Hawker Beechcraft

Model G36 Bonanza

(Serials E-3630, E-3636 and After)

Pilot's Operating Handbook and FAA Approved Airplane Flight Manual

FAA Approved in the Utility Category based on CAR Part 3. This document must be carried in the airplane at all times, and be kept within reach of the pilot during all flight operations. This handbook includes the material required to be furnished to the pilot by CAR Part 3.

Airplane Serial Number:______________________

Airplane Registration Number:________________

FAA Approved by: Victoria E. Gb

for Randolph Shields, ODA Lead administrator
Hawker Beechcraft Corporation
ODA-230339-CE

P/N 36-590002-71
Issued: October, 2005

P/N 36-590002-71A6
Revised: June, 2011

NOTE

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Published by
Hawker Beechcraft Corporation
P.O. Box 85
Wichita, Kansas
67201-0085 USA

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P/N 36-590002-71

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Airplane Registration Number:_________________

FAA Approved by: Ronald L Dyke

for Randolph Shields, ODA Lead administrator
Beechcraft Corporation
ODA-230339-CE

P/N 36-590002-71
Issued: October, 2005

P/N 36-590002-71A9
Revised: July, 2014

Hawker Beechcraft Corporation

LOG OF TEMPORARY CHANGES

Model G36 Bonanza

Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

P/N 36-590002-71

March, 2011

Temporary Changes to this manual must be in the airplane for all flight operations.

PART NUMBER	SUBJECT	DATE
36-590002-71TC1	Adds TAWS limitations regarding flight over large bodies of sea level water.	May, 2008
36-590002-71TC2	Incorporated into the 36-590002-71A5 revision. Please discard all 36-590002-71TC2 pages: 1 of 4 thru 4 of 4.	Incorporated
36-590002-71TC3	Adds Chinese Aviation Gasoline RH-95/130 and RH-100/130 to Section 1 - GENERAL and Section 2 - LIMITATIONS.	January, 2010
36-590002-71TC4	Adds Leaning Using the Exhaust Gas Temperature (EGT) Indication procedure to Section 4 - NORMAL PROCEDURES.	January, 2011

NOTE: This page should be filed in the front of the manual immediately in front of the *Log Of Revisions* page(s). This page replaces any *Log Of Temporary Changes* page dated prior to the date of this Log.

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LOG OF TEMPORARY CHANGES

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P/N 36-590002-71

June, 2011

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36-590002-71TC1	Adds TAWS limitations regarding flight over large bodies of sea level water.	May, 2008
36-590002-71TC2	Incorporated into the 36-590002-71A5 revision. Please discard all 36-590002-71TC2 pages: 1 of 4 thru 4 of 4.	Incorporated
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36-590002-71TC4	Incorporated into the 36-590002-71A6 revision. Please discard all 36-590002-71TC4 pages: 1 of 4 thru 4 of 4.	Incorporated

NOTE: This page should be filed in the front of the manual immediately in front of the *Log Of Revisions* page(s). This page replaces any *Log Of Temporary Changes* page dated prior to the date of this Log.

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P/N 36-590002-71

January, 2011

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PART NUMBER	SUBJECT	DATE
36-590002-71TC1	Adds TAWS limitations regarding flight over large bodies of sea level water.	May, 2008
36-590002-71TC2	Adds Service Ceiling to Section 1.	April, 2009
36-590002-71TC3	Adds Chinese Aviation Gasoline RH-95/130 and RH-100/130 to Section 1 - GENERAL and Section 2 - LIMITATIONS.	January, 2010
36-590002-71TC4	Adds Leaning Using the Exhaust Gas Temperature (EGT) Indication procedure to Section 4 - NORMAL PROCEDURES.	January, 2011

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Published by
RAYTHEON AIRCRAFT COMPANY
P.O. Box 85
Wichita, Kansas
67201-0085 USA

NOTE

Where Beech Aircraft Corporation is referred to in this publication, it will be taken to read Raytheon Aircraft Company.

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Revision A9 - July, 2014

Title Page. . . . . July, 2014
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Published by
Beechcraft Corporation
P.O. Box 85
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2-17 thru 2-20	Revised "Garmin G1000 Integrated Avionics System"
2-21 thru 2-25	Revised "GPS Navigation" and Shifted Data
2-26 thru 2-38	Revised and added Illustrations and Shifted Data
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not be operated closer to peak EGT than 20°C (rich side or lean side).

4. If engine roughness is encountered operating at lower power settings on the lean side of peak, enrich the mixture slightly for smooth engine operation.
5. If required fuel flows cannot be achieved when leaning to the rich side of peak, switch the fuel boost pump to LO, then lean as required.
6. Changes in altitude and power settings require the peak EGT to be rechecked and the mixture reset.
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NOTE

A Lean Assist function is available through the Garmin software utilizing the CYL SLCT and ASSIST Softkeys. Reference Garmin Cockpit Reference Guide for details on the procedure.

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Airplane Serial Number: E-3784

Airplane Registration Number: N784BB

FAA Approved by: David J Bernstorf
David Bernstorf
Raytheon Aircraft Company
DOA-230339-CE

P/N 36-590002-71
Issued: October, 2005

P/N 36-590002-71A1
Revised: January, 2007

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7-55 thru 7-76	Revised "General" and Shifted Data
7-77 thru 7-80	Revised "Stormscope (if installed)" Added "Distance Measuring Equipment (if installed)" and Shifted Data
8-1 thru 8-4	Revised Table of Contents
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INTRODUCTION

The format and contents of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual conform to GAMA (General Aviation Manufacturers Association) Handbook Specification No. 1 through Revision No. 2, dated October 18, 1996. Use of this specification by all manufacturers will provide the pilot with the same type of data in the same place in all handbooks.

Attention is called to Section 10, SAFETY INFORMATION. Raytheon Aircraft Company feels that it is highly important to have Safety Information in a condensed form in the hands of the pilots. The Safety Information should be read and studied. Periodic review will serve as a reminder of good piloting techniques.

WARNING

Use only genuine Raytheon Aircraft or Raytheon Aircraft approved parts obtained from Raytheon Aircraft approved sources, in connection with the maintenance and repair of Beech airplanes.

Genuine Raytheon Aircraft parts are produced and inspected under rigorous procedures to ensure airworthiness and suitability for use in Beech airplane applications. Parts purchased from sources other than Raytheon Aircraft, even though outwardly identical in appearance, may not have had the required tests and inspections, may be different in fabrication techniques and materials, and may be dangerous when installed in an airplane.

Salvaged airplane parts, reworked parts obtained from non-Raytheon Aircraft approved sources, or parts, components, or structural assemblies, the service history of which is unknown or cannot be authenticated, may have been subjected to unacceptable stresses or temperatures or have other hidden damage, not discernible through routine visual or usual nondestructive testing techniques. This may render the part, component, or structural assembly, even though originally manufactured by Raytheon Aircraft, unsuitable or unsafe for airplane use.

Raytheon Aircraft expressly disclaims any responsibility for malfunctions, failures, damage or injury caused by use of non-Raytheon Aircraft approved parts.

IMPORTANT NOTICE

This handbook should be read carefully by the owner and the operator in order to become familiar with the operation of the airplane. Suggestions and recommendations have been made within it to aid in obtaining maximum performance without sacrificing economy. Be familiar with, and operate the airplane in accordance with, the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual and/or placards which are located in the airplane. This handbook includes the material required to be furnished to the pilot by the Title 14 Code of Federal Regulations and additional information provided by the manufacturer and constitutes the FAA Approved Flight Manual.

As a further reminder, the owner and the operator should also be familiar with the Federal Aviation Regulations applicable to the operation and maintenance of the airplane, and, as appropriate 14 CFR Part 91 General Operating and Flight Rules. Further, the airplane must be operated and maintained in accordance with FAA Airworthiness Directives which may be issued against it.

The Title 14 Code of Federal Regulations place the responsibility for the maintenance of this airplane on the owner and the operator, who should ensure that all maintenance is done by qualified mechanics in conformity with all airworthiness requirements established for this airplane.

All limits, procedures, safety practices, time limits, servicing, and maintenance requirements contained in this handbook are considered mandatory for continued airworthiness and to maintain the airplane in a condition equal to that of its original manufacture.

Raytheon Aircraft Authorized Outlets can provide recommended modification, service, and operating procedures issued by both the FAA and Raytheon Aircraft Company, which are designed to get maximum utility and safety from the airplane.

USE OF THE HANDBOOK

WARNINGS, CAUTIONS, AND NOTES

The following definitions apply to (WARNINGS), (CAUTIONS), and (NOTES) found throughout the handbook:

WARNING

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

CAUTION

Operating procedures, techniques, etc., which could result in damage to equipment if not carefully followed.

NOTE

An operating procedure, technique, etc., which is considered essential to emphasize.

REVISING THE HANDBOOK

The Pilot's Operating Handbook is designed to facilitate maintaining the documents necessary for the safe and efficient operation of the airplane. The handbook has been prepared in loose-leaf form for ease in maintenance. It incorporates quick-reference tabs imprinted with the title of each section.

NOTE

In an effort to provide as complete coverage as possible, applicable to any configuration of the airplane, some optional equipment has been included in the scope of the handbook. However, due to the variety of airplane appointments and arrangements available, optional equipment described or depicted herein may not be designated as such in every case.

Immediately following the Title Page is a List of Effective Pages. A complete listing of all pages is presented along with the current status of the material contained; i.e. Original Issue, Reissued or Revised. A reissue of the manual or the revision of any portion will be received with a new List of Effective Pages to replace the previous one. Reference to the List of Effective Page(s) enables the user to determine the current issue, revision, or reissue in effect for each page in the handbook, except for the Supplements Section.

When the handbook is originally issued, and each time it is revised or reissued, a new Log of Revisions page is provided immediately following the List of Effective Pages. All Log of Revisions pages must be retained until the handbook is reissued. A capital letter in the lower right corner of the Log of Revisions page designates the Original Issue ("A") or reissue ("B", "C", etc.) covered by the Log of Revisions page. If a number follows the letter, it designates the sequential revision (1st, 2nd, 3rd, etc.,) to the Original Issue or reissue covered by the Log of Revisions page. Reference to the Log of Revisions page(s) provides a record of changes made since the Original Issue or the latest reissue.

That portion of text or an illustration which has been revised by the addition of, or a change in, information is denoted by a solid revision bar located adjacent to the area of change and placed along the outside margin of the page.

REVISION SERVICE

The following publications will be provided, at no charge, to the registered owner and/or operator of this airplane:

1. Reissues and revisions of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.
2. Original issues and revisions of FAA Approved Airplane Flight Manual Supplements.
3. Original issues and revisions of Raytheon Aircraft Service Bulletins.

The above publications will be provided only to the registered owner/operator at the address listed on the FAA Aircraft Registration Branch List or the Raytheon Aircraft Domestic/International Owner's Notification Service List. Further, the owner/operator will receive only those publications pertaining to the registered airplane serial number. For detailed information on how to obtain "Revision Service" applicable to this handbook or other Raytheon Aircraft Service Publications, consult any Raytheon Aircraft Authorized Outlet or refer to the latest revision of Raytheon Aircraft Service Bulletin No. 2001.

Raytheon Aircraft Company expressly reserves the right to supersede, cancel, and/or declare obsolete, without prior notice, any part, part number, kit, or publication referenced in this handbook.

The owner/operator should always refer to all supplements for possible placards, limitations, emergency, abnormal, normal, and other operational procedures for proper operation of the airplane with optional equipment installed.

WARNING

It shall be the responsibility of the owner/operator to ensure that the latest revisions of publications referenced in this handbook are utilized during operation, servicing, and maintenance of the airplane.

SUPPLEMENTS

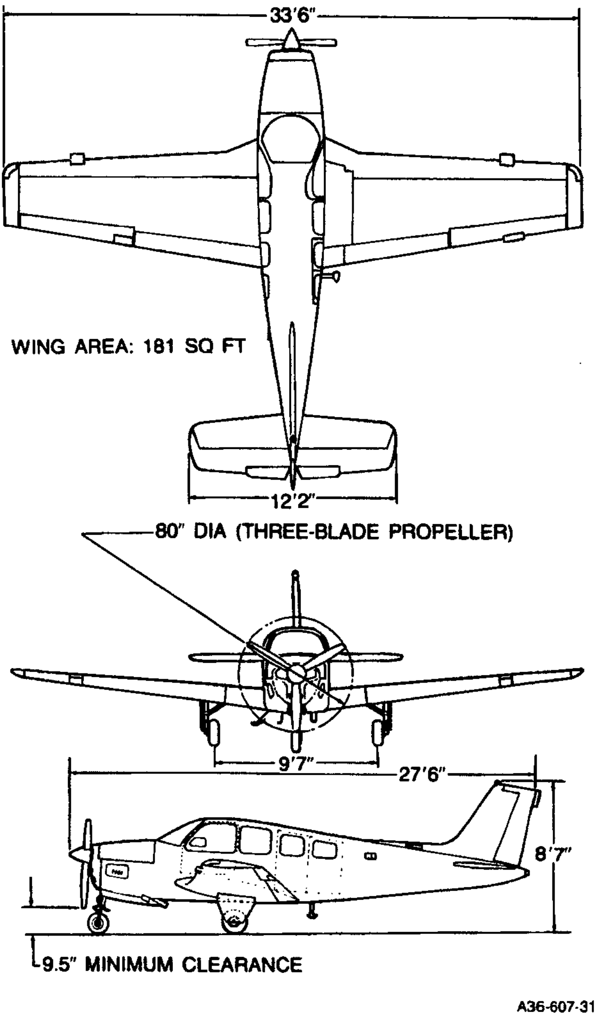
When a new airplane is delivered from the factory, the handbook delivered with it contains either an STC (Supplemental Type Certificate) Supplement or a Raytheon Aircraft Flight Manual Supplement for every installed item requiring a supplement. If a new handbook for operation of the airplane is obtained at a later date, it is the responsibility of the owner/operator to ensure that all required STC Supplements (as well as Weight and Balance and other pertinent data) are transferred into the new handbook.

AIRPLANE FLIGHT MANUAL SUPPLEMENTS REVISION RECORD

Section 9, Supplements, contains the FAA-approved Airplane Flight Manual Supplements, headed by a Log of Supplements page. When new supplements are received or existing supplements are revised, a new Log page will replace the previous one, since it contains a listing of all previous approvals, plus the new approval. The supplemental material will be added to the Section in accordance with the sequence specified on the Log page.

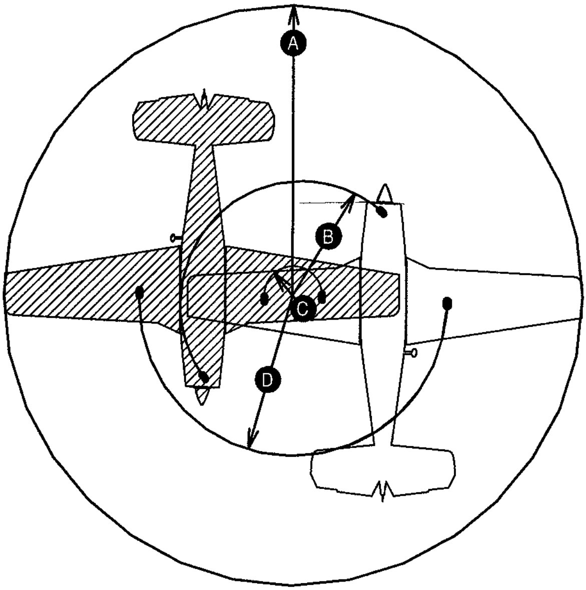
NOTE

Upon receipt of a new or revised supplement, compare the existing Log of Supplements in the handbook with the corresponding applicable Log page accompanying the new or revised supplement. It may occur that the Log page already in the handbook is dated later than the Log page accompanying the new or revised supplement. In any case, retain the Log page having the later date and discard the older Log page.



AIRPLANE THREE VIEW

GROUND TURNING CLEARANCE



A RADIUS FOR WING TIP	27 FEET 7 INCHES
B RADIUS FOR NOSE WHEEL......................	13 FEET 8 INCHES
C RADIUS FOR INSIDE GEAR........................	6 FEET 3 INCHES
D RADIUS FOR OUTSIDE GEAR.................	15 FEET 10 INCHES

TURNING RADII ARE CALCULATED USING FULL STEERING, ONE BRAKE AND PARTIAL POWER.

E#01C
050553AA.AI

DESCRIPTIVE DATA

ENGINE

NUMBER OF ENGINES

One

ENGINE MANUFACTURER

Teledyne Continental Motors, Inc., (Mobile, Alabama)

ENGINE MODEL NUMBER

IO-550-B

ENGINE TYPE

Normally aspirated, Fuel-injected, direct-drive, air-cooled, horizontally opposed, 6-cylinder, 550-cubic-inch displacement.

HORSEPOWER RATING

300 H.P.

PROPELLER

One

PROPELLER MANUFACTURER

Hartzell Propeller, Inc., (Piqua, Ohio) holds the Supplemental Type Certificate (STC) for the installed propeller. Refer to supplement HPA36-2 in Section 9, SUPPLEMENTS

NUMBER OF BLADES

Three

FUEL

APPROVED ENGINE FUELS

Aviation Gasoline Grade 100LL (blue)

Aviation Gasoline Grade 100 (green)

FUEL CAPACITY

Total Capacity . . . . .80 Gallons

Total Usable . . . . .74 Gallons

ENGINE OIL

OIL CAPACITY

Total . . . . 12 Quarts

SPECIFICATION

Use MIL-L-22851 Ashless Dispersant Oils meeting the requirements of the latest revision of Teledyne Continental Motors Corporation Specification MHS-24B or current applicable Teledyne Continental Service Bulletin. Refer to Section 8, HANDLING, SERVICING AND MAINTENANCE for a list of approved oils.

Ambient Air Temperature	Single Viscosity Grade Oil	Multiviscosity Grade Oil
Below 5°C	SAE 30 (max.)	15W-50, 20W-50
Above 5°C	SAE 50 (min.)	15W-50, 20W-50 25W-60

When operating temperatures overlap indicated ranges, use the lighter grade of oil.

MAXIMUM CERTIFICATED WEIGHTS

Maximum Ramp Weight .... 3663 lbs

Maximum Take-off Weight .... 3650 lbs

Maximum Landing Weight .... 3650 lbs

Maximum Zero Fuel Weight .... No Structural Limitation

Maximum Weight in Baggage
Compartment............. See Section 2, LIMITATIONS

CABIN AND ENTRY DIMENSIONS

Interior Cabin Length ....12 ft 7 in.

Interior Cabin Width (max) ....3 ft 6 in.

Interior Cabin Height (max)......................4 ft 2 in.

Fwd Cabin Door Opening .... 37 in. wide x 36 in. high

Aft Utility Door Opening .... 45 in. wide x 35 in. high

CABIN BAGGAGE VOLUMES

Rear Cabin Compartment
(Rear Spar to Sta. 170.0) .... 37 cu ft

Extended Aft Compartment
(Sta. 170.0 to 190.0)......................... 10 cu ft

SPECIFIC LOADINGS

Wing Loading at Maximum Take-off Weight.....20.2 lbs/sq ft

Power Loading at Maximum Take-off Weight..... 12.2 lbs/hp

SERVICE CEILING

Service Ceiling .... 18,500 ft

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

The following glossary is applicable within this handbook.

GENERAL AIRSPEED TERMINOLOGY

CAS	*Calibrated Airspeed* is the indicated airspeed of an airplane corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.
GS	*Ground Speed* is the speed of an airplane relative to the ground.
IAS	*Indicated Airspeed* is the speed of an airplane as shown on the airspeed indicator. IAS values published in this handbook assume zero instrument error.
KCAS	*Calibrated Airspeed* expressed in knots.
KIAS	*Indicated Airspeed* expressed in knots.
TAS	*True Airspeed* is the airspeed of an airplane relative to undisturbed air, which is the CAS corrected for altitude, temperature, and compressibility.
V_A	*Maneuvering Speed* is the maximum speed at which application of full available aerodynamic control will not overstress the airplane.
V_{FE}	*Maximum Flap Extended Speed* is the highest speed permissible with wing flaps in a prescribed extended position.
V_{LO}	*Maximum Landing Gear Operating Speed* is the maximum speed at which the landing gear can be safely extended or retracted.

V_{LE}	*Maximum Landing Gear Extended Speed* is the maximum airspeed at which an airplane can be safely flown with the landing gear extended.
V_{NE}	*Never Exceed Speed* is the airspeed limit that may not be exceeded at any time.
V_{NO}	*Maximum Structural Cruising Speed* is the airspeed that should not be exceeded except in smooth air and then only with caution.
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.
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.

METEOROLOGICAL TERMINOLOGY

Indicated Pressure Altitude	The number actually read from an altimeter when the barometric subscale has been set to 29.92 inches of mercury (1013.2 millibars).
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 inches of mercury (1013.2 millibars); 4. The temperature gradient from sea level to the altitude at which the temperature is -56.5°C (-69.7°F) is -0.00198°C (-0.003566°F) per foot and zero above that altitude.
OAT	*Outside Air Temperature* is the free air static temperature, obtained either from the temperature indicator (IOAT) adjusted for compressibility effects, or from ground meteorological sources.
Pressure Altitude	Altitude measured from standard sea-level pressure (29.92 in. Hg/1013.2 millibars) by a pressure (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. Position errors may be obtained from the Altimeter Correction graphs.
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.

POWER TERMINOLOGY

Cruise Climb Power	Power recommended for cruise climb.
Economy Cruise Power	Minimum power setting for which specific values of fuel flow and airspeed are presented.
Maximum Cruise Power	Maximum power setting for which specific values of fuel flow and airspeed are presented.
Recommended Cruise Power	Power settings for which specific values of fuel flow and airspeed are presented.
Take-off and Maximum Continuous Power (MCP)	Highest power rating not limited by time.

ENGINE CONTROLS AND INSTRUMENTS TERMINOLOGY

EGT	The Exhaust Gas Temperature display is used to identify the lean and best-power fuel flow mixtures for various power settings during cruise.
Manifold Pressure	The regulated absolute air pressure in the intake manifold of the engine located between the throttle valve and the cylinders.
Manifold Pressure Display	Displays the absolute pressure in the intake manifold of an engine, expressed in inches of mercury (in.Hg).
Mixture Control	Used to set fuel flow in all modes of operation, and to cut off fuel completely for engine shutdown.
Propeller Control	Used to control the rpm setting of the propeller governor. Movement of the control results in an increase or decrease in prop rpm.
Propeller Governor	Regulates the rpm of the engine/ propeller by increasing or decreasing the propeller pitch through a pitch change mechanism in the propeller hub.
Tachometer	Displays the rotational speed of the propeller in revolutions per minute (rpm).
Throttle Control	Used to control power by introducing fuel-air mixture into the intake passages of an engine. Settings are reflected by readings on the manifold pressure display.

AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Climb Gradient The 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 velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests. The value shown is not limiting.

GPH U.S. Gallons per hour.

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.

WEIGHT AND BALANCE TERMINOLOGY

Airplane Center of Gravity (CG) The point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.

Arm The horizontal distance from the reference datum to the center of gravity (C.G.) of an item.

Basic Empty Weight	The weight of an empty airplane including full engine oil and unusable fuel. This equals empty weight plus the weight of unusable fuel, and the weight of all the engine oil required to fill the lines and tanks. Basic empty weight is the basic configuration from which loading data is determined.
CG Arm	The arm is obtained by adding the airplane's individual moments and dividing the sum by the total weight.
CG Limits	The extreme center of gravity locations within which the airplane must be operated at a given weight.
Empty Weight	The weight of an empty airplane before any oil or fuel has been added. This includes all permanently installed equipment, fixed ballast, full hydraulic fluid, full chemical toilet fluid, and all other operating fluids full, except that the engines, tanks, and lines do not contain any engine oil or fuel.
Engine Oil	Total system oil including undrainable.
Jack Points	Points on the airplane identified by the manufacturer as suitable for supporting the airplane for weighing or other purposes.
Leveling Points	Those points which are used during the weighing process to level the airplane.
Maximum Landing Weight	Maximum weight approved for the landing touchdown.
Maximum Ramp Weight	Maximum weight approved for ground maneuvering (includes weight of start, taxi, and runup fuel).

Maximum Take-off Weight	Maximum weight approved for the start of the take-off run.
Maximum Zero Fuel Weight	Maximum weight exclusive of usable fuel.
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.
Reference Datum	An imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Station	A location along the airplane fuselage usually given in terms of distance from the reference datum.
Tare	The weight of chocks, blocks, stands, etc., used on the scales when weighing an airplane.
Unusable Fuel	Fuel that is not available for flight planning.
Usable Fuel	Fuel available for flight planning.
Useful Load	Difference between Ramp Weight, and Basic Empty Weight.

ACRONYMS

Generic:

ADC	Air Data Computer
AHRS	Attitude and Heading Reference System
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
LNAV	Lateral Navigation
LPV	Localizer Performance with Vertical Guidance
LRU	Line Replaceable Unit
MFD	Multifunction Display
PFD	Primary Flight Display
RNAV	Area Navigation
SBAS	Satellite Based Augmentation System (equivalent to WAAS in the United States)
TAWS	Terrain Awareness and Warning System
VNAV or (VNV)	Vertical Navigation
WAAS	Wide Area Augmentation System

Garmin:

GDC	Garmin Air Data Computer
GDU	Garmin Display Unit
GEA	Garmin Engine Airframe Unit
GIA	Garmin Integrated Avionics Unit
GDL	Garmin Data Link
GMA	Garmin Audio Panel
GMU	Garmin Magnetometer Unit
GRS	Garmin Attitude and Heading Reference System
GSA	Garmin Autopilot Servo
GSM	Garmin Autopilot Servo Mount
GTX	Garmin Transponder

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LIMITATIONS

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The limitations included in this section have been approved by the Federal Aviation Administration and should be observed in the operation of this airplane.

AIRSPEED LIMITATIONS

SPEED	KCAS	KIAS	REMARKS
Never Exceed (V_{NE})	203	205	Do not exceed this speed in any operation.
Maximum Structural Cruising (V_{NO} or V_C)	165	167	Do not exceed this speed except in smooth air and then only with caution.
Maneuvering (V_A)	139	141	Do not make full or abrupt control movements above this speed.
Maximum Flap Extension/ Extended (V_{FE}) Approach (12°) Full Down (30°)	 152 122	 154 124	Do not extend flaps or operate with flaps extended above this speed.
Maximum Landing Gear Operating Extended (V_{LO}/V_{LE})	152	154	Do not extend, retract or operate with gear extended above this speed, except in emergency.

AIRSPEED INDICATOR DISPLAY

COLOR CODED SPEED RANGE STRIP OR MARKING	KIAS RANGE	SIGNIFICANCE
Red Strip	20 - 61	Low Speed Awareness
White Strip	61 - 124	Full Flap Operating Range Lower Limit = Stall speed with flaps down at maximum weight. Upper Limit = Maximum speed permissible with flaps fully extended.
White Triangle	154	Maximum Speed for approach flaps
Green Strip	68 - 167	Normal Operating Range Lower Limit = Stalling speed with flaps up at maximum weight. Upper Limit = Maximum Structural Cruise Speed
Yellow Strip	167 - 205	Caution Range. Approved for smooth air only. Upper Limit = Never Exceed Speed. Maximum speed for all Operations
Red & White Strip	> 205	High Speed Warning

The airspeed pointer will turn red when the airspeed or airspeed trend vector reaches 205 KIAS.

An airspeed trend vector is displayed on the right side of the color-coded speed range strip during accelerations and decelerations. The end of the trend vector indicates the airspeed that will be reached in 6 seconds if the current rate of acceleration is maintained. The trend vector is not displayed if the airspeed is constant.

Reference speeds for Glide, V_X, and V_Y are pilot programmable and selectable using the TMR/REF soft key on the PFD. If one or more of these speeds is selected for display, a pointer will be positioned on the right side of the airspeed display opposite the speed that was programmed. The pointers are placarded [G] for glide, [Y] for V_Y, and [X] for V_X.

POWER PLANT LIMITATIONS

NUMBER OF ENGINES

One

ENGINE MANUFACTURER

Teledyne Continental Motors, Inc., (Mobile, Alabama)

ENGINE MODEL NUMBER

IO-550-B

ENGINE TYPE

Normally aspirated, fuel-injected, direct-drive, air-cooled, horizontally opposed, 6-cylinder, 550-cubic-inch displacement, 300-HP.

ENGINE OPERATING LIMITATIONS

Take-off and Maximum
Continuous Power. . . . . Full Throttle, 2700 RPM

Cylinder Head Temperature
Maximum . . . . 238°C

Oil Temperature

Minimum (Take-Off) . . . . 24°C

Maximum . . . . 116°C

Oil Pressure

Minimum (idle) . . . . 10 psi

Maximum . . . . 100 psi

Fuel Flow

Maximum . . . . 27.4 gph

Manual Leaning Limitations

See Manifold Pressure vs RPM Graph in Section 5, PERFORMANCE, for Engine Leaning Limitations.

Aux Fuel Pump

The HI position of the auxiliary fuel pump is not to be used during flight except when failure of the engine-driven fuel pump occurs.

Starter

Do not engage starter for more than 30 seconds in any 4-minute time period.

FUEL LIMITS

APPROVED ENGINE FUELS

100LL (blue)

100 (green)

RH-95/130 (Chinese)

RH-100/130 (Chinese)

FUEL CAPACITY

Total Capacity . . . . 80 gal

Total Usable . . . . 74 gal

FUEL MANAGEMENT

Do not take off when Fuel Quantity indicates in the Yellow arc or with less than 13 gallons in each main tank.

Maximum Slip Duration . . . . 30 seconds

Maximum fuel imbalance with autopilot engaged is 15 GAL (approximately 90 lbs).

OIL SPECIFICATION

Use MIL-L-22851 Ashless Dispersant Oils meeting the requirements of the latest revision of Teledyne Continental Motors Corporation Specification MHS-24B or current applicable Teledyne Continental Service Bulletin. Refer to Section 8, HANDLING, SERVICING AND MAINTENANCE, for a list of approved oils.

NUMBER OF PROPELLERS

One

PROPELLER MANUFACTURER

Hartzell Propeller, Inc., (Piqua, Ohio) holds the Supplemental Type Certificate (STC) for the installed propeller. Refer to supplement HPA36-2 in Section 9, SUPPLEMENTS.

NUMBER OF BLADES

Three

PROPELLER TYPE

Constant-speed, Hydraulically Actuated

PITCH SETTING (30-INCH STATION)

Low . . . . 13.0 ± 0.2°

High. . . . . 36.0 ± 1.0°

PROPELLER DIAMETER

Maximum . . . . 80 Inches

Minimum . . . . 78 inches

POWER PLANT INSTRUMENT MARKINGS

Power Plant displays are found on the MFD on the Engine Default page, the Systems page, and the Lean page in both digital and analog formats. When the MFD is not operable, the displays are found on the PFD.

The pointer, digital display, and instrument placard on the bar graphs are normally white, but will change color to yellow or red if the engine parameter is operating in a caution or prohibited range. If the engine parameter is operating in the prohibited range, the pointer, digits and placard will flash.

MANIFOLD PRESSURE

Operating Range (Green arc) . . . . >15.0 to 29.6 in. Hg

TACHOMETER

Operating Range (Green Arc). . . . . >1800 to 2700 rpm

Prohibited Range (Red Arc) . . . . >2700 to 3000 rpm

Overspeed Indications:

2701 RPM to 2754 RPM for 4 minutes . . . . . White Digits, White Needle

2701 RPM to 2754 RPM for > 4 minutes . . . Yellow Digits, Yellow Needle

2755 RPM & Above . . . . Red Digits, Red Needle

FUEL FLOW

Operating Range (Green Bar) . . . . >3 to 27.4 GPH

Prohibited Range (Red Bar). . . . . >27.4 to 30.0 GPH

Leaning Indicator (Cyan Pointer) - This pointer will automatically be displayed during MCP Climb and Cruise Climb power settings. The pointer indicates the required fuel flow based on existing RPM, Fuel Flow, and altitude. Fuel flow must be manually set to match the pointer during climbs.

NOTE

The leaning indicator will provide the correct climb fuel flows for only two power settings:

2700 RPM and Full Throttle
2500 RPM and Full Throttle

CYLINDER HEAD TEMPERATURE

The number displayed in the pointer indicates the hottest cylinder.

Operating Range (Green Bar) . . . . >116° to 238°C

Prohibited Range (Red Bar). . . . . >238° to 250°C

OIL TEMPERATURE

If engine is operating below 500 RPM, oil temperatures in the yellow bar will not cause the pointer or digits to change color.

Caution Range (Yellow Bar). . . . . 0° to 24°C

Operating Range (Green Bar) . . . . >24° to 116°C

Prohibited Range (Red Bar). . . . . >116° to 120°C

OIL PRESSURE

If engine is operating below 500 rpm, oil pressures in the yellow or red bar will not cause the pointer or digits to change color.

Prohibited Range (Red Bar) . . . . 0 to 10 psi

Caution Range (Yellow Bar) . . . . >10 to 30 psi

Operating Range (Green Bar). . . . . >30 to 60 psi

Prohibited Range (Red Bar) . . . . >100 to 105 psi

MISCELLANEOUS INSTRUMENT MARKINGS

The pointer(s), digital display, and instrument placard on the bar graphs are normally white, but will change color to yellow if the parameter is operating in a caution range.

ALTERNATOR LOAD

Two pointers, placarded 1 and 2, indicate the load of each alternator.

100% load on alternator 1 = 100 amps.

100% load on alternator 2 = 20 amps.

Operating Range (Green Bar). . . . . 0 to 100%

Caution Range (Yellow Bar, Yellow Digits). . . . . >100 to 110%

Alternator 2 Overload Indications:

- >100% to 120% for 5 minutes . . . . Normal (White)
- >100% to 120% for >5 minutes . . . . Caution (Yellow)
- >120% . . . . Caution (Yellow)

BUS VOLTAGE

Two pointers, placarded 1 and 2, indicate the voltage on Bus 1 and Bus 2. If the engine is operating below 500 RPM, bus voltages in the yellow bar will not cause the pointer or digits to change color from white to yellow.

Caution Range (Yellow Bar). . . . . >10 to 24 volts

Operating Range (Green bar). . . . . >24 to 30 volts

Caution Range (Yellow Bar). . . . . >30 to 33 volts

FUEL QUANTITY

Two pointers, placarded L and R, indicate the fuel quantity in each tank.

Caution Range (Yellow Bar). . . . . >0 to 13 Gal

Operating Range (Green Bar) . . . . >13 to 37 Gal

PROPELLER DEICE AMMETER (if installed)

Normal Operating Range . . . . .14 to 18 amps
(Do not operate the system unless engine is operating. This system must be OFF when using the Standby Magnetic Compass.

WEIGHT LIMITS

Maximum Ramp Weight. . . . . 3663 lbs

Maximum Take-off Weight . . . . 3650 lbs

Maximum Landing Weight . . . . 3650 lbs

Maximum Zero Fuel Weight . . . . .No Structural Limitation

Maximum Weights in Baggage Compartments:

- Between Spars . . . . 200 lbs
- Rear Spar to Sta. 170 . . . . 400 lbs
- Aft Compartment (Sta. 170 to Sta. 190) . . . . 70 lbs

Floor Structure Load Limits:

Between Spars. . . . . 50 lbs per sq ft

Rear Spar to Sta. 170 . . . . 100 lbs per sq ft

Maximum combined weight of aft seat occupants is 250 lbs unless otherwise placarded.

CENTER OF GRAVITY LIMITS (Landing Gear Extended)

FORWARD LIMITS

74.0 inches aft of datum at 3100 lbs or less, with straight line variation to 81.0 inches at 3650 lbs.

AFT LIMIT

87.7 inches aft of datum at all weights.

REFERENCE DATUM

Datum is 83.1 inches forward of center line through forward jack points.

MEAN AERODYNAMIC CHORD

MAC leading edge is 66.7 inches aft of datum.

MAC length is 65.3 inches.

MANEUVER LIMITS

This is a utility category airplane. Spins are prohibited. No acrobatic maneuvers are approved except those listed under Approved Maneuvers.

APPROVED MANEUVERS

MANEUVER	ENTRY SPEED	
	KCAS	KIAS
Chandelle	132	134
Steep Turn	132	134
Lazy Eight	132	134
Stall (Except Whip)	Use Slow Deceleration	
Minimum fuel for above maneuvers - 10 gallons each main tank		

Maximum Slip Duration .... 30 seconds

FLIGHT LOAD FACTOR LIMITS

Flaps Up	Flaps Down
4.4 positive g's 1.76 negative g's	3.0 positive g's 0 g's

MINIMUM FLIGHT CREW

One (1) Pilot

MAXIMUM PASSENGER SEATING CONFIGURATION

Six (6) people including pilot.

SEATING

Do not take off or land with the seat back of an occupied pilot's or copilot's seat in the full back position. The seat back of an occupied optional copilot's full reclining seat and all other occupied seats must be in the most upright position for take-offs and landings. Occupied aft-facing seats must have head-rests fully extended.

WINTER BAFFLES

Winter baffles are not to be installed when the airplane is flown at temperatures above ISA + 3°C.

AIR CONDITIONING SYSTEM (if installed)

1. The air conditioning system must be off during takeoff. The [AC DOOR EXTD] Caution Alert must be extinguished (condenser retracted) before takeoff.
2. The air conditioning system must be off when using the standby magnetic compass.

AVIONICS

GENERAL

1. Garmin G1000 Cockpit Reference Guide for the Beechcraft A36/G36, P/N 190-00525-00, Rev A, dated July, 2005 or later appropriate revision, must be immediately available to the flight crew.
2. The L-3 Communications SkyWatch Traffic Advisory System Model SKY497 Traffic Advisory System Pilot's Guide, P/N 009-10801-001, Rev E, or later revision, must be available to the pilot during flight with the SkyWatch operating.

GARMIN G1000 INTEGRATED AVIONICS SYSTEM

1. Upon initial certification, the G1000 system was equipped with A36/G36 Airframe System Software Version 0458.04. The following Airframe System Software Versions have also been approved for the Model G36:
   - 0858.05 that adds SBAS (WAAS) capability
   - 0858.06 that adds SBAS capability for EASA operational requirements

   The airplane must utilize these versions of software, or later FAA approved versions. Line Replaceable Units (LRUs) associated with each version of software are listed on the following pages.

NOTE

Airframe System Software 0464.08 and 0464.10 have also been approved for the G36 under Supplemental Type Certificate STC SA01725SE. Refer to the 190-00422-05 Revision D, or later supplement for related information.

The following methods may be used to determine the level of software installed on the airplane.

a. Refer to the MFD upon initial power up. The "Splash Screen" will display the current system software version at the top of the page, e.g. "Beechcraft Bonanza A36/G36 System 0858.05".

b. Select the SYSTEM STATUS page of the AUX Group on the MFD. The current software versions of the hardware shown in the tables below will be displayed.

c. Refer to the laminated card found at the back of this manual. This card shows the system software version and the software associated with each piece of hardware that is currently loaded in the G1000 system. The loader card is contained in a pouch located next to the laminated card.

The following methods may be used to determine if the software loaded in the airplane is the most current software available.

a. Call the Hawker Beechcraft Corporation Customer Support at 1-800-429-5372.
b. Visit the http://www.hawkerbeechcraft.com/service_support/pubs/default.aspx web site

AIRFRAME SYSTEM SOFTWARE VERSION 0458.04

SYSTEM	ABBREVIATION	SOFTWARE VERSION
Primary Flight Display	PFD1	5.01
Multifunction Display	MFD1	5.01
Audio Control Panel & Marker Beacon System	GMA1	2.07
Attitude and Heading Reference System (AHRS)	GRS1	2.03
Air Data Computer (ADC)	GDC1	2.05
Integrated Avionics Unit	GIA1, GIA2	3.02
Engine/Airframe Unit	GEA1	2.06
Global Positioning System	GPS1, GPS2	3.01
Autopilot	GSA PTCH CTL, GSA PTCH MON, GSA PTCH TRIM C, GSA PTCH TRIM M, GSA ROLL CTL, GSA ROLL MON, GSA YAW CTL, GSA YAW MON	2.05
Data Link	GDL 69	3.00.00
Mode S Transponder	GTX1	4.02

AIRFRAME SYSTEM SOFTWARE VERSION 0858.05

SYSTEM	ABBREVIATION	SOFTWARE VERSION
Primary Flight Display	PFD1	8.10
Multifunction Display	MFD1	8.10
Audio Control Panel & Marker Beacon System	GMA1	3.03
Attitude and Heading Reference System (AHRS)	GRS1	2.11
Air Data Computer (ADC)	GDC1	3.01
Integrated Avionics Unit	GIA1, GIA2	5.40
Engine/Airframe Unit	GEA1	2.07
Global Positioning System	GPS1, GPS2	3.0
Autopilot	GSA PTCH CTL, GSA PTCH MON, GSA PTCH TRIM C, GSA PTCH TRIM M, GSA ROLL CTL, GSA ROLL MON, GSA YAW CTL, GSA YAW MON	2.13
Data Link	GDL 69	3.20.00
Mode S Transponder	GTX1	4.06

AIRFRAME SYSTEM SOFTWARE VERSION 0858.06

SYSTEM	ABBREVIATION	SOFTWARE VERSION
Primary Flight Display	PFD1	8.10
Multifunction Display	MFD1	8.10
Audio Control Panel & Marker Beacon System	GMA1	4.02
Attitude and Heading Reference System (AHRS)	GRS1	2.11
Air Data Computer (ADC)	GDC1	3.01
Integrated Avionics Unit	GIA1, GIA2	5.40
Engine/Airframe Unit	GEA1	2.07
Global Positioning System	GPS1, GPS2	3.0
Autopilot	GSA PTCH CTL, GSA PTCH MON, GSA PTCH TRIM C, GSA PTCH TRIM M, GSA ROLL CTL, GSA ROLL MON, GSA YAW CTL, GSA YAW MON	2.13
Data Link	GDL 69	3.20.00
Mode S Transponder	GTX1	4.06

2. If not previously defined, the following default settings must be made on the MFD prior to operation by selecting the SYSTEM SETUP page of the AUX Group.

DISPLAY UNITS	DEFAULT SETTING	RESULTS
DIS. SPD	Nautical (NM, KT)	Distance will be shown in nautical miles and speed in knots.
ALT. VS	Feet (FT, FPM)	Altitude will be shown in feet and vertical speed in feet per minute.
POSITION	HDDD° MM.MM'	Latitude and longitude will be entered in degrees, minutes, and decimal minutes i.e. 45° 30' 30" would be entered as 45° 30.5 minutes.
Map Datum	WGS 84	The G1000 will use the WGS 84 Datum. In some areas outside the United States, datums other than WGS 84 may be used. If the G1000 is authorized for use by the appropriate Airworthiness Authority, the required geodetic datum must be set in the G1000 prior to its use for navigation.

3. Use of the VOR/ILS receiver to fly approaches not approved for GPS require VOR/ILS navigation data to be valid on the PFD display.
4. Fuel Planning information found on the MFD by selecting the TRIP PLANNING page of the AUX Group are advisory only and do not replace the primary fuel quantity and fuel flow displays.
5. The temperature limit of the G1000 system is -40° C. The temperature of the PFD and MFD must be -20° C or above to function properly.
6. Viewability of the PFD and MFD displays may be degraded when wearing polarized sunglasses.
7. For Airframe Software Version 0458.04, do not load a new arrival or departure procedure in the flight plan if one currently exists without first removing the existing arrival or departure procedure. Failing to observe this limitation can cause deviation indications, loss of GPS navigation information, and other display anomalies. If display anomalies are noted after editing the flight plan, perform either a direct to or activate leg operation as appropriate on the flight plan to ensure correct flight plan sequencing and guidance.

GPS NAVIGATION

1. Navigation is based upon use of only the Global Positioning System (GPS) operated by the United States of America.
2. Navigational information is referenced to the World Geodetic System 1984 (WGS-84), and must only be used with aeronautical information (electronic data and aeronautical charts) which conforms to WGS-84, or equivalent. Operations in areas outside of the United States which use datums other than WGS-84 are approved when authorized by the appropriate Airworthiness Authority. In such cases the required geodetic datum must be set in the G1000 prior to its use for navigation.
3. Navigation using the GPS system is prohibited unless the pilot verifies the currency of the Aviation Database or verifies each selected waypoint for accuracy by reference to current approved data. The Aviation Database version is displayed on the MFD power-up page immediately after system power-up and must be acknowledged.
4. Provided the Garmin G1000 GPS receivers are receiving adequate and usable GPS signals, it has been demonstrated capable of and meets the accuracy specifications for the following:
   a. VFR/IFR enroute, oceanic, and terminal operations within the U.S. National Airspace System in accordance with AC 20-138A.
   b. VFR/IFR non-precision instrument approach operations within the U.S. National Airspace System in accordance with AC 20-138A, including “GPS”, “or GPS”, and “RNAV(GPS)” approaches.
   c. VFR/IFR operations on Standard Instrument Departures (SIDs) (RNAV 1) and Standard Instrument Arrivals (STARs) (RNAV 1) in accordance with AC 90-100.

d. VFR/IFR Oceanic and Remote operations in accordance with Appendix 1 of AC 20-138A. A Garmin Prediction Program, or equivalent, must have been run with satisfactory results. This does not constitute an operational approval.

e. Operation in European B-RNAV airspace is accordance with AC 90-96, AC 20-138A, and JAA temporary Guidance Material, Leaflet No. 2, Rev. 1. This does not constitute an operational approval.

f. Operations up to 70° North and 70° South Latitudes except as follows:

   1) Operations North of 65° Latitude are prohibited between 75° West and 120° West Longitude.

   2) Operations South of 55° Latitude are prohibited between 120° East and 165° East Longitude.

5. Instrument approaches must be accomplished in accordance with approved instrument approach procedures that are retrieved from the GPS database. The GPS database must incorporate the current update cycle or be verified for accuracy using current approved navigation data.

6. Instrument approaches must be conducted in the GPS approach mode and Receiver Autonomous Integrity Monitoring (RAIM) must be available at the Final Approach Fix.

7. Accomplishment of ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for GPS overlay with the GPS receiver is not authorized.

8. When an alternate airport is required by the applicable operating rules, it must be served by an approach based on other than GPS navigation, the airplane must have the operational equipment capable of using that navigation aid, and the required navigation aid must be operational.

9. Airplanes equipped with Airframe System Software Version 0858.05 or 0858.06 are approved for approach procedures with vertical guidance including LPV, L/VNAV and LNAV+V, within the U.S. National Airspace System.
10. Airplanes not equipped with Baro VNAV:
    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 a normal position to land. VNAV also does not guarantee compliance with intermediate altitude constraints between the top of descent and the waypoint where the VNAV path terminates in terminal or enroute operations.
11. Airplanes equipped with Baro VNAV:
    Baro VNAV is approved for enroute and terminal vertical navigation only. Baro VNAV is not approved for instrument approaches.

GARMIN GFC 700 AUTOPILOT SYSTEM (AUTOPILOT, FLIGHT DIRECTOR, ELECTRIC TRIM)

1. The autopilot preflight self-test must be successfully completed prior to any flight in which the autopilot, flight director or manual electric trim is to be used.
2. During autopilot operations, a pilot must be seated in the left seat with the seat belt and shoulder harness fastened.
3. The autopilot and yaw damper must be off for takeoff and landing.
4. The autopilot minimum engagement heights are:
   After Takeoff - 400 feet
   During Cruise - 1000 feet
   During precision and non-precision approaches - 200 feet
5. Autopilot operations with the G1000 intentionally placed in the reversionary mode (either the PFD or MFD inoperative) is limited to VFR training operations.

6. Airspeed Limitations
   Autopilot
   Maximum: 190 KIAS
   Minimum: 80 KIAS
   Electric Trim
   Maximum: 190 KIAS
7. The maximum coupled intercept angle for a Back Course (BC) approach is 74°.
8. Overriding the autopilot in pitch or roll is prohibited.
9. Operation of the autopilot with a pitch trim failure (Red PTRM annunciation) is prohibited.
10. The autopilot system is only approved for Category I ILS approaches and non-precision approaches.
11. ***(Airframe System Software Version 0458.04)***
    When conducting GPS assisted intercepts of ILS final approach courses with the autopilot engaged, the ILS CDI Capture mode on the System Setup page of the Auxiliary Page Group must be set to Manual.

L-3 COMMUNICATIONS SKYWATCH SKY497 TRAFFIC ADVISORY SYSTEM (if installed)

1. The pilot must not maneuver the airplane based only on the traffic display. The traffic display is intended to assist in visually locating traffic and lacks the resolution necessary for use in evasive maneuvering.
2. If the pilot is advised by Air Traffic Control to disable the altitude reporting function of the transponder, the Traffic Advisory System must be placed in Standby.

GARMIN TERRAIN AWARENESS AND WARNING SYSTEM (TAWS) ***(Airframe System Software Version 0858.05 or 0858.06)***

NOTE

Refer to the 190-00422-05 Revision D or later Supplement for Airframe System Software Versions 0464.08 and 0464.10 installed in compliance with STC SA01725SE.

1. The terrain database provides world coverage. The obstacle database provides coverage for only the continental U.S. Thus, obstacle cautions and warnings will not be provided outside of the continental U.S. An Airport database provides more detailed terrain information around airports to prevent nuisance alerts.
2. Terrain data is not displayed when the airplane latitude is greater than 75 degrees North or 60 degrees South. This will be annunciated as [TAWS N/A].
3. Navigation must not be predicated upon the use of the TAWS display. The TAWS 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.
4. The GPS ALT displayed on the MFD is a calculated value and must not be considered as a primary source of altitude or used for navigation purposes.

PLACARDS/MARKINGS

Placards/markings are required to remind the flight crew and occupants of operating limitations and safety device limitations. The following illustrations depict placards/markings pertinent to operations and safety of flight.

On Left Side Panel (Airspeed Values are IAS):

AIRSPEED LIMITATIONS (IAS)

MAX. LDG GEAR EXTENDED(NORMAL)......154 KTS
MAX. APPROACH FLAPS(12°)............154 KTS
MAX. FULL DOWN FLAPS(30°)...........124 KTS
MAX. MANEUVERING....................141 KTS

UTILITY CATEGORY AIRPLANE
OPERATE IN ACCORDANCE WITH FAA APPROVED AIRPLANE FLIGHT MANUAL.

INTENTIONAL SPINS PROHIBITED

NO ACROBATIC MANEUVERS APPROVED EXCEPT THOSE LISTED IN THE AIRPLANE FLIGHT MANUAL.

C94E#02C2438

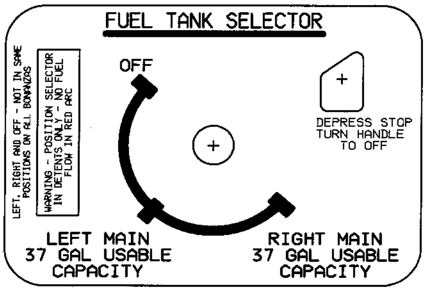
74-Gallon System

On Fuel Tank Selector Cover:

DO NOT TAKE OFF IF FUEL QUANTITY GAGES
INDICATE IN YELLOW BAND OR WITH LESS
THAN 13 GALLONS IN EACH MAIN TANK

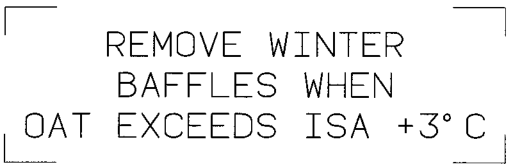
C95E#02C0073

On Fuel Tank Selector Cover:



C96EA00C2515 C

On Fuel Tank Selector Cover:



C94E#02C2440

On Upper Right Side of Instrument Panel (E-3700, E-3755 and After):

TH02C
063324AA.AI

On Instrument Panel Above MFD:

TAKEOFF & CLIMB - LEAN AS REQUIRED

DESCENT - ENRICH AS REQD

BEFORE LANDING - FULL RICH
OR AS REQD BY FIELD ELEV

E#02C
051578AA.AI

On upper right side of instrument panel:

WHEN UTILITY DOORS
ARE REMOVED - AIR
SPEED IS NOT TO
EXCEED 166 KNOTS IAS

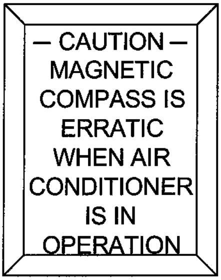
E#02C
052871AA.AI

On Left Side of Instrument Panel (if Air Conditioner installed):

AIR COND. SYS. MUST BE
OFF BEFORE TAKEOFF

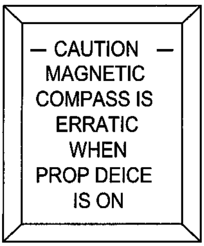
E#02C
060731AA.AI

On Forward Left Window Post:



E#02C
050616AA.AI

On Forward Left Window Post:

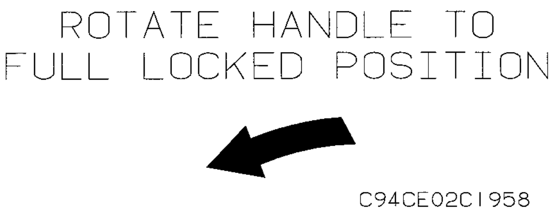


EA02C
050225AA.AI

On Top of Front Spar Carry-Thru Cover Between Front Seats:

On Landing Gear Emergency Crank Access Cover:

Above Cabin Door Handle On Window Moulding And Above Utility Door Handle On Window Molding.

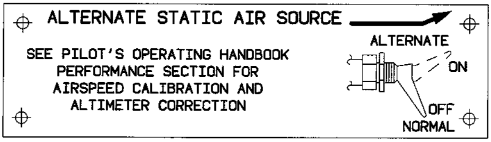


On Left Side Panel:

TURN STROBE LIGHT OFF WHEN TAXING IN VICINITY OF OTHER AIRCRAFT, OR WHEN FLYING IN FOG OR CLOUDS. STANDARD POSITION LIGHTS TO BE USED FOR ALL NIGHT OPERATIONS

C94E#02C2441 C

On Left Sidepanel Circuit Breaker Escutcheon:



C94E#02C2443

On Window Adjacent to Pilot's Seat:

SHOULDER HARNESS MUST BE WORN WHILE AT PILOT POSITIONS.
FOR TAKEOFF AND LANDING, SEAT BACK MUST NOT BE IN FULL BACK POSITION.

C94E#02C2445

On Window Adjacent to Copilot's Seat:

SHOULDER HARNESS MUST BE WORN
WHILE AT PILOT POSITIONS.
FOR TAKEOFF AND LANDING, SEAT BACK
MUST NOT BE IN FULL BACK POSITION OR
OPTIONAL FULL RECLINING BACK MUST
BE UPRIGHT.

C94E#02C2446

On Windows Adjacent To 3rd & 4th Seats (When Forward Facing) And 5th & 6th Seats:

SHOULDER HARNESS
MUST BE WORN DURING
TAKE-OFF AND LANDING
WITH SEAT BACK UPRIGHT

C94CE02C1962 C

On Windows Adjacent to 3rd & 4th Aft Facing Club Seats:

SHOULDER HARNESS
MUST BE WORN DURING
TAKE-OFF AND LANDING
WITH SEAT BACK UPRIGHT
AND AFT FACING SEATS
MUST HAVE HEADREST
FULLY EXTENDED

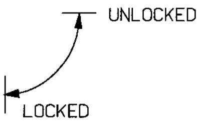
C94E#02C2447 C

On Openable Windows:

DO NOT OPEN IN FLIGHT	LATCH WINDOW BEFORE TAKE-OFF

C94CE02C1957

Above Openable Window Thumbcatch:



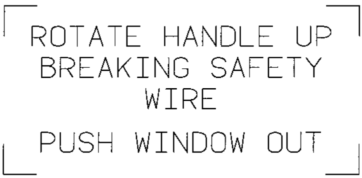
C94CE02C1978

On the Face of Emergency Exit Latch Cover:

EMERGENCY EXIT
PULL COVER
ROTATE HANDLE UP
BREAKING SAFETY WIRE
PUSH WINDOW OUT

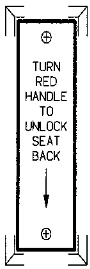
C94CE02C1954

On Emergency Exit Handle:



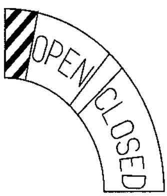
C94CE02C1955

On Inboard Side of Seat Back for 3rd & 4th Seats:



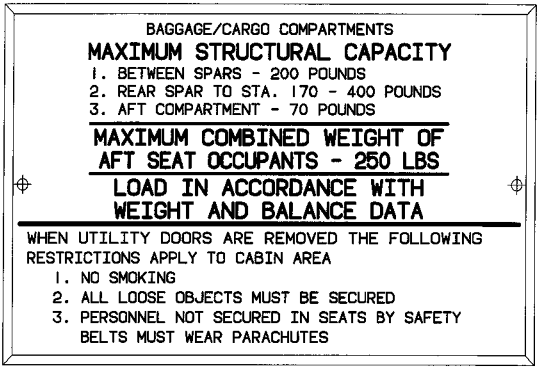
C94CE02C1963

On Inside of Cabin Door Adjacent to Door Handle:



C94CE02C1956

On Aft Cabin Bulkhead in Aft Baggage Compartment:

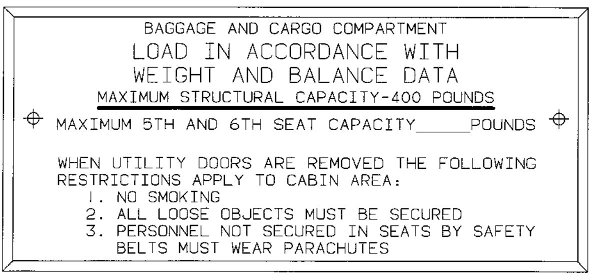


C94E#02C2449

NOTE

Maximum combined weight of aft seat occupants may be less than 250 lbs if required by CAR 3.74, due to optional equipment configuration.

In Lieu of Aft Cabin Bulkhead Placard:



C94E#02C2450

Adjacent to Oil Filler Cap:

OIL

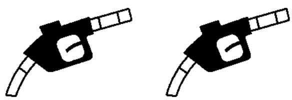
USE SAE 50 ABOVE 40° F

USE SAE 30 BELOW 40° F

TH02D
082106AA.AI

Adjacent to Fuel Filler Caps:

AVGAS ONLY



GRADE 100LL

GRADE 100

FOR ALTERNATE FUELS SEE
PILOTS OPERATING HANDBOOK

CAPACITY 40 US GALLONS(37 USABLE)
WITH WINGS LEVEL
CAP. TO TAB BOTTOM 30 GAL(27 USABLE)
CAP. TO TAB SLOT 35 GAL(32 USABLE)

E#00C
090714AA.AI

Adjacent to Fuel Filler Caps:

CAUTION
DO NOT INSERT
FUEL NOZZLE
MORE THAN 3"
INTO TANK

E#00C
090715AA.AI

On External Power Compartment Door:

EXTERNAL
POWER
24 VOLT

TH02D
082104AA.AI

KINDS OF OPERATIONS

This airplane is approved for the following types of operations when the required equipment as shown in the KINDS OF OPERATIONS EQUIPMENT LIST, is installed and operable:

1. VFR day and night
2. IFR day and night

WARNING

FLIGHT IN ICING CONDITIONS PROHIBITED.

