on the pilot's aft circuit breaker panel, Row A, Position 6).

SECTION 7 - DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS (continued)

HEATED PROPELLER

The propeller de-ice system consists of dual element heater boots bonded to the inner 1/3 portion of each propeller blade, slip ring assemblies connected to the propeller hub to distribute power to the propeller blade heating elements, a modular brush assembly which transfers electrical power to the rotating slip rings, and an electronic control module (timer) to cycle power to the heaters. In flight, when the **PROP HEAT** switch is selected **ON**, the electronic control module directs power through the modular brush assembly and slip ring to the outer 4 propeller blade heating elements for approximately 90 seconds. The electronic control module then switches power to the inner 4 propeller blade heating elements for approximately 90 seconds. This cycle will continue as long as the **PROP HEAT** switch is in the **ON** position and the airplane is airborne.

During **Ground** operations with the **PROP HEAT** switch engaged, power is sent to the outer 4 propeller blade heating elements for 30 seconds and the green PRP HTR ON annunciator will illuminate.

During the next 30 seconds, power is directed to the inner 4 propeller blade heating elements and the green PRP HTR ON annunciator will flash. After one minute, the electronic control module will remove power to the boots and the green PRP HTR ON annunciator will extinguish. As long as the airplane remains on the ground, the system will remain **OFF** unless the operator manually selects the **PROP HEAT** switch **ON**, again, or until the airplane leaves the ground.

A red Prop Heat Fail (PRP HTR FAIL) annunciator will illuminate if:

1. An over current (greater than 30 amps).
2. An under current (less than 18.0 amps).
3. A loss of power when the PROP HEAT is selected on.
4. 28 Vdc applied when the PROP HEAT switch is not engaged.

In the over current scenario, the timer will de-energize the propeller heat, extinguish the green PRP HTR ON annunciation, and illuminate the red PROP HEAT FAIL annunciation. In the under current scenario, the timer will maintain the propeller heat on, continue to illuminate the green PRP HTR ON annunciation, and illuminate the red PRP HTR FAIL annunciation.

SECTION 7 - DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS (continued)

HEATED WINDSHIELD

The left pilot's windshield is heated by current from the aircraft electrical system. Windshield heat is controlled by a 3 position rocker switch located in the overhead switch panel and placarded **WINDSHLD HT DEFOG - OFF - ANTI ICE**. Circuit protection for the heated windshield is provided by the **WINDSHIELD HEAT CONTROL** and **POWER** circuit breakers in the pilot's aft circuit breaker panel (Row A, Position 7 and 8).

NOTE

The right copilot's windshield is not heated, therefore during icing conditions visibility through the right windshield may be impaired or completely eliminated.

CAUTION

To avoid possible windshield distortion or over heat during ground operations, or during testing do not position the WINDSHLD HT switch to ANTI ICE or DEFOG for more than 20 seconds.

WINDSHLD HT should be selected to the **ANTI ICE** position prior to entering suspected icing conditions. Sudden penetration into icing conditions, with the windshield heat **OFF**, will greatly reduce its effectiveness to prevent or eliminate windshield ice.

An over-temperature sensor is included as an integral part of the heated windshield. A system failure causing an over-temperature condition (above 170°F / 77°C) will illuminate the red Windshield Overtemperature light (WNDSHLD OVR TMP) located in the annunciator panel.

NOTE

During high ambient temperature conditions when switching windshield heat from ANTI ICE to DEFOG the red Windshield Overtemperature annunciator (WNDSHLD OVR TMP) may illuminate and remain illuminated until the windshield surface temperature cools to the DEFOG heat temperature range.

SECTION 7 - DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS (continued)

HEATED PITOT

A pitot heat anti-ice system is installed to assure proper airspeed indications in the event icing conditions are encountered. The system is designed to prevent ice formation rather than remove it, once formed. During normal operations pitot heat should be selected **ON** and the amber Pitot Heat Off annunciator (PITOT HTR OFF) extinguished before take-off.

One heated pitot head is installed on the underside of each wing. Pitot heat is controlled by a single **PITOT HEAT** switch located in the overhead switch panel and protected by **L PITOT HEAT** and **R PITOT HEAT** circuit breakers located in the pilot's aft circuit breaker panel (Row A Position 2 and 3).

CAUTION

Care should be taken when an operational check of the heated pitot head is being performed on the ground. The unit becomes very hot.

HEATED STALL WARNING

A heated stall warning vane is installed in the leading edge of the left wing. It is controlled by a **STALL HEAT** switch located in the overhead switch panel and is protected by a **STALL HEAT** circuit breaker located in the pilot's aft circuit breaker panel (Row A Position 5). To prevent damage during ground operation, the stall warning has an in-line resistor activated by the main gear squat switch which limits the ground electrical load to approximately 33 percent of the in-flight load.