KINDS OF OPERATIONS EQUIPMENT LIST

This airplane may be operated in day or night VFR and day or night IFR conditions when the required systems and equipment are installed and operable.

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

1. The airplane is approved to be operated in accordance with a current Minimum Equipment List (MEL) issued by the FAA.

or;

2. An alternate procedure is provided in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for the inoperative state of the listed system or equipment and all limitations are complied with.

Numbers in the Kinds of Operations Equipment List refer to quantities required to be operative for the specified condition. The list does not include all equipment that may be required by specific operating rules. It also does not include components obviously required for the airplane to be airworthy, such as wings, empennage, engine, etc.

SYSTEM and/or EQUIPMENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	REMARKS and/or EXCEPTIONS
ELECTRICAL POWER					
Alternators	2	2	2	2	
Battery Systems	2	2	2	2	
COCKPIT DISPLAY SYSTEM					
Primary Flight Display (PFD)	1	1	1	1	
Multifunctional Display (MFD)	0	1	1	1	
Integrated Avionics Unit (GIA)	1	1	2	2	
Attitude / Heading Unit (AHRS)	1	1	1	1	
Engine / Airframe Unit (GEA)	1	1	1	1	
Air Data Computer (ADC)	1	1	1	1	
Audio Panel (GMA)	0	0	1	1	
OAT	1	1	1	1	

SYSTEM and/or EQUIPMENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	REMARKS and/or EXCEPTIONS
FLIGHT CONTROLS					
Aileron Trim Tab Indicator	1	1	1	1	
Elevator Trim Tab Indicator	1	1	1	1	
Flap Position Indicator Lights	3	3	3	3	
Flap System	1	1	1	1	
Stall Warning System	1	1	1	1	
FUEL					
Auxiliary Fuel Pump System	1	1	1	1	
Fuel Selector Valve	1	1	1	1	
ICE AND RAIN PROTECTION					
Alternate Static Air System	0	0	1	1	
Pitot Heat	0	0	1	1	
LANDING GEAR					
Emergency Landing Gear Extension System	1	1	1	1	
Landing Gear Motor and Gearbox	1	1	1	1	
Landing Gear Position Indicator Lights	4	4	4	4	
Landing Gear Warning Horn	1	1	1	1	
LIGHTS					
Cockpit and Display Lighting System	0	1	1	1	
Landing Light	0	1	0	1	
Navigation Lights	0	3	0	3	
Rotating Beacon	0	1	0	1	

SYSTEM and/or EQUIPMENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	REMARKS and/or EXCEPTIONS
RESTRAINT SYSTEM					
Seat Belt (per seat)	1	1	1	1	
Shoulder Harness (per seat)	1	1	1	1	
Shoulder Harness (crew compartment)	1	1	1	1	Right side may be inoperative provided the seat remains unoccupied.
Standby Instruments					
Airspeed Indicator	1	1	1	1	
Attitude Indicator	1	1	1	1	
Altimeter	1	1	1	1	
Magnetic Compass	1	1	1	1	

SECTION 3
EMERGENCY PROCEDURES
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All airspeeds quoted in this section are indicated airspeeds (IAS) and assume zero instrument error.

Closed [BRACKETS] in this section denotes Warning, Caution and Advisory alerts or miscellaneous annunciations which appear on the PFD and MFD.

NOTE

The following information is presented to enable the pilot to form, in advance, a definite plan of action for coping with the most probable emergency situations which could occur in the operation of the airplane.

Immediate action procedures are delineated by bold type with the remaining procedures following.

EMERGENCY AIRSPEEDS

Emergency Descent .... 154 Kts
Maximum Range Glide .... 110 Kts
Landing Approach - Without Power .... 85 Kts

WARNING

The stall warning horn will be inoperative when power is lost to Bus 1, i.e. if BAT 1 and ALT 1 are both inoperative.

ABORTED TAKEOFF

1. **Throttle .... CLOSED**
2. **Brakes .... AS REQUIRED TO ACHIEVE STOPPING DISTANCE**

If airplane cannot be stopped on remaining runway:

3. **Mixture .... CUT OFF**
4. **Ground Loop .... IF REQUIRED**

When airplane comes to a stop:

5. **Fuel Selector Valve .... OFF**
6. **Battery 1 & 2, Alternator 1 & 2 .... OFF**
7. **Magnetos .... OFF**
8. **Evacuate airplane and move to a safe distance.**

ENGINE FAILURE

NOTE

The most probable causes of engine failure are loss of fuel flow, ignition system malfunction or blockage of the induction system.

ENGINE FAILURE DURING TAKE-OFF GROUND ROLL

1. **Throttle .... CLOSED**
2. **Braking .... AS REQUIRED TO ACHIEVE STOPPING DISTANCE**
3. Fuel Selector Valve .... OFF
4. Battery 1 & 2, Alternator 1 & 2 .... OFF
5. Magnetos .... OFF

ENGINE FAILURE IN FLIGHT

WARNING

If engine failure occurs immediately after takeoff, landing straight ahead is usually advisable.

1. **Airspeed**
   - **Immediately After Takeoff .... 85 KTS (minimum)**
   - **With Sufficient Altitude .... 110 KTS**

If sufficient time is available, accomplish the following:

2. **Turn toward the Most Favorable Landing Site.**
3. **Air Conditioner (if installed).................. OFF**
4. **Fuel Selector Valve......... SELECT OTHER TANK (feel for detent & visually check)**
5. **Magnetos............... CHECK BOTH SELECTED**
6. **Aux Fuel Pump .... HI**
7. **Mixture.... FULL RICH, THEN LEAN AS REQUIRED**

WARNING

If power is restored when the Auxiliary Fuel Pump is selected to HI, then manual adjustment of the mixture control will be required for all power changes to prevent engine roughness. Do not retard throttle to idle until landing is assured.

If engine does not start:

8. **Aux Fuel Pump .... OFF**
9. **Mixture.............................. FULL RICH**
10. **Magnetos....... CHECK LEFT, RIGHT, THEN BOTH**
11. **Alternate Air T-Handle .... PULL AND RELEASE**

If engine still does not start:

12. See MAXIMUM GLIDE CONFIGURATION procedure.

ENGINE FIRE IN FLIGHT

1. **Firewall Air Control Knob . . . . PULL TO CLOSE**

WARNING

The red FIREWALL AIR control knob on the outboard side of the left lower subpanel should be pulled to close off all heating system outlets so that smoke and fumes will not enter the cabin.

2. **Engine . . . . SHUTDOWN**
   a. **Fuel Selector Valve . . . . OFF**
   b. **Mixture . . . . CUT OFF**
   c. **Propeller . . . . LOW RPM**
   d. **Alternator 1 & 2 . . . . OFF**
   e. **Magnetos . . . . OFF**
3. **Engine . . . . DO NOT ATTEMPT TO RESTART**
4. See the following procedures, as required:
   a. EMERGENCY DESCENT
   b. MAXIMUM GLIDE CONFIGURATION
   c. LANDING WITHOUT POWER

ENGINE FIRE ON THE GROUND

1. **Mixture . . . . CUT OFF**
2. **Fuel Selector Valve . . . . OFF**
3. **Battery 1 & 2, Alternator 1 & 2 . . . . OFF**
4. **Magnetos . . . . OFF**
5. **Evacuate airplane and move to a safe distance.**

PROPELLER OVERSPEED

1. **Throttle .... RETARD**
2. **Airspeed .... REDUCE UNTIL RPM IS AT OR BELOW 2700**
3. Oil Pressure .... CHECK

WARNING

If loss of oil pressure was the cause of overspeed, the engine will seize after a short period of operation.

4. Land .... AS SOON AS PRACTICAL
5. If engine seizes, see following procedures in this section, as required:
   a. MAXIMUM GLIDE CONFIGURATION
   b. LANDING WITHOUT POWER

ELECTRICAL SMOKE OR FIRE

Action to be taken must consider existing conditions and equipment installed:

1. **Battery 1 & Alternator 1 .... OFF**
2. **Firewall Air Control .... PULL**
   (if smoke or fire is present in engine compartment)
3. **Autopilot and Flight Director......... DISENGAGE**
4. **Avionics Switch and All Electrical Equipment Switches............ OFF**
5. Dissipation of smoke may be aided by the following:
   a. Firewall Air Control (if engine is not source of smoke) .... FULL FORWARD
   b. Wing Root Fresh Air Outlets .... OPEN
      (Rotate CCW)
   c. Overhead Fresh Air Outlets .... OPEN

If smoke subsides:

6. Land .... AS SOON AS PRACTICAL

WARNING

Dissipation of smoke is not sufficient evidence that the fire has been extinguished. If it cannot be visually confirmed that no fire exists, land at the nearest suitable airport.

If smoke persists:

7. **Airplane Control .... MAINTAIN USING STANDBY INSTRUMENTS**
8. **Battery 2 & Alternator 2 .... OFF**
9. Land .... AS SOON AS PRACTICAL

If Smoke Subsides and Avionics equipment is required to land the airplane, restore Bus No.1:

10. Battery 1 & Alternator 1....................... ON

EMERGENCY DESCENT

1. **Power ....IDLE**
2. **Propeller............................. HIGH RPM**
3. **Landing Gear (154 Kts Maximum).......... DOWN**
4. **Flaps (154 Kts Maximum).............APPROACH**
5. **Airspeed............................ 154 KIAS**

MAXIMUM GLIDE CONFIGURATION

1. **Landing Gear................................UP**

CAUTION

The landing gear will not retract unless the throttle is in a position corresponding to approximately 17 in. Hg manifold pressure or above.

2. **Flaps ....UP**
3. **Propeller ....LOW RPM**
4. **Cowl Flaps............................CLOSED**
5. **Airspeed .... 110 KTS**
6. Air Conditioner (if installed)...................OFF
7. Alternator 1 & 2...........................OFF
8. ELT.......................................ON
9. Glide Ratio ....1.7 NM / 1000 FEET
   (2 statute miles / 1000 feet)
10. Nearest Airport ....DETERMINE
    a. PFD .... PRESS NEAREST SOFTKEY
    b. Large FMS Knob .... SELECT DESIRED AIRPORT
    c. Direct-To Key........................ PRESS
    d. ENT Key.....................PRESS TWICE

LANDING WITHOUT POWER

1. **Fuel Selector Valve.........................OFF**
2. **Mixture............................ CUT OFF**
3. **Magnetos................................OFF**
4. **Flaps ....DOWN**
5. **Landing Gear..................... DOWN or UP**
   (depending on terrain)

CAUTION

The landing gear will not retract unless the throttle is in a position corresponding to approximately 17 in. Hg manifold pressure or above.

6. **Airspeed.......................85 KIAS MINIMUM**
7. **Alternator 1 & 2 .... OFF**

When landing is assured and PFD is not required:

8. **Battery 1 & 2 .... OFF**

LANDING WITH GEAR RETRACTED - WITH POWER

If possible, choose firm sod. Make a normal approach using flaps as necessary.

CAUTION

The landing gear will not retract unless the throttle is in a position corresponding to approximately 17 in. Hg manifold pressure or above.

When landing is assured:

1. **Throttle............................. CLOSED**
2. **Mixture .... CUT OFF**
3. **Alternator 1 & 2 .... OFF**
4. **Magnetos .... OFF**
5. **Fuel Selector Valve .... OFF**
6. Maintain wings level during landing.
7. Battery 1 & 2 (after landing) .... OFF
8. Evacuate the airplane and move to a safe distance.

ELECTRICAL

ALTERNATOR 1 AND 2 FAILURE [ALT 1 - 2 INOP] & [BUSES TIED]

1. Alt 1 and Alt 2 . . . . CHECK
   a. Alternator 1 & 2 Switches. . . . . .VERIFY ON
   b. Alt Load 1 & 2 . . . . CHECK
   c. Bus Volts 1 & 2 . . . . CHECK

If Alt Load 1 & 2 indicate a load, a false warning is indicated.

2. Continue to use Alternator 1 & 2.

If Alt Load 1 & 2 show no load and the Bus Volts 1 & 2 gradually drop below 25 volts, alternator 1 & 2 are inoperative. Attempt to reset the alternators as follows:

3. Alternator 1 & 2. . . . . . OFF MOMENTARILY, THEN ON (to reset the over-voltage relay)

If [ALT 1 - 2 INOP] *Extinguishes:*

4. Continue to use Alternator 1 & 2.

If Alt Load 1 & 2 continue to show no load and Bus Volts 1 & 2 continue to indicate below 25 volts:

5. Alternator 1 & 2. . . . . .OFF
6. Autopilot and Flight Director . . . . .DISENGAGE
7. Avionics Switch. . . . . .OFF
8. Bus 1 and Bus 2 . . . . LOAD SHED AS REQD (see ELECTRICAL LOAD SHEDDING procedures)
9. Land . . . . AS SOON AS PRACTICAL

ALTERNATOR 1 FAILURE [ALT 1 INOP]

1. Alternator 1 ....CHECK
   a. Alternator 1 Switch .... VERIFY ON
   b. Alt Load 1 ....CHECK
   c. Bus Volts 1 ....CHECK

If Alt Load 1 indicates a load and Bus Volts 1 is 27.5 to 29.0 volts, a false warning is indicated.

2. Continue to use Alternator 1.

If Alt Load 1 shows no load and the Bus Volts 1 gradually drops to below 25 volts, alternator 1 is inoperative. Attempt to reset the alternator as follows:

3. Alternator 1 ....OFF MOMENTARILY, THEN ON (to reset the over-voltage relay)

If [ALT 1 INOP] *Extinguishes:*

4. Continue to use Alternator 1.

If Alt Load 1 continues to show no load and Bus Volts 1 continues to indicate below 25 volts:

5. Alternator 1 .... OFF
6. Bus 1 ....LOAD SHED AS REQD (See ELECTRICAL LOAD SHEDDING Procedures)
7. Land .... AS SOON AS PRACTICAL
8. The landing gear may have to be extended manually at the destination depending on the condition of Battery 1. See LANDING GEAR MANUAL EXTENSION in Section 3A, ABNORMAL PROCEDURES.

ALTERNATOR 2 FAILURE [ALT 2 INOP], [BUSES TIED]

CAUTION

During ground operations, a failure of alternator 2 can only be detected at RPMs above 2000.

NOTE

It is normal for the [BUSES TIED] to be displayed when engine RPM is < 2000 RPM, such as during ground operations and during landings.

An inoperative Alternator 2 will allow the bus tie relay to close. Battery 2 and BUS 2 will receive power from Bus 1.

1. Alternator 2 . . . . CHECK
   a. Alternator 2 Switch. . . . . .VERIFY ON
   b. Alt Load 2. . . . . CHECK
   c. Bus Volts 2. . . . . CHECK

If Alt Load 2 indicates a load and Bus Volts 2 is 27.5 to 29.0 volts, a false caution alert is indicated.

2. Continue to use Alternator 2.

If Alt Load 2 shows no load and Bus Volts 2 gradually drops to approximately 2 volts below Bus Volts 1, Alternator 2 is inoperative. Attempt to reset the alternators as follows:

3. Alternator 2 . . . . OFF MOMENTARILY, THEN ON (to reset the over-voltage relay)

If the [ALT 2 INOP] *and* [BUSES TIED] *Extinguishes:*

4. Continue to use Alternator 2.

If Alt Load 2 continues to show no load and the [ALT 2 INOP] *and* [BUSES TIED] *remain illuminated:*

5. Alternator 2 . . . . OFF
6. Alt Load 1 . . . . MONITOR
7. BUS 1 . . . . LOAD SHED IF REQD
   (See ELECTRICAL LOAD SHEDDING Procedures)
8. Land . . . . AS SOON AS PRACTICAL

ALTERNATOR 2 FAILURE & BUS TIE FAILURE [ALT 2 INOP]

Illumination of the [ALT 2 INOP] *without the Illumination of the* [BUSES TIED] *indicates that the Bus Tie Contactor has failed to close. Thus, Bus 2 will be powered only by Battery 2.*

1. Alternator 2 . . . . CHECK
   a. Alternator 2 Switch . . . . VERIFY ON
   b. Alt Load 2 . . . . CHECK
   c. Bus Volts 2 . . . . CHECK

If Alt Load 2 indicates a load and Bus Volts 2 indicates 27.5 to 29.0, a false caution alert is indicated.

2. Continue to use Alternator 2.

If Alt Load 2 shows no load and Bus Volts 2 is zero, Alternator 2 is inoperative and the bus tie did not close. Attempt to reset the alternator as follows:

3. Alternator 2 . . . . OFF MOMENTARILY, THEN ON
   (to reset the over-voltage relay)

If the [ALT 2 INOP] *Extinguishes:*

4. Continue to use Alternator 2.

If Alt Load 2 continues to show no load and the [ALT 2 INOP] *remains illuminated:*

5. Alternator 2 . . . . OFF

Bus 2 will be powered only by Battery 2:

6. BUS 2 . . . . LOAD SHED IF REQD
(See ELECTRICAL LOAD SHEDDING Procedures)
7. Land .AS SOON AS PRACTICAL

ELECTRICAL LOAD SHEDDING

LOSS OF ALTERNATOR 1 OR ALTERNATOR 1 AND 2

The following items are powered only by Battery 1 and Alternator 1. These items are candidates for load shedding if Alternator 1 fails or if Alternator 1 and 2 fail. This can be accomplished by turning switches off, pulling circuit breakers, or refraining from using the system. Items to be shed are at the discretion of the pilot and should be chosen based on the flight conditions; however, for a dual alternator failure those items with an * must be shed in order to conserve battery power.

ITEMS LOCATED ON BUS 1

* 1. Avionics Circuit Breaker Panel - Individual equipment may be shed by pulling the respective circuit breaker shown below. These are located on the Avionics Circuit Breaker Panel under the title "AVIONICS BUS." **As an alternative, all items may be turned off by turning the Avionics Switch off.**

NOTE

If the Avionics Switch is turned off, the Autopilot will disengage and the flight director will not be able to be used. Both should be turned off prior to turning the Avionics Switch off.

a. MFD
b. COMM2
c. INTEG AVION 2
(Autopilot, GPS 2 and NAV 2 will be lost)

   d. AUDIO MKR
   e. DME (if installed)
   f. STORM SCOPE (if installed)
   g. TRAFFIC ALERT
   h. DATA LINK
   i. AP SERVOS
   j. AVIONICS FAN
2. Pilot's Sub Panel Switches
 * a. STROBE LIGHTS
 * b. BEACON LIGHTS
 * c. PANEL LIGHTS
   d. TAXI LIGHTS
   e. LDG LIGHTS
 * f. VENT BLOWER (if installed)
 * g. PROP DE-ICE (if installed)
 * h. AC (Air Conditioner) (if installed)
 * i. AC BLOWER (if installed)
   j. LANDING GEAR
   k. FLAPS
3. Left Circuit Breaker Panel
   a. CLOCK
   b. STBY HORIZ (Note: The standby horizon will continue to be powered by Battery 1 until Bus Volts 1 drops below 10 volts.)
 * c. UTIL PWR (unplug equipment from utility outlet)
 * d. CABIN LIGHTS

LOSS OF ALTERNATOR 2 OR ALTERNATOR 1 AND 2

In Flight, the following items are powered by Battery 2 and Alternator 2. If Alternator 2 fails, these items will be powered by Alternator 1 and Battery 1 and may be candidates for load shedding; however, for a dual alternator failure those items with an * must be shed in order to conserve battery power.

ITEMS LOCATED ON BUS 2

1. Avionics Circuit Breaker Panel -The following equipment is located on the Avionics Circuit Breaker Panel under the title "BUS 2". It is recommended that these items not be shed unless absolutely necessary.
   a. PFD
   b. ENG/AFR SENSOR
   c. COMM1
   d. INTEG AVION 1
   (Autopilot, GPS 1 and NAV 1 will be lost.)
   e. XPNDR
   f. AHRS
   g. ADC
   h. PFD FAN
2. Pilot's Sub Panel Switches
   a. PITOT HEAT
   * b. NAV LIGHTS
   c. FLOOD LIGHTS
   * d. AUX FUEL PUMP
3. Left Circuit Breaker Panel
   a. HOUR METER
   b. LDG GR POS LTS

COMPLETE ELECTRICAL FAILURE

The G36 is designed to prevent a complete electrical failure. If the airplane is maintained properly, and operated according to prescribed procedures, such a failure should not occur.

1. Airplane Control. . . . . MAINTAIN USING STANDBY INST
   a. Standby Airspeed Indicator
   b. Standby Attitude Indicator
   c. Standby Altimeter
   d. Standby Compass
2. Standby Attitude Indicator . . . . .PRESS STBY PWR BUTTON
   (to cancel flashing yellow LED & latch battery on)

WARNING

If STBY PWR button is not pressed during the one minute that the LED remains flashing, the standby battery will automatically turn off and the instrument will flag. If this occurs, press the STBY PWR button once to turn the battery back on.

3. Standby Attitude Indicator . . . . CONFIRM FLAG IS PULLED
4. Night Operations . . . USE FLASHLIGHT AS REQUIRED
   (only the standby attitude indicator will be illuminated)
5. Maintain, or Obtain VFR Conditions.
6. Land at the Nearest Suitable Airport.
   a. Plan on a flaps up landing.
   b. See LANDING GEAR MANUAL EXTENSION IN Section 3A, ABNORMAL PROCEDURES.

c. Plan on no more than 1 hour of battery life for the standby attitude indicator. Duration may be less depending on battery condition.

EMERGENCY EXITS

The openable windows on the left and right side of the cabin may be used for emergency egress in addition to the cabin door and utility doors. An emergency exit instructions placard is located on each openable window/emergency exit latch cover.

To Open the Emergency Exit:

1. Remove cover as indicated by placard in center of openable window emergency exit latch.
2. Rotate exposed red latch handle up (as indicated by placard), breaking safety wire, and push window out.

NOTE

Anytime the window has been opened by breaking the safety wire on the red emergency latch handle, the window must be reattached and wired by a qualified mechanic using a single strand of QQ-W-343, Type S, .020 diameter copper wire prior to future airplane operation.

For Access Past the 3rd and/or 4th seats:

1. Rotate red handle located on lower inboard side of seat back.
2. Fold seat back over.

SPINS

Intentional spins are prohibited. If an unintentional spin is encountered, perform the following procedure IMMEDIATELY - THE LONGER THE DELAY, THE MORE DIFFICULT RECOVERY WILL BECOME. Steps 1 through 3 should be done AGGRESSIVELY and SIMULTANEOUSLY. The full forward position of the control column may be reduced slightly, if required, to prevent the airplane from exceeding a 90° nose down (inverted) attitude.

If a Spin is Entered Inadvertently:

1. **Control Column................FULL FORWARD, AILERONS NEUTRAL**
2. **Full Rudder ...OPPOSITE THE DIRECTION OF SPIN**
3. **Throttle.................................IDLE**
4. **Rudder .... NEUTRALIZE WHEN ROTATION STOPS**
5. **Execute a smooth pullout.**

EMERGENCY SPEED REDUCTION

In an emergency, the landing gear may be used to create additional drag.

1. **Throttle.................................IDLE**
2. **Landing Gear.......................... DOWN**
3. **Airspeed.......................... MONITOR**
4. **Throttle....................... AS REQUIRED**
5. **Landing Gear................... AS REQUIRED**

NOTE

If disorientation is possible, leave the landing gear down to reduce the tendency of subsequent speed buildups.

NOTE

Should the landing gear be used at speeds higher than the maximum extension speed, a special inspection of the gear doors in accordance with maintenance manual procedures is required, with repair as necessary.

AVIONICS

AUTOPILOT FAILURES

AUTOPILOT MALFUNCTION ALTITUDE LOSSES (FEET)

Climb, Cruise, Descent 350

Maneuvering 300

Approach 126

AUTOPILOT MANUAL DISENGAGEMENT

When the autopilot is manually disengaged normally, the green [AP] in the AFCS Status Bar will change to a black [AP] on a yellow background, flash for 5 seconds, then extinguish, and a 2-second aural alert will sound. The [YD] will also change color and flash if it disconnects.

The autopilot can be manually disengaged by:

1. Pressing the red AP DISC switch on the pilot's control wheel (Also disconnects the Yaw Damp.)
2. Moving the left (outboard) side of the trim switch (Yaw Damp will not disengage.)
3. Pressing the AP key on the MFD (Yaw Damp will not disengage.)
4. Pressing the GO AROUND switch on the left side of the Throttle (Yaw Damp will not disengage.)

The autopilot can also be disengaged in an emergency by turning the Avionics Switch off. If this procedure is used the following will occur:

1. No aural alert will sound.
2. A red flashing [AP] will be displayed in the AFCS Status Bar. The left side of the trim switch must be used to cancel it.

3. A yellow flashing [YD] will be displayed for 5 seconds then extinguish.
4. The Flight Director will remain displayed but cannot be used.
5. The electric trim will be inoperative.
6. The MFD will be inoperative.

AUTOPILOT AUTOMATIC DISENGAGEMENT

Red Flashing [AP] and Aural Tone

Red [AFCS]

Possible Red [PITCH] and/or [ROL] to indicate axis failed

Loss of the following items will cause the autopilot to automatically disconnect. The autopilot will remain inoperative and cannot be re-engaged until the inoperative item is restored. AHRS, ADC, PFD, GEA 1 (INTEG AVION 1), and GEA 2 (INTEG AVION 2).

1. AP DISC Switch .... PRESS
(to cancel tone and flashing [AP])

or

2. Left (outbound) Side of Trim Switch .... ACTUATE
(to cancel tone and flashing [AP])
3. Pitch Trim .... RETRIM AS REQD

WARNING

Do not re-engage the autopilot until the cause of the malfunction has been determine.

AUTOPILOT OVERSPEED RECOVERY [MAXSPD]

If the airspeed reaches approximately 190 KIAS, a flashing yellow [MAXSPD] will be displayed above the airspeed display and the autopilot will command a pitch up in order to decelerate the airplane below 190 KIAS.

1. **Throttle .... REDUCE POWER AS REQUIRED**
2. **Autopilot**
   a. **Disconnect and manually slow the airplane.**

   (or, if altitude permits:)

   b. **Use VS or PIT Mode and NOSE UP key to slow the airplane.**
3. [MAXSPD]. . . . . EXTINGUISHED (when speed is reduced below approx. 185 KIAS)

CAUTION

If in PIT mode, the flight director will revert to the original pitch attitude when the [MAXSPD] is cancelled if the pitch attitude is not adjusted with the NOSE UP key.

4. Autopilot Overspeed Recovery is not available in Altitude Hold (ALT) or glideslope (GS) modes.
5. If in FLC Mode, the speed reference cannot be adjusted while in the Overspeed Recovery Mode.

AUTOPILOT RESPONSE TO ERRONEOUS AHRS INPUT

A failure of the AHRS may cause erroneous autopilot responses and/or electric pitch trim activations.

One or more of the following indications may be present.

Red [AFCS]

Yellow or Red [AP]

Yellow [CHECK ATTITUDE]

Unexpected Roll or Pitch Deviations

Erroneous Attitude Indication

1. **Control Wheel .... HOLD FIRMLY**
2. **Standby Attitude Indicator .... CROSS CHECK FOR PROPER ATTITUDE**
3. **AP DISC Switch .... PRESS AND HOLD**
4. **Pitch Trim .... RETRIM IF REQD**
5. **AP DISC Switch .... RELEASE**

If uncommanded deviation occurs again:

6. AP DISC Switch .... PRESS AND HOLD
7. AP SERVOS Circuit Breaker .... PULL
8. AP DISC Switch .... RELEASE
9. Pitch Trim .... RETRIM IF REQD

ELECTRIC PITCH TRIM FAILURE [PTRM]

Illumination of the [PTRM] indicates that the electric pitch trim has failed.

1. Control Wheel . . . . HOLD FIRMLY and maintain (be prepared for out-of-trim condition)
2. AP DISC Switch . . . . PRESS
3. The autopilot will not engage after it has been disconnected with a failed pitch trim system.

UNSCHEDULED ELECTRIC PITCH TRIM

Red Flashing [PTRM]

Possible yellow [↓ELE] or [↑ELE]

1. Airplane Attitude . . . . MAINTAIN USING ELEVATOR CONTROL (expect residual pitch forces)
2. AP DISC Switch . . . . DEPRESS AND HOLD (to interrupt the pitch trim)
3. Avionics Switch. . . . . OFF
4. AP DISC Switch . . . . RELEASE
5. AP SERVOS Circuit Breaker . . . . PULL
6. Avionics Switch. . . . . ON
7. Pitch Trim . . . . RETRIM AS REQD

NOTE

Autopilot will not re-engage with a failed electric pitch trim system or with the AP SERVOS circuit breaker pulled.

AIR DATA COMPUTER (ADC) FAILURE

Yellow [AIRSPEED FAIL]

Yellow [ALTITUDE FAIL]

Yellow [VERT SPEED FAIL]

Red X over TAS and OAT Displays

1. Refer to the standby airspeed and altimeter.
2. Land . . . . AS SOON AS PRACTICAL

ATTITUDE AND HEADING REFERENCE SYSTEM (AHRS) FAILURE

Yellow [ATTITUDE FAIL]

Red X over attitude display

Removal of Sky/Ground Display

Yellow [HDG] with red X

Compass Rose Digits Removed

Course Pointer will indicate straight up

Autopilot and Yaw Damp will Disengage

1. AP DISC Switch . . . . PRESS
   (if required to cancel autopilot tone & flashing [AP])
2. Use Standby Attitude Indicator and Magnetic Compass.
3. Nav Course . . . . SET USING DIGITAL WINDOW
4. Land . . . . AS SOON AS PRACTICAL

FAILURE OF PFD OR MFD

If the remaining display does not automatically revert to the reversionary mode:

1. DISPLAY BACKUP Button on Audio Panel. . . . . PRESS
2. Com 1 and Nav 1 will be lost if the PFD fails.
3. Comm 2 and Nav 2 will be lost if the MFD fails.

FAILURE OF PFD AND MFD

1. Transition to the Standby Instruments.
2. 121.5 MHZ will automatically be available to the pilot through the pilot's headset.
3. Land . . . . AS SOON AS PRACTICAL

EMERGENCY COMMUNICATIONS

The 121.5 MHZ Emergency frequency will be automatically loaded in the active frequency field under the following conditions:

1. Pressing and holding the COM Frequency Toggle Key for approximately 2 seconds.
2. When a COM tuning failure is detected by the system.
3. In the event of a failure of the PFD and the MFD, the emergency frequency will be available to the pilot through the headset.

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ABNORMAL PROCEDURES
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Closed [BRACKETS] in this section denotes Warning, Caution and Advisory alerts or miscellaneous annunciations which appear on the PFD and MFD.

FORWARD CABIN DOOR OPEN IN FLIGHT

If the forward cabin door is not properly latched, it may open during takeoff roll or during flight. The door may trail open approximately 3 inches, but the flight characteristics of the airplane will not be affected. The rate-of-climb will be reduced.

If the forward cabin door opens in flight:

1. Maintain Control of the Airplane.
2. Do not attempt to close the door until after landing.
3. All Occupants remain seated with seat belts fastened.
4. Land as soon as practical using Normal Procedures.

If occupant in right seat can assist:

5. Hold door during and after landing to prevent it from swinging open.

ROUGH RUNNING ENGINE

1. Fuel Selector Valve. . . . . .SWITCH TANKS

If engine roughness continues:

2. Aux Fuel Pump . . . . LO
3. Mixture . . . . . FULL RICH, THEN LEAN AS REQUIRED

If engine roughness continues:

4. Magnetos . . . . CHECK LEFT, RIGHT, THEN BOTH

If engine roughness continues:

5. Alternate Air T-Handle . . . . .PULL AND RELEASE

SYSTEMS

STARTER ENGAGED [STARTER ENGD]

After engine start, if the starter relay remains engaged, the starter will remain energized and the [STARTER ENGD] will be displayed in the Annunciation Window. This will eventually lead to the failure of Bus 1.

1. Battery 1 & Alternator 1 . . . . OFF
2. DO NOT TAKE OFF.

ALTERNATOR 1 OVERVOLTAGE [BUS1 VOLT HI]

An Alternator 1 overvoltage condition will overcharge battery 1 and possibly damage equipment on Bus 1.

1. Bus Volts 1 . . . . CHECK

If voltage is less than 30 volts a false warning is indicated.

2. Continue to use Alternator 1.

If voltage is greater than 32 volts a failure of the overvoltage relay is indicated.

3. Alternator 1 . . . . OFF
4. Bus 1 . . . . LOAD SHED AS REQD
   (See ELECTRICAL LOAD SHEDDING in Section 3, EMERGENCY PROCEDURES)
5. Land . . . . AS SOON AS PRACTICAL
6. The landing gear may have to be extended manually at the destination depending on the condition of Battery 1. See LANDING GEAR MANUAL EXTENSION.

ALTERNATOR 2 OVERVOLTAGE [BUS2 VOLT HI]

An Alternator 2 overvoltage condition will overcharge Battery 2 and possibly damage equipment on Bus 2.

1. Bus Volts 2 . . . . CHECK

If voltage is less than 30 volts a false warning is indicated.

2. Continue to use Alternator 2.

If voltage is greater than 32 volts a failure of the overvoltage relay is indicated.

3. Alternator 2 . . . . .OFF

Buses 1 and 2 will be powered by Alternator 1, Battery 1, and Battery 2.

4. [BUSES TIED] . . . . ILLUMINATED
5. Voltmeters. . . . . .CHECK
   a. Bus Volts 1 . . . . .NORMAL
   b. Bus Volts 2. . . . APPROX 2 V LOWER THAN BUS 1
6. Alt Load 1 . . . . .MONITOR (100% Max)
7. BUS 1 and 2 . . . . LOAD SHED IF REQD (See ELECTRICAL LOAD SHEDDING in Section 3, EMERGENCY PROCEDURES)
8. Land . . . . .AS SOON AS PRACTICAL

ALTERNATOR 2 OVERLOAD

Yellow ALT LOAD 2 Display

If Battery 2 is not fully charged when the [BUSES TIED] extinguishes (RPM ≥ 2000), ALT LOAD 2 may exceed 100% for a short period of time. ALT LOAD 2 is approved up to 120% for 5 minutes at which time the display will turn yellow.

If the ALT LOAD 2 display turns yellow:

1. Alternator 2 . . . . .OFF
   [BUSES TIED] - Illuminated

Allow Bus 1 to charge Battery 2 for approximately 2 minutes.

2. Alternator 2 . . . . .ON
   [BUSES TIED] - Extinguished
3. ALT LOAD 2 . . . . .MONITOR

If the ALT LOAD 2 continues to show an over-loaded condition in excess of the 5 minute limitation (yellow display):

4. Alternator 2 . . . . OFF

BUS TIE RELAY CLOSED [BUSES TIED]

If the [BUSES TIED] is illuminated during flight, Bus 1 and Bus 2 will be linked and any failure on one bus may affect the other bus, potentially damaging instruments and equipment on both buses.

1. Continue to destination.
2. Repair as soon as practical.

CIRCUIT BREAKER TRIPPED

1. Nonessential Circuit . . . . . DO NOT RESET IN FLIGHT
2. Essential Circuit (necessary for continued safe flight):
   a. Circuit Breaker (after allowing to cool for a minimum of 10 sec) . . . . PUSH TO RESET

   If Circuit Breaker Trips Again:

   b. Circuit Breaker . . . . DO NOT RESET

LANDING GEAR MANUAL EXTENSION

1. Airspeed . . . . .154 KTS or LESS
   (lower speeds facilitate a manual extension)
2. LANDING GEAR MOTOR Circuit Breaker . . . . . . PULL
   (left circuit breaker panel)
3. Landing Gear Handle . . . . DOWN
4. Handcrank Handle Cover . . . . REMOVE
   (at rear of front seat)
5. Handcrank. . . . . ENGAGE AND TURN CCW AS FAR AS POSSIBLE
   (approximately 50 turns)

6. If the electrical system is operative, a positive gear down indication can be made as follows:
   a. LDG GR WARN Circuit Breaker. . . . . .CHECK IN
   b. Landing GEAR DN & LOCKED Lights. . . . . ILLUMINATED
   c. Gear Warning Horn . . . . DOES NOT SOUND WHEN THE THROTTLE IS RETARDED TO IDLE
7. Handcrank . . . . .DISENGAGE, THEN STOW
8. Landing Gear Handle . . . . DO NOT MOVE
9. LANDING GEAR MOTOR Circuit Breaker. . . . DO NOT RESET
10. The landing gear should be considered UNLOCKED until the airplane is on jacks and the system has been cycled and checked.

CAUTION

Do not operate the landing gear electrically with the handcrank engaged. Damage to the mechanism could occur.

CAUTION

The manual extension system is designed to lower the landing gear only. DO NOT ATTEMPT TO RETRACT THE GEAR MANUALLY.

LANDING GEAR RETRACTION AFTER PRACTICE MANUAL EXTENSION

After practice manual extension of the landing gear, the gear can only be retracted electrically, as follows:

1. Handcrank.................... CONFIRM STOWED
2. LANDING GEAR MOTOR Circuit Breaker .... IN
3. Landing Gear Handle .... UP

NOTE

The landing gear will not retract unless the throttle is in a position corresponding to approximately 17 in. Hg manifold pressure or above.

INDUCTION SYSTEM ICING

If induction system icing occurs, the Alternate air door should automatically open. To ensure the door opens:

1. Alternate Air T-Handle.......... PULL AND RELEASE

ALTERNATE STATIC AIR SOURCE

THE ALTERNATE STATIC AIR SOURCE SHOULD BE USED FOR CONDITIONS WHERE THE NORMAL STATIC SOURCE HAS BEEN OBSTRUCTED. When the airplane has been exposed to moisture and/or icing conditions, especially on the ground, the possibility of obstructed static ports should be considered. Partial obstruction will result in the rate of climb indication being sluggish during a climb or descent. Verification of suspected obstruction is possible by switching to the alternate system and noting a sudden sustained change in rate of climb. This may be accompanied by abnormal indicated airspeed and altitude changes beyond normal calibration differences.

Whenever any obstruction exists in the Normal Static Air System or the Alternate Static Air System is desired for use:

1. Alternate Static Air Source . . . . (ALTERNATE) ON
2. For Airspeed Calibration and Altimeter Correction, refer to Section 5, PERFORMANCE.

When the Alternate Static Air System is no longer needed:

3. Alternate Static Air Source . . . . (NORMAL) OFF

NOTE

In the ALTERNATE ON position, static pressure at the normal static buttons is averaged with the static pressure in the cabin.

ELECTROTHERMAL PROPELLER DEICE (if installed)

Abnormal Readings On Propeller Deice Ammeter:
(Normal operation: 14 - 18 amps.)

1. Zero Amps
   a. Prop Deice Switch . . . . CHECK POSITION

If Off:

   b. Reposition to ON after 30 seconds.

If Propeller Deice Ammeter still indicates zero amps:

   c. Prop Deice Switch . . . . OFF, THEN ON

If Propeller Deice Ammeter still indicates zero amps:

   d. Prop Deice . . . . . OFF AND ASSUME INOPERATIVE

2. Below 14 Amps, Occasionally or Regularly:
   a. Continue Operation.
   b. If propeller imbalance occurs, increase rpm briefly to aid in ice removal.
   c. If serious imbalances occur, turn prop deice off.

3. Over 18 Amps, Occasionally or Regularly:
   - If the Propeller Deice Ammeter indicates more than 18 amps, the system should not be operated unless the need for propeller deice is urgent.

AIR CONDITIONING SYSTEM MALFUNCTION

1. Air Conditioning System . . . . OFF

If air conditioning system circuit breakers trip, do not reset until the cause of the malfunction has been determined and corrected.

AVIONICS

AUTOPILOT FAILURES

FAILURE OF AUTOPILOT PRE-FLIGHT TEST

Red [PFT FAIL]

1. AP SERVOS Circuit Breaker. . . . . PULL
   [PFT FAIL] - Extinguished
2. Do Not Reset Circuit Breaker Unless Airplane is on the Ground.

AUTOPILOT OUT-OF-TRIM

Yellow [RUD→], [←RUD], [←AIL], [AIL→], [↑ELE], or [↓ELE]

CAUTION

Do not attempt to overpower the autopilot in the event of a mistrim. The autopilot servos will oppose pilot input and, in the case of the pitch axis, will trim the elevator in the opposite direction to the pilot input. This could lead to a significant out-of-trim condition.

If [←AIL] or [AIL→], *is illuminated:*

1. Slip/Skid Indicator . . . . VERIFY CENTER
2. Fuel Imbalance . . . . CHECK
   (max. allowable = 15 Gal. or ~3.2 divisions on gage)

If [RUD→] *is illuminated during a climb:*

3. Right Rudder Pedal . . . . APPLY LIGHT FORCE
   (as required to extinguish the [RUD→])

If an annunciation remains illuminated:

4. Control Wheel . . . . HOLD FIRMLY
   (be prepared to apply force in the direction of the arrow)
5. AP DISC Switch . . . . PRESS
6. Pitch & Aileron Trim . . . . RETRIM IF REQD
7. Autopilot (after mistrim is corrected) . . . . . RE-ENGAGE

LOSS OF A FLIGHT DIRECTOR/AUTOPILOT MODE

Yellow flashing Mode Annunciator

Loss of a mode, or failure of it to engage, will be annunciated by a flashing of the mode in yellow in the AFCS status bar. After 10 seconds the flight director will revert to the default mode (ROL or PIT).

Loss of Selected Vertical Mode (FLC, VS, ALT, GS), or
Loss of Selected Lateral Mode (HDG, VOR, GPS, BC, LOC, VAPP, LOC)

1. Autopilot Mode Control . . . . SELECT ANOTHER VERTICAL OR LATERAL MODE

If on an Instrument Approach:

2. Autopilot (if coupled) & Flight Director . . DISCONNECT
   (continue the approach manually or execute missed approach)

LOSS OF NAVIGATION INFORMATION

Yellow flashing Mode annunciator [VOR], [VAPP], [GPS], [LOC], [BC], or [GS]

Loss of a navigation signal will be annunciated by a flashing of the mode in yellow in the AFCS status bar. After 10 seconds the flight director will revert to the default ROL mode.

1. CDI Soft Key . . . . . SELECT ANOTHER NAV SOURCE
2. HDG Bug (if required) . . . SELECT INTERCEPT ANGLE
3. HDG Mode (if required) . . . . SELECT
4. NAV Mode . . . . ARM

If on an instrument approach at the time the navigation signal is lost:

5. Execute Missed Approach.

AVIONICS MASTER SWITCH FAILURE

If the Avionics Master Switch fails to Operate in the on Position:

- AVIONICS MASTER Circuit Breaker (Left panel) . . . . PULL

NOTE

Turning on the Avionics Master Switch removes power that holds the avionics relay open. If the switch fails to the OFF position, pulling the AVIONICS MASTER circuit breaker will restore power to the avionics bus.

TRANSPONDER FAILURE

[XPDR FAIL]

The display is not receiving information from the transponder.

1. Confirm status of transponder with ATC.

If Transponder is inoperative:

2. Traffic Advisory System (TAS) (if installed) . . . . . .STBY

ENGINE AND/OR FUEL DISPLAY FAILURE

Red X through data field or indications which are not compatible with other instruments.

The following displays will be inoperative if the ENG/AFR SENSOR Circuit Breaker is out. MAP, RPM, EGT, CHT, Oil Press, Oil Temp, Fuel Flow, Fuel Qty, and Alt Load.

If all engine instruments are inoperative:

1. ENG/AFR SENSOR Circuit Breaker. . . . . . . .CHECK IN

If a partial failure has occurred:

2. ENG/AFR SENSOR
   Circuit Breaker. . . . . PULL AND RESET

If one or more engine or fuel displays remain inoperative:

3. Power
   (if RPM and/or MAP are inop.). . . . . . SET BASED ON:
   a. Throttle Position
   b. Engine Noise
   c. Airspeed
   d. Fuel Flow from cruise tables in Section 5, PERFORMANCE
   e. EGT
4. Available Instruments . . . . .MONITOR

ERRONEOUS FAILURE DISPLAYS

Erroneous Warning, Caution or Advisory Alerts, Red X's, or Erroneous Exceedence displays.

There is a remote chance that an alert, red X or red exceedence display may be erroneously displayed.

If it is suspected that an erroneous failure display has occurred:

1. Use other system information to determine if the failure display is valid.

If the validity of the failure display cannot be confirmed:

2. Assume the failure display is valid and follow the appropriate Emergency or Abnormal procedures.

SYSTEM FAILURE WITHOUT AN ASSOCIATED FAILURE DISPLAY

There is a remote chance that a system failure could occur WITHOUT an associated failure indication (Alert, Red X, or Exceedence Display.)

1. Use other system information to determine if the system failure is valid.

If it cannot be determined that the system failure is the result of an erroneous display:

2. Assume the failure is valid and follow the appropriate Emergency or Abnormal procedures.

FAILED HEADING DURING GROUND OPERATIONS

(RED "X" OVER [HDG] FLAG ON PFD)

Interference from GPS repeaters operating inside nearby hangars or magnetic anomalies caused by nearby structures can cause an intermittent loss of heading display while the airplane is on the ground. Moving the airplane more than 100 yards away from the source of the interference should alleviated the condition. Takeoff should not be attempted until fault clears.

SYSTEM FAILURE WITHOUT AN ASSOCIATED FAILURE DISPLAY

There is a remote chance that a system failure could occur WITHOUT an associated failure indication (Alert, Red X, or Exceedence Display.)

1. Use other system information to determine if the system failure is valid.

If it cannot be determined that the system failure is the result of an erroneous display:

2. Assume the failure is valid and follow the appropriate Emergency or Abnormal procedures.

FAILURE OF COOLING FANS [PFD FAN FAIL], [MFD FAN FAIL] or [AVIONICS FAN] Advisory Message

Presentation of one or more of these advisory messages indicates that the PFD fan has failed, the MFD fan has failed, or the Avionics Fan has failed. Cooling extends the life of this equipment, but is not required for continued operation.

1. Continue to destination.
2. Repair as soon as practical.

GLOBAL POSITIONING SYSTEM (GPS)

LOSS OF, OR INVALID GPS SIGNAL

- Utilize NAV 1 or NAV 2 receivers.

POSITION ERROR [POSN ERROR]

1. GPS signal will flag.
2. Utilize NAV 1 or NAV 2 receivers.

LOSS OF RECEIVER AUTONOMOUS INTEGRITY MONITORING (RAIM)

During enroute, oceanic, terminal, or initial approach phase of flight:

1. Continue to navigate using GPS.
2. Verify position using NAV 1 or NAV 2 every 15 minutes.

Or:

3. Utilize NAV 1 or NAV 2 receivers.

During Final Approach:

1. GPS navigation will continue for up to 5 minutes.
2. Conduct missed approach.
3. If terminal GPS sensitivity is lost during the missed approach, revert to NAV 1 or NAV 2 receivers.

FAILURE OF COOLING FANS [PFD FAN FAILURE], [MFD FAN FAILURE] Or [AVIONICS FAN FAILURE] Advisory Message

Presentation of one or more of these advisory messages indicates that the PFD fan has failed, the MFD fan has failed, or the Avionics Fan has failed. Cooling extends the life of this equipment, but is not required for continued operation.

1. Continue to destination.
2. Repair as soon as practical.

GLOBAL POSITIONING SYSTEM (GPS)

LOSS OF OR INVALID GPS SIGNAL

• Utilize NAV 1 or NAV 2 receivers.

POSITION ERROR [POSN ERROR]

1. GPS signal will flag.
2. Utilize NAV 1 or NAV 2 receivers.

FAILURE OF REMOTE AUTONOMOUS INTEGRITY MONITORING (RAIM)

During enroute, oceanic, terminal, or initial approach phase of flight:

1. Continue to navigate using GPS.
2. Verify position using NAV 1 or NAV 2 every 15 minutes.

Or:

3. Utilize NAV 1 or NAV 2 receivers.

During Final Approach:

1. GPS navigation will continue for up to 5 minutes.
2. Conduct missed approach.
3. If terminal GPS sensitivity is lost during the missed approach, revert to NAV 1 or NAV 2 receivers.

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NORMAL PROCEDURES

LEANING USING THE EXHAUST GAS TEMPERATURE (EGT) INDICATION

This procedure replaces the Leaning Using The Lean Assist Page procedure.

A thermocouple-type exhaust gas temperature (EGT) probe is mounted in each cylinder exhaust. All probes interface with the Engine/Airframe Unit (GEA 71). The indicators are calibrated in degrees Celsius. Use the EGT system to lean the fuel/air mixture when cruising at 2500 rpm and 25 in. Hg manifold pressure power setting or less in the following manner:

See the following information in Section 5, PERFORMANCE:

- MANIFOLD PRESSURE vs RPM graph for leaning limitations
- CRUISE POWER SETTING tables

The EIS Lean page is found on the MFD.

1. ENGINE Softkey . . . . PRESS
2. LEAN Softkey . . . . PRESS
   a. Rich of Peak: Slowly lean the mixture and note the first cylinder EGT to peak. Then enrich the mixture to the desired cruise mixture. Enriching the mixture is referred to as operation on the rich side of peak EGT.
   b. Lean of Peak: Slowly lean the mixture and note the last cylinder EGT to peak. Further lean the mixture to the desired cruise mixture. Further leaning is referred to as operation on the lean side of peak EGT.
3. At lower power settings, the engine may be continuously operated at any mixture setting from FULL RICH to 27°C on the lean side of peak EGT. At higher power settings, as indicated on the MANIFOLD PRESSURE vs RPM graph (Section 5, PERFORMANCE), the engine should

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AIRSPEEDS FOR SAFE OPERATION (3650 LBS)

All airspeeds quoted in this section are indicated airspeeds (IAS) and assume zero instrument error.

Closed [BRACKETS] in this section denotes Warning, Caution and Advisory alerts or miscellaneous annunciations which appear on the PFD and MFD.

Maximum Demonstrated Crosswind Component...... 17 Kts

Take-off Speeds:

Flaps UP (0°)

Rotation................................ 73 Kts

50-ft................................... 84 Kts

Flaps APPROACH (12°)

Rotation................................ 67 Kts

50-ft................................... 77 Kts

Best Angle-of-Climb (V_X)........................ 84 Kts

Best Rate-of-Climb (V_Y)........................ 100 Kts

Cruise Climb.................................. 110 Kts

Turbulent Air Penetration....................... 141 Kts

Maximum Speed with Utility Door Removed........ 166 Kts

Landing Approach

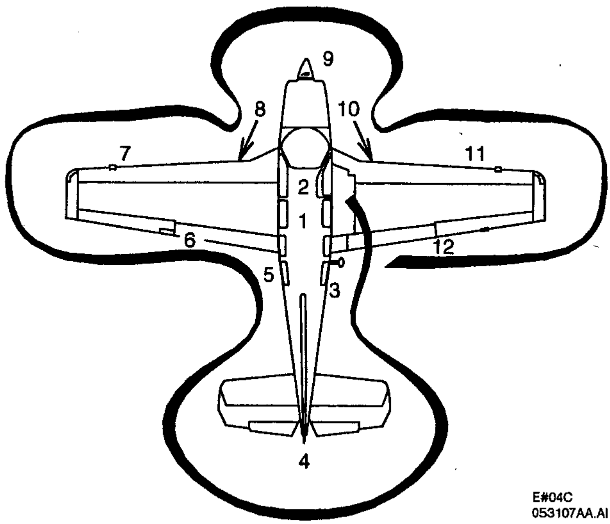
Flaps DOWN (30°)........................ 79 Kts

Flaps UP (0°)........................... 90 Kts

Balked Landing Climb........................ 80 Kts

Refer to all applicable Raytheon Aircraft Supplements and STC Supplements for flight phase procedures for optional equipment installed in the airplane.

PREFLIGHT INSPECTION



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1. CABIN
   a. Emergency Exits. . . . . .CHECK
      1) Safety Wire (Beneath Cover). . . . . INTACT
      2) Windows . . . . CLOSED & LOCKED
   b. Seats and Seat Belts . . . . . PROPERLY INSTALLED
   c. Baggage. . . . . SECURE

2. COCKPIT
   a. Landing Gear Emergency Handcrank . . . . STOWED AND ACCESSIBLE
   b. Parking Brake . . . . .SET
   c. Control Locks . . . . REMOVE
   d. All Switches . . . . .OFF
   e. Landing Gear Handle .DOWN
   f. Trim Tabs . . . . SET TO ZERO
   g. Battery System . . . . CHECK
      1) Battery 1 . . . . .ON
      2) PFD . . . . VERIFY REVERSIONARY MODE
      3) Soft Keys . . . . SELECT ENGINE & SYSTEM
      4) Bus 1 & Bus 2 Voltages . . . . CHECK
         a) Bus 1 = 23 Volts minimum
         b) Bus 2 = Approx 2 volts less than Bus 1
      5) Battery 2 . . . . .ON
      6) Battery 1 . . . . .OFF
      7) Bus 1 & Bus 2 Voltages . . . . CHECK
         a) Bus 1 = 0 Volts
         b) Bus 2 = 20 Volts Minimum
      8) Battery 1 . . . . .ON
   h. Landing Gear Position Lights . . . . .CHECK 3 GREEN
   i. Annunciator Test Button . . . . PRESS
      - Gear In-Transit Light and Flap Lights. . . . . ILLUMINATED
   j. Exterior/Interior Lights . . . . .CHECK, AS REQUIRED
   k. Standby Attitude Indicator . . . . FLAG PULLED
   l. Battery 1 & Battery 2 . . . . .OFF
   m. Standby Attitude Indicator . . . . .YELLOW LED BLINKING
      - Will automatically shutdown after 1 minute

3. RIGHT FUSELAGE
   - Static Port . . . . CLEAR
4. EMPENNAGE
   a. Vertical & Horizontal Stabilizers . . . . CHECK
   b. Rudder & Elevator . . . . CHECK MOVEMENT & SECURITY
   c. Elevator Trim Tab . . . . CHECK SECURITY, ALIGNMENT WITH ELEVATOR
   d. Static Wicks . . . . CHECK
   e. Nav Light and Flashing Beacon . . . . CHECK
   f. Tie Down . . . . REMOVE
   g. Cabin Air Intake . . . . CLEAR
5. LEFT FUSELAGE
   a. Cabin Air Exhaust . . . . CLEAR
   b. Static Port . . . . CLEAR
   c. All Antennas . . . . CHECK
   d. Lower Flashing Beacon . . . . CHECK
6. LEFT WING TRAILING EDGE
   a. Flap . . . . CHECK
   b. Aileron Trim Tab . . . . CHECK SECURITY, ALIGNMENT WITH AILERON
   c. Aileron . . . . CHECK MOVEMENT & SECURITY
   d. Static Wicks . . . . CHECK
   e. Wing Tip . . . . CHECK
7. LEFT WING LEADING EDGE
   a. Navigation and Strobe Lights . . . . CHECK
   b. Stall Warning Vane . . . . CHECK MOVEMENT
   c. Pitot Tube . . . . CLEAR
   d. Siphon Break Port . . . . CLEAR

e. Tie Down . . . . REMOVE

f. ADC OAT Probe . . . . CHECK

g. Fuel Tank. . . .CHECK QTY, O-RING, CAP SECURE

h. Cabin Air Intake . . . . CLEAR

i. OAT Probe. . . . . CLEAR

8. LEFT LANDING GEAR AREA

a. Left Main Gear . . . . CHECK

1) Gear Doors . . . . .SECURE & FLUSH

2) Landing Gear Uplock Roller . . . . . . .CHECK FOR FREEDOM TO ROTATE

3) Weight-On-Wheels Switch Linkage. . . . .SECURE

4) Scissors Linkage. . . . . .SECURE

5) Shock Strut . . . . .PROPER INFLATION

6) Tire . . . . CONDITION

7) Chocks . . . . REMOVE

b. Fuel Vent Tube . . . . CLEAR

c. Flush Fuel Vent . . . . CLEAR

d. Fuel Sump . . . . DRAIN & CHECK FUEL

e. Fuel Selector Valve Sump (located under access door). . . . . CHECK

1) Drain and Check Fuel.

2) Close and Secure Door.

9. NOSE SECTION

a. Left Cowl Flap . . . . .SECURE

b. Engine Compartment, Left Side. . . . . CHECK

1) Brake Fluid Reservoir . . . . . . CHECK QUANTITY

2) Engine Oil . . . . 10 QTS MINIMUM

3) Engine Oil Cap .SECURE

4) Engine Baffles. .SECURE

5) Left Engine Cowl Door . . . . CLOSED & SECURE

c. Left Cooling Louver . . . . SECURE & CLEAR

d. Propeller / Spinner . . . . .CHECK
(Nicks, Leaks, Deice Boots)

e. Cooling Air Inlet . . . . . .CLEAR & BAFFLES INTACT

f. Landing and Taxi Lights . . . . .CHECK

g. Induction Air Inlet . . . . CLEAR

h. Nose Gear . . . . .CHECK

1) Gear Doors . . . . SECURE

2) Shock Strut . . . . PROPER INFLATION

3) Shimmy Damper . . . . SECURE

4) Scissor Linkage & Tow Pins . . . . .CHECK

5) Tire. . . . . .CONDITION

6) Chocks. . . . . REMOVE

i. Engine Compartment, Right Side . . . . .CHECK

1) Fuses. . . . . .CHECK

2) A/C Belt Tension (if installed) . . . . .CHECK

3) Engine Baffles . . . . SECURE

4) Right Engine Cowl Door . . . CLOSED & SECURE

j. Right Cooling Louver . . . . SECURE & CLEAR

k. External Power Door . . . . SECURE

l. Right Cowl Flap . . . . SECURE

m. Air Conditioner Condenser (if installed) . . . . .CHECK
SECURITY AND ATTACHMENT

10. RIGHT LANDING GEAR AREA

a. Fuel Sump . . . . .DRAIN & CHECK FUEL

b. Fuel Vent Tube. . . . . CLEAR

c. Flush Fuel Vent . . . . CLEAR

d. Right Main Gear . . . . CHECK
   1) Gear Doors . . . . SECURE & FLUSH
   2) Landing Gear Uplock Roller . . . . CHECK FOR FREEDOM TO ROTATE
   3) Weight-On-Wheels Switch Linkage . . . . . SECURE
   4) Scissors Linkage . . . . SECURE
   5) Shock Strut . . . . PROPER INFLATION
   6) Tire . . . . CONDITION
   7) Chocks . . . . REMOVE

11. RIGHT WING LEADING EDGE
   a. Cabin Air Intake . . . . CLEAR
   b. Fuel Tank . . . . CHECK QTY, O-RING, CAP SECURE
   c. Siphon Break Port . . . . CLEAR
   d. Tie Down . . . . REMOVE
   e. Navigation and Strobe Lights . . . . CHECK

12. RIGHT WING TRAILING EDGE
   a. Wing Tip . . . . CHECK
   b. Static Wicks . . . . CHECK
   c. Aileron . . . . CHECK MOVEMENT & SECURITY
   d. Flap . . . . CHECK
   e. Utility Doors . . . . CLOSED AND LOCKED

BEFORE ENGINE STARTING

1. Seats . . . . POSITION FOR TAKEOFF
2. Rudder Pedals . . . . ADJUST
3. Seat Belts and Shoulder Harness . . . . FASTEN/ADJUST
4. Parking Brake . . . . CONFIRM SET
5. Left Side Circuit Breakers . . . . IN
6. Alternate Static Air Source . . . . NORMAL
7. Subpanel Switches . . . . OFF, BEACON ON

8. Landing Gear Handle . . . . DN
9. Throttle . . . . .CLOSED
10. Propeller . . . . HIGH RPM
11. Mixture. . . . . .FULL RICH
12. Cowl Flaps. . . . . .OPEN
13. Flaps . . . . UP
14. Avionics Circuit Breakers . . . . IN
15. ELT Switch . . . . ARM
16. Battery System Check. . . . . CONFIRM COMPLETE
17. Battery 1 & 2, Alternator 1 & 2. . . . . ON
18. PFD . . . . .VERIFY REVERSIONARY MODE
19. Alerts . . . . .CHECK & CONSIDERED
20. Fuel Remaining . . . . SET
    a. Select ENGINE and SYSTEM Soft Keys
    b. With Full Fuel . . . . Press RST FUEL (to reset full fuel to 74 gallons)
    c. With Partial Fuel (if required) . . . . . Press DEC FUEL or INC FUEL (to adjust GAL REM)
21. Fuel Selector Valve . . . . .CHECK OPERATION THEN SELECT FULLER TANK (feel for detent/confirm visually)

WARNING

Do not take off if fuel quantity indication is in the yellow band or with less than 13 gallons in each tank.

22. Aux Fuel Pump . . . . VERIFY OPERATION
    a. Aux Fuel Pump. . . . . .SELECT LO, LISTEN FOR OPERATION
    b. Aux Fuel Pump. . . . . .SELECT OFF

ENGINE STARTING (BATTERY)

CAUTION

Do not engage starter for more than 30 seconds in any 4-minute time period.

COLD STARTS

1. Throttle . . . . FULL OPEN
2. Propeller . . . . HIGH RPM
3. Mixture . . . . FULL RICH
4. Aux Fuel Pump . . . . HI UNTIL FUEL FLOW PEAKS THEN OFF
5. Throttle . . . . .CLOSE, THEN OPEN APPROXIMATELY 1/2 INCH
6. Magneto/Start Switch . . . . START (Release to BOTH when engine starts)
   - The [STARTER ENGD] Caution Alert will illuminate during the Start and should extinguish when starter is released.
7. Throttle . . . . 1000 to 1200 RPM AFTER START

FLOODED ENGINE

1. Mixture . . . . CUT OFF
2. Propeller . . . . HIGH RPM
3. Throttle . . . . 1/2 OPEN
4. Magneto/Start Switch . . . . START (Release to BOTH when engine starts)
5. As Engine Starts:
   a. Throttle . . . . IDLE
   b. Mixture . . . . FULL RICH

HOT STARTS

1. Mixture. . . . . CUT OFF
2. Propeller . . . . HIGH RPM
3. Aux Fuel Pump . . . . HI FOR 30-60 SECONDS, THEN OFF
4. Mixture. . . . . .FULL RICH
5. Throttle . . . . FULL OPEN
6. Aux Fuel Pump . . . . HI UNTIL FUEL FLOW PEAKS THEN OFF
7. Throttle . . . . CLOSE; THEN OPEN APPROXIMATELY 1/2 INCH
8. Magneto/Start Switch . . . . START (Release to BOTH when engine starts)
9. Aux Fuel Pump (if required) . . . . HI (Momentarily after starting to purge the system)
10. Aux Fuel Pump . . . . OFF

BEFORE TAXI

1. Throttle . . . . 1000 to 1200 RPM
2. Oil Temperature and Pressure . . . . .CHECK

CAUTION

Engine oil temperature and oil pressure must be in the green band prior to engine run-up above 1200 RPM.

3. Avionics Master. . . . . ON
4. Air Conditioner (if installed). . . . . .AS REQUIRED
5. Autopilot Preflight test . . . . COMPLETE
   a. Red AFCS Message. . . . . ILLUMINATED WHILE AHRS ALIGNS
   b. Red AFCS Message. . . . . EXTINGUISHED

c. White PFT Message . . . . ILLUMINATED (~5 Seconds)

d. White PFT Message . . . . EXTINGUISHED

e. Autopilot Disconnect Tone . . . . .SOUNDS

6. MFD . . . . . AVIATION DATA BASE ACKNOWLEDGED (press ENT to continue)

7. PFD and MFD. . . . . . . DISPLAYED IN NORMAL MODE

8. AHRS . . . . ALIGN

9. ALT 1 and ALT 2. . . . . CHECK

a. ALT 1 . . . . .POSITIVE LOAD

b. ALT 2 . . . . ZERO LOAD

10. Bus 1 and Bus 2 Voltages . . . . CHECK

a. MFD . . . . SELECT ENGINE AND SYSTEM

b. Bus 1 . . . . 27.5 - 29.0 Volts

c. Bus 2 . . . . 25.5 - 27.0 Volts

11. Alerts/Messages . . . . CHECK
[BUSES TIED] - ILLUMINATED
[AC DOOR EXTD] - ILLUMINATED IF AC ON

12. Lights . . . . AS REQUIRED

13. Avionics . . . . CHECK & SET

a. Radio - Comm and Nav

b. Altimeter

c. CDI Nav Source

d. Transponder

e. Altitude Preselect

f. Flight Plan

14. Standby Altimeter . . . . SET

15. Standby Attitude Indicator. . . . . PULL KNOB TO ERECT (release knob slowly)

CAUTION

The indicator may be damaged if the PULL-TO-CAGE knob is released with a snap.

16. Brakes .... RELEASE AND CHECK

CAUTION

Never taxi with flat shock strut.

BEFORE TAKEOFF (RUNUP)

1. Parking Brake .... SET
2. Seat Belts and Shoulder Harnesses .... CONFIRM BUCKLED
3. Engine Instruments ... CHECK WITHIN OPER. LIMITS
4. Flight Instruments .... CHECK
5. Throttle .... 1700 RPM
6. Propeller .... EXERCISE (to obtain 200 to 300 RPM drop)
7. Magnetos .... CHECK INDIVIDUALLY
   a. Variance between individual magnetos should not exceed 50 RPM.
   b. Maximum drop should not exceed 150 RPM.
8. Alternator 2 and Bus Tie .... CHECK
   a. Throttle .... ≥ 2000 RPM
      [BUSES TIED] - Extinguished
      Voltmeter 2: 27.5 - 29.0 VOLTS
      Loadmeter 2: POSITIVE LOAD
   b. Throttle .... 1000 - 1200 RPM
      [BUSES TIED] - Illuminated
9. TAS (if installed) .... TEST
   a. Large FMS Knob (if reqd.) .. SELECT MAP GROUP
   b. Small FMS Knob .... SELECT TRAFFIC MAP

c. TEST Softkey........................PRESS
   1) Test Pattern................VERIFY ON MFD
   2) [TRAFFIC]..................VERIFY ON PFD
d. Verify Voice Message .... "Traffic Advisory Test Passed"
e. ALT MODE..................SET AS DESIRED
f. Small FMS Knob ...SELECT DESIRED MAP PAGE

10. Standby Attitude Indicator..................ERECT
   a. Standby Battery............CHECK IF DESIRED (See OTHER NORMAL PROCEDURES)
   b. STBY PWR LED ...............EXTINGUISHED
   c. Flag ....PULLED

11. Electric Elevator Trim ....CHECK
   a. Left and Right Segments..............ACTUATE INDIVIDUALLY (verify there is no trim movement. Red PTRM illuminated on PFD if actuated for > 4 sec.)
   b. Left and Right Segments ... ACTUATE TOGETHER (verify proper trim movement)
   c. AP DISC Switch................ACTUATE WITH TRIM IN MOTION (verify trim motion stops)

12. Trim.......................................SET
   a. Aileron ....NEUTRAL
   b. Elevator ....3° NOSE UP (6° nose up if only front seats are occupied)

13. Flaps..... CHECK OPERATION, SET FOR TAKEOFF

14. Flight Controls....CHECK FREEDOM OF MOVEMENT AND PROPER DIRECTION OF TRAVEL

15. Doors and Windows ....SECURE
   • Cabin Door Lock Indicator ....CHECK CLOSED

16. Fuel Selector Valve........CHECK TANK SELECTED (feel for detent; confirm visually)

17. Aux Fuel Pump . . . . OFF
18. Alerts/Messages . . . . EXTINGUISHED OR CONSIDERED
19. TAS (if installed) . . . . CONSIDERED
20. Parking Brake . . . . .RELEASE

BEFORE TAKEOFF (FINAL ITEMS)

1. Pitot Heat. . . . . .AS REQUIRED
2. Lights. . . . . .AS REQUIRED
3. Air Conditioning (if installed) . . . . OFF

WARNING

The [AC DOOR EXTD] Caution Alert must be extinguished before Takeoff.

4. Flaps . . . . .CONFIRM SET
5. Transponder Code . . . . .CONFIRM SET
6. Rotation Speed . . . . .CONFIRM
(for 3650 lbs., Flaps UP = 73 KTS
Flaps Approach = 67 KTS)

TAKEOFF

1. Take-Off Power . . . . SET
   a. Throttle . . . . .FULL FORWARD
   b. Propeller. . . . . HIGH RPM
   c. Mixture . . . . SET FUEL FLOW AT CYAN CLIMB FUEL FLOW MARKER
2. [BUSES TIED]. EXTINGUISHED
3. Brakes. . . . . .RELEASE
4. Instruments . . . . .CHECK
(MAP, RPM, Fuel Flow, Oil Temp/Press)
5. Rotation Speed . . . . .ROTATE

6. Landing Gear
   (when positive R/C established) . . . . RETRACT
7. Flaps (if used for takeoff) . . . . RETRACT

CLIMB

1. Power . . . . SET
   a. Throttle. . . . . FULL FORWARD
   b. Propeller. . . . . MCP Climb - 2700 RPM
      Cruise Climb - 2500 RPM
   c. Mixture . . . . MAINTAIN FUEL FLOW AT
      CYAN CLIMB FUEL FLOW MARKER

NOTE

The fuel flow marker will not revert to the Cruise Climb schedule until the RPM is initially reduced to 2490 or below. The Cruise Climb schedule will then be available up to 2530 RPM.

2. Cowl Flaps . . . . AS REQUIRED
3. Airspeed . . . . 100 KTS FOR MCP CLIMB
   110 KTS FOR CRUISE CLIMB
4. Engine Temperatures . . . . MONITOR
5. Air Conditioner (if installed). . . . . AS REQUIRED
6. Aux Fuel Pump . . . . AS REQUIRED

CAUTION

Engine roughness, fuel flow fluctuation or low fuel flow can occur when climbing on hot days. These can be eliminated by switching the auxiliary fuel pump from OFF to LO and leaning the fuel flow to the cyan climb fuel flow marker.

The cyan climb fuel flow marker on the fuel flow indicator is programmed to follow the schedule noted below when climbing at 2700 RPM. When climbing at 2500 RPM, the fuel flow-marker is programmed to follow a schedule which is 2 GPH less than that shown below.

Pressure Altitude (Ft)	Cyan Climb Fuel Flow Marker @ 2700 RPM* (GPH)
SL	25.7
2000	25.7
4000	25.1
6000	24.0
8000	22.4
10,000	20.9
12,000	19.6
14,000	18.8
16,000	17.9

* Subtract 2 GPH when cruise climbing at 2500 RPM.

CRUISE

1. Cowl Flaps .... CLOSE
2. Power ....SET
   (See Cruise Tables in Section 5, PERFORMANCE)

NOTE

Return the mixture control to full rich before turning the aux fuel pump off.

3. Aux Fuel Pump (if selected on for climb) ....OFF
4. Mixture .... LEAN USING EGT
   (See Leaning Using the Lean Assist Page in Other Normal Procedures)
   (Cyan Climb Fuel Flow Marker will extinguish as fuel flow is leaned.)

DESCENT

1. Altimeters (PFD and Standby) ....SET
2. Cowl Flaps .... CONFIRM CLOSED
3. Power ....AS REQUIRED
   (Avoid prolonged idle settings. Cylinder head temperature should not fall below the green band.)
4. Mixture ....AS REQUIRED
   (The mixture must be manually enriched as the airplane descends. An optional procedure is to retard the throttle as the airplane descends to maintain a constant manifold pressure. Then adjust the mixture to maintain the EGT within its limits.)
5. Engine Temperatures ....MONITOR
6. Flaps............................AS REQUIRED
7. Windshield Defroster................AS REQUIRED
   (On before descent into warm, moist air)

BEFORE LANDING

1. Seat Belts and Shoulder Harnesses . . . . . . FASTENED
2. Seat Backs . . . . POSITION FOR LANDING
3. Fuel Selector Valve . . . . SELECT FULLER TANK (feel for detent & confirm visually)
4. Cowl Flaps. . . . . AS REQUIRED
5. Mixture. . . . . FULL RICH (or as required by field elevation)
6. Landing Gear (154 kts or below). . . . . DOWN AND CHECK
7. Landing Lights. . . . . AS REQUIRED
8. Propeller . . . . HIGH RPM

NORMAL LANDING

1. Flaps (124 kts or below) . . . . DOWN
2. Airspeed . . . . ESTABLISH NORMAL APPROACH SPEED
3. Yaw Damp. . . . . OFF

BALKED LANDING

1. Throttle and Propeller . . . . FULL FORWARD
2. Airspeed . . . . 80 KTS (until clear of obstacles, then trim to 110 KTS)
3. Flaps . . . . UP
4. Landing Gear. . . . . RETRACT
5. Cowl Flaps. . . . . OPEN

AFTER LANDING

1. Cowl Flaps . . . . OPEN
2. Flaps . . . . UP
3. Landing, Taxi, and Strobe Lights . . . . . . AS REQUIRED
4. Trim Tabs . . . . RESET AS REQUIRED
5. [BUSES TIED] . . . . ILLUMINATED

SHUTDOWN AND SECURING

1. Parking Brake . . . . SET
2. Avionics . . . . OFF
   a. MFD . . . . EXTINGUISHED
   b. PFD . . . . VERIFY REVERSIONARY MODE
3. Electrical Equipment . . . . OFF
4. Air Conditioner (if installed) . . . . OFF
5. Throttle . . . . 1000 RPM
6. Mixture . . . . CUT OFF
7. Magnetos . . . . OFF
   (after engine stops)
8. Battery 1 & 2, Alternator 1 & 2 . . . . OFF
9. Standby Attitude Indicator
   (if desired) . . . . CHECK EMERGENCY MODE
   (See OTHER NORMAL PROCEDURES)
10. Control Locks . . . . INSTALL
11. Wheel Chocks . . . . INSTALL
12. Parking Brake . . . . RELEASE

OTHER NORMAL PROCEDURES

USING EXTERNAL POWER

The following precautions shall be observed while using external power.

1. Never use external power without Battery 1 and Battery 2 installed in the system.
2. Battery 1 must be ON, the Avionics Master Switch OFF, and all other electrically operated systems OFF prior to applying external power to the airplane. This protects the voltage regulators and associated electrical equipment from voltage transients.
3. Battery 2 must be ON if it is desired to charge it using external power.
4. The airplane has a negative ground system. Connect the positive and negative leads of the external power source to the corresponding positive and negative terminals of the airplane's external power receptacle.
5. In order to prevent arcing, turn external power source off (after verifying correct voltage) before connecting to the airplane.

ENGINE STARTING USING EXTERNAL POWER

1. Battery 1 & 2, Alternator 1 & 2 .... OFF
2. Avionics Master Switch .... OFF
3. Electrical Equipment .... OFF
4. External Power Source .....SET OUTPUT, THEN OFF (27 to 28.5 volts)
5. External Power Source .... CONNECT
6. Battery System .... CHECK, IF REQD
   a. Battery 1 .... ON
   b. PFD ....VERIFY REVERSIONARY MODE

c. Soft Keys .... SELECT ENGINE & SYSTEM

d. Bus 1 & Bus 2 Voltages .... CHECK

1) Bus 1 = 23 Volts Minimum

2) Bus 2 = Approx 2 volts less than Bus 1

e. Battery 2 .... ON

f. Battery 1 .... OFF

g. Bus 1 & Bus 2 Voltages .... CHECK

1) Bus 1 = 0 Volts

2) Bus 2 = 20 Volts Minimum

h. Battery 1 .... ON

7. Alerts .... CHECK & CONSIDERED
8. External Power Source .... ON
9. Engine ...... START USING NORMAL PROCEDURES
10. External Power Source .... OFF
11. External Power Source .... DISCONNECT
12. Alternator 1 and Alternator 2 .... ON

STANDBY ATTITUDE INDICATOR

AFTER STARTING

When power is supplied by Bus 1, the warning flag will be pulled from view. After allowing the gyro to spin up for approximately one minute, the PULL-TO-CAGE knob must be pulled fully out and held momentarily until the display stabilizes, then released slowly.

CAUTION

The indicator may be damaged if knob is released with a "snap".

BEFORE TAKEOFF

Standby Battery Check

The status of the standby battery may be checked as follows if Bus 1 has powered the standby attitude indicator for at least 5 minutes:

1. STBY PWR Button .... PRESS AND HOLD UNTIL STBY PWR LED STARTS FLASHING (places battery in one minute test mode)
2. Green Test LED .... ILLUMINATED
3. Red Test LED .... EXTINGUISHED
4. Emergency LED Lighting............. ILLUMINATED
5. Amber Standby Power LED .... EXTINGUISHED (after approx. 1 minute)
6. Green Test LED .... EXTINGUISHED

CAUTION

If the red test LED illuminates any time during the one minute test, the standby battery is not sufficiently charged. This may indicate that additional charging is required, or that the standby battery must be removed for service or replacement.

NOTE

All LEDs extinguish after one minute. Thus, the red LED could illuminate towards the end of the test period and then extinguish when the test is complete without the pilot's knowledge unless the display is continually monitored.

SHUTDOWN

During a normal shutdown, the Standby Power LED will flash for approximately one minute after power is removed from Bus 1 (Alternator 1 and Battery 1 off). No action is required and the standby attitude indicator will automatically shutdown after the one minute has elapsed. If desired, the STBY PWR button may be pushed TWICE to manually turn the indicator off.

NOTE

A momentary pause must occur between each push of the STBY PWR button. If the second push of the button occurs too quickly, it will not be recognized. If the processor detects only one push of the STBY PWR button the standby battery will be latched on and continue to power the indicator. This will cause the standby battery to completely drain if not turned off by a second push of the button. If the standby battery is allowed to completely drain, it will have to be removed and serviced prior to the next flight. The airplane power will not adequately recharge a completely drained battery. To ensure the standby battery is off, verify that the gyro warning flag is in view.

Emergency Mode Check

The emergency mode may be checked during shutdown after all power has been removed from the airplane as follows.

1. Battery 1 .... OFF
2. Amber Standby Power LED .... FLASHING
3. STBY PWR Button .... PRESS ONCE
   (latches standby battery on)
   - Gyro Warning Flag .... OUT OF VIEW

- Amber Standby Power LED. . . . . EXTINGUISHED

4. STBY PWR Button . . . . PRESS ONCE
(disconnects emergency battery)
- Gyro Warning Flag. . . . . IN VIEW
5. Battery 1 . . . . ON
- Gyro Warning Flag. . . . . OUT OF VIEW
6. Battery 1 . . . . OFF
- Amber Standby Power LED. . . . . FLASHES FOR ONE MINUTE, THEN EXTINGUISHES
7. Gyro Warning Flag . . . . IN VIEW

LEANING USING THE LEAN ASSIST PAGE

See the following information in Section 5, PERFORMANCE.

- MANIFOLD PRESSURE vs RPM graph for leaning limitations
- CRUISE POWER SETTING Tables

The Lean Assist page is found on the MFD.

1. ENGINE Soft Key . . . . PRESS
2. LEAN Soft Key . . . . PRESS
3. ASSIST Soft Key. . . . . PRESS
4. Mixture. . . . . LEAN
   a. Verify power is set at 2500 RPM/25 in. Hg or below.
   b. Monitor the fuel flow while continuously leaning the mixture. Do not pause during the leaning process as this may cause the wrong cylinder to be selected as the hot cylinder.
   c. Note the point on the EGT display when a hollow cyan bar appears at the top of one of the cylinder displays. (This is the first cylinder to reach a peak EGT, then drop by 4°.)

4. STBY PWR Button . . . . PRESS ONCE
(disconnects emergency battery)
   • Gyro Warning Flag . . . . IN VIEW
5. Battery 1 . . . . .ON
   • Gyro Warning Flag . . . . OUT OF VIEW
6. Battery 1 . . . . .OFF
   • Amber Standby Power LED . . . . .FLASHES FOR ONE MINUTE, THEN EXTINGUISHES
7. Gyro Warning Flag . . . . IN VIEW

LEANING USING THE EXHAUST GAS TEMPERATURE (EGT) INDICATION

A thermocouple-type exhaust gas temperature (EGT) probe is mounted in each cylinder exhaust. All probes interface with the Engine/Airframe Unit (GEA 71). The indicators are calibrated in degrees Celsius. Use the EGT system to lean the fuel/air mixture when cruising at 2500 rpm and 25 in. Hg manifold pressure power setting or less in the following manner:

See the following information in Section 5, PERFORMANCE:

- MANIFOLD PRESSURE vs RPM graph for leaning limitations
- CRUISE POWER SETTING tables

The EIS Lean page is found on the MFD.

1. ENGINE Softkey . . . . PRESS
2. LEAN Softkey . . . . PRESS
   a. Rich of Peak: Slowly lean the mixture and note the first cylinder EGT to peak. Then enrich the mixture to the desired cruise mixture. Enriching the mixture is referred to as operation on the rich side of peak EGT.
   b. Lean of Peak: Slowly lean the mixture and note the last cylinder EGT to peak. Further lean the mixture to the desired cruise mixture. Further leaning is referred to as operation on the lean side of peak EGT.

d. Simultaneously note that a ΔPEAK temperature is displayed below the fuel flow. (Initially, this will be the Δ temperature on the lean side of peak EGT.)

e. Lean or enrich the mixture to the desired cruise mixture as denoted by the ΔPEAK temperature. (Further leaning is referred to as operation on the lean side of peak EGT. Enriching the mixture until the ΔPEAK temperature decreases to zero and then starts to increase again is referred to as operation on the rich side peak EGT.) Graphically, each bar on the EGT display represents 20°C.

NOTE

The cylinder with the hottest EGT may shift during the leaning process.

f. At lower power settings, the engine may be continuously operated at any mixture setting from full rich to 27°C on the lean side of peak. At higher power settings, the engine must not be operated closer to peak EGT than 20°C. (See MANIFOLD PRESSURE VS RPM graph in Section 5, PERFORMANCE.)

g. If engine roughness is encountered when operating at lower power settings on the lean side of peak, enrich the mixture slightly to achieve smooth engine operation.

h. If required fuel flows cannot be achieved when leaning to the rich side of peak, switch the auxiliary fuel pump to LO, then lean as required.

i. If the altitude or power setting is changed, the peak EGT must be rechecked and the mixture reset if required. To reset the Lean Assist Mode, select the ASSIST soft key off, then back on.

3. At lower power settings, the engine may be continuously operated at any mixture setting from FULL RICH to 27°C on the lean side of peak EGT. At higher power settings, as indicated on the MANIFOLD PRESSURE vs RPM graph (Section 5, PERFORMANCE), the engine should not be operated closer to peak EGT than 20°C (rich side or lean side).
4. If engine roughness is encountered operating at lower power settings on the lean side of peak, enrich the mixture slightly for smooth engine operation.
5. If required fuel flows cannot be achieved when leaning to the rich side of peak, switch the fuel boost pump to LO, then lean as required.
6. Changes in altitude and power settings require the peak EGT to be rechecked and the mixture reset.
7. MFD Softkeys . . . . .RETURN TO MAIN ENGINE PAGE

NOTE

A Lean Assist function is available through the Garmin software utilizing the CYL SLCT and ASSIST Softkeys. Reference Garmin Cockpit Reference Guide for details on the procedure.

MONITORING ENGINE SYSTEMS (OIL, FUEL, ELECTRICAL)

The Engine Systems page is found on the MFD.

1. ENGINE Soft Key .... PRESS
2. SYSTEM Soft Key........................ PRESS

MONITORING THE CHTs AND EGTs

Specific EGT and CHT values for each cylinder are found on the MFD.

1. ENGINE Soft Key .... PRESS
2. LEAN Soft Key .... PRESS
3. CYL SLCT Soft Key....................... PRESS
   (Each press of the key cycles the display to the next cylinder. The selected cylinder display number changes color from white to cyan and the digital displays show the absolute temperature and deviation from Peak temperature for the selected cylinder.)

AVIONICS

AUTOPILOT/FLIGHT DIRECTOR

GENERAL

WARNING

It is the responsibility of the Pilot to monitor the autopilot when it is engaged. The pilot should be prepared to immediately disconnect the autopilot and take prompt corrective action in the event of unexpected or unusual autopilot behavior.

Do not attempt to manually fly the airplane with the autopilot engaged except when using the Control Wheel Steering (CWS) button. The autopilot pitch servo will oppose pilot pitch inputs and will trim the elevator in the opposite direction of the pilot input. This could lead to a significant out-of-trim condition in the pitch axis. Disconnect the autopilot using the AP DISC switch, the left side of the trim switch, or the AP key if manual control is desired.

The pilot must use proper autopilot modes and proper engine power settings to ensure that aircraft speed is maintained between 80 KIAS and 190 KIAS. Operation in the pitch (PIT) or vertical speed (VS) modes below 80 KIAS can result in a stall. If an inadvertent stall is encountered as indicated by the stall warning horn, airframe buffeting, or loss of control effectiveness, disconnect the autopilot using the AP DISC switch and manually return the airplane to stabilized flight prior to re-engaging the autopilot.

AUTOPILOT/ FLIGHT DIRECTOR PROCEDURES

The following are basic guidelines for operation of the autopilot and Flight Director. They are one way, but not necessarily the only way, of operating the AFCS. See Section 2, LIMITATIONS, Section 3, EMERGENCY PROCEDURES, Section 3A, ABNORMAL PROCEDURES, Section 7, SYSTEMS DESCRIPTION, and the Garmin G1000 Cockpit Reference Guide or G1000 Pilot's Guide for more information.

Yaw Damp (With Autopilot Off)

To Engage the Yaw Damper:

1. YD Key . . . . PRESS
   Green [YD] Displayed

To disengage the YD use one of the following methods. The green [YD] *will change to a black* [YD] on a yellow background, *flash for 5 seconds*, then extinguish.

1. AP DISC Switch . . . . PRESS

(or)

2. YD Key . . . . PRESS

Engaging the Autopilot (80 - 190 KIAS)

1. AP Key ..... PRESS TO ENGAGE AUTOPILOT & YD
   green [ROL], [AP], [YD], [PIT], & white [ALT] Displayed
2. ALT Key..... PRESS TO HOLD EXISTING ALTITUDE
   [PIT] & [ALT] are replaced by a green [ALT XXXXX FT]
3. HDG Knob (if required) ..... SET DESIRED HEADING
4. HDG Key................................. PRESS
   [HDG] replaces [ROL]
5. CRS Knob (if required) ......SET DESIRED COURSE
6. HDG and/or NAV Key .... PRESS
   [HDG] and/or Nav replaces [ROL]

Disengaging the Autopilot or Autopilot & Yaw Damper

When the autopilot is manually disengaged the green [AP] will change to a black [AP] on a yellow background, flash for 5 seconds, then extinguish, and a 2-second aural alert will sound. The [YD] will also change color and flash if it disconnects

To disengage only the AP and leave the FD and YD engaged use one of the following methods:

1. Left Side of Trim Switch ....ACTUATE

(or)

2. AP Key .... PRESS

To disengage the AP and YD and leave the FD engaged:

1. AP DISC Switch .... PRESS

Use of Roll Mode [ROL]

1. AP Key ..... PRESS TO ENGAGE AUTOPILOT & YD
   green [ROL], [AP], [YD], [PIT], & white [ALT] Displayed

If bank angle is ≥ 6°:

2. Bank Angle is Maintained.

If bank angle is < 6°:

3. Existing heading is maintained.

To Change Bank Angle or Heading:

4. CWS Switch . . . . PRESS
5. Heading or Bank Angle. . . . . . . CHANGE AS DESIRED
6. CWS Switch . . . . RELEASE

Use of Heading Hold Mode [HDG]

1. Heading Knob . . . . .SET DESIRED HEADING
   a. Press knob to select existing heading.
   b. Rotate knob to select a new heading.
   c. New heading will be displayed in box to left of HSI for 3 seconds.
2. HDG Key. . . . . PRESS
   [HDG] Displayed
3. The airplane will turn in the direction the HDG bug is moved unless the heading change is greater than 340°.

Use of Navigation Mode [GPS], [VOR], [LOC], or [BC]

If not initially established on the desired course:

1. CDI Key . . . . SELECT NAVIGATION SOURCE
2. CRS Knob (if required) . . . . . . SET DESIRED COURSE (course will be displayed in the box to right of HSI for 3 seconds)
3. HDG Knob . . . . SELECT INTERCEPT HEADING
4. HDG Key. . . . . PRESS
   [HDG] Displayed
5. NAV Key . . . . PRESS

If CDI Deviation is > 1Dot:

a. [GPS], [VOR], [LOC], or [BC] . . . . DISPLAYED IN WHITE

When CDI Deviation is ≤ 1 Dot:

b. [GPS], [VOR], [LOC], or [BC] . . . . DISPLAYED IN GREEN

Use of Altitude Preselect

1. ALT Knob . . . . ROTATE TO SET DESIRED ALTITUDE (Desired altitude displayed in altitude reference box above altitude display)
2. PIT, VS, or FLC Mode. . . . . SET TO INTERCEPT ALTITUDE
   a. At 1,000 feet from desired altitude, the altitude in the reference box will change from cyan digits on a black background to black digits on a cyan back ground, and the box will flash for 5 seconds.
   b. At 300 feet from the desired altitude, a cyan altitude reference bug will be visible on the left side of the altitude display opposite the desired altitude.
   c. At 200 feet from the desired altitude, the altitude in reference box returns to cyan digits on a black background, will flash for 5 seconds, and a tone will sound.
   d. When established on the desired altitude, the altitude reference bug will be aligned with the indicated altitude. The white [ALT] in the AFCS Status Bar will be replaced with a green [ALT XXXXX$_{FT}$]. The [ALT] will flash for 10 seconds.
   e. If the indicated altitude deviates more than ± 200 feet, the altitude reference box will change to yellow digits on a black background and will flash for 5 seconds. A tone will be heard. The yellow display will remain until the deviation is corrected or the desired altitude is changed.

Use of the Pitch Mode (PIT)

1. ALT Knob . . . . . SET DESIRED LEVEL-OFF ALTITUDE
   a. Preset Altitude is displayed in window above the altimeter display.
2. Deselect other vertical modes (VS or FLC), if required.
3. Green [PIT] and White [ALT] . . . . DISPLAYED IN AFCS STATUS BAR
4. NOSE UP or NOSE DN Key. . PRESS AS REQ TO SET CLIMB OR DESCENT PITCH ATTITUDE (each press changes pitch by 0.5 degrees)

(or)

5. CWS Switch . . . . PRESS AND HOLD WHILE ADJUSTING PITCH, THEN RELEASE (Pitch reference will change to that which exists when switch is released.)
6. Power . . . . AS REQUIRED
7. Upon Reaching the Preset Altitude, the green [PIT] and white [ALT] will be replaced by a green [ALT] and [XXXXX$_{FT}$] and the green [ALT] will flash 10 seconds and then become steady.

Use of Altitude Hold Mode [ALT]

To Maintain a desired altitude:

1. ALT Key . . . . PRESS
   Green [ALT XXXXX$_{FT}$] Displayed

To change the selected altitude:

2. CWS Switch . . . . PRESS AND HOLD
3. Airplane Altitude . . . . CHANGE AS DESIRED
4. CWS Switch . . . . RELEASE (new altitude will be displayed next to [ALT])
5. Barometric Changes . . . . AIRPLANE WILL CLIMB OR DESCEND TO MAINTAIN SELECTED ALTITUDE

Use of the Vertical Speed Mode [VS]

1. ALT Knob .....SET DESIRED LEVEL-OFF ALTITUDE
   a. Preset Altitude is displayed in window above the altimeter display.

NOTE

If the Flight Director is in Altitude Hold (green [ALT XXXXXFT] displayed in the AFCS status bar), the desired altitude must be set either above or below the Altitude Hold value for the VS mode to function.

2. VS Key ....PRESS
   a. Green [VS] and green current vertical speed [XXXXFPM] displayed in AFCS status bar.
   b. Current vertical speed displayed in window above (for a climb) or below (for a descent) the Vertical Speed display.
   c. Cyan VS Reference bug displayed on left side of VS display.
   d. White [ALT] Displayed in AFCS Status Bar.
3. NOSE UP or NOSE DN Key.........PRESS AS REQ TO SET CLIMB OR DESCENT VS (each press changes VS by 100 fpm)

(or)

4. CWS Switch ....PRESS AND HOLD WHILE ADJUSTING PITCH TO CHANGE VS, THEN RELEASE (VS reference will change to that which exists when switch is released.)
5. Power ....ADJUST AS REQUIRED FOR DESIRED AIRSPEED
6. Maximum and minimum VS references are 1500 fpm R/C and -3000 fpm R/S.

NOTE

The VS pointer will only indicate a maximum of -2000 FPM; however, the digits in the pointer will continue to indicate the vertical speed up to -3000 FPM.

7. Upon Reaching the Preset Altitude, the green [VS], [XXXXFPM], and white [ALT] will be replaced by a green [ALT] and [XXXXXFT], and the green [ALT] will flash for 10 seconds and then become steady.

Use of the Flight Level Change Mode [FLC]

1. ALT Knob . . . . . SET DESIRED LEVEL-OFF ALTITUDE
   a. Preset Altitude is displayed in window above the altimeter display.

NOTE

If the Flight Director is in Altitude Hold (green [ALT XXXXXFT] displayed in the AFCS status bar), the desired altitude must be set either above or below the Altitude Hold value for the FLC mode to function.

2. FLC Key . . . . PRESS
   a. Green [FLC] and green current airspeed [XXXKT] displayed in AFCS status bar.
   b. Current airspeed displayed in window above the airspeed display.
   c. Cyan airspeed reference bug displayed on right side of the airspeed display.
   d. White [ALT] Displayed in AFCS Status Bar.
3. NOSE UP or NOSE DN Key. . . . . PRESS AS REQ TO SET CLIMB OR DESCENT SPEED (each press changes speed by 1 knot)

(or)

4. CWS Switch .... PRESS AND HOLD WHILE ADJUSTING PITCH TO CHANGE AIRSPEED, THEN RELEASE (FLC airspeed reference will change to the airspeed that exists when switch is released.)
5. Power .... ADJUST AS REQUIRED FOR DESIRED R/C OR R/S
6. Maximum and minimum FLC reference airspeeds are 190 and 80 Kts.
7. Upon Reaching the Preset Altitude, the green [FLC], [XXX$_{KT}$], and white [ALT] will be replaced by a green [ALT] and [XXXXX$_{FT}$], and the green [ALT] will flash for 10 seconds and then become steady.

APPROACH PROCEDURES

VOR or ILS Approaches [VAPP] or [LOC] & [GS]

1. CDI Key................ SELECT VOR 1 OR VOR 2
2. CRS Knob .... SET REQUIRED COURSE
3. HDG Knob..........SELECT INTERCEPT HEADING
4. HDG Key.............................. PRESS
   [HDG] Displayed
5. APR Key .... PRESS
   White [VAPP] Display for VOR Approaches
   White [LOC], & [GS] Displayed for ILS Approaches
6. Airspeed .... ESTABLISH
7. AFCS Status Bar...... VERIFY MODE IS CAPTURED (white annunciator(s) turns green)

GPS Approach [GPS]

1. CDI Key......................... SELECTED GPS
2. Approach.................... VERIFY ACTIVATED

3. NAV or APR Key. . . . . PRESS
[GPS] Displayed
4. Airspeed . . . . ESTABLISH
5. PFD. VERIFY [GPS APR] MODE WITHIN 2 NM OF FAF

Back Course Approach [BC]

1. CDI Key . . . . SELECT VOR 1 OR VOR 2
2. CRS Knob. . . . . .SET TO ILS FRONT COURSE
3. HDG Knob . . . . .SELECT INTERCEPT HEADING
4. HDG Key. . . . . PRESS
[HDG] Displayed
5. NAV Key. . . . . PRESS
White [BC] Displayed
6. Airspeed . . . . ESTABLISH
7. AFCS Status Bar . . . . . VERIFY MODE IS CAPTURED
(white [BC] annunciator turns green)

Go Around [GA] & [GA] (With an Active Approach Loaded)

1. Go Around Button on Throttle. . . . . PRESS
[GA] & [GA] Displayed
2. Throttle and Propeller . . . . FULL FORWARD
3. Flaps. . . . . .UP
4. Landing Gear . . . . .UP
5. Missed Approach . . . . .EXECUTE
6. CDI Key (if required). . . . . . . PRESS TO SELECT GPS
7. SUSP (if required). . . . . PRESS TO INITIATE GPS MISSED APPROACH SEQUENCE
8. ALT Knob (if required) . . . . .SET ALTITUDE

A 400 feet minimum:

9. AP Key . . . . PRESS TO ENGAGE AUTOPILOT

10. CWS . . . . .PRESS TO CNX GA MODE & ADJUST PITCH
11. HDG or NAV Key. . . . . .PRESS

TRAFFIC INFORMATION SERVICE (TIS)

1. If the SKY497 TAS system is installed, TIS will not be available.
2. TIS is only available when the aircraft is within the service volume of a TIS capable terminal radar site.
3. TIS information is displayed on the MFD on the Traffic Map page of the Map Group.
4. Rotate the RANGE knob to change the display range.

L-3 COMMUNICATIONS SKYWATCH SKY497 TRAFFIC ADVISORY SYSTEM (TAS) (IF INSTALLED)

WARNING

The SKY497 can only detect aircraft that are equipped with operating transponders.

1. Traffic information shown on the PFD and MFD is provided as an aid in visually acquiring traffic. Pilots must maneuver the airplane based only upon ATC guidance or positive visual acquisition of conflicting traffic.
2. If the pilot is advised by ATC to disable transponder altitude reporting, the SKY497 must be placed in STANDBY.

ENVIRONMENTAL SYSTEMS

AIR CONDITIONER OPERATION (if installed)

During ground operations, the compressor may shut down unless the airplane is pointed into the wind and the engine is operating at 1200 RPM or higher. The compressor may be turned back on after such a shutdown.

If the air conditioner is operated during cruise, the range and airspeed will decrease by approximately 5% due to the extension of the condenser to the flight position.

HEATING AND DEFROST

To obtain maximum heating for the pilot and right front seat:

1. Overhead Fresh Air Shutoff Valve . . . . CLOSE
2. Vent Blower . . . . .OFF
3. Wing Root Fresh Air Outlets . . . . CLOSED (rotate knob CW)
4. Firewall Air Control .PUSH OPEN
5. Cabin Heat Control . . . . .PULL ON (amount of heat is proportional to amount control is pulled out)
6. Aft Cabin Heat Control . . . . PUSH OFF
7. Defrost Control . . . . AS REQUIRED

To obtain heat to the 3rd, 4th, 5th and 6th seats:

1. Aft Cabin Heat Control . . . . PULL OUT
   - Amount of heat delivered to aft cabin is proportional to amount control is pulled out.
   - Amount of heat delivered to front seats will be reduced as control is pulled out.

To obtain maximum defrost:

1. Cabin Heat Control . . . . .PULL ON (amount of heat is proportional to amount control is pulled out)
2. Aft Cabin Heat Control . . . . PUSH IN
3. Defrost Control . . . . .PULL FULL OUT

VENTILATION

To obtain maximum ventilation:

1. Overhead Fresh Air Shutoff Valve. . . . . OPEN
2. Vent Blower. . . . . ON
3. Wing Root Fresh Air Outlets . . . . OPEN (rotate knob CCW)
4. Firewall Air Control . . . . PUSH OPEN

MAXIMUM COOLING

1. Firewall Air Control . . . . .PULL CLOSED

COLD WEATHER OPERATION

PREFLIGHT INSPECTION

All accumulations of ice, snow and frost must be removed from the wings, fuselage, control surfaces and hinges, propeller, induction inlet, windshield, fuel tank filler caps, crankcase vents, and fuel vents prior to takeoff. The deposits will not blow off in flight. Airfoil contours may be altered by the ice and snow to the extent that their lift qualities will be seriously impaired. Ice and snow on the fuselage can increase drag and weight. If use of a Type I deicing fluid is required to produce a clean airplane, special attention must be given to ensure that the pitot mast, static ports, fuel vents, stall warning vane, windshield and the area in front of the windshield, and the induction inlet are free of the deicing solution.

The normal preflight procedures should then be completed, with particular attention given to checking flight controls for complete freedom of movement.

Use Approved Engine Oils in accordance with Section 8, HANDLING, SERVICING AND MAINTENANCE. Always pull the propeller through by hand, opposite the direction of rotation, several times to clear the engine and "limber up" the cold, heavy oil before using the starter. This will also lessen the load on the battery if external power is not used.

Under very cold conditions, it may be necessary to preheat the engine prior to a start. Particular attention should be given to the oil cooler, engine sump, and propeller hub to ensure proper preheat. A start with congealed oil in the system may produce an indication of normal pressure immediately after the start, but then the oil pressure may decrease when residual oil in the engine is pumped back with the congealed oil in the sump. If an engine heater capable of heating both the engine sump and cooler is not available, the oil should be drained while the engine is hot and stored in a warm area until the next flight.

AFTER STARTING

If there is no oil pressure within 30 seconds after start, or if oil pressure drops after a few minutes of ground operation, shut down and check for broken oil lines, oil cooler leaks, or congealed oil.

NOTE

It is advisable to use external power for starting in cold weather.

During warm-up, monitor engine temperature closely since it is quite possible to exceed the cylinder head temperature limit while trying to increase the oil temperature. Exercise the propeller several times to remove cold oil from the pitch change mechanism. The propeller should also be cycled occasionally in flight.

DESCENT

During descent and landing, give special attention to cylinder head temperatures, since the engine will have a tendency to over-cool.

Refer to Engine Manufacturers' Operator's Manual for more detailed information on COLD WEATHER OPERATION.

GPS Approach [LNAV+V]
(Software version 0858.05 or 0858.06)

1. Baro Minimums . . . . SET
2. CDI Key . . . . SELECTED GPS
3. Approach . . . . VERIFY ACTIVATED
4. Altitude Preselect . . . . SET
5. NAV Key . . . . PRESS
   Green [GPS] Displayed
6. Airspeed . . . . ESTABLISH
7. AFSC Status Bar . . . . VERIFY [GPS] MODES ARE CAPTURED

NOTE

During LNAV+V approaches it will be necessary to follow the glide path using either the [VS] or [PITCH] modes in order for the airplane to level off at the preselected MDA.

Back Course Approach [BC]

1. CDI Key . . . . SELECT VOR 1 OR VOR 2
2. CRS Knob . . . . SET TO ILS FRONT COURSE
3. HDG Knob . . . . SELECT INTERCEPT HEADING
4. HDG Key . . . . PRESS
   [HDG] Displayed
5. NAV Key . . . . PRESS
   White [BC] Displayed
6. Airspeed . . . . ESTABLISH
7. AFCS Status Bar . . . . . VERIFY MODE IS CAPTURED
   (white [BC] annunciator turns green)

ICING CONDITIONS

Flight in icing conditions is prohibited.

PROPELLER DEICE (if installed)

PREFLIGHT

With the Engine Running:

1. PROP DE-ICE . . . . ON
2. Propeller Deice Ammeter . . . . MONITOR
   a. System will cycle on for 90 seconds, then off for 90 seconds.
   b. Normal Prop Amps . . . . . . 14 - 18 Amps (Green Arc)

If Propeller Deice Ammeter indicates zero when initially turned on:

3. PROP DE-ICE . . . . OFF, THEN ON

IN-FLIGHT

If inadvertent Icing Conditions are encountered:

1. PROP DE-ICE . . . . ON
   a. The system may be operated continuously in flight, and will function automatically until the switch is turned off.
   b. Relieve propeller imbalance due to ice by increasing RPM briefly, then returning to the desired setting. Repeat as necessary.
   c. If the Propeller Deice Ammeter does not indicate 14 - 18 amperes, refer to Section 3A, ABNORMAL PROCEDURES.

Go Around [GA] & [GA] (With an Active Approach Loaded)
(Software Version 0458.04)

1. Go Around Button on Throttle . . . . PRESS
[GA] & [GA] Displayed
2. Throttle and Propeller . . . . FULL FORWARD
3. Flaps . . . . UP
4. Landing Gear. . . . . UP
5. Missed Approach. . . . . EXECUTE
6. CDI Key (if required) . . . . PRESS TO SELECT GPS
7. SUSP (if required). . . . . PRESS TO INITIATE
GPS MISSED APPROACH SEQUENCE
8. ALT Knob (if required). . . . . SET ALTITUDE

At 400 feet minimum:

9. AP Key . . . . PRESS TO ENGAGE AUTOPILOT
10. CWS . . . . PRESS TO CANCEL GA MODE
& ADJUST PITCH
11. HDG or NAV Key. . . . . PRESS

Go Around [GA] & [GA] (With an Active Approach Loaded)
(Software version 0858.05 or 0858.06)

1. Go Around Button on Throttle . . . . PRESS
2. Throttle and Propeller . . . . FULL FORWARD
3. Flaps . . . . UP
4. Landing Gear. . . . . UP
5. Missed Approach. . . . . EXECUTE
6. CDI Key (if required) . . . . PRESS TO SELECT GPS
7. ALT Knob (if required). . . . . SET ALTITUDE

At 400 feet minimum:

8. AP Key . . . . PRESS TO ENGAGE AUTOPILOT
9. CWS . . . . PRESS TO CANCEL GA MODE
& ADJUST PITCH
10. HDG or NAV Key. . . . . PRESS

NOISE CHARACTERISTICS

Approach to and departure from an airport should be made so as to avoid prolonged flight at low altitude near noise-sensitive areas. Avoidance of noise-sensitive areas, if practical, is preferable to overflight at relatively low altitudes.

For VFR operations over outdoor assemblies of persons, recreational and park areas, and other noise-sensitive areas, pilots should make every effort to fly not less than 2,000 feet above the surface, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.

NOTE

The preceding recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions, or where, in the pilot's judgement, an altitude of less than 2,000 feet is necessary to adequately exercise his duty to see and avoid other airplanes.

Flyover noise level established in compliance with 14 CFR Part 36 is 76.7 dB(A).

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

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Performance
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Except as noted, all airspeeds quoted in this section are indicated airspeeds (IAS) and assume zero instrument error.

INTRODUCTION TO PERFORMANCE

REQUIRED CORRECTIONS TO PERFORMANCE GRAPHS AND TABLES

1. The performance obtained from the following graphs must be adjusted by the specified percentage or fixed amount at all altitudes above sea level. The resulting performance is approximate and will vary with airspeed, temperature, and other ambient conditions.

   TAKE-OFF DISTANCE - FLAPS UP

   TAKE-OFF DISTANCE - FLAPS APPROACH

   -Increase Distance by 6%

   CLIMB

   -Decrease Rate-of-Climb by 75 FT/MIN

   TIME, FUEL, AND DISTANCE TO CRUISE CLIMB

   -Increase Time to Climb by 8%

   RANGE PROFILES and ENDURANCE PROFILES

   -Decrease Range and Endurance by:

   SL to 4000 ft 0.5%

   4000 to 8000 ft. 1.0%

   8000 to 12,000 ft 2.0%

   12,000 to 16,000 ft. 4.0%

2. After the previous corrections have been made, the following additional corrections must be made for all airplanes when the ambient temperature exceeds that for a standard (ISA) day. Linearly interpolate to obtain corrections for other ambient temperatures between ISA and ISA + 30°C.

GRAPHS/TABLES	ISA + 10°C	ISA + 20°C	ISA + 30°C
TAKE-OFF DISTANCE - FLAPS UP TAKE-OFF DISTANCE - FLAPS APPROACH Increase Take-Off Distance by:	8%	15%	23%
CLIMB Decrease Rate-of-Climb by:	90 fpm	180 fpm	270 fpm
TIME, FUEL, AND DISTANCE TO CRUISE CLIMB Increase Time to Climb by:	15%	30%	45%
CRUISE POWER SETTINGS Decrease cruise speeds by:	4 KIAS	7 KIAS	11 KIAS

3. Using the power settings given in this section, with the air conditioner in operation, range and airspeed will decrease by approximately 5% due to the extension of the condenser to the flight extension position. This is to be taken into consideration during flight planning.

HOW TO USE THE GRAPHS

1. In addition to presenting the answer for a particular set of conditions, the example on the graph also presents the order in which the various scales on the graph should be used. For instance, if the first item in the example is OAT, then enter the graph at the known OAT and proceed to the remaining item(s) in the example in the order given.
2. The reference lines indicate where to begin following the guidelines. Always project to the reference line first, then follow the guidelines to the next known item by maintaining the same PROPORTIONAL DISTANCE between the guideline above and the guideline below the projected line. For instance, if the projected line intersects the reference line in the ratio of 30% down/70% up between the guidelines, then maintain this same 30%/70% relationship between the guidelines all the way to the next known item or answer.
3. Indicated airspeeds (IAS) were obtained by using the AIRSPEED CALIBRATION - NORMAL SYSTEM Graph.
4. The associated conditions define the specific conditions from which performance parameters have been determined. They are not intended to be used as instructions. However, performance values determined from the charts can only be achieved if the specified conditions exist.
5. The full amount of usable fuel is available for all approved flight conditions.

EXAMPLE CALCULATIONS

Examples have been presented on all performance graphs. In addition, the calculations for flight time, block speed and fuel required for a proposed flight are listed below. All examples and calculations utilize the following conditions:

CONDITIONS

At Departure:

Outside Air Temperature . . . . 15°C (59°F)
Field Elevation . . . . 5333 ft
Altimeter Setting. . . . . 29.60 in. Hg
Runway 26L Length . . . . 10,004 ft

At Destination:

Outside Air Temperature . . . . 25°C (77°F)
Field Elevation . . . . 3605 ft
Altimeter Setting. . . . . 29.56 in. Hg
Wind. . . . . 190° at 12 kts
Runway 22 Length . . . . 13,502 ft

ROUTE SEGMENT	AVERAGE MAGNETIC COURSE	AVERAGE MAGNETIC VARIATION	DIST NM	WIND AT 11,500 FEET DIR/KTS	OAT 11,500 FEET °C
LEG A	155°	12°E	51	010°/30	-5
LEG B	153°	12°E	40	010°/30	-5
LEG C	135°	12°E	74	100°/20	0
LEG D	132°	11°E	87	200°/20	9
LEG E	126°	10°E	70	200°/20	10

PRESSURE ALTITUDE

To determine pressure altitude at departure and destination airports, add 1000 ft to field elevation for each 1.00 in. Hg below 29.92, and subtract 1000 ft from field elevation for each 1.00 in. Hg above 29.92.

Pressure Altitude at Departure:

29.92 - 29.60 = .32 in. Hg

.32 X 1000 ft = 320 ft

The Pressure Altitude at the departure airport is 320 ft above the field elevation.

5333 ft + 320 ft = 5653 ft

Pressure Altitude at Destination:

29.92 - 29.56 = .36 in. Hg

.36 X 1000 ft = 360 ft

The Pressure Altitude at the destination airport is 360 ft above the field elevation.

3605 ft + 360 ft = 3965 ft

NOTE

For flight planning, the difference between cruise altitude and cruise pressure altitude has been ignored.

FLIGHT TIME, BLOCK SPEED AND FUEL REQUIREMENT

CRUISE CLIMB

Enter the TIME, FUEL, AND DISTANCE TO CRUISE CLIMB Graph at 15°C to 5653 feet pressure altitude and to 3650 lbs. Again at -5°C to 11,500 feet pressure altitude and to 3650 lbs, and read:

Time to Climb = 18.0 - 6.5 = 11.5 min

Fuel Used to Climb = 6.0 - 2.5 = 3.5 gal

Distance Traveled = 36.0 - 12.5 = 23.5 nm

CRUISE

The air temperatures for cruise are presented for 20°C below a Standard Day (ISA -20°C), for a Standard Day (ISA) and for 20°C above a Standard Day (ISA +20°C). OAT is used to enter the Cruise Power Setting tables to determine the enroute cruise power setting. OAT is displayed in the OAT Box located in the lower left corner of the PFD. For temperature values between ISA and ISA ±20°C, interpolate to determine the cruise power setting.

Enter the ISA CONVERSION Graph at 11,500 ft and the temperature for the route segment:

ROUTE SEGMENT	OAT	ISA CONDITION
LEG A-B	-5°C	ISA + 3°C
LEG C	0°C	ISA + 8°C
LEG D	9°C	ISA + 17°C
LEG E	10°C	ISA + 18°C

Enter the MAXIMUM CRUISE POWER table at 10,000 ft and at 12,000 ft at ISA and ISA + 20°C:

ALTITUDE FEET	TEMPERATURE			
	ISA		ISA + 20°C	
	FUEL FLOW GAL/HR	TAS KNOTS	FUEL FLOW GAL/HR	TAS KNOTS
10,000	14.5	171	14.0	171
12,000	13.5	167	13.0	167

Interpolate for 11,500 ft and the temperature for the appropriate route segment. Results of the interpolations are:

ROUTE SEGMENT	ISA CONDITION	FUEL FLOW GPH	TAS KNOTS
LEG A-B	ISA + 3°C	13.7	168
LEG C	ISA + 8°C	13.6	168
LEG D	ISA + 17°C	13.4	168
LEG E	ISA + 18°C	13.3	168

Time and fuel used were calculated as follows:

Time = Distance ÷ Ground Speed

Fuel Used = (Distance ÷ Ground Speed) X Fuel Flow

Results are:

ROUTE SEGMENT	DISTANCE NM	EST GROUND SPEED KNOTS	TIME AT CRUISE ALTITUDE HRS:MIN	FUEL USED CRUISE GAL
LEG A	51 - 23.5 = 27.5*	195	:08.5	2.0
LEG B	40	195	:12	2.9
LEG C	74	156	:29	6.6
LEG D	87	156	:33.5	7.5
LEG E	70	158	:27	5.9
TOTAL	298.5		1:50	24.9

* Distance required to climb has been subtracted from segment distance.

TIME - FUEL - DISTANCE CHART

ITEM	TIME HRS:MINS	FUEL GAL	DISTANCE NM
Start, Runup, Taxi, and Take-off acceleration	0:00	2.2	0
Climb	:11.5	3.5	23.5
Cruise	1:50	24.9	298.5
Total	2:01.5	30.6	322

Total Flight Time: 2 hours, 1.5 minutes (= 2.03 hrs)

Block Speed: 322 NM ÷ 2.03 hours = 159 knots

RESERVE FUEL

Enter the ECONOMY CRUISE POWER table at ISA and ISA + 20°C at 10,000 ft and 12,000 ft. Interpolate to find the Fuel Flow at 11,500 ft at ISA + 18°C:

Total Fuel Flow . . . . 9.3 gph

Reserve Fuel (45 minutes x 9.3 gph) = 7.0 gallons

TOTAL FUEL REQUIREMENT

Total Fuel Required = Calculated Fuel Usage + Reserve Fuel

Total Fuel Required = 30.6 gal + 7.0 gal = 37.6 gallons

LANDING WEIGHT

The estimated landing weight is determined by subtracting the fuel required for the trip from the ramp weight:

Assumed Ramp Weight . . . . 3663 lbs

Estimated Fuel (30.6 gal at 6 lbs/gal). . . . . 184 lbs

Estimated Landing Weight (3663 lbs - 184 lbs) = 3479 lbs

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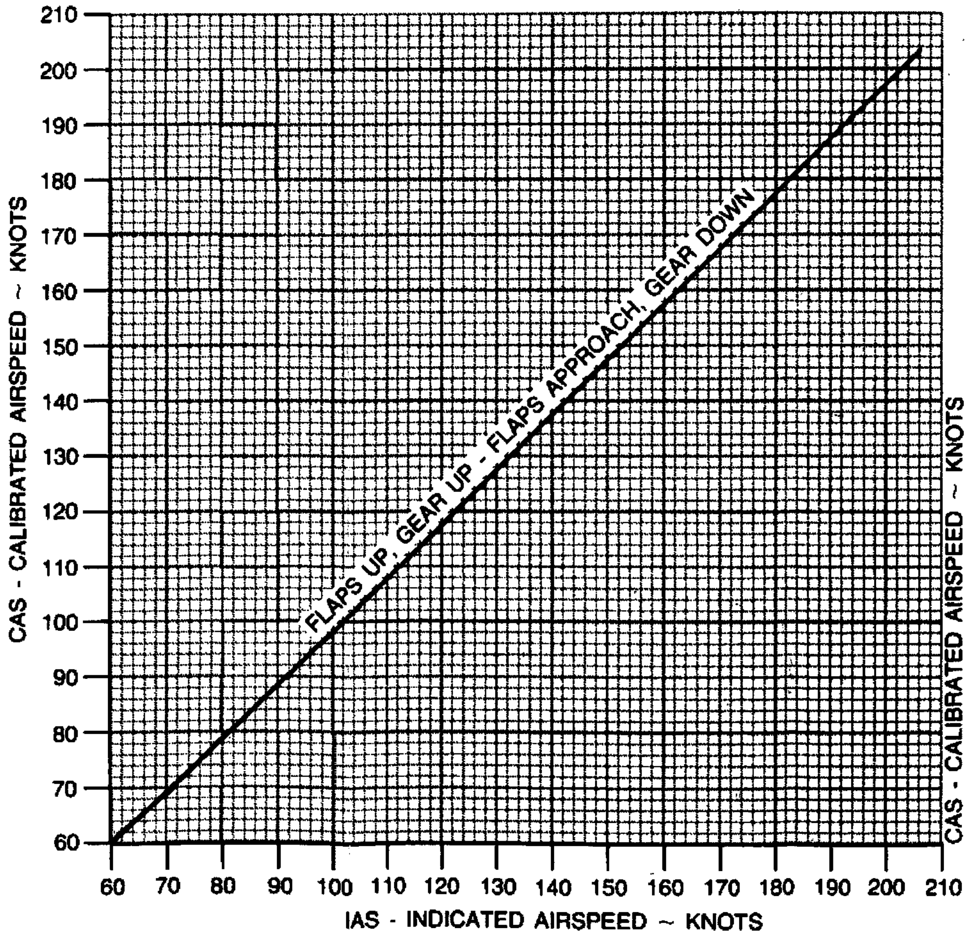
AIRSPEED CALIBRATION – NORMAL SYSTEM

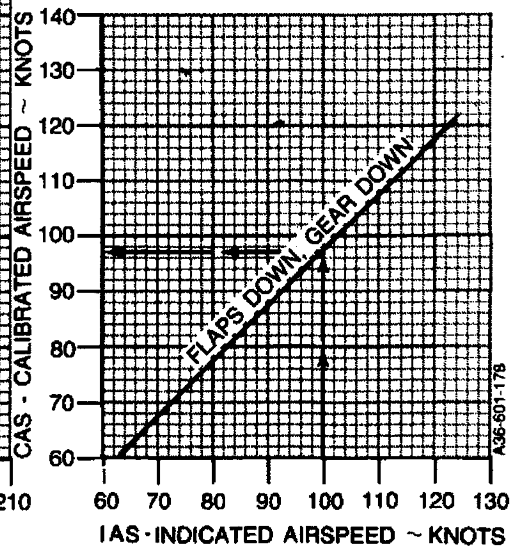
NOTE: INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR



EXAMPLE:

FLAPS .... DOWN
IAS .... 100 KTS

CAS .... 97 KTS



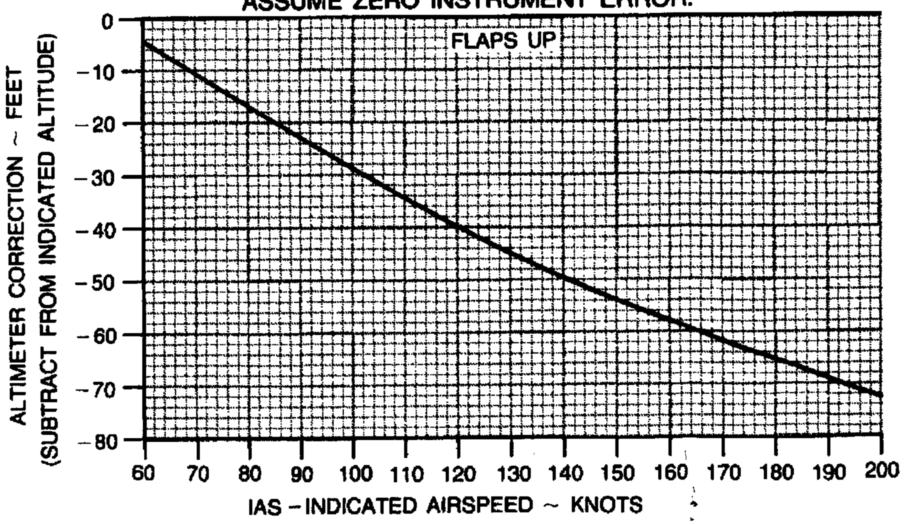
EXAMPLE:

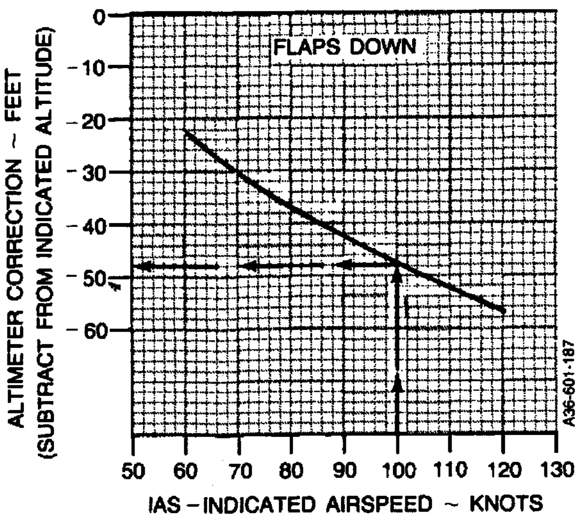
FLAPS .... DOWN
IAS .... 100 KTS
INDICATED PRESSURE
ALTITUDE .... 4500 FT

ALTITUDE CORRECTION .... -48 FT
ACTUAL PRESSURE ALTITUDE ... 4452 FT

ALTIMETER CORRECTION – NORMAL SYSTEM

NOTE: INDICATED AIRSPEED AND INDICATED ALTITUDE ASSUME ZERO INSTRUMENT ERROR.