SECTION 7 - DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS (continued)

WING INSPECTION LIGHT

An ice detection light is installed on the left side of the forward fuselage, and when selected **ON**, will illuminate the left wing leading edge. The ice detection light is controlled by the **ICE LIGHT** switch located in the overhead switch panel. Circuit protection is provided by an **ICE** circuit breaker located in the **EXTERIOR LIGHTS** section of the pilot's forward circuit breaker panel (Row A Position 8).

ALTERNATE STATIC SOURCE

An alternate static source control valve is located on the sidewall below the lower left corner of the instrument panel. For normal operation, the control valve lever should be in the down position. To select the alternate static source, the control valve lever should be placed in the up position. When alternate static source is selected, the pilot's airspeed, altimeter and vertical speed indicators, and the standby airspeed and altimeter, are vented to the alternate static buttons located on the right and left side of the AFT fuselage. During operation with the alternate static source selected, the airspeed, altimeter, and vertical speed indicator will give slightly different readings than normal. Charts depicting airspeed and altitude position error calibrations using alternate static source are provided in the Pilots Operating Handbook and FAA Approved Airplane Flight Manual, Section 5, Performance.

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PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 7
FOR
S-TEC MAGIC 1500 THREE AXIS
AUTOMATIC FLIGHT GUIDANCE SYSTEM

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the S-TEC MAGIC 1500 Three Axis Automatic Flight Guidance System is installed per the Equipment List. The information contained herein supplements or supersedes the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

FAA APPROVED: [signature]
LINDA J. DICKEN
DOA-510620-CE
THE NEW PIPER AIRCRAFT, INC.
VERO BEACH, FLORIDA

DATE OF APPROVAL: May 6, 2005

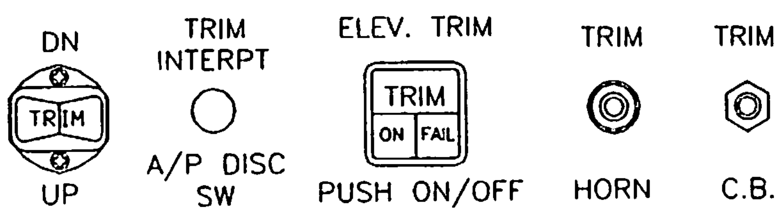
SECTION 1 - GENERAL

This supplement is to acquaint the pilot with the features and functions of the MAGIC 1500 Three Axis Autopilot and to provide operating instructions for the system when installed in the Piper Model PA-46-500TP Meridian. The aircraft must be operated within the limitations herein provided when the autopilot is in use.

The flight control system in this aircraft includes: Flight Director, Integral Altitude Selector, Trim Monitor (Elevator Trim Push ON/OFF Switch), Automatic and Manual Electric Trim and Yaw Damper.

ELECTRIC TRIM SYSTEM DESCRIPTION

The S-TEC Electric Trim System is designed to accept any single failure, either mechanical or electrical, without uncontrolled operation resulting during operations in the Manual Electric Trim Mode. During autotrim mode the system is designed to limit the effect of any failure causing trim operation. In order to assure proper operation of these safeguards, it is necessary to conduct a pre-flight test of the system.



Trim System with Trim Monitor
Figure 1

The Trim Monitor System consists of the components pictured in figure 1 and is designed to alert the pilot of a trim failure or a trim in motion.

SECTION 1 - GENERAL (continued)

The system is activated by pushing the Elevator Trim (Push ON/OFF) switch ON. A green ON light, a yellow TRIM light and a red FAIL light will illuminate in the switch and the trim audio horn will activate for one second, as a test. A trim fault will cause the TRIM and FAIL lights to illuminate along with continuous horn operation. The pilot should press and hold the red Trim Interrupt button on the control wheel and conduct the emergency procedures listed in Section 3 of this supplement.

SECTION 2 - LIMITATIONS

1. The MAGIC 1500 Autopilot Pilot's Operating Handbook, p/n 87131, appropriate revision, must be carried in the aircraft and be available to the pilot while in flight.
2. Autopilot and yaw damper operation prohibited above 188 KIAS.
3. Autopilot and yaw damper operation prohibited below 100 KIAS.
4. Autopilot coupled missed approach maneuver not authorized.
5. The autopilot and yaw damper must be disengaged from the aircraft controls for takeoff and landing.
6. Approved for Category I operations only.
7. Autopilot use prohibited below 200 feet AGL during coupled approach operations.
8. Manual Electric Trim preflight check (per Section 4 of this supplement) must be conducted and found satisfactory prior to each flight on which the manual electric trim is to be used.

SECTION 3 - EMERGENCY PROCEDURES

AUTOPILOT

In the event of an autopilot malfunction, or anytime the autopilot is not performing as expected or commanded:

Aircraft Control ....Manually stabilize by overpowering the autopilot

Autopilot Disconnect.....................................Depressing the red AP Disconnect button on the left horn of the pilot's control wheel

FD/AP Master Switch ....OFF
Autopilot Circuit Breaker ....Pull
(Located on pilot's aft panel Row C, Position 2)

NOTE

Do not re-engage the autopilot until the problem has been identified and corrected.

CAUTION

The autopilot will disconnect and the aural autopilot disconnect alert will sound when the stall warning is activated.

Bank Angle and Altitude Loss During a Malfunction and Recovery:

a. The following bank angles and altitude losses were recorded after a malfunction with a 3 second recovery delay.

Configuration	Bank Angle / Altitude Loss
Climb	58° / -150 ft.
Cruise	60° / -220 ft.
Descent	45° / -400 ft.

b. The following bank angles and altitude losses were recorded after a malfunction with a 1 second recognition delay:

Configuration	Bank Angle / Altitude Loss
Maneuvering	12° / -40 ft.
Approach (coupled or uncoupled)	20° / -80 ft.

SECTION 3 - EMERGENCY PROCEDURES (continued)

TRIM

In the event of a Trim Runaway:

Aircraft Control .... Maintain by manually overpowering the trim system

Autopilot Disconnect /
Trim Interrupt Switch
(Pilot's Control Wheel) .... Depress and Hold
Elevator Trim ON/OFF Switch .... Push OFF
Pitch Trim Circuit Breaker .... Pull
(Located on Pilot's aft panel Row C, Position 1)
Manual Trim .... Retrim as required

YAW DAMPER

In the event of Abnormal Operation of the Yaw Damper System:

Aircraft Control .... Manually stabilize by application of rudder to overpower the rudder servo
Autopilot Disconnect Switch
(Pilot's Control Wheel) .... PRESS
Rudder Trim .... Retrim as required

NOTE

Re-engage the autopilot. If the Yaw Damper problem persists, deselect the Yaw Damper by pressing the YD button on the Autopilot. This will allow the pilot to use all A/P functions except the Yaw Damper.

Yaw, Bank Angle and Altitude Loss during a Yaw Damper System malfunction:

A Yaw Damper malfunction during climb, cruise or descent with a 3 second delay in recovery initiation could result in 8° of yaw and 20° bank and 100 feet altitude loss.

SECTION 4 - NORMAL PROCEDURES

This section contains preflight procedures for the autopilot, trim and yaw damper systems. **For detailed normal operating procedures, including system description, pre-flight and in-flight procedures, refer to the MAGIC 1500 Pilot's Operating Handbook, p/n 87131, appropriate revision.**

PRE-FLIGHT PROCEDURES

NOTE

Full system voltage is required for this test, either by running the aircraft engine or by using a suitable APU.

Avionics Master Switch .... ON
Autopilot Master Switch .... ON
Trim Master Switch .... ON
Autopilot Self Test .... COMPLETE
ADAHRS Initialization .... COMPLETE - "A/P READY" is displayed

NOTE

If the system fails to initialize it will annunciate "A/P FAIL" and not allow any mode to function. If the ADAHRS system malfunctions it will annunciate "ATT FAIL" and not allow any mode to function.

A/P Button .... Press - A/P, FD, YD indicators illuminate and servos engage. Roll and Pitch annunciate. Steering bars appear on EADI
EHSI HDG BUG .... Move to center
Hdg Button .... Press - Move Hdg Bug left and right. Aileron control and Steering bars should follow Hdg bug.

NOTE

It is difficult to test the autopilot NAV, APR and REV functions during a preflight test without a VOR signal generator, therefore, these modes may be left for in-flight evaluation.

SECTION 4 - NORMAL PROCEDURES (continued)

PRE-FLIGHT PROCEDURES (continued)

IAS Button...Press - IAS indicates "90".
Press and Hold UP button; IAS number increases.
Press and Hold DN button; IAS number decreases.

VS Button ....Press - VS indicates "0".
Press UP button until ↑500 is displayed.
Steering bar moves up and pitch control moves
slowly aft (pilot may have to assist a heavy yoke).
Press DN button until ↓500 is displayed.
Steering bar moves down and pitch control moves
slowly in (forward).

ALT button ....Press - ALT HOLD is displayed.
Slowly pull aft on pitch control;
autotrim runs nose down after 3 seconds and
trim-in-motion is displayed and voice annunciated.
Slowly push forward on pitch control;
trim runs nose up after 3 seconds and
trim-in-motion is displayed and voice annunciated.

EADI Altimeter ....Set altitude to field elevation.