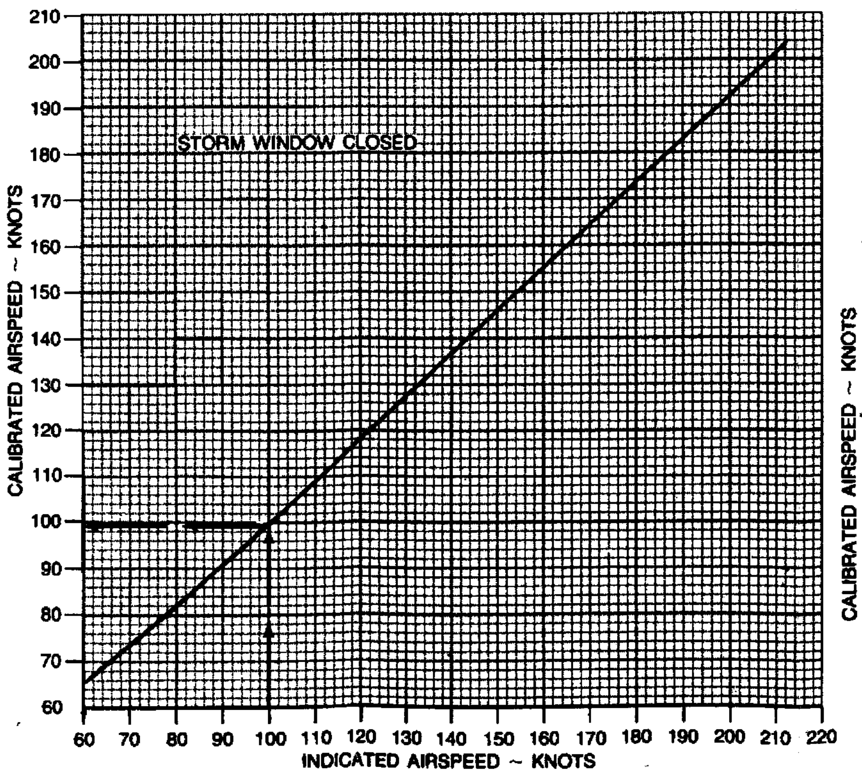
AIRSPEED CALIBRATION - ALTERNATE SYSTEM

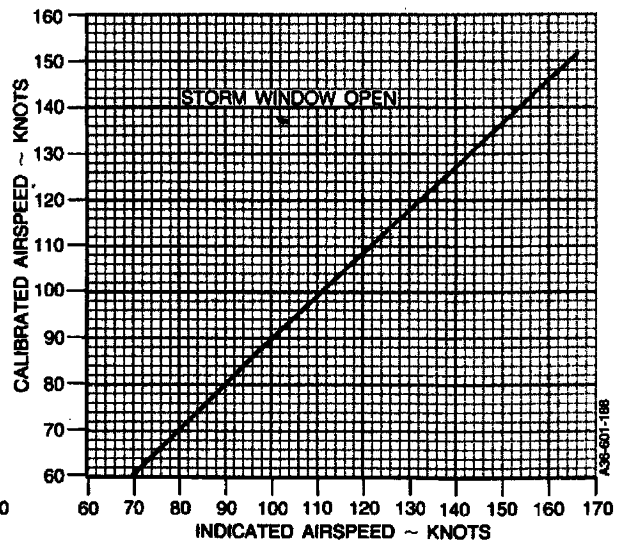
ALL FLAP POSITIONS

NOTES:
1. INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR.
2. NORMAL STATIC PORTS ARE OBSTRUCTED.

EXAMPLE:

IAS	100 KNOTS
STORM WINDOW	CLOSED
CAS	99.5 KNOTS





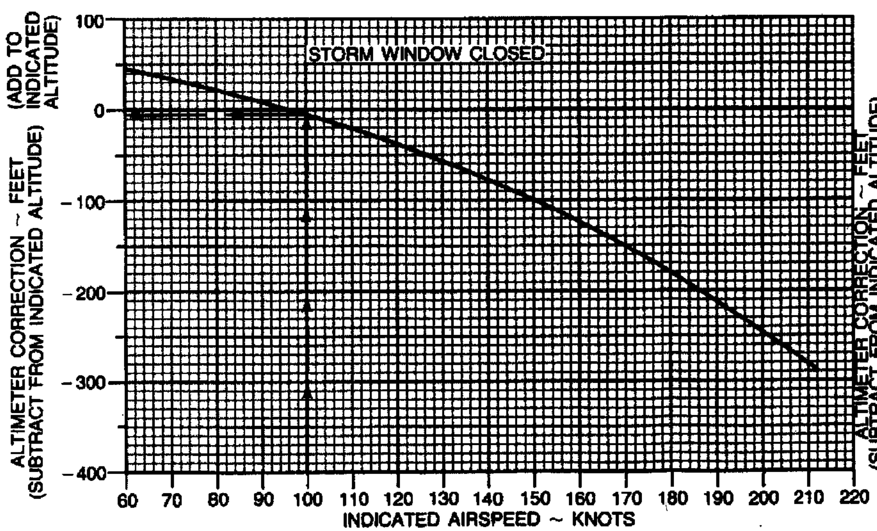
ALTIMETER CORRECTION - ALTERNATE SYSTEM

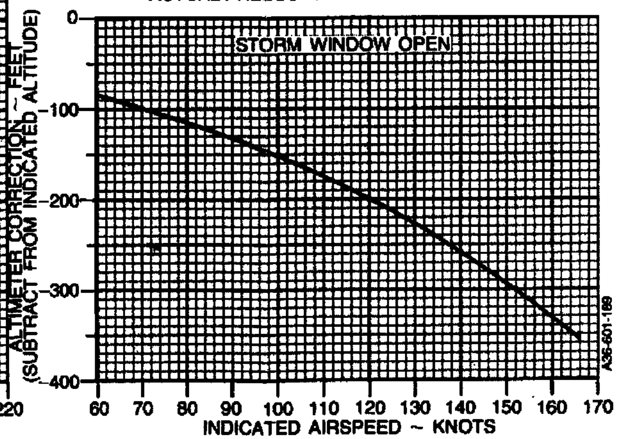
ALL FLAP POSITIONS

NOTES:
1. INDICATED AIRSPEED AND INDICATED ALTITUDE ASSUME ZERO INSTRUMENT ERROR.
2. NORMAL STATIC PORTS ARE OBSTRUCTED.

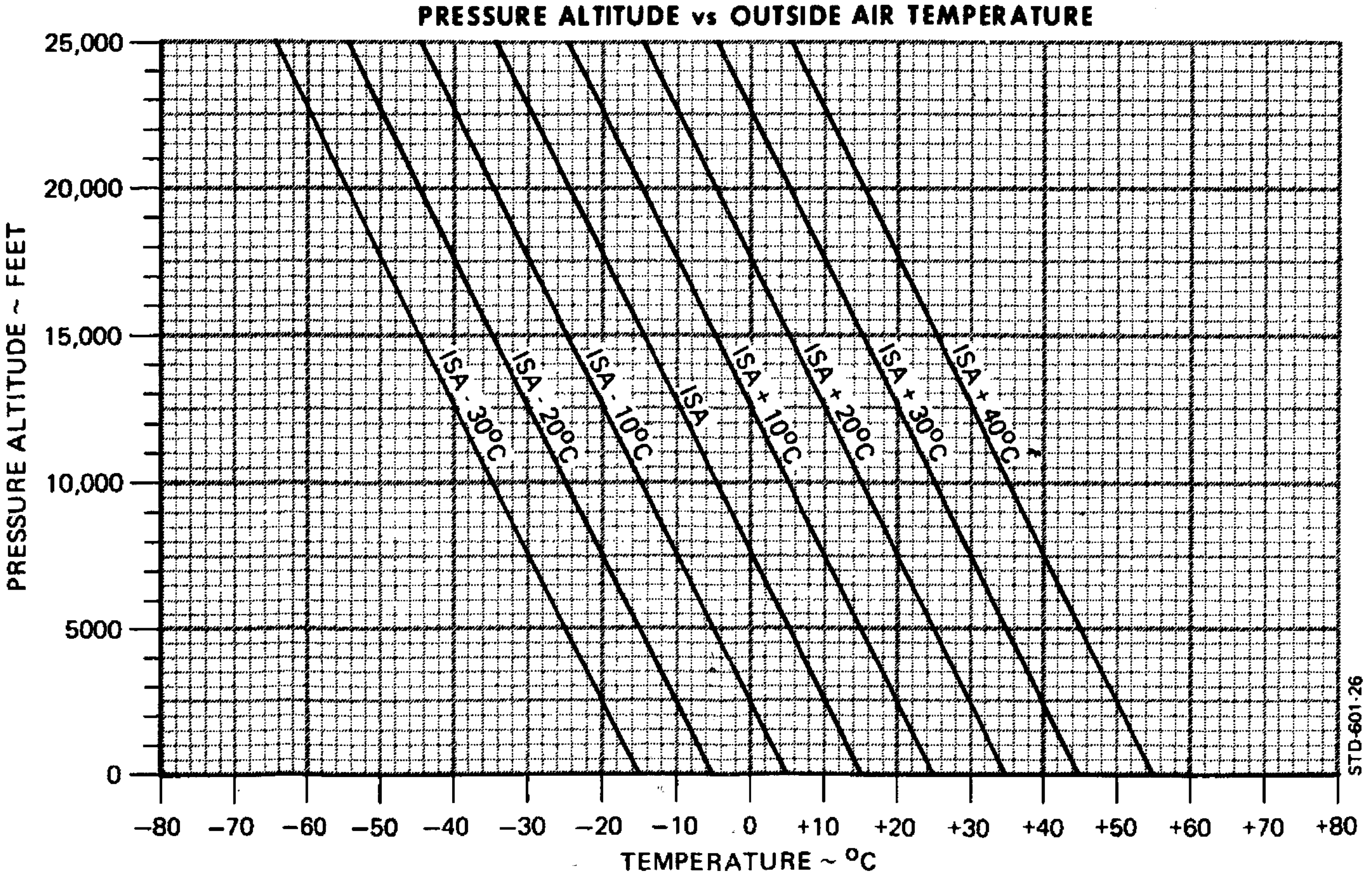
EXAMPLE:

IAS	100 KNOTS
STORM WINDOW	CLOSED
INDICATED PRESSURE ALTITUDE	5000 FEET
ALTITUDE CORRECTION	− 6 FEET
ACTUAL PRESSURE ALTITUDE	4994 FEET

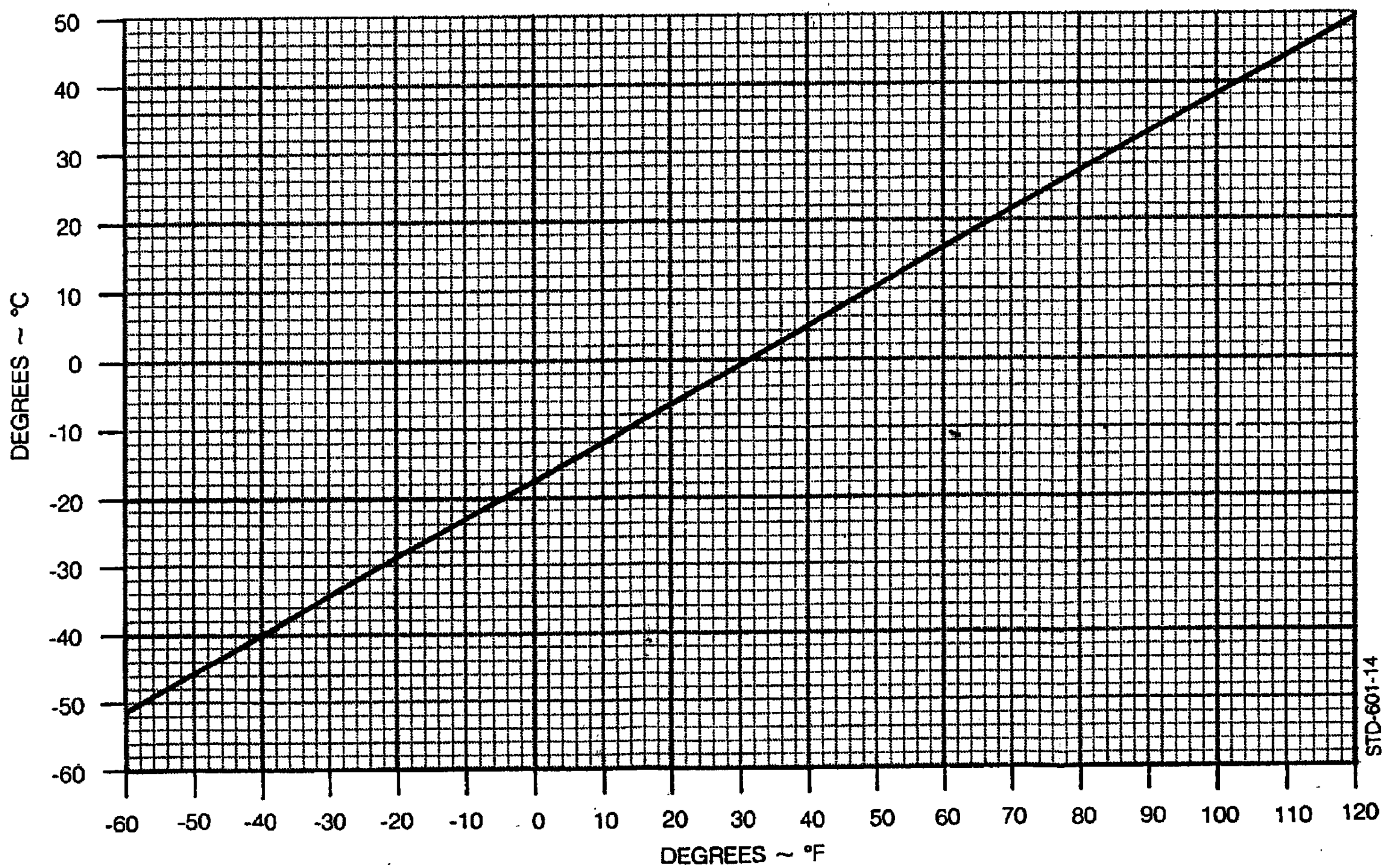




ISA CONVERSION



FAHRENHEIT TO CELSIUS TEMPERATURE CONVERSION



STALL SPEEDS – POWER IDLE

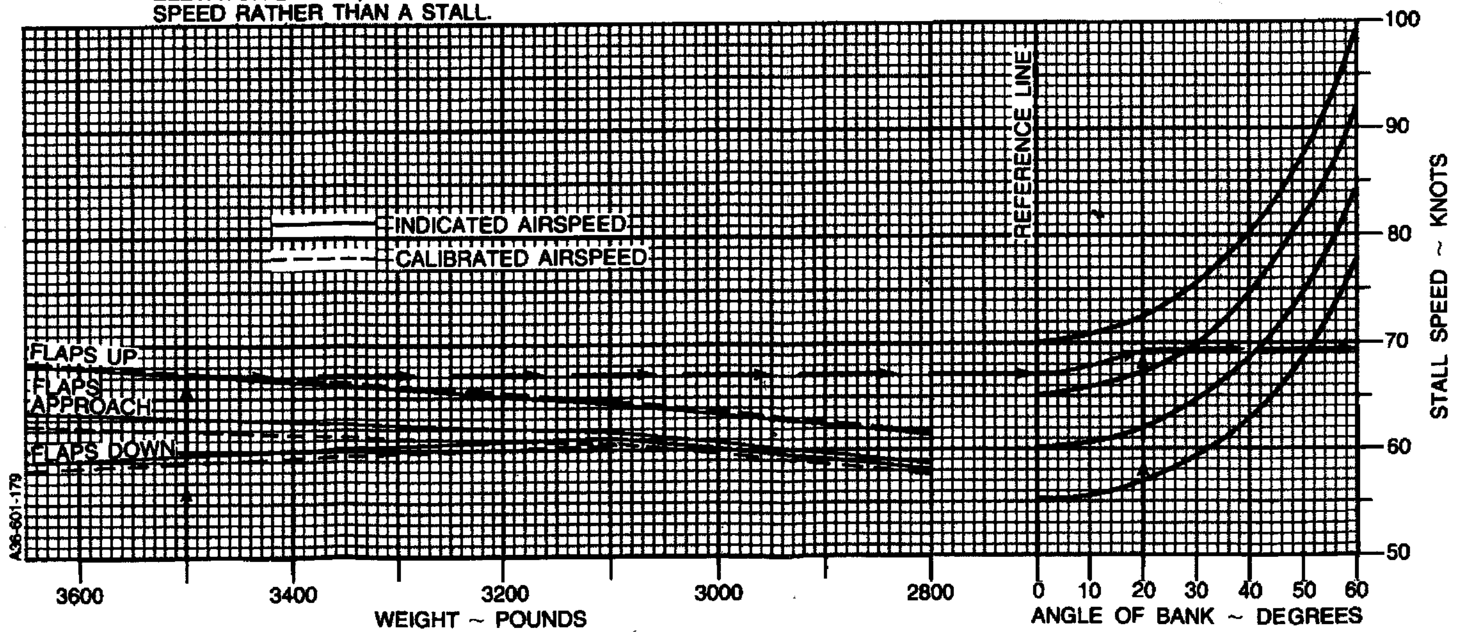
Notes: 1. THE MAXIMUM ALTITUDE LOSS EXPERIENCED WHILE CONDUCTING STALLS IN ACCORDANCE WITH CAR 3.120 WAS 320 FEET.

2. THESE STALL SPEEDS WERE DETERMINED AT THE FORWARD CENTER OF GRAVITY LIMIT FOR EACH WEIGHT. AT SOME LOADINGS THE AIRPLANE IS ELEVATOR LIMITED, RESULTING IN A MINIMUM STEADY SPEED RATHER THAN A STALL.

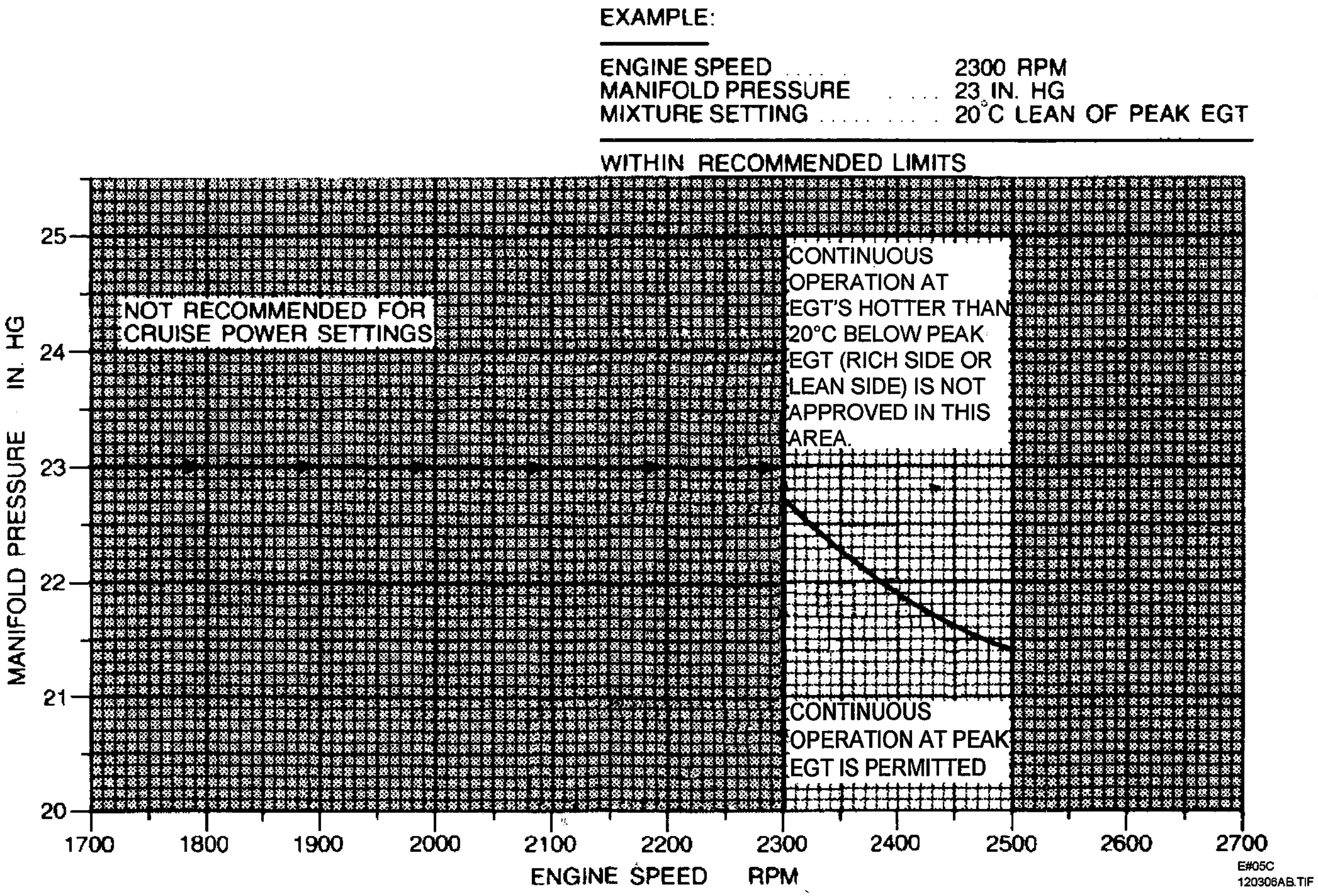
EXAMPLE:

WEIGHT .... 3500 LBS
FLAPS .... UP
BANK ANGLE .... 20°

STALL SPEED .... 69.4 KTS INDICATED



MANIFOLD PRESSURE vs RPM



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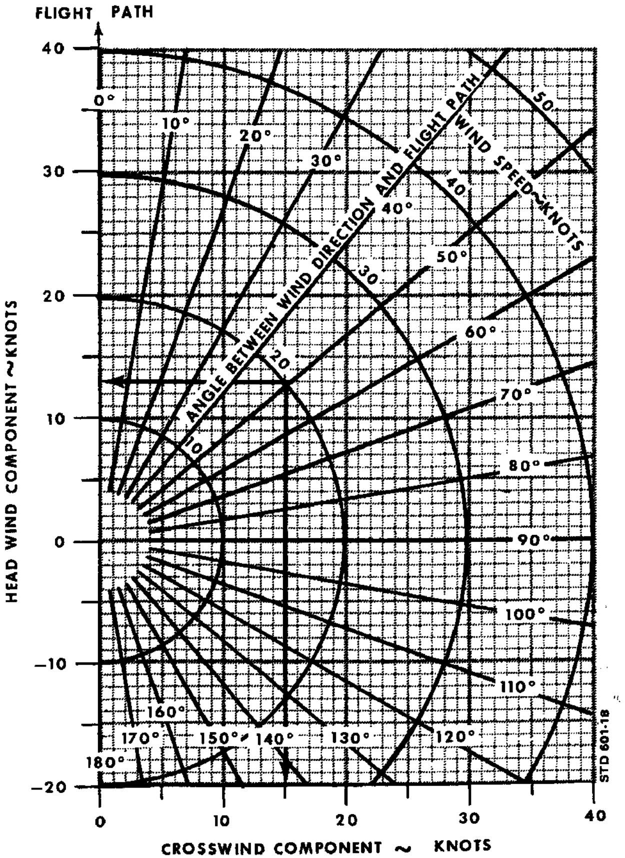
WIND COMPONENTS

Demonstrated Crosswind is 17 kts

EXAMPLE:

WIND SPEED	20 KTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	50°
HEADWIND COMPONENT	13 KTS
CROSSWIND COMPONENT	15 KTS



TAKE-OFF DISTANCE – FLAPS UP

ASSOCIATED CONDITIONS:

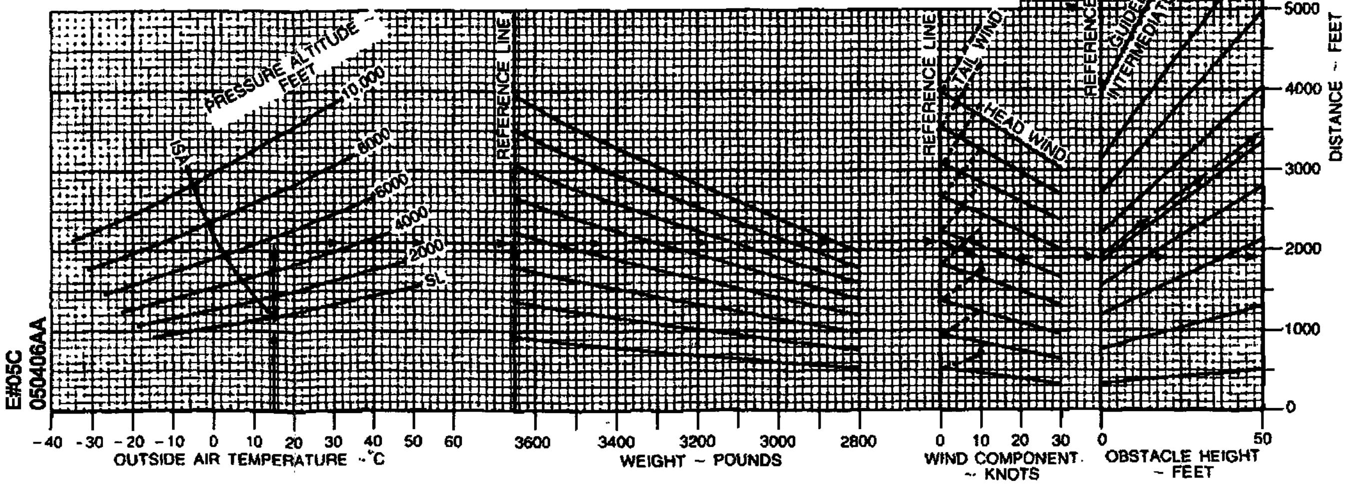
POWER .... TAKE-OFF POWER SET BEFORE BRAKE RELEASE
MIXTURE .... AS REQUIRED BY FIELD ELEVATION
FLAPS .... UP
LANDING GEAR .. RETRACT AFTER POSITIVE CLIMB ESTABLISHED
COWL FLAPS ..... OPEN
RUNWAY .... PAVED, LEVEL, DRY SURFACE

EXAMPLE:

OAT .... 15°C
PRESSURE ALTITUDE .... 5653 FT
TAKE-OFF WEIGHT .... 3650 LBS
HEAD WIND COMPONENT ...... 10 KTS

GROUND ROLL .... 1900 FT
TOTAL DISTANCE OVER 50-FT OBSTACLE .. 3475 FT
TAKE-OFF SPEED AT
ROTATION .... 73 KTS
50-FT .... 84 KTS

WEIGHT POUNDS	TAKE-OFF SPEED	
	ROTATION KNOTS	50 FT KNOTS
3650	73	84
3600	72	83
3400	71	82
3200	70	80
3000	68	78
2800	65	75



TAKE-OFF DISTANCE – FLAPS APPROACH

ASSOCIATED CONDITIONS:

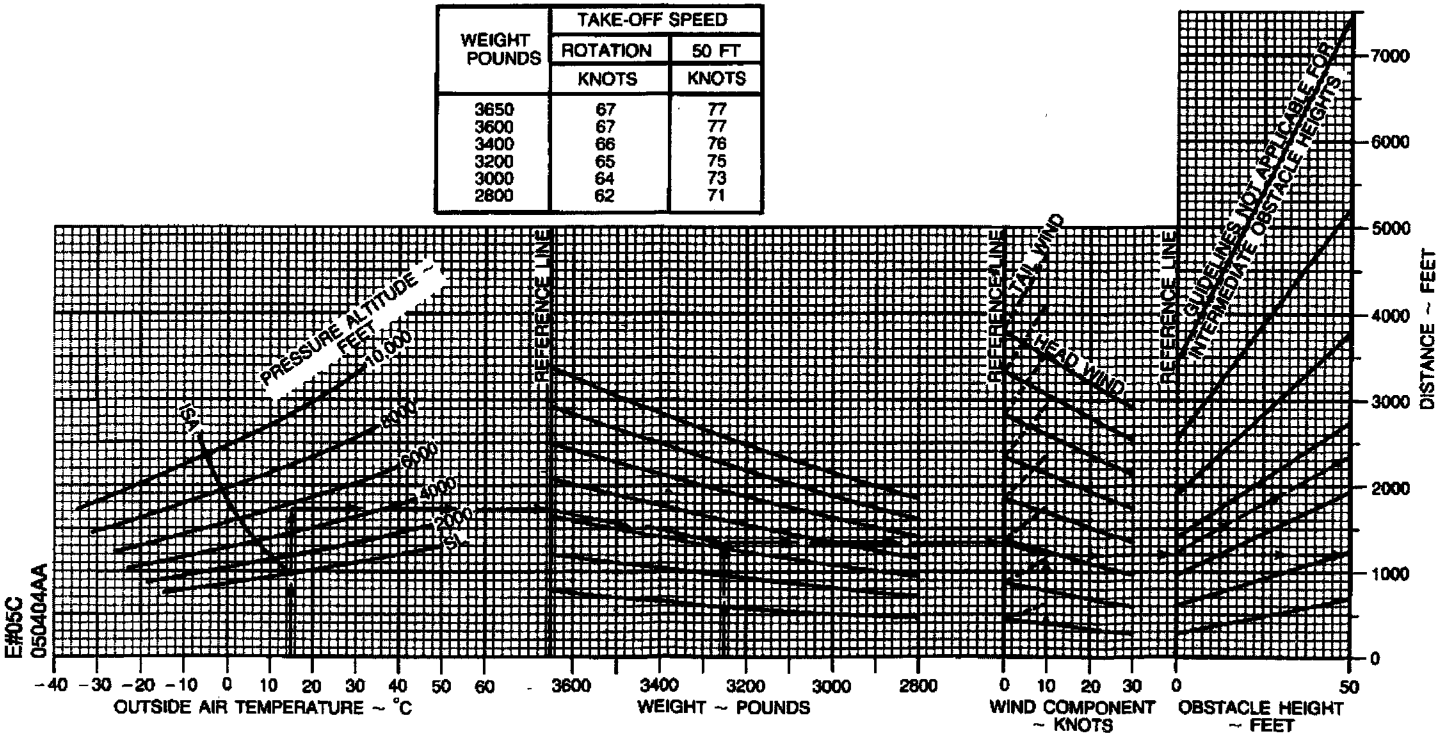
POWER.......... TAKE-OFF POWER SET BEFORE BRAKE RELEASE
MIXTURE......... AS REQUIRED BY FIELD ELEVATION
FLAPS........... APPROACH (BLUE)
LANDING GEAR... RETRACT AFTER POSITIVE CLIMB ESTABLISHED
COWL FLAPS..... OPEN
RUNWAY......... PAVED, LEVEL, DRY SURFACE

EXAMPLE:

OAT .... 15°C
PRESSURE ALTITUDE .... 5653 FT
TAKE-OFF WEIGHT .... 3250 LBS
HEAD WIND COMPONENT .... 10 KTS

GROUND ROLL .... 1200 FT
TOTAL DISTANCE OVER 50-FT OBSTACLE .... 2350 FT
TAKE-OFF SPEED AT
ROTATION .... 65 KTS
50 FT .... 75 KTS

WEIGHT POUNDS	TAKE-OFF SPEED	
	ROTATION	50 FT
	KNOTS	KNOTS
3650	67	77
3600	67	77
3400	66	76
3200	65	75
3000	64	73
2800	62	71



CLIMB

CLIMB SPEED: 100 KNOTS ALL WEIGHTS

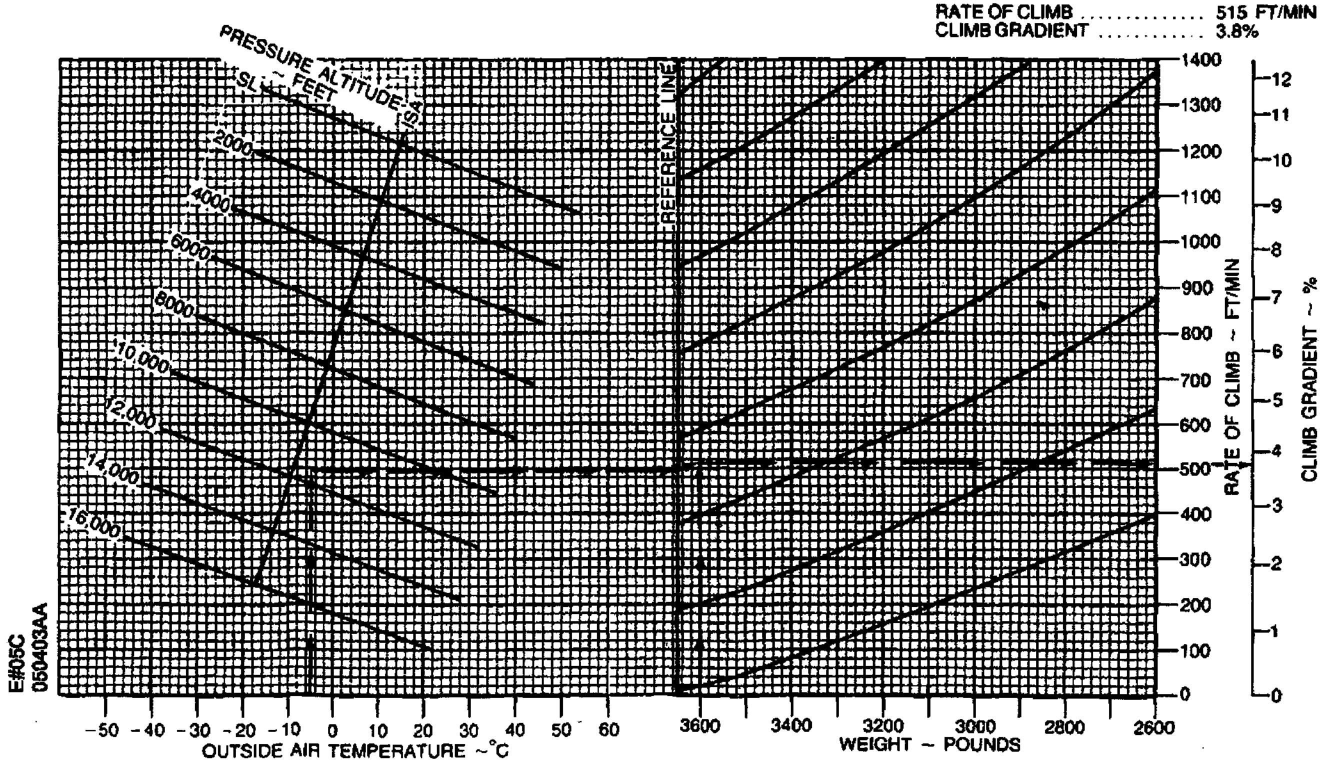
ASSOCIATED CONDITIONS:

POWER.......... FULL THROTTLE, 2700 RPM
MIXTURE......... AS REQUIRED BY ALTITUDE
FLAPS........... UP
LANDING GEAR... UP
COWL FLAPS..... AS REQUIRED

EXAMPLE:

OAT .... -5°C
PRESSURE ALTITUDE .... 11,500 FT
WEIGHT .... 3600 LBS

RATE OF CLIMB .... 515 FT/MIN
CLIMB GRADIENT 3.8%



TIME, FUEL, AND DISTANCE TO CRUISE CLIMB

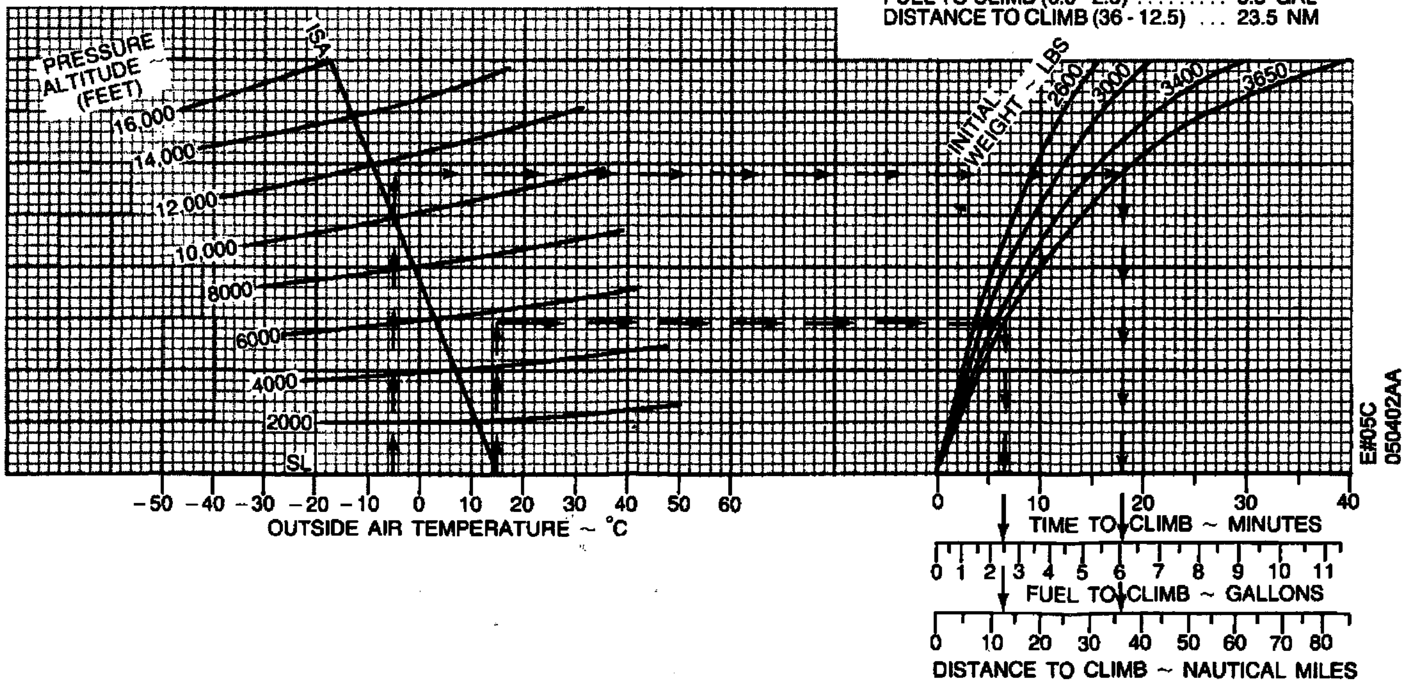
CLIMB SPEED: 110 KNOTS ALL WEIGHTS

ASSOCIATED CONDITIONS:

POWER........ FULL THROTTLE, 2500 RPM
FUEL DENSITY.. 6.0 LBS/GAL
MIXTURE....... AS REQUIRED BY ALTITUDE
COWL FLAPS ... AS REQUIRED

EXAMPLE:

OAT AT TAKEOFF	15°C
OAT AT CRUISE	-5°C
AIRPORT PRESSURE ALTITUDE ..	5653 FT
CRUISE PRESSURE ALTITUDE	11,500 FT
INITIAL CLIMB WEIGHT	3650 LBS
TIME TO CLIMB (18 - 6.5)	11.5 MIN
FUEL TO CLIMB (6.0 - 2.5)	3.5 GAL
DISTANCE TO CLIMB (36 - 12.5) ...	23.5 NM



CRUISE POWER SETTINGS

20°C RICH
OF PEAK EGT

MAXIMUM CRUISE POWER
25 IN. HG (OR FULL THROTTLE)
@ 2500 RPM (3400 LBS.)

	PRESS. ALT.	OAT		MAN. PRESS.	FUEL FLOW		AIR-SPEED	
	FEET	°C	°F	IN. HG	PPH	GPH	KIAS	KTAS
ISA - 20° C (ISA - 36° F)	SL	-5	23	25.0	102.1	17.0	172	164
	2000	-9	16	25.0	105.6	17.6	172	169
	4000	-13	9	25.0	109.1	18.2	172	174
	6000	-17	2	24.1	106.1	17.7	169	175
	8000	-21	-6	22.3	97.7	16.3	162	173
	10,000	-25	-13	20.6	90.2	15.0	155	170
	12,000	-29	-20	19.1	83.5	13.9	147	167
	14,000	-33	-27	17.7	78.3	13.1	140	163
	16,000	-37	-34	16.3	73.1	12.2	131	158
STANDARD DAY (ISA)	SL	15	59	25.0	98.1	16.4	167	165
	2000	11	52	25.0	101.3	16.9	167	170
	4000	7	45	25.0	104.6	17.4	167	175
	6000	3	38	24.1	101.8	17.0	164	176
	8000	-1	30	22.3	93.9	15.7	157	174
	10,000	-5	23	20.6	86.9	14.5	150	171
	12,000	-9	16	19.1	80.8	13.5	142	167
	14,000	-13	9	17.7	76.0	12.7	134	163
	16,000	-17	2	16.3	71.2	11.9	125	157
ISA + 20° C (ISA + 36° F)	SL	35	95	25.0	94.1	15.7	163	166
	2000	31	88	25.0	97.2	16.2	163	171
	4000	27	81	25.0	100.3	16.7	162	176
	6000	23	74	24.1	97.7	16.3	159	177
	8000	19	66	22.3	90.3	15.1	152	174
	10,000	15	59	20.6	83.8	14.0	144	171
	12,000	11	52	19.1	78.1	13.0	137	167
	14,000	7	45	17.7	73.9	12.3	129	162
	16,000	3	38	16.3	69.8	11.6	119	155

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NOTES:
1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.
3. Fuel flows are to be used for flight planning only and will vary from airplane to airplane. Lean using the EGT.

CRUISE POWER SETTINGS

20°C LEAN OF PEAK EGT

RECOMMENDED CRUISE POWER
25 IN. HG (OR FULL THROTTLE)
@ 2500 RPM (3400 LBS.)

	PRESS. ALT.	OAT		MAN. PRESS.	FUEL FLOW		AIR-SPEED	
	FEET	°C	°F	IN. HG	PPH	GPH	KIAS	KTAS
ISA - 20° C (ISA - 36° F)	SL	-5	23	25.0	86.3	14.4	168	159
	2000	-9	16	25.0	89.3	14.9	168	164
	4000	-13	9	25.0	92.3	15.4	168	169
	6000	-17	2	24.1	89.8	15.0	164	170
	8000	-21	-6	22.3	82.6	13.8	157	168
	10,000	-25	-13	20.6	76.0	12.7	150	165
	12,000	-29	-20	19.1	70.2	11.7	143	162
	14,000	-33	-27	17.7	65.5	10.9	135	158
	16,000	-37	-34	16.3	60.8	10.1	126	152
STANDARD DAY (ISA)	SL	15	59	25.0	82.9	13.8	163	160
	2000	11	52	25.0	85.6	14.3	163	165
	4000	7	45	25.0	88.5	14.8	163	170
	6000	3	38	24.1	86.1	14.4	159	171
	8000	-1	30	22.3	79.3	13.2	152	169
	10,000	-5	23	20.6	73.3	12.2	145	166
	12,000	-9	16	19.1	67.8	11.3	137	162
	14,000	-13	9	17.7	63.5	10.6	129	157
	16,000	-17	2	16.3	59.1	9.9	120	150
ISA + 20° C (ISA + 36° F)	SL	35	95	25.0	79.5	13.3	158	161
	2000	31	88	25.0	82.1	13.7	158	166
	4000	27	81	25.0	84.7	14.1	158	171
	6000	23	74	24.1	82.5	13.8	154	172
	8000	19	66	22.3	76.2	12.7	147	169
	10,000	15	59	20.6	70.5	11.8	140	165
	12,000	11	52	19.1	65.5	10.9	132	161
	14,000	7	45	17.7	61.5	10.3	123	155
	16,000	3	38	16.3	57.5	9.6	113	146

NOTES:
1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.
3. Fuel flows are to be used for flight planning only and will vary from airplane to airplane. Lean using the EGT.

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CRUISE POWER SETTINGS

20°C RICH
OF PEAK EGT

RECOMMENDED CRUISE POWER
23 IN. HG (OR FULL THROTTLE)
@ 2300 RPM (3400 LBS.)

	PRESS. ALT.	OAT		MAN. PRESS.	FUEL FLOW		AIR-SPEED	
	FEET	°C	°F	IN. HG	PPH	GPH	KIAS	KTAS
ISA - 20° C (ISA - 36° F)	SL	-5	23	23.0	81.6	13.6	158	150
	2000	-9	16	23.0	84.2	14.0	158	154
	4000	-13	9	23.0	86.9	14.5	158	159
	6000	-17	2	23.0	89.7	15.0	158	164
	8000	-21	-6	22.4	89.0	14.8	156	166
	10,000	-25	-13	20.7	82.7	13.8	148	163
	12,000	-29	-20	19.2	77.1	12.9	141	160
	14,000	-33	-27	17.8	73.2	12.2	133	155
	16,000	-37	-34	16.4	69.2	11.5	124	150
STANDARD DAY (ISA)	SL	15	59	23.0	79.0	13.2	153	150
	2000	11	52	23.0	81.4	13.6	153	155
	4000	7	45	23.0	83.9	14.0	153	160
	6000	3	38	23.0	86.5	14.4	153	165
	8000	-1	30	22.4	85.8	14.3	150	167
	10,000	-5	23	20.7	80.0	13.3	143	163
	12,000	-9	16	19.2	75.1	12.5	135	159
	14,000	-13	9	17.8	71.5	11.9	127	154
	16,000	-17	2	16.4	67.9	11.3	117	147
ISA + 20° C (ISA + 36° F)	SL	35	95	23.0	76.5	12.8	148	151
	2000	31	88	23.0	78.7	13.1	148	155
	4000	27	81	23.0	81.0	13.5	148	160
	6000	23	74	23.0	83.4	13.9	148	165
	8000	19	66	22.4	82.8	13.8	145	167
	10,000	15	59	20.7	77.3	12.9	138	163
	12,000	11	52	19.2	73.0	12.2	130	158
	14,000	7	45	17.8	69.8	11.6	121	152
	16,000	3	38	16.4	66.6	11.1	109	142

NOTES:
1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.
3. Fuel flows are to be used for flight planning only and will vary from airplane to airplane. Lean using the EGT.

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CRUISE POWER SETTINGS

20°C LEAN
OF PEAK EGT

RECOMMENDED CRUISE POWER
23 IN. HG (OR FULL THROTTLE)
@ 2300 RPM (3400 LBS.)

	PRESS. ALT.	OAT		MAN. PRESS.	FUEL FLOW		AIR-SPEED	
	FEET	°C	°F	IN. HG	PPH	GPH	KIAS	KTAS
ISA - 20° C (ISA - 36° F)	SL	-5	23	23.0	67.6	11.3	152	144
	2000	-9	16	23.0	69.7	11.6	152	149
	4000	-13	9	23.0	72.1	12.0	153	154
	6000	-17	2	23.0	74.4	12.4	153	158
	8000	-21	-6	22.4	73.8	12.3	150	160
	10,000	-25	-13	20.7	68.4	11.4	143	157
	12,000	-29	-20	19.2	63.8	10.6	135	153
	14,000	-33	-27	17.8	60.0	10.0	127	148
	16,000	-37	-34	16.4	56.3	9.4	117	141
STANDARD DAY (ISA)	SL	15	59	23.0	65.4	10.9	147	145
	2000	11	52	23.0	67.4	11.2	147	149
	4000	7	45	23.0	69.4	11.6	148	154
	6000	3	38	23.0	71.7	12.0	148	159
	8000	-1	30	22.4	71.1	11.9	145	160
	10,000	-5	23	20.7	66.2	11.0	137	157
	12,000	-9	16	19.2	61.8	10.3	129	152
	14,000	-13	9	17.8	58.5	9.8	120	146
	16,000	-17	2	16.4	55.3	9.2	109	137
ISA + 20° C (ISA + 36° F)	SL	35	95	23.0	63.2	10.5	142	145
	2000	31	88	23.0	65.1	10.9	143	149
	4000	27	81	23.0	67.1	11.2	143	154
	6000	23	74	23.0	69.0	11.5	142	158
	8000	19	66	22.4	68.5	11.4	140	160
	10,000	15	59	20.7	64.0	10.7	132	156
	12,000	11	52	19.2	60.0	10.0	123	151
	14,000	7	45	17.8	57.1	9.5	113	142
	16,000	--	--	--	--	--	--	--

NOTES:
1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.
3. Fuel flows are to be used for flight planning only and will vary from airplane to airplane. Lean using the EGT.