A. Select VS mode on the autopilot.
B. Using the altitude selector knobs, select an altitude 100 feet below field elevation.
C. Using the Baro knob on the PFD, slowly reduce altitude to the same as that selected on the A/P altitude selector.
D. A/P should display "Altitude Hold" when the two altitudes match.

CWS button ....Press and HOLD.
All servos disengage and controls are free.
CWS annunciator is displayed.
Release CWS button. Servos re-engage.

YAW DAMPER ....VERIFY ENGAGED.
Rotate Yaw trim knob CW;
right rudder pedal moves slowly forward.
Rotate Yaw trim knob CCW;
left rudder pedal moves slowly forward.
Recenter trim knob.

SECTION 4 - NORMAL PROCEDURES (continued)

PRE-FLIGHT PROCEDURES (continued)

A/P DISC SW. (on control wheel) ....Press - All A/P modes disconnect followed by aural tone and voice annunciation.

GO-AROUND button (on throttle) ....Press - FD mode illuminates, Roll and Pitch annunciate, and pitch steering bar moves to 8° up position.

MANUAL ELECTRIC TRIM TEST

A. Trim Master (Push ON/OFF) Switch ....VERIFY ON. Move each segment of the Manual Electric Trim switch fore and aft; trim should not run. Move both segments forward together; trim should run nose down. Move both segments aft; trim should run nose up.

B. AP DISC/TRIM INTR switch ....Run TRIM nose up or down. Press and hold AP DISC/TRIM INTR switch; trim motion should stop. Release switch; trim motion should resume.

SECTION 4 - NORMAL PROCEDURES (continued)

PRE-FLIGHT PROCEDURES (continued)

NOTE

If either the Manual Electric Trim or Autotrim fails any portion of the preflight test, push the Elevator Trim (push ON/OFF) switch OFF. DO NOT USE THE ELECTRIC TRIM UNTIL THE FAULT IS CORRECTED. With Elevator Trim (push ON/OFF) switch OFF, the Autopilot Trim UP/DN indicator and audio warning are activated. If the Electric Trim fails, or has an in-flight power failure, the system automatically reverts to an out-of-trim annunciation and audio warning.
SHOULD THIS OCCUR, PUSH THE ELEVATOR TRIM (PUSH ON/OFF) SWITCH OFF, AND REVERT TO MANUAL AIRCRAFT TRIM UNTIL THE FAULT IS CORRECTED.

NOTE

BEFORE FLIGHT VERIFY THAT THE AUTOPILOT IS DISENGAGED AND ALL TRIM SYSTEMS ARE SET FOR TAKEOFF.

SECTION 4 - NORMAL PROCEDURES (continued)

GLIDE SLOPE FLIGHT PROCEDURE - AUTOMATIC ARM/CAPTURE

To arm the Automatic Glideslope (GS) capture function the following conditions must be met:

A. NAV Receiver must be tuned to the appropriate localizer frequency.
B. Glideslope signal must be valid - no flag.
C. Autopilot must be in APR/ALT modes.
D. Aircraft must be 15% or more below the GS centerline for 1 second and within 50% needle deviation of the localizer centerline for automatic arming to occur.

Glideslope arming will occur when the above conditions have existed for 1 second. Illumination of the GS annunciator will occur, indicating arming has been accomplished. The ALT annunciator remains on. Glideslope capture is indicated by extinguishing of the ALT annunciator.

Approach the GS intercept point (usually the OM) with the flaps set to approach deflection of 0 - 20° (as desired) at 110 - 130 KIAS and with the aircraft stabilized in altitude hold mode. At the glideslope intercept, lower the landing gear and adjust power for desired descent speed. For best tracking results, make power adjustments in small, smooth increments to maintain desired airspeed.

At the missed approach point or the decision height, disconnect the autopilot for landing or for the go-around maneuver. (See Limitations Section.)

NOTE

If a valid localizer or glideslope signal is lost during the approach, as evidenced by flashing "APR" or "GS" and PFD steering bars, the pilot should immediately execute a missed approach and advise ATC of intentions.

GO-AROUND MODE

If a missed approach is required, the pilot may press the Go-Around button on the throttle which will engage the Flight Director in the Go-Around mode. The pilot can hand fly the aircraft with reference to the steering bars or the autopilot may be re-engaged after the aircraft has been reconfigured for and established in a stabilized climb.

SECTION 4 - NORMAL PROCEDURES (continued)

SELECTING MISSED APPROACH ALTITUDE

When conducting an ILS approach, the pilot can program the missed approach altitude into the altitude selector once established on the final approach altitude and **before** glideslope capture. Simply dial in the missed approach altitude. At glideslope capture the displayed altitude will be replaced with dashes and cannot be adjusted during the approach. At the missed approach point press the GO-AROUND button on the throttle which will disengage the autopilot and engage the Flight Director in the ROLL and PITCH modes. Next, press the altitude selector center knob once, which will bring up the preset missed approach altitude. The pilot should fly the aircraft by reference to the steering command bars. The autopilot may be engaged by pressing the A/P button when a safe altitude has been reached.

SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

No change.

SECTION 7 - DESCRIPTION AND OPERATION

No change.

SECTION 8 - HANDLING, SERVICING, AND MAINTENANCE

No change.

SECTION 9 - SUPPLEMENTS

Refer to contents of this supplement for operation of the MAGIC 1500 Automatic Flight Guidance System.

SECTION 10 - OPERATING TIPS

No change.

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PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 8
FOR
BENDIX/KING KR-87 DIGITAL ADF
WITH KI-227 INDICATOR

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the Bendix/King KR-87 Digital ADF with the KI-227 Indicator is installed per the Equipment List. The information contained herein supplements or supersedes the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

FAA APPROVED: [signature]
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THE NEW PIPER AIRCRAFT, INC.
VERO BEACH, FLORIDA

DATE OF APPROVAL: January 11, 2006

SECTION 1 - GENERAL

The Bendix/King Digital ADF is a panel mounted, digitally tuned, automatic direction finder. It is designed to provide continuous 1 kHz digital tuning in the frequency range of 200 kHz to 1799 kHz and eliminates the need for mechanical band switching. The system is comprised of a receiver, a built-in electronic timer, a bearing indicator and a KA-44B combined loop and sense antenna.

The Bendix/King Digital ADF can be used for position plotting and homing procedures, and for aural reception of amplitude modulated (AM) signals.

The "flip-flop" frequency display allows switching between pre-selected "STANDBY" and "ACTIVE" frequencies by pressing the frequency transfer button. Both preselected frequencies are stored in a non-volatile memory circuit (no battery power required) and displayed in self-dimming gas discharge numerics. The active frequency is continuously displayed in the left window, while the right window will display either the standby frequency or the selected readout from the built-in timer.

The built-in electronic timer has two separate and independent timing functions: (1) An automatic flight timer that starts whenever the unit is turned on. This timer functions up to 59 hours and 59 minutes. (2) An elapsed timer which will count up or down for up to 59 minutes and 59 seconds. When a preset time interval has been programmed and the countdown reaches :00, the display will flash for 15 seconds. Since both the flight timer and elapsed timer operate independently, it is possible to monitor either one without disrupting the other. The pushbutton controls and the bearing indicator are internally lighted.

SECTION 2 - LIMITATIONS

No change.

SECTION 3 - EMERGENCY PROCEDURES

No change.

SECTION 4 - NORMAL PROCEDURES

To Operate as an Automatic Direction Finder:

1. OFF/VOL Control - ON.
2. Frequency Selector Knobs - SELECT desired frequency in the standby frequency display.
3. FRQ Button - PRESS to move the desired frequency from the standby to the active position.
4. ADF SPEAKER/PHONE - Selector Switch (on audio control panel) - SELECT as desired.
5. OFF/VOL Control - SET to desired volume level.
6. ADF Button - SELECT ADF mode and note relative bearing on indicator.

ADF Test (Pre-flight or In-flight):

1. ADF Button - SELECT ANT mode and note pointer moves to 90° position.
2. ADF Button - SELECT ADF mode and note the pointer moves without hesitation to the station bearing. Excessive pointer sluggishness, wavering or reversals indicate a signal that is too weak or a system malfuction.

SECTION 4 - NORMAL PROCEDURES (continued)

NOTE

The Standby Frequency which is in memory while Flight Time or Elapsed Time modes are being displayed may be called back by pressing the FRQ button, then transferred to active use by pressing the FRQ button again.

To Operate Elapsed Time Timer-Count Down Mode:

1. OFF/VOL Control - ON.
2. FLT/ELT Mode Button - PRESS (once or twice) until ET is annunciated.
3. SET/RST Button - PRESS until the ET annunciation begins to flash.
4. FREQUENCY SELECTOR KNOBS - SET desired time in the elapsed time display. The small knob is pulled out to tune the 1's. The small knob is pushed in to tune the 10's. The outer knob tunes minutes up to 59 minutes.

NOTE

Selector knobs remain in the time set mode for 15 seconds after the last entry or until the SET/RST, FLT/ET, or FRQ button is pressed.

5. SET/RST Button - PRESS to start countdown. When the timer reaches 0, it will start to count up as display flashes for 15 seconds.

NOTE

While FLT or ET are displayed, the active frequency on the left side of the window may be changed, by using the frequency selector knobs, without any effect on the stored standby frequency or the other modes.

SECTION 4 - NORMAL PROCEDURES (continued)

ADF Operation NOTES:

Erroneous ADF Bearing Due to Radio Frequency Phenomena:

In the U.S., the FCC, which assigns AM radio frequencies, occasionally will assign the same frequency to more than one station in an area. Certain conditions, such as Night Effect, may cause signals from such stations to overlap. This should be taken into consideration when using AM broadcast station for navigation.

Sunspots and atmospheric phenomena may occasionally distort reception so that signals from two stations on the same frequency will overlap. For this reason, it is always wise to make positive identification of the station being tuned, by switching the function selector to ANT and listening for station call letters.

Electrical Storms:

In the vicinity of electrical storms, an ADF indicator pointer tends to swing from the station tuned toward the center of the storm.

Night Effect:

This is a disturbance particularly strong just after sunset and just after dawn. An ADF indicator pointer may swing erratically at these times. If possible, tune to the most powerful station at the lowest frequency. If this is not possible, take the average of pointer oscillations to determine relative station bearing.

Mountain Effect:

Radio waves reflecting from the surface of mountains may cause the pointer to fluctuate or show an erroneous bearing. This should be taken into account when taking bearings over mountainous terrain.

Coastal Refraction:

Radio waves may be refracted when passing from land to sea or when moving parallel to the coastline. This also should be taken into account.

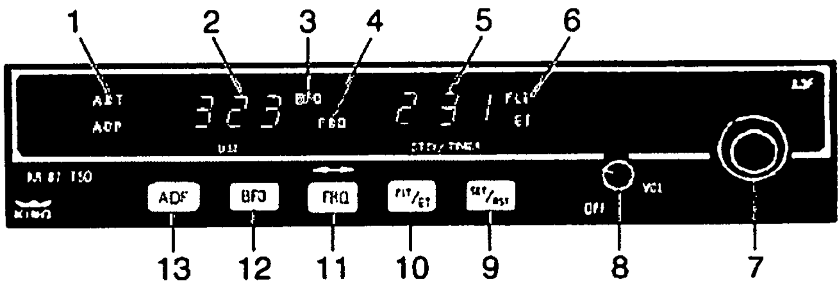
SECTION 5 - PERFORMANCE

No change.

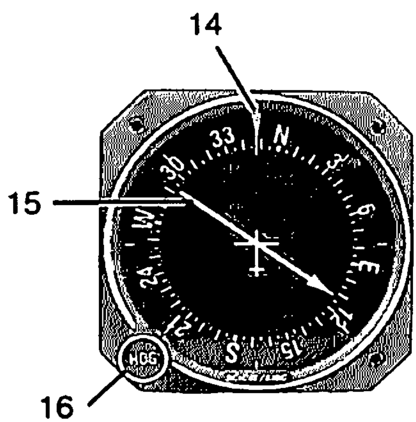
SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in Section 6 of the Pilot's Operating Handbook and Airplane Flight Manual.

SECTION 7 - DESCRIPTION AND OPERATION



KR-87 Digital ADF



KI-227 Indicator

King Digital ADF Operating Controls and Indicators
Figure 1

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Legend - Figure 1

1. Mode Annunciation - Antenna (ANT) is selected by the "out" position of the ADF button. This mode improves the aural reception and is usually used for station identification. The bearing pointer is deactivated and will park in the 90° relative position. Automatic Direction Finder (ADF) mode is selected by the depressed position of the ADF button. This mode activates the bearing pointer. The bearing pointer will point in the direction of the station relative to the aircraft heading.
2. Active Frequency Display - The frequency to which the ADF is tuned is displayed here. The active ADF frequency can be changed directly when either of the timer functions are selected.
3. Beat Frequency Oscillator (BFO) - The BFO mode, activated and annunciated when the "BFO" button is depressed, permits the carrier wave and associated morse code identifier broadcast on the carrier wave to be heard.

NOTE

CW signals (Morse Code) are unmodulated and no audio will be heard without use of BFO. This type of signal is not used in the United States air navigation. It is used in some foreign countries and marine beacons.

4. Standby Frequency Annunciation (FRQ) - When FRQ is displayed, the STANDBY frequency is displayed in the right hand display. The STANDBY frequency is selected using the frequency select knobs. The selected STANDBY frequency is put into the ACTIVE frequency window by pressing the frequency transfer button.
5. Standby Frequency Display - Either the standby frequency, the flight timer, or the elapsed time is displayed in this position. The flight timer and elapsed timer are displayed replacing the standby frequency which goes into "blind" memory to be called back at any time by depressing the FRQ button. Flight time or elapsed time are displayed and annunciated alternatively by depressing the FLT/ET button.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Legend - Figure 1 (continued)