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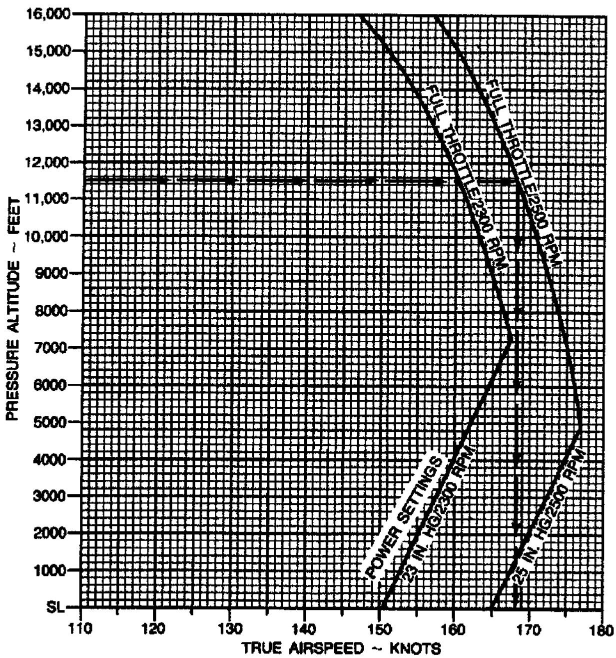
CRUISE SPEEDS

20°C RICH

OF PEAK EGT

ASSOCIATED CONDITIONS:	
AVERAGE CRUISE WT	3400 LBS
TEMPERATURE	STD DAY (ISA)

EXAMPLE:	
CRUISE ALTITUDE	11,500 FT
POWER SETTING	FULL THROTTLE, 2500 RPM
TRUE AIRSPEED	168 KTS



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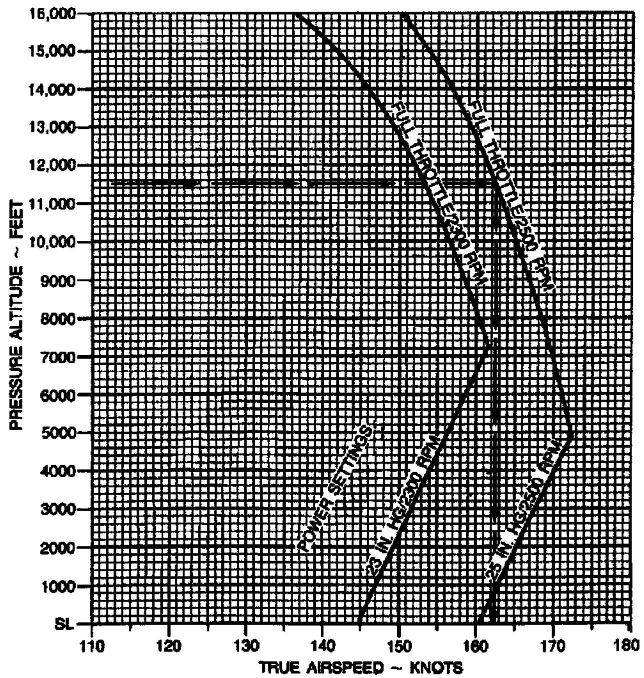
CRUISE SPEEDS

20°C LEAN

OF PEAK EGT

ASSOCIATED CONDITIONS:		EXAMPLE:	
AVERAGE CRUISE WT	3400 LBS	PRESSURE ALTITUDE	11,500 FT
TEMPERATURE	STD DAY (ISA)	POWER SETTING	FULL THROTTLE, 2500 RPM
		TRUE AIRSPEED	163 KTS



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ASSOCIATED CONDITIONS:

WEIGHT	3663 LBS BEFORE ENGINE START
FUEL	AVIATION GASOLINE
FUEL DENSITY	6.0 LBS/GAL
INITIAL FUEL LOADING	74 U.S. GAL (444 LBS)
TAKE-OFF ALTITUDE	SL
WIND	ZERO

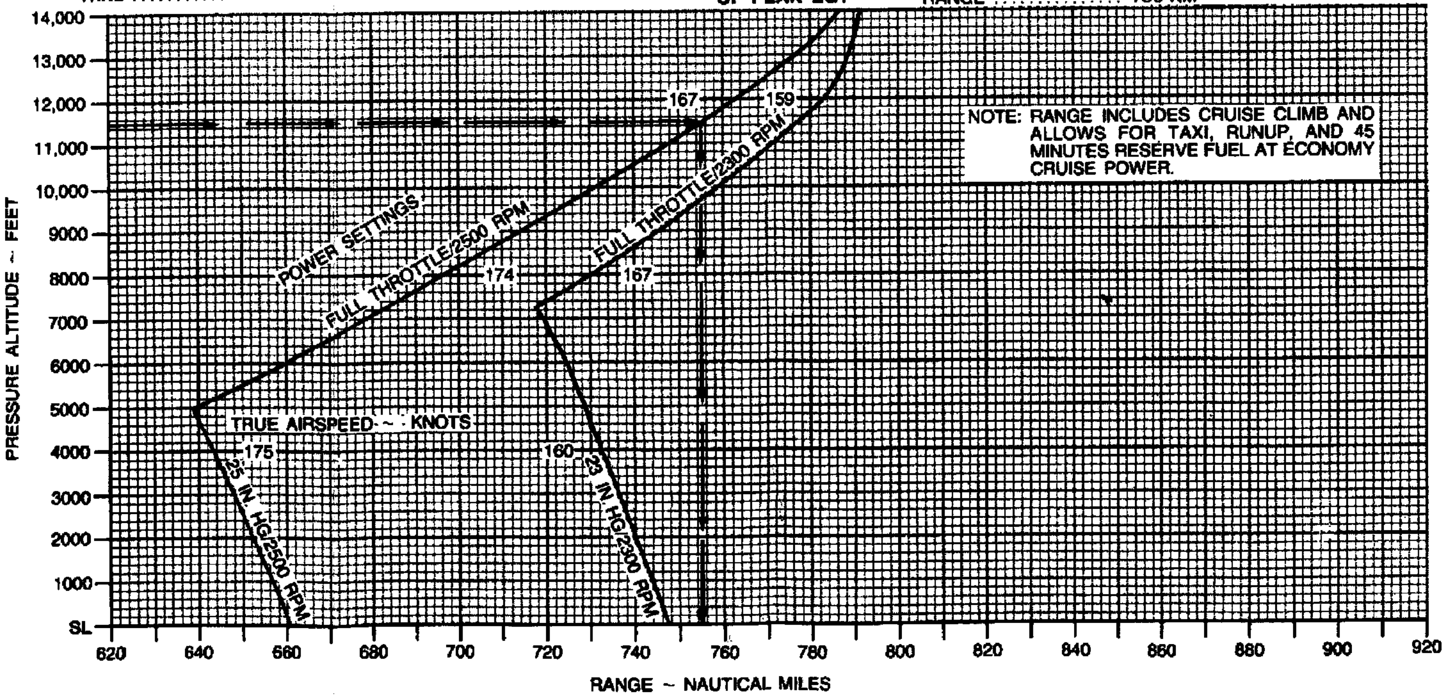
RANGE PROFILE

STANDARD DAY (ISA)

20°C RICH OF PEAK EGT

EXAMPLE:

CRUISE ALTITUDE	11,500 FT
POWER SETTING	FULL THROTTLE, 2500 RPM
RANGE	755 NM



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RANGE PROFILE
STANDARD DAY (ISA)

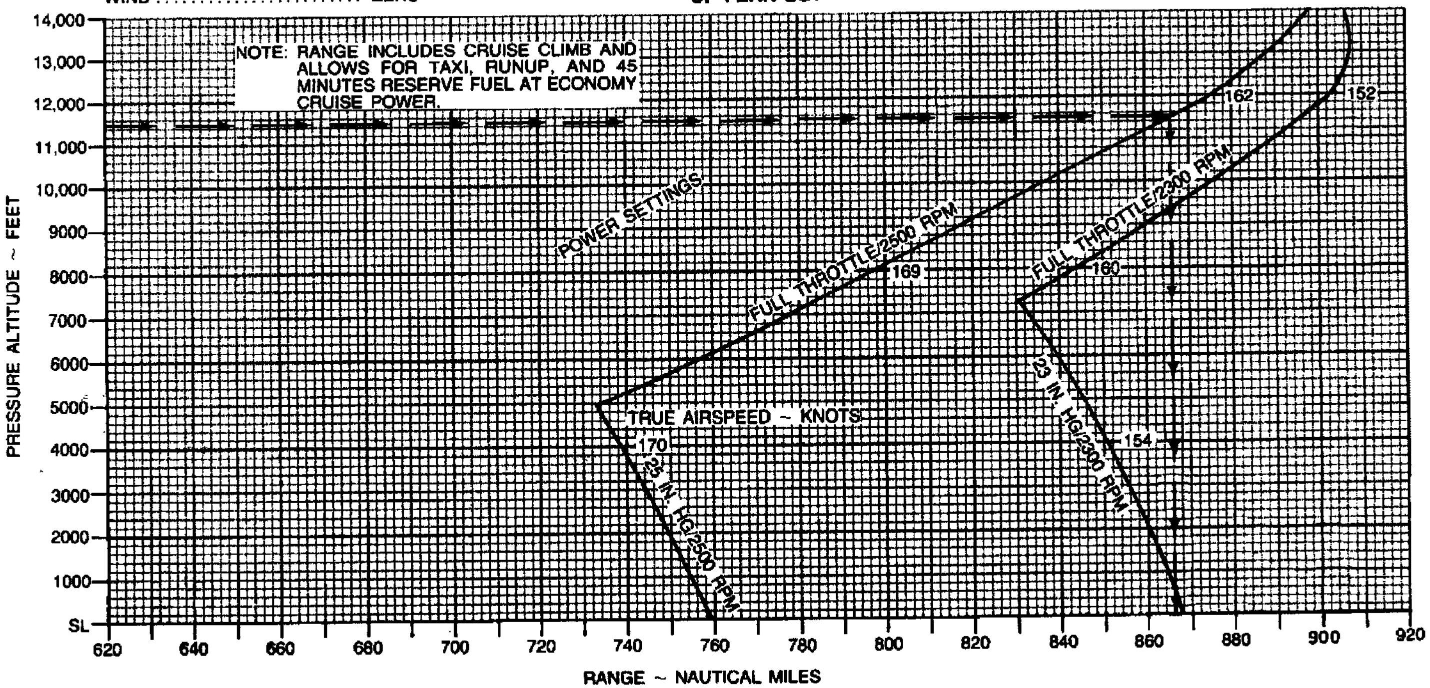
ASSOCIATED CONDITIONS:

WEIGHT	3663 LBS BEFORE ENGINE START
FUEL	AVIATION GASOLINE
FUEL DENSITY	6.0 LBS/GAL
INITIAL FUEL LOADING	74 U.S. GAL (444 LBS)
TAKE-OFF ALTITUDE	SL
WIND	ZERO

20°C LEAN OF PEAK EGT

EXAMPLE:

CRUISE ALTITUDE	11,500 FT
POWER SETTING	FULL THROTTLE, 2500 RPM
RANGE	866 NM



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ENDURANCE PROFILE

STANDARD DAY (ISA)

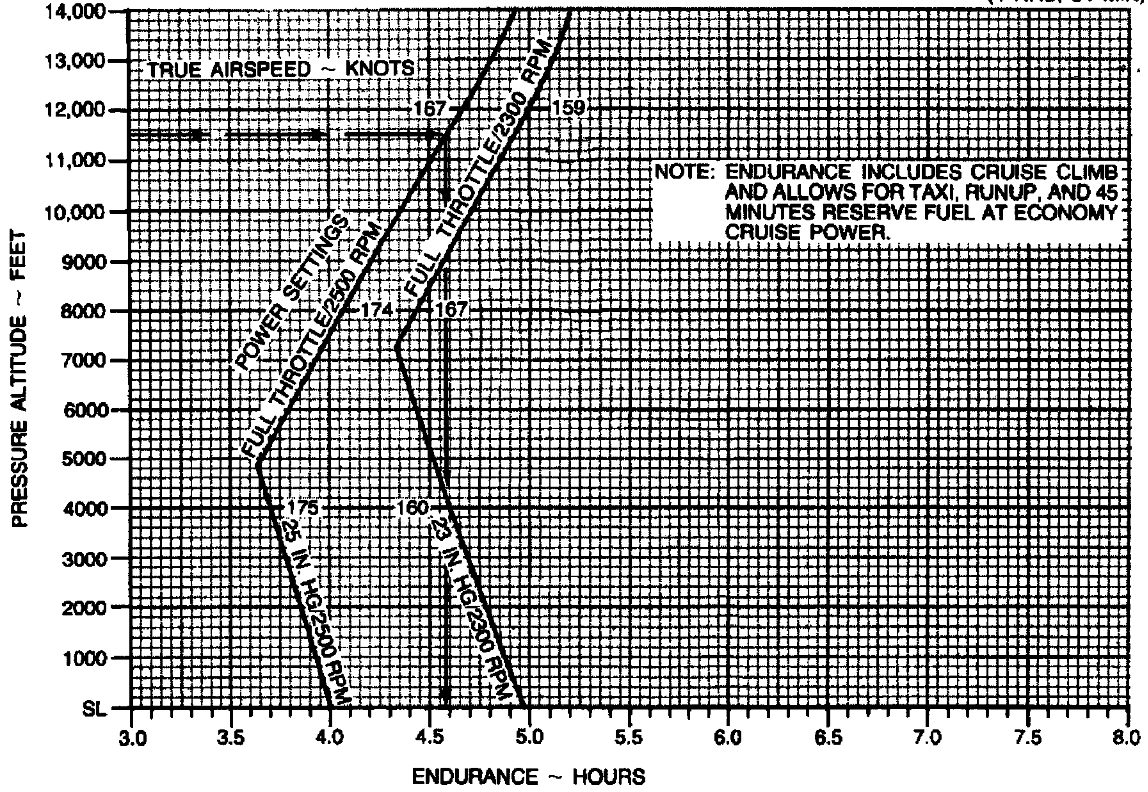
ASSOCIATED CONDITIONS:

WEIGHT	3663 LBS BEFORE ENGINE START
FUEL	AVIATION GASOLINE
FUEL DENSITY	6.0 LBS/GAL
INITIAL FUEL LOADING	74 U.S. GAL (444 LBS)
TAKE-OFF ALTITUDE	SL

20°C RICH OF PEAK EGT

EXAMPLE:

CRUISE ALTITUDE	11,500 FT
POWER SETTING	FULL THROTTLE, 2500 RPM
ENDURANCE	4.58 HRS (4 HRS, 34 MIN)



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ENDURANCE PROFILE

STANDARD DAY (ISA)

ASSOCIATED CONDITIONS:

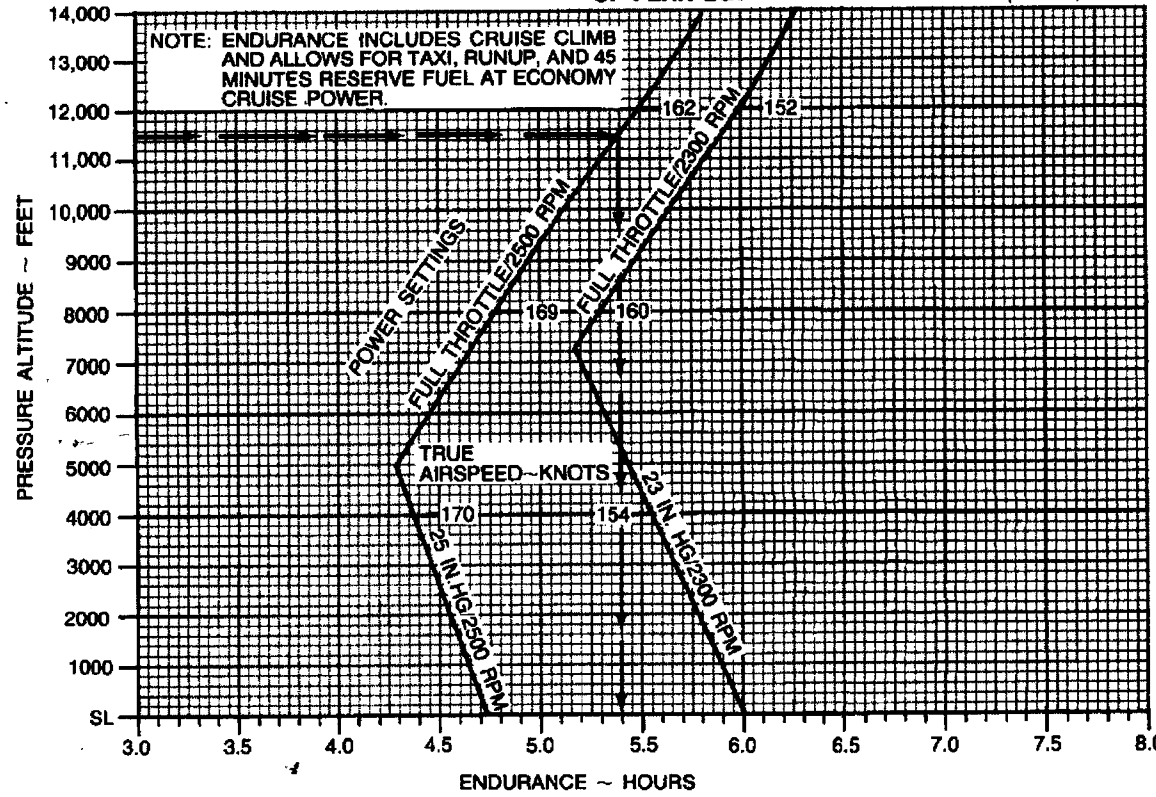
WEIGHT .... 3663 LBS BEFORE ENGINE START
FUEL .... AVIATION GASOLINE
FUEL DENSITY .... 6.0 LBS/GAL
INITIAL FUEL LOADING .... 74 U.S. GAL (444 LBS)
TAKE-OFF ALTITUDE .... SL

20°C LEAN OF PEAK EGT

EXAMPLE:

CRUISE ALTITUDE ..... 11,500 FT
POWER SETTING ...... FULL THROTTLE, 2500 RPM

ENDURANCE .... 5.39 HRS
(5 HRS, 23 MIN)



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LANDING DISTANCE

ASSOCIATED CONDITIONS:

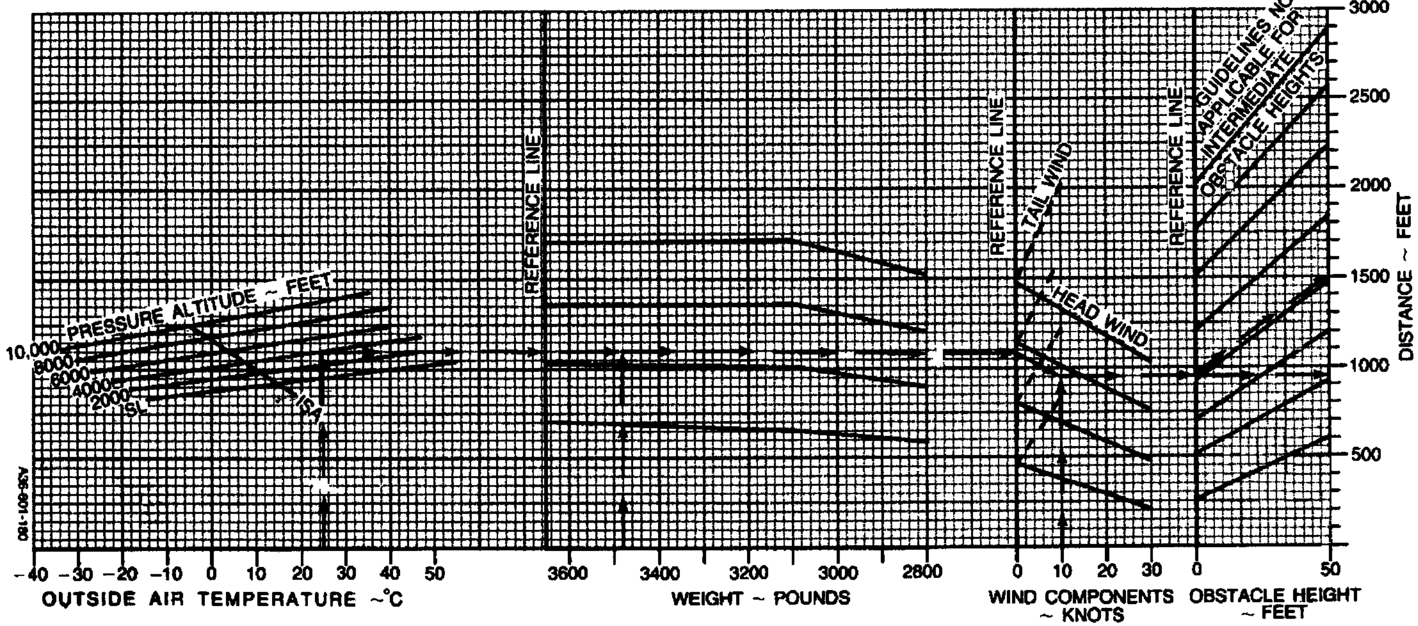
POWER .... RETARDED TO MAINTAIN 900 FT/MIN ON FINAL APPROACH
FLAPS .... DOWN (AMBER)
LANDING GEAR .... DOWN
RUNWAY .... PAVED, LEVEL, DRY SURFACE
APPROACH SPEED .... IAS AS TABULATED
BRAKING .... MAXIMUM

WEIGHT ~ POUNDS	SPEED AT 50 FT KNOTS
3650	79
3400	80
3200	81
3000	81
2800	78

EXAMPLE:

OAT .... 25°C
PRESSURE ALTITUDE .... 3965 FT
WEIGHT .... 3479 LBS
HEADWIND COMPONENT .... 10 KTS

GROUND ROLL .... 960 FT
TOTAL OVER 50-FT OBSTACLE .... 1515 FT
APPROACH SPEED .... 80 KTS



SECTION 6
WEIGHT AND BALANCE/EQUIPMENT LIST

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LOAD DATA SHEET

NAME OF ORGANISATION	Ozweigh Pty. Ltd.
AIRCRAFT REGO VH-VCT	AIRCRAFT TYPE Beechcraft Bonanza G36 S/N E-3784

APPROVED LOADING SYSTEM

Raytheon Aircraft Company Model G 36 Pilot's Operating Handbook & FAA approved Airplane Flight Manual.

AUTHORISED BY	DATE OF ISSUE	DATE OF EXPIRY	ISSUE NUMBER
COLIN WHYTE	4-7-2007	INDEFINITE	ONE

Aircraft Weight and Balance

ITEM	Weight lbs	Arm inches	INDEX	CONFIGURATION
EMPTY WEIGHT	2491lbs	79.8"	198767	6 SEATS TOTAL
BASIC EMPTY WEIGHT INCLUDES FULL ENGINE OIL & UNUSABLE FUEL				
BASIC EMPTY WEIGHT	2523lbs	79.8"	201296	6 SEATS TOTAL
METRIC BASIC EMPTY WT.	1144.7kgs	2027mm	2320215	6 SEATS TOTAL

Notes

ABOVE EMPTY WEIGHT INCLUDES FULL ENGINE OIL, ZERO FUEL , 6 SEATS FITTED .

BASIC EMPTY WEIGHT INCLUDES FULL ENGINE OIL , UNUSABLE FUEL 6 SEATS TOTAL.

NOTE; These figures & equipment list issued from American reweigh

Dated 6-6-2007 & not from weighing performed by OZWEIGH PTY. LTD.

OZWEIGH PTY. LTD. A.C.N. 066 994 760. P.O. BOX 2006 FRESHWATER, QLD. 4870.
APPROVED
AQ15

Basic Empty Weight and Balance - As Certificated

Serial No.: E-3784 **Date: 6/6/2007**

Reference Dimensions in Fuselage Stations (Inches Aft of Datum)				
Wheel Axle Centerline			**Jack Point Location**	
	Nose	**Main**		
Extended Strut	*1.8*	*96.0*	*Forward*	*83.1*
Compressed Strut	*3.1*	*97.0*	*Aft*	*271.0*

Reaction - Wheel	**SCALE READING** (lb.)	**TARE** (lb.)	**NET WEIGHT** (lb.)	**ARM** (in.)	**MOMENT** (lb.-in.)
Left Main	1,017	0	1,017		
Right Main	1,031	0	1,031		
Sub Total - Mains	2,048	0	2,048	96.6	197,837
Nose	443	0	443	2.1	930
Total - As Weighed	2,491	0	2,491	79.8	198,767
Additions and Subtractions to As Weighed Condition					
Less: Protective Seat Covers (2)			-2	80.0	-160
Add: Drainable Unusable Fuel			34	79.1	2,689
BASIC EMPTY WEIGHT - ACTUAL			**2,523**	**79.8**	**201,296**

Note: Basic Empty Weight includes full engine oil & unusable fuel.

Prepared/Approved by: Larry Van Sike

Larry Van Sike
Mass Properties Engineer

Basic Empty Weight and Balance - Seat Removal Options

Serial No.: E-3784 **Date: 6/6/2007**

The following Basic Empty Weights are calculated to aid the Operator in computing loadings with passenger seats removed.

ITEM	WEIGHT (lb.)	ARM (in.)	MOMENT (lb.-in.)
***OPTION A* Seat Removal**			
6/6/2007 Basic Empty Weight	2,523	79.8	201,296
Remove: 5th **or** 6th Seat w/Belt	-17	155.0	-2,635
***OPTION A* BASIC EMPTY WEIGHT**	2,506	79.3	198,661

ITEM	WEIGHT (lb.)	ARM (in.)	MOMENT (lb.-in.)
***OPTION B* Seat Removal**			
6/6/2007 Basic Empty Weight	2,523	79.8	201,296
Remove: 5th **&** 6th Seats w/Belts	-34	155.0	-5,270
***OPTION B* BASIC EMPTY WEIGHT**	2,489	78.8	196,026

ITEM	WEIGHT (lb.)	ARM (in.)	MOMENT (lb.-in.)
***OPTION C* Seat Removal**			
6/6/2007 Basic Empty Weight	2,523	79.8	201,296
Remove: 3rd & 4th Aft Facing Seats	-53	106.0	-5,618
***OPTION C* BASIC EMPTY WEIGHT**	2,470	79.2	195,678

ITEM	WEIGHT (lb.)	ARM (in.)	MOMENT (lb.-in.)
***OPTION D* Seat Removal**			
6/6/2007 Basic Empty Weight	2,523	79.8	201,296
Remove: 3rd & 4th Aft Facing Seats	-53	106.0	-5,618
5th & 6th Seats w/Belts	-34	155.0	-5,270
***OPTION D* BASIC EMPTY WEIGHT**	2,436	78.2	190,408

Equipment List - As Certificated

Serial No. E-3784 **Date: 6/6/2007**

Notes: 1. The "Item No.", when shown, is used in reference to FAA Aircraft Specification No. 3A15.
2. An "" indicates that an Airplane Flight Manual Supplement (AFMS) is required.*
3. All part numbers are those of Hawker Beechcraft Corp. unless otherwise noted.

Item No.		Equipment Description		Weight (lb.)	Arm (in.)
22	*	Hartzell 3-Bladed Propeller with Spinner per STC SA00719LA, AFMS p/n HPA36-2		80.3	-9.0
102 (e)		Oil Radiator - TCM 655090	(Incl. in Engine Weight)	7.4	26.0
103		Induction Air Cleaner		1.0	0.0
117 (j)		Fuel Pump - Engine Driven, TCM 646212	(Incl. in Engine Weight)	2.0	29.0
117 (l)		Fuel Pump - Boost, Dukes 4613-00-5		2.3	74.0
118 (c)		Starter - TCM 655566F	(Incl. in Engine Weight)	16.4	29.0
201 (k)		Main Wheel-Brake Assembly (2 ea.) - Cleveland 6.00-6, No. 20-69 c/o: 40-83B Wheel Assembly & 30-54A Brake Assembly		19.0	97.0
202 (f)		Main Wheel Tire (2ea.) - 7.00-6, 6-ply Rating Tire with Tube		24.0	97.0
205 (f)		Nose Wheel Assembly - Cleveland 5.00-5, No. 40-77E		3.0	2.0
206 (a)		Nose Wheel Tire - 5.00-5, 4-ply Rating Tire with Tube		7.0	2.0
211		Brakes - Copilot		4.0	44.0
309 (e)		Alternator - 100 Amp, TCM 649305	(Incl. in Engine Weight)	17.6	1.0
309 (g)		B&C Specialty Products BC410-1 Alternator		5.8	31.0
310 (a)		Battery - 24 Volt, 10 Amp-Hr		25.0	38.0
310 (b)		Battery - Backup, 24 Volt, 3.5 Amp-Hr		12.0	45.3
311 (a)		Landing Light (2ea.) - General Electric 4596		2.0	-1.0

Equipment List - As Certificated (continued)

Serial No. E-3784 **Date: 6/6/2007**

Item No.	Equipment Description		Weight (lb.)	Arm (in.)
312 (c)	Voltage Regulator - 36-380096-1		1.0	45.0
312 (d)	B&C Specialty Products BC203-2E Alternator Controller		0.7	40.0
315 (g)	Anti-Collision Light - Dual, Whelen 01-0790081-00 Top and Grimes 40-0100-3C Bottom		3.0	150.0
403 (bn)	Pilot's Operating Handbook and FAA Approved Airplane Flight Manual - 36-590002-71		-	-
601 (b)	Stall Warning Indicator - Safe-Flight, per 58-361013		negl.	-
602 (c)	Heated Pitot Head - 35-361159		1.0	74.0
609 (a)	Emergency Static Air Source - 35-324428		negl.	-
613 (o)	Club Seating Arrangement			
	Third and Fourth Aft Facing Seats		53.0	106.0
	Fifth and Sixth Forward Facing Seats with Seat Belts		34.0	155.0

Equipment not listed in FAA Aircraft Specification No. 3A15:

Item No.	Equipment Description		Weight (lb.)	Arm (in.)
	Engine - TCM IO-550-B with Spec. 39B Accessories	Maximum Spec. Weight	478.5	15.0
	106-530060-79 Pilot's Seat with Seat Belt & Armrest		22.0	80.0
	106-530060-81 Copilot's Seat with Seat Belt		20.5	80.0
	Cabin Fire Extinguisher		5.0	106.0
	Executive Writing Desk		12.0	135.0
	Wing Tips and Tail Strobe Lights		9.0	151.0
	Cabin Fresh Air Blower		5.0	203.0
	Artex ELT 110-4-002 Emergency Locator Transmitter with Battery, Tray & End Cap		4.2	228.0
	Artex 110-334 ELT Antenna		0.5	241.2

Equipment List - As Certificated (continued)

Serial No. E-3784 **Date: 6/6/2007**

Equipment Description	Weight (lb.)	Arm (in.)
Garmin G1000 Integrated Avionics System (weights for units only)		
GTX 33 Mode-S Transponder	3.0	51.5
GIA 63 Integrated Avionics Unit (2)	9.8	51.7
GDL 69A XM Receiver	1.9	51.9
GEA 71 Engine & Airframe Monitor	1.8	52.1
GDC 74A Air Data Computer	1.7	52.9
GCF 328 Cooling Fan (3)	2.1	53.1
GMA 1347 Audio Panel	1.7	54.6
GDU 1040 PFD Display Unit	6.3	57.6
GDU 1043 MFD Display Unit	6.3	57.6
GMU 44 Magnetometer	0.4	95.0
GSA 81/GSM 85 Roll Servo & Mount	3.5	113.3
GPT 59 OAT Probe	0.2	114.4
GRS 77 AHRS	2.4	177.3
GSA 81/GSM 85 Pitch Trim Servo & Mount	3.5	209.4
GSA 81/GSM 85 Yaw Servo & Mount	3.5	210.2
GSA 81/GSM 85 Pitch Servo & Mount	3.5	211.9
L3 Comm WX-500 Stormscope Weather Mapping System		
Processor with Mtg. Tray	2.5	199.0

Equipment List - As Certificated (continued)

Serial No. E-3784

Date: 6/6/2007

Equipment Description	Weight (lb.)	Arm (in.)
System Antennas		
Garmin GA 56 GPS (2)	0.6	88.4
100-384129 Transponder	0.3	95.3
58-380112 VHF Comm 1	0.8	134.0
Garmin GA 55 XM Satellite	0.3	157.0
36-380090 VHF Comm 2	0.8	174.0
101-384179 Marker Beacon	0.8	198.0
L3 Comm NY-163 Stormscope	0.8	227.0
58-380114 Nav	1.5	277.0
Avionics Miscellaneous		
Mid-Continent 4300-205 Electric Attitude Indicator w/Battery	3.7	54.0
58-380045-3 Altimeter	1.5	56.0
58-380037-49 Airspeed Indicator	1.0	57.0
Cabin Interphone System	3.5	110.0
36-340310-27 Aft Fuselage Avionics Shelf	1.4	199.0

Sample Loading - As Certificated

(Loaded to maximum payload with full fuel)

Serial No.: E-3784 **Date: 6/6/2007**

ITEM	WEIGHT (lb.)	ARM (in.)	MOMENT/100 (lb.-in.)
***BASIC EMPTY WEIGHT**	1144 2,523	79.8	2,013
Pilot and Front Seat Passenger	154 340	80.0	272
3rd and/or 4th Seat Passengers	154 340	115.0	391
5th and/or 6th Seat Passengers	0	152.0	0
Baggage - Between Spars	0	108.0	0
Baggage - Aft of Rear Spar	0	150.0	0
Baggage - Aft Compartment	16	180.0	29
Other -	0	-	0
ZERO FUEL WEIGHT	3,219	84.0	2,705
Fuel Loading (Full)	444	75.0	333
RAMP WEIGHT *(DO NOT EXCEED 3,663 LB)*	3,663	82.9	3,038
**Less Fuel for Start, Taxi and Run-up	-13	75.0	-10
TAKE-OFF WEIGHT 1660 KG *(DO NOT EXCEED 3,650 LB)*	3,650	83.0	3,028
Less Fuel to Destination	-275	75.0	-206
LANDING WEIGHT	3,375	83.6	2,822

* If the Basic Empty Weight exceeds 2,565 lbs., the combined 5th and 6th seat occupants' weight will be limited to a placarded weight of less than 250 lbs. - See Limitations Section, page 2-33.

** Fuel for start, taxi and run-up is typically 13 lb with a Moment/100 of 10 lb-in., which may operationally vary.

INTRODUCTION

Every new Model G36 Bonanza is delivered with the following forms which are unique to each serial-numbered airplane:

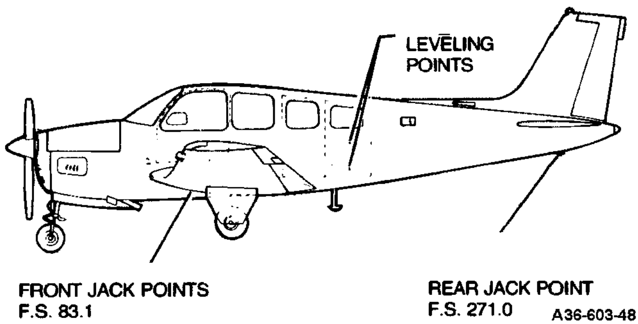
- Basic Empty Weight and Balance (Actual)
- Sample Loading
- Equipment List

It is the Owner's responsibility to ensure that changes in equipment and weight and balance are kept up-to-date. It is recommended that the *Weight and Balance Record* in this POH/AFM Section, or similar form, be used. The current Equipment List and Basic Empty Weight and Balance data must stay with the airplane when it changes ownership. Raytheon Aircraft Company cannot maintain the current airplane configuration status.

The airplane Pilot-in-Command is responsible for the airplane to be properly loaded for each flight. All pertinent weight and balance loading data is presented in this POH/AFM Section. The airplane weight and center of gravity limits are shown on the *Weight and Balance Diagram* page, with the moment limits shown in the *Moment Limits vs. Weight Table*. A blank *Weight and Balance Loading Form*, along with *Computing Procedure* instructions on how to complete it, are provided for the Pilot's use, or to use as an example for creating a separate loading form. Payload and fuel weights, center of gravities, moments/100 and applicable limits are shown on the *Useful Load Weights and Moments* pages.

All Weights are in pounds (lb) and all Arms are in horizontal inches (in.) from the Fuselage Datum, which may also be expressed as Fuselage Stations (FS). Moments/100 are in pound-inches (lb-in.).

WEIGHING INSTRUCTIONS



Periodic weighing of the Model G36 Bonanza may be required to keep the Basic Empty Weight current. All changes to the airplane affecting weight and balance are the responsibility of the airplane's owner and/or operator.

1. Three jack points are provided for weighing: two on the wing front spar at Fuselage Station 83.1 and one on the aft fuselage at Fuselage Station 271.0.
2. Fuel should be drained prior to weighing. Tanks are drained from the regular drain ports with the airplane in static ground attitude. When tanks are drained, 1.5 pounds of trapped fuel remain in the airplane at Fuselage Station 76.0. The remainder of the unusable fuel to be added to a drained system is 34.5 pounds at Fuselage Station 79.1.
3. Engine oil must be at the full level or completely drained. Total engine oil when full is 26 pounds at Fuselage Station 14.5. (Includes 3 pounds trapped.)
4. To determine airplane configuration at time of weighing, installed equipment is checked against the airplane equipment list or superseding forms. All installed equipment must be in its proper place during weighing.

5. At the time of weighing, the airplane must be level both longitudinally and laterally, and the landing gear must be fully extended. Leveling screws are located on the left side of the fuselage at approximately Fuselage Station 152.25. Longitudinally level attitude is determined with a plumb bob. Laterally level attitude is obtained when the vertical distance from each wing tip to the floor is equal.
6. Measurement of the reaction arms for a wheel weighing is made using a steel measuring tape. Measurements are taken with the airplane level on the scales, from the reference (a plumb bob dropped from the center of either main jack point) to the axle center line of the main gear and then to the nose wheel axle center line. The main wheel axle center line is best located by stretching a string across from one main wheel to the other. All measurements are to be taken with the tape level with the hangar floor and parallel to the fuselage center line. The locations of the wheel reactions will be approximately at Fuselage Station 96.7 for main wheels and Fuselage Station 2.7 for the nose wheel.
7. Jack point weighings are accomplished by placing scales at the jack points specified in step 1 above. Since the center of gravity of the airplane is forward of Fuselage Station 83.1, the tail reaction of the airplane will be in an up direction. This can be measured on regular scales by placing ballast of approximately 200 pounds on the scales to which the aft weighing point is attached by cable of adjustable length. The up reaction will then be total ballast weight minus the scale reading and is entered in the weighing form as a negative quantity.
8. Weighing should always be made in an enclosed area which is free from air currents. The scales used should be properly calibrated and certified.

BASIC EMPTY WEIGHT AND BALANCE

BONANZA G36 SER. NO ________ REG. NO ________ DATE ________

STRUT POSITION - NOSE		**MAIN**	**JACK POINT LOCATION**		**PREPARED BY**
EXTENDED	1.8	96.0	*FORWARD*	83.1	*Company* ________
COMPRESSED	3.1	97.0	*AFT*	271.0	*Signature* ________

REACTION WHEEL - JACK POINTS	SCALE READING	TARE	NET WEIGHT	ARM	MOMENT
LEFT MAIN					
RIGHT MAIN					
NOSE OR TAIL					
TOTAL (AS WEIGHED)					
Space below provided for additions and subtractions to as - weighed condition					
ADD:					
DRAINABLE USABLE FUEL			34.5	79.1	2729
BASIC EMPTY WEIGHT					

NOTE: Basic Empty Weight includes full engine oil and unusable fuel.

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WEIGHT AND BALANCE RECORD

SERIAL NO. ____________ REGISTRATION NO. ____________ PAGE NO. ____________

DATE	ITEM NO.		DESCRIPTION OF ARTICLE OR CHANGE	WEIGHT CHANGE ADDED (+) OR REMOVED (-)			RUNNING BASIC EMPTY WEIGHT	
	IN	OUT		WT (LBS)	ARM (IN.)	$\frac{\text{MOM}}{100}$	WT (LBS)	$\frac{\text{MOM}}{100}$

BT04946

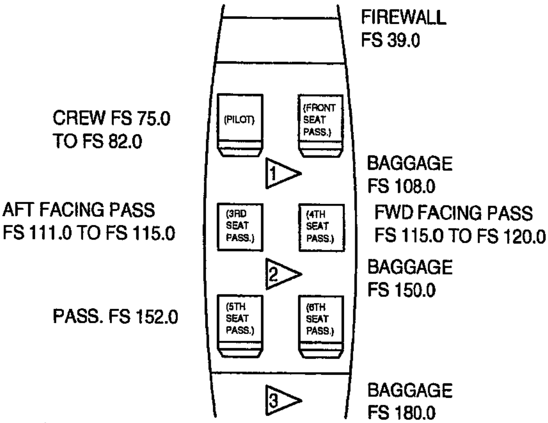
WEIGHT AND BALANCE RECORD

SERIAL NO. __________ REGISTRATION NO. __________ PAGE NO. __________

DATE	ITEM NO.		DESCRIPTION OF ARTICLE OR CHANGE	WEIGHT CHANGE ADDED (+) OR REMOVED (-)			RUNNING BASIC EMPTY WEIGHT	
	IN	OUT		WT (LBS)	ARM (IN.)	MOM / 100	WT (LBS)	MOM / 100

BT04946

PAYLOAD LOCATIONS



1. Maximum Baggage Weight is 200 pounds between Front and Rear Spars with aft facing or removed 3rd and 4th seats. This location is not approved for baggage when the 3rd and 4th seats are facing forward.

2. Maximum Baggage Weight is 400 pounds aft of the Rear Spar, with 5th and 6th seats removed, or 200 pounds with only the 5th or 6th seat removed.

3. Maximum Baggage Weight is 70 pounds.

Notes

1. The floor structure load limit is 50 pounds per square foot between the front and rear spars, and 100 pounds per square foot aft of the rear spar.
2. Any combination of the 3rd, 4th, 5th and 6th seats may be removed by the Owner/Operator or Pilot-in-Command, with the appropriate Log Book approved entry and Weight and Balance Record change. Refer to the Equipment List for seat weights and arms.
3. All Maximum Baggage Weights include baggage, cargo and installed equipment, if applicable. All baggage and cargo must be secured with an approved retention system.

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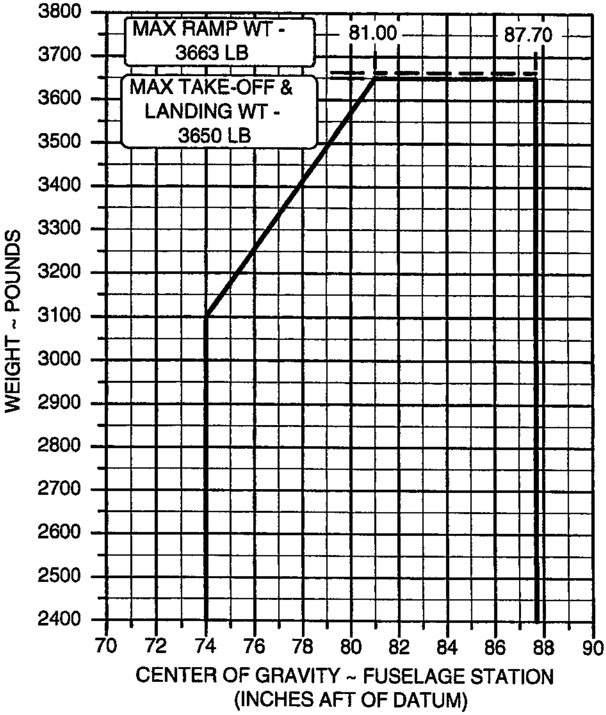
WEIGHT AND BALANCE DIAGRAM



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MOMENT LIMITS vs. WEIGHT TABLE

WEIGHT (lb)	MOMENT/100 (lb-in.)	
	FWD LIMIT	AFT LIMIT
2800	2072	2456
2825	2091	2478
2850	2109	2499
2875	2128	2521
2900	2146	2543
2925	2165	2565
2950	2183	2587
2975	2202	2609
3000	2220	2631
3025	2239	2653
3050	2257	2675
3075	2276	2697
3100	2294	2719
3125	2322	2741
3150	2351	2763
3175	2380	2784
3200	2409	2806
3225	2438	2828
3250	2467	2850
3275	2496	2872
3300	2526	2894
3325	2556	2916
3350	2586	2938
3375	2616	2960
3400	2646	2982
3425	2676	3004
3450	2707	3026
3475	2737	3048
3500	2768	3070
3525	2799	3091
3550	2830	3113
3575	2862	3135
3600	2893	3157
3625	2925	3179
3650	2957	3201

LOADING COMPUTING PROCEDURE

NOTE

Loadings may be prepared accumulating weights and moments/100 only and using the *Moment Limits vs. Weight Table* for Step 7. compliance. Or, by also including the calculated arms as indicated and using the *Weight and Balance Diagram* for Step 7. compliance. For each step that indicates the Arm to be calculated, divide the total moment/100 by the total weight and multiply the result by 100.

1. Record the most current **Basic Empty Weight**, Arm (optional) and Moment on line 1. The moment must be divided by 100 to correspond to the *Useful Load Weights and Moments Tables.*
2. Record the weight, arm (optional) and corresponding moment/100 from the appropriate *Useful Load - Payload, Weights and Moments Table*, for each payload item on lines 2. through 8.
3. Total the weight column and moment/100 column to determine the **Zero Fuel Weight** on line 9. Calculate the arm.
4. Record the weight and corresponding moment/100 for the total fuel loaded on line 10. Add the fuel weight and moment/100 to the Zero Fuel Weight values to determine the **Ramp Weight** on Line 11. Calculate the arm.
5. Record the weight and corresponding moment/100 for the fuel to be used for start, taxi and take-off on Line 12. Subtract the fuel weight and moment/100 from the Ramp Weight values to determine the **Take-off Weight** on Line 13. Calculate the arm.

6. Record the weight and corresponding moment/100 for the fuel used to destination on Line 14. Subtract the fuel weight and moment/100 from the Take-Off Weight values to determine the **Landing Weight** on Line 15. Calculate the arm.
7. Refer to the *Moment Limits vs. Weight Table* or the *Weight and Balance Diagram* and ensure that the **Zero Fuel Weight, Take-Off Weight** and **Landing Weight** are all within the Weight and Center of Gravity or Moment/100 Limits. If not, rearrange or remove Useful Load Item(s) to stay within the limits.

WEIGHT AND BALANCE LOADING FORM

Serial No.: ______________ **Date:** ____________

LINE	ITEM	WEIGHT (lb)	ARM (in.)	MOMENT / 100 (lb-in.)
1.	**BASIC EMPTY WEIGHT**			
2.	Pilot and Front Seat Passenger			
3.	3rd and/or 4th Seat Passengers			
4.	5th and/or 6th Seat Passengers		152.0	
5.	Baggage - Between Spars		108.0	
6.	Baggage - Aft of Rear Spar		150.0	
7.	Baggage - Aft Compartment		180.0	
8.	Other -			
9.	**ZERO FUEL WEIGHT**			
10.	Fuel Load		75.0	
11.	**RAMP WEIGHT** *(DO NOT EXCEED 3663 LB)*			
12.	*Less Fuel for Start, Taxi and Run-Up		75.0	
13.	**TAKE-OFF WEIGHT** *(DO NOT EXCEED 3650 LB)*			
14.	Less Fuel to Destination		75.0	
15.	**LANDING WEIGHT**			

* Fuel for start, taxi and run-up is typically 13 lb with a Moment/100 of 10 lb-in., which may operationally vary.

WEIGHT AND BALANCE LOADING FORM

Serial No.: ______________ **Date:** ____________

LINE	ITEM	WEIGHT (lb)	ARM (in.)	MOMENT / 100 (lb-in.)
1.	**BASIC EMPTY WEIGHT**	2523	79.8	2012
2.	Pilot and Front Seat Passenger	190	78	150
3.	3rd and/or 4th Seat Passengers	-53 160	106 120	-56.18 192
4.	5th and/or 6th Seat Passengers	-34	152.0 -155	-52.70
5.	Baggage - Between Spars		108.0	
6.	Baggage - Aft of Rear Spar	223	150.0	330
7.	Baggage - Aft Compartment	20	180.0	36
8.	Other -			
9.	**ZERO FUEL WEIGHT**	3029		2611.42
10.	Fuel Load	444	75.0	333
11.	**RAMP WEIGHT** *(DO NOT EXCEED 3663 LB)*	3473		2944
12.	*Less Fuel for Start, Taxi and Run-Up	-13	75.0	-10
13.	**TAKE-OFF WEIGHT** *(DO NOT EXCEED 3650 LB)*	3460		2934
14.	Less Fuel to Destination	-338	75.0	-253
15.	**LANDING WEIGHT**	3122		2681

* Fuel for start, taxi and run-up is typically 13 lb with a Moment/100 of 10 lb-in., which may operationally vary.

USEFUL LOAD - PAYLOAD, WEIGHTS AND MOMENTS TABLE

OCCUPANTS

Weight (lb)	Pilot & 2nd Seats		3rd & 4th Seats				5th & 6th Seats
			Aft Facing (Club Arr.)		Forward Facing		
	Fwd. Pos. Arm 75 (in.)	78 in Aft Pos. Arm 82 (in.)	Fwd. Pos Arm 111 (in.)	Aft Pos. Arm 115 (in.)	Fwd. Pos. Arm 115 (in.)	Aft Pos. Arm 120 (in.)	Arm 152 (in.)
	Moment/100 (lb-in.)						
100	75	82	111	115	115	120	152
110	83	90	122	127	127	132	167
120	90	98	133	138	138	144	182
130	98	107	144	150	150	156	198
140	105	115	155	161	161	168	213
150	113	123	167	173	173	180	228
160	120	131	178	184	184	192	243
170	128	139	189	196	196	204	258
180	135	148	200	207	207	216	274
8bfe 190	143	150 156	211	219	219	228	289
200	150	164	222	230	230	240	304

Note: Occupant Arms and Moments/100 for adjustable seats are shown at their extreme positions. Intermediate positions (0.75 in. increments for the front seats and 1.00 in. increments for the 3rd & 4th seats) will require interpolation of the Moment/100 values.

USEFUL LOAD - PAYLOAD, WEIGHTS AND MOMENTS TABLE

BAGGAGE				
Weight (lb)	Between Spars (Aft Facing or Removed 3rd and 4th Seats) Arm 108 (in.)	Aft of Rear Spar (5th or 6th Seat Removed) Arm 150 (in.)	Aft of Rear Spar (5th and 6th Seats Removed) Arm 150 (in.)	Aft Compartment Arm 180 (in.)
	Moment/100 (lb-in.)			
10	11	15	15	18
20	22	30	30	36
30	32	45	45	54
40	43	60	60	72
50	54	75	75	90
60	65	90	90	108
70	76	105	105	126
80	86	120	120	
90	97	135	135	
100	108	150	150	
110	119	165	165	
120	130	180	180	
130	140	195	195	
140	151	210	210	
150	162	225	225	
160	173	240	240	
170	184	255	255	
180	194	270	270	
190	205	285	285	
200	216	300	300	
220			330	
240			360	
260			390	
280			420	
300			450	
320			480	
340			510	
360			540	
380			570	
400			600	

NOTE: All baggage must be secured with an approved retention system.

USEFUL LOAD WEIGHTS AND MOMENTS TABLE

USABLE FUEL		
Arm 75 (in.)		
Gallons	Weight (lb)	Moment/100 (lb-in.)
5	30	23
10	60	45
15	90	68
20	120	90
25	150	113
30	180	135
35	210	158
40	240	180
45	270	203
50	300	225
54	324	243
(Filler Neck Tab Bottom)		
60	360	270
64	384	288
(Filler Neck Tab Detent Slot)		
70	420	315
74	444	333

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AIRFRAME

The Model G36 is an all-metal, low-wing, single-engine airplane with retractable tricycle landing gear.

SEATING ARRANGEMENTS

The Model G36 is a six-place airplane. The standard configuration consist of club seating in the cabin, with the 3rd and 4th seats facing aft and the 5th and 6th seats facing forward. An optional cabin seating arrangement is available which allows the 3rd and 4th seats to be arranged in a forward-facing position.

FLIGHT CONTROLS

CONTROL SURFACES

Control surfaces are operated through push-pull rods and conventional cable systems terminating in bellcranks.

CONTROL COLUMNS

The airplane is equipped with dual control columns for the pilot and copilot. The control wheels are interconnected and provide aileron and elevator control.

RUDDER PEDALS

To adjust the rudder pedals, press the spring-loaded lever on the side of each pedal and move the pedal to its forward or aft position. The adjustment lever can also be used to place the right set of rudder pedals against the floor when not in use (when the copilot brakes are not installed).

TRIM CONTROLS

Elevator trim is controlled by a handwheel located on the left of the pedestal or an electric trim switch located on the left side of the pilot's control wheel. An elevator tab position indicator dial is located to the right of the elevator trim handwheel.

Aileron trim is controlled by a knob located on the front of the pedestal. The aileron tab position indicator is located adjacent to the knob.

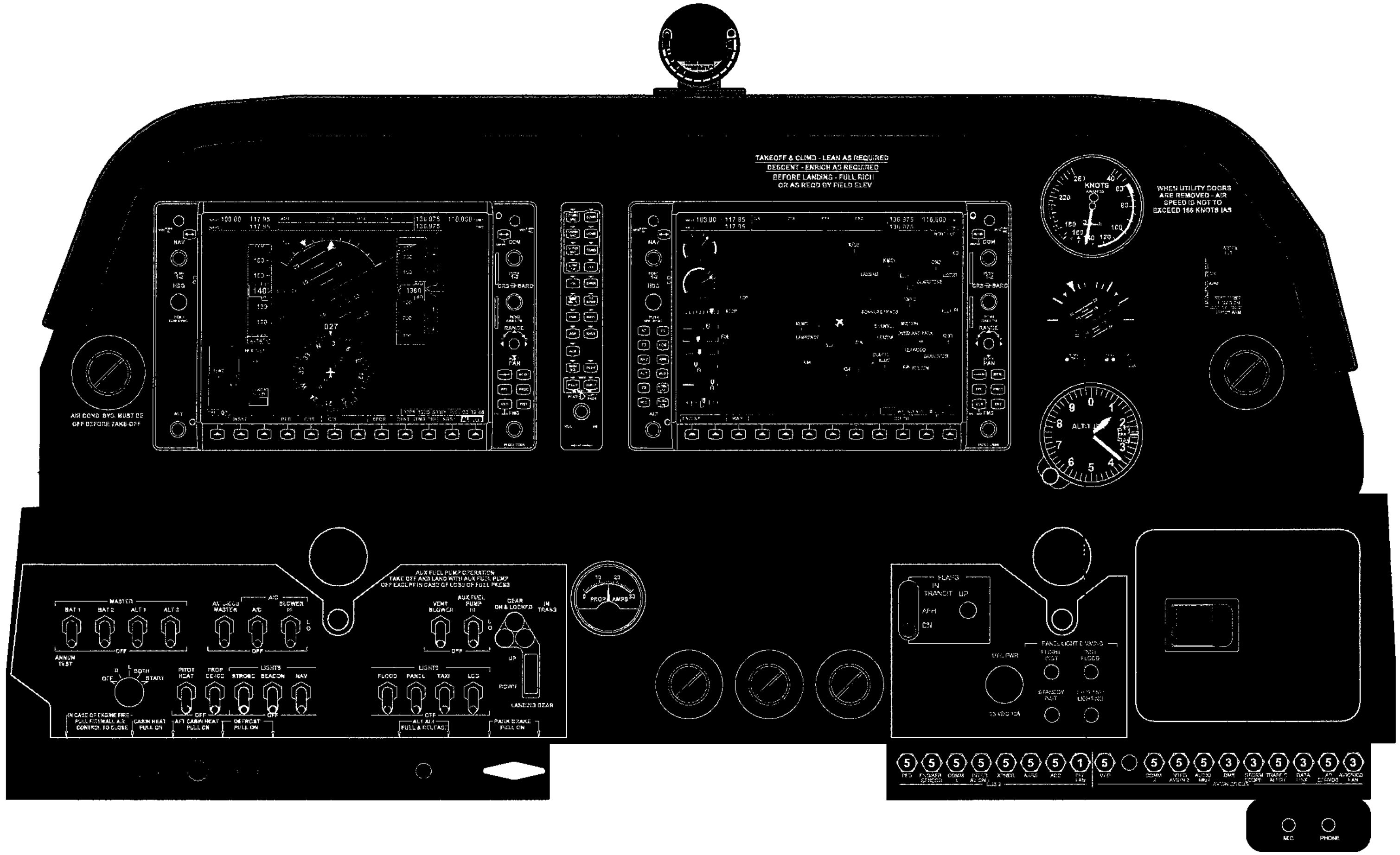
INSTRUMENT PANEL

The instrument panel of the Model G36 has an upper flight/ navigation instrument panel and a lower subpanel.

The avionics circuit breaker panel is located below the lower right subpanel and the left circuit breaker panel is on the side panel to the left of the pilot's seat.

FLIGHT/NAVIGATIONAL INSTRUMENT PANEL

The flight/navigation instrument panel is equipped with electronic displays, an audio panel and standby flight instruments. The electronic displays consist of a Primary Flight Display (PFD) located in front of the pilot and a Multifunction Display (MFD) located to the right of the PFD and audio panel. The audio panel is located between the PFD and the MFD. Located to the right of the MFD in a vertical stack are an airspeed indicator, attitude indicator, and altimeter that function as standby instruments. See the Avionics description in this section for more detailed information.



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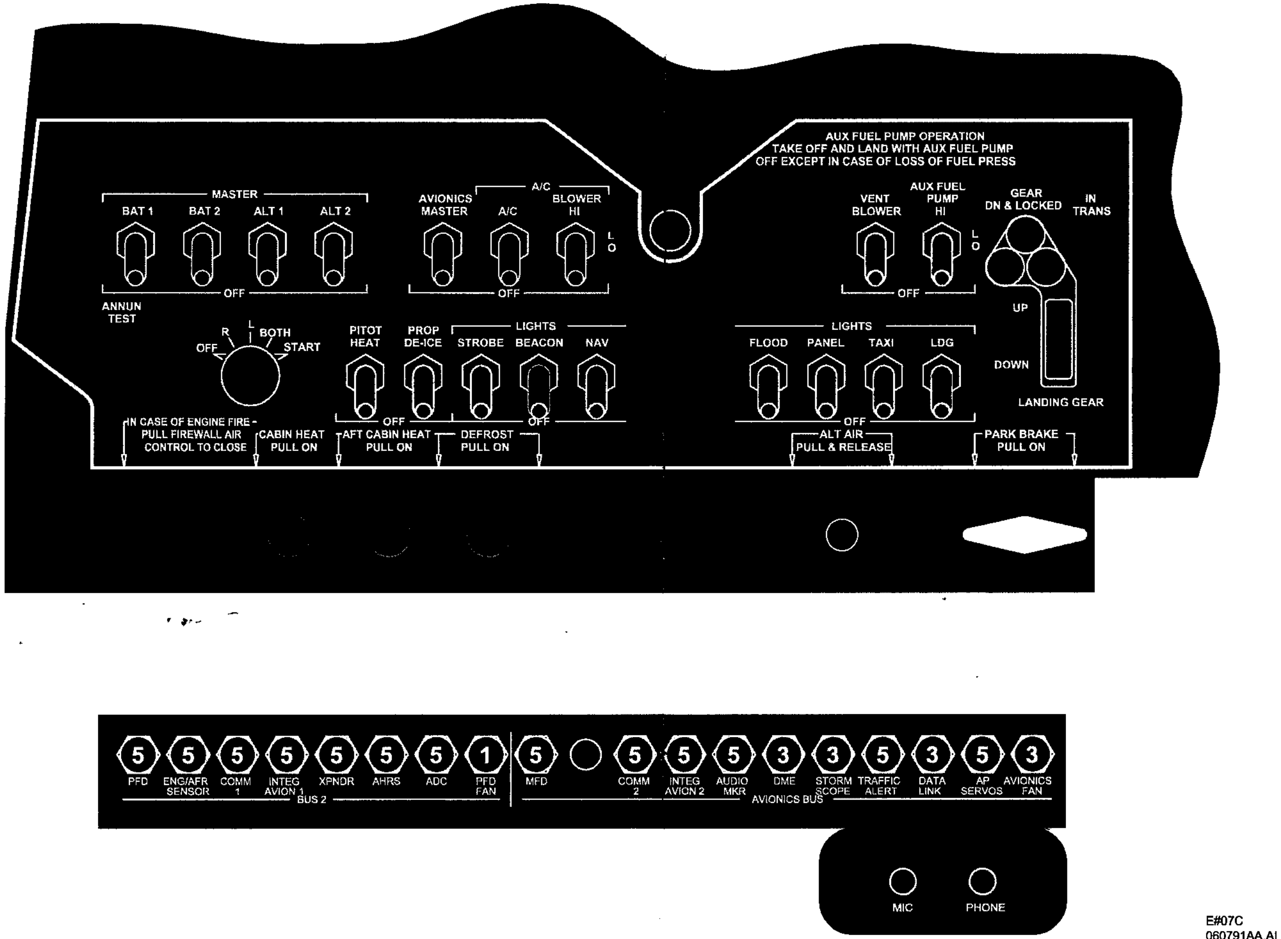
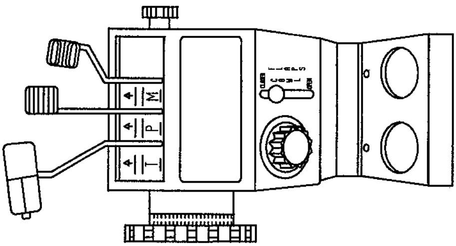
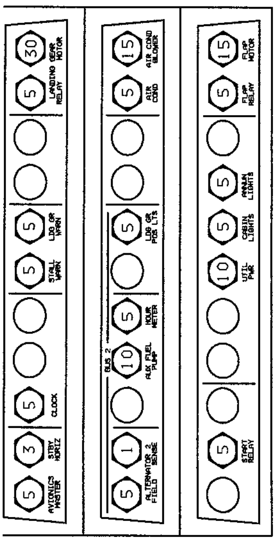
TYPICAL INSTRUMENT PANEL



PILOT'S AND COPILOT'S SUBPANEL



PEDESTAL



LEFT CIRCUIT BREAKER PANEL

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SUBPANEL

The magneto/start switch and switches for the batteries, alternators, avionics master, pitot heat, propeller deice (if installed), exterior and interior lights, vent blower, air conditioner (if installed), annunciator test button for landing gear and flap position lights and auxiliary fuel pump are located in the left subpanel. Also located in the left subpanel are the landing gear position indicator lights and landing gear handle. The prop deice ammeter is located in the center subpanel. Located in the right subpanel are the flap switch, flap position lights, utility power outlet, lighting rheostats, and glove compartment. The avionics circuit breaker panel is below the right subpanel and the left circuit breaker panel is on the side panel to the left of the pilot's seat.

OAT GAGE

The OAT (Outside Air Temperature) gage is located on the left cabin side panel just aft of the instrument panel. Its temperature sensing probe extends through the cabin sidewall into the outside air to measure outside air temperature.

PEDESTAL

The pedestal is located below the center portion of the instrument subpanel. The upper portion of the pedestal houses the throttle (black), propeller (blue), and mixture (red) control levers. The elevator trim handwheel and elevator trim indicator are located on the left side of the pedestal. The aileron trim tab is adjustable with the knob mounted on the front of the pedestal. The manual cowl flaps controller is located to the right of the aileron trim control.

GROUND CONTROL

Steering is accomplished by use of the rudder pedals through a linkage arrangement which connects the nose gear to the rudder pedal shaft. Nose wheel straightening is accomplished by engagement of a roller with a track as the nose wheel is retracted. The steering link attaches to the steering mechanism on the nose gear with a swivel connection which permits the mechanism to disengage when the nose gear is retracted. Operation of the rudder pedals will have no tendency to turn the nose wheel with the gear retracted.

The minimum wing tip turning radius, using full steering, one brake and partial power, is 27 feet 7 inches.

WING FLAPS

The wing flaps have three positions; UP (0°), APH (12°), and DN (30°). To extend the flaps, the flap switch, located on the copilot's subpanel, must be pulled out and down for each position change. The flap switch may be selected to the UP position without pulling it out.

Three flap position lights, placarded IN TRANSIT (red), APH (blue), and DN (amber), are located immediately to the left of the flap switch. All of the lights are extinguished when the flaps are in the UP position. The illumination intensity of the lights is controlled by the photoelectric cell dimmer switch located above the landing gear handle. The lamps can be tested by pressing the annunciator test button (ANNUN TEST) on the left side of the pilot's subpanel.

Lowering the flaps in flight will produce the following effects:

- Attitude - Nose Down
- Airspeed - Reduced
- Stall Speed - Lowered

LANDING GEAR

The landing gear is operated through an adjustable linkage connected to an actuator assembly mounted beneath the front seats. The actuator assembly is driven by an electric motor. The landing gear may be electrically retracted and extended, and may be lowered manually using the handcrank.

CONTROL SWITCH

The landing gear is controlled by a two-position switch located on the pilot's subpanel. The switch handle must be pulled out of the safety detent before it can be moved to the opposite position.

CAUTION

The landing gear will not retract unless the throttle is in a position corresponding to approximately 17 in. Hg manifold pressure or above.

CAUTION

Do not change the position of the control switch to reverse the direction of the landing gear while the landing gear is in transit. This could cause damage to the retract mechanism.

POSITION INDICATORS

The landing gear position indicator lights are located above the landing gear switch handle. Three green lights, one for each gear, are illuminated whenever the landing gear is down. The red IN TRANS light illuminates any time one or all of the landing gears are in transit or in any intermediate position. All of the lights will be out when the gear is up.

Testing of the landing gear position indicator lamps is accomplished with the annunciator test button (ANNUN TEST) located on the pilot's left subpanel.

SAFETY SWITCHES

Inadvertent retraction of the landing gear while on the ground is prevented by either compressing the two main strut safety switches or by retarding the throttle below approximately 17 in. Hg manifold pressure. The throttle switch which deactivates the landing gear control circuit will always activate at the same throttle position. The resultant manifold absolute pressure is dependent upon altitude and rpm.

WARNING

Never rely on the safety switches to keep the gear down during taxi, takeoff, landing roll, or in a static position. Always make certain that the landing gear switch is in the DN position during these operations.

CIRCUIT BREAKERS

The LANDING GEAR RELAY, LANDING GEAR MOTOR, LDG GR POS LTS, and LDG GR WARN circuit breakers are located on the left circuit breaker panel and will pop out under overload conditions. These circuit breakers are the pull-and-reset type.