6. Timer Mode Annunciation - Either the elapsed time (ET) or flight time (FLT) mode is annunciated here.
7. Frequency Selector Knobs - Selects the standby frequency when FRO is displayed and directly selects the active frequency whenever either of the timer functions is selected. The frequency selector knobs may be rotated either clockwise or counterclockwise. The small knob is pulled out to tune the 1's. The small knob is pushed in to tune the 10's. The outer knob tunes the 100's with rollover into the 1000's. These knobs are also used to set the desired time when the elapsed timer is used in the countdown mode.
8. Off/Volume Control (OFF/VOL) - Controls primary power and audio output level. Clockwise rotation from OFF position applies primary power to receiver; further clockwise rotation increases audio level. Audio muting causes the audio output to be muted unless the receiver is locked on a valid station.
9. Set/Reset Button (SET/RST) - The set/reset button, when pressed, resets the elapsed timer whether it is being displayed or not.
10. Flight Time/Elapsed Time Mode Selector Button (FLT/ET) - The Flight Timer/Elapsed Time mode selector button, when pressed, alternatively selects either Flight Timer mode or Elapsed Timer mode.
11. Frequency Transfer Button (FRQ) - The FRQ transfer button, when pressed, exchanges the active and standby frequencies. The new frequency becomes active and the former active frequency goes into standby.
12. BFO Button - The BFO button selects the BFO mode when in the depressed position (see Note under item 3).
13. ADF Button - The ADF button selects either the ANT mode or the ADF mode. The ANT mode is selected with the ADF button in the out position. The ADF mode is selected with the ADF button in the depressed position.
14. Index (Rotatable Card) - Indicates relative, magnetic, or true heading of aircraft, as selected by the HDG control.

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Legend - Figure 1 (continued)

15. Pointer - Indicates station bearing in degrees of azimuth, relative to the nose of the aircraft. When heading control is adjusted, indicates relative, magnetic, or true bearing of radio signal.
16. Heading Card Control (HDG) - Rotates card to set in relative, magnetic, or true bearing information.

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT NO. 9
FOR
BENDIX/KING KN-63 DME

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the Bendix/King KN-63 DME is installed per the Equipment List. The information contained herein supplements or supersedes the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

FAA APPROVED: [signature]
LINDA J. DICKEN
DOA-510620-CE
THE NEW PIPER AIRCRAFT, INC.
VERO BEACH, FLORIDA

DATE OF APPROVAL: January 11, 2006

SECTION 1 - GENERAL

The Bendix/King KN-63 DME supplies continuous slant range distance information from a fixed ground station to an aircraft in flight.

The equipment consists of a KDI-572 Panel Display which contains all the operating controls and displays, and a remotely mounted KN-63 Receiver-Transmitter. The KDI-572 Panel Display digitally displays distances in nautical miles, ground speed in knots, and time to station in minutes. All displays are in self-dimming gas discharge numerics.

SECTION 2 - LIMITATIONS

No change.

SECTION 3 - EMERGENCY PROCEDURES

No change.

SECTION 4 - NORMAL PROCEDURES

DME Operation

1. DME Mode Selector Switch - SET to N1 or N2.
2. NAV 1 and NAV 2 VHF Navigation Receivers - ON; SET FREQUENCY selector switches to VOR/DME station frequencies, as required.

NOTE

When the VOR frequency is selected, the appropriate DME frequency is automatically channeled.

3. DME SPEAKER/PHONE selector buttons (on audio control panel) - SET to desired mode.

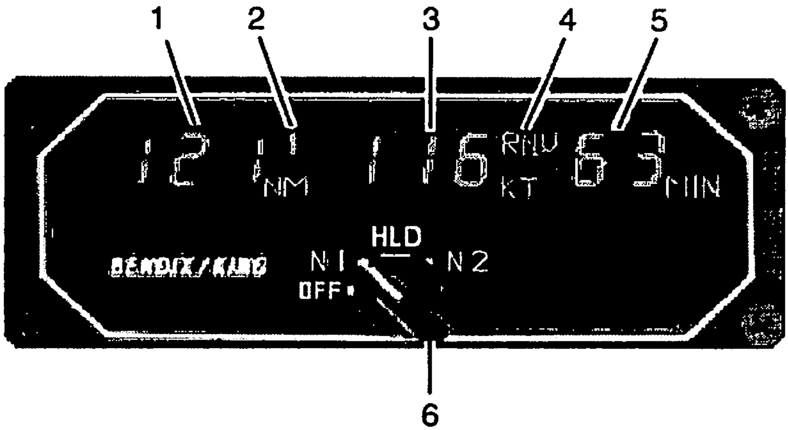
SECTION 5 - PERFORMANCE

No change.

SECTION 6 - WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data in Section 6 of the Pilot's Operating Handbook and Airplane Flight Manual.

SECTION 7 - DESCRIPTION AND OPERATION



Bendix/King KN-63 DME
Figure 1

Legend - Figure 1

1. DISTANCE DISPLAY (NM) - DME distance to VORTAC/WAYPOINT displayed in .1 nautical mile increments up to 99.9 NM, then in increments of one nautical mile to 389 NM.
2. DME MODE ANNUNCIATOR - Displays the DME operating mode; NAV 1 (1); NAV 2 (2); NAV 1 HOLD (H1); NAV 2 HOLD (H2); of the mode selector switch (6).
3. GROUND SPEED DISPLAY (KT) - Displays ground speed in knots to or from VORTAC/WAYPOINT up to 999 knots (aircraft must be flying directly to or from the VORTAC/WAYPOINT for true ground speed indication).
4. RNAV ANNUNCIATOR (RNV) - Indicates RNV when displayed data is in relation to the RNAV waypoint. If the wrong DME mode is selected during RNAV operation, the RNAV annunciator will flash.
5. TIME-TO-STATION DISPLAY (MIN) - Displays time-to-station (VORTAC/WAYPOINT) in minutes up to 99 minutes (aircraft must be flying directly to or from the Vortac/Waypoint for true time-to-station indication).

SECTION 7 - DESCRIPTION AND OPERATION (continued)

Legend - Figure 1 (continued)

6. DME MODE SELECTOR SWITCH (OFF, N1, HLD, N2) - Applies power to the DME and selects DME operating mode as follows:

   OFF: Turns DME power off.

   NAV 1
   (N1): Selects DME operation with No. 1 VHF navigation set; enables channel selection by NAV 1 frequency selector controls.

   HOLD
   (HLD): Selects DME memory circuit; DME remains channeled to station to which it was last channeled when HOLD was selected and will continue to display information relative to this channel. Allows both the NAV 1 and NAV 2 navigation receivers to be set to new operational frequencies without affecting the previously selected DME operation.

   NOTE

   In the HOLD mode there is no annunciation of the VOR/DME station frequency. However, an annunciator labeled "H1" or "H2" illuminates on the DME display to flag the pilot that the DME is in the HOLD mode.

   NAV 2
   (N2): Selects DME operation with No. 2 VHF navigation set; enables channel selection by NAV 2 frequency selector switches. Brightness of the labels for this switch is controlled by the RADIO light dimming rheostat.

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SECTION 10

OPERATING TIPS

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SECTION 10

OPERATING TIPS

10.1 GENERAL

This section provides operating tips of particular value in the operation of the Meridian.

10.3 OPERATING TIPS

(a) Learn to trim for takeoff so that only a very light back pressure on the control wheel is required to lift the airplane off the ground.

(b) On takeoff, do not retract the gear prematurely. The airplane may settle and make contact with the ground because of lack of flying speed, atmospheric conditions, or rolling terrain.

(c) To slow the airplane while taxiing and to save the brakes, it is permissible to move the prop into beta and reverse.

(d) To reduce flap operating loads, it is desirable to have the airplane at a speed slower than the maximum allowable before extending the flaps.

(e) Before attempting to reset any circuit breaker, allow a two to five minute cooling off period.

(f) Before starting the engine, check that all radio switches, light switches and the pitot heat switch are in the off position so as not to create an overloaded condition when the starter is engaged.

(g) Anti-collision lights should not be operating when flying through cloud, fog or haze, since reflected light can produce spatial disorientation. Strobe lights should not be used in close proximity to the ground, such as during taxiing, takeoff or landing.

10.3 OPERATING TIPS (continued)

(h) In extreme turbulence, reduce power setting to obtain design operating speed. (See Section 2 Limitations for correct speeds).

(i) In an effort to avoid accidents, pilots should obtain and study the safety related information made available in FAA publications, such as regulations, advisory circulars, Aviation News, AIM and safety aids.

(j) Prolonged slips or skids which result in excess of 2000 feet of altitude loss or other radical or extreme maneuvers which could cause uncovering of the fuel outlet must be avoided as fuel flow interruption may occur when the tank being used is not full.

(k) In order to prevent propeller strikes while taxiing on rough terrain or crossing over rises, the airplane should be taxied slowly with minimum power and rises should be crossed at an acute angle. Tires and struts should be properly inflated.

(l) Pilots who fly above 10,000 feet should be aware of the need for special physiological training. Appropriate training is available for a small fee at approximately twenty-three Air Force Bases throughout the United States. The training is free at the NASA Center in Houston and at the FAA Aeronautical Center in Oklahoma.

Forms to be completed (Physiological Training Application and Agreement) for application for the training course may be obtained by writing to the following address:

Chief of Physiological Training, AAC-143
FAA Aeronautical Center
P.O. Box 25082
Oklahoma City, Oklahoma 73125

It is recommended that all pilots who plan to fly above 10,000 feet receive physiological training and then take refresher training every two or three years.