If the LANDING GEAR RELAY or LANDING GEAR MOTOR circuit breakers are pulled, the landing gear will not operate electrically.

BRAKES

The brakes on the main landing gear wheels are operated by applying toe pressure to the rudder pedals. The parking brake T-handle is located on the lower left subpanel. To set the parking brake, pull the T-handle out and depress each toe pedal until firm. Push the T-handle in to release the parking brake.

CAUTION

The parking brake should be left off and wheel chocks installed if the airplane is to be left unattended. Changes in ambient temperature can cause the parking brake to release or to exert excessive pressures.

MANUAL EXTENSION

The landing gear can be manually extended by operating a handcrank at the rear of the front seats. This procedure is described in Section 3A, ABNORMAL PROCEDURES.

WARNING HORN AND [GEAR UP] ANNUNCIATION

With the landing gear retracted, a warning horn will sound intermittently and the red [GEAR UP] warning alert will be displayed in the annunciation window of the PFD if the throttle is retarded below approximately 12 in. Hg manifold pressure or if the flaps are fully extended. The ALERTS softkey in the lower right of the PFD will also change to a red flashing WARNING.

NOTE

The switch which activates the warning horn and [GEAR UP] Warning Alert is operated by the throttle; thus the horn and [GEAR UP] Warning Alert will always activate at the same throttle position. The resultant manifold absolute pressure is dependent on altitude and rpm.

BAGGAGE COMPARTMENT

The baggage compartment is accessible through the utility doors on the right side of the fuselage. This area extends aft of the pilot and copilot seats to the rear bulkhead. Because of structural limitations, this area is divided into subcompartments, each having a different weight limitation. Loading within the baggage compartment must be in accordance with the data in the Section 6, WEIGHT AND BALANCE/EQUIPMENT LIST. All baggage must be secured with an approved cargo retention system.

WARNING

Unless authorized by applicable Department of Transportation regulations, do not carry hazardous material anywhere in the airplane.

Do not carry children in the baggage compartment unless secured in a seat.

SEATS, SEAT BELTS, AND SHOULDER HARNESSES

SEATS

The front two seats are adjustable as follows:

Forward and Aft - Pull up on the release bar located below the forward left side of the seat and slide the seat to the desired position.

On airplanes E-3630, E-3636 thru E-3691, vertical adjustment can be made by pulling up on the release lever located below the forward right side of the seat, lean forward, and shift weight forward. The seat will tilt forward and can be adjusted to numerous angles as required. On airplanes E-3692 and after, seats are equipped with special conforming foam to automatically accommodate pilots of different weights/heights.

Seat Backs - Use the red release lever located at the aft inboard side of each seat to vary the inclination of the seat back to one of four preset positions. Lean forward to release pressure on the seat back. Lift the lever up, and then allow the seat back to recline to the desired position. (The seat backs of the middle two seats may have to be folded aft to reach the full aft position.)

The middle two seats are adjustable as follows:

Forward and Aft - Pull up on the release bar located below the forward right side of the seat and slide the seat to the desired position.

Seat Backs - The seat backs are equipped with a locking back to accommodate the shoulder harness. Thus, the seat backs cannot be reclined, but can be folded down by releasing the red handle located on the aft inboard side of each seat.

The Aft two seats are adjustable as follows:

The seat backs can be folded down to provide access to the extended baggage compartment. The seat cushions can be folded up to provide additional floor space.

Outboard armrests for all seats are built into the cabin side-walls. Center armrests of the front two seats and the middle two seats can be elevated or positioned flush with the seat cushions. Lift up on the armrest and raise to the elevated position. It will automatically lock into place. To lower the armrests, lift up and move it forward.

When the club seating arrangement is utilized, the aft-facing seats must have the headrests in the fully raised position during takeoff and landing.

If desired, the 3rd and 4th seats can be arranged to face forward in the cabin. These movable stops are located on the tracks under each seat. The stops should be located as follows:

For Aft-facing Seats:

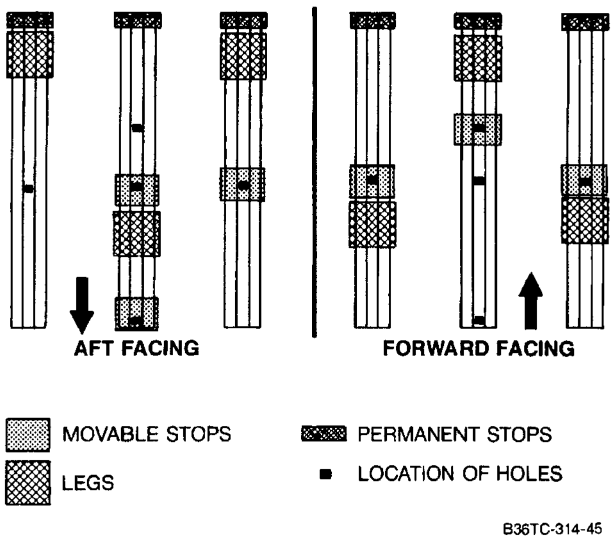
1. One stop in each of the two aft holes of the center track (position center leg between stops).
2. One stop stowed in one of the outer tracks.

For Forward-facing Seats:

3. One stop in the only hole in each outer track (for convenience, install these stops prior to installation of seats).
4. One stop in the most forward available hole of the center track.

NOTE

When installing the seats, ensure that the armrests are toward the center of the airplane.



SEAT CHANGE SCHEMATIC

SEAT BELTS

Every seat in the airplane is equipped with a seat belt. The seat belt can be lengthened by turning the male half of the buckle at a right angle to the belt, then pulling the male half in the direction away from the anchored end of the belt. The buckle is locked by sliding the male half into the female half of the buckle. The belt is then tightened by pulling the short end of the belt through the male half of the buckle until a snug fit is obtained. The belt is released by lifting the large, hinged release lever on the female buckle half and pulling the male half of the buckle free. All occupants must wear seat belts during takeoff and landing.

SHOULDER HARNESSES

A shoulder harness is standard with all seats. The spring loading at the inertial reel keeps the harness snug but will allow normal movement during flight operations. The inertial reel is designed with a locking device that will secure the harness in the event of sudden forward movement or an impact action. When using the shoulder harnesses, the limitations stated on the cabin window placards must be observed.

The strap is worn over the shoulder and down across the body, where it is fastened by a metal loop into the seat belt buckle. For the pilot seats, the harness strap is contained in an inertial reel attached to the side canopy structure of the cockpit. The inertial reel is covered with an escutcheon and the strap runs up from the reel location to a looped fitting attached to the window frame just aft of the pilot seats. For the 3rd and 4th passenger seats, the inertial reel is attached into the seat back structure and is covered with the seat back upholstery. The strap runs up the seat back and over the outboard corner of the seat back. For the 5th and 6th passenger seats, the strap is contained in an inertia reel attached to the upper fuselage side structure, just aft of the seat back and is covered with an escutcheon.

NOTE

The seat belt is independent of the shoulder harness, but the outboard seat belt and the shoulder harness must be connected for stowage when the seat is not occupied.

DOORS, WINDOWS AND EXITS

FORWARD CABIN DOOR

The airplane has a conventional cabin door on the forward right side of the fuselage. The spring-loaded outside handle will fit into the door recess creating a flat, aerodynamically clean surface. The door may be locked with a key.

To open the door from the outside, lift the handle from its recess and pull until the door opens.

To close the cabin door from the inside, observe that the door handle is in the open position. In this position, the latch handle is free to move approximately one inch in either direction before engagement of the locking mechanism. Grasp the door and firmly pull the door closed. Rotate the door handle fully counterclockwise into the locked position. Observe that the door handle indicator is in the CLOSED position. When the door is properly locked, the door latch handle is free to move approximately one inch in either direction.

NOTE

When checking the door latch handle, do not move it far enough to engage the door latch release mechanism.

Press firmly outward at the top rear corner of the door. If any movement of the door is detected, completely open the door and close again following the above instructions.

To open the door from the inside, depress the lock button and rotate the handle clockwise.

UTILITY DOORS

The utility doors, located on the aft right side of the cabin, provide for loading and unloading of passengers and baggage. The aft door must be closed first. A latch on the forward edge of the aft door moves downward to a locked position to secure the hooks at the top and bottom of the door to the door frame. The forward door cannot be fully closed until the latch of the aft door is latched and flush with the edge of the door. After the forward door is closed, it can be latched from the outside by rotating the half-moon shaped handle to the CLOSED position. A conventional handle on the inside of this door provides for opening or closing from the inside.

The [AFT DOOR] (amber) caution alert will be displayed in the annunciation window of the PFD and remain until the doors are properly latched. The ALERTS SOFTKEY in the lower right of the PFD will change to an amber flashing CAUTION until the key is pressed to acknowledge the alert or the doors are properly latched.

OPERATION WITH AFT UTILITY DOORS REMOVED

The Model G36 is approved for operation with the aft utility doors removed. The factory installed placards pertaining to airspeed and other operating restrictions when the utility doors are removed are shown in Section 2, LIMITATIONS.

OPENABLE CABIN WINDOWS

NOTE

Windows are to be closed before and during flight.

A plastic-covered multi-purpose latch on each openable window is used to provide partial opening of the window for ventilation during ground operations. It also provides quick unlatching for emergency egress.

To Open Window For Ventilation (Only on Ground):

NOTE

Use red handle for emergency exit only.

1. Rotate lock handle to UNLOCKED position.
2. Lift thumb catch (window will release).
3. Push latch up and outward to over-center position.

To close window:

1. Pull latch inward and push down until locked (listen for catch engagement).
2. Rotate lock handle to LOCKED position.

To operate the window as an emergency exit:

1. Remove Emergency Exit Latch Cover.
2. Rotate exposed red handle up, breaking safety wire, and push window out.

NOTE

Anytime the window has been opened by breaking the safety wire on the red emergency latch, the window must be reattached and wired by a qualified mechanic using a single strand of QQ-W-343, Type S, .020 diameter copper wire prior to further airplane operation.

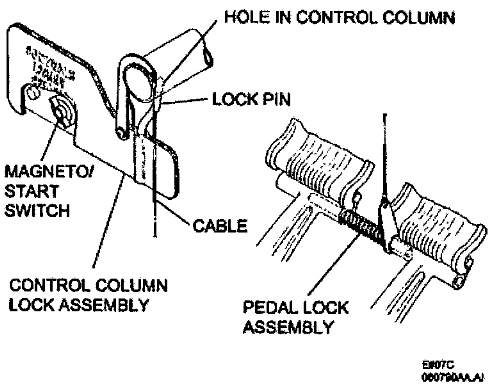
CONTROL LOCKS

To Install The Control Locks:

1. Rotate pilot's control wheel and move column so the hole in the bottom of the collar lock and the hole in the column align to accept the lock pin.
2. Push the control column lock pin through the hole provided in the collar lock and into the hole in the control column. Push pin through hole as far as possible.
3. Rotate control lock hanger over control column so interconnecting cable is to the right of control column.
4. Assure positive retention of the lock pin by checking for movement in the control wheel.
5. Position pilot's rudder pedals in aft position and install spring lock between pedals.

WARNING

Before starting engine, remove the lock, reversing the above procedure.



The Control Column Pin Assembly Is Placarded As Follows:

Placard Facing Pilot with Control Locks Properly Installed:

CONTROLS
LOCKED
REMOVE
BEFORE
FLIGHT

C95EA07C0573

Placard Facing Instrument Panel with Control Locks Properly Installed:

INSTALLATION INSTRUCTIONS
INSTALL OTHER SIDE FACING PILOT

1. ROTATE CONTROL WHEEL APPROX 12° TO THE RIGHT. INSTALL LOCK PIN THROUGH COLLAR LOCK & CONTROL COLUMN (PILOT'S) ROTATE HOOK OVER CONTROL COLUMN.
2. POSITION PEDALS IN AFT POSITION & INSTALL LOCK IN PILOT'S RUDDER PEDALS WITH CABLE AROUND RIGHT SIDE OF CONTROL COLUMN.
3. REMOVE IN REVERSE ORDER.

C95EA07C0574

POWER PLANT

The Model G36 is powered by one Teledyne Continental Motors Corporation model IO-550-B, normally aspirated, fuel-injected, direct-drive, air-cooled, horizontally opposed, 6-cylinder, 550-cubic-inch displacement, 300-horsepower engine.

ENGINE CONTROLS

THROTTLE, PROPELLER, AND MIXTURE

The control levers are grouped along the upper portion of the pedestal. Pushing forward on a control lever increases its appropriate function, pulling back decreases it. The knobs on the levers are shaped to standard FAA configuration so they can be identified by touch. The controls are centrally located for ease of operation from either the pilot's or the copilot's seat. An adjustable friction knob, located on the right side of the pedestal, is provided to prevent creeping of the control levers.

COWLING

The Model G36 is equipped with latch mechanisms on the right and left upper engine cowling for quick and easy access to the engine compartments without the aid of tools. Each cowl latch is locked and released by a single recessed handle located in the lower cowling panel on each side of the engine. To close the cowling requires lowering the cowling to the closed position with the handle in the prelatched position.

The handle has three positions:

1. Flush with the fuselage - Latched
2. Held fully forward - Unlatched (open cowling)
3. Approximately 90° to the fuselage - Prelatch (ready to close cowl)

An audible click denotes the bayonet fittings, located forward and aft on the upper cowl, sliding into the latch safety catches. The cowl is locked by moving the latch handle to the full recessed position. The security of the latches can be checked by pulling out and up on the check tabs attached to the lower edge of the upper cowling. If the cowling can be moved after latching, open the cowling, check the latch alignment and re-latch.

COWL FLAPS

The cowl flaps control is located on the center pedestal. Except in extremely low temperatures, the cowl flaps should be open during ground operations, takeoff, and are to be adjusted as required during flight.

INDUCTION SYSTEM ICING

The possibility of induction system icing is reduced by the non-icing characteristics of the Bonanza's fuel injected engine and automatic alternate air source. Under certain conditions, however, impact ice can form at several points in the induction system. If the air intake or filter becomes clogged with ice, a spring-loaded door in the intake duct will open automatically and the induction system will operate on alternate air. If the alternate air source door becomes frozen in the closed position, a pull-and-release T-handle is provided to force the door open.

LUBRICATION SYSTEM

The engine oil system is the full-pressure, wet-sump type and has a 12-quart capacity, 8 of which are usable. Oil operating temperatures are controlled by an automatic thermostat bypass control. The bypass control will limit oil flow through the oil cooler when operating temperatures are below normal and will permit the oil to bypass the cooler if it should become blocked.

STARTER

The starter is relay controlled and is actuated by a rotary type, momentary-on switch incorporated in the magneto/start switch. To energize the starter circuit, rotate the magneto/start switch beyond the BOTH position to START. After starting, release the switch to the BOTH position.

The [STARTER ENGD] (amber) caution alert will be displayed in the annunciation window of the PFD whenever electrical power is being supplied to the starter. If the [STARTER ENGD] caution alert continues to be displayed after starting, the starter relay has remained engaged and loss of electrical power may result. The Battery 1 and Alternator 1 switches should be turned off if the [STARTER ENGD] caution alert continues to be displayed after starting. If the [STARTER ENGD] caution alert does not display during starting, the alerting system is inoperative.

PROPELLER

Propeller rpm is controlled by a governor which regulates hydraulic oil pressure to the hub. A control lever (blue knob) on the pedestal allows the pilot to select the governor's rpm range.

If oil pressure is lost, the propeller will go to the full high rpm position. This is because propeller low rpm is obtained by governor-boosted engine oil pressure working against the centrifugal twisting moment of the blades.

Refer to STC Supplement HPA36-2 for further information.

FUEL SYSTEM

The engine is designed to operate on aviation gasoline grade 100LL (blue) or grade 100 (green). However, the use of grade 100LL (blue) is preferred.

FUEL CELLS

The fuel system consists of a rubber fuel cell located in each wing leading edge. The fuel capacity consists of two 40-gallon cells (37 gallons usable.) A visual measuring tab is attached to each filler neck of each individual cell. The bottom of the tab indicates 27 gallons of usable fuel in the cell, and the detent slot on the tab indicates 32 gallons of usable fuel in the cell. The engine-driven fuel injector pump delivers approximately 10 gallons of excess fuel per hour, which bypasses the fuel control and returns it to the cell being used. Three fuel drains are provided, one in each fuel cell sump on the underside of each wing, and one on the fuel selector valve inboard of the left wing root. These points should be drained before the first flight of the day.

FUEL DRAINS

The fuel system is drained at 3 locations: one under each wing just outboard of the fuselage, and a system low spot drain in the bottom of the fuel selector valve (accessible through a small door on the underside of the fuselage near the left wing root). These fuel drains are snap-type valves which are actuated by pushing up and twisting on the valve and then releasing when the desired amount of fuel has been drained. The drain may be locked open.

The three fuel drains should be sampled after refueling and prior to each flight in accordance with the Preflight Inspection in Section 4, NORMAL PROCEDURES. When possible, the inspection of the fuel should be made after sufficient time has been allotted for any contaminants to settle into the sumps. If inspections are made immediately after the airplane has been moved or refueled, contaminants may be flushed from the sump, or newly added contaminants may not have had time to settle into the sumps. Sampling should be conducted with the airplane parked on level ground. Check fuel for the proper grade, type and absence of water, dirt, rust or other contaminants.

WARNING

Do not fly the airplane with contaminated or unapproved fuel.

FUEL QUANTITY INDICATION

Fuel quantity is measured by float-operated fuel level sensors located in each wing tank system. These sensors transmit electrical signals to the engine and airframe interface (GEA) to generate left and right usable fuel quantity display in the engine and systems display portion of the MFD.

AUXILIARY FUEL PUMP

The auxiliary fuel pump is a dual-speed, dual-pressure, electrically-driven, vane-type pump. The pump, located below the pilot's seat, is controlled by a single three-position switch. The switch is located on the pilot's subpanel to the left of the landing gear handle. The pump is used to perform the following functions:

LO POSITION

1. Minor vapor purging.
2. Increase fuel flow.

HI POSITION

1. Normal start, priming.
2. Extreme vapor purging.
3. To provide fuel pressure in event of engine-driven pump failure.

AUXILIARY FUEL PUMP SWITCH

The auxiliary fuel pump switch is placarded OFF-LO-HI. The LO position is used to supply a low boost to the fuel flow during all flight conditions.

The HI position is used for priming the engine during cold starts and also to provide an alternate source of fuel pressure in the event the engine-driven fuel pump fails. HI boost must not be used during flight unless the engine-driven fuel pump has failed. The increased pressure of the HI boost will overdrive the fuel control unit producing abnormally high fuel flows which, in turn, will cause engine roughness. In some cases, engine combustion may cease.

Normal takeoffs and landings are made with the auxiliary fuel pump in the OFF position.

FUEL TANK SELECTION

The fuel selector valve handle is located forward and to the left of the pilot's seat. Takeoffs and landings must be made using the tank that is nearest full.

The pilot is cautioned to observe that the long, pointed end of the handle aligns with the fuel tank position being selected. The tank positions are placarded adjacent to the respective LEFT MAIN, RIGHT MAIN or OFF detent. The OFF position is forward and to the left. A stop (lock-out) button prevents inadvertent selection of the OFF position. To select OFF, depress the stop button and rotate the handle to the full clockwise position. Depression of the lock-out stop is not required when moving the handle counterclockwise from OFF to LEFT MAIN or RIGHT MAIN. When selecting the LEFT MAIN or RIGHT MAIN fuel tanks, position handle by sight and feel for the detent.

WARNING

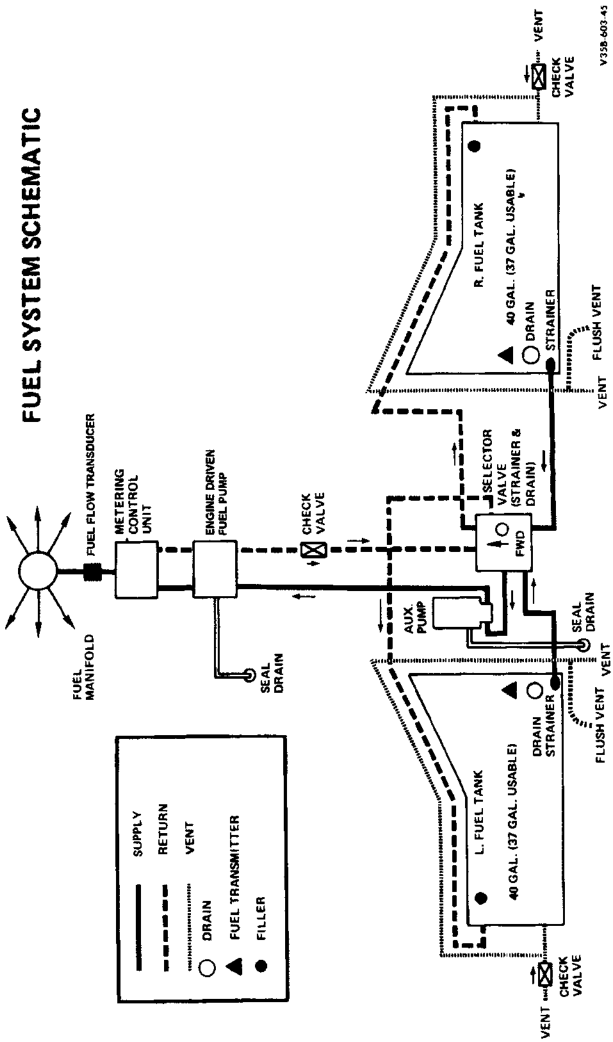
> Position selector valve handle in detents only. There is no fuel flow to the engine between detents (indicated by red arc).

If the engine stops because of insufficient fuel, refer to Section 3, EMERGENCY PROCEDURES, for the ENGINE FAILURE IN FLIGHT procedures.

FUEL REQUIRED FOR FLIGHT

It is the pilots' responsibility to ascertain that the fuel quantity indication is functioning and maintaining a reasonable degree of accuracy and to be certain of ample fuel for a flight. Takeoff is prohibited if the fuel quantity indication is not above the yellow band. A minimum of 13 gallons of fuel is required in each tank before takeoff. The caps should be removed and fuel quantity checked to give the pilot an indication of fuel on board. The airplane must be approximately level for visual inspection of the tank. If it is not certain that at least 13 gallons are in each tank, fuel shall be added so that the amount of fuel will not be less than 13 gallons per tank at takeoff. Plan for an ample margin of fuel for any flight.

FUEL SYSTEM SCHEMATIC



ELECTRICAL SYSTEM

POWER SOURCES

Refer to the Electrical Schematic Diagram and Avionics/Electrical Equipment Bus Connections Table.

The airplane electrical system is a 28-vdc (nominal) system with the negative lead of each power source grounded to the main airplane structure. DC electrical power is provided by the following sources.

Battery 1 - A 10 amp-hour, 24 volt, lead acid battery located on the right forward side of the firewall. Battery 1 is capable of supplying power to the entire electrical system.

Battery 2 - A 3.5 amp-hour, 24 volt, sealed lead acid battery located on the cabin side of the firewall, forward of the glove box. Battery 2 is capable of supplying power only to Bus 2 due to the reverse current blocking diodes located between Bus 1 and Bus 2.

Alternator 1 - A 100-amp, 28.5 volt, gear-driven alternator located in front of the right forward cylinder. The alternator will deliver 100 amps at 2300 RPM and above. It is capable of supplying power to the entire electrical system.

Alternator 2 - A 20-amp, 28.5 volt, gear driven alternator located at the rear of the engine. The alternator is capable of supplying power only to Bus 2 due to the reverse current blocking diodes between Bus 1 and Bus 2. In addition, the output of the alternator is dependent upon the engine RPM. At low RPMs, such as would be experienced during ground operations, the alternator output is insufficient to power Bus 2. Thus, the Bus Tie contactor is closed allowing Bus 1 to power Bus 2. This condition is annunciated to the pilot with the BUSES TIED Advisory Alert. A shunt, located downstream from the alternator, senses the output current of alternator 2 and provides this information to the GEA 71 Engine/Airframe sensor. When the GEA 71 senses a current above 2.8 amps and an engine RPM at or above 2000, it sends a signal to open the Bus Tie Contactor and extinguish the BUSES TIED Advisory Alert. Alternator 2 and Battery 2 are now the sole source of power to Bus 2. The Bus Tie Contactor will close whenever the engine RPM drops below 1800 or the output current from Alternator 2 drops below 2 amps.

Standby Power for the Standby Attitude Indicator - A sealed lead acid battery is attached to the back of the Standby Attitude Indicator. If power is lost to Bus 1, (or to Left Circuit Breaker Panel 1B powered by Bus 1) this battery will power the standby attitude indicator for a minimum of one hour if the battery is fully charged.

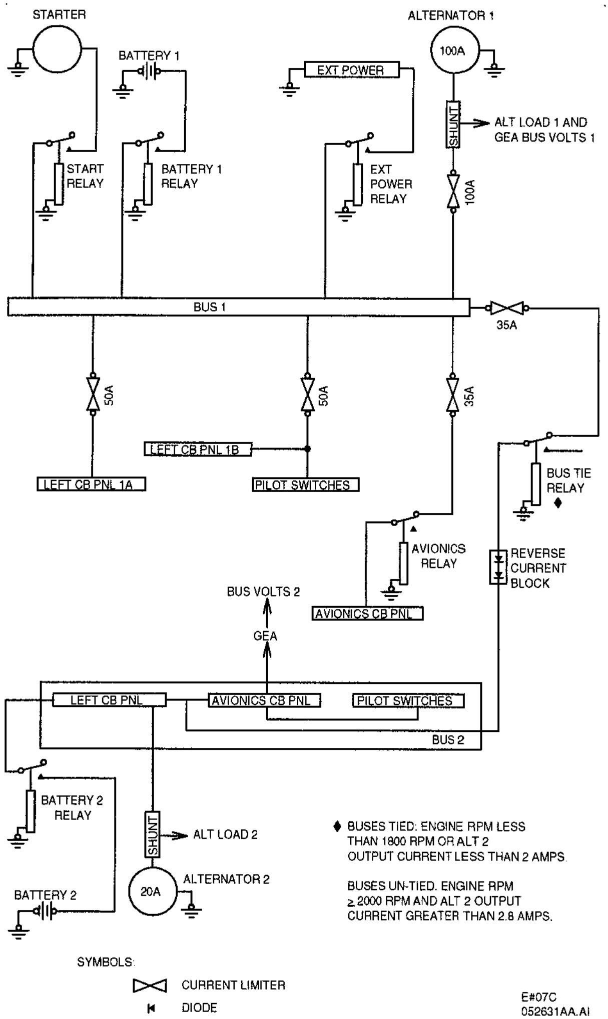
PROTECTIVE DEVICES

The electrical system is protected by current limiters, circuit breakers, and circuit breaker type switches. A row of re-settable circuit breakers are located below the right subpanel. This panel contains the majority of the avionics circuit breakers and thus is referred to as the Avionics Circuit Breaker Panel. Another group of re-settable circuit breakers are located on the left side of the cockpit. These are arranged in three rows and consist primarily of circuit breakers for airplane systems. This panel is referred to as the Left Circuit Breaker Panel. Circuit-breaker-type switches are located on the pilot's instrument subpanel. Current limiters are installed throughout the system to connect some buses together and provide a quick response to short circuits. Current limiters are not re-settable and are not available to the pilot.

Transistorized voltage regulators adjust the output of the alternators to maintain a constant voltage of 27.5 to 29.0 volts. When the Bus Tie Contactor is closed, the voltage on Bus 2 will be approximately 2 volts less than on Bus 1 due to the voltage drop created by the reverse current blocking diodes. When the Bus Tie Contactor is open, both buses should indicate 27.5 - 29.0 volts. The voltage regulators incorporate an over voltage protection device which will automatically turn an alternator off if an over voltage condition should occur.

DISTRIBUTION

Battery 1 and Alternator 1 are connected to Bus 1 while Battery 2 and Alternator 2 are connected to Bus 2. Bus 1 powers four smaller buses through current limiters as shown in the schematic diagram. Bus 2 is actually composed of three individual buses as shown in the schematic diagram; however, these busses are considered as only one bus since they are connected only with wire and are not separated by any type of protective device. Each of the individual buses associated with Bus 1 and Bus 2 power equipment which is protected by circuit breakers or circuit breaker switches located in three main areas of the cockpit; circuit breakers located on the avionics circuit breaker panel, circuit breakers located on the left circuit breaker panel, and the circuit-breaker-type switches located on the Pilot's Instrument Subpanel. The location of each item of equipment is shown in the AVIONICS/ELECTRICAL EQUIPMENT BUS CONNECTION table.



ELECTRICAL SCHEMATIC DIAGRAM

AVIONICS / ELECTRICAL EQUIPMENT BUS CONNECTION

The following table shows the equipment that is powered by Bus 1, organized by system. Reference Electrical Schematic Diagram.

BUS 1			
System	**Avionics Circuit Breaker Panel***	**Left Circuit Breaker Panel 1A & 1B****	**Pilot's Subpanel Circuit Breaker Switches**
Avionics	AP SERVOS	AVIONICS MASTER (1B)	
	AUDIO MKR	CLOCK (1B)	
	AVIONICS FAN	STBY HORIZ (1B)	
	COMM 2		
	DATA LINK		
	DME (opt)		
	INTEG AVION 2		
	MFD		
	STORM SCOPE (opt)		
	TRAFFIC ALERT (opt)		
Electrical		UTIL PWR (1A)	ALT 1
Engine		START RELAY (1A)	

AVIONICS / ELECTRICAL EQUIPMENT BUS CONNECTION

Environmental		AIR COND (1A)	VENT BLOWER
		AIR COND BLOWER (1A)	
Flight Controls		FLAP RELAY (1A)	
		FLAP MOTOR (1A)	

BUS 1 (cont)			
System	**Avionics Circuit Breaker Panel***	**Left Circuit Breaker Panel 1A & 1B****	**Pilot's Subpanel Circuit Breaker Switches**
Landing Gear		LANDING GEAR RELAY (1A)	
		LANDING GEAR MOTOR (1A)	
Lights		CABIN LIGHTS (1A)	BEACON
			LDG
			PANEL
			STROBE
			TAXI
Warning		STALL WARN (1A)	
		LDG GR WARN (1A)	
		ANNUN LIGHTS (1A)	
Weather			PROP DE-ICE

* items in this column are controlled by the avionics master switch.

** Equipment located on Left Circuit Breaker panel 1A are denoted by (1A). Those located on Left Circuit Breaker panel 1B are denoted by (1B).

AVIONICS / ELECTRICAL EQUIPMENT BUS CONNECTION

The following table shows the equipment that is powered by Bus 2, organized by system. Reference Electrical Schematic Diagram.

BUS 2			
System	**Avionics Circuit Breaker Panel**	**Left Circuit Breaker Panel**	**Pilot's Subpanel Circuit Breaker Switches**
Avionics	ADC		
	AHRS		
	COMM 1		
	ENG/AFR SENSOR		
	INTEG AVION 1		
	PFD		
	PFD FAN		
	XPNDR		
Electrical		ALTERNATOR 2 FIELD	
		ALTERNATOR 2 SENSE	
Engine		AUX FUEL PUMP	
		HOUR METER	
Landing Gear		LDG GR POS LTS	
Lights			NAV
			FLOOD
Weather			PITOT HEAT

MONITORING THE ELECTRICAL SYSTEM

The status of the electrical system can be monitored using the following displays and alerts. The voltage of Bus 1 and Bus 2, (BUS VOLTS 1 and BUS VOLTS 2), and the percent load being delivered by Alternator 1 and Alternator 2, (ALT LOAD 1 and ALT LOAD 2), are displayed on the default engine page of the Engine Indicating System (EIS). Numerical values for alternator loads and bus voltages are available by pressing the ENGINE softkey at the lower left corner of the display to access the SYSTEM page. This page is normally displayed along the left side of the MFD. In the event the MFD is not operational, the engine default page will be displayed along the left side of the PFD.

The following examples illustrate the use of the voltmeters.

1. Prior to engine start, Battery 1 is selected on. The BUS VOLTS 1 display will indicate the voltage of Battery 1 (23 volts minimum). The Bus VOLTS 2 display will indicate approximately 2 volts less than Bus 1 due the voltage drop across reverse current blocking diodes installed between Bus 1 and Bus 2. In order to evaluate the voltage of Battery 2, Battery 1 must be turned off after Battery 2 has been turned on. This is to preclude the interference of Battery 1 voltage with Battery 2 voltage. The Bus VOLTS 1 display will now indicate zero voltage since the reverse current blocking diodes prevents Bus 2 from feeding Bus 1, and the Bus VOLTS 2 display will indicate the voltage of Battery 2.
2. During engine operation on the ground with RPM less than 2000, Alternator 1 will be supplying the power to Bus 1 and 2 through the Bus Ties Contactor. In this case, the Bus VOLTS 1 display will indicate the voltage of Alternator 1 (27.5 - 29) volts. The Bus VOLTS 2 display will indicate approximately 2 volts less than Bus 1 due to the voltage drop across the reverse current blocking diodes installed between the two buses.

3. During flight operations, the BUS VOLTS 1 display will indicate the voltage applied to Bus 1 by Alternator 1. The BUS VOLTS 2 display will indicate the voltage applied to Bus 2 by Alternator 2. Both voltages should be 27.5 - 29.0 volts.

Failure of the alternators/regulators is annunciated by the G1000 Alerting System as shown in the following table.

Condition	Type of Alert	Annunciator Display-Brief Text	Alert Display-Descriptive Text
Alternator 1 & 2 Inoperative	Warning (red)	ALT 1-2 INOP	Alternator 1 and 2 Off-line
Alternator 1 Inoperative	Warning (red)	ALT 1 INOP	Alternator 1 Off-line
Alternator 2 Inoperative	Warning (red)	ALT 2 INOP	Alternator 2 Off-line
Voltage Regulator 1 Inoperative	Caution (amber)	BUS1 VOLT HI	Bus 1 voltage greater than 30 VDC
Voltage Regulator 2 Inoperative	Caution (amber)	BUS2 VOLT HI	Bus 2 voltage greater than 30 VDC

EXTERNAL POWER RECEPTACLE

The external power receptacle is located on the right side of the engine cowling. Before connecting an external power unit, ensure that battery 1 and 2 are installed in the airplane. Turn the battery switches ON and all avionics and electrical switches OFF. This protects the electronic voltage regulators and associated electrical equipment from voltage transients (power fluctuations). If polarity is reversed, a diode in the coil circuit will prevent contactor operation.

If the external power unit does not have a standard plug, check the polarity and connect the positive lead from the external power source to the positive battery terminal and the negative lead to the negative battery terminal.

NOTE

A negative ground external power source is required. If the polarity is reversed, the polarity relay will not close. This prevents current flow to the airplane.

LIGHTING SYSTEM

INTERIOR LIGHTING

Instrument Panel lighting is controlled by two switches on the pilot's subpanel placarded FLOOD LIGHTS and PANEL LIGHTS, and four rheostats located on the right subpanel placarded FLIGHT INST, INST FLOOD, STANDBY INST, AND SUBPANEL LIGHTING. Once the rheostats are set to the desired level, cockpit lighting is immediately available merely by turning on one or both of the switches.

When the FLOOD LIGHTS switch is turned on, the INST FLOOD rheostat may be used to adjust the intensity of the LED flood lights located on the underside of the glareshield. When the PANEL LIGHTS switch is turned on the other three rheostats may be used to control the illumination of the following items

FLIGHT INST Rheostat - Adjusts the lighting intensity of the PFD and MFD and the electroluminescent panels associated with the PFD, MFD, and audio panel.

STANDBY INST rheostat - Adjusts the lighting intensity of the following items:

Control Wheel Clock

Elevator Trim Post Light

Aileron Trim Post Light

Cowl Flaps Post Light

Prop Deice Ammeter (if installed)

Standby Airspeed Indicator

Standby Altimeter

Standby Attitude Indicator

SUBPANEL LIGHTING rheostat - Adjusts the lighting intensity of the electroluminescent subpanels and circuit breaker panels.

The map, compass and OAT indicator lights are controlled by a push-on, push-off switch located on the pilot's control wheel. Cabin reading lights are located above each seat and are operated by a push-on, push-off switch adjacent to each light.

The three cabin reading lights on the right side of the ceiling are wired to operate as courtesy lights. A step light located above the step on the right fuselage and these courtesy lights will illuminate any time the utility door or cabin door is opened. To limit battery drain, the step light and courtesy lights are connected to a timer which will extinguish the lights approximately 15 minutes after the door is opened. To reset the timer for the step light and courtesy lights, both doors must be closed and latched. The lights will illuminate when either door or both doors are opened.

EXTERIOR LIGHTING

The switches for all of the exterior lights are located on the left subpanel. The exterior lights consist of a landing light in the fuselage nose, a taxi light attached to the nose landing gear strut, and navigation lights located on the wing tips and tail cone. Use the landing light and the taxi light sparingly. Avoid prolonged operation which could cause overheating during ground maneuvering. An anti-collision light mounted on the vertical stabilizer is required for night flight.

NOTE

Particularly at night, reflections from anti-collision lights on clouds, dense haze or dust can produce optical illusions and intense vertigo. Such lights, when installed, should be turned off before entering an overcast; their use may not be advisable under instrument or limited VFR conditions.

ENVIRONMENTAL SYSTEM

CABIN HEATING

A heat exchanger behind the engine on the exhaust manifold from the right hand bank of cylinders provides for heated air to 5 outlets in the forward and aft areas of the cabin. The two forward outlets are located above and forward of each set of rudder pedals. The two aft outlets are installed behind the right front seat and the right rear seat. The fifth outlet provides heated air for windshield defrosting.

In flight, ram air enters an intake air scoop on the left side of the engine cowl, passes through the heater muff, then into a mixer valve on the forward side of the firewall. In the mixer valve, the heated air is combined with a controlled quantity of unheated ram air picked up at an intake on the right side of the nose. Air of the desired temperature is then ducted from the mixer valve to the outlets in the cabin.

HEATER AND DEFROSTER OPERATION

The heater controls are located below the pilot's left subpanel. To obtain heated air through the cabin outlets, pull the CABIN HEAT control. The control regulates the amount of hot air that is mixed with the unheated air. When the control is pulled fully out, the cold air is shut off and only heated air enters the cabin. The forward vents, located on the firewall forward of the rudder pedals, deliver heated air to the forward cabin when the CABIN HEAT control is pulled out. To deliver heated air to the aft seat outlets, pull the AFT CABIN HEAT control. For maximum heat, the control is pulled fully out. To obtain heated air for defrosting the windshield, pull the DEFROST control out. It may be necessary to vary or close the AFT CABIN HEAT control to obtain maximum air flow for defrosting. To close off all air from the heater system, pull the red FIREWALL AIR CONTROL knob located to the extreme left below the pilot's left subpanel.

CABIN VENTILATION

In moderate temperatures, ventilation air can be obtained from the same outlets used for heating by pushing the CABIN HEAT control full forward. However, in extremely high temperatures, it may be desirable to pull the red FIREWALL AIR CONTROL knob and use only the fresh air outlets described in the following paragraphs.

CABIN FRESH AIR OUTLETS

A duct in each wing root is connected directly to an adjustable outlet in the upholstery panel forward of each front seat. Airflow from each outlet is controlled by a center knob. Rotating the knob CCW opens the vent. The direction of airflow on the pilot's side is controlled by rotating the louvered cover with the small knob on the rim.

INDIVIDUAL OVERHEAD FRESH AIR OUTLETS

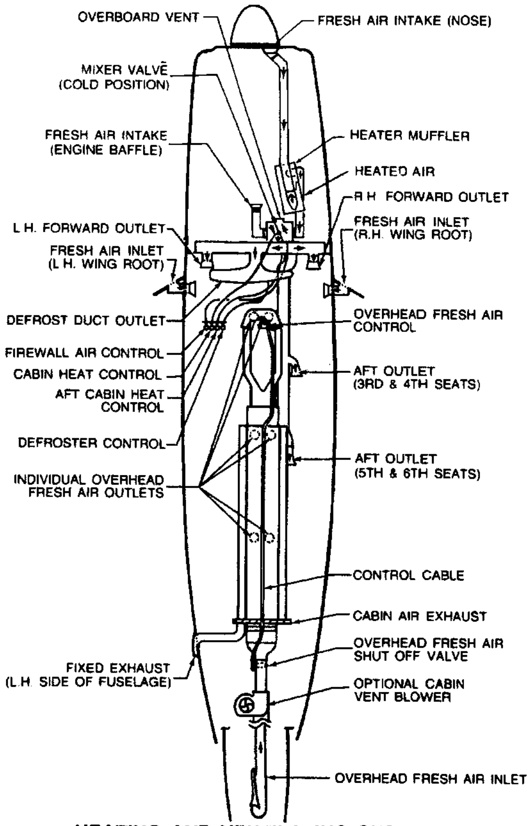
Fresh ram air enters the cabin through the fresh air scoop located on the left side of the dorsal fairing. This air is ducted through the optional cabin vent blower and overhead fresh air shutoff valve to the six overhead fresh air outlets. Each outlet can be adjusted to control the volume and direction of airflow to its respective seat. The total air flow to the six outlets can be varied by turning the overhead fresh air shutoff control knob, which controls the shutoff valve.

FRESH AIR VENT BLOWER (if installed)

An optional fresh air vent blower controlled by a switch placarded VENT BLOWER OFF on the subpanel is available. It provides ventilation through the individual overhead outlets during both ground and in-flight operations.

EXHAUST VENT

A fixed exhaust vent is located in the aft cabin.



HEATING AND VENTILATING SYSTEM

A36-603-49

AIR CONDITIONING SYSTEM (if installed)

Cabin cooling is provided by a 12,000 Btu, 30-cfm, refrigerative type air conditioning system. The principal components of the air conditioning system are the compressor and clutch unit (belt-drive from a drive pulley on the engine), the retractable condenser on the center line of the fuselage bottom skin, the dehydrator beneath the right front seat, the evaporator module beneath the left front seat, the various retractable condenser limit switches, the system controls on the subpanel, and the circuit breakers. The circuit breakers are located in the left circuit breaker panel.

The three-position retractable condenser is operated by an electric motor and jackscrew actuator, and controlled by two internal stops in the motor, two limit switches on the condenser, the landing gear safety switch, and a throttle limit switch. The three retractable condenser positions are ground extension, flight extension, and retracted.

When the airplane is on the ground and the air conditioner is turned on, the condenser extends to the ground extension (lowest) position below the fuselage bottom to facilitate condenser cooling by ambient air from the propeller slipstream. The compressor may shutdown on hot days unless the airplane is nosed into the wind with the engine running at 1200 rpm or higher. It may be turned back on after a shutdown. With the condenser in the ground extension position, the [AC DOOR EXTD] caution alert will be displayed in the annunciator window of the PFD.

When the airplane is in flight with the landing gear retracted and the air conditioner is turned on, the condenser extends only to the flight extension position. The flight extension position produces less drag than the ground extension position, but provides adequate condenser cooling from the airstream. The [AC DOOR EXTD] caution alert is not displayed in the annunciation window of the PFD with the condenser in the flight extension position.

When the air conditioner is turned off, the condenser returns to the retracted position, which produces minimum drag.

NOTE

The air conditioning system has a time-delay relay that requires 20 seconds after air conditioning system shutdown to restart the air conditioner compressor.

For cooling, cabin air is drawn into the evaporator module plenum below the forward edge of the left front seat. When cabin ambient air at a temperature of approximately 90°F passes over the evaporator coils, the temperature of the air is reduced to approximately 56°F. The evaporator module electric blower then forces the cooled air through outlet ducting to adjustable eyeball outlets in the instrument panel and subpanel. The cabin air continues to circulate as described until the air conditioner is turned off.

After engine start the air conditioner may be turned on by actuating a toggle switch in the subpanel placarded A/C - OFF. Either HI or LO blower speed may be selected and the airflow can be distributed by moving the eyeball outlets. The blower may be used separately from the air conditioner as well as in conjunction with the air conditioner.

Before takeoff, make certain that the air conditioner is off and that the [AC DOOR EXTD] caution alert is not displayed in the annunciation window. After takeoff with the landing gear retracted and the airplane clear of all obstacles, the air conditioner may be turned on if desired.

The A/C toggle switch should be turned OFF before engine shutdown.

The throttle limit switch is a safety device designed to operate only at full throttle with the landing gear extended, and is installed inside the pedestal by the throttle control. When the air conditioner is on during landing approach with the landing gear extended and partial throttle, the condenser is in the flight extension position. However, should a go-around be necessary, the application of full throttle will cause the throttle limit switch to shutdown the compressor for maximum engine power and retract the condenser to the retracted position to minimize drag. When the landing gear is retracted and/or the throttle is retarded, the compressor, after a 20 second delay, will resume operation and the condenser will return to the flight extension position.

PITOT AND STATIC SYSTEMS

PITOT SYSTEM

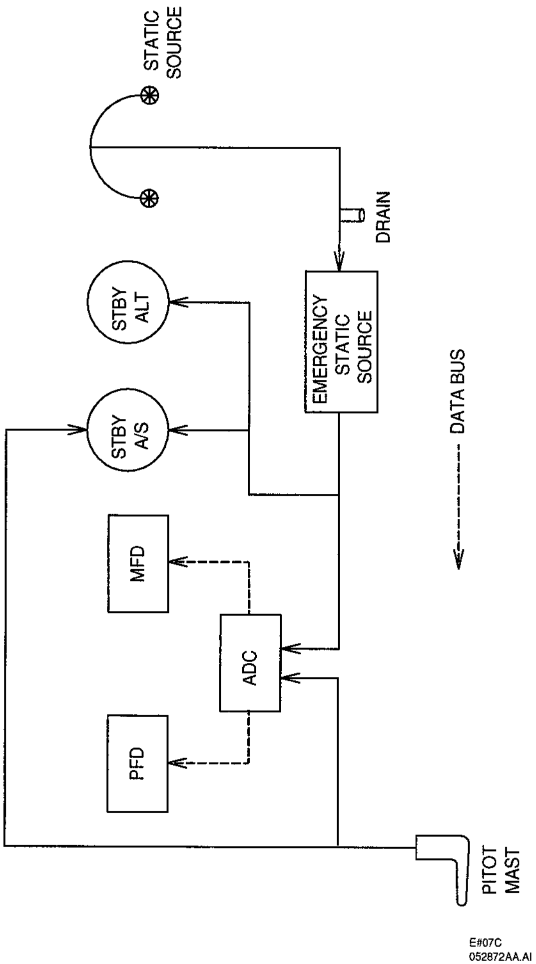
The pitot system provides a source of impact air for operation of the ADC and Standby Airspeed Indicator. The pitot mast is located under the leading edge of the left wing.

PITOT HEAT

Pitot mast contains an electrical heater element. The PITOT HEAT switch is located on the left subpanel and should be ON when flying in visible moisture. It is not advisable to operate the pitot heat on the ground except for testing or for short intervals of time to remove ice or snow.

NORMAL STATIC AIR SYSTEM

The normal static system provides a source of static air to the ADC, standby airspeed indicator, and standby altimeter for operation through a flush static fitting on each side of the airplane fuselage. A low point drain tube is provided for water that may condense in the system. It is accessible through the fuel selector valve drain access door. The access door is located in the lower fuselage adjacent to the left wing. The tube is plugged and the plug is held in place with a hose clamp.



PITOT AND STATIC SYSTEM SCHEMATIC

ALTERNATE STATIC AIR SYSTEM

The alternate static air source system is installed to provide air to the ADC, standby airspeed indicator, and standby altimeter for operation should the static ports become blocked. Refer to Section 3A, ABNORMAL PROCEDURES, for procedures describing how and when to use this system.

STALL WARNING HORN

A stall warning horn located forward of the instrument panel sounds a warning signal (Bat 1 switch must be ON) as the airplane approaches a stall condition. The signal is triggered by a sensing vane on the leading edge of the left wing and is effective at all attitudes. The warning signal will become steady as the airplane approaches a complete stall.

NOTE

The stall warning horn is inoperative when Bat 1 and Alt 1 switches are turned off. Airplane certification requires the stall warning system to be on during flight except in emergency conditions as stated in Section 3, EMERGENCY PROCEDURES.

ELECTROTHERMAL PROPELLER DEICE (if installed)

The Electrothermal Propeller Deice system is intended for use in the event of an inadvertent icing encounter. The Model G36 is not approved for flight into icing conditions even with anti-ice or deice equipment installed.

Electrothermal boots are cemented to the propeller blades and are heated by the airplane's 28-volt power supply through Bus 1. A slip ring assembly consisting of two rings is mounted on the propeller spinner. These rings make contact with a brush block to complete the circuit from the boots to the power supply. A circuit-breaker-type switch on the pilot's subpanel controls the system through an electronic timer which cycles the system on for 90 seconds, then off for 90 seconds. When the switch is initially turned on, the electronic timer may be in the off cycle resulting in a zero reading on the propeller deice ammeter. Cycling the switch off and back on will reset the timer to the on position. A green arc on the propeller deice ammeter indicates the normal range of 14 to 18 amps required to heat the propeller blades when the system is on. The propeller deice ammeter will indicate zero when the system is cycled off by the electronic timer. If icing is suspected, the system should be turned on and left on until it is certain that icing conditions no longer exist. The system must not be on during ground operations unless the engine is running.

ENGINE BREAK-IN INFORMATION

MIL-C-6529 Type II Multiviscosity 20W50 Corrosion-Preventative Oil is installed in the engine at the factory. It is recommended that this oil be removed and the oil filter changed at 20 hours of engine operation or no later than 25 hours. If additional oil is needed during the first 25 hours of operation, use an approved straight mineral oil per MIL-L-6082. If oil consumption has not stabilized by this time, the engine should be drained and refilled with MIL-L-6082 Mineral Oil. This oil should be used until oil consumption stabilizes; usually a total of approximately 50 hours. After oil consumption has stabilized, MIL-L-22851 Ashless Dispersant Oil should be used. Oils must meet the requirements of the latest revision of Teledyne Continental Motors Corporation Specification MHS-24 or current applicable Teledyne Continental Service Bulletin. Refer to Section 8, HANDLING, SERVICING AND MAINTENANCE, for a list of approved oils.

CAUTION

Do not exceed 25 hours of operation or 6 months, whichever occurs first, with factory break-in oil (MIL-C-6529, Type II, Multiviscosity, 20W50 Corrosion-preventative). When changing to MIL-L-22851 Ashless Dispersant oil, change the oil and oil filter using the procedures outlined in the G36 Maintenance Manual.

Failure to remove the corrosion-preventative oil and replace the oil filter within the time interval specified may cause varnish deposits to form on the pistons and cylinder walls and deteriorate the filter element.

Drain and replace the engine oil as recommended in Section 8, HANDLING, SERVICING and MAINTENANCE. If operating conditions are unusually dusty and dirty, more frequent oil changes may be necessary. Oil changes are more critical during break-in period than at any other time.

Use full throttle for every takeoff and maintain until at least 400 feet AGL, then reduce power as necessary for cruise climb. Maintain the highest power recommended for cruise operation during the break-in period (50 to 75 hrs) and interrupt cruise power every 30 minutes or so by smoothly advancing to takeoff power for approximately 30 seconds, then return to cruise power.

Avoid long power-off descents above 8000 ft, especially during the break-in period. Maintain sufficient power during descent to permit cylinder head temperatures to remain in the green arc.

Minimize ground operation time, especially during warm weather. During the break-in period, avoid idling in excess of 15 minutes, especially in high ambient temperatures.

AVIONICS

GENERAL

The G1000 Integrated Avionics System is a fully integrated flight, engine, communication, navigation, autopilot and surveillance instrumentation system. The system consists of a Primary Flight Display (PFD), Multi-Function Display (MFD), and audio panel (GMA) that make up the instrument panel. Line Replaceable Units (LRUs) that are included in the above displays and controls include the following:

- A single Air Data Computer (ADC)
- A single Attitude and Heading Reference System (AHRS)
- A single Engine/Airframe Processing Unit (GEA)
- Two Integrated Avionics Units (GIA) containing dual VHF communications transceivers, dual VOR/ILS receivers, and dual GPS receivers.
- A single Transponder
- A single Magnetometer
- A Flight Director/Autopilot System that is integral to the GIA and the autopilot servo units.

PRIMARY FLIGHT DISPLAY (PFD)

The Primary Flight Display (PFD) is a 10.4 inch Liquid Crystal Display (LCD) referred to by Garmin as a Garmin Display Unit (GDU) 1040. It displays airspeed, attitude, altitude, and heading information in a traditional format. A vertical speed display is located to the right of the altitude display. A crew alerting window and annunciation window are available for display. Slip information is shown as a trapezoid under the bank pointer. One width of the trapezoid is equal to a one ball width slip. Rate of turn information is shown on the scale above the compass rose. Full scale deflection is equal to a standard rate turn.

The PFD incorporates controls for communications, navigation, altimeter control, and Flight Management System functions. Trend vectors are shown on the airspeed and altimeter displays as a magenta line which predicts the airspeed or altitude 6 seconds in the future assuming the current rate of change is maintained. The turn rate indicator also functions as a trend indicator on the compass scale. The PFD can be displayed in a composite format for emergency use by pressing the DISPLAY BACKUP button on the audio panel. In the composite mode, the full crew alerting function is retained, but no map functions are available. When battery 1 is turned on or external power is supplied to the aircraft, a reduced subset of the G1000 system will power up including the PFD operating in composite mode. This will allow the pilot to monitor engine and electrical status prior to and during engine start. The PFD is powered by Bus 2 and is protected by a circuit breaker, placarded PFD, located on the avionics circuit breaker panel. See the Garmin G1000 Primary Flight Display Pilot's Guide for more detailed information.

MULTIFUNCTION DISPLAY (MFD)

The Multi-Function Display (MFD) is a 10.4 inch Liquid Crystal Display (LCD) referred to by Garmin as a Garmin Display Unit (GDU) 1043. It displays engine data, maps, terrain, traffic and topography displays, and flight planning and progress information. It also controls and displays weather data link information, lighting strike information, and audio entertainment features. The display unit is identical to the PFD and contains the same controls plus the addition of autopilot controls. Discrete engine sensor information is processed by the Garmin Engine/Airframe (GEA) sub-system. When an engine sensor indicates a value outside the normal operating range, the legend on the MFD will turn yellow for the caution range, and red for the warning range. The legend will also flash when the warning range is activated. If the pilot is on a page other than the primary engine indication page when an engine parameter is exceeded, the primary engine page will automatically pop up to allow the viewing of the parameter that has been exceeded. The MFD is powered by Bus 1 and is protected by a circuit breaker, placarded MFD, located on the Avionics Circuit Breaker panel. See the Garmin G1000 Multi Function Display Pilot's Guide for more detailed information.

MASTER AUDIO PANEL (GMA)

The audio panel is a Garmin GMA 1347 and provides pilot and copilot microphone selection of communication radios and audio selection for all communication and navigation receiver radios. The audio panel has volume controls for both pilot and copilot. There are controls for speaker on/off selection and interphone mode selection. If power is lost to the audio panel, the pilot's headset and microphone are connected directly to COMM 1. An internal clearance recorder can play back the last 2 1/2 minutes of received COMM audio. A marker beacon receiver is also contained within the audio panel with visual information provided on the PFD. The red button at the bottom of the audio panel is used to manually select the reversionary mode for the PFD and MFD displays. The GMA is powered by Bus 1 through the Avionics Master relay and protected by the 5-amp AUDIO MKR circuit breaker located on the Avionics Circuit Breaker Panel. See the Garmin G1000 Audio Panel Pilot's Guide for more detailed information.

INTEGRATED AVIONICS UNITS (GIA)

Two Garmin Integrated Avionics Units (GIA 63) are installed. Both GIAs provide interfaces to all Line Replaceable Units (LRUs) in the G1000 system. Each GIA contains VHF COMM, VHF NAV, glideslope, and GPS functions. GIA 1 provides autopilot mode control and servo control and monitoring. GIA 2 provides servo control and monitoring. The No. 1 GIA is powered by Bus 2. The COMM portion is protected by the 5-amp COMM 1 circuit breaker and the other portions are protected by the 5-amp INTEG AVION 1 circuit breaker. The No. 2 GIA is powered by Bus 1 through the Avionics Master relay. The COMM portion is protected by the 5-amp COMM 2 circuit breaker and the other portions are protected by the 5-amp INTEG AVION 2 circuit breaker. All four circuit breakers are located on the Avionics Circuit Breaker Panel.

AIR DATA COMPUTER (ADC)

The Garmin Air Data Computer (GDC 74A) is connected to the pitot and static air system and a Outside Air Temperature (OAT) probe which is located on the bottom of the left wing. The ADC provides OAT, airspeed, altitude, and vertical speed for pilot displays and Flight Management System (FMS) functions. The ADC is powered by Bus 2 and is protected by the 5-amp ADC circuit breaker located on the Avionics Circuit Breaker Panel. See pitot and static system description in this section for more detailed information.

MAGNETOMETER (GMU)

The Garmin Magnetometer Unit (GMU 44) senses the earth's magnetic field and provides this information to the AHRS for processing to determine the airplane's magnetic heading. The GMU 44 is located in the left wing tip area and is powered by the AHRS.

ATTITUDE AND HEADING REFERENCE SYSTEM (AHRS)

The Garmin Attitude and Heading Reference System (GRS 77) provides pitch, roll, heading, and angular rate information for pilot display and for FMS calculations. The AHRS is powered by Bus 2 and protected by a 5-amp circuit breaker located on the Avionics Circuit Breaker Panel. See the Garmin G1000 pilot's guide, Section 2, System Overview, for more information.

ENGINE/AIRFRAME INTERFACE UNIT (GEA)

The Garmin Engine/Airframe Interface Unit (GEA 71) provides input and output for engine and airframe sensors and systems. The GEA has inputs for the following signals:

Manifold Absolute Pressure (MAP)

Engine RPM

Fuel Flow

Six Cylinder Head Temperature (CHT) probes

Six Exhaust Gas Temperature (EGT) probes

Oil Temperature

Oil Pressure

Alternator 1 Load

Alternator 2 Load

Bus 1 Voltage

Bus 2 Voltage

Fuel Quantity Left Tank

Fuel Quantity Right Tank

Starter Engaged

Utility Door Switch

Air Conditioning Condenser position

This information is used to display Engine and System information on the left side of the MFD and alerts in the annunciation window of the PFD. A discrete output from the GEA is used to control the bus tie relay that connects electrical Bus 1 to Bus 2.

TRANSPONDER (GTX)

The Garmin Transponder (GTX 33) is a solid-state transponder that replies to Mode A (4096 codes), Mode C and Mode S interrogations. It is capable of responding with transponder capability and aircraft Flight ID to ground station interrogation to support elementary surveillance. If the aircraft is not equipped with the optional Skywatch system or it is not operational, the GTX 33 will work with the Traffic Information Service (TIS). Where TIS is available, the GTX 33 will display all responding ATCRBS Mode A and Mode C transponder equipped aircraft within seven nautical miles from 3000 feet below to 3500 feet above the aircraft. The TIS system only operates while in the ground-based service area. It will not display aircraft without an operating transponder. Transponder codes and mode selection are accessed by the XPDR softkey at the bottom of the PFD. Squawk codes can be entered using the PFD FMS knob ***(Software Version 0858.05 or 0858.06)***. The GTX 33 is powered by Bus 2 and protected by a 5-amp circuit breaker located on the Avionics Circuit Breaker Panel.

ENGINE INDICATING SYSTEM

Engine information is available in a vertical arrangement along the left side of the MFD. In reversionary mode, this information will also be generated along the left side of the PFD.

ENGINE DISPLAY

The engine display page is the default display and shows manifold pressure, engine RPM, fuel flow, cylinder head temperature, oil temperature, oil pressure, alternator 1 and alternator 2 load, Bus 1 and Bus 2 voltage, left fuel tank and right fuel tank quantity.

Manifold pressure is the absolute pressure in the engine manifold and is calibrated in inches of mercury. A circular scale with a pointer provides overall manifold indication with numeric value just below. A manifold pressure sensor located on the induction manifold is wired to the GEA for display information.

and throttle controls, the power output of the engine can be adjusted. To avoid excessive cylinder pressures during cruise operations, observe the maximum recommended rpm and manifold pressure limits as indicated on the Manifold Pressure vs RPM graph in Section 5, PERFORMANCE.

A circular scale with a pointer provides overall engine speed in revolutions per minute (RPM), with numeric value just below. A transducer attached to the engine sends electrical signals to the GEA for display information.

Fuel flow is indicated on a linear scale with a numeric readout in gallons per hour above and to the right of the scale. A turbine rotor installed in the fuel line rotates in proportion to the fuel flow. The speed of rotation is converted to an electrical signal which is input to the GEA for display information.

Cylinder head temperature is indicated on a linear scale. The hottest of the six cylinders is displayed and is identified by the numeric value inside the pointer. All six cylinder heads have temperature probes that are wired to the GEA. These can be displayed by accessing the LEAN engine page.

Oil temperature is indicated on a linear scale and is sensed as it enters the engine from the oil cooler. The sensor is wired to the GEA for display. Numeric temperature value is displayed on the SYSTEM engine page.

Oil pressure is sensed at the back of the engine off a port below the oil cooler and wired to the GEA for display. The display is liner, with a numeric pressure value available on the SYSTEM engine page.

The ALT LOAD and BUS VOLTS displays are described in the electrical systems description and the FUEL QTY GAL display is described in the fuel systems description. See the Garmin G1000 Engine Indication System Pilot's guide for more detailed information.

ALERTING SYSTEM

The G1000 provides an Annunciation window and an Alerts window on the PFD to inform the pilots of Warning Alerts, Cautions Alerts, Advisory Alerts, and Messages that may occur during the operation of the airplane. Both windows are also available on the MFD to provide the same notifications when the MFD is operating in the reversionary mode. The available alerts and selected messages are shown in the table below. When an alert occurs, three things occur simultaneously.

1. The ALERTS softkey will assume a new label and color depending on the level of alert. The softkey label will change to a red WARNING label for warning alerts, a yellow CAUTION label for caution alerts, and a white ADVISORY label for advisory alerts. The label will also assume a flashing mode.
2. An aural tone will be provided for warning Alerts and Caution Alerts. The tone for Warning Alerts will continue to pulse until the pilot presses the WARNING softkey to acknowledge the Alert. (Note: The [GEAR UP] Warning Alert has no tone since the airplane gear warning system provides the aural alert.) The tone will sound only once for a Caution Alert and does not need to be acknowledged. A tone is not provided for an Advisory Alert.
3. An annunciation with the same color as the alerts label is displayed in the Annunciation Window as shown in the table below.

The pilot action in response to an alert is to press the Alerts Softkey to cancel the aural tone associated with a Warning Alert, and to cancel the flashing mode of the softkey. When an alert is acknowledged, the annunciation is moved to the top portion of the Annunciation Window and is separated from subsequent annunciations that may occur by a white line. If more than one annunciation is displayed, they are arranged in order of priority, with the highest priority at the top of the list.

Thus, they would be arranged from top to bottom in the order of red, yellow, and white.

If the Alerts Softkey is pressed again, the Alerts Window will be displayed. This window will display the annunciation along with a descriptive text that elaborates on the meaning of the annunciation. The Alerts Window arranges the alerts and messages in order of priority, as explained for the Annunciation Window. If there are more alerts/messages in the Alerts Window than can be displayed at one time, hidden alerts/messages may be accessed by using the large FMS knob to scroll through the list.

The G1000 alerting system provides numerous messages relating solely to the status of the G1000. These messages may be viewed only in the Alerts Window. When a new message is active, the Alerts Softkey label will change to ADVISORY and flash in a manner identical to Message Alert. The ADVISORY softkey is then pressed once to acknowledge the message, and then pressed a second time to display the message in the Alerts Window.

Alerts and messages will be retained in the respective windows until the fault is cleared. They will then automatically be moved. See the Garmin G1000 Annunciations and Alerts Pilot's Guide for more detailed information.

AIRPLANE ALERTS AND MESSAGES

Type of Alert/ Messages	Color	Annunciation Window	Alerts Window Descriptive Text	Alerts Softkey	Tone
Warning Alert	Red	GEAR UP	Gear Up	WARNING	*Cont.
Warning Alert	Red	ALT 1-2 INOP	Alternator 1 and 2 offline	WARNING	Cont.
Warning Alert	Red	ALT 1 INOP	Alternator 1 offline	WARNING	Cont.
Warning Alert	Red	ALT 2 INOP	Alternator 2 offline	WARNING	Cont.
Caution Alert	Yellow	AC DOOR EXTD	Air conditioner on and door extended	CAUTION	Single
Caution Alert	Yellow	STARTER ENGD	Starter relay has power applied	CAUTION	Single
Caution Alert	Yellow	BUS1 VOLT HI	Bus 1 voltage greater than 30 VDC	CAUTION	Single
Caution Alert	Yellow	BUS2 VOLT HI	Bus 2 voltage greater than 30 VDC	CAUTION	Single
Caution Alert	Yellow	AFT DOOR	Aft door not latched	CAUTION	Single
Advisory Alert	White	BUSES TIED	Bus 2 is tied to Bus 1	ADVISORY	None
Message	White	PFD FAN FAIL	Cooling fan for the PFD is inoperative	ADVISORY	None
Message	White	MFD FAN FAIL	Cooling fan for the MFD is inoperative	ADVISORY	None
Message	White	AVIONICS FAN	Cooling fan for remote avionics is inoperative	ADVISORY	None

* Into G1000 Audio from an electronic warning horn.

AUTOPILOT

GFC 700 AUTOMATIC FLIGHT CONTROL SYSTEM (AFCS)

COMPONENTS

The GFC 700 AFCS consists of the following components:

1. The following mode control keys on the MFD:
   a. AP (Autopilot engage/disengage)
   b. YD (Yaw Damp engage/disengage)
   c. FD (Flight Director On/Off)
   d. HDG (Heading Mode On/Off)
   e. NAV (Nav Mode On/Off)
   f. APR (Approach Mode On/Off)
   g. ALT (Altitude Hold Mode On/Off)
   h. VS (Vertical Speed Mode On/Off)
   i. FLC (Flight Level Change Mode On/Off)
   j. NOSE UP and NOSE DN (vertical mode reference change)
2. A two-segment pitch trim switch located on the left side of the pilot's control wheel.
3. A red autopilot-disconnect and pitch-trim-interrupt switch (AP DISC/TRIM INTER) located on the left side of the pilot's control wheel. Pressing this switch also acknowledges a manual or automatic autopilot disconnect by canceling the tone and flashing AP annunciator.
4. A Control Wheel Steering switch (CWS) located on the left side of the pilot's control wheel.
5. A Go-Around switch located on the left side of the throttle.

6. Servos with autopilot processing logic in the pitch, pitch trim and roll control systems. A servo with independent processing logic for the Yaw Damp function. The servos are protected by a 5-amp AP SERVOS circuit breaker located on the Avionics circuit breaker panel. (The pitch trim servo is used for automatic pitch trim when the autopilot is engaged and for manual electric pitch trim operation when the autopilot is disengaged.)
7. Servo mounts and brackets.
8. Flight Director processing logic is contained in the two integrated Avionics Units, GIA 63 No. 1 and No. 2. The GIAs are protected by the 5-amp INTEG AVION 1 and INTEG AVION 2 circuit breakers located on the Avionics circuit breaker panel. Both GIAs are required to be operational for the AFCS to operate.
9. The AFCS also utilizes the PFD/MFD mounted altitude preselect knob (ALT), heading select knob (HDG), and course select knob (CRS) associated with the G1000 system.

PFD DISPLAYS

1. A Flight Director command bar is displayed on the artificial horizon when the Flight Director is active.
2. The status of the autopilot, yaw damp, and flight director modes are displayed on the PFD in an AFCS Status Bar which is displayed just above the Attitude Indicator. In general, green indicates an active flight director mode and white indicates an armed mode. When a mode is directly selected by the pilot, no flashing of the mode will occur. When normal automatic mode changes occur, the new mode will flash in green for ten seconds. If a mode becomes unavailable for whatever reason, the mode will flash in yellow for ten seconds and then be replaced by the new active mode in green.

3. An AFCS System Status Field is displayed above and to the left of the attitude indicator and is used to annunciate the status of the preflight self-test, failures of the AFCS, and failures of the electric pitch trim system. Upon initial system power-up and verification of required sensor inputs, the autopilot, flight director, and pitch trim systems undergo a preflight self-test, as follows:
   When the AHRS system is aligned, the red [AFCS] in the system status field extinguishes and is replaced with a white [PFT] indicating that the AFCS Preflight Test is in progress. At the end of a successful self-test, the white [PFT] extinguishes and the autopilot disconnect tone sounds. Successful completion of the preflight test is required for the autopilot, flight director and pitch trim systems to be operational. If the Preflight Test fails, a red [PFT] is displayed in the system status field. If a failure occurs after the preflight test has been successfully passed, a red [AFCS] will be displayed in the field. If a failure of the electric pitch trim system occurs, a red [PTRM] will be displayed in the field.
4. OVERSPEED PROTECTION [MAXSPD] - If the indicated airspeed or the airspeed trend vector reaches approximately 190 KIAS, the flight director will enter the overspeed protection mode and increase the airplane pitch to slow the airplane down. When the overspeed protection is activated, a flashing yellow [MAXSPD] will be displayed at the top of the airspeed display. Once the airspeed has been reduced to approximately 185 KIAS the overspeed protection will be cancelled. If the flight director pitch reference (PIT or VS) has not been corrected, the flight director will resume its original pitch setting and another overspeed will likely occur.

AUTOPILOT DISCONNECTS

Normal autopilot disconnects are annunciated with a yellow flashing [AP] in the AFCS Status Bar accompanied by a two second autopilot disconnect tone. Normal disconnects are those manually initiated by the pilot using the AP DISC switch, the manual trim switch, the AP key or the Go-Around switch. Abnormal (automatic) disconnects will be accompanied by a red flashing [AP] in the AFCS Status Bar and a continuous autopilot disconnect tone. The disconnect tone and red flashing [AP] can normally be cancelled by pressing the AP DISC switch or the left side of the pitch trim switch. A few failures, such as loss of power to the servos or turning the Avionics Switch off, will also render the AP DISC switch inoperative. In such cases the left side of the pitch trim switch will still cancel the disconnect tone and flashing annunciator. The following conditions will cause the autopilot and, in the first six cases, the yaw damper to disengage:

1. AFCS electrical power failure, including pulling the AP SERVOS circuit breaker and turning the Avionics Master switch off.
2. An internal Autopilot System Failure.
3. An AHRS malfunction.
4. Failure of the Air Data Computer.
5. Failure of the PFD.
6. Depressing the red AP DISC switch on the pilot's control wheel.
7. Actuating the left side of the electric pitch trim switch on the pilot's control wheel.
8. Pressing the AP Mode control key on the MFD.
9. Pressing the GA switch on the throttle.

DESCRIPTION OF AFCS KEYS LOCATED ON THE MFD

The following is a brief description of the Autopilot and Flight Director Mode Control Keys.

AP (Autopilot) - Engages and disengages the autopilot and yaw damper. The flight director will be activated upon engagement but will not be cancelled upon disengagement. When the autopilot is engaged, the green [AP], [YD], [ROLL], [PIT] and white [ALT] will illuminate in the AFCS Status Bar.

YD (Yaw Damp) - Engages and disengages the yaw damper. If the autopilot and yaw damper are engaged, turning the YD off will not disengage the autopilot. When the yaw damper is engaged, the green [YD] will illuminate in the AFCS Status Bar.

FD (Flight Director) - Engages and disengages the Flight Director if the autopilot is not engaged. When the flight director is engaged, the green, [ROLL], [PIT] and white [ALT] will illuminate in the AFCS Status Bar.

HDG (Heading Mode) - Engages and disengages the Heading Mode. The Flight Director will maintain the heading selected with the Heading (HDG) knob. When the Heading Mode is selected, the green [HDG] will illuminate in the AFCS Status Bar.

NAV (Navigation Mode) - Engages and disengages the Nav Mode. The Navigation mode is used to track the following Nav courses:

1. Enroute VOR or GPS
2. GPS non-precision approaches (Tracking accuracy will be identical to the APR Mode.)
3. LOC only approaches
4. BC approaches

When the Navigation mode is selected, the [VOR], [GPS], [BC], or [LOC] will illuminate in the AFCS Status Bar. The annunciator displayed will depend on the navigation source selected. The color of the annunciator will be white until the selected course is captured, then it will turn green and flash for 10 seconds before becoming steady.

APR (Approach Mode) - Engages and disengages the Approach Mode. The Approach mode is used to track the following types of approaches:

1. ILS approaches [LOC] and [GS]
2. GPS non-precision approaches (Tracking accuracy will be identical to the NAV Mode.) [GPS]
3. VOR non-precision approaches [VAPP]

WAAS:
(Software Version 0858.05 or 0858.06)

4. LPV approach with lateral and vertical guidance [GPS] and [GP]
5. LNAV/VNAV approach with lateral and vertical guidance [GPS] and [GP]

When the Approach mode is selected, the [LOC], [GS], [GPS], [VAPP] or [GP] will illuminate in the AFCS Status Bar. The color of the annunciator will be white until the selected course or glideslope is captured, then it will turn green and flash for 10 seconds before becoming steady.

ALT (Altitude Hold Mode) - Engages and disengages the Altitude Hold Mode. The Altitude Hold Mode is used to maintain a selected altitude. Once engaged, the altitude will be maintained regardless of changes in the Altitude Selector (using the ALT knob), or changes in the Baro setting. When the Altitude Hold Mode is selected, the green [ALT] and the current altitude [XXXXXFT] are displayed in the AFCS Status Bar.

2. The NOSE UP and NOSE DN keys (Each press of the NOSE UP key increases the selected vertical speed by 100 fpm. Each press of the NOSE DN key decreases the vertical speed by 100 fpm.)

When the Vertical Speed Mode is selected, the green [VS] and the current vertical speed [XXXX$_{FPM}$] are displayed in the AFCS Status Bar. In addition, the selected [VS] is displayed in a box above (for a climb) or below (for a descent) the vertical speed display and a reference bug is displayed on the left side of the Vertical Speed Display.

FLC (Flight Level Change Mode) - Engages and disengages the Flight Level Change Mode. The Flight Level Change Mode is used to change altitude in conjunction with a desired airspeed. The airspeed existing at the time of activation is maintained until adjusted. The airspeed may be adjusted using:

1. The CWS button
2. The NOSE UP and NOSE DN keys (Each press of the NOSE UP key decreases the selected airspeed by 1 knot. Each press of the NOSE DN key increases the airspeed by 1 knot.)

When the Flight Level Change Mode is selected, the green [FLC] and the current airspeed [XXX$_{KT}$] are displayed in the AFCS Status Bar. In addition, the selected airspeed is displayed in a box above the airspeed indicator and a reference bug is displayed on the right side of the airspeed Display.

NOSE UP / NOSE DN Keys - Used to adjust the pitch in the Pitch Mode [PIT], the VS in the Vertical Speed Mode [VS], and the airspeed in the Flight Level Change Mode [FLC]. Each press of a key results in the following changes:

1. Pitch attitude - 0.5° pitch change
2. Vertical Speed - 100 fpm change
3. Flight Level Change - 1 knot change

OTHER CONTROLS ASSOCIATED WITH THE AFCS

GO-AROUND - A Go-Around switch is located on the left side of the throttle. Pressing the switch initiates the following actions:

1. Engages the Flight Director in a wings-level, 7° nose up pitch attitude.
2. Disengages the autopilot.
3. Cancels all armed modes including Altitude Hold.

The autopilot may be re-engaged after GO-AROUND is selected.

The GO-AROUND Mode can be cancelled using one of the following methods:

1. Select another roll mode such as HDG or NAV.
2. Adjust the pitch attitude using the CWS.
3. Adjust the pitch using the NOSE UP / NOSE DN keys.

CONTROL WHEEL STEERING (CWS) - Pressing the CWS switch on the pilot's control wheel disengages the control surface servos without disengaging the autopilot as long as the switch is depressed. The servos are re-engaged when the switch is released and the system will synchronize to the existing airspeed, vertical speed, pitch angle or roll angle depending upon the mode selected. If the autopilot and flight director have not previously been engaged, pressing the CWS button will activate the flight director in the pitch and roll hold modes. When the CWS mode is active, a white [CWS] replaces the green [AP] in the AFCS status bar.

MANUAL ELECTRIC PITCH TRIM - When the autopilot is not engaged, the electric pitch trim system may be operated with the split trim switch located on the left side of the pilot's control wheel. The switches must be moved together in order to activate the trim system. If either side is independently activated for more than 3 seconds, a red [PTRM] is displayed in the

AFCS System Status Field. The annunciator will extinguish shortly after the switch is released. The red [PTRM] will also illuminate when a failure of the pitch trim system occurs. If the autopilot is engaged when this occurs, it will remain engaged. See ELECTRIC PITCH TRIM FAILURE in Section 3.

Refer to Section 2, LIMITATIONS; Section 3, EMERGENCY PROCEDURES; Section 3A, ABNORMAL PROCEDURES; and Section 4, NORMAL PROCEDURES; and the GARMIN Cockpit Reference Guide, Garmin P/N 190-00525-00, Rev. A, or later revision, for additional information on the AFCS.

STANDBY INSTRUMENTS

MID-CONTINENT INSTRUMENT 4300-205 ELECTRIC STANDBY ATTITUDE INDICATOR

The standby attitude indicator is located on the right side of the instrument panel and is normally powered by Bus 1 through a 3-amp circuit breaker, placarded STBY HORIZ, located on the pilot's circuit breaker panel. If power is completely lost from Bus 1, power is supplied from a standby power source, an integral standby battery, for approximately one hour*. If power from Bus 1 gradually decreases, power is supplied from the standby battery when Bus 1 voltage reaches 10 volts. The standby attitude indicator is usable through 360° of pitch and roll.

The standby attitude indicator includes the following items:

1. A mechanical red gyro warning flag, which is displayed when the gyro motor is not receiving sufficient power to operate.
2. A Pull-To-Cage Knob. This knob will not lock the gyro. After allowing the gyro to spin up for approximately one minute, pulling the knob out will erect the gyro.
3. An amber standby power LED that illuminates in one of several ways to indicate that the attitude indicator is operating from its standby battery.

4. A STBY PWR Button. This is essentially an ON-OFF switch for the indicator but functions in several different ways.
   a. If the indicator has not previously been powered by Bus 1, pressing the button once will power the indicator using its standby battery. The only indication that the indicator is operating from the standby battery is the absence of the warning flag. Pressing the button again will turn the standby power off, causing the warning flag to be displayed.
   b. If the indicator is being powered by Bus 1 and subsequently loses power from that bus, the amber standby power LED will flash for one minute. If the button is pressed once during that one minute, the flashing standby power LED will be cancelled and the standby battery is latched on, providing power for approximately one hour.
   c. The button may be used to activate the battery test mode while power is being supplied by Bus 1. See the procedure below.
5. A red and green Test LED used to check the standby battery status.
6. A standby power source, in the form of a sealed lead acid battery, attached to the back of the indicator. The battery will power the indicator for a minimum of one hour*, if fully charged, when power is lost from Bus 1 and the pilot subsequently latches it on by pressing the STBY PWR button. This battery must be removed and checked once a year and replaced every 3 years.
7. Emergency LED lighting provided when the indicator is operating from standby battery. This lighting is not adjustable.

* Actual operation time of the standby battery may vary considerably depending on temperature, charge status, and battery condition. Temperatures below 32°F will temporarily degrade battery capacity. Internal chemistry will slowly degrade battery capacity over several years of operation even when correctly maintained. A poorly maintained battery will suffer accelerated degradation. Extended storage in a discharges state and overcharging will permanently damage a battery. Complete charging is required to bring the battery up to full capacity if it has been unused for more than four months or partially discharged.

STANDBY AIRSPEED INDICATOR

A standby mechanical airspeed indicator is mounted on the right side of the instrument panel. The indicator is connected to the airplane's pitot and static systems along with the Air Data Computer. The airspeed indicator remains operational in the event of complete electrical failure and will also operate with the alternate static source. Lighting is provided by Bus 1 and is controlled by the STANDBY INST rheostat located on the right subpanel.

STANDBY ALTIMETER

A standby mechanical altimeter is located on the right side of the instrument panel. It is connected to the airplane's normal and alternate static systems along with the ADC and is independent of the airplane's electrical system except for lighting. Lighting is provided by Bus 1 and is controlled by the STANDBY INST rheostat located on the right subpanel.

STANDBY COMPASS (MAGNETIC COMPASS)

The standby compass is a self-contained, non-stabilized compass that will provide magnetic heading should the electric heading reference fail from the Attitude and Heading Reference System (AHRS) or become unavailable from a loss of electric power. A compass correction card mounted below the compass provides "steer to" heading for each thirty degrees of heading. The magnetic compass is compensated and correction values are determined with all avionics equipment operating and engine running at 2400 RPM. There will be considerable error at low engine RPM or with the Alternator 2 off. The magnetic compass is erratic when the air conditioner or electric prop deice is in operation. The compass has a light powered by BUS 1 through the CLOCK circuit breaker. The light is turned on and off by a switch on the right side of the pilot's control wheel labeled MAP OAT COMP.

SKYWATCH 497 TRAFFIC ADVISORY SYSTEM (if installed)

The L-3 Communications SKYWATCH system consists of a remote-mounted processor and a top-mounted directional antenna. It monitors the airspace around the aircraft and indicates where to look for nearby transponder-equipped aircraft. After receiving replies to its Mode C interrogations, the SKYWATCH system computes the responding aircraft's range, bearing, relative altitude and closure rate -- predicting potential traffic conflicts within an 11 nautical mile range. Aural traffic alerts are annunciated through the aircraft audio system and visual targets are displayed on the MFD. It tracks up to 30 intruder aircraft simultaneously and displays eight of the most threatening.

The system is on anytime the Avionics Master Switch is on and the TRAFFIC ADVISORY circuit breaker is in. The system can be placed in the STANDBY or OPERATE mode from the MFD. Selection of monitored airspace ABOVE/BELOW/NORMAL/ UNRESTRICTED is also performed from the MFD.

For additional details refer to the L-3 Communications Pilot's Guide for the SKYWATCH Traffic Advisory System Model SKY497 P/N 009-10801-001.

STORMSCOPE (if installed)

The BF Goodrich WX-500 system consists of a remote mounted processor and externally mounted antenna. This system passively detects electrical discharges associated with thunderstorm activity within 200 nm of the airplane. It is powered by the Avionics Bus and protected by a 3-amp circuit breaker, placarded STORM SCOPE, located on the Avionics Circuit Breaker Panel. The WX-500 stormscope displays lightning information directly on the MFD, either on a dedicated page or overlaid on the moving map. The WX-500 stormscope operates in the Strike and Cell Mode and controlled through the MFD panel.

Momentary forward activation of the AUD/STRM switch, located on the pilot's control wheel, will clear lightning strike and cell data from the MFD.

For details on operation refer to BF Goodrich WX-500 Operator's Manual, P/N 009-11501-001.

DISTANCE MEASURING EQUIPMENT (if installed)

The Honeywell Bendix/King Distance Measuring Equipment (DME) system consists of a remote mounted KN 63 transmitter/receiver and a bottom mounted antenna. Channel selection is coupled to the selected NAV frequency. Selection of NAV1, NAV2 or HOLD is made by accessing the tuning window with the DME softkey on the PFD. DME information is displayed in the DME information window to the lower left of the HSI display. The DME information window can be selected on or off by pressing the PFD softkey on the PFD followed by the DME softkey. Audio identification of the station is made by selection of DME audio using the switch located on the master audio panel. The DME is powered by Bus 1 through the Avionics Master relay and is protected by a 3-amp circuit breaker located on the avionics circuit breaker panel.

EMERGENCY LOCATOR TRANSMITTER

The Artex 110-4-002 Emergency Locator Transmitter (ELT) System is designed to meet the requirements of TSO C91a. The system consists of the ELT transmitter, located in the aft fuselage area, an antenna mounted on the aft fuselage, and a remote switch with a red transmit light, usually located on the right side of the instrument panel. Neither the remote switch, nor the switch on the ELT transmitter, can be positioned to prevent the automatic activation of the ELT transmitter. The system is independent from other airplane systems except for the transmit light which is hot-wired to the airplane battery.

The ELT will automatically activate during a crash and transmit a sweeping tone on 121.5 and 243.0 Mhz. This activation is independent of the remote switch setting or availability of airplane power. The remote switch is installed to perform the following functions:

- Test the ELT
- Deactivate the ELT if it has been inadvertently activated by the "G" switch.
- Activate the ELT in an in-flight emergency if an off-airport landing is anticipated.
- Activate the ELT after an off-airport landing, if the impact did not automatically activate it.

The ELT should be tested every twelve months. The test consists of turning the unit on and then resetting it using the following procedures.

- Tests should be conducted between the times of on-the-hour until 5 minutes after the hour.
- Notify any nearby control towers.
- Provide power to an airplane radio and tune it to 121.5 Mhz.

- Place the ELT remote switch to ON. Wait for at least 3 sweeping tones on the airplane radio, which will take about 1 second, then return the switch to ARM.
- The test is successful if the sweeping tones are heard and the transmit light next to the switch blinks immediately. If there is a delay in the illumination of the transmit light, the system is not working properly.

If the ELT should be inadvertently activated by the "G" switch, the transmit light next to the switch will blink. The ELT can be deactivated by momentarily placing the remote switch ON and then back to ARM.

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INTRODUCTION TO SERVICING

The purpose of this section is to outline the requirements for maintaining the Model G36 in a condition equal to that of its original manufacture. This information sets the time intervals at which the airplane should be taken to a Raytheon Aircraft Authorized Outlet for periodic servicing or preventive maintenance.

Title 14 Code of Federal Regulations places the responsibility for the maintenance of this airplane on the owner and operator, who must ensure that all maintenance is done by qualified mechanics in conformity with all airworthiness requirements established for this airplane.

All limits, procedures, safety practices, time limits, servicing and maintenance requirements contained in this handbook are considered mandatory.

Raytheon Aircraft Authorized Outlets can provide recommended modification, service, and operating procedures issued by both the FAA and Raytheon Aircraft which are designed to get maximum utility and safety from the airplane.

If a question arises concerning the care of the Model G36, it is important to include the airplane serial number in any correspondence. The serial number appears on the model designation plate attached to the right side of the fuselage beneath the horizontal stabilizer.

PUBLICATIONS

The following publications for the Model G36 are available through Raytheon Aircraft Authorized Outlets:

1. Pilot's Operating Handbook and FAA Approved Airplane Flight Manual
2. Maintenance Manual
3. Parts Catalog

4. Service Bulletins
5. Various Inspection Forms
6. Electrical Wiring Diagram Manual
7. Avionics Wiring Diagram Manual

The following information will be provided, at no charge, to the registered owner and/or operator of this airplane:

1. Reissues and revisions of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.
2. Original issues and revisions of FAA Approved Airplane Flight Manual Supplements.
3. Original issues and revisions of Raytheon Aircraft Service Bulletins.

The above publications will be provided only to the owner and/or operator at the address listed on the FAA Aircraft Registration Branch List or the Raytheon Aircraft Domestic/International Owner's Notification Service List. Further, the owner and/or operator will receive only those publications pertaining to the registered airplane serial number. For detailed information on how to obtain "Revision Service" applicable to this handbook or other Raytheon Aircraft Service Publications, consult any Raytheon Aircraft Authorized Outlet, or refer to the latest revision of Raytheon Aircraft Service Bulletin No. 2001.

AIRPLANE INSPECTION PERIODS

1. FAA Required Annual Inspection.
2. FAA Required 100-Hour Inspection (for airplanes operated for hire).
3. Raytheon Aircraft Recommended Inspection Guide.
4. Continuing Care Inspection Guide.
5. Refer to the Maintenance Manual for further inspection schedules.

NOTE

In event of any gear or flap extension at speeds above the respective normal extension speeds, inspect gear retract rods, gear doors, and flaps, for damage or distortion before the next flight.

PREVENTATIVE MAINTENANCE THAT MAY BE ACCOMPLISHED BY A CERTIFICATED PILOT

1. A certificated pilot may perform limited maintenance. Refer to 14 CFR Part 43 for the items which may be accomplished.

NOTE

To ensure proper procedures are followed, obtain a model *Bonanza Series Maintenance Manual* before performing preventative maintenance.

2. All other maintenance must be performed by licensed personnel.

NOTE

Pilots operating airplanes of other than U.S. registry should refer to the regulations of the registering authority for information concerning preventative maintenance that may be performed by pilots.

ALTERATIONS OR REPAIRS TO THE AIRPLANE

The FAA should be contacted prior to any alterations on the airplane to ensure that the airworthiness of the airplane is not violated.

NOTE

Alterations and repairs to the airplane must be made by properly licensed personnel.

WARNING

Use only genuine Raytheon Aircraft or Raytheon Aircraft approved parts obtained from Raytheon Aircraft approved sources, in connection with the maintenance and repair of Beech airplanes.

Genuine Raytheon Aircraft parts are produced and inspected under rigorous procedures to ensure airworthiness and suitability for use in Beech airplane applications. Parts purchased from sources other than Raytheon Aircraft, even though outwardly 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.

Salvaged airplane parts, reworked parts obtained from non-Raytheon Aircraft approved sources, or parts, components, or structural assemblies, the service history of which is unknown or cannot be authenticated, may have been subjected to unacceptable stresses or temperatures or have other hidden damage, not discernible through routine visual or usual nondestructive testing techniques. This may render the part, component or structural assembly, even though originally manufactured by Raytheon Aircraft, unsuitable and unsafe for airplane use.

Raytheon Aircraft expressly disclaims any responsibility for malfunctions, failures, damage or injury caused by use of non-Raytheon Aircraft approved parts.

GROUND HANDLING

The three-view drawing in Section 1, GENERAL, shows the minimum hangar clearances for a standard airplane. Allowances must be made for any special radio antennas.

CAUTION

To ensure adequate propeller clearance, always observe recommended shock strut servicing procedures and tire inflation pressures.

TOWING

The nose landing gear is designed with tow lugs on the lower nose gear torque knee. The tow lugs are the only area of attachment to be used when towing the airplane. Under no circumstances should the airplane be towed using other points on the nose landing gear as an attach point for a tow bar.

One person can move the airplane on a smooth and level surface using the hand tow bar furnished with the loose equipment. Attach the tow bar to the tow lugs on the nose gear lower torque knee.

Where movement is restricted, two people can pivot the airplane on the main wheels. One person should push on the wing leading edge or hold the wing tip, while the other operates the tow bar.

CAUTION

Do not exert force on the propeller or control surfaces. Do not place weight on the empennage to raise the nose wheel. When towing with a tug, limit turns to prevent damage to the nose gear. Do not attempt to tow airplane backward by the tail tie-down ring. Do not tow when the main gear is obstructed by mud or snow.

Care should be used when removing the tow bar to prevent damage to the lubrication fittings on the landing gear.

PARKING

The parking brake push-pull T-handle is located on the lower left subpanel. To set the parking brake, pull the parking brake T-handle and depress each toe pedal until firm. Push the T-handle in to release the brakes.

CAUTION

The parking brake should be left off and wheel chocks installed if the airplane is to remain unattended. Changes in ambient temperature can cause the parking brake to release or to exert excessive pressures.

TIE-DOWN

It is advisable to nose the airplane into the wind. Three tie-down lugs are provided; one on the lower side of each wing and a third at the rear of the fuselage.

1. Install the control locks.
2. Chock the main wheels, fore and aft.
3. Using nylon line or chain of sufficient strength, secure the airplane at the three points provided. DO NOT OVERTIGHTEN; if the line at the rear of the fuselage is excessively tight, the nose may rise and produce lift due to the angle of attack of the wings.
4. Release the parking brake.

If high winds are anticipated, a vertical tail post should be installed at the rear tie-down lug and a tie-down line attached to the nose gear.

MAIN WHEEL JACKING

1. Check the shock strut for proper inflation to prevent damage to the landing gear door by the jack adapter and to facilitate installation of the adapter.

CAUTION

Persons should not be in or on the airplane while it is on a main wheel jack.

2. Insert the main wheel jack adapter into the main wheel axle.
3. A scissors-type jack is recommended for raising and lowering the wheel.
4. When lowering the wheel, exercise care to prevent compression of the shock strut, which would force the landing gear door against the jack adapter.

PROLONGED OUT OF SERVICE CARE

The storage procedures listed are intended to protect the airplane from deterioration while it is not in use. The primary objectives of these measures are to prevent corrosion and damage from exposure to the elements.

FLYABLE STORAGE - 7 TO 30 DAYS

For more extended storage periods consult the *Bonanza Series Maintenance Manual* and Teledyne Continental Service Bulletin M81-3 or later issue.

MOORING

If airplane cannot be placed in a hangar, tie down securely at the three points provided. Do not use hemp or manila rope. It is recommended a tail support be used to compress the nose strut and reduce the angle of attack of the wings.

ENGINE PREPARATION FOR STORAGE

Engines in airplanes that are flown only occasionally tend to exhibit cylinder wall corrosion much more than engines that are flown frequently.

Check for correct oil level and add oil if necessary to bring level to full mark.

Run engine at least five minutes at 1200 to 1500 rpm with oil and cylinder head temperatures in the normal operating range.

FUEL CELLS

Fill to capacity to minimize fuel vapor and protect cell inner liners.

FLIGHT CONTROL SURFACES

Lock with internal and external locks.

GROUNDING

Static ground airplane securely and effectively.

PITOT TUBE

Install cover.

WINDSHIELD AND WINDOWS

Close all windows and window vents. It is recommended that covers be installed over windshield and windows.

DURING FLYABLE STORAGE

Each seven days during flyable storage, the propeller should be rotated by hand. After rotating the engine six revolutions, stop the propeller 60° to 120° from the position it was in.

WARNING

Before rotation of propeller blades, ascertain magneto/start switch is OFF, throttle in CLOSED position, and mixture control is in the IDLE CUT-OFF position. Always stand in the clear while turning propeller.

If at the end of 30 days, the airplane has not been removed from storage, the engine should be started and run. The preferred method is to fly the airplane for 30 minutes.

PREPARATION FOR SERVICE

Remove all covers, tape and control locks. Clean the airplane and give it a thorough inspection, particularly landing gear, control surfaces, and static pressure and pitot openings.

Preflight the airplane thoroughly.

EXTERNAL POWER

When using external power, it is very important that the following precautions be observed:

1. Battery 1 and 2 must be installed in the airplane.
2. The airplane has a negative ground system. Exercise care to avoid reversed polarity. Be sure to connect the positive lead of the external power unit to the positive terminal of the airplane's external power receptacle and the negative lead to the negative terminal of the external power receptacle. A positive voltage must also be applied to the small guide pin.
3. To prevent arcing, make certain no power is being supplied when the connection is made.
4. Make certain that the BAT 1 and BAT 2 switches are ON, all avionics and electrical switches are OFF, and a batteries are in the system before connecting an external power unit. This protects the electronic voltage regulators and associated electrical equipment from voltage transients (power fluctuations).

CHECKING ELECTRICAL EQUIPMENT

Connect an external power unit as instructed. (See EXTERNAL POWER in Section 4, NORMAL PROCEDURES). Ensure that the current is stabilized prior to making any electrical equipment or avionics check.

CAUTION

If the external power unit has poor voltage regulation or produces voltage transients, the equipment connected to the unit may be damaged.

SERVICING

FUEL SYSTEM

Refer to Section 2, LIMITATIONS, for a list of approved engine fuels.

FUEL CELLS

CAUTION

Never leave the fuel cells completely empty for more than a few days, as the cell inner lining may dry out and crack, permitting fuel to diffuse through the walls of the cell after refueling. If the cells are to remain empty for a week or more, a thin coating of light engine oil should be sprayed or flushed onto the inner lining of the cells.

The fuel cell installation consists of a 40-gallon capacity (37 gallons usable) fuel cell and filler cap in each wing leading edge. The filler neck in this installation contains a visual measuring tab to permit partial filling of the tank. Filling the tank until the fuel touches the bottom of the tab indicates 27 gallons of usable fuel. Filling to the slot on the tab indicated 32 gallons of usable fuel. The airplane must be level for the tabs to indicate accurately.

FUEL DRAINS

The fuel system is drained at 3 locations: one under each wing just outboard of the fuselage, and a system low point drain in the bottom of the fuel selector valve. All three drains are of snap-type actuation. The fuel selector valve drain is accessible through a door in the fuselage adjacent to the left wing. The three fuel drains should be sampled after refueling and prior to each flight in accordance with the Preflight Inspection in Section 4, NORMAL PROCEDURES.

FUEL STRAINERS

At each 100-hour inspection, the strainer plug should be removed from the fuel injection control valve, and the fuel injection control valve screen washed in fresh cleaning solvent. After the strainer plug has been reinstalled and safetied, the installation should be pressure checked for leakage. The strainer at the bottom of the fuel selector valve should also be removed and cleaned with solvent every 100 hours. To reduce the possibility of contaminated fuel, always cap any disconnected fuel lines or fittings.

Ordinarily, the finger strainers in the fuel cell outlets should not require cleaning unless there is a definite indication of solid foreign material in the cells or the airplane has been stored for an extended period.

OIL SYSTEM

CAUTION

Oil consumption tends to be higher during the break-in period on new engines. Maximum range flights should be avoided and oil level brought to full after each flight during this period.

The engine oil filler cap/dipstick is accessible by raising the left cowl door. Sump capacity is 12 quarts.

The oil should be changed and the oil filter replaced every 100 hours under normal operating conditions. To assure complete drainage, the engine should be at operating temperature. Change the oil as follows:

1. Remove the access plate from the engine cowl on the lower right side.
2. Locate the oil sump drain valve at the low point of the engine sump.

3. Locate drain adapter fitting packaged with loose tools and accessories (P/N 107B Probe Auto-Valve Inc.), and attach a piece of 1/2-inch inside-diameter plastic or rubber tubing (not supplied) of suitable length.
4. Insert drain adapter into quick-drain valve to begin draining oil from the engine.
5. Loosen the spin-off oil filter and remove the filter.
6. Clean and lubricate the new filter gasket with engine oil.
7. Position the new filter on the engine mounting adapter and tighten the filter to a torque of 18-20 foot-pounds.
8. Safety wire the filter to the engine adapter.
9. Remove the drain adapter fitting from the oil sump drain valve; the spring-loaded valve is self-closing. The engine may now be filled with oil.
10. Re-secure the cowl access plate.

The engine manufacturer specifies Ashless Dispersant Oils only. However, for the first 20 hours, MIL-C-6529 Type II Multi viscosity 20W50 Corrosion-Preventative Oil is used. It is recommended that this oil be removed and the oil filter changed at 20 hours of engine operation (not to exceed 25 hours). If oil consumption has not stabilized at this point, MIL-L-6082 Mineral Oil may be used.

After the break-in period, when oil consumption has stabilized, use MIL-L-22851 Ashless Dispersant Oil. Oils must meet the requirements of the latest revision of Teledyne Continental Motors Corporation Specification MHS-24 or current applicable Teledyne Continental Service Bulletin. Refer to APPROVED ENGINE OILS in this section for a list of approved oils.

CAUTION

Do not exceed 25 hours of operation with factory break-in oil (MIL-C-6529, Type II, Multi viscosity, 20W50 Corrosion-preventive). When changing to MIL-L-22851 Ashless Dispersant oil, change the oil and oil filter as previously described.

Failure to remove the corrosion-preventative oil and replace the oil filter within the time interval specified may cause varnish deposits to form on the pistons and cylinder walls and deteriorate the filter element.

BATTERY 1

Battery 1 is accessible by opening the right door of the engine cowling. Check the electrolyte level after each 25 hours of operation and add distilled water as necessary. Do not fill the battery above the bottom of the split ring.

CAUTION

Excessive overcharging can cause heating and boiling. If the charge condition of the battery is not known, water should be added to just cover the separators. Only when the battery is known to be fully charged should the electrolyte level be filled to the split ring. This will prevent electrolyte from percolating out of the battery due to over filling.

Excessive water consumption may be an indication that the voltage regulator requires resetting. The specific gravity of the electrolyte should be checked periodically *(see Bonanza Series Maintenance Manual).*

The battery box is vented overboard to dispose of the hydrogen gas and the electrolyte fumes that are discharged during normal charging operation. To ensure disposal of the fumes and gas, the vent tube should be checked frequently for obstructions.

BATTERY 2

Battery 2 is a sealed lead acid battery located on the cabin side of the firewall, forward of the glove box.

TIRES

An inflation pressure of 33 to 40 psi should be maintained on the 7.00 x 6 main wheel tires. The 5.00 x 5 nose wheel tire should be inflated to 40 psi. Maintaining proper tire inflation will minimize tread wear and aid in preventing tire failure caused from running over sharp stones. When inflating tires, visually inspect them for cracks and breaks.

CAUTION

Raytheon Aircraft cannot recommend the use of recapped tires. Recapped tires have a tendency to swell as a result of the increased temperature generated during takeoff. Increased tire size can jeopardize proper function of the landing gear retract system, with the possibility of damage to the landing gear doors and retract mechanism.

NOTE

While Raytheon Aircraft cannot recommend the use of recapped tires, tires retreaded by an FAA-approved repair station with a specialized service-limited rating in accordance with the latest revision of TSO-C62 may be used.

SHOCK STRUTS

The following procedures may be used for servicing both the main and the nose gear shock struts.

To Inflate Struts:

1. Check to see that the airplane is empty except for full fuel and oil.
2. While rocking the airplane gently to prevent possible binding of the piston in the barrel, inflate each main gear shock strut until 3 inches of the piston is showing. Inflate the nose gear shock strut until the piston is extended 5 inches as indicated on the shock strut servicing instructions placard.

CAUTION

If a compressed air bottle containing air under extremely high pressure is used, exercise care to avoid over-inflating the shock strut.

WARNING

NEVER FILL SHOCK STRUTS WITH OXYGEN.

3. Remove all foreign material from the exposed piston with a soft cloth moistened with hydraulic fluid.

To Replenish Strut Hydraulic Fluid:

1. Support the airplane on jacks at the wing jack points.
2. Remove the air valve cap, depress the valve core, and allow the strut to fully deflate.
3. Raise and block the strut 1/4 inch from the compressed position.

WARNING

Do not remove the valve body assembly until all air pressure has been released or it may blow off, causing injury to personnel or damage to equipment.

4. Carefully remove the valve body assembly.
5. Fill the strut to the level of the valve body assembly with hydraulic fluid (refer to the *Bonanza Series Maintenance Manual*).
6. Slowly extend the strut from the blocked position and replace the valve body assembly.
7. Completely compress the strut to release excess air and oil, then reinstall valve core.
8. Inflate the strut as described in the preceding inflation procedure.

SHIMMY DAMPER

The shimmy damper has a reservoir of fluid carried in the piston rod. Two coil springs installed in the piston rod keep the fluid in the shimmy damper under pressure. As fluid is lost through leakage it is automatically replenished from the reservoir until the reservoir supply is exhausted.

To check the fluid in the shimmy damper, insert a wire approximately 1/32 inch in diameter through the hole in the disc at the aft end of the piston rod until it touches the bottom of the hole in the floating piston. Mark the wire, remove it, and measure the depth of the insertion. When the shimmy damper is full, insertion depth is 2-3/16 inches; when empty, 3-1/16 inches.

NOTE

The measuring wire should be inserted in the hole in the floating piston rather than against the piston face, to give a more accurate reading. To determine if the wire is inserted in the hole in the floating piston, insert the wire several times, noting insertion depth each time. When the wire is inserted in the hole, the depth will be about 1/4-inch greater than when it rests against the piston face.

When the shimmy damper is found empty or nearly empty, it should be refilled. See *Bonanza Series Maintenance Manual.*

BRAKES

The brake hydraulic fluid reservoir is located on the firewall in the engine compartment. A dipstick is attached to the reservoir cap. Refer to the *Bonanza Series Maintenance Manual* for hydraulic fluid specification.

The brakes require no adjustments, since the pistons move to compensate for lining wear.

INDUCTION AIR FILTER

This filter should be inspected for foreign matter at least once during each 50-hour operating period. In adverse climatic conditions, or if the airplane is stored, preflight inspection is recommended.

To Remove Filter:

1. Remove the fuselage nose section grill.
2. Remove the threaded fasteners securing the filter and remove the filter.

PROPELLER

Propeller operation, servicing, and maintenance instructions are contained in the propeller operator's manual furnished with the airplane.

WARNING

When servicing a propeller, always make certain the ignition switch is off and that the engine has cooled completely. STAND IN THE CLEAR WHEN MOVING A PROPELLER. THERE IS ALWAYS SOME DANGER OF A CYLINDER FIRING WHEN A PROPELLER IS MOVED.

MINOR MAINTENANCE

RUBBER SEALS

To prevent sticking of the rubber seals around the windows, doors, and engine cowling, the seals should be coated with Oakite 6 compound. The compound is noninjurious to paint and can be removed by normal cleaning methods.

ALTERNATORS

Since both alternators and electronic voltage regulators are designed for use on a negative ground system only, the following precautionary measures must be observed when working on the charging circuit, or serious damage to the electrical equipment will result:

1. When installing a battery, make certain that the ground polarity of the battery and the ground polarity of the alternator are the same.
2. When connecting a power source, be sure to connect the negative battery terminals together and the positive battery terminals together.

3. When using a battery charger, connect the positive lead of the charger to the positive battery terminal and the negative lead of the charger to the negative battery terminal.
4. Do not operate an alternator on an open circuit. Be sure all circuit connections are secure.
5. Do not short across or ground any of the terminals on the alternator or electronic voltage regulator.
6. Do not attempt to polarize an alternator.

MAGNETOS

Ordinarily, the magnetos will require only occasional adjustment, lubrication, and breaker point replacement. This work should be done by a Raytheon Aircraft Authorized Outlet.

WARNING

To be safe, treat the magnetos as hot whenever a switch lead is disconnected at any point; they do not have an internal automatic grounding device. The magnetos can be grounded by replacing the switch lead at the noise filter capacitor with a wire which is grounded to the engine case. Otherwise, all spark plug leads should be disconnected or the cable outlet plate on the rear of the magneto should be removed.

CLEANING

EXTERIOR PAINTED SURFACES

CAUTION

Polyester urethane finishes undergo a curing process for a period of 30 days after application. Wash uncured painted surfaces with a mild non-detergent soap (MILD detergents can be used on urethane finishes) and cold or lukewarm water only. Use soft cloths, keeping them free of dirt and grime. Any rubbing of the surface should be done gently and held to a minimum to avoid damaging the paint film. Rinse thoroughly with clear water. Stubborn oil or soot deposits may be removed with automotive tar removers.

Prior to cleaning, cover the wheels, making certain the brake discs are covered. Attach the pitot cover securely and plug or mask off all other openings. Be particularly careful to mask off all static air buttons before washing or waxing. When cleaning, use special care to avoid removing lubricant from lubricated areas.

Hand washing may be accomplished by flushing away loose dirt with clean water, then washing with a mild soap and water, using soft cleaning cloths or a chamois. Avoid harsh, abrasive, or alkaline soaps or detergents which could cause corrosion or scratches. Thorough clear-water rinsing prevents buildup of cleaning agent residue, which can dull the paint's appearance. To remove oily residue or exhaust soot, use a cloth dampened with an automotive tar remover. Wax or polish the affected area if necessary.

WARNING

Do not expose control surface trim tab hinge lines and their pushrod systems to the direct stream or spray of high-pressure soap-and-water washing equipment. Fluid dispensed at high pressure could remove the protective lubricant, allowing moisture from heavy or prolonged rain to collect at hinge lines, and then to freeze at low temperatures. After high-pressure or hand washing, and at each periodic inspection, lubricate trim tab hinge lines and trim tab pushrod end fittings (Brayco 300 per Federal Specification VV-L-800 preferred). See the *Bonanza Series Maintenance Manual*.

When using high-pressure washing equipment, keep the spray or stream clear of wheel bearings, propeller hub bearings, etc. Openings such as pitot tubes, static air buttons, and battery and avionics equipment cooling ducts should be securely covered or masked off. Avoid directing high-pressure sprays toward the fuselage, wings, and empennage from the rear, where moisture and chemicals might more easily enter the structure, causing corrosion damage to structural members and moving parts.

CAUTION

When cleaning wheel well areas with solvent, especially if high-pressure equipment is used, exercise care to avoid washing away grease from landing gear components. After washing the wheel well areas with solvent, lubricate all lubrication points, or premature wear may result.

During the curing period, do not make prolonged flights in heavy rain or sleet, and avoid all operating conditions which might cause abrasion or premature finish deterioration.

CAUTION

Do not apply wax, polish, rubbing compound or abrasive cleaner to any uncured painted surface. Use of such items can permanently damage the surface finish. Also, waxes and polishes seal the paint from the air and prevent curing.

Waxing of polyester urethane finishes, although not required, is permitted. However, never use abrasive cleaner-type waxes, polishes, or rubbing compounds, as these products cause eventual deterioration of the characteristic urethane gloss.

For waxing, select a high quality automotive or aircraft waxing product. Do not use a wax containing silicones, as silicon polishes are difficult to remove from surfaces. A buildup of wax on any exterior paint finish will yellow with age; therefore, wax should be removed periodically. Generally, aliphatic naphtha (see the *Bonanza Series Maintenance Manual*) is adequate and safe for this purpose.

NOTE

Before returning the airplane to service, remove all maskings and coverings and relubricate as necessary.

WINDOWS AND WINDSHIELDS

The windshield and plastic windows should be kept clean and waxed. To prevent scratches, wash the windows carefully with plenty of soap and water, using the palm of the hand to dislodge dirt and mud. Flood the surface with clean water to rinse away dirt and soap. After rinsing, dry the windows with a clean, moist chamois. Rubbing the surface of the plastic with a dry cloth should be avoided, as it builds up an electrostatic charge on the surface which attracts dust particles.

NOTE

The manufacturer of the windshield/window material has approved the use of Permatex Plastic Cleaner and Whiz Aircraft Windshield Cleaner for cleaning the windshield and cabin windows. However, the use of soap and water is still the preferred method of cleaning.

Remove any oil or grease on the surface of the plastic with a cloth moistened with kerosene, then wash the surface with soap and water. Never use gasoline, benzene, alcohol, acetone, carbon tetrachloride, fire-extinguisher agent, anti-ice fluid, lacquer thinner, or glass cleaner other than noted above. These materials will soften the plastic and may cause it to craze.

After a thorough cleaning, wax the surface with a good grade of commercial wax that does not have an acrylic base. The wax will fill in minor scratches and help prevent further scratching. Apply a thin, even coat of wax and bring it to a high polish by rubbing lightly with a clean, dry, soft flannel cloth. Do not use a power buffer. The heat generated by the buffing pad may soften the plastic.

ENGINE

Clean the engine with neutral solvent. Spray or brush the fluid over the engine, then wash off with water and allow to dry.

CAUTION

Do not use solutions which may attack rubber or plastic. Protect engine switches, controls and seals. Fluid applied at high pressure can unseat seals, resulting in contamination of the sealed systems.

LANDING GEAR

After operation on salty or muddy runways, wash the main gear and nose gear with low-pressure water and a mild detergent as soon as practical. Rinse with clear water and blow dry with low-pressure air immediately after rinsing. Relubricate as necessary.

INTERIOR

To remove dust and loose dirt from the upholstery, headliner, and carpet, clean the interior regularly with a vacuum cleaner.

Blot up any spilled liquid promptly with cleansing tissues or rags. Do not pat the spot. Press the blotting material firmly and hold it for several seconds. Continue blotting until no more liquid is taken up. Scrape off sticky materials with a dull knife, then spot clean the area.

Oily spots may be cleaned with household spot removers, used sparingly. Before using any solvent, read the instructions on the container and test it on an obscure place on the fabric to be cleaned. Never saturate the fabric with a volatile solvent, as it may damage the padding and backing materials.

Soiled upholstery and carpet may be cleaned with foam-type detergent used according to the manufacturer's instructions.

To minimize wetting the fabric, keep the foam as dry as possible and remove it with a vacuum cleaner.

The plastic trim, instrument panels, and control knobs need only be wiped with a damp cloth. Oil and grease on the control wheel and control knobs can be removed with a cloth moistened with kerosene. Volatile solvents, such as those mentioned in the article on care of plastic windows should never be used, since they soften and craze the plastic.

CONSUMABLE MATERIALS

For a complete list of Consumable Materials refer to the *Bonanza Series Maintenance Manual.*

APPROVED ENGINE OILS

COMPANY	BRAND NAME
BP Oil Corporation	BP Aero Oil D65/80
Castrol Ltd (Australia)	Grade 40, Castrolaero AD Oil
Continental Oil Co.	Conoco Aero S (SAE 10W30)
Delta Petroleum Co.	Delta Avoil
Exxon Company, USA	Exxon Aviation Oil EE
Gulf Oil Corporation	Gulfpride Aviation AD
Mobil Oil Co.	Mobil Aero, Super Aero Oil 20W50
Phillips Petroleum Co.	Phillips 66 Aviation Oil Type A
Quaker State Oil and Ref. Corp.	Quaker State AD Aviation Engine Oil
Red Ram Ltd (Canada)	Red Ram X/C Aviation Oil 20W50
Sinclair Refining Co.	Sinclair Avoil 20W40
Shell Oil Co.	Aeroshell Oil W (in 4 grades)
Shell Canada, Ltd	Aeroshell Oil W
Socony - Mobil	Mobil Aero Oil
Texaco, Inc.	Texaco Aircraft Engine Oil Premium AD
Union Oil of California	Union Aircraft Engine Oil HD

This chart lists all oils which were certified as meeting the requirements of Teledyne Continental Motors Corporation Specification MHS-24 at the time this handbook was published. Any other oil which conforms to this specification may be used.

LAMP REPLACEMENT GUIDE

LOCATION	*NUMBER*
Close Focus Reading Lights, Cabin	303
Combination Tail Strobe/Navigation Light	678
Compass Light	MS25237-237 or M6363/8-5
Control Wheel Map Light	WL-41069R
Courtesy Light, Cabin and Utility Door	303
Elevator Tab Position Indicator Light	A-7195-4-334
Flap Position Light	MS25237-237 or M6363/8-5
Fuel Selector Placard Light	A6795B
Instrument Flood Light Overhead	01-0271008-00
Instrument Light, Post	327
Instrument Wedge Light	58-380022-13
Landing Gear Position Light	MS25237-237 or M6363/8-5
Landing Light, Nose Section	4596
Navigational Light, Wing	A1815A-R-7512
Flashing Beacon (Grimes)	A-7079B-24
Flashing Beacon (Whelen)	34-0226010-91
Step Light	1495
Taxi Light, Nose Shock Strut	4596
Wing Strobe Lights	
Grimes	30-1331-3
SDI	701148-7-2

SUPPLEMENTS

NOTE

The supplemental data contained in this section is for equipment that was delivered on the airplane including standard optional equipment that was available, whether it was installed or not. Airplane Flight Manual Supplements for equipment for which the vendor obtained a Supplemental Type Certificate were included as loose equipment with the airplane at the time of delivery. These and other Airplane Flight Manual Supplements for other equipment that was installed after the airplane was delivered new from the factory should be placed in this section.

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Raytheon Aircraft Company

LOG OF SUPPLEMENTS

Model G36 Bonanza

Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

P/N 36-590002-71

June, 2006

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

PART NUMBER	SUBJECT	REV NO.	DATE
HPA36-2	Hartzell 3-Bladed Propellers per STC SA00719LA	C	Jan, 2006
*36-590002-77	Airplanes Registered in Brazil		Apr, 2006

NOTE: Supplements applicable to equipment other than that installed may, at the discretion of the owner/operator, be removed from the manual.

** Supplements marked with an asterisk will not be supplied with handbooks sold through Authorized Raytheon Outlets due to their limited applicability. If a document is required for your airplane, please order the document through normal channels.*

Marsh Aviation Co.
5060 E. Falcon Dr.
Mesa, Arizona 85215
Supplement #HPA36-2

PILOT'S OPERATING HANDBOOK
and
FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
to the
RAYTHEON A36, G36 BONANZA POH & FAA APPROVED AFM

(IO-550 engine)

Hartzell PHC-C3YF-1RF/F8468A (B,K)-6R propeller installation

REVISION C, January 5, 2006

Aircraft S/N: __________ Aircraft Reg. No: __________

General

This supplement must be attached to the FAA Approved Airplane Flight Manual when the airplane is modified by the installation of a Hartzell PHC-C3YF-1RF/F8468A(B,K) – 6R propeller in accordance with STC SA00719LA

The information contained herein supplements or supersedes the basic manual only in those areas listed herein. For limitations, procedures, and performance information not contained in this supplement, consult the POH & FAA Approved AFM P/N 36-590002-37 or 36-590002-71.

FAA Approved [signature]
Manager, Flight Test Branch ACE-117C
Federal Aviation Administration
Chicago Aircraft Certification Office

Date: JAN 20 2006

Marsh Aviation Co.
5060 E. Falcon Dr.
Mesa, Arizona 85215
Supplement #HPA36-2

PILOT'S OPERATING HANDBOOK
and
FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
to the
RAYTHEON A36, G36 BONANZA
POH & FAA APPROVED AFM (IO-550 engine)

STC No. SA00719LA

LOG OF PAGES

Revision Number	Page	Date	Description	FAA Approved
Original	1 2 3 4	12-31 1998	Complete Supplement	
A	All	4/6/05	Added G36 Model	
B	1	10/26/05	Added P/N for G36 AFM/POH	
C	1	1/5/06	Corrected P/N for G36 AFM/POH	Lum Anderson ACE-117C

Revision denoted by change bar in the left margin

JAN 20 2006

Marsh Aviation Co.
5060 E. Falcon Dr.
Mesa, Arizona 85215
Supplement #HPA36-2

PILOT'S OPERATING HANDBOOK
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to the
RAYTHEON A36, G36 BONANZA
POH & FAA APPROVED AFM (IO-550 engine)

STC No. SA00719LA

General Sec-I & Limitations Sec – II

Propeller:	Hartzell	PHC-C3YF-1RF/ F8468A(B,K)-6R
Pitch		High: 36.0 ± 1.0 degrees Low: 13.0 ± 0.2 degrees Measured at 30 inch station Maximum Diameter: 80 inches Minimum Diameter: 78 inches
Spinner:		Hartzell A-2295-2(P) and A-2476-7 spinner mounting kit.
Governor:		Woodward D210760 or McCauley C290D3-X/T23

Emergency Procedures Sec-III

No change.

FAA Approved Date: JAN 20 2006

Marsh Aviation Co.
5060 E. Falcon Dr.
Mesa, Arizona 85215
Supplement #HPA36-2

PILOT'S OPERATING HANDBOOK
and
FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
to the
RAYTHEON A36, G36 BONANZA POH & FAA APPROVED AFM (IO-550 engine)

STC No. SA00719LA

Normal Procedures Sec – IV

No change.

Performance Sec – V
No change.

Weight and Balance/Equipment List Sec – VI
Weight and balance information is contained in the STC Installation Instructions HPA36-1 or HP36-1A, and the Aircraft Equipment List.

Systems Description Sec – VII
Constant speed, 3 blade propeller with aluminum hub and aluminum blades. A full description may be found in Hartzell Manual 115N.

Handling Service and Maintenance Sec – VIII
Refer to Hartzell Manual 115N. Recommended time-between-overhaul may be found in Hartzell Service Letter 61 or Hartzell Manual 113 B.

FAA Approved Date: JAN 2 0 2006

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SAFETY INFORMATION
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INTRODUCTION

Beech Aircraft Corporation has developed this special summary publication of safety information to refresh pilots' and owners' knowledge of safety related subjects. Topics in this publication are dealt with in more detail in FAA Advisory Circulars and other publications pertaining to the subject of safe flying.

The skilled pilot recognizes that safety consciousness is an integral - and never-ending - part of his or her job. Be thoroughly familiar with your airplane. Know its limitations and your own. Maintain your currency, or fly with a qualified instructor until you are current and proficient. Practice emergency procedures at safe altitudes and airspeeds, preferably with a qualified instructor pilot, until the required action can be accomplished without reference to the manual. Periodically review this safety information as part of your recurrency training regimen.

BEECHCRAFT airplanes are designed and built to provide you with many years of safe and efficient transportation. By maintaining your BEECHCRAFT properly and flying it prudently you will realize its full potential.

. . . . Beech Aircraft Corporation

WARNING

Because your airplane is a high performance, high speed transportation vehicle, designed for operation in a three-dimensional environment, special safety precautions must be observed to reduce the risk of fatal or serious injuries to the pilot(s) and occupant(s).

It is mandatory that you fully understand the contents of this publication and the other operating and maintenance manuals which accompany the airplane; that FAA requirements for ratings, certifications and review be scrupulously complied with; and that you allow only persons who are properly licensed and rated, and thoroughly familiar with the contents of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual to operate the airplane.

IMPROPER OPERATION OR MAINTENANCE OF AN AIRPLANE, NO MATTER HOW WELL BUILT INITIALLY, CAN RESULT IN CONSIDERABLE DAMAGE OR TOTAL DESTRUCTION OF THE AIRPLANE, ALONG WITH SERIOUS OR FATAL INJURIES TO ALL OCCUPANTS.

GENERAL

As a pilot, you are responsible to yourself and to those who fly with you, to other pilots and their passengers and to people on the ground, to fly wisely and safely.

The following material in this Safety Information publication covers several subjects in limited detail. Here are some condensed Do's and Don'ts.

DO'S

Be thoroughly familiar with your airplane, know its limitations and your own.

Be current in your airplane, or fly with a qualified instructor until you are current. Practice until you are proficient.

Preplan all aspects of your flight - including a proper weather briefing and adequate fuel reserves.

Use services available - weather briefing, inflight weather and Flight Service Station.

Carefully preflight your airplane.

Use the approved checklist.

Have more than enough fuel for takeoff, plus the trip, and an adequate reserve.

Be sure your weight and C.G. are within limits.

Use seatbelts and shoulder harnesses at all times.

Be sure all loose articles and baggage are secured.

Check freedom and proper direction of operation of all controls during preflight inspection.

Maintain the prescribed airspeeds in takeoff, climb, descent, and landing.

Avoid wake turbulence (Vortices).

Preplan fuel and fuel tank management before the actual flight. Utilize auxiliary tanks only in level cruise flight. Take off and land on the fullest main tank, NEVER use auxiliary tanks for takeoff or landing.

Practice emergency procedures at safe altitudes and airspeeds, preferably with a qualified instructor pilot, until the required action can be accomplished without reference to the manual.

Keep your airplane in good mechanical condition.

Stay informed and alert; fly in a sensible manner.

DON'TS

Don't take off with frost, ice or snow on the airplane.

Don't take off with less than minimum recommended fuel, plus adequate reserves, and don't run the tank dry before switching.

Don't fly in a reckless, show-off, or careless manner.

Don't fly into thunderstorms or severe weather.

Don't fly in possible icing conditions.

Don't fly close to mountainous terrain.

Don't apply controls abruptly or with high forces that could exceed design loads of the airplane.

Don't fly into weather conditions that are beyond your ratings or current proficiency.

Don't fly when physically or mentally exhausted or below par.

Don't trust to luck.

SOURCES OF INFORMATION

There is a wealth of information available to the pilot created for the sole purpose of making your flying safer, easier and more efficient. Take advantage of this knowledge and be prepared for an emergency in the event that one should occur.

PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL

You must be thoroughly familiar with the contents of your operating manuals, placards, and check lists to ensure safe utilization of your airplane. When the airplane was manufactured, it was equipped with one or more of the following: placards, Owner's Manual, FAA Approved Airplane Flight Manual, FAA Approved Airplane Flight Manual Supplements, Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. Beech has revised and reissued many of the early manuals for certain models of airplanes in GAMA Standard Format as Pilot's Operating Handbooks and FAA Approved Airplane Flight Manuals. For simplicity and convenience, all official manuals in various models are referred to as the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. If the airplane has changed ownership, the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual may have been misplaced or may not be current. Replacement handbooks may be obtained from any BEECHCRAFT Authorized Outlet.

BEECHCRAFT SERVICE PUBLICATIONS

Beech Aircraft Corporation publishes a wide variety of manuals, service letters, service instructions, service bulletins, safety communiques and other publications for the various models of BEECHCRAFT airplanes. Information on how to obtain publications relating to your airplane is contained in BEECHCRAFT Service Bulletin number 2001, entitled "General - BEECHCRAFT Service Publications - What is Available and How to Obtain It."

Beech Aircraft Corporation automatically mails original issues and revisions of BEECHCRAFT Service Bulletins (Mandatory, Recommended and Optional), FAA Approved Airplane Flight Manual Supplements, reissues and revisions of FAA Approved Airplane Flight Manuals, Flight Handbooks, Owners Manuals, Pilot's Operating Manuals and Pilot's Operating Handbooks, and original issues and revisions of BEECHCRAFT Safety Communiques to BEECHCRAFT Owner addresses as listed by the FAA Aircraft Registration Branch List and the BEECHCRAFT International Owner Notification Service List. While this information is distributed by Beech Aircraft Corporation, Beech can not make changes in the name or address furnished by the FAA. The owner must contact the FAA regarding any changes to name or address. Their address is: FAA Aircraft Registration Branch (AAC250) P.O. Box 25082, Oklahoma City, OK 73125, Phone (405) 680-2131.

It is the responsibility of the FAA owner of record to ensure that any mailings from Beech are forwarded to the proper persons. Often the FAA registered owner is a bank or financing company or an individual not in possession of the airplane. Also, when an airplane is sold, there is a lag in processing the change in registration with the FAA. If you are a new owner, contact your BEECHCRAFT Authorized Outlet and ensure your manuals are up to date.

Beech Aircraft Corporation provides a subscription service which provides for direct factory mailing of BEECHCRAFT publications applicable to a specific serial number airplane. Details concerning the fees and ordering information for this owner subscription service are contained in Service Bulletin number 2001.

For owners who choose not to apply for a Publications Revision Subscription Service, Beech provides a free Owner Notification Service by which owners are notified by post card of BEECHCRAFT manual reissues, revisions and supplements which are being issued applicable to the airplane owned. On receipt of such notification, the owner may obtain the publication through a BEECHCRAFT Authorized Outlet. This notification service is available when requested by the owner. This request may be made by using the owner notification request card furnished with the loose equipment of each airplane at the time of delivery, or by a letter requesting this service, referencing the specific airplane serial number owned. Write to:

Supervisor, Special Services
Dept. 52
Beech Aircraft Corporation
P.O. Box 85
Wichita, Kansas 67201-0085

From time to time Beech Aircraft Corporation issues BEECHCRAFT Safety Communiques dealing with the safe operation of a specific series of airplanes, or airplanes in general. It is recommended that each owner/operator maintain a current file of these publications. Back issues of BEECHCRAFT Safety Communiques may be obtained without charge by sending a request, including airplane model and serial number, to the Supervisor, Special Services, at the address listed above.

Airworthiness Directives (AD's) are not issued by the manufacturer. They are issued and available from the FAA.

FEDERAL AVIATION REGULATIONS

FAR Part 91, General Operating and Flight Rules, is a document of law governing operation of airplanes and the owner's and pilot's responsibilities. Some of the subjects covered are:

Responsibilities and authority of the pilot-in-command

Certificates required

Liquor and drugs

Flight plans

Preflight action

Fuel requirements

Flight rules

Maintenance, preventive maintenance, alterations, inspection and maintenance records

You, as a pilot, have responsibilities under government regulations. The regulations are designed for your protection and the protection of your passengers and the public. Compliance is mandatory.

AIRWORTHINESS DIRECTIVES

FAR Part 39 specifies that no person may operate a product to which an Airworthiness Directive issued by the FAA applies, except in accordance with the requirements of that Airworthiness Directive.

AIRMAN'S INFORMATION MANUAL

The Airman's Information Manual (AIM) is designed to provide airmen with basic flight information and ATC procedures for use in the national airspace system of the United States. It also contains items of interest to pilots concerning health and medical facts, factors affecting flight safety, a pilot/controller glossary of terms in the Air Traffic Control system, information on safety, and accident/hazard reporting. It is revised at six-month intervals and can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

This document contains a wealth of pilot information. Among the subjects are:

Controlled Airspace
Emergency Procedures
Services Available to Pilots
Weather and Icing
Radio Phraseology and Technique
Mountain Flying
Airport Operations
Wake Turbulence - Vortices
Clearances and Separations
Medical Facts for Pilots
Preflight
Bird Hazards
Departures - IFR
Good Operating Practices
En route - IFR
Airport Location Directory
Arrival - IFR

All pilots must be thoroughly familiar with and use the information in the AIM.

ADVISORY INFORMATION

NOTAMS (Notices to Airmen) are documents that have information of a time-critical nature that would affect a pilot's decision to make a flight; for example, an airport closed, terminal radar out of service, or enroute navigational aids out of service.

FAA ADVISORY CIRCULARS

The FAA issues Advisory Circulars to inform the aviation public in a systematic way of nonregulatory material of interest. Advisory Circulars contain a wealth of information with which the prudent pilot should be familiar. A complete list of current FAA Advisory Circulars is published in AC 00-2, which lists Advisory Circulars that are for sale, as well as those distributed free of charge by the FAA, and provides ordering information. Many Advisory Circulars which are for sale can be purchased locally in aviation bookstores or at FBO's. These documents are subject to periodic revision. Be certain the Advisory Circular you are using is the latest revision available. Some of the Advisory Circulars of interest to pilots are:

***00-6**	Aviation Weather
00-24	Thunderstorms
00-30	Rules of Thumb for Avoiding or Minimizing Encounters with Clear Air Turbulence
***00-45**	Aviation Weather Services
00-46	Aviation Safety Reporting Program
20-5	Plane Sense
20-32	Carbon Monoxide (CO) Contamination in Aircraft - Detection and Prevention
20-35	Tie-Down Sense
20-43	Aircraft Fuel Control
20-105	Engine Power-Loss Accident Prevention
20-113	Pilot Precautions and Procedures to be Taken in Preventing Aircraft Reciprocating Engine Induction System & Fuel System Icing Problems
20-125	Water in Aviation Fuel

21-4	Special Flight Permits for Operation of Overweight Aircraft
43-9	Maintenance Records: General Aviation Aircraft
43-12	Preventive Maintenance
60-4	Pilot's Spatial Disorientation
60-6	Airplane Flight Manuals (AFM), Approved Manual Materials, Markings and Placards - Airplanes
60-12	Availability of Industry-Developed Guidelines for the Conduct of the Biennial Flight Review
60-13	The Accident Prevention Counselor Program
*61-9	Pilot Transition Courses for Complex Single-Engine and Light Twin-Engine Airplanes
*61-21	Flight Training Handbook
*61-23	Pilot's Handbook of Aeronautical Knowledge
*61-27	Instrument Flying Handbook
61-67	Hazards Associated with Spins in Airplanes Prohibited from Intentional Spinning.
61-84	Role of Preflight Preparation
*67-2	Medical Handbook for Pilots
90-23	Aircraft Wake Turbulence
90-42	Traffic Advisory Practices at Nontower Airports

90-48	Pilot's Role in Collision Avoidance
90-66	Recommended Standard Traffic Patterns for Airplane Operations at Uncontrolled Airports
90-85	Severe Weather Avoidance Plan (SWAP)
91-6	Water, Slush and Snow on the Runway
91-13	Cold Weather Operation of Aircraft
*91-23	Pilot's Weight and Balance Handbook
91-26	Maintenance and Handling of Air Driven Gyroscopic Instruments
91-33	Use of Alternate Grades of Aviation Gasoline for Grade 80/87 and Use of Automotive Gasoline
91-35	Noise, Hearing Damage, and Fatigue in General Aviation Pilots
91-43	Unreliable Airspeed Indications
91-44	Operational and Maintenance Practices for Emergency Locator Transmitters and Receivers
91-46	Gyroscopic Instruments - Good Operating Practices
91-50	Importance of Transponder Operations and Altitude Reporting
91-51	Airplane Deice and Anti-ice Systems
91-59	Inspection and Care of General Aviation Aircraft Exhaust Systems
91-65	Use of Shoulder Harness in Passenger Seats

103-4	Hazards Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft
210-5A	Military Flying Activities

*** For Sale**

FAA GENERAL AVIATION NEWS

FAA General Aviation News is published by the FAA in the interest of flight safety. The magazine is designed to promote safety in the air by calling the attention of general aviation airmen to current technical, regulatory and procedural matters affecting the safe operation of airplanes. FAA General Aviation News is sold on subscription by the Superintendent of Documents, Government Printing Office, Washington D.C., 20402.

FAA ACCIDENT PREVENTION PROGRAM

The FAA assigns accident prevention specialists to each Flight Standards and General Aviation District Office to organize accident prevention program activities. In addition, there are over 3,000 volunteer airmen serving as accident prevention counselors, sharing their technical expertise and professional knowledge with the general aviation community. The FAA conducts seminars and workshops, and distributes invaluable safety information under this program.

Usually the airport manager, the FAA Flight Service Station (FSS), or Fixed Base Operator (FBO), will have a list of accident prevention counselors and their phone numbers available. All Flight Standards and General Aviation District Offices have a list of the counselors serving the District.

Before flying over unfamiliar territory, such as mountainous terrain or desert areas, it is advisable for transient pilots to consult with local counselors. They will be familiar with the more desirable routes, the wind and weather conditions, and the service and emergency landing areas that are available along the way. They can also offer advice on the type of emergency equipment you should be carrying.

ADDITIONAL INFORMATION

The National Transportation Safety Board and the Federal Aviation Administration periodically issue, in greater detail, general aviation pamphlets concerning aviation safety. FAA Regional Offices also publish material under the FAA General Aviation Accident Prevention Program. These can be obtained at FAA Offices, Weather Stations, Flight Service Stations or Airport Facilities. Some of these are titled:

12 Golden Rules for Pilots
Weather or Not
Disorientation
Plane Sense
Weather Info Guide for Pilots
Wake Turbulence
Don't Trust to Luck, Trust to Safety
Rain, Fog, Snow
Thunderstorm - TRW
Icing
Pilot's Weather Briefing Guide
Thunderstorms Don't Flirt ... Skirt 'em
IFR-VFR - Either Way Disorientation Can Be Fatal
IFR Pilot Exam-O-Grams
VFR Pilot Exam-O-Grams
Tips on Engine Operation in Small General Aviation Aircraft
Estimating Inflight Visibility
Is the Aircraft Ready for Flight
Tips on Mountain Flying
Tips on Desert Flying
Always Leave Yourself An Out

Safety Guide for Private Aircraft Owners
Tips on How to Use the Flight Planner
Tips on the Use of Ailerons and Rudder
Some Hard Facts About Soft Landings
Propeller Operation and Care
Torque "What it Means to the Pilot"
Weight and Balance. An Important Safety Consideration for Pilots

GENERAL INFORMATION ON SPECIFIC TOPICS

MAINTENANCE

Safety of flight begins with a well maintained airplane. Make it a habit to keep your airplane and all its equipment in airworthy condition. Keep a "squawk list" on board, and see that all discrepancies, however minor, are noted and promptly corrected.

Schedule your maintenance regularly, and have your airplane serviced by a reputable organization. Be suspicious of bargain prices for maintenance, repair and inspections.

It is the responsibility of the owner and the operator to assure that the airplane is maintained in an airworthy condition and that proper maintenance records are kept.

Use only genuine BEECHCRAFT or BEECHCRAFT approved parts obtained from BEECHCRAFT approved sources, in connection with the maintenance and repair of Beech airplanes.

Genuine BEECHCRAFT parts are produced and inspected under rigorous procedures to insure airworthiness and suitability for use in Beech airplane applications. Parts purchased from sources other than BEECHCRAFT, even though outwardly 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.

Salvaged airplane parts, reworked parts obtained from non-BEECHCRAFT approved sources or parts, components, or structural assemblies, the service history of which is unknown or cannot be authenticated, may have been subjected to unacceptable stresses or temperatures or have other hidden damage not discernible through routine visual or usual nondestructive testing techniques. This may render the part, component, or structural assembly, even though originally manufactured by BEECHCRAFT, unsuitable and unsafe for airplane use.

BEECHCRAFT expressly disclaims any responsibility for malfunctions, failures, damage or injury caused by use of non-BEECHCRAFT parts.

Airplanes operated for Air Taxi or other than normal operation, and airplanes operated in humid tropics, or cold and damp climates, etc., may need more frequent inspections for wear, corrosion and/or lack of lubrication. In these areas, periodic inspections should be performed until the operator can set his own inspection periods based on experience.

NOTE

The required periods do not constitute a guarantee that the item will reach the period without malfunction, as the aforementioned factors cannot be controlled by the manufacturer.

Corrosion and its effects must be treated at the earliest possible opportunity. A clean, dry surface is virtually immune to corrosion. Make sure that all drain holes remain unobstructed. Protective films and sealants help to keep corrosive agents from contacting metallic surfaces. Corrosion inspections should be made most frequently under high-corrosion-risk operating conditions, such as in areas of excessive airborne salt concentrations (e.g., near the sea) and in high-humidity areas (e.g., tropical regions).

If you have purchased a used airplane, have your mechanic inspect the airplane registration records, logbooks and maintenance records carefully. An unexplained period of time for which the airplane has been out of service, or unexplained significant repairs may well indicate the airplane has been seriously damaged in a prior accident. Have your mechanics inspect a used airplane carefully. Take the time to ensure that you really know what you are buying when you buy a used airplane.

HAZARDS OF UNAPPROVED MODIFICATIONS

Many airplane modifications are approved under Supplemental Type Certificates (STC's). Before installing an STC on your airplane, check to make sure that the STC does not conflict with other STC's that have already been installed. Because approval of an STC is obtained by the individual STC holder based upon modification of the original type design, it is possible for STC's to interfere with each other when both are installed. Never install an unapproved modification of any type, however innocent the apparent modification may seem. Always obtain proper FAA approval.

Airplane owners and maintenance personnel are particularly cautioned not to make attachments to, or otherwise modify, seats from original certification without approval from the FAA Engineering and Manufacturing District Office having original certification responsibility for that make and model.

Any unapproved attachment or modification to seat structure may increase load factors and metal stress which could cause failure of seat structure at a lesser "G" force than exhibited for original certification.

Examples of unauthorized attachments found are drilling holes in seat tubing to attach fire extinguishers and drilling holes to attach approach plate book bins to seats.

FLIGHT PLANNING

FAR Part 91 requires that each pilot in command, before beginning a flight, familiarize himself with all available information concerning that flight.

Obtain a current and complete preflight briefing. This should consist of local, enroute and destination weather and enroute navaid information. Enroute terrain and obstructions, alternate airports, airport runways active, length of runways, and takeoff and landing distances for the airplane for conditions expected should be known.

The prudent pilot will review his planned enroute track and stations and make a list for quick reference. It is strongly recommended a flight plan be filed with Flight Service Stations, even though the flight may be VFR. Also, advise Flight Service Stations of changes or delays of one hour or more and remember to close the flight plan at destination.

The pilot must be completely familiar with the performance of the airplane and performance data in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. The resultant effect of temperature and pressure altitude must be taken into account in performance if not accounted for on the charts. An applicable FAA Approved Airplane Flight Manual must be aboard the airplane at all times and include the weight and balance forms and equipment list.

PASSENGER INFORMATION CARDS

Beech has available, for most current production airplanes, passenger information cards which contain important information on the proper use of restraint systems, oxygen masks, emergency exits and emergency bracing procedures. Passenger information cards may be obtained at any BEECHCRAFT Authorized Outlet. A pilot should not only be familiar with the information contained in the cards, but should always, prior to flight, inform the passengers of the information contained in the information cards. The pilot should orally brief the passengers on the proper use of restraint systems, doors and emergency exits, and other emergency procedures, as required by Part 91 of the FAR's.

STOWAGE OF ARTICLES

The space between the seat pan and the floor is utilized to provide space for seat displacement. If hard, solid objects are stored beneath seats, the energy absorbing feature is lost and severe spinal injuries can occur to occupants.

Prior to flight, pilots should insure that articles are not stowed beneath seats that would restrict seat pan energy absorption or penetrate the seat in event of a high vertical velocity accident.

FLIGHT OPERATIONS

GENERAL

The pilot MUST be thoroughly familiar with ALL INFORMATION published by the manufacturer concerning the airplane, and is required by law to operate the airplane in accordance with the FAA Approved Airplane Flight Manual and placards installed.

PREFLIGHT INSPECTION

In addition to maintenance inspections and preflight information required by FAR Part 91, a complete, careful preflight inspection is imperative.

Each airplane has a checklist for the preflight inspection which must be followed. USE THE CHECKLIST.

WEIGHT AND BALANCE

Maintaining center of gravity within the approved envelope throughout the planned flight is an important safety consideration.

The airplane must be loaded so as not to exceed the weight and center of gravity (C.G.) limitations. Airplanes that are loaded above the maximum takeoff or landing weight limitations will have an overall lower level of performance compared to that shown in the Performance section of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. If loaded above maximum takeoff weight, takeoff distance and the landing distance will be longer than that shown in the Performance section; the stalling speed will be higher, rate of climb, the cruising speed, and the range of the airplane at any level of fuel will all be lower than shown in the Performance section.

If an airplane is loaded so that the C.G. is forward of the forward limit, it will require additional control movements for maneuvering the airplane with correspondingly higher control forces. The pilot may have difficulty during takeoff and landing because of the elevator control limits.

If an airplane is loaded aft of the aft C.G. limitation, the pilot will experience a lower level of stability. Airplane characteristics that indicate a lower stability level are; lower control forces, difficulty in trimming the airplane, lower control forces for maneuvering with attendant danger of structural overload, decayed stall characteristics, and a lower level of lateral-directional damping.

Ensure that all cargo and baggage is properly secured before takeoff. A sudden shift in balance at rotation can cause controllability problems.

AUTOPILOTS AND ELECTRIC TRIM SYSTEMS

Because there are several different models of autopilots and electric trim systems installed in Beech airplanes and different installations and switch positions are possible from airplane to airplane, it is essential that every owner/operator review his Airplane Flight Manual (AFM) Supplements and ensure that the supplements properly describe the autopilot and trim installations on his specific airplane. Each pilot, prior to flight, must be fully aware of the proper procedures for operation, and particularly disengagement, for the system as installed.

In addition to ensuring compliance with the autopilot manufacturer's maintenance requirements, all owners/operators should thoroughly familiarize themselves with the operation, function and procedures described in the Airplane Flight Manual Supplements. Ensure a full understanding of the methods of engagement and disengagement of the autopilot and trim systems.

Compare the descriptions and procedures contained in the Supplements to the actual installation in the airplane to ensure that the supplement accurately describes your installation. Test that all buttons, switches and circuit breakers function as described in the Supplements. If they do not function as described, have the system repaired by a qualified service agency. If field service advice or assistance is necessary, contact Beech Aircraft Corporation, Customer Support Department.

As stated in all AFM Supplements for autopilot systems and trim systems installed on Beech airplanes, the preflight check must be conducted before every flight. The preflight check assures not only that the systems and all of their features are operating properly, but also that the pilot, before flight, is familiar with the proper means of engagement and disengagement of the autopilot and trim system.

Autopilot Airplane Flight Manual Supplements caution against trying to override the autopilot system during flight without disengaging the autopilot because the autopilot will continue to trim the airplane and oppose the pilot's actions. This could result in a severely out of trim condition. This is a basic feature of all autopilots with electric trim follow-up.

Do not try to manually override the autopilot during flight.

IN CASE OF EMERGENCY, YOU CAN OVERPOWER THE AUTOPILOT TO CORRECT THE ATTITUDE, BUT THE AUTOPILOT AND ELECTRIC TRIM MUST THEN IMMEDIATELY BE DISENGAGED.

It is often difficult to distinguish an autopilot malfunction from an electric trim system malfunction. The safest course is to deactivate both. Do not re-engage either system until after you have safely landed. Then have the systems checked by a qualified service facility prior to further flight.

Depending upon the installation on your airplane, the following additional methods may be available to disengage the autopilot or electric trim in the event that the autopilot or electric trim does not disengage utilizing the disengage methods specified in the Supplements.

CAUTION

Transient control forces may occur when the autopilot is disengaged.

1. Turn off the autopilot master switch, if installed.
2. Pull the autopilot and trim circuit breaker(s) or turn off the autopilot switch breaker, if installed.
3. Turn off the RADIO MASTER SWITCH, if installed, and if the autopilot system and the trim system are wired through this switch.

CAUTION

Radios, including VHF COMM are also disconnected when the radio master switch is off.

4. Turn off the ELECTRIC MASTER SWITCH.

WARNING

Almost all electrically powered systems will be inoperative. Consult the AFM for further information.

5. Push the GA switch on throttle grip, if installed (depending upon the autopilot system).
6. Push TEST EACH FLT switch on the autopilot controller, if installed.

NOTE

After the autopilot is positively disengaged, it may be necessary to restore other electrical functions. Be sure when the master switches are turned on that the autopilot does not re-engage.

The above ways may or may not be available on your autopilot. It is essential that you read your airplane's AFM SUPPLEMENT for your autopilot system and check each function and operation on your system.

The engagement of the autopilot must be done in accordance with the instructions and procedures contained in the AFM SUPPLEMENT.

Particular attention must be paid to the autopilot settings prior to engagement. If you attempt to engage the autopilot when the airplane is out of trim, a large attitude change may occur.

IT IS ESSENTIAL THAT THE PROCEDURES SET FORTH IN THE APPROVED AFM SUPPLEMENTS FOR YOUR SPECIFIC INSTALLATION BE FOLLOWED BEFORE ENGAGING THE AUTOPILOT.

FLUTTER

Flutter is a phenomenon that can occur when an aerodynamic surface begins vibrating. The energy to sustain the vibration is derived from airflow over the surface. The amplitude of the vibration can (1) decrease, if airspeed is reduced; (2) remain constant, if airspeed is held constant and no failures occur; or (3) increase to the point of self-destruction, especially if airspeed is high and/or is allowed to increase. Flutter can lead to an in-flight break up of the airplane. Airplanes are designed so that flutter will not occur in the normal operating envelope of the airplane as long as the airplane is properly maintained. In the case of any airplane, decreasing the damping and stiffness of the structure or increasing the trailing edge weight of control surfaces will tend to cause flutter. If a combination of those factors is sufficient, flutter can occur within the normal operating envelope.

Owners and operators of airplanes have the primary responsibility for maintaining their airplanes. To fulfill that responsibility, it is imperative that all airplanes receive a thorough preflight inspection. Improper tension on the control cables or any other loose condition in the flight control system can also cause or contribute to flutter. Pilot's should pay particular attention to control surface attachment hardware including tab pushrod attachment during preflight inspection. Looseness of fixed surfaces or movement of control surfaces other than in the normal direction of travel should be rectified before flight. Further, owners should take their airplanes to mechanics who have access to current technical publications and prior experience in properly maintaining that make and model of airplane. The owner should make certain that control cable tension inspections are performed as outlined in the applicable Beech Inspection Guide. Worn control surface attachment hardware must be replaced. Any repainting or repair of a moveable control surface will require a verification of the control surface balance before the airplane is returned to service. Control surface drain holes must be open to prevent freezing of accumulated moisture, which could create an increased trailing-edge-heavy control surface and flutter.

If an excessive vibration, particularly in the control column and rudder pedals, is encountered in flight, this may be the onset of flutter and the procedure to follow is:

1. IMMEDIATELLY REDUCE AIRSPEED (lower the landing gear if necessary).
2. RESTRAIN THE CONTROLS OF THE AIRPLANE UNTIL THE VIBRATION CEASES.
3. FLY AT THE REDUCED AIRSPEED AND LAND AT THE NEAREST SUITABLE AIRPORT.
4. HAVE THE AIRPLANE INSPECTED FOR AIRFRAME DAMAGE, CONTROL SURFACE ATTACHING HARDWARE CONDITION/SECURITY, TRIM TAB FREE PLAY, PROPER CONTROL CABLE TENSION, AND CONTROL SURFACE BALANCE BY ANOTHER MECHANIC WHO IS FULLY QUALIFIED.

TURBULENT WEATHER

A complete and current weather briefing is a requirement for a safe trip.

Updating of weather information enroute is also essential. The wise pilot knows that weather conditions can change quickly, and treats weather forecasting as professional advice, rather than an absolute fact. He obtains all the advice he can, but stays alert to any sign or report of changing conditions.

Plan the flight to avoid areas of reported severe turbulence. It is not always possible to detect individual storm areas or find the in-between clear areas.

The National Weather Service classifies turbulence as follows:

Class of Turbulence	Effect
Extreme	Airplane is violently tossed about and is practically impossible to control. May cause structural damage.
Severe	Airplane may be momentarily out of control. Occupants are thrown violently against the belts and back into the seat. Unsecured objects are tossed about.
Moderate	Occupants require seat belts and occasionally are thrown against the belt. Unsecured objects move about.
Light	Occupants may be required to use seat belts, but objects in the airplane remain at rest.

Thunderstorms, squall lines and violent turbulence should be regarded as extremely dangerous and must be avoided. Hail and tornadic wind velocities can be encountered in thunderstorms that can destroy any airplane, just as tornadoes destroy nearly everything in their path on the ground.

Thunderstorms also pose the possibility of a lightning strike on an airplane. Any structure or equipment which shows evidence of a lightning strike, or of being subjected to a high current flow due to a strike, or is a suspected part of a lightning strike path through the airplane should be thoroughly inspected and any damage repaired prior to additional flight.

A roll cloud ahead of a squall line or thunderstorm is visible evidence of extreme turbulence; however, the absence of a roll cloud should not be interpreted as denoting that severe turbulence is not present.

Even though flight in severe turbulence must be avoided, flight in turbulent air may be encountered unexpectedly under certain conditions.

The following recommendations should be observed for airplane operation in turbulent air:

Flying through turbulent air presents two basic problems, the answer to both of which is proper airspeed. On one hand, if you maintain an excessive airspeed, you run the risk of structural damage or failure; on the other hand, if your airspeed is too low, you may stall.

If turbulence is encountered, reduce speed to the turbulent air penetration speed, if given, or to the maneuvering speed, which is listed in the Limitations section of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. These speeds give the best assurance of avoiding excessive stress loads, and at the same time provide the proper margin against inadvertent stalls due to gusts.

Beware of overcontrolling in an attempt to correct for changes in attitude; applying control pressure abruptly will build up G-forces rapidly and could cause structural damage or even failure. You should watch particularly your angle of bank, making turns as wide and shallow as possible. Be equally cautious in applying forward or back pressure to keep the airplane level. Maintain straight and level attitude in either up or down drafts. Use trim sparingly to avoid being grossly out of trim as the vertical air columns change velocity and direction. If necessary to avoid excessive airspeeds, lower the landing gear.

WIND SHEAR

Wind shears are rapid, localized changes in wind direction, which can occur vertically as well as horizontally. Wind shear can be very dangerous to all airplanes, large and small, particularly on approach to landing when airspeeds are slow.

A horizontal wind shear is a sudden change in wind direction or speed that can, for example, transform a headwind into a tailwind, producing a sudden decrease in indicated airspeed because of the inertia of the airplane. A vertical wind shear, is a sudden updraft or downdraft. Microbursts are intense, highly localized severe downdrafts.

The prediction of wind shears is far from an exact science. Monitor your airspeed carefully when flying near storms, particularly on approach. Be mentally prepared to add power and go around at the first indication that a wind shear is being encountered.

WEATHER RADAR

Airborne weather avoidance radar is, as its name implies, for avoiding severe weather--not for penetrating it. Whether to fly into an area of radar echoes depends on echo intensity, spacing between the echoes, and the capabilities of you and your airplane. Remember that weather radar detects only precipitation drops; it does not detect turbulence. Therefore, the radar scope provides no assurance of avoiding turbulence. The radar scope also does not provide assurance of avoiding instrument weather due to clouds and fog. Your scope may be clear between intense echoes; this clear area does not necessarily mean you can fly between the storms and maintain visual sighting of them.

Thunderstorms build and dissipate rapidly. Therefore, do not attempt to plan a course between echoes using ground based radar. The best use of ground radar information is to isolate general areas and coverage of echoes. You must avoid individual storms from in-flight observations either by visual sighting or by airborne radar. It is better to avoid the whole thunderstorm area than to detour around individual storms unless they are scattered.

Remember that while hail always gives a radar echo, it may fall several miles from the nearest visible cloud and hazardous turbulence may extend to as much as 20 miles from the echo edge. Avoid intense or extreme level echoes by at least 20 miles; that is, such echoes should be separated by at least 40 miles before you fly between them. With weaker echoes you can reduce the distance by which you avoid them.

Above all, remember this: never regard any thunderstorm lightly. Even when radar observers report the echoes are of light intensity, avoiding thunderstorms is the best policy. The following are some do's and don'ts of thunderstorm avoidance:

1. Don't land or take off in the face of an approaching thunderstorm. A sudden gust front of low level turbulence could cause loss of control.
2. Don't attempt to fly under a thunderstorm even if you can see through to the other side. Turbulence and wind shear under the storm could be disastrous.
3. Don't fly without airborne radar into a cloud mass containing scattered embedded thunderstorms. Embedded thunderstorms usually can not be visually circumnavigated.
4. Don't trust visual appearance to be a reliable indicator of the turbulence inside a thunderstorm.

5. Do avoid by at least 20 miles any thunderstorm identified as severe or giving an intense radar echo. This is especially true under the anvil of a large cumulonimbus.
6. Do circumnavigate the entire area if the area has 6/10 or greater thunderstorm coverage.
7. Do remember that vivid and frequent lightning indicates the probability of a severe thunderstorm.
8. Do regard as extremely hazardous any thunderstorm with tops 35,000 feet or higher, whether the top is visually sighted or determined by radar.

If you cannot avoid penetrating a thunderstorm, the following are some do's BEFORE entering the storm:

9. Tighten your safety belt, put on your shoulder harness, and secure all loose objects.
10. Plan and hold your course to take you through the storm in minimum time.
11. To avoid the most critical icing, establish a penetration altitude below the freezing level or above the level of -15°C.
12. Verify that pitot heat is on and turn on carburetor heat or engine anti-ice. Icing can be rapid at any altitude and cause almost instantaneous power failure and/or loss of airspeed indication.

MOUNTAIN FLYING

Pilots flying in mountainous areas should inform themselves of all aspects of mountain flying, including the effects of topographic features on weather conditions. Many good articles have been published, and a synopsis of mountain flying operations is included in the FAA Airman's Information Manual, Part 1.

Avoid flight at low altitudes over mountainous terrain, particularly near the lee slopes. If the wind velocity near the level of the ridge is in excess of 25 knots and approximately perpendicular to the ridge, mountain wave conditions are likely over and near the lee slopes. If the wind velocity at the level of the ridge exceeds 50 knots, a strong mountain wave is probable with extreme up and down drafts and severe turbulence. The worst turbulence will be encountered in and below the rotor zone, which is usually 8 to 10 miles downwind from the ridge. This zone is sometimes characterized by the presence of "roll clouds" if sufficient moisture is present; altocumulus standing lenticular clouds are also visible signs that a mountain wave exists, but their presence is likewise dependent on moisture. Mountain wave turbulence can, of course, occur in dry air and the absence of such clouds should not be taken as assurance that mountain wave turbulence will not be encountered. A mountain wave downdraft may exceed the climb capability of your airplane. Avoid mountain wave downdrafts.

VFR - LOW CEILINGS

If you are not instrument rated, do not attempt "VFR on Top" or "Special VFR" flight or clearances. Being caught above a solid cloud layer when an emergency descent is required (or at destination) is an extremely hazardous position for the VFR pilot. Accepting a clearance out of airport control zones with no minimum ceiling and one-mile visibility as permitted with "Special VFR" is a foolish practice for the VFR pilot.

Avoid areas of low ceilings and restricted visibility unless you are instrument rated and proficient and have an instrument equipped airplane. Then proceed with caution and with planned alternates.

VFR AT NIGHT

When flying VFR at night, in addition to the altitude appropriate for the direction of flight, pilots should maintain a safe minimum altitude as dictated by terrain, obstacles such as

TV towers, or communities in the area flown. This is especially true in mountainous terrain, where there is usually very little ground reference. Minimum clearance is 2,000 feet above the highest obstacle enroute. Do not depend on your ability to see obstacles in time to miss them. Flight on dark nights over sparsely populated country can be the same as IFR, and must be avoided by inexperienced or non-IFR rated pilots.

VERTIGO - DISORIENTATION

Disorientation can occur in a variety of ways. During flight, inner ear balancing mechanisms are subjected to varied forces not normally experienced on the ground. This, combined with loss of outside visual reference, can cause vertigo. False interpretations (illusions) result, and may confuse the pilot's conception of the attitude and position of his airplane.

Under VFR conditions, the visual sense, using the horizon as a reference, can override the illusions. Under low visibility conditions (night, fog, clouds, haze, etc.) the illusions predominate. Only through awareness of these illusions, and proficiency in instrument flight procedures, can an airplane be operated safely in a low visibility environment.

Flying in fog, dense haze or dust, cloud banks, or very low visibility, with strobe lights or rotating beacons turned on can contribute to vertigo. They should be turned off in these conditions, particularly at night.

All pilots should check the weather and use good judgment in planning flights. The VFR pilot should use extra caution in avoiding low visibility conditions.

Motion sickness often precedes or accompanies disorientation and may further jeopardize the flight.

Disorientation in low visibility conditions is not limited to VFR pilots. Although IFR pilots are trained to look at their instruments to gain an artificial visual reference as a replacement for the loss of a visual horizon, they do not always do so. This can happen when the pilot's physical condition will not permit him to concentrate on his instruments; when the pilot is not proficient in flying instrument conditions in the airplane he is flying; or, when the pilot's work load of flying by reference to his instruments is augmented by such factors as turbulence. Even an instrument rated pilot encountering instrument conditions, intentional or unintentional, should ask himself whether or not he is sufficiently alert and proficient in the airplane he is flying, to fly under low visibility conditions and in the turbulence anticipated or encountered.

If any doubt exists, the flight should not be made or it should be discontinued as soon as possible.

The result of vertigo is loss of control of the airplane. If the loss of control is sustained, it will result in an excessive speed accident. Excessive speed accidents occur in one of two manners, either as an inflight airframe separation or as a high speed ground impact; and they are fatal accidents in either case. All airplanes are subject to this form of accident.

For years, Beech Pilot's Operating Handbooks and FAA Approved Airplane Flight Manuals have contained instructions that the landing gear should be extended in any circumstance in which the pilot encounters IFR conditions which approach the limits of his capability or his ratings. Lowering the gear in IFR conditions or flight into heavy or severe turbulence, tends to stabilize the airplane, assists in maintaining proper airspeed, and will substantially reduce the possibility of reaching excessive airspeeds with catastrophic consequences, even where loss of control is experienced.

Excessive speed accidents occur at airspeeds greatly in excess of two operating limitations which are specified in the manuals: Maximum maneuvering speed and the "red line" or "never exceed" speed. Such speed limits are set to protect the structure of an airplane. For example, flight controls are designed to be used to their fullest extent only below the airplane's maximum maneuvering speed. As a result, the control surfaces should never be suddenly or fully deflected above maximum maneuvering speed. Turbulence penetration should not be performed above that speed. The accidents we are discussing here occur at airspeeds greatly in excess of these limitations. No airplane should ever be flown beyond its FAA approved operating limitations.

STALLS, SLOW FLIGHT AND TRAINING

The stall warning system must be kept operational at all times and must not be deactivated by interruption of circuits, circuit breakers, or fuses. Compliance with this requirement is especially important in all high performance single engine airplanes during simulated engine-out practice or stall demonstrations, because the stall speed is critical in all low-speed operation of airplanes.

Training should be accomplished under the supervision of a qualified instructor-pilot, with careful reference to the applicable sections of the FAA Practical Test Standards and FAA Pilot Transition Courses for Complex Single Engine and Light Twin Engine Airplanes (AC 61-9). In particular, observe carefully the warnings in the Practical Test Standards.

SPINS

A major cause of fatal accidents in general aviation airplanes is a spin. Stall demonstrations and practice are a means for a pilot to acquire the skills to recognize when a stall is about to occur and to recover as soon as the first signs of a stall are evident.
If a stall does not occur - A spin cannot occur.

It is important to remember, however, that a stall can occur in any flight attitude, at any airspeed, if controls are misused.

Unless your airplane has been specifically certificated in the aerobatic category and specifically tested for spin recovery characteristics, it is placarded against intentional spins.

The pilot of an airplane placarded against intentional spins should assume that the airplane may become uncontrollable in a spin, since its performance characteristics beyond certain limits specified in the FAA regulations may not have been tested and are unknown. This is why airplanes are placarded against intentional spins, and this is why stall avoidance is your protection against an inadvertent spin.

Pilots are taught that intentional spins are entered by deliberately inducing a yawing moment with the controls as the airplane is stalled. Inadvertent spins result from the same combination - stall plus yaw. That is why it is important to use coordinated controls and to recover at the first indication of a stall when practicing stalls.

Always remember that extra alertness and pilot techniques are required for slow flight maneuvers, including the practice or demonstration of stalls. In addition to the foregoing mandatory procedure, always:

- Be certain that the center of gravity of the airplane is as far forward as possible. Forward C.G. aids stall recovery, spin avoidance and spin recovery. An aft C.G. can create a tendency for a spin to stabilize, which delays recovery.
- Whenever a student pilot will be required to practice slow flight, be certain that the qualified instructor pilot has a full set of operable controls available. FAA regulations prohibit flight instruction without full dual controls.

- Conduct any maneuvers which could possibly result in a spin at altitudes in excess of five thousand (5,000) feet above ground level in clear air only.
- Remember that an airplane, at or near traffic pattern and approach altitudes, cannot recover from a spin, or perhaps even a stall, before impact with the ground. On final approach maintain at least the airspeed shown in the flight manual.
- Remember that if an airplane flown under instrument conditions is permitted to stall or enter a spin, the pilot, without reference to the horizon, is certain to become disoriented. He may be unable to recognize a stall, spin entry, or the spin condition and he may be unable to determine even the direction of the rotation.
- Finally, never forget that stall avoidance is your best protection against an inadvertent spin. MAINTAIN YOUR AIRSPEED.

In airplanes not certificated for aerobatics, spins are prohibited. If a spin is entered inadvertently:

Immediately move the control column full forward and simultaneously apply full rudder opposite to the direction of the spin; continue to hold this position until rotation stops and then neutralize all controls and execute a smooth pullout. Ailerons should be neutral and the throttle in idle position at all times during recovery.

DESCENT

In single engine piston-powered airplanes, supercharged or normally aspirated, it is necessary to avoid prolonged descents with low power, as this produces two problems: (1) excessively cool cylinder head temperatures which cause premature engine wear, and (2) excessively rich mixtures due to idle enrichment (and altitude) which causes soot and lead deposits on the spark plugs (fouling). The second of these is the more serious consideration; the engine may not respond to the throttle when it is desired to discontinue the descent. Both problems are amenable to one solution: maintain adequate power to keep cylinder head temperature in the "green" range during descent, and lean to best power mixture (that is, progressively enrich the mixture from cruise only slightly as altitude decreases). This procedure will lengthen the descent, of course, and requires some advance planning. If it is necessary to make a prolonged descent at or near idle, as in practicing forced landings, at least avoid the problem of fouled spark plugs by frequently advancing the throttle until the engine runs smoothly, and maintain an appropriate mixture setting with altitude. (Refer to pre-landing check list.)

VORTICES - WAKE TURBULENCE

Every airplane generates wakes of turbulence while in flight. Part of this is from the propeller or jet engine, and part from the wing tip vortices. The larger and heavier the airplane, the more pronounced and turbulent the wakes will be. Wing tip vortices from large, heavy airplanes are very severe at close range, degenerating with time, wind and distance. These are rolling in nature, from each wing tip. In tests, vortex velocities of 133 knots have been recorded. Encountering the rolling effect of wing tip vortices within two minutes after passage of large airplanes is most hazardous to light airplanes. This roll effect can exceed the maximum counterroll obtainable in a light airplane. The turbulent areas may remain for as long as three minutes or more, depending on wind conditions, and may extend several miles behind the airplane. Plan to fly slightly above and to the windward side of other airplanes. Because of the wide variety of conditions that can be encountered, there is no set rule to follow to avoid wake turbulence in all situations. However, the Airman's Information Manual, and to a greater extent Advisory Circular 90-23, Aircraft Wake Turbulence, provide a thorough discussion of the factors you should be aware of when wake turbulence may be encountered.

TAKEOFF AND LANDING CONDITIONS

When taking off on runways covered with water or freezing slush, the landing gear should remain extended for approximately ten seconds longer than normal, allowing the wheels to spin and dissipate the freezing moisture. The landing gear should then be cycled up, then down, wait approximately five seconds and then retracted again. Caution must be exercised to insure that the entire operation is performed below Maximum Landing Gear Operating Airspeed.

Use caution when landing on runways that are covered by water or slush which cause hydroplaning (aquaplaning), a phenomenon that renders braking and steering ineffective because of the lack of sufficient surface friction. Snow and ice covered runways are also hazardous. The pilot should also be alert to the possibility of the brakes freezing.

Use caution when taking off or landing during gusty wind conditions. Also be aware of the special wind conditions caused by buildings or other obstructions located near the runway.

MEDICAL FACTS FOR PILOTS

GENERAL

When the pilot enters the airplane, he becomes an integral part of the man-machine system. He is just as essential to a successful flight as the control surfaces. To ignore the pilot in preflight planning would be as senseless as failing to inspect the integrity of the control surfaces or any other vital part of the machine. The pilot has the responsibility for determining his reliability prior to entering the airplane for flight. When piloting an airplane, an individual should be free of conditions which are harmful to alertness, ability to make correct decisions, and rapid reaction time.

FATIGUE

Fatigue generally slows reaction time and causes errors due to inattention. In addition to the most common cause of fatigue; insufficient rest and loss of sleep, the pressures of business, financial worries, and family problems can be important contributing factors. If you are tired, don't fly.

HYPOXIA

Hypoxia, in simple terms, is a lack of sufficient oxygen to keep the brain and other body tissues functioning properly. There is a wide individual variation in susceptibility to hypoxia. In addition to progressively insufficient oxygen at higher altitudes, anything interfering with the blood's ability to carry oxygen can contribute to hypoxia (anemias, carbon monoxide, and certain drugs). Also, alcohol and various drugs decrease the brain's tolerance to hypoxia.

Your body has no built-in alarm system to let you know when you are not getting enough oxygen. It is impossible to predict when or where hypoxia will occur during a given flight, or how it will manifest itself. Some of the common symptoms of hypoxia are increased breathing rate, a light-headed or dizzy sensation, tingling or warm sensation, sweating, reduced visual field, sleepiness, blue coloring of skin, fingernails, and lips, and behavior changes. A particularly dangerous feature of hypoxia is an increased sense of well-being, called euphoria. It obscures a person's ability and desire to be critical of himself, slows reaction time, and impairs thinking ability. Consequently, a hypoxic individual commonly believes things are getting progressively better while he nears total collapse.

The symptoms are slow but progressive, insidious in onset, and are most marked at altitudes starting above ten thousand feet. Night vision, however, can be impaired starting at an altitude of 5,000 feet. Persons who have recently overindulged in alcohol, who are moderate to heavy smokers, or who take certain drugs, may be more susceptible to hypoxia. Susceptibility may also vary in the same individual from day to day or even morning to evening. Use oxygen on flights above 10,000 feet and at any time when symptoms appear.

Depending upon altitude, a hypoxic individual has a limited time to make decisions and perform useful acts, even though he may remain conscious for a longer period. The time of useful consciousness is approximately 3-5 minutes at 25,000 feet of altitude and diminishes markedly as altitude increases.

Should symptoms occur that cannot definitely be identified as either hypoxia or hyperventilation, try three or four deep breaths of oxygen. The symptoms should improve markedly if the condition was hypoxia (recovery from hypoxia is rapid).

Pilots who fly to altitudes that require or may require the use of supplemental oxygen should be thoroughly familiar with the operation of the airplane oxygen systems. A preflight inspection of the system should be performed, including proper fit of the mask. The passengers should be briefed on the proper use of their oxygen system before flight.

Pilots who wear beards should be careful to ensure that their beard is carefully trimmed so that it will not interfere with proper sealing of the oxygen masks. If you wear a beard or moustache, test the fit of your oxygen mask on the ground for proper sealing. Studies conducted by the military and oxygen equipment manufacturers conclude that oxygen masks do not seal over beards or heavy facial hair.

Federal Aviation Regulations related to the use of supplemental oxygen by flight crew and passengers must be adhered to if flight at higher altitudes is to be accomplished safely. Passengers with significant circulatory or lung disease may need to use supplemental oxygen at lower altitudes than specified by these regulations.

HYPERVENTILATION

Hyperventilation, or overbreathing, is a disturbance of respiration that may occur in individuals as a result of emotional tension or anxiety. Under conditions of emotional stress, fright, or pain, breathing rate may increase, causing increased lung ventilation, although the carbon dioxide output of the body cells does not increase. As a result, carbon dioxide is "washed out" of the blood. The most common symptoms of hyperventilation are: dizziness, nausea, sleepiness, and finally, unconsciousness. If the symptoms persist, discontinue use of oxygen and consciously slow your breathing rate until symptoms clear, and then resume normal breathing rate. Normal breathing can be aided by talking aloud.

ALCOHOL

Common sense and scientific evidence dictate that you must not fly as a crew member while under the influence of alcohol. Alcohol, even in small amounts, produces (among other things):

- A dulling of critical judgement.
- A decreased sense of responsibility.
- Diminished skill reactions and coordination.
- Decreased speed and strength of muscular reflexes (even after one ounce of alcohol).
- Decreases in efficiency of eye movements during reading (after one ounce of alcohol).
- Increased frequency of errors (after one ounce of alcohol).
- Constriction of visual fields.
- Decreased ability to see under dim illuminations.
- Loss of efficiency of sense of touch.
- Decrease of memory and reasoning ability.

- Increased susceptibility to fatigue and decreased attention span.
- Decreased relevance of response.
- Increased self confidence with decreased insight into immediate capabilities.

Tests have shown that pilots commit major errors of judgment and procedure at blood alcohol levels substantially less than the minimum legal levels of intoxication for most states. These tests further show a continuation of impairment from alcohol up to as many as 14 hours after consumption, with no appreciable diminution of impairment. The body metabolizes ingested alcohol at a rate of about one-third of an ounce per hour. Even after the body completely destroys a moderate amount of alcohol, a pilot can still be severely impaired for many hours by hangover. The effects of alcohol on the body are magnified at altitudes, as 2 oz. of alcohol at 18,000 feet produce the same adverse effects as 6 oz. at sea level.

Federal Aviation Regulations have been amended to reflect the FAA's growing concern with the effects of alcohol impairment. FAR 91 states:

"Alcohol or drugs.

(a) No person may act or attempt to act as a crewmember of a civil aircraft -

(1) Within 8 hours after the consumption of any alcoholic beverage;

(2) While under the influence of alcohol;

(3) While using any drug that affects the person's faculties in any way contrary to safety; or

(4) While having .04 percent by weight or more alcohol in the blood.

(b) Except in an emergency, no pilot of a civil aircraft may allow a person who appears to be intoxicated or who demonstrates by manner or physical indications that the individual is under the influence of drugs (except a medical patient under proper care) to be carried in that aircraft."

Because of the slow destruction of alcohol by the body, a pilot may still be under influence eight hours after drinking a moderate amount of alcohol. Therefore, an excellent rule is to allow at least 12 to 24 hours between "bottle and throttle," depending on the amount of alcoholic beverage consumed.

DRUGS

Self-medication or taking medicine in any form when you are flying can be extremely hazardous. Even simple home or over-the-counter remedies and drugs such as aspirin, antihistamines, cold tablets, cough mixtures, laxatives, tranquilizers, and appetite suppressors, may seriously impair the judgment and coordination needed while flying. The safest rule is to take no medicine before or while flying, except after consultation with your Aviation Medical Examiner.

SCUBA DIVING

Flying shortly after any prolonged scuba diving could be dangerous. Under the increased pressure of the water, excess nitrogen is absorbed into your system. If sufficient time has not elapsed prior to takeoff for your system to rid itself of this excess gas, you may experience the bends at altitudes even under 10,000 feet, where most light planes fly.

CARBON MONOXIDE AND NIGHT VISION

The presence of carbon monoxide results in hypoxia which will affect night vision in the same manner and extent as hypoxia from high altitudes. Even small levels of carbon monoxide have the same effect as an altitude increase of 8,000 to 10,000 feet. Smoking several cigarettes can result in a carbon monoxide saturation sufficient to affect visual sensitivity equal to an increase of 8,000 feet altitude.

DECOMPRESSION SICKNESS

Pilots flying unpressurized airplanes at altitudes in excess of 10,000 feet should be alert for the symptoms of 'decompression sickness'. This phenomenon, while rare, can impair the pilot's ability to perform and in extreme cases, can result in the victim being rendered unconscious. Decompression sickness, also known as dysbarism and aviators "bends", is caused by nitrogen bubble formation in body tissue as the ambient air pressure is reduced by climbing to higher altitudes. The symptoms are pain in the joints, abdominal cramps, burning sensations in the skin, visual impairment and numbness. Some of these symptoms are similar to hypoxia. The only known remedy for decompression sickness is recompression, which can only be accomplished in an unpressurized airplane by descending. The pilot should immediately descend if it is suspected that this condition exists, since the effects will only worsen with continued exposure to the reduced pressure environment at altitude and could result, if uncorrected, in complete incapacitation. The possibility of decompression sickness can be greatly reduced by pre-breathing oxygen prior to flight and by commencing oxygen breathing well below the altitudes where it is legally mandatory.

A FINAL WORD

Airplanes are truly remarkable machines. They enable us to shrink distance and time, and to expand our business and personal horizons in ways that, not too many years ago, were virtually inconceivable. For many businesses, the general aviation airplane has become the indispensable tool of efficiency.

Advances in the mechanical reliability of the airplanes we fly have been equally impressive, as attested by the steadily declining statistics of accidents attributed to mechanical causes, at a time when the airframe, systems and power plants have grown infinitely more complex. The explosion in capability of avionics systems is even more remarkable. Radar, RNAV, LORAN, sophisticated autopilots and other devices which, just a few years ago, were too large and prohibitively expensive for general aviation size airplanes, are becoming increasingly commonplace in even the smallest airplanes.

It is thus that this Safety Information is directed to the pilot, for it is in the area of the skill and proficiency of you, the pilot, that the greatest gains in safe flying are to be made over the years to come. Intimate knowledge of your airplane, its capabilities and its limitations, and disciplined adherence to the procedures for your airplane's operation, will enable you to transform potential tragedy into an interesting hangar story when - as it inevitably will - the abnormal situation is presented.

Know your airplane's limitations, and your own. Never exceed either.

Safe flying,

BEECH AIRCRAFT CORPORATION

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GARMIN G1000 SOFTWARE CONFIGURATION MATRIX
FOR THE MODEL A36/G36

The following is the approved configuration of GARMIN hardware and it's associated software. This document may be subsequently revised by Service Bulletins and/or product upgrades. To confirm the approved configuration for your airplane visit http://www.raytheonaircraft.com/service_support/publications.asp or call Raytheon Aircraft Customer Support at 1-800-429-5372.

G1000 A36/G36 Code Loader Card, Garmin Part Number 010-00458-04 (Installs G1000 System Software Version 0458.04)				
Description	Compatible LRU P/N's	System Status Page Name	Software	
			P/N	VER.
GTX 33 Mode S Transponder	011-00779-01	GTX1-GIA1	006-B0172-xx	4.02
		GTX1-GIA2		
GEA 71 Engine/Airframe Unit	011-00831-00	GEA1-GIA1	006-B0193-04	2.06
		GEA1-GIA2		
GDC 74A ADC	011-00882-00	GDC1-GIA1	006-B0261-03	2.05
		GDC1 FPGA	006-C0055-00	01.05
GMU 44 Magnetometer	011-00870-00	GMU1	006-B0224-00	2.01
		GMU1 FPGA	006-C0048-00	2.00
GDU 1040 PFD	011-00972-03	PFD1	006-B0319-31	5.01
GDU 1043 MFD	011-01079-00	MFD1	006-B0319-31	5.01
GIA 63 No. 1 (1)	011-00781-01	GIA1	006-B0190-22	3.02
		GPS1	006-B0093-xx	3.01
		COM1	006-B0081-xx	7.00
		NAV1	006-B0082-xx	4.00
		GS1	006-B0083-xx	3.00
GIA 63 No. 2 (1)	011-00781-01	GIA2	006-B0190-22	3.02
		GPS2	006-B0093-xx	3.01
		COM2	006-B0081-xx	7.00
		NAV2	006-B0082-xx	4.00
		GS2	006-B0083-xx	3.00
GRS 77 AHRS	011-00868-10	GRS1-GIA1	006-B0223-02	2.03
		GRS1-FPGA	006-C0049-00	02.00

GARMIN G1000 SOFTWARE CONFIGURATION MATRIX
FOR THE MODEL A36/G36

GMA 1347 Audio Panel	011-00809-00	GMA1-GIA1	006-B0203-06	2.07
		GMA1-GIA2		
		GRS1 MV DB	006-D0159-00	2000.00
GDL 69A Data Link	011-00987-00	GDL69	006-B0317-10	3.00.00
GSA 81 Autopilot Servo – Qty 4	011-00878-00	(3)	006-B0398-12	2.05
		(2)	006-D0372-01	2.01

(1) Garmin Service Bulletin 0418 must be complied with.
(2) All LRU entries that begin with GFC1 CERT or CFC2 CERT.
(3) All LRU entries that begin with GSA